



**DEPARTMENT OF BUILDING SURVEYING
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA
CAWANGAN PERAK
KAMPUS SERI ISKANDAR**

THE WORK OF REPAIRING DAMAGES ROOF AND TRUSSES STRUCTURE AND
OTHER RELATED WORK AT PUSAT KOKURIKULUM PEJABAT PENDIDIKAN LAMA,
HULU TERENGGANU, TERENGGANU.

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DIPLOMA IN BUILDING SURVEYING

PRACTICAL TRAINING REPORT

MARCH -JULY 2018

ACKNOWLEDGEMENT

Firstly, I would like to thank ALLAH S.W.T and my family because they have given me strength and patience during doing this internship report and doing the internship I had with Jabatan Kerja Raya (JKR) Hulu Terengganu. It was a great chance for learning and professional development. Therefore, I consider myself as a very lucky individual as I was provided with an opportunity to be a part of it. I am also grateful for having a chance to meet so many wonderful people and professionals who led me through this internship period. I would like to thank my supervisor lecturer Sr Suriani Ngah Abdul Wahab for the guiding and advice. She inspired me greatly to work and commit in this internship.

Bearing in mind previous, I am using this opportunity to express my deepest gratitude and special thanks to Jurutera Daerah, Encik Mohd Fadzlie Bin Ibrahim for allowing me to attend the internship session at this government organization. All of the people at this organization had done the best for giving me the great working experience indeed. I learn many things here.

Thank you also to my office supervisor, Encik Tengku Shukri Atan Bin Tengku Atan who in spite of being extraordinarily busy with his duties, took time out to hear, guide and keep me on the correct path and allowing me to carry out my project at that organization. He was also teaching me a lot about the profession during the internship session besides advising me for my future soon.

I perceive as this opportunity as a big milestone in my career developments. I will strive to use gained skills and knowledge in the best possible way, and I will continue to work on their improvement, in order to attain desired career objectives.

TABLE OF CONTENT

NO	ITEM	PAGE
1	DECLARATION BY STUDENTS AND SV ACKNOWLEDGEMENT TABLE CONTENTS LIST OF FIGURES LIST OF PHOTOS LIST OF TABLES ABSTRACT	III IV V – VII VIII X-IX XI XII
2	CHAPTER 1 : INTRODUCTION 1.1. Introduction 1.2. Organization Profile 1.3. Vision, Mission and Objectives 1.3.1 Vision 1.3.2 Mission 1.3.3 Objectives 1.4. Building Background 1.4.1 Location 1.4.2 Building View 1.4.3 Adjacent Building 1.4.4 Basic Amenities 1.5. Organization Structure 1.6. Scope of Work 1.7. Summary	1 – 19 2 3 4 – 5 4 4 5 6 – 13 6 - 7 8 9 - 11 12 - 13 14 15 16

NO	ITEM	PAGE
3	CHAPTER 2 : THEORETICAL STUDY 2.1 Introduction 2.2 Definition of Building Maintenance 2.3 Types of Maintenance 2.4 Introduction of Element 2.4.1. Introduction of Roof 2.4.2. Types of Roof in Malaysia 2.6 Summary	17 – 28 18 19 20 21 – 27 21 – 22 23 – 27 28
4	CHAPTER 3 : CASE STUDY 3.1 Introduction 3.2 Introduction of Case Study 3.2.1 Project Summary 3.2.2 Objective 3.2.3 Scope of Work 3.2.4 Tools and Equipment 3.2.5 Manpower 3.2.6 Types of Roof Used 3.3 Method of Construction 3.4 Safety Precaution 3.5 Summary	29 – 49 30 31 32 32 32 33 – 34 35 36 37 – 45 46 – 48 49
5.	CHAPTER 4 : PROBLEMS AND RECCOMENDATIONS 4.1 Introduction 4.2 Problems and Recommendation 4.3 Summary	50 – 53 51 52 53

NO	ITEM	PAGE
6.	CHAPTER 5 : CONCLUSION 5.1 Conclusion	54 - 55
7.	REFERENCES	56 – 58

LIST OF FIGURES

NO	DESCRIPTION
Figure 1	Map of Hulu Terengganu
Figure 2	Map of Jabatan Kerja Raya Hulu Terengganu
Figure 3	Site Location of Jabatan Kerja Raya Hulu Terengganu
Figure 4	Organization Chart of Building Department
Figure 5	Types of Roof Used in Malaysia
Figure 6	Types of Maintenance
Figure 7	Gable Roof Building in 3D Sketches
Figure 8	Sketches of Gable Roof Element
Figure 9	Sketches of Gambrel Roof Element
Figure 10	Gable Roof Frame in 3D Sketches
Figure 11	Example of Gable Roof Building In Malaysia
Figure 12	Sketches of Hip Roof Building
Figure 13	Sketches of Lean To Roof

LIST OF PHOTOS

NO.	DESCRIPTION
Photo 1	View of Jabatan Kerja Raya Hulu Terengganu
Photo 2	Front Elevation of Jabatan Kerja Raya Hulu Terengganu
Photo 3	Hospital Hulu Terengganu
Photo 4	Pejabat Agama Daerah Hulu Terengganu
Photo 5	Pejabat Kesihatan Daerah Hulu Terengganu
Photo 6	Bank Rakyat Cawangan Kuala Berang
Photo 7	The Serai Cottage (Boutique Hotel)
Photo 8	MR DIY Taman Kirana, Kuala Berang
Photo 9	Bank Rakyat
Photo 10	Hospital
Photo 11	Petronas
Photo 12	7 Eleven
Photo 13	Example of Building with Gable Roof
Photo 14	Gable Roof
Photo 15	Example of Building with Lean To Roof
Photo 16	The front view of Pusat Kokurikulum Pejabat Pendidikan Lama
Photo 17	Grinder
Photo 18	Fastener Drivers
Photo 19	Ladder
Photo 20	Measuring Tape
Photo 21	Marker Pen (Sharpie)
Photo 22	Fastener
Photo 23	Metal Deck
Photo 24	Cold-Formed Steel Trusses
Photo 25	Removing existing items work
Photo 26	Disposal Work
Photo 27	Damaged Timber Column
Photo 28	Cleared Site

