



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

**ROAD TESTING WORK UNDER  
MAJLIS DAERAH BALING AS LOCAL AUTHORITIES**

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DIPLOMA IN BUILDING SURVEYING**

**PRACTICAL TRAINING REPORT  
DECEMBER 2016 – MARCH 2017**

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Then, I would like to extend my gratitude too, to the organization, Majlis Daerah Baling, for their kindness and their trust for giving me a chance to have my practical training in there. And at the same time, I would like to take a chance here to express my deeply thankful for my supervisor, Madam Atikah Binti Muhamad who had taken a lot of effort to go through my daily logbook report and answering all my doubtful concern around the work required here. Finally, I would like to express my heartfelt gratitude to my family, friends and also lecturer for their support, constructive suggestion and also critics.

## ABSTRACTS

Road testing work under Majlis Daerah Baling as Local Authorities function is to determine the quality of road construction made by the developer based on thickness, process of work and strength of road. There are several steps to test the strength of the road conducted by MDB. MDB task to work of road testing is usually done on the street of residential houses, lots of shops and areas of operation of newly built sites require testing determining the strength of the land before it is opened to be fully used. MDB only test roads under surveillance of MDB only. If to roads and highways, the MDB is not involved in the work of the road testing because JKR that manages it. Road testing was do when the client submit letter to Engineering Department Majlis Daearah Baling to notice the road ready to testing.

There a several steps work to test strength of road. Firstly, test soil moisture content or scientifically name is Field Density Test (FDT). FDT is done by placing the tray plate on the ground that has churser run. After that, the ground is excavated to a depth of 1 feet using drill machine. The excavated soil is put into plastic. Next, sand being carried separately and have burned without moisture ( $0^{\circ}$ ) inserted into a hole dug using cyiling cone. Sand that is inserted into the hole reinserted into the plastic and brought to a laboratory for testing the moisture content level of the soil and moisture content level of a sand that put into holes dug. . The road was test point to point. To calculate the amount of point of the *area of site must divide with  $500m^2$*  and then can get the amount point that must do a test.

The next road testing steps is California Bearing Ratio (CBR). CBR is done by pressing down the burden with using a lorry that has high loads as a burden. For example, install the mechanical type machine jack on the back of the lorry and turning mechanical jack type machine while gravity support and pressing the road surface and burden to down. There have a dial gauge install with CBR equipment and the function of dial gauge is as a reading for pressure of load at the lorry. If the needle of a dial gauge move faster, means the road surface was not solid and not strength enough. So, the contractor need to re-

surface the crusher run until the surface was strength and the dial gauge reading get more than 90%. Then, if the needle of dial gauge move slowly and the reading of dial gauge more than 90% means the road surface was strength and solid and was achieve with criteria of Majlis Daerah Baling. The road was test point to point. To calculate the amount of point of the *area of site must divide with  $500m^2$*  and then can get amount point that must do a test. It was same with Field Density Test (FDT), because it was do at the same time. Next, after calculate the area of site. The amount of point that gets divide by 2. **For example:** - Get 14 point, so 7 tests point for FDT and 7 tests point for CBR.

Then, test the thickness of churser run either complies with the standards of MDB or not. A thickness of churser run was not less than 1 feet (300mm). Otherwise, the contractor required to make a re-pavement churser run up to 300mm or more.

Finally, for the last road test under Majlis Daerah Baling as Local Authorities is Coring Test. Function of coring test is to check the thickness of premix. This test was doing after CBR, FDT and check thickness of crusher run was approval from MDB. Then, the premix was pavement on the crusher run surface. After settle pavement the premix, in 2 or 3 days after pavement the premix, coring test will do. It because to make sure premix was strength and already to do coring test. Coring test was test point by point. To know the total of point must calculate *area of site divide by  $500m^2$*  to get the point need to test. Coring test was doing use core machine to drill and get the thickness of premix. Then, the core was measure using digital caliper. Thickness of premix has 2 types, Asphaltic Concrete Wearing Course (ACWC) with 40mm thickness and Asphaltic Concrete Binder Course (ACBC) with 60mm thickness. So, the combine of premix thickness is 100mm. After that, the hole that digs to get the core was closed with a new premix and compact with compact machine. If the thickness of premix was less than 100mm, contractor needs to re-surface premix until get 100mm or more.

Majlis Daerah Baling only handle for 4 steps of road testing, for a site clearance, pavement the crusher run and premix was handle by developer and their own contractor. The needed of crusher run and premix for the one site was brought to the site by lorry that have already measure how much tan lorry it need by measure the area of the site. For premix , it come from premix plant that have mix the premix. Premix cannot have water because it can make premix become crack. Premix has specified temperature, in the lorry the temperature is 150°C. And if the premix was cool the premix was rejected. Premix cannot have in the lorry more than 24 hours / day. While lay the premix at the site, it temperature is 120 °C. During compact work it temperature is no less than 80 °C.

All this road testing cannot do when a raining day because structure of soil have not strength enough and smooth because have water. The result for checking thickness crusher run, , CBR and coring test can get at the site when do the test because it was in-situ test. But the result for FDT, contractor brought the soil and test at the lab. It because to the take the moisture content of soil. So, it only can do at the lab. But for the core of premix that have drill by do coring test was bring to lab and compress to measure the size of crusher run and the content of bitumen. But for this test of at the lab Local Authorities only get the result from contractor of lab. But MDB only test the basic of road test and for the detail road test under JKR.

# CHAPTER 1

## **1.1 INTRODUCTION OF PRACTICAL TRAINING**

Practical training is focusing to create awareness, identification and early preparation to the students about various aspects of working practices before proceeding to the actual working environment. Practical training also provides opportunities for students to gain experience in addition to help students in developing good fundamentals as a prospective employee is required to meet the needs of industry. This training is important for students to build confidence, expand their technical skills and knowledge to apply the theory taught by lecturers at the university. In addition, students are also exposed to methods of communication and interaction between the corporate or colleagues and the management company. All students are required to undergo practical training to meet graduation requirements and eligibility.

Prior to be awarded the Diploma, as a student from University Teknologi Mara (UiTM), we are required to undergo practical training in any placement of an organization government or private agency, company or industry.

Practical training program provides pre-professional work experience with specific assignments and responsibilities. It may help students to improve their marketability when they go for the industry after graduated. The objective of practical training is to expose student to the real working environments whereby they will encounter new problems and challenges. Besides, students will also learn the communication and interpersonal skills. So, we can prepare our self before attempt in real working environment.

The practical training takes 4 months for Diploma students to gain knowledge and working experiences in real environment. From this experience, students will learn how to apply the skills when they involved in industry on future. Hopefully student will be successful in practical training and follow all the rules while maintaining the name and reputation of UiTM and faculty.

## **1.2 OBJECTIVE**

The objective of the practical training module is to give an opportunity to student in order to implement the knowledge of theory and skills that have had learned in the class and automatically expose to the real working environment in the specific fields which can enhance the ability and skills.

### **1.2.1 THE GENERAL OBJECTIVES OF PRACTICAL TRAINING**

- To expose the student to the real condition and working environment.
- To implement the theory knowledge that have learned in the university in decision making and problem solving that related to their specific fields.
- To expose the student to the new technology that has being used in the industry.

### **1.2.2 THE SPECIFIC OBJECTIVES OF PRACTICAL TRAINING**

- To understand and develop responsible manner in the real working environment.
- To acquire an experience on working in industry that suit with the related course.
- To develop a professional ethical value.
- To enhance the ability in communication skill.
- To have a good professional bonding between workers and student in industry.

