DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

PROCESS DOCUMENTATION AND METHOD INSTALLATION OF ALUMINIUM STRIP CEILING

Prepared by:

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DEPARTMENT OF BUILDING
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA
(PERAK)

FEBRUARY 2022

It is recommended that the report of this practical training provided

By

MUHAMMAD AIZAT BIN MA'AMOR
2019246004

Entitled

PROCESS DOCUMENTATION AND METHOD INSTALLATION OF ALUMINIUM STRIP CEILING

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

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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 NUR MEGA REALTY SDN BHD for duration of 20 weeks starting from 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 requirements for obtaining the Diploma in Building.

…….

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UiTM ID No : 2019246004

Date : 10 JANUARY 2022

ACKNOWLEDGEMENT

Alhamdulillah, praise to Allah, the Most Merciful, the Most Graceful.

I would like to extend my heartfelt gratitude for the guidance, advice and help rendered throughout the period of training by the following group of amazing individuals. First and foremost, I would like to thank Mr. Megat Juma'ah Luddin Bin Megat Idris for the opportunity given, to conduct my training in his esteem company, NUR MEGA REALTY SDN BHD. His team of professionals have enabled me to learn and develop my understanding, knowledge and feel of real time projects, and the theory involved in analysis of structures, building and civil works. They are also responsible towards streamlining and assessing my training It is an honour for me to be given the opportunity to 'work' with all of you.

I would also like to thank all the UiTM lecturers that have taught and nurtured me in becoming a better student and person. I would also like to extend my deepest appreciation to the lecturers who are directly involved during my training stint. To Ts Azira Binti Ibrahim, Supervising Lecturer, Madam Nor Azizah Talkis Evaluation Lecturer, Dr Nor Asma Hafizah Binti Hadzaman, Practical Training Coordinator and Dr. Dzulkarnaean Bin Ismail, Programme Coordinator, I value the time, effort, encouragement, and ideas that they have contributed towards the successful completion of my training, this report and the valuable knowledge that have been shared over the last few semesters.

Finally, my special thanks to my beloved parents for their sacrifices over the years. Thank you so much.

ABSTRACT

The ceiling, the overhead surface or surfaces that cover a room, and the underside of a floor or a roof are all examples of ceilings. Ceilings are frequently utilised to conceal the construction of floors and roofs. The NUR MEGA REALTY chose an aluminium strip ceiling for its aesthetic appeal when installing ceiling the back gate of Politeknik Ungku Omar's guard house. Strip ceilings are created in a variety of widths and lengths to meet the needs of the customer's project. The aim for the report is the construction of aluminium strip ceiling that was utilised for the project in Politeknik Ungku Omar. For the objective of this report is to identify the process approval documentation of ceiling item. Second, objectives are to identify the methods of installation aluminium strip ceiling and lastly to identify the time to complete aluminium strip ceiling. The method of study for this report is by observation how the process of installing an aluminium strip ceiling is carried out from the beginning to finish. Next, by document review to acquire all the construction data include the firm profile, construction drawings, standard operating procedures (SOP), progress reports, and photographs taken by other personnel. Furthermore, by method of interview. It was conducted with the company manager, as well as with the contractor who oversees overseeing the project while it is being built on the construction site. This report not only analyse process documentation of aluminium strip ceiling, but also analyse the method installation of aluminium strip ceiling. In conclusion, an aluminium strip ceiling is one of the options in constructing ceiling. It is one of the easiest ways of building ceiling and have a stunning look.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1.0

INTRODUCTION

1.1 Background of Study

The ceiling, the overhead surface or surfaces that cover a room, and the underside of a floor or a roof are all examples of ceilings. Ceilings are frequently utilised to conceal the construction of floors and roofs. Their flat surfaces have long been used for decorative purposes, whether by painting the flat surface, emphasising the structural parts of a roof or floor, or treating the flat surface as a field for an overall pattern of relief, since the beginning of time. Typically, there are ten various varieties of ceiling design and profile to choose from. There are many different types of ceilings, each with its own character that can easily transform the look and feel of any place.

NUR MEGA REALTY chose an aluminium strip ceiling for its aesthetic appeal when installing ceiling the back gate of Politeknik Ungku Omar's guard house. Strip ceilings are created in a variety of widths and lengths to meet the needs of the customer's project. Because of this characteristic, they are an excellent choice for a wide range of applications and designs. Strip ceilings are easily customised to accommodate light fixtures, vents, air conditioning, and ventilation, among other ceilings.

The first and most important benefit and offer provided by utilizing aluminium strip ceilings is that they are incredibly long-lasting and do not require frequent maintenance or replacement like other types of ceilings do. They are quite durable and can be cleaned with a simple soapy water solution and a cloth to remove any leftover residue from the surface. In comparison to traditional dropped ceiling materials, aluminium strip ceiling systems are stronger and more durable, while also providing easy access to the ceiling void. These items require routine maintenance and repair on an as-needed basis. Additionally, these ceilings are resistant to moisture, which reduces the likelihood of staining and crumbling because of leaks in the building. As an added plus, they are also fireproof, allowing you to sleep soundly knowing that the ceiling will remain intact no matter what happens. Second, this strip ceiling is very customizable, allowing it to be installed precisely in accordance with the needs of the

homeowner or business. They are also simple to install, which means that they do not necessitate the payment of hefty installation expenses. Next, aluminium strip ceiling is acoustic, this type of ceiling aid in the absorption or redirection of sound, preventing the formation of an echo chamber. Acoustic tiles with mineral wool inlays or fleece absorb sound and provide less noise interruption than traditional materials, which may not be found in other types of flooring. Ceilings with a heavy system also reduce background noise from adjacent rooms.

Finally, this ceiling is stylish and variety. It is because these ceilings are available in a wide range of styles, textures, and finishes to complement any interior design. It is possible to have the ceiling systems painted or coated in any colour of client choosing, and they can be made to look like anything from classic tin roof squares to an elegant smooth finish in client signature colours. One of the most effective applications for this type of material is to conceal an unsightly plaster ceiling. If want to avoid painting client furniture, choose for metal colours instead, which come in a variety of attractive hues and finishes on their own: steel, brass, copper, aluminium, and chrome, among others. They are available in a variety of finishes, including plain metal with a base colour, powder coated, brushed, and polished. The material used for linear metal ceiling systems is also available in a variety of shapes, allowing for a spectacular view. It is possible to achieve a completely different appearance by including designs and crafting the underlying supports in curving structures, as well as by giving the linear system a varying height. This strip ceiling blends in with any ceiling area and can be suspended, installed, and unplugged with ease, allowing to cover nearly any surface with it.