NO	DESCRIPTION
Photo 29	Installation of Tie Beam
Photo 30	Installation of Steel Hollow
Photo 31	Installation of Roof Trusses
Photo 32	Installation of Rafter
Photo 33	Stick The Double Sided Tape
Photo 34	Lay The Bubble Foam
Photo 35	Gently Pull To Tighten The Foam
Photo 36	Secure The Foam
Photo 37	Remove The Release Line And Lightly Press The Foam
Photo 38	Seal The Foam With The Aluminum Foil Tape
Photo 39	Ridge Space
Photo 40	Arrangement of Metal Deck
Photo 41	Drill The Bolt Onto Metal Deck
Photo 42	Covered Roof Trusses with Metal Deck
Photo 43	Installation of Metal Deck onto the Region
Photo 44	Cut Metal Deck
Photo 45	Apply the Tape Sealant
Photo 46	Outside Closure Placed
Photo 47	Tube Sealant Applied
Photo 48	Cut The Side of the Ridge Cap
Photo 49	Fold the Cut Item
Photo 50	Fasten The Screw on Ridge Cap
Photo 51	Cut The End Of The Gable
Photo 52	Fold The Cut Part
Photo 53	Place The Gable Onto The End Of The Roof
Photo 54	Fasten Using Appropriate Fastener
Photo 55	Gloves
Photo 56	Safety Helmet
Photo 57	Safety Glasses
Photo 58	Reflective Vest
Photo 59	Safety Boots
Photo 60	Proper Clothing

LIST OF TABLES

NO	DESCRIPTION
Table 1	Project Summary
Table 2	Tools and Equipment
Table 3	Table of The Demolishing Work of the Existing Roof Covering and Trusses Structure and Remove to the Relevant Allowed Places
Table 4	Method Construction of Structure Work
Table 5	Method Construction of Roofing Work
Table 6	Analysis Problems and Recommendations

ABSTRACT

The practical training takes 4 months to complete the study taking the diploma as a Building Surveyor. Honestly, within 4 months the practical training that had been faced, there are too many subjects that can learn out of the subject have been teach by our lecture in class.

This course as well, makes the practical student learn more about the maintenance procedure of government sector beside the method construction of roof and its structure. Jabatan Kerja Raya Hulu Terengganu is one of the main governments sectors that responsible to the construction work around district of Hulu Terengganu. They not the only involve during the construction of new building only, but also during maintenance and road work.

Because of the excellence record finishing the work, the subject that been chosen for this report is the method construction of cold formed-steel trusses and metal deck roof.

CHAPTER 1: INTRODUCTION

1.1 Introduction

This chapter had describing the details about the company details and its organization profile. We can know about its vision, mission and also objectives.

Beside, this chapter will also explain about the location of the company with the accurate and specific map. At the same time, describing the department that we work with which is, the Maintenance Department and also its scope of work.

1.2 Organization Profile

Jabatan Kerja Raya (JKR) Malaysia been established ever since 1872 and operates as the technical expert to the Government of Malaysia. JKR is responsible in establishing development projects and infrastructure preservation to the various boards of ministries, departments, statutory bodies and state governments, such as roads, buildings, airports, harbors and piers.

JKR also had been form as a strategic partner to the customers in achieving the successful government success. In the other hand, JKR also responsible to be the main leader of its specialty such, in asset management, project management and the excellence of engineering in Malaysia. Beside, JKR is one of the main organizations in Malaysia for distributing providing the infrastructures for the country. Then, JKR is responsible on the maintenances of roads and selected government buildings. Lastly, JKR is being as technical advisory services to the Federal Government, as well as states and districts.

1.3 Vision, Mission and Objective

1.3.1 Vision

To become a world-class service provider and centre of excellence in asset management, project management and engineering services for the development of the nation's infrastructure through creative and innovative human capital and state-of-the-art technology.

1.3.2 Mission

JKR mission is to be a factor to national improvement by:

- Helping our customers grasp the basic information and providing services through collaborations as a strategic partner.
- Standardize our procedures and systems to deliver results dependable services.
- Provide asset management services and an effective and pioneering project.
- Strengthen existing engineering expertise.
- Develop human capital and new competencies.
- Prioritize integrity in delivering the service.
- Foster a well-proportioned relationship with the community.
- Preserve the environment in service delivery.

1.3.3 Objectives

As Principal Consultant to the Government of Malaysia, the Department of Public Works objectives are to :

“Yield the product and execute the maintenance services that congregate the quality, cost and time are set to accomplish the optimum benefit asset”

1.4 Building Background

1.4.1 Location of Jabatan Kerja Raya Hulu Terengganu

JKRHT was located at Kuala Berang, Hulu Terengganu and the location seems to be strategic because it located near the main road from the town of Kuala Berang heading towards Kuala Terengganu. The distance of JKRHT from Kuala Terengganu is around 30 kilometers. Those location also have the transportation network as it close to the Lebuhraya Pantai Timur (LPT).