## **1.3 PRACTICAL TRAINING SCOPE**

Scope of the practical training must let the student expose to the real working environment and give them an opportunity to apply their skill and knowledge in their related specific fields that they have taken in university.

# CHAPTER 2



## 2.1 COMPANY BACKGROUND

Baling District Council (Majlis Daerah Baling or MDB) is a governing Local Authority (Pihak Berkuasa Tempatan or PBT) established for the purpose of administering the district of Baling, Kedah. Formerly called Local Government District Council (Majlis Daerah Kerajaan Tempatan), establishment was set 1<sup>st</sup> April 1976. It was changed to Majlis Daerah Baling on 1987.

Baling is a town located in the northern state of Kedah in Malaysia. With an area of 1530 square kilometers, Baling is the second largest district in Kedah. Bordering with Betong, the southernmost district of Thailand, it is also situated near Perak border on the east, the district of Sik and Kuala Muda on the west, and the district of Kulim on the south.

MDB enforce regulations which included 6 local government acts, 18 by-laws and 1 enactment. The town is headed by one District Officer (Pegawai Daerah). There are 7 governing sub district in Baling, namely Siong, Baling, Bongor, Pulau, Kupang, Tawar, Teloi Kanan, and Bakai.

MDB have a branch at Kuala Ketil and the new branch at Charuk Nau, Baling. New branch at Charuk Nau was transfer in October 2016. Departments that have transfer to Charuk Nau are Department of Engineering and Department Planning Development and Landscape also One Stop Centre (OSC).

I was assigned under Department of Engineering and Building Division. The office Department of Engineering was located at Charuk Nau.

In addition there also the 3 Kampung Baru which later absorbed into the administrative Majlis Daerah Baling, namely: -

- a) Kampung Baru Kejai
- b) Kampung Baru Kampung Lalang
- c) Kampung Baru Simpang Empat Jalan Kroh

In 1987, the Local Government District Council was renamed **DISTRICT COUNCIL BALING** (Majlis Daerah Baling)

All these areas are taxed except Kampung Lalang, Kampung Baru Kejai, Pekan Malau and Parit Panjang. However, the Majlis Daerah Baling is taking action to register the holdings located in the area that has been gazetted as taxable Council area such Pekan Malau, Pekan Estate, Kampung Baru Kejai, Pekan Kampung Lalang and Pekan Pulaui. The services provided are as providing infrastructure such as bus stops, supermarkets, garbage carried trash to landfills and provide street lighting.

## 2.2 AREA OF MAJLIS DAERAH BALING ADMINISTRATION

Table 2.1 : Area of MDB Administration

<b>MUKIM</b>	<b>AREA (HECTARES)</b>	<b>PERCENTAGE (%)</b>
SIONG	54,270	35.49
BONGOR	4,470	2.92
BALING	3,867	2.58
PULAI	15,615	10.21
KUPANG	19,925	13.03
TELOI KANAN	15,410	10.08
TAWAR	12,742	8.34
BAKAI	26,600	17.40
<b>TOTAL</b>	<b>152,900</b>	<b>100</b>

### 2.3 AREA OF MDB ADMINISTRATION PLAN

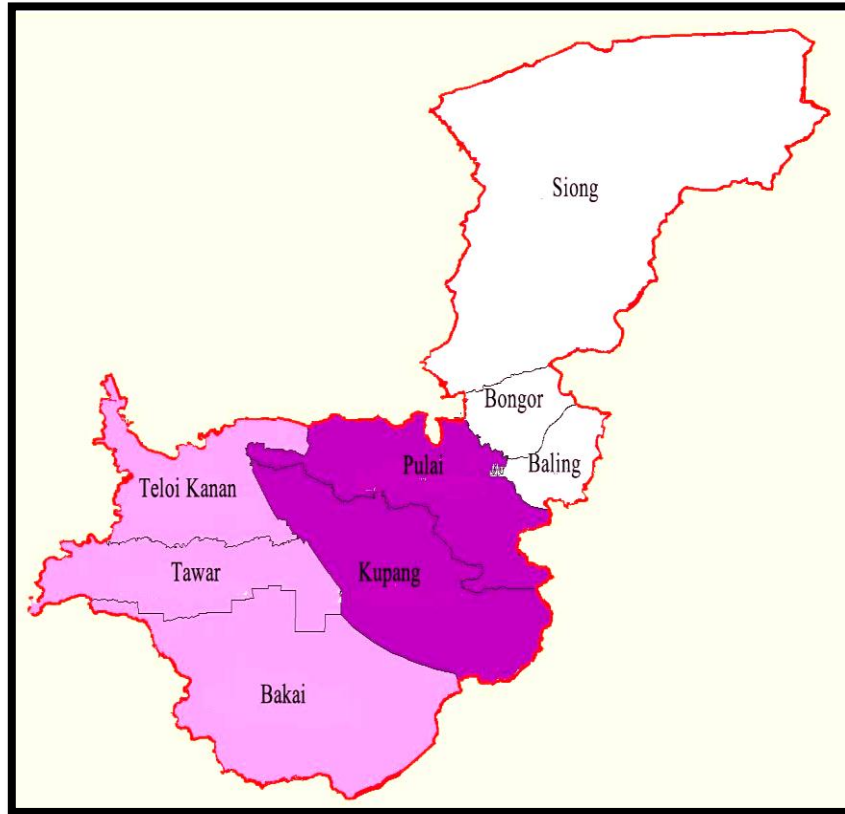


Figure 2.1 : Area of MDB Administration Plan

## 2.4 PLAN OF MAJLIS DAERAH BALING



Figure 2.2 : Main Office of Majlis Daerah Baling

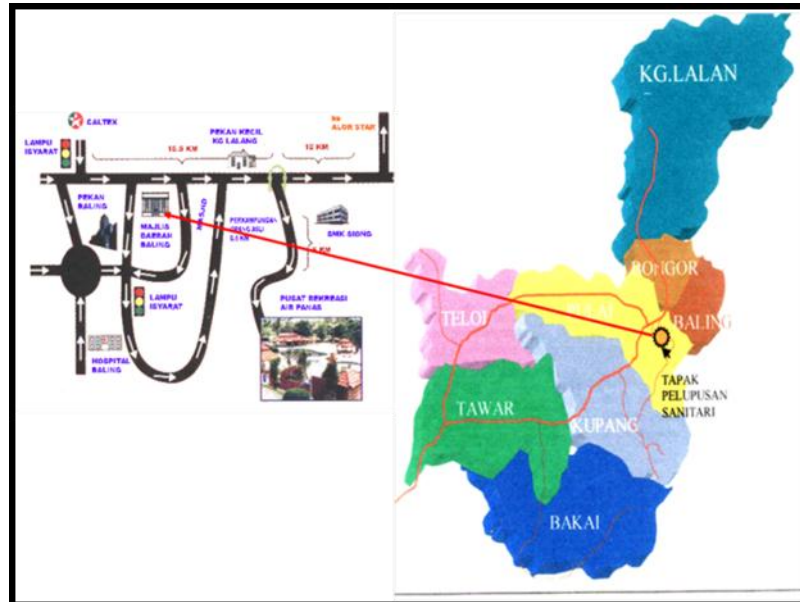


Figure 2.3 : Location Plan of Baling Town

**2.4 DIRECTON PLAN FROM MAIN OFFICE OF MAJLIS DAERAH  
BALING TO ENGINEERING DEPARTMENT OFFICE.**



Figure 2.4 : Location Majlis Daerah Baling (Main Building in the red label)



Figure 2.5 : The path to the MDB Engineering Department (labeled) from the  
main building



Figure 2.6 : Building of MDB Engineering Department



Figure 2.7 : Office of Engineering Department

## 2.5 VISION AND MISSION

The company vision is “Toward a planned, beautiful and peaceful city”, while the missions is “Working hard towards a planned, beautiful and peaceful city”. The objectives of Majlis Daerah Baling are supremacy of organization, leadership and successful administration, high quality of life, participation and customer satisfaction, and focus of investment.