There are many different types of ceilings that can be used to enhance the beauty of a building throughout the world. Nonetheless, throughout internship at NUR MEGA REALTY SDN BHD, supervisor giving a task to concentrate on construction of aluminium strip ceiling that was utilised for the project in Politeknik Ungku Omar.

1.2 Objectives

i) To identify the process approval documentation of ceiling item

ii) To identify the methods of installation aluminium strip ceiling

iii) To identify the time to complete aluminium strip ceiling

1.3 Scope of Study

The Politeknik Ungku Omar, which is located at Jalan Raja Musa Mahadi, Politeknik Ungku Omar, 31400 Ipoh, Perak, has been designated as the location for the study. The documentation and method installation of aluminium strip ceiling is the primary focus of this investigation. This report is to examine the process of documentation and the methods of installation, such as the materials that are being used. Finally, the time required to complete the aluminium strip ceiling installation from beginning to the end of constructing it.

1.4 Methods of Study

1.4.1 Observation

The observation is a method of gathering information by observing things. The observation is about how the process of installing an aluminium strip ceiling is carried out from the beginning to finish and how to make documentation for item that being used for the construction. Their work is recorded with a photograph snapped with a phone, and any pertinent information is written down in brief notes.

1.4.2 Document review

The documents reviewed to acquire all the construction data include the firm profile, construction drawings, standard operating procedures (SOP), progress reports, and photographs taken by other personnel. The drawing design will be utilised as a reference at the site while ceiling work process is being monitored. The photographs that belong to others are also the best sources of information during document examinations. Additionally, the construction flow can be simply understood by referring to the BQ of the currently under construction building that was provided by Practical Supervisor.

1.4.3 Interview

The interview is one of the methods for collecting construction data, and it involves conducting a structured or semi-structured interview with a trusted person who is familiar with the project. The observations and work at the site were taken while the observers and workers were on site. The interview was conducted with the company manager, as well as with the contractor who in charge of overseeing the project while it is being built on the construction site. This interview was also conducted with the workers who were on the construction site at the time of the work on the aluminium strip ceiling. Weekly semi-structured interviews were also conducted with the contractor in charge of overseeing the project's execution in the office, with each interview lasting approximately 5 minutes on average. The semi-structured interview was documented with brief notes.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

NUR MEGA REALTY SDN BHD is a company that deals with construction works and was established by two joint directors named Megat Juma'ah Luddin Bin Megat Idris and Megat Hisham Bin Megat Idris on date 16 June 2017. This company is actively involved building exclusive infrastructure projects all over the country and have completed several contracts with various multinational and local companies and individuals. They experienced in providing quality services and products. This company involved in varioustypes of construction and maintenance works involving government agencies such as Jabatan Kerja Raya (JKR), Lembaga Air Perak (LAP), Tenaga Nasional Berhad (TNB) and others.

2.2 Company Profile

NUR MEGA REALTY SDN BHD was established in year 2003 as general works contractor and maintenance services. Over the years, the group has undertaken many projects and accumulated skills know-how and experiences in design and build solutions, project management services, building trades and related engineering works. Since then, NUR MEGA REALTY SDN BHD focus has been upon serving multinational services providers and property management firms and individuals, with various services related to civil construction, steel works and road works. Through extensive task history of constructing ventures, we have developed a customer services business philosophy, proactive and timely customer service is the backbone of this company

Today, NUR MEGA REALTY SDN BHD takes on the role of main contractor for small to mediumuse projects and perform project management services to coordinates specialist trades for industrial commercial projects. This company also provide design inputs and building solutions as value-add services to our details. This are list of previous projects of Nur Mega Enterprise company.

Figure 2.2 NUR MEGA REALTY company logo

Table 2.2 Information of Nur Mega Realty

COMPANY	NUR MEGA REALTYSDN BHD
COMPANY MANAGER	i) Megat Juma'ah Luddin Bin Megat Idris ii) Megat Hisham Bin Megat Idris
REGISTRATION NO.	1235466-K
REGISTRATION DATE	07/07/2003
ADDRESS	No. 991, Persiaran Chandan 2/6, Taman Chandan Putri, 33000 Kuala Kangsar, Perak Darul Ridzuan.
CONTACT	012 - 536 4368
EMAIL	tagem6457@gmail.com
BANK	**(Malayan Banking Berhad)** Cawangan Kuala Kangsar, 68-70 Jalan Raja Bendahara, Fasa II, Bandar Baru, 33000 Kuala Kangsar.
CIDB REGISTRATION NO.	0120180109-PK191033
COMPANY CAPITAL	RM 50,000.00
COMPANY OWNERSHIP	100% BUMIPUTERA
COMPANY GRADE	G3
TYPE OF REGISTERED BUSINESS	B (Pembinaan Bangunan) CE (Pembinaan Kejuruteraan Awam) ME (Mekanikal & Elektrikal)

2.2.1 Company Vision and Mission

VISION

'OUR SUCCESS IS THE PRIDE OF THE UMMAH'

MISSION

i) We are committed to manufacture and provide a service quality, efficient and effective as well as profitable to fulfil the aspirations customers and all stakeholders.

ii) We value friendly relationships with customers, the community and responsible for the development of the nation and human civilization.

iii) We believe our success depends on a commitment to fulfil customer needs, quality of service, use of technology and Tawakkal to Allah S.W.T.