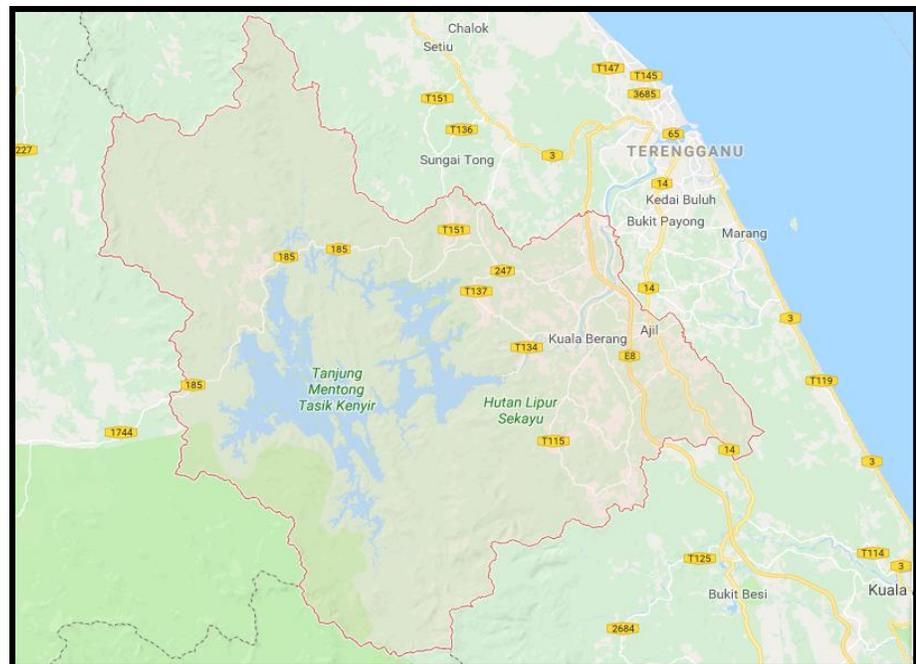


Figure 1 - Map of Hulu Terengganu



Figure 2 - Map of Jabatan Kerja Raya Hulu Terengganu



Figure 3 - Site Location of Jabatan Kerja Raya Hulu Terengganu

1.4.2 View of Jabatan Kerja Raya Hulu Terengganu



Photo 1 – View of Jabatan Kerja Raya Hulu Terengganu



Photo 2 – Front Elevation of Jabatan Kerja Raya Hulu Terengganu

1.4.3 Adjacent Building



Photo 3 – Hospital Hulu Terengganu



Photo 4 – Pejabat Agama Daerah Hulu Terengganu



Photo 5 – Pejabat Kesihatan Daerah Hulu Terengganu



Photo 6 – Bank Rakyat Cawangan Kuala Berang



Photo 7 – The Serai Cottage (Boutique Hotel)



Photo 8 – MR DIY Taman Kirana, Kuala Berang

1.4.4 Basic Amenities



Photo 9 – Bank Rakyat



Photo 10 – Hospital



Photo 11 – Petronas



Photo 12 – 7 Eleven

1.5 Organization Structure

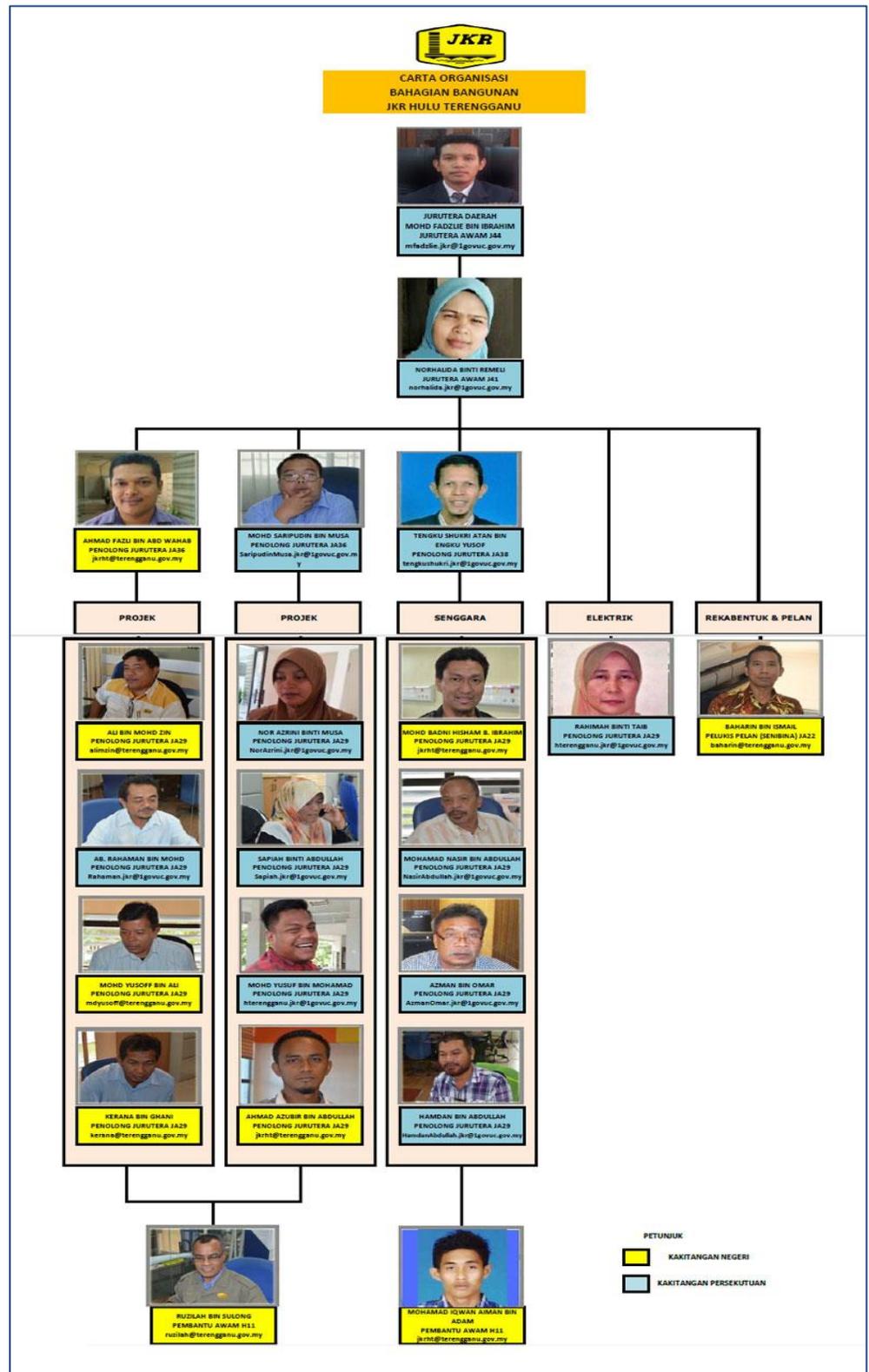


Figure 4 – Organization Chart of Building Department

1.6 Scope of Work Building Department

- Planning, controlling and supervising building design work.
- Planning, controlling and supervising building construction.
- Technical advisor services to government departments and agencies.
- Maintain government buildings.
- Document management.
- Responsible for all matters relating to electrical works for all development projects and building and road maintenance.
- Design, control and supervise electrical-related design work.

1.7 Summary

At the end of this chapter, I able to know a bit about this organization's location, the view of the building and also its amenities, their organization structure and the scope of work of Building Department.