## 2.6 OBJECTIVE OF MAJLIS DAERAH BALING

Majlis Daerah Baling is a government sector that gives services to the villagers and focusing to make Baling district as an emerging government state with clean and beautiful environment. Majlis Daerah Baling exists with three main objectives:

- i. Making Baling as an emerging district.
- ii. Enhancing the productivity and quality through successful and discipline working environment.
- iii. Live peacefully with clean and beautiful environment.

## 2.7 MOTTO

The motto of Majlis Daerah Baling is **CLEAN, SUCCESSFUL** and **PEACEFULL** which is a key to give support and commitment as the objective will be achieved.



## 2.8 OFFICIAL SYMBOL

This is the official symbol representing the MDB organization.



Figure 2.8 : Logo of Majlis Daerah Baling

**Four distinctive colours and a geometric shape used in the logo represent the meanings as follow:**

Table 2.2 : Explanation logo's colour of Majlis Daerah Baling

COLOUR	RATIONALE
Light Blue	Hope and happiness in Baling district
Dark Blue	Mount Baling as the district's landmark
Red	Rapid development in the district
Yellow	Kedah as 'Rice Bowl' state the auspice of His Royal Highness
Octagonal shape	Eight sub districts in Baling

## **2.9 FUNCTIONS OF MAJLIS DAERAH BALING**

As a local governing authority (PBT), MDB functions in establishing policies and strategies towards structured development including:

- Rancangan Struktur Majlis Daerah Baling (1992-2010)
- Rancangan Struktur Negeri Kedah (2001-2020)
- Pelan Tindakan Kedah Maju (2001-2010)
- Providing a comprehensive land usage map
- Suggestion of programs and development guidelines
- Coordinating developments in the area under MDB jurisdiction
- Involving local residents in local planning.

## **2.10 ACTIVITIES IN MAJLIS DAERAH BALING**

- a. Gives licenses and control the business advertisement and vendors.
- b. Planning and controlling construction and preparing plan structure.
- c. Supervising and helping to develop new town.
- d. Controlling advertisement block and signboard.
- e. Making the beautiful town with an interesting landscape.
- f. Constructing and maintaining the road in housing area and Baling district area.
- g. Preparing facilities likes bus stop, hall for vendors, exercise's complex, and playground for children.

## 2.11 UNITS IN MAJLIS DAERAH BALING

Table 2.3 : Units in Majlis Daerah Baling

BIL	UNIT	CHIEF UNIT
1	Unit Pusat Setempat (OSC)	<ul style="list-style-type: none"> <li>• Encik Abdul Rahman Madri Bin Che Ahmad</li> <li>•</li> </ul>
2	Unit Undang-Undang	<ul style="list-style-type: none"> <li>• Encik Mohd Helmi Bin Ghazali</li> </ul>
3	Unit Perhubungan Awam Dan Komunikasi Korporat, Inovasi Dan Kualiti	<ul style="list-style-type: none"> <li>• -</li> </ul>
4	Unit Audit Dalam	<ul style="list-style-type: none"> <li>• -</li> </ul>

## 2.12 DEPARTMENTS IN MAJLIS DAERAH BALING

Table 2.4 : Departments in Majlis Daerah Baling

BIL	DEPARTMENT	CHIEF DEPARTMENT /DIVISION
1	Jabatan Khidmat Pengurusan a. Bahagian Pentadbiran & Keurusetiaan b. Bahagian Pengurusan Maklumat c. Bahagian Pengurusan Sumber Manusia	<ul style="list-style-type: none"> <li>• Encik Afif Bin Shaari</li> <li>a. Puan Siti Norhayati Binti Abdul Rani</li> <li>b. Encik Ahmad Badawi Bin Abdul Ghani.</li> <li>c. -</li> </ul>

2	Jabatan Perbendaharaan	<ul style="list-style-type: none"> <li>• Cik Norhayati Binti Yaacob</li> </ul>
3	Jabatan Penilaian dan Pengurusan Harta	<ul style="list-style-type: none"> <li>• Tuan Haji Rozali Bin Mustafa</li> </ul>
4	Jabatan Perancang Pembangunan dan Landskap	<ul style="list-style-type: none"> <li>• -</li> </ul>
5	<p>Jabatan Kejuruteraan</p> <p>a. Bahagian Bangunan</p> <p>b. Bahagian Infrastruktur dan Penyelenggaraan</p> <p>c. Bahagian Mekanikal dan Elektrikal</p> <p>d. Bahagian Pembangunan Projek</p>	<ul style="list-style-type: none"> <li>• Encik Badrul Hisham Bin Yaakub</li> </ul> <p>a. Puan Atiqah Binti Muhamad</p> <p>b. Encik Mohd Rohaizad Bin Mohd Rodzi</p> <p>c. Encik Mohd Faizal Bin Mohd Razali</p> <p>d. Encik Mohd Hafiz Bin Shahir</p>
6	<p>Jabatan Kesihatan dan Persekitaran</p> <p>a. Bahagian Kesihatan Awam</p> <p>b. Bahagian Inspektorat</p> <p>c. Bahagian Pelesenan</p>	<ul style="list-style-type: none"> <li>• Encik Ishak Bin Ibrahim</li> </ul> <p>a. Cik Siti Nor Aishah Binti Omar</p> <p>b. Encik Jamil Bin Abu Yazid</p> <p>c. -</p>
7	Jabatan Penguatkuasaan	<ul style="list-style-type: none"> <li>• Encik Mohd Lafti Abdul Ghani</li> </ul>
8	<p>Jabatan Pembangunan Masyarakat</p> <p>a. Bahagian Pembangunan Pelancongan dan Rekreasi</p> <p>b. Bahagian Pembangunan Sosial</p>	<ul style="list-style-type: none"> <li>• -</li> </ul> <p>a. Encik Afif Bin Shaari (Tanggung Tugas)</p> <p>b. -</p>

### **2.13 BUILDING DIVISION**

Building Division is one of the divisions under the Department of Engineering, aside from the Infrastructure and Maintenance Division, Project Development Division and Mechanical and Electrical Division, in Majlis Daerah Baling. The Department of Engineering contains 24 staffs consisting of officers, subordinates and field workers.

The trainee, Norfazliana Binti Azizan, is assigned to the Building Division for a period of 4 months (1<sup>st</sup> December 2016-31<sup>th</sup> March 2017). Building Division is headed by Madam Atikah Binti Muhamad. Under her supervision, the building division contains 3 staffs consisting 1 as an Assistant of Engineer and 2 as an Administration Assistant.