2.3 Company Organization Chart

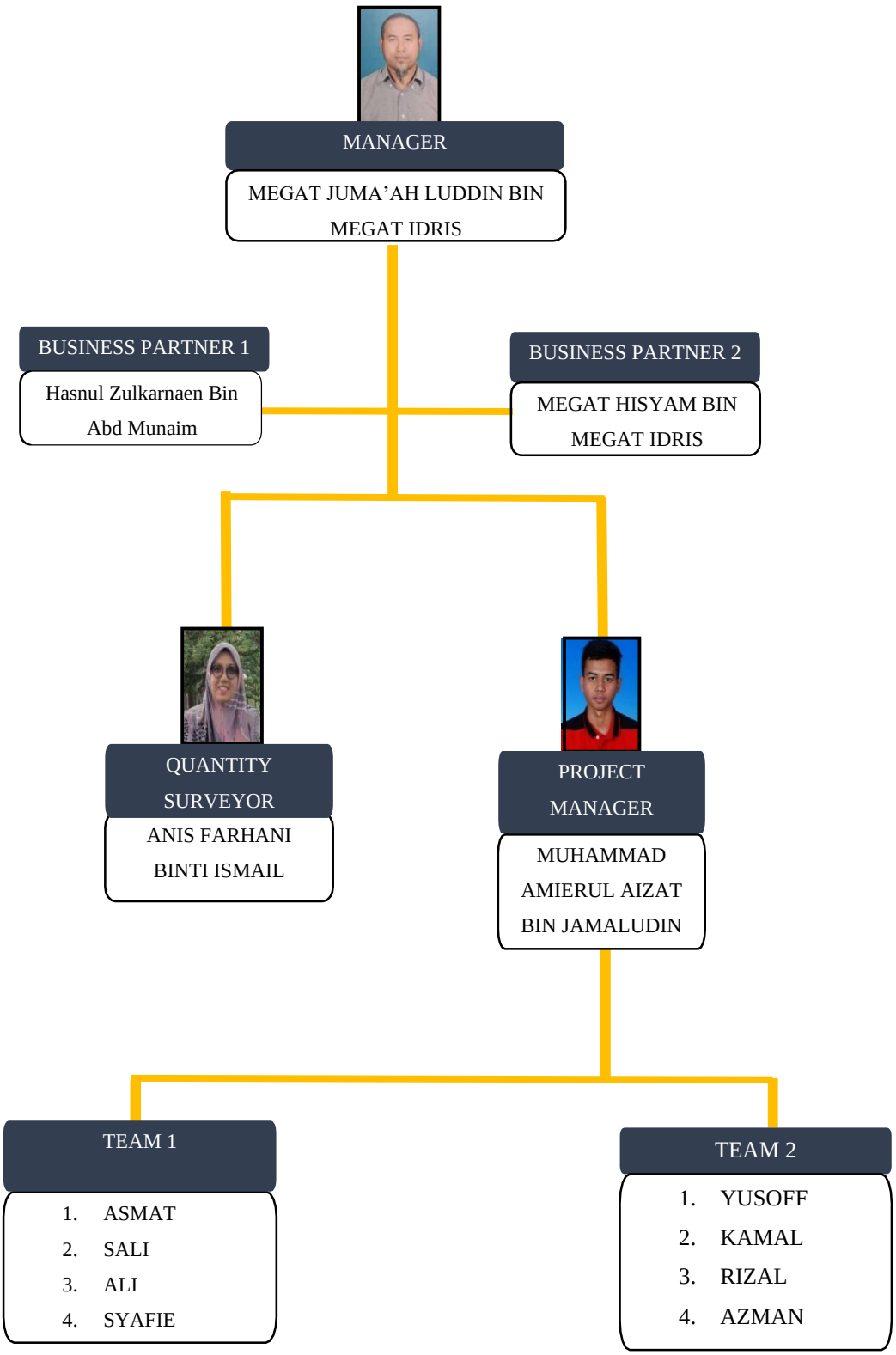


Figure 1.3 Company organisation chart of NUR MEGA REALTY

2.4 List of Projects

2.4.1 Completed Projects

Table 2.4.1 Completed projects of NUR MEGA REALTY

No	Project Title	Contract Value (RM)	Project Duration	Client
1.	REPLACING DAMAGED BRIDGE	RM 264,900.00	Start date: - Completion date: 13/10/2015 Project duration: -	(Pejabat Pembangunan Persekutuan Negeri Perak)
2.	ROAD MAINTENANCE WORKS AND THEIR RELATED INCLUDING ROAD SHOULDER	RM 524,700.00	Start date: - Completion date: 03/12/2015 Project duration:	(Majlis Bandaraja Ipoh)
3.	PROPOSED ROAD REPAIR	RM 236,793.40	Start date: - Completion date: 6/10/2016 Project duration: -	(Majlis Perbandaran Taiping)
4.	MAINTAINING A WALKING ON THE SHOULDER OF THE ROAD	RM 226,431.20	Start date: - Completion date: 20/10/2016 Project duration: -	(Majlis Perbandaran Kuala Kangsar)

5.	PROPOSED WORK TO RENOVATE THE EXISTING BUILDING TO THE INFORMATION CENTER AND THE ARRIVAL TICKET QUANTTER INCLUDING OTHER RELATED WORKS	RM 344,766.84	Start date: - Completion date: 27/04/2017 Project duration: -	Jabatan Kemajuan Orang Asli Negeri Perak dan Kedah)
6.	LAND CONSERVATION WORKS (LIMITING)	RM 218,788.00	Start date: - Completion date: 02/07/2017 Project duration: -	Kementerian Pertanian dan Industri Asas Tani Malaysia (Kerian))
7.	REPAIR WORKS OF VARIOUS SOURCE WATER TREATMENT SYSTEMS	RM 468,408.30	Start date: - Completion date: 25/09/2017 Project duration: -	Jabatan Kemajuan Orang Asli Malaysia)
8.	CIVIL WORKS	RM 1,300,000.00	Start date: - Completion date: 27/09/2017 Project duration: -	(Tenaga Nasional Berhad)

9.	CIVIL WORKS	RM 2,600,000.00	Start date: - Completion date: 28/10/2019 Project duration: -	(Tenaga Nasional Berhad)

2.4.2 Project in Progress

Table 2.4.2 Project in progress for NUR MEGA REALTY

No	Project Title	Contract Value (RM)	Start Date	Completion Date	Project Duration	Client
1.	PROJECT UPGRADING FACILITIES AND INFRASTRUCTURE FOR POLITEKNIK UNGKU OMAR, IPOH PERAK	RM 6,963,392.80	24/11/2020	16/8/2022	2-year and 4 months	MINISTRY OF HIGHER EDUCATION

CHAPTER 3.0

CASE STUDY

3.1 Introduction to Case Study

NUR MEGA REALTY SDN BHD is involve in currently ongoing project in Politeknik Ungku Omar, Ipoh Perak which named “Projek Menaiktaraf Fasiliti dan Infrastruktur bagi Politeknik Ungku Omar, Ipoh Perak” under the supervision of Project manager that is Megat Juma’ah bin Megat Idris and his assistant project manager Rifdi bin Ahmad. The project has begun on 24 November 2020 and expected to be completed on 16 August 2022. The cost for the whole construction is RM 6,969,392.80 if the construction has been smoothly and no problem occur during construction in progress.