Besides, along the process of collecting the details for this chapter, I got the experience for introducing myself to the professional. This is my first working experience indeed. I feel so much different since there are various level of age here.

CHAPTER 2: THEORETICAL STUDY

2.1 Introduction

This chapter will explain the details about the topics that had been chose. It will be explaining based on the theoretical study and the knowledge from the trusted sources which I already did a few research based on books and internet.

In this chapter, we will learn the theoretical study about the definition of maintenance works and its types that had been use by Jabatan Kerja Raya Malaysia. Besides, the element of the topic that I had been chose, the roof. It will including the definition of the roof, the types of the roof used in Malaysia and its description..

2.2 Introduction of Building Maintenance

Based on BS 3811, the definition of Building Maintenance is the combination of all technical and associated administrative actions intended to retain an item in, or restore it to, a state in which it can perform its required function. It also can be classified into three elements which, building maintenance, planned maintenance and breakdown maintenance. Building maintenance is the work, other than daily and routine cleaning, necessary to maintain the performance of the building fabric and its services. Then, planned maintenance is the maintenance organized and carried out with control and the use of records, to a predetermined plan based on the results of previous condition surveys. Meanwhile, breakdown maintenance is the operation of restoring an item to fulfill its original function after a failure in its performance.

The factor that why we need to maintain the building is it is very important for its building life cycle, so that the building can used for a long time soon with the efficiency function and minimize the operational cost. Next, it is very important for the occupant safety and they feel comfortable as it can prevent the building from the Sick Building Syndrome (SBS). Besides, every people love to see a good view, it is important to take care of its aesthetic value and at the same time obeying the authority requirement.

2.1.1 The types of Building Maintenance

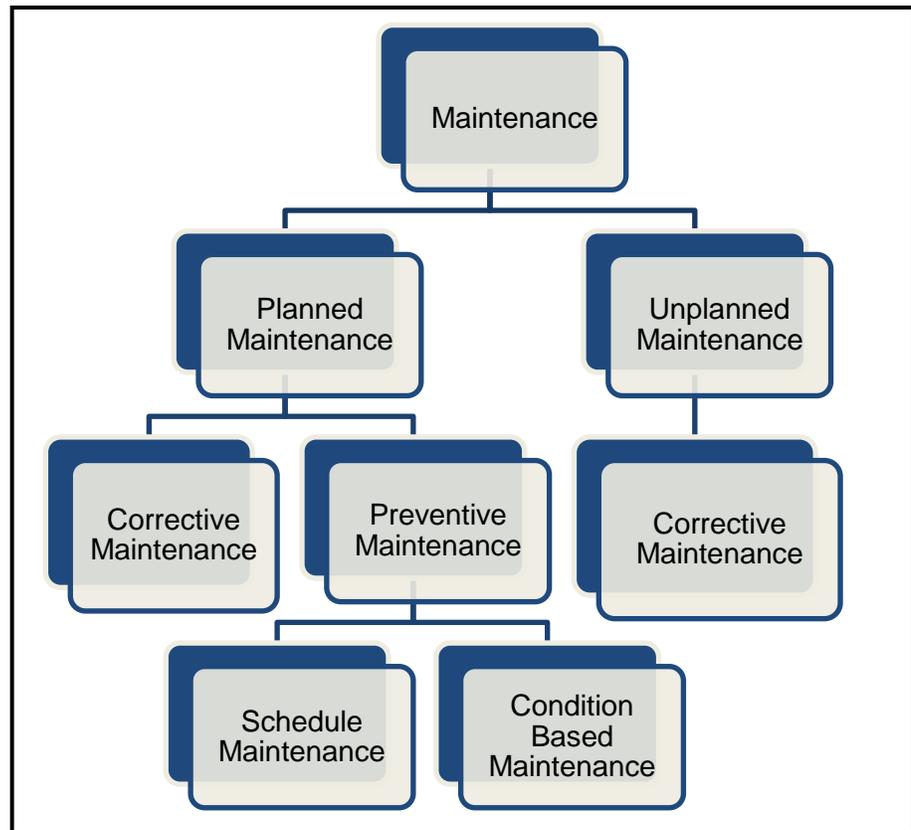


Figure 5 – Types of Maintenance

At Jabatan Kerja Raya Malaysia (JKR), the maintenance service that this sector provides is corrective maintenance. The client will send the proposal letter to the JKR and explaining about the details of the project. If the proposal approved, then the next process will be continue. The representatives from JKR will prepare the Bill of Quantities based on the site visit. After the value had been decide, the quotation will be sell to the local contractors for choose the responsible one.

2.3 Introduction of Roof

Roof is an essential part of every building as it act as the part of building envelope. It is covering on the uppermost part of a building, which provides protection from animals and weather, notably rain but also heat, wind and sunlight. The word also denotes the framing or structure, which supports that covering.

i) Function of the roof

- To keep out of the rain, wind and dust
- To protect the interior of the building from the direct sunlight
- Designed to accommodate all stressed encountered
- Designed to accept movement due changes in temperature and moisture content
- To provide lateral restraint and stability to adjacent walls
- To resist penetration of fire and spread of flame from external sources

ii) Factor to be considered in determining roof structure

- Type of building
- Condition of foundation
- Roof loading
- Brightness needed
- Services ducting
- Future renovation
- Maintenance aspect
- Aesthetic
- The penetration durability of moisture, heat, sound and other.

- iii) Functional Requirement
 - Strength stability
 - Weather resistance
 - Thermal insulation
 - Fire resistance
 - Sound insulation
 - Durability
 - Aesthetic
 - Services allowance

iv) Types of roof used in Malaysia

i) Pitch Roof

The terms of pitched roof includes any roof whose angle of slope to the horizontal lies between 10° and 70° . For the roof, which below these range it would be classified as a wall. The pitched is generally determined by the covering which is to be placed over the timber carcasses, whereas the basic form governed by load and span.