2.14 ORGANIZATION CHART OF MAJLIS DAERAH BALING

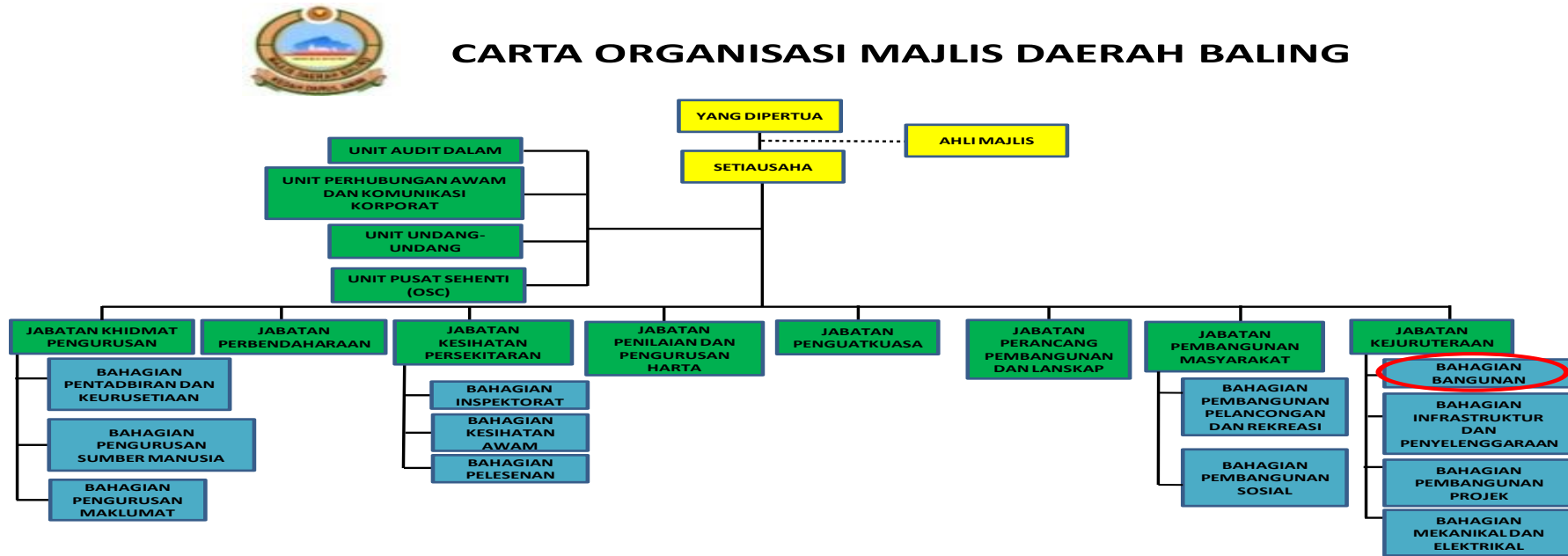


Figure 2.9 : Organization Chart Of Majlis Daerah Baling

2.15 ORGANIZATION CHART OF ENGINEERING DEPARTMENT



Figure 2.10 : Organization Chart Of Engineering Department

2.16 ORGANIZATION CHART FOR BUILDING DIVISION

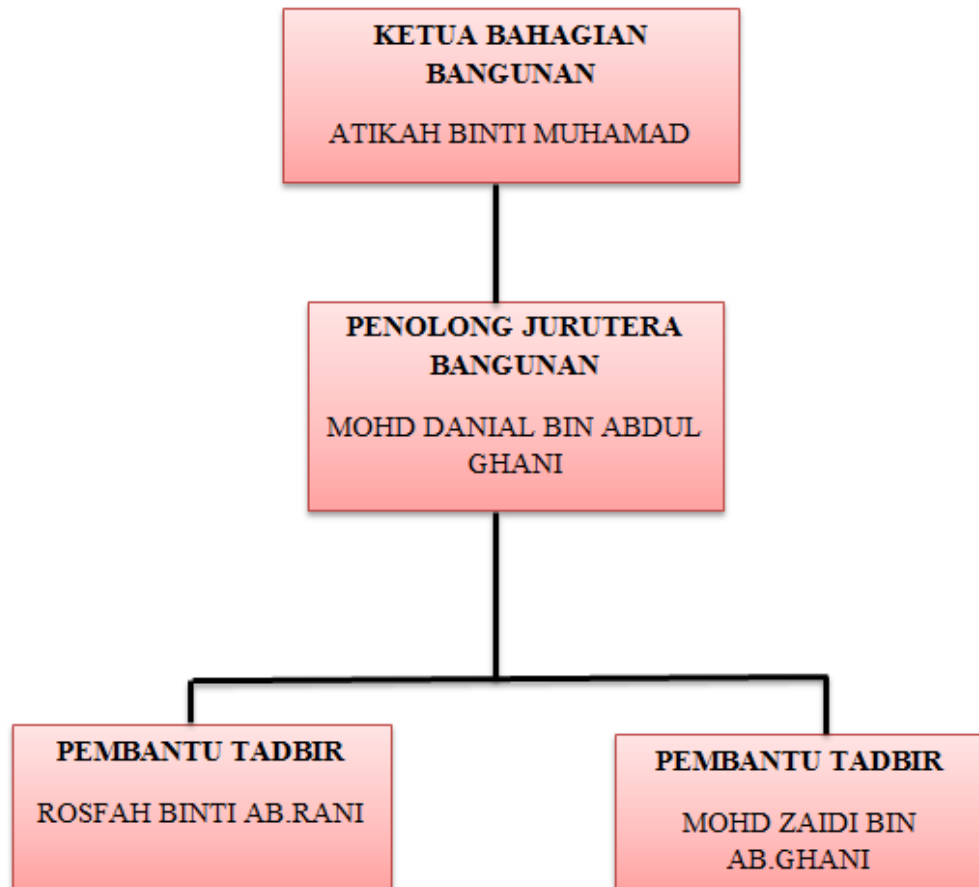


Figure 2.11 : Organization Chart For Building Division



## **2.17 DUTIES AND RESPONSIBILITIES OF BUILDING DIVISION**

1. Responsible to Mr. President and Mr. Secretary;
2. Responsible for planning, controlling and directing the staff and determine the continuity of the work in the building;
3. Responsible for reviewing plans proposed housing schemes and other development plans including infrastructure so that approval;
4. Responsible visit / monitor construction sites and other housing schemes developed by the developer / applicant to comply with the conditions of approval and current standards;
5. Responsible for the working visit of the building is ready for review and confirmation of the withdrawal of the Certificate of Fitness for Occupation (CFO) / Certificate of Completion and Compliance (CCC);
6. Presenting a paper application building plans and other plans in the OSC Committee Meeting / Internal Technical Committee;
7. Responsible for taking action on matters arising and the decision of the Full Meeting, Meetings Committee One Stop Centre (OSC) as well as other meetings attended;
8. Responsible for coordinating actions and feedback on complaints relating to the Building Division;
9. Responsible for processing the application and give its approval to the plan amendment / supplement / Standard Plan / Minor Work Permit;
10. Responsible for monitoring and taking appropriate action in accordance with the provisions of the existing Act on buildings that do not comply with the approval of the Council, including the issuing of notices related.

## 2.18 OBJECTIVE OF WORK

- There are several objectives needs to be done namely:
  - To learn and understanding road testing work under Local Authorities.
  - To determine the effectiveness of a paved road by the developer either fulfill the criteria set by Local Authorities
  - To identify design of road layer.
  - To test the strength of the soil.
  - To test safety of road before use.
  - To avoid the occurrence of soil.
  - To test moisture content of soil.
  - To determine the quality of road construction made by the developer based on:
    - i. Thickness
    - ii. Process of work
    - iii. Strength of road

## 2.19 SCOPE OF WORK

The scope of this research is involving the road testing work under Majlis Daerah Baling as Local Authorities:-

- Go to site that the road surface was been razed with crusher run.
- Do the Field Density Test (FDT) and check the thickness of the crusher run on road surface. The thickness must more than 1 feet and for the thickness of FDT also must more than 1 feet.
- California Bearing Ratio (CBR) was doing by use a CBR equipment test and lorry as a load to press the surface to make sure the soil surface was strength.
- Result for thickness and CBR test will get at the site because it was in situ test while for FDT the result was known from lab test.
- Then, do a coring test. Coring test was test after the road surface was paved by premix .This test doing by drill at the surface of premix use by core machine. And after get the core .The hole was compact with a new premix and compact with compact machine.
- All tests were test point by point. To know the total of point and must calculate *area of site divide by 500m<sup>2</sup>* to get the point that need to test.