The site supervisor assigned a few tasks during the 20-week industrial. It is to be in charge to supervise for a project name “Naiktaraf Pondok Pengawal (Kampus B)”. The case study that I do is about documentation and installation of aluminium strip ceiling. The ceiling purposely created to conceal the any upper material inside roof and aid to create enclosure and separation between spaces, control the distribution of light and sound around a room, and prevent sound from passing between rooms for guard house. The cost for one of the construction projects that is “Naiktaraf Pondok Pengawal (Kampus B)” is RM432,343.00. The project is situated inside Politeknik Ungku Omar that is located at Jalan Raja Musa Mahadi, Politeknik Ungku Omar, 31400 Ipoh, Perak. The guard house is open space without any shade. It is near to main road of Jalan Raja Musa Mahadi and facing RTM building.

3.1.1 Project Signboard

Figure 2.1.1 Signboard project for POLITEKNIK UNGKU OMAR

Table 3.1.1 Information in the project signboard

PROJECT UPGRADING FACILITIES AND INFRASTRUCTURE U FOR POLITEKNIK UNGKU OMAR, IPOH PERAK	
Enforcement Officer	JKR DISTRICT ENGINEER, KINTA DISTRICT, PERAK
Deputy Superintendent	JKR DISTRICT ENGINEER, KINTA DISTRICT, PERAK
Client	MINISTRY OF HIGHER EDUCATION
Main Contractor	JUJUR PERANGSANG SDN. BHD
Contractor Address	NO. 459-A, JALAN JELAPANG, TAMAN SILIBIN, PERAK, 30100 IPOH
Start Date	24/11/2020