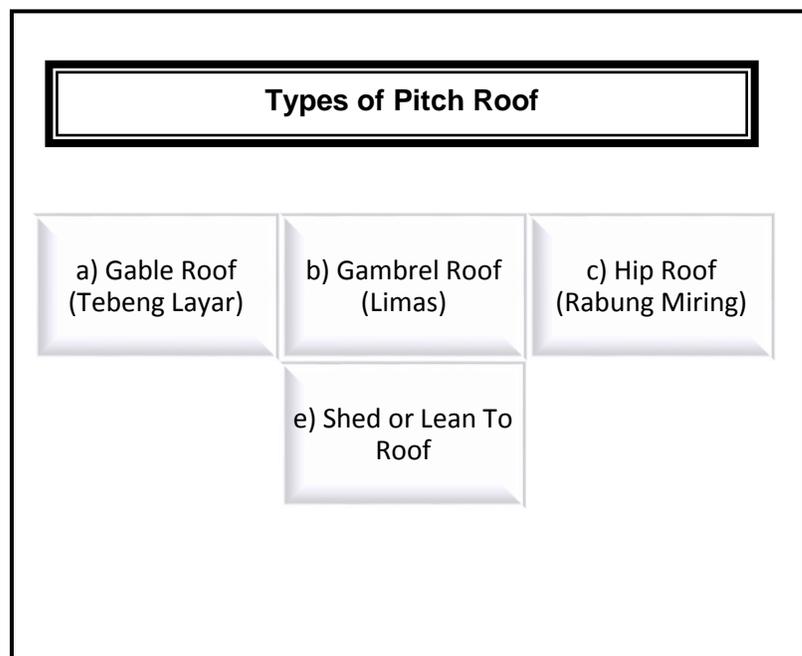


Figure 6 – Types of Roof Used in Malaysia

a) Gable Roof

Gable roof is very common in Malaysia. As informed, the gable roof is triangular section and it does have two slopes meeting at the center or ridge and forming a gable.



Figure 7 – Gable Roof Building in 3D Sketches



Photo 13 – Example of Building with Gable Roof

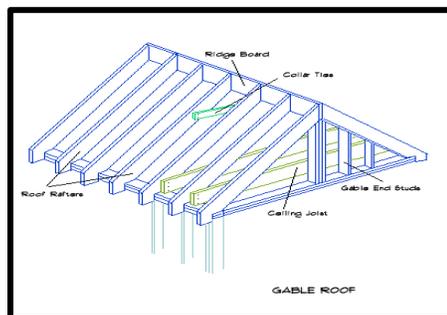


Figure 8 – Sketches of Gable Roof Element

Gable roofs have several advantages. They are inexpensive and it is may be designed in many different ways besides they are very weather-resistant. It also has some disadvantages. Only roof windows and gable windows may be use for illumination. Then, low-pitch gable roofs result in a loss of living space.

b) Gambrel Roof

Gambrel roof is a usually symmetrical two-sided roof with two slopes on each side. The upper slope positioned at a shallow angle, while the lower slope is steep.

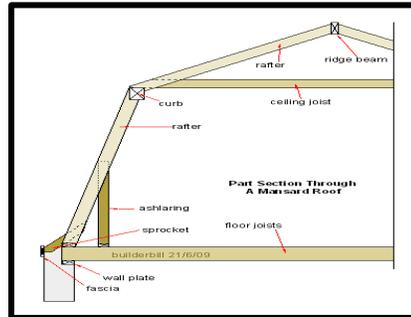


Figure 9 – Sketches of Gambrel Roof Element



Figure 10 – Gable Roof Frame in 3D Sketches

In Malaysia, one of the buildings that use gambrel roof is Christ Church, Melaka.



Figure 11 – Example of Gable Roof Building In Malaysia

c) Hip Roof

The hip roof formed by four straight sides. All sloping toward the centre of the building and terminating ridge instead of a deck.

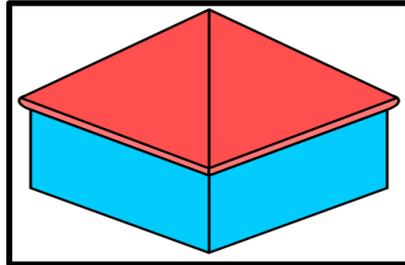


Figure 12 – Sketches of Hip Roof Building



Photo 14 – Gable Roof

A hip roof is self-bracing, requiring less diagonal bracing than a gable roof. Hip roofs are thus much better suited for hurricane regions than gable roofs. Hip roofs have no large, flat, or slab-sided ends to catch wind and are inherently much more stable than gable roofs. However, for a hurricane region, the roof also has to be steep-sloped, at least 35° from horizontal or steeper in slope is preferred. When wind flows over a shallow sloped hip roof, the roof can behave like an airplane wing.

d) Shed or Lean to Roof

This type of roof is actually the type of simple structure originally added to an existing building with the rafter leaning against another wall. It was freestanding lean-to structure are generally used as a shelter. This is the simplest form of roof and usually employed for small sheds and out buildings. It has a single and is not a thing of beauty.



Figure 13 – Sketches of Lean To Roof



Photo 15 – Example of Building with Lean To Roof

2.6 Summary

For this chapter, the types of maintenance that carried out by Jabatan Kerja Raya already identified. Usually, all of government building such as school and hospital were under its responsible. They just need to find the budget of the construction work.

Besides, listed out the types of the types of roof used in Malaysia never be easy. Since Malaysia had different climate from other countries, the suitable roof type was not much but the choice still effective and suitable for the weather in Malaysia.

CHAPTER 3: CASE STUDY

3.1. Introduction

At this chapter will explain about the research of the topic at the actual site in preparing this practical training report. Besides, it will tell the method of construction about the topic that had chosen before, which the installation of roof. In addition, this chapter will explain a bit about the types of the roof that been used.

However, this project already started earlier before I attend my practical training. Sadly, I missed a few steps of the process. Thankfully, my office supervisor had helped me to get all of the information besides explaining the process from the work started until the end. All the information of this chapter I got from the research besides interview of experienced people.

3.2. Case Study at Pusat Kokurikulum Pendidikan Lama



Photo 16 – The front view of Pusat Kokurikulum Pejabat Pendidikan Lama

Pusat Kokurikulum Pejabat Pendidikan Lama is one of the building under Kementerian Pelajaran Malaysia. This buiding had ever function as Pejabat Pendidikan Daerah Hulu Terengganu (PPDHT) before they move to the new building. Since the space of the new building of Pejabat Pendidikan Daerah Hulu Terengganu is too limited, they decide to renovate this building as they will used it as their second building for meeting and others.