# **CHAPTER 3**

## **(LITERATURE REVIEW)**

### 3.1 INTRODUCTION

This chapter was explaining about common road testing methods work that use by all contractor in the world. This road testing work was recognized for all contractor to easily their road testing work. It also to test the strength of road and to avoid from any problem happen in the future when road was use by everyone. Also to make sure road was safe to use with a high load pressure.

All this testing road methods was use by all contractors because they do base of technical guidelines. For Malaysia, it follow based on Arahan Teknik Jalan 85/2Kerja Raya and others but most of them Malaysia was follow by Jabatan Kerja Raya. But for Local Authority it was test for Municipal Road and it not test all layer of design road. And it was testing from sub base such as crusher run until premix layer only. This is because for details road testing was done by Jabatan Kerja Raya such as at the highway and bridge.

### 3.2 DEFINITION OF WORK

Road must be testing to get approval and before people use it must in a safe condition. There have a few steps to do testing road to make sure that road been strength and safe to people for use it.

So, for test the design layer of road it have a step and methods to do the test. Firstly, it must test the thickness of crusher run by digging 1 feet depth to make sure the sub base was strength and fully pavement with crusher run. Because to avoid from have a clay because clay can make surface because smooth when have a pressure.

Then, do Field Density Test by do sand replacement to measure the moisture content of the soil. Next, check the strength of road surface

by doing California Bearing Ratio (CBR) with pressure the crusher surface using a lorry.

Lastly, do the coring test to check the thickness of premix by drill the core 100mm. If all tests follow the criteria of Local Authorities, the road testing will get approval.

### **3.3 PROCESS CHECK THICKNESS OF CRUSHER RUN**

- Check the thickness of the soil on the crusher run surface by digging the depth of soil 1 feet.
- Then, measure the hole using measuring tape.
- Close the hole using a hoe.

#### **3.3.1 OBJECTIVE THICKNESS OF CRUSHER RUN**

- To determine the strong of road surface.
- To ensure the thickness of crusher run was 1 feet to avoid from soil silt when have raining day.

### **3.4 FIELD DENSITY TEST (FDT)**

#### **3.4.1 INTRODUCTION**

- Field Density Test was made of sand replacement test to measure the dry density of compacted soil.
- With this method, the hole was dug to determine the value:
  - Moisture content in the soil
  - A weight of soil removed
  - Volume of hole = A weight of sand that is inserted into the hole.
- This method is suitable for granular soils. (sandy soil)
- The verification of the degree of compaction can be determinate on site by a simple procedure consisting essentially in removing and weighing a part of compacted soil and replacing in the hole with sand by a simple apparatus recording the volume of sand and then calculating the density of the removed soil.

#### **3.4.2 OBJECTIVES FIELD DENSITY TEST**

- To determine the in situ dry density in compacting works at the site.

### 3.4.3 EQUIPMENT TEST



Figure 3.1 : Dynamic Cone Penetration Test and Tray Plate



Figure 3.2 : The worker put the soil into the Dynamic Cone Penetration  
Test



### 3.4.4 PROCESS OF FIELD DENSITY TEST

1. Flatten the ground level surface until it touch the whole flat tray was used.
2. Dig a hole as deep as 150 mm to 100 mm in diameter on the ground first. Weigh the soil has been excavated. Make sure there is no land being left in the hole that had been dug. Take a little soil to determine moisture content in the soil. (Oven method or how quickly the moisture content).
3. Cylinder pouring placed over the hole that had been dug. Open the lid and let the sand fills the hole and cone. (Make sure there is no vibration in the surrounding area of the test carried out).
4. When no more sand pouring out of the cylinder, close the lid and take the sand that has pour into the hole to the plastic.
5. Contractor brought to the lab and the result of moisture content will submit to Local Authorities for approval.

### 3.5 CALIFORNIA BEARING RATIO TEST

#### 3.5.1 INTRODUCTION

- California Bearing Ratio is a penetration test to evaluate the strength of road subgrades and base courses.
- The California Bearing Ratio Test (CBR Test) is a penetration test developed by California State Highway Department (U.S.A.) for evaluating the bearing capacity of subgrade soil for design of flexible pavement.
- And created by O.J. Potter. Then was modified by the United States military (US Army Corps Of Engineers)
- The California Bearing Ratio (CBR) field test is optimal for measuring the relative strength of in-situ soils and some base course materials for use in pavement design. Field tests are run by forcing a piston into the soil at the test site and comparing the load on the piston to the depth of penetration.
- Penetration Dial Gauges and Load Rings measure penetration and applied force. A Dial support bridge and mounting accessories position the Dial Gauges for measuring penetration.

### 3.5.2 OBJECTIVES CALIFORNIA BEARING RATIO TEST

- California bearing ratio is to determine the penetration testing of burden on a road surface.
- The CBR test is one of the most commonly used methods to evaluate the strength of a sub grade soil, sub base, and base course material for design of thickness for highways and airfield pavement.
- The california bearing ratio test is penetration test meant for the evaluation of subgrade strength of roads and pavements. The results obtained by these tests are used with the empirical curves to determine the thickness of pavement and its component layers. This is the most widely used method for the design of flexible pavement.



Figure 3.3 : The CBR equipment was installing at the lorry.

### 3.5.3 PROCESS CALIFORNIA BEARING RATIO TEST

- 1) Equipment for test is placed on top of the road for testing the strength of crusher run parked.
- 2) The burden imposed on the coating by using any available vehicles, usually using the lorry.
- 3) Dial gauge will measure the depth of the puncture occurs according to the applied load.
- 4) Data is recorded and linked to the value ratio California

### **3.6 CORING TEST**

- A compression test on a sample of hardened concrete cut out with a core drill.

#### **3.6.1 INTRODUCTION CORING TEST**

- Coring is the process of removing a cylindrical sample, or core, of the land, or a paved surface.
- Employees do this test using special core drilling machines.
- Coring tests conducted to determine the subsurface conditions or test the strength and stability of the ground or pavement

#### **3.6.2 OBJECTIVES CORING TEST**

- Test the strength of a road.
- Test the stability of the concrete buildings or bridges



Figure 3.4 : The worker was drill the premix surface



Figure 3.5 : Have a hole in the surface of premix

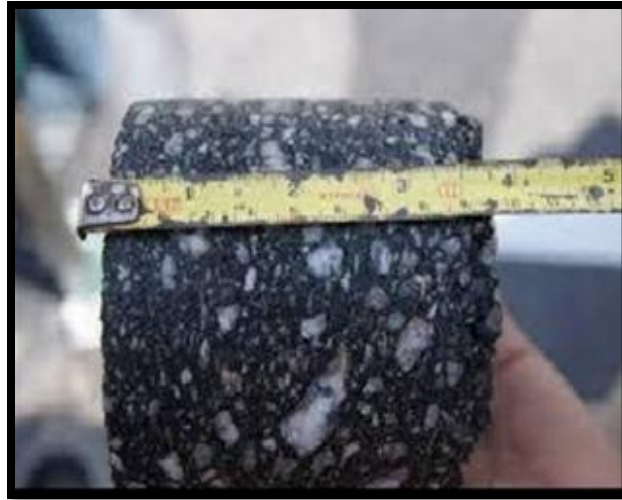


Figure 3.6 : The core of premix

### 3.6.3 PROCESS CORING TEST

- Drill the surface of premix by using core drill machine.
- Design layer was cut. Then taken using special cutting blades 75 mm, 100 mm or 150 mm diameter.
- The location chosen to avoid the steel in order to minimize damage to the structure.
- The sample size measured depth issued in length either to meet the specification.