3.1.2 Site Organization Chart

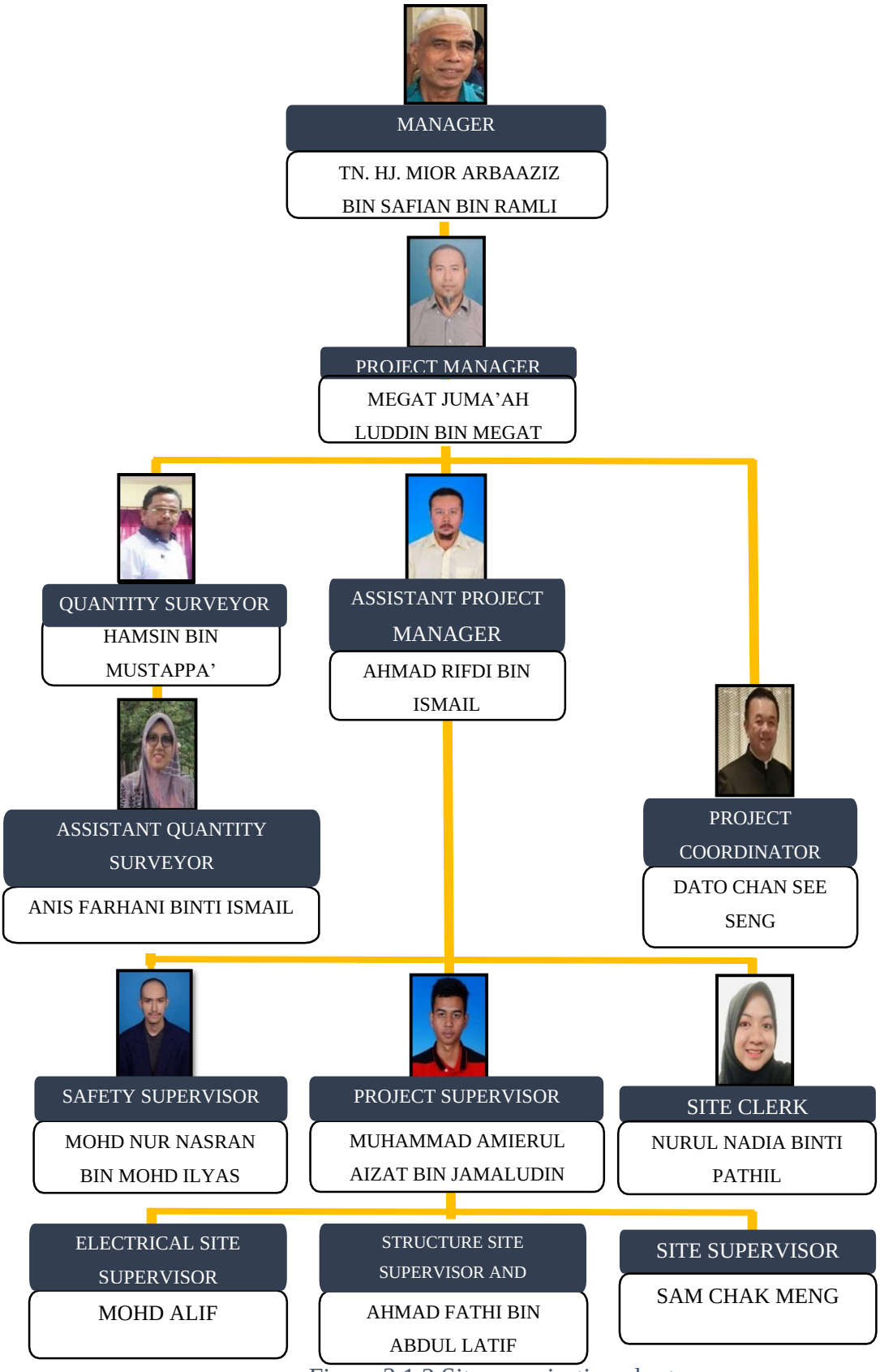


Figure 3.1.2 Site organisation chart

3.2 Process documentation approval of ceiling item

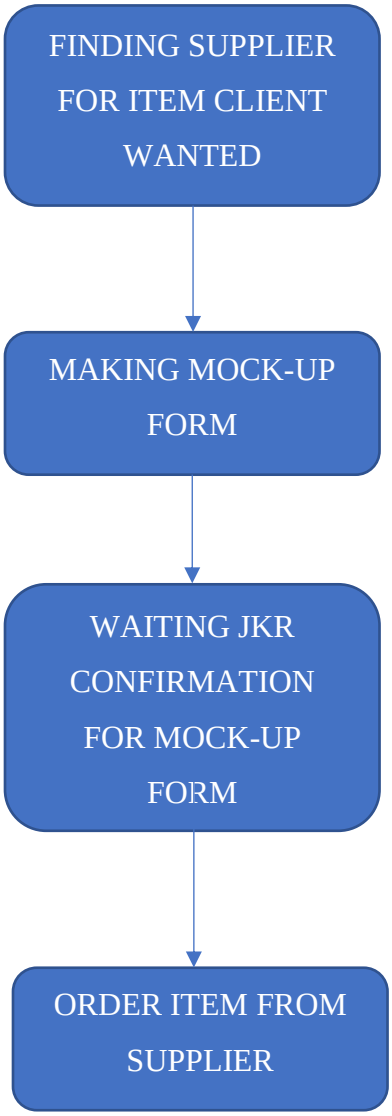


Figure 3.2 Flow chart for process documentation of Mock-Up form

3.2.1 Finding Supplier

To find any company suppliers for item features that the client demanded be installed in the building, contractors use online platforms such as Google to search for any company suppliers. In this particular construction project, the client prefers to use aluminium strip ceiling for the guard house ceiling features rather than a false ceiling or a drop ceiling, hence the client chose this option. False and drop ceilings are two types of ceilings that are frequently used as decorative features for any ceiling, whether it is in a house, a room, or anywhere else. The choice of aluminium strip ceiling for the ceiling features is therefore unique and only rarely seen in the context of ceilings. The contractor will contact the supplier to inquire as to whether or not their company still has stock of the desired item. If they have stock, the contractor will proceed to obtain a sample of the item, as well as documentation and certification from the company.

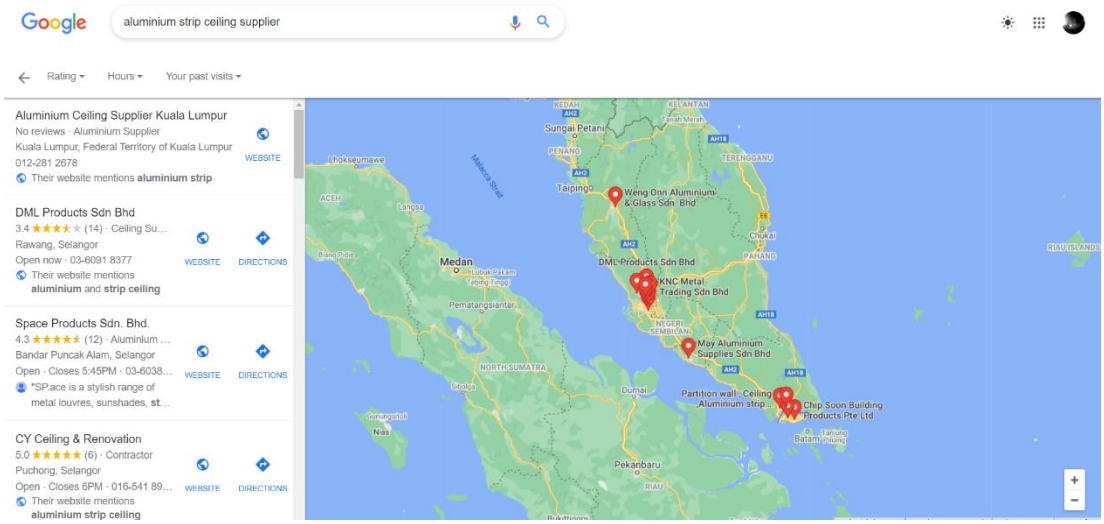
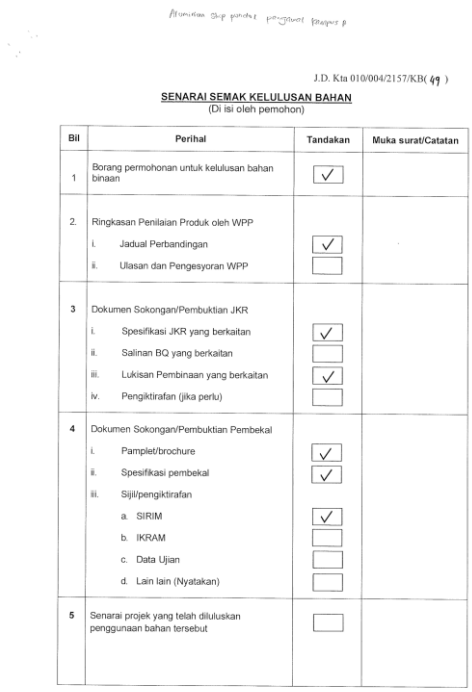


Figure 3.2.1 Platform for searching supplier

3.2.2 Making Mock-Up Form

A mock-up form will be created by the contractor after receiving confirmation from the supply company that the stock, sample, document, and certificate have been provided. The mock-up form or document is A mock-up is a file that allows you to create a sample of your product or show your work in a real-world setting without having to create a physical product.

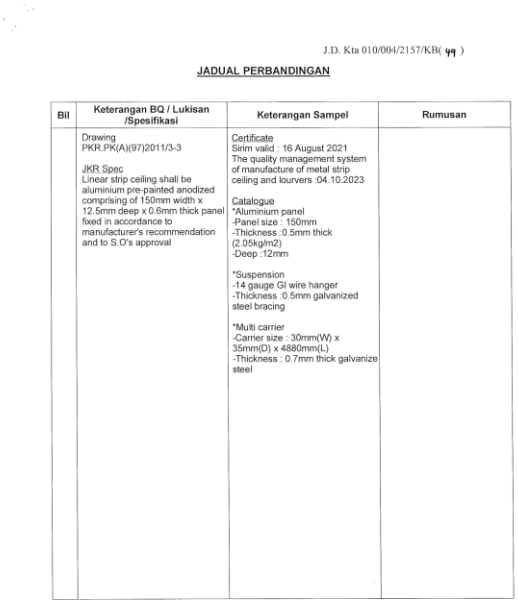


J.D. Kta 010/004/2157/KB(49)

SENARAI SEMAK KELULUSAN BAHAN
(Di isi oleh pemohon)