This building still can be use but there a few structures that need to improvise because of safety and comfortability factor. The building also built for a few decades ago and the materials not suitable for nowadays specification. As they got the budget from Kementerian Pelajaran Malaysia, the client (PPDHT) proposing this project to the Jabatan Kerja Raya Hulu Terengganu to approve.

3.2.1 PROJECT SUMMARY	
Project Title	The Work of Repairing Damages Roof and Trusses Structure and other Related Work At Pusat Kokurikulum Pejabat Pendidikan Lama, Hulu Terengganu, Terengganu
Main Contractor	MKH Engineering and Services (Grade G3)
No. Contract	JKR/T/HT/P/10/2017
Original Contract Sum	RM 632,714.00
Current Contract Price	RM 547,489.85 (including GST)
Date of Commencement	7 th August 2017
Date of Completion	4 th March 2018
Contract Period	7 Month
Current Date of Completion	4 th March 2018
Defect Liability Period	4 th March 2018 until 3 rd March 2019
Local Authority	Jurutera Daerah Hulu Terengganu
Client	Kementerian Pelajaran Malaysia

Table 1 – Project Summary

3.2.2 Objectives

- To outline the work methodology of repairing the roof and trusses structure and other related work.

3.2.3 Scope of Work

- The repairing work of the roof and trusses structure and other related work.
- Electrical Work (will not stated the details)
- Mechanical Work (will not stated the details)

3.2.4 Tools and Equipment

No.	Photo	Function
1.	 <p data-bbox="607 688 873 722">Photo 17 – Grinder</p>	<p data-bbox="1019 415 1409 548">Cut the excessive metal deck. It also can be use as marking item.</p>
2.	 <p data-bbox="545 1129 935 1163">Photo 18 – Fastener Drivers</p>	<p data-bbox="1024 800 1406 877">Make the fastener installation faster</p>
3.	 <p data-bbox="610 1703 865 1736">Photo 19 – Ladder</p>	<p data-bbox="1032 1289 1398 1367">Used to climb up to the high place</p>

No.	Photo	Function
4.	 <p data-bbox="548 726 932 758">Photo 20 – Measuring Tape</p>	Measuring Item
5.	 <p data-bbox="516 1192 964 1224">Photo 21 – Marker Pen (Sharpie)</p>	Marking item
6.	 <p data-bbox="602 1646 881 1677">Photo 22 – Fastener</p>	As the connector of every element

Table 2 – Tools and Equipment

3.3.5 Types of Roof and Trusses Structure Used on Pusat Kokurikulum Pejabat Pendidikan Lama, Hulu Terengganu, Terengganu

a) *Metal Deck*

It designed for pitched and flat roof. Metal deck is popular because it is strong, lightweight, economical and easy to install.



Photo 23 – Metal Deck

b) Cold-Formed Form Steel Truss

The advantages of using this structure are, it non-combustible materials, insects resistant, moisture and mold resistant and resistant against material deterioration and shrinkage.



Photo 24 – Cold-Formed Steel Trusses

3.3.6 Manpower

- Site Supervisor
- Skilled Labor
- Unskilled Labor

3.3. Method of Construction

a) Demolishing Work of the Existing Roof Covering and Trusses Structure and Remove to the Relevant Allowed Places

Photograph	Work Description
 <p data-bbox="451 951 870 1031">Photo 25 – Removing Existing Items Work</p>	<p data-bbox="919 625 1490 705">Firstly, the existing roof covering and the trusses structure will be removed</p>
 <p data-bbox="480 1392 839 1423">Photo 26 – Disposal Work</p>	<p data-bbox="919 1104 1479 1236">Then, all of the removed material had been collected and it will be disposed to the allowed places</p>
 <p data-bbox="464 1764 857 1843">Photo 27 – Damaged Timber Column</p>	<p data-bbox="919 1493 1495 1776">Remove the damaged element like timber columns. This is not under the scope of work but it dangerous for the building structure itself since it will use for a long time soon. Besides, can cause harm to the building occupant. And it replaced by the</p>

Photograph	Work Description
 <p data-bbox="496 699 823 730">Photo 28 – Cleared Site</p>	<p data-bbox="915 373 1487 558">Now, the site already cleared and ready for the installation work. The opened roof already covered by canvas sheet as the preparation to adapt the rainy days</p>

Table 3 – Table of The Demolishing Work of the Existing Roof Covering and Trusses Structure and Remove to the Relevant Allowed Places

b) Structure Work

All fabricated components shall be manufactured only by reputable licensed truss fabricator producing quality assured products and services, to the approval of the Superintending Officer (S.O).

The contractor shall submit to the S.O, the manufacturer's product data and installation instruction for each type of cold formed steel framing and accessories required. The fabrication drawings submitted shall show roof truss layout, type, location, spacing, size and gauge member, method of attachment and other necessary details.

<https://www.jkr.gov.my/apkpkkr/pdf/Bhq11.PDF>

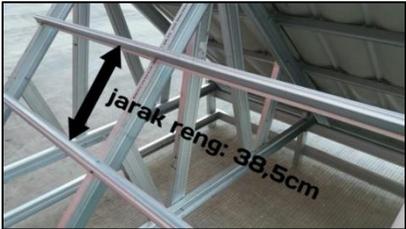
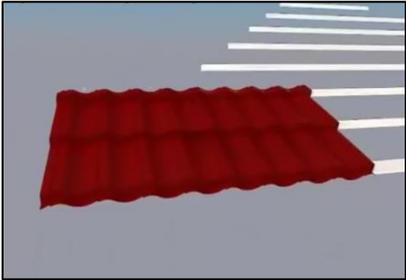
Photograph	Work Description
 <p>Photo 29 – Installation of Tie Beam</p>	<p>Main contractor informs that this building had no tie beam before. So that, the tie beam will be install first.</p>
 <p>Photo 30 – Installation of Steel Hollow</p>	<p>After that, main contractor adding the steel hollow as the additional trusses structure at the certain part of the building to support the structure itself</p>