# **CHAPTER 4**

## **(CASE STUDY)**



#### 4.0 INTRODUCTION

For this chapter, I was explaining the details about road testing under Majlis Daerah Baling as Local Authorities. It show the detail method statement of work testing that Majlis Daerah Baling test for road to be approval and Local Authorities must make sure all test was comply with term and condition of Majlis Daerah Baling .

Road testing of Majlis Daerah Baling have 4 testing methods. And Majlis Daerah Baling only focus and testing for crusher run layer until ACWC layer only. For under of crusher run layer was managed by developer. Road testing under Majlis Daerah Baling is checking the thickness of crusher run, do Field Density Test (FDT), do California Bearing Ratio (CBR), and Coring Test (Checking Thickness of Premix).

For Majlis Daerah Baling testing road at the site, their staff only saw and take a note of testing road and the contractor of lab that have pay by the developer of project do all the test .It because to avoid from deception occurs. And all result of road test will be process by lab contractor and Majlis Daerah Baling will recheck and give the approval based on the testing result submitted. Road testing under Majlis Daerah Baling is Municipal Road such as housing road, shops road and factory road. For State and Federal Road was managed by PWD.

This information comes from inquiry to experienced people and some I have learn during practical. It also gives a lot of experience and knowledge for me.

I am very thankful and grateful to staffs in this department who were willing help. Also not forget to my supervisor to give me an advice and knowledge. Thanks also to my friends and people outside who were willing to help in finding information to complete my work.

#### **4.1 NAME OF PROJECT FOR CASE STUDY**

##### **4.1.1 PROPOSED CONSTRUCTION AND COMPLETION:**

- 24 UNIT SEMI-D HOUSES 2 STOREY
- 39 UNIT TERRACE HOUSES 1 STOREY
- 5 UNIT SHOP HOUSES 2 STOREY
- TAMAN DESA CAMELIA, ON LOT 9787 (G2661),  
RAMBONG MUKIM PULAI, DAERAH BALING,  
KEDAH DARUL AMAN.

I choose this project because when I register at the second week of my practical training at Engineering Department Majlis Daerah Baling, this project was in process to start the testing road. And at the same time I was join the staff to this site to saw the testing road. And I very excited to know about this road testing because at university this topic I never learn before this. So, I decide to learn more about this road testing and I choose to take as my case study report title.

For this testing work cannot do during raining day because surface of crusher run and premix become smooth. So, if this testing work was doing during raining day it difficult to get actual reading and maybe have many problems. For example when do CBR test, reading of penetration will don't get 90% and it was fail from criteria of Majlis Daerah Baling.

## 4.2 DEFINITION OF WORK

Majlis Daerah Baling manage road testing only for the project under their surveillance. The projects under the surveillance of the Majlis Daerah Baling is test for the Municipal Road such as road of residential areas, factories internal roads and shops area. This road testing work is do when a new project paved the surface of road has been prepared by the crusher run and premix. The road test also tested for a re-paved road to ensure that the road is safe to use and will bear with heavy burden.

Majlis Daerah Baling was handle the project of testing road work under Majlis Daerah Baling as Local Authorities have four (4) steps. The steps are:

- Check the thickness of crusher run.
- Field Density Test (FDT) - To check the moisture content of the soil.
- California Bearing Ratio (CBR) - To check the strength of soil surface.
- Coring Test- To check the thickness of premix

## **4.3 COMMON TERMS**

### **4.3.1 COMMENTARY OF ENGINEERING DEPARTMENT MAJLIS DAERAH BALING**

After examining the road and drainage plans submitted, the Department is has no ban of support the application with the following conditions:

- i. Road design complies with the guidelines Majlis Daerah Baling according to the hierarchy road reserve (reserve road width, the width of the carriage way, the width of green area, wide footway or drain and median width.
- ii. Basic details construction of the road according to the road hierarchy (carriage way width, the thickness of the crusher run, binder course and wearing course) complies with the guidelines Majlis Daerah Baling.
- iii. The level a suggestion new road is designed in accordance with the existing road.
- iv. Drains and drainage design including sump and culvert construction complies with the guidelines Majlis Daerah Baling.
- v. Developers should fully responsible in the event of a flash flood or others along areas of the water at the project site.

#### **4.4 THE CONDITIONS BASIC**

##### **4.4.1 CONSTRUCTION OF ROADS**

**a.** All the roads in this project shall be constructed in accordance with the quality standards approved by the PWD(JKR) and should first be connected to the PWD (JKR) when the road should be built later.

**b.** For road construction, the thickness shall be as follows:

Table 4.1 : The thickness shall

<b>RIGHT OF WAY</b>	<b>CRUSHERRUN THICKNESS</b>	<b>PREMIX THICKNESS</b>
Entrance / Exit Way 66' 0"	12"	100 mm
Exix Way 40' 0"	12"	100 mm
Inside Way 20' / 40'	12"	100 mm
Rear Way / Side Way 20'	12"	100 mm

**c.** The entrance to every building should be tarred or must be concrete.

**d.** The streets are provided shall be installed road kerb and road marking.

**e.** Road side must be installed at palces that need it.

**f.**Side table ('bahu jalan') must be flatted and was planted closely with grass and tress should be planted at a distance of 20 feet for every one fence to make it beauty and nice.

**g.** Where has the high level of side table from drain surface, so that drain cliff must enhance to avoid side table land come into the drains.

**h.**If have found the distance between roadside drains and fence , so area of that drains must be cemented.

- i.** Minimum Sight distance ( Jarak Penglihatan) for each intersection must not less than 205 meter.
- j.** Intersection design and the proposed road pavement must follow the Current Standards of JKR contained in the Technique (Road) instructions. It must designed according to the actual soil conditions and must include a drainage system was perfect, street lighting, traffic control device (signboard, road lines) and others. The design of the junction shall be prepared and signed by a qualified professional engineer and the design costs are the responsibility of the developers themselves.
- k.** Gradient from entrance road to main road cannot more than 2% until 12%.for throughout 50 meter from side road provided.
- l.** When entrance road crossing roadside drains, road culvert saiz 1200mm in diameter shall be constructed in accordance with the requirements of the JKR.
- m.** Junctions of traffic light must be constructed with additional lanes and channellisation.
- n.** Junctions of traffic light should provided with turning lanes that have related with Geometric Instructions Technique (Road) .

#### 4.5 DESIGN OF ROAD LAYER FOR THE 30/40 TAN

Every path is made mostly according to MacAdam construction methods which are coated with several layers. Below are the most common design was created.