Bil	Perihal	Tandakan	Muka surat/Catatan
1	Borang permohonan untuk kelulusan bahan binaan	☑	
2.	Ringkasan Penilaian Produk oleh WPP		
	i. Jadual Perbandingan	☑	
	ii. Ulasan dan Pengesyoran WPP	☐	
3	Dokumen Sokongan/Pembuktian JKR		
	i. Spesifikasi JKR yang berkaitan	☑	
	ii. Salinan BQ yang berkaitan	☐	
	iii. Lukisan Pembinaan yang berkaitan	☑	
	iv. Pengiktirafan (jika perlu)	☐	
4	Dokumen Sokongan/Pembuktian Pembekal		
	i. Pamplet/brochure	☑	
	ii. Spesifikasi pembekal	☑	
	iii. Sijil/pengiktirafan		
	a. SIRIM	☑	
	b. IKRAM	☐	
	c. Data Ujian	☐	
	d. Lain lain (Nyatakan)	☐	
5	Senarai projek yang telah diluluskan penggunaan bahan tersebut	☐	

Figure 3.2.2(1) Material approval checklist of Mock-up form



J.D. Kta 010/004/2157/KB(99)

JADUAL PERBANDINGAN

Bil	Keterangan BQ / Lukisan /Spesifikasi	Keterangan Sampel	Rumusan
	Drawing PKR.PK(A)(97)2011/3-3 JKR Spec Linear strip ceiling shall be aluminium pre-painted anodized comprising of 150mm width x 12.5mm deep x 0.6mm thick panel fixed in accordance to manufacturer's recommendation and to S.O's approval	Certificate Sirim valid : 16 August 2021 The quality management system of manufacture of metal strip ceiling and lourvers :04.10.2023 Catalogue *Aluminium panel -Panel size : 150mm -Thickness :0.5mm thick (2.05kg/m2) -Deep :12mm *Suspension -14 gauge GI wire hanger -Thickness :0.5mm galvanized steel bracing *Multi carrier -Carrier size : 30mm(W) x 35mm(D) x 4880mm(L) -Thickness : 0.7mm thick galvanize steel	

Figure 3.2.2(2) Comparison table from Mock-up form

JKR MALAYSIA

PROSEDUR PEMBINAAN DAN PENYELIAAN TAPAK BINA

No. Dokumen	: JKR.PK(O).04-5
No. Keluaran	: 06
No. Pindaan	: 01
Tarikh	: 19 Sept 2019
Muka Surat	: 1 / 2

LAMPIRAN 5

BORANG KELULUSAN BAHAN/ PERALATAN/ PEMERIKSAAN *MOCK-UP*

PROJEK: MENAIKTARAF KEMUDAHAN FASILITI DAN INFRASTRUKTUR BAGI POLITEKNIK UNGKU OMAR, PERAK

No. Rujukan : J.D. Kta 010/004/2157/KB(99)

No. Kontrak : PERS/PK/258/2020

Kontraktor : JUJUR PERANGSANG SDN. BHD.

Butiran Kerja: *Kelulusan Bahan/ Peralatan/ *Mock-Up/* Deskripsi Item/ Sampel:
Aluminium strip ceiling

Lokasi: *Mock-up/ Bahan/ Kerja :
Pondok pengawal kampus B (Siling luar pada rasuk bumbung aras 1)

Bidang: ☐ Sivil ☐ Struktur ☑ Senibina ☐ Mekanikal ☐ Elektrik ☐ Lain-Lain:.....

Model: DML 150G | **Pengilang:**DML product sdn.bhd. | **Pengedar :**

Dilampirkan:

☑ Katalog ☑ Sijil ☑ Sampel Bahan ☐ Spesifikasi ☐ Sampel Kerja ☐ *Method Statement*
☐ *Warranty* ☐ Lukisan/*Shop Drawing* ☐ *Mock-Up* ☑ Lain-lain : Installation plan.....

PERAKUAN KONTRAKTOR:

Saya dengan ini berjanji akan mematuhi kehendak JKR/ Perunding* dan memastikan cadangan *bahan/ peralatan/ *mock-up* kerja adalah berfungsi sebagaimana spesifikasi dan lukisan seperti di dalam kontrak.

Tandatangan Kontraktor:

MUHAMMAD AMIRUL AIZAT BIN JAMALUDIN
WAKIL TAPAK
Tarikh : 19/8/2021

Nama & Jawatan / Cop Rasmi:

JUJUR PERANGSANG SDN BHD 542757-U

SEMAKAN JKR (PTB) / HODT*(Arkitek/ M&E/ C&S) jika perlu/ PERUNDING*(Arkitek/ M&E/ C&S):

(Rujuk Nota Semakan Pembinaan dan Penyeliaan Tapak Bina sekiranya perlu)

Cadangan *bahan/ peralatan/ *mock-up* adalah:

☐ Mematuhi

☐ Tidak Mematuhi

Ulasan:
*JKR (PTB)/ HODT/ Perunding: _____

Tandatangan *JKR (PTB) / HODT/ Perunding:	Nama & Jawatan / Cop Rasmi:
Tarikh :	

Nota: * Potong yang tidak berkenaan

DOKUMEN TERKAWAL

Figure 3.2.2(3) Mock-up inspection equipment material approval form

3.2.3 Waiting JKR Confirmation of Mock-Up Form

Next, JKR will review the form that was submitted by the contractor and will determine whether the form should be accepted or rejected based on the specifications of the item. The JKR may reject a mock-up form if the item specified by the contractor as in the mock-up form either because of unsuitable or does not meet the specifications set by the JKR to achieve the desired results. It may take 1 weeks or more.

3.2.4 Order an Item from Supplier and Installed the Ceiling

The supplier of the aluminium strip ceiling is contacted immediately after JKR approved the item for inclusion in the ceiling features. Following that, the contractor will wait for the item to arrive at the job site to begin installation.