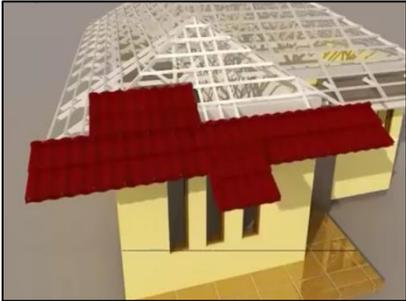
Photograph	Work Description
 <p data-bbox="448 674 870 751">Photo 31 – Installation of Roof Trusses</p>  <p data-bbox="440 1085 878 1115">Photo 32 – Installation of Rafter</p>	<p data-bbox="919 451 1492 730">Then, install the roof trusses. The type of roof trusses used, cold frame roof trusses. The trusses already assembled by manufacture. Install trusses in accordance with manufacture's instruction. Tighten the structure with the fastener.</p> <p data-bbox="919 804 1492 877">Hence, it will follow by the installation of rafter.</p>

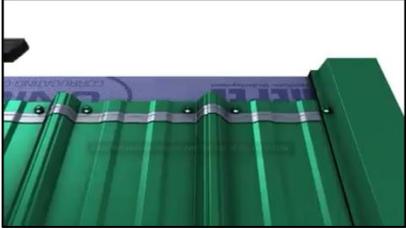
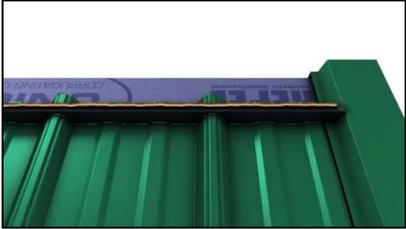
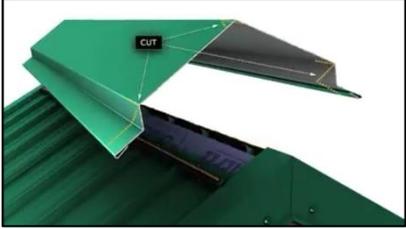
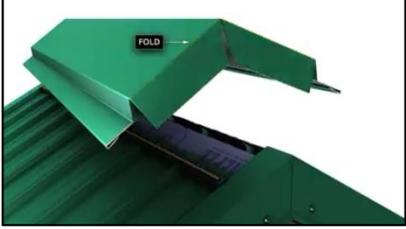
Table 4 – Method Construction of Structure Work

c) Metal Deck Roofing Work

Photograph	Work Description
 <p data-bbox="453 655 930 737">Photo 33 - Stick The Double Sided Tape</p>	<p data-bbox="980 401 1182 426">Insulation Work</p>
 <p data-bbox="464 1016 919 1045">Photo 34 - Lay The Bubble Foam</p>	<ul data-bbox="1027 499 1552 930" style="list-style-type: none">I) Stick the double sided tape (this is for temporary)II) Lay the bubble foamIII) Gently pull to tighten the foamIV) Secure the foamV) Remove the release line and lightly press the foamVI) Seal the foam with the aluminum foil tape
 <p data-bbox="456 1373 927 1455">Photo 35 – Gently Pull To Tighten The Foam</p>	
 <p data-bbox="492 1776 891 1806">Photo 36 – Secure The Foam</p>	

Photograph	Work Description
 <p data-bbox="433 552 951 632">Photo 37 – Remove The Release Line And Lightly Press The Foam</p>  <p data-bbox="444 957 940 1037">Photo 38 – Seal The Foam With The Aluminum Foil Tape</p>	
 <p data-bbox="526 1413 859 1444">Photo 39 – Ridge Space</p>  <p data-bbox="464 1766 919 1845">Photo 40 – Arrangement of Metal Deck</p>	<p data-bbox="980 1163 1273 1194">Installation of the Roof</p> <ol style="list-style-type: none"> <li data-bbox="1027 1213 1552 1293">I) Make sure the ridge had a space <li data-bbox="1027 1312 1552 1392">II) Then arrange the metal deck roof started from left to right. <li data-bbox="1027 1411 1552 1491">III) Drill the bolt on the metal deck roof sheet <li data-bbox="1027 1509 1552 1589">IV) Repeat those steps until the region fully covers <li data-bbox="1027 1608 1552 1797">V) After the metal deck roof finish installed at the certain region, cut the excess corner of it using the grinder.

Photograph	Work Description
 <p data-bbox="441 562 941 646">Photo 41 – Drill The Bolt Onto Metal Deck</p>	
 <p data-bbox="441 987 941 1071">Photo 42 – Covered Roof Trusses with Metal Deck</p>	
 <p data-bbox="441 1417 941 1501">Photo 43 – Installation of Metal Deck onto the Region</p>	
 <p data-bbox="441 1827 941 1869">Photo 44 – Cut Metal Deck</p>	

Photograph	Work Description
 <p data-bbox="451 548 935 579">Photo 45 – Apply the Tape Sealant</p>	<p data-bbox="980 298 1552 428">Installation of the Ridge and its Equipment (Ridge is the intersection at the top of two slope in a pitched roof)</p> <ol style="list-style-type: none"> <li data-bbox="1027 499 1552 831">I) Apply tape sealant across the width of the panel on both sides of the ridge. The tape sealant should be located so that the ridge fastener penetrate the centre of the tape sealant once the ridge cap is in place <li data-bbox="1027 852 1552 926">II) Place the outside closure over the top of the tape <li data-bbox="1027 947 1552 1020">III) Apply tube sealant to the top side of the outside closure <li data-bbox="1027 1041 1552 1073">IV) Cut the side of the ridge cap <li data-bbox="1027 1094 1552 1125">V) Fold the cut item <li data-bbox="1027 1146 1552 1276">VI) Fasten with the screw along the length of the ridge at each major panel rib
 <p data-bbox="451 850 935 882">Photo 46 – Outside Closure Placed</p>	
 <p data-bbox="451 1150 935 1182">Photo 47 – Tube Sealant Applied</p>	
 <p data-bbox="451 1453 935 1535">Photo 48 – Cut The Side of the Ridge Cap</p>	
 <p data-bbox="451 1801 935 1833">Photo 49 – Fold the Cut Item</p>	