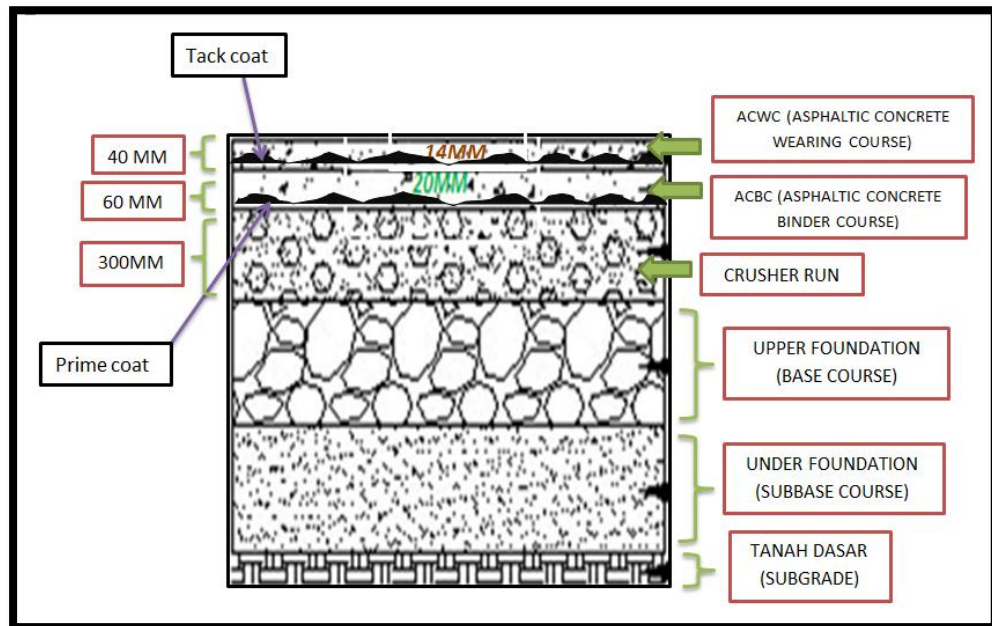


Figure 4.1 : Design layer of road

##### 4.5.1 HISTORY OF DESIGN ROAD LAYER MACADAM

- It was established on years 1756-1836 by John Loudon McAdam.
- Known because spirit to doing road with cheap cost payment.
- The shaped of road is crusher run that have been arrange compactly and backfilled with gravel.
- Design Road Macadam was very easy because crusher run didn't not to arrange 1 per 1 and interlock as a unit and it became strength.

## **4.5.2 COATED LAYER**

### **4.5.2.1 PRIME COAT**

This coat is one of layer a thin layer of liquid bitumen is sprayed on the surface of the sub-base clean and dry. It functions for piercing and bind dust and aggregate and improve the bond between base and the surface layer. It also acts as a waterproofing coating

Prime coated materials should be of approved material. Aggregate in prime coated should have a size of between 12.5mm to 19mm. when transported to the site, it must be covered to avoid bad weather conditions and also reduce temperature loss along the way. The coating must be laid as soon as possible. Then, it will be compressed to a specific thickness.

### **4.5.2.2 TACK COAT**

A thin layer of liquid bitumen is sprayed on bituminous layer it function to improve bonding between bituminous layers. Bitumen is sprayed at a rate of 0:25 to 0:55 litres per square meter. It will be compacted with rollers with 8 times the route that weighs 8 tons. Shattered rock types (nominal 20mm) will be used in this process to fill the empty spaces.

Next the surface will be paved 80/100 bitumen with the original 4:08 liters per square. A layer of rock (nominal 19mm) thin laid roughly to cover the entire surface and compacted. Then, a thin layer of river sand or quarry dust sprayed the entire surface and compacted. Must remember, excess spray should be avoided as it can cause problems on the road surface of effusion bitumen. Binder layer will only be overlayed on above a road that have been cleaned and coated with prime coat. Overlaying must be done in dry weather conditions



#### 4.6 SYSTEMS & HIERARCHY ROAD

Road hierarchy should follow the standards set by local authorities that are main road:

The minimum internal road width:

- Route 2 way: 9.1 meters (30 feet)
- The one-way: 6.1 meters (24 feet)
- Walkways: 2.5 meters
- Route utility / Drain: 2.5 meters

The minimum width of the entrance road: 20 meters

The minimum width of the road of terrace houses:

- Road junction setback= 12 meters(40 feet)
- Rear setback= 6 meters(20 feet)
- Side setback= 2 meters

The minimum width of the road of semi-d houses:

- Road junction setback= 12 meters(40 feet)
- Side setback= 2 meters
- Don't have a rear setback

The minimum width of the road of shop houses:

- Entrance road= 12 meters (40 feet)
- Rear road= 6 meters(20 feet)
- Side setback= 40 feet

4.7 PLAN OF CASE STUDY

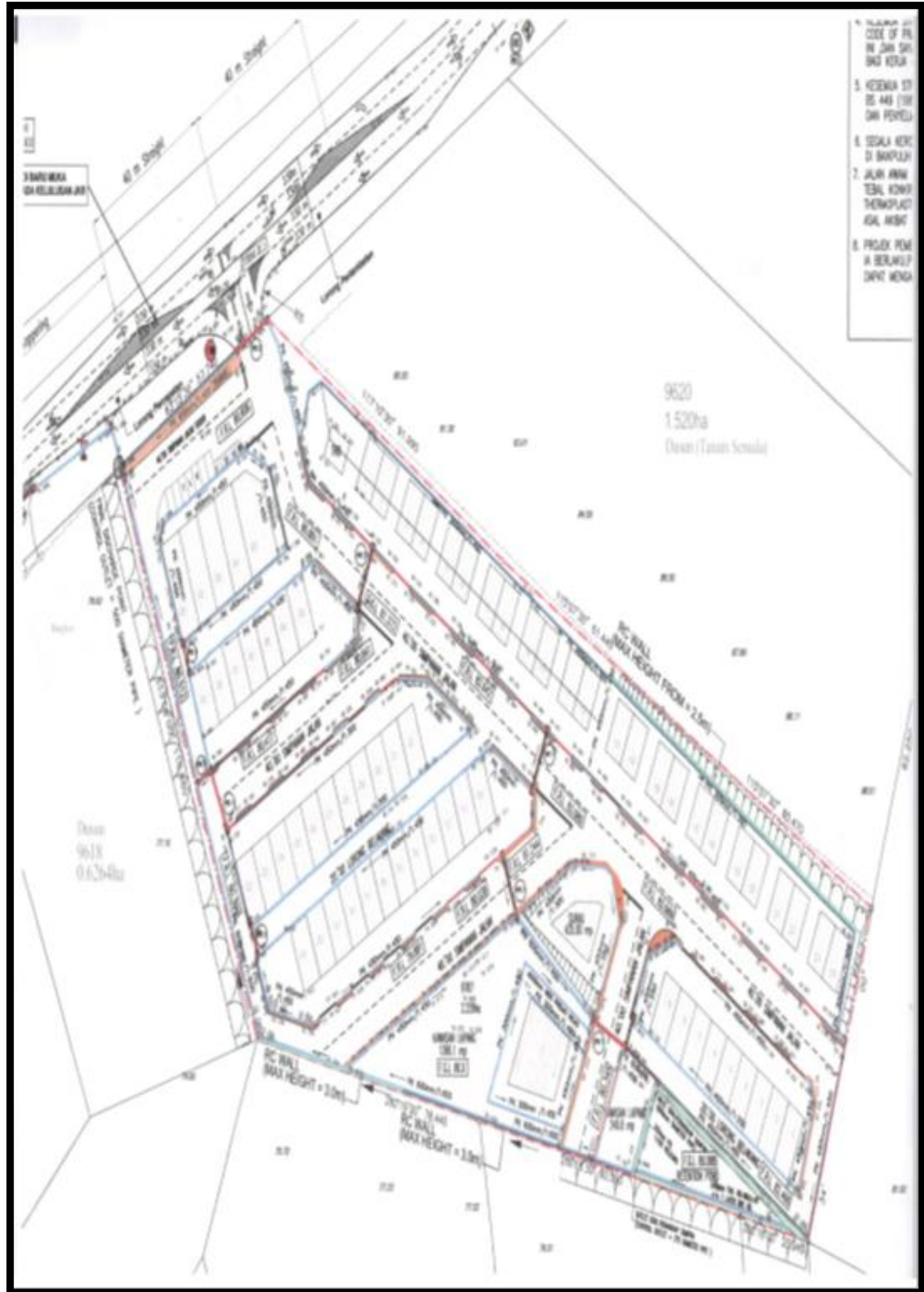


Figure 4.2 : Plan of Taman Desa Camelia

#### **4.8 SITE OF CASE STUDY**



Figure 4.3 : Site of Case Study

#### **4.8.1 THE METHOD OF ROAD TESTING FOR MAJLIS DAERAH BALING**


##### **HAVE 4 TESTING METHODS:-**



- i.** Check the thickness of crusher run
- ii.** Do Field Density Test (FDT)
- iii.** Do California Bearing Ratio (CBR)
- iv.** Do Coring Test (Checking Thickness of Premix)