3.3 Method of installation Aluminium strip ceiling

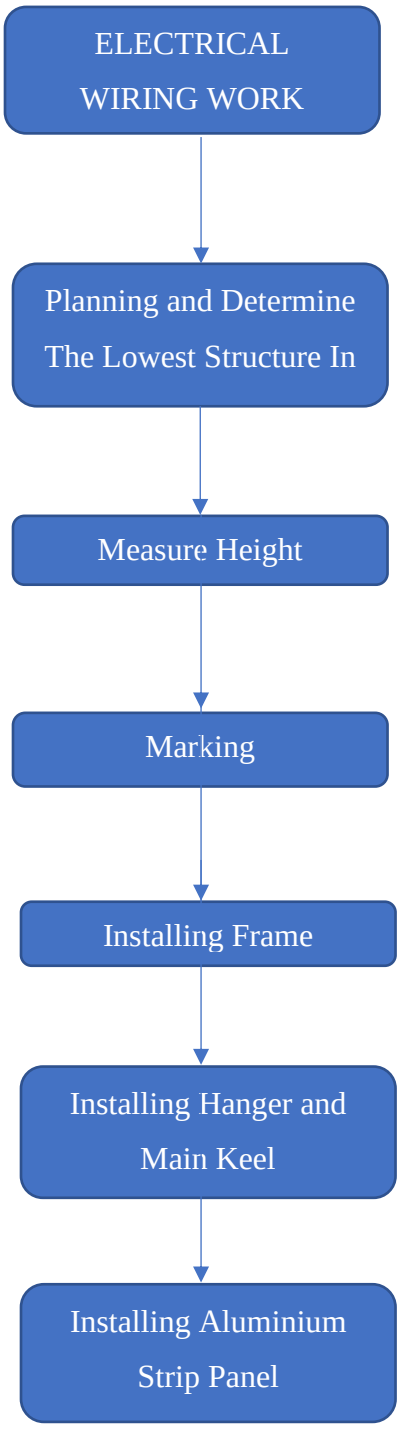


Figure 3.3 Flow chart for method installation of aluminium strip ceiling

3.3.1 Electrical Wiring Work

After roof work finished, the electrical worker will install wiring and electrical plug for the building before starting any ceiling work. It is because it will be hard to do any electrical work if the ceiling installs first. The ceiling will block any wiring to make the building look neat in client eyes.

Figure 3.3.1(1) Worker doing an electrical wiring work inside guard house

Figure 3.3.1(2) Worker doing an electrical wiring work outside guard house

3.3.2 Planning and Determine the Lowest Structure in Site

First and foremost, before beginning the installation of an aluminium strip ceiling, workers must examine the building's architecture drawing to establish the height at which the ceiling will be installed. After that, they search the site for anything else that is lower in height than the measurement specified in the drawing. Anything below that level, such as cement paste, roof framing, and tubing is covered by this policy. In terms of the site, the pipe is the lowest appropriate thing on the site. To put the frame, the workers utilise 2 inches below the pipe as a measuring tool.

Figure 3.3.2(1) The arrow on the picture shows the lowest structure at site for measurement

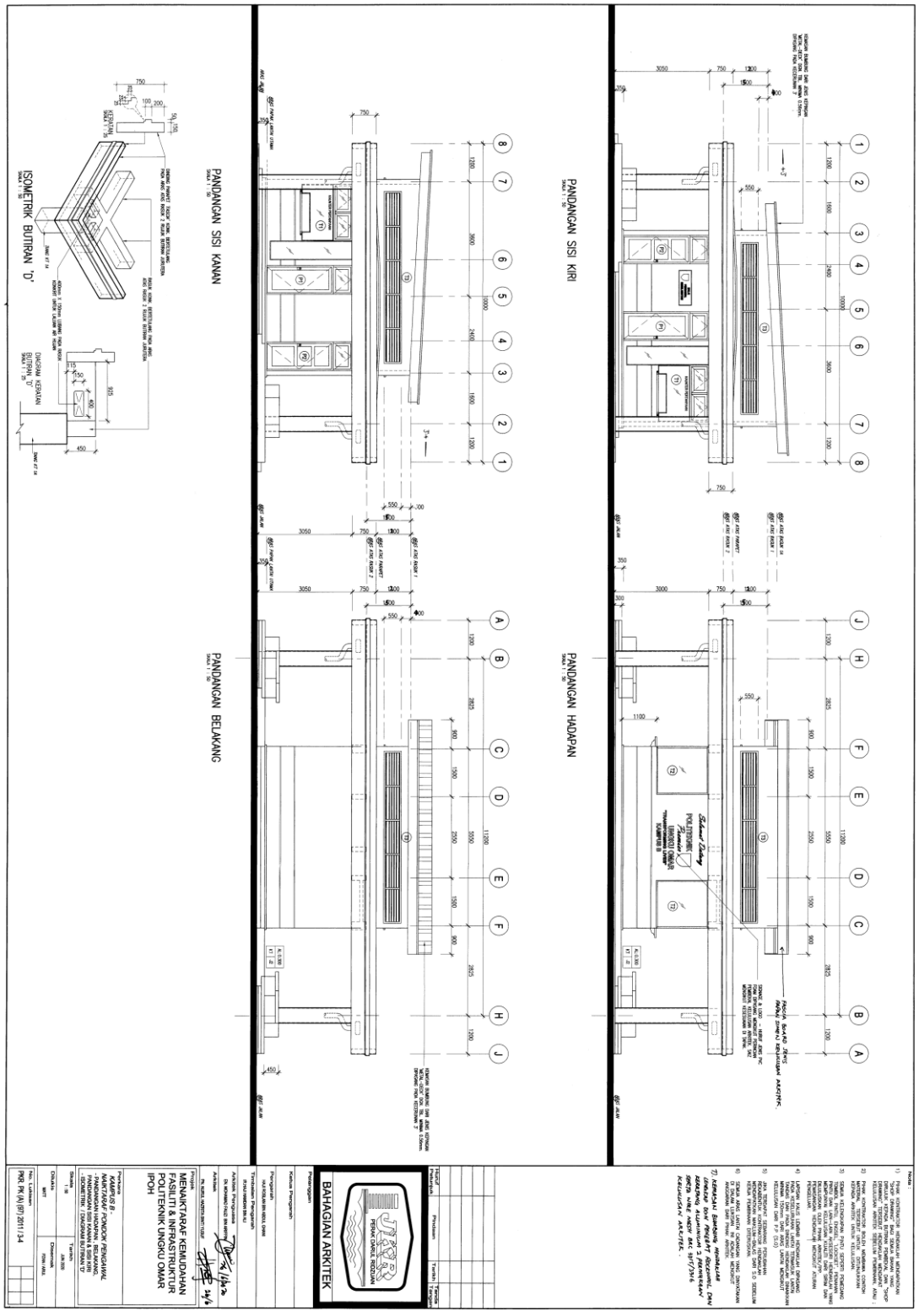


Figure 3.3.2(2) An architecture drawing of guard house used to check the height for installation of ceiling

3.3.3 Measuring Height

After determining the lowest structure on the site, workers utilize a laser to create a straight horizontal line on all 360 degrees of the structure, allowing for simple measurement and labelling. The laser is being placed in the middle and on top of a chair according to how high the worker desired for all the sides that were going to be installing the aluminium strip ceiling. The height of the laser is the same for all the ceilings where the installation will take place to make the ceilings parallel on all sides.