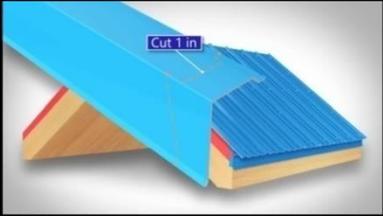
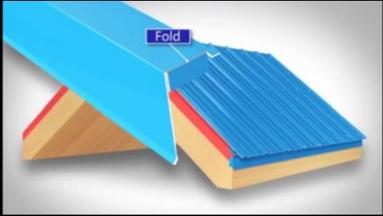
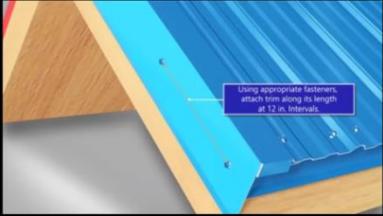
Photograph	Work Description
 <p data-bbox="467 499 917 577">Photo 50 – Fasten The Screw on Ridge Cap</p>	
 <p data-bbox="431 835 953 867">Photo 51 – Cut The End Of The Gable</p>  <p data-bbox="492 1125 893 1157">Photo 52 – Fold The Cut Part</p>  <p data-bbox="431 1413 953 1497">Photo 53 – Place The Gable Onto The End Of The Roof</p>  <p data-bbox="436 1755 948 1839">Photo 54 - Fasten Using Appropriate Fastener</p>	<p data-bbox="979 648 1300 680">Installation of Gable End</p> <p data-bbox="979 699 1552 982">(It was design needed of roof trusses structure. Main proposes of why it need to install at the end of roof trusses is to prevent the rainwater into the ceiling which will damage the electrical circuit and its appliance.)</p> <ol style="list-style-type: none"> <li data-bbox="1024 1052 1435 1083">I) Cut the end of the gable <li data-bbox="1024 1102 1338 1134">II) Fold the cut part <li data-bbox="1024 1152 1552 1236">III) Place it at the end of roof trusses <li data-bbox="1024 1255 1552 1339">IV) Fasten using appropriate fastener

Table 5 – Method Construction of Roofing Work

3.4 Safety Precaution

http://blog.abcmetalroofing.com/using-ppe-to-safely-install-metal-roofs/?_ga=2.178982820.1287747304.1528373705-1151841604.1528373705

i) Personal Protective Equipment

a) Gloves

- Protect from the sharp edge and corner of roof sheet



Photo 55 – Gloves

b) Safety Helmet

- Protect from the possibilities of getting the head injuries



Photo 56 – Safety Helmet

c) Safety Glasses

- Protect the eye during cut the metal deck sheet



Photo 57 – Safety Glasses

d) Reflective Vests

- Safety wear for alerting other worker presence



Photo 58 – Reflective Vest

e) Safety Boot

- Protect the foot from damage



Photo 59 – Safety Boots

f) Proper Clothing

- Wear well fitted clothing



Photo 60 – Proper Clothing

ii) Site Rules

- Only skilled worker is allowed to install the trusses structure and metal deck sheet
- Workplace must always be cleaned after work done
- All of the labors must wear proper PPE. It is compulsory.
- All of the machineries must be kept at the site office as soon after used

3.5 Summary

In this chapter already described the details about the work at the case study which Pusat Kokurikulum Pejabat Pendidikan Lama. This chapter will give knowledge to know more details how metal deck roofs be installed. It shows that Malaysia also have proper skill in installing this type of roof.

However, there is a lot of picture which not in actual site. But all of the details that got from the internet already approved by the professional so that the source might be relevant for this case study.

CHAPTER 4: PROBLEM AND RECOMMENDATION

4.1 Introduction

In this chapter will describe the result from the finding and analysis from data collected at the case study which Pusat Kokurikulum Pejabat Pendidikan Lama. Especially, during the construction work.

Based on the observation, there were minimum problems at the site since the main contractor is very responsible during inspecting the progress work. However, there were a few minor problems that will list out and relevant recommendations.

4.2 Problems and Recommendations

No	Problem	Recommendation
1.	During the construction started, main contactor had realizes certain part of the building there is no tie beam. Hence, it will cause the problem especially during the installation of trusses structure.	Clean the part of no tie beam and install with the new one.
2.	Since those building age of the building already old, there were a few main supporting element such rotten timber column.	Timber column is hard to maintain because it will expose to the rainy days and the termite attack. Since this column located at the outside of the building, installation of steel column very recommended.
3.	The sizes of existed steel column are too small and not relevant to during installation the trusses structure.	Collaborate with the manufacture of the trusses structure to change the steel column with bigger size.
4.	During the inspection before the handing over session, the site had not cleared yet as there is still lots of old newspaper and other garbage messes on the floor.	Ask the worker to clean it as fast at they can.

Table 6 – Analysis Of Problems and Recommendations

4.3 Summary

As stated, there were a few problems occur during the construction which it was not stated in the scope of work in the Bill of Quantity (BQ). Surprisingly, the problem already solved by the main contractor. Another praised that should give to the main contractor because they know how to manage all of the expense for not to overprice than its actual.

This project is already handing-over safely and finish the work on time. Hopefully, the building will function as before with the advanced comfort-ability level.

CHAPTER 5: CONCLUSION

5.1 Conclusion

Firstly, the conclusions for this Practical Training Report is we get to adapt and expose with the new things as it is different with the things that we face during learning session at the university. It is a good thing because almost every day, we get to know the new knowledge, which we can use it in our daily life soon.

At the first chapter, we get to know the details of the organization and background of Jabatan Kerja Raya HULu Terengganu. We can know the professions and their scope of work maybe we do not at all before this. Facing with the senior age of staff does give us more encouragement to be more confident and motivation to work hard successful like them.

At the second chapter, we had learned about the scope of maintaining works and its procedure. At the same time, we get to know the types of roofs used in Malaysia.

The most crucial chapter is chapter three. It asked us to be more independent for getting the information about that case study. It is because the staffs there were so busy with their work. Thankfully, instead of their busy schedule they still had time to explaining for me every steps of the method construction of the metal deck roof.

For the chapter four, we need to analyze the problems and recommendation. But we just get a few of it. It is because the main contractor is to alert with the problems and solve it as soon as they get the permission from Jabatan Kerja Raya Hulu Terengganu.

In a nutshell, this practical training report really affecting us for being more matured about local construction industry. Besides give us motivation to gain more knowledge to be successful person.

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