#### 4.9 CHECKING FOR THICKNESS OF CRUSHER RUN

- To check the thickness of crusher run, the worker digging the soil follow the point that have been mark at plan.
- The soil was digging use a manual method. It is digging use chop and hoe..
- The hole for thickness of crusher run must dig 300mm (1 feet) or more.
- After measure the thickness of crusher run, they close the hole with a chop.
- If the thickness of crusher run less than 300mm (1 feet), the developer must re-pavement the crusher run until it get the reading of thickness 300mm (1 feet) and above.
- It because to make sure the road surface was strength with a high of load and to avoid from deposition occurs after premix was resurface on the crusher run.

Table 4.1 : Process check the thickness of crusher run

NO.	PICTURE	REMARKS
1.	 <p data-bbox="467 1865 943 1904">Figure 4.4 : The hole was digging</p>	The worker was digging the hole use the chop.

2.	 <p>Figure 4.5 : Measure the hole to take the thickness of crusher run</p>	<p>The thickness of crusher runs was measure 300mm (1 feet) using measuring tape.</p>
3.	 <p>Figure 4.6 : Close the hole</p>	<p>After measure the thickness, worker close the hole use hoe.</p>

#### 4.10 FIELD DENSITY TEST (FDT)



- To do the test of Field Density Test (FDT), to get amount of point that want to test must calculate the area of site project divide by  $500\text{m}^2$ . And it can get the total point that want to test.
- For example, area of site  $7000\text{ m}^2$  divide by  $500\text{m}^2 = 14\text{ m}^2$ . So, the point that want to test is 14 point. But need divide with California Bearing Ratio (CBR). So, 14 point divides into 2. Get 7. So, 7 point for FDT and 7 point for CBR.
- The function of FDT is to determining the in situ dry density in compacting works at the site and to measure moisture content of crusher run layer.




##### 4.10.1 PROCEDURE OF FDT

- i. Flatten the crusher run level surface until it touch the whole flat tray was used.
- ii. Dig a hole use a drill as deep as 150 mm to 100 mm in diameter on the ground first. Then, soil that has been excavated put into plastic bag. Make sure there is no soil being left in the hole that had been dug. This soil will bring to lab by contractor to test it moisture content.
- iii. After that, put sand that have been baked with  $(0^0)$  (Oven method or how quickly the moisture content) use Dynamic Cone Penetration Test placed over the hole that had been dug. Open the lid and let the sand fills the hole and cone. (Make sure there is no vibration in the surrounding area of the test carried out).
- iv. Next, sand that have pour at the hole use the Dynamic Cone Penetration Test was put into plastic bag.
- v. When no more sand pouring out of the Dynamic Cone, close the hole.




- vi. And the sand that have put into plastic bag was brought to lab to check the moisture content of soil by contractor.
- vii. The result of moisture content soil and sand was submitted to Local Authorities to get approval for do next road testing

Table 4.2 : Process of Field Density Test

NO.	PICTURES	REMARKS
1.	 <p data-bbox="464 1290 1038 1323">Figure 4.8: The worker was digging the hole</p>	<p data-bbox="1145 757 1417 1003">The worker was digging the hole of crusher run use tray plate and drill machine.</p>
2.	 <p data-bbox="464 1818 1123 1910">Figure 4.9 : The hole was empty because crusher run soil was put into the plastic bag.</p>	<p data-bbox="1145 1352 1417 1877">The worker was put the crusher run soil that have been excavate into plastic bag. And the hole was empty and don't have any soil. It because to measure moisture content of sand.</p>

<p>3.</p>	 <p>Figure 4.10 : Put cylinder cone on the hole.</p>	<p>The worker put cylinder cone on the hole that has been excavated and pour the sand that has baked with (0°) moisture content into hole using the cylinder cone.</p>
<p>4.</p>	 <p>Figure 4.11 : Extra sand that has poured into the cylinder cone into plastic bag.</p>	<p>The worker was put extra sand that has pour into the cylinder cone into plastic bag.</p>
<p>5.</p>	 <p>Figure 4.12 : Put sand into the other plastic bag</p>	<p>Sand that have put into the hole was put into other plastic to bring to lab to check moisture content of hole that was absorb to the sand.</p>



6.	 <p>Figure 4.13 : The empty hole</p>	The empty hole after the sand was put into the plastic bag
7.	 <p>Figure 4.14 : The worker bury the hole</p>	The worker bury the hole using hoe
8.	 <p>Figure 4.15 : Hole that have been close.</p>	The hole that have been finish close.

#### 4.11 CALIFORNIA BEARING RATIO (CBR) TEST

- A penetration test to evaluate the strength of road subgrades and base courses.
- It functions to determine the penetration testing of burden in the laboratory.

Pressing down the burden with using a lorry that has high loads as a burden. For example, install the mechanical type machine jack on the back of the lorry and turning mechanical jack type machine while gravity support and pressing the road surface and burden to down. There have a dial gauge install with CBR equipment and the function of dial gauge is as a reading for pressure of load at the lorry.

If the needle of a dial gauge move faster, means the road surface was not solid and not strength enough. So, the contractor need to re-surface the crusher run until the surface was strength and the dial gauge reading get more than 90%.Then, if the needle of dial gauge move slowly and the reading of dial gauge more than 90% means the road surface was strength and solid and was achieve with criteria of Majlis Daerah Baling.

The road was test point to point. To calculate the amount of point of the area of site must divide with 500m<sup>2</sup> and then can get amount point that must do a test. It was same with Field Density Test (FDT), because it was do at the same time.. Next, after calculate the area of site. The amount of point that gets divide by 2.For example: - Get 14 point, so 7 tests point for FDT and 7 tests point for CBR.

#### 4.11.1 PROCEDURE CALIFORNIA BEARING RATIO TEST

- i. Equipment for test is placed on top of the road for testing the strength of crusher run parked.
- ii. The burden imposed on the coating by using the lorry that has a high of burden.
- iii. The worker was turning the mechanical jack machine.
- iv. Dial gauge will measure the depth of the puncture occurs according to the applied load.
- v. Data is recorded and linked to the value ratio California.
- vi. Do at other point with a same technic.

Table 4.3 : Process of California Bearing Ratio


NO	PICTURES	REMARKS
1.	 <p data-bbox="560 1787 1107 1877">Figure 4.16 : California Bearing Ratio Equipment was install at the lorry</p>	California Bearing Ratio Equipment was install at the lorry. And the lorry as the burden to pressing the load down



Figure 4.17 : Turning mechanical jack machine.

The worker was turning mechanical jack machine to take the reading of dial gauge.



Figure 4.18 : Dial Gauge for penetration

Dial gauge function is to record the reading of road pressure. The reading of dial gauge must 90% above to make sure the soil was strength.



Figure 4.19 : Dial Gauge for take it reading to calculate