Figure 3.3.3(1) The laser worker used to help marking height for installation of the ceiling

Figure 3.3.3(2) Worker measuring the height to mark for installation of ceiling

3.3.4 Marking

Following that, the worker indicates the height of the wall with a pencil or marker, starting at the ends of the left and right of walls. After that, they utilize string that has been soaked in dark ink to draw a single straight line by following the marked marker or pencil and the height of the measurement that was taken previously. It is a suitable and cautious approach to install the ceiling frame so that no error happens when installing the frame in a manner that is not parallel with other areas of the building that require frame installation as well.

Figure 3.3.4(1) Worker are marking before installing frame

Figure 3.3.4(2) String used as marking item and it soaked with dark ink

3.3.5 Installation Frame

Worker will first measure and bend the frame that will be used to hold the aluminium strip ceiling because some of the area is not perfectly rectangle. As a result, the worker will measure and cut it at the end to bend it into the shape of the guard house's column. So that the ceiling can completely cover everything without leaving even a speck of empty space. Next, every 3 feet of the frame, the worker will bend and cut a small portion of the top of the frame to make it easier for the worker to nail the frame to the wall without it teetering. Finally, after completing all the steps, the worker completes the frame installation on all sides.

Figure 3.3.5 Worker installing frame

3.3.6 Installation Hanger and Main Keel

Next, the worker will install two hangers at the roof frame, left and right using driller. The worker uses the ceiling frame for the hanger of the main keel. Worker will make the surplus ceiling frame become a small ‘L’ shape by measure and cut the ceiling frame that is not yet being fixed on the wall as hanger. The roof frame distance of each one is 5 feet therefore, every 5 feet each of the roof frame is being drill and fix 2 hangers on 1 steel. After that, worker will carry the main keel of the aluminium strip to attach it to the hangers.

Figure 3.3.6(1) Worker install hanger to hold the main keel later.

Figure 3.3.6(2) Main keel have been installed and ready to hold the aluminium panel

3.3.7 Installation Aluminium Strip Panel

Before installing the aluminium strip ceiling, the worker measures the length from the left frame to the right frame to determine the exact length of the aluminium strip plank before affixing it to the frame. This is since the size of the aluminium strip ceiling board does not match the size required on the job site. As a result, they will often measure the plank with a tape measure and then cut the plank with a stationery knife. Next, for light fixtures, workers make a circle with a cardboard of the size of lamp on the middle of the aluminium strip ceiling plank every 4 feet. It is for the next worker who oversees electrical lamp work to install the lamp. The worker also cuts a circle in the centre of the plank with a stationery knife, and the cardboard is created by themselves using the example lamp provided by the client. Every panel will be fixed with pressure spring at all perimeters. Next, cut plank support bracket will also be fixed with screws. The cut plank support bracket will eliminate pop rivets. Workers continue same step until finished.

Figure 3.3.7(1) Worker installing the aluminium strip panel

Figure 3.3.7(2) Worker is making a round hole for light features and cut it for installation of light features later

3.4 Time installation of aluminium strip ceiling

Aluminium strip ceiling is one of the options in making a ceiling. The ceiling is rarely used in Malaysia because most people prefer on constructing false ceiling as their feature ceiling for their houses. The process to complete the installation doesn't take a lot of time to complete because step for installing the ceiling is easier than other type of ceiling. The process of the installation aluminium strip ceiling only takes about 2 to 3 days only from Thursday to Saturday. The installation of the ceiling takes about 6 working hours per day. There has only 2 workers doing the installation. Therefore, it takes much more time than usual. Moreover, the worker will stop any works when the heavy rain occurs because the area of the working is open, and it is not safe for them to do any work while heavy rain still not calm. Falling in matter of time if they keep doing work because of the floor wet and slippery.

Worker installing aluminium strip ceiling on the front of the guard house building until finished on 28 October.

Figure 3.4(1) Day 1 of working. Worker installing aluminium strip ceiling on the front of the guard house

Worker continue installing ceiling at back of guard house on 29 October. They unfortunately only can do the work for a short time only because the weather is unfavourable for them because of heavy raining for a long time

Figure 3.4(2) Day 2 of working. Worker continue installing ceiling and the picture above is the worker is marking using a string

30th October is the day the worker finishes all the installation.

Figure 3.4(3): Last day of working. The worker in the picture measuring height before installing ceiling

Table 3.4 Gantt chart of worker doing installation of aluminium strip ceiling

TIME TAKEN FOR WORKER DOING INSTALLATION ALUMINIUM STRIP CEILING										
TIME / DAY	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM
THURSDAY										
SATURDAY										
MONDAY										

CHAPTER 4.0

CONCLUSION

In conclusion, an aluminium strip ceiling is one of the options in constructing ceiling. It is one of the easiest ways of building ceiling and have a stunning look. There are lot of advantages of using an aluminium strip as ceiling features. The advantages of the type of ceiling are that when compared to other ceiling systems, installing aluminium strip ceiling system has several advantages. They are durable, easy to clean, and present a professional appearance. In comparison to traditional dropped ceiling materials, aluminium strip ceiling systems are stronger and more durable, while also providing easy access to the ceiling void.

The method for documentation approval item in the construction of the internship company are common method and it like the theory. There is nothing that carried out differently during the process of making documentation approval item of ceiling features. This process time of construction work depends fully on JKR. The faster the JKR confirm or reject the mock-up form the faster the construction work can begin and finished it.

Next, the process of installation is 3 days of working days, starting from 28 October until 30 October 2021. The installation has already been complete from beginning to end due to 3 days of their working. Although, worker took much more time completed it because of the heavy rain on 29 October 2021. Although, the work can be finish within only 1 to 2 days of works.

Finally, the method for aluminium strip ceiling in the construction are rare method and it is different with theory. The worker did not use an exact hanger as in theory. They used other method and item to hold the main keel as replacement for wire.

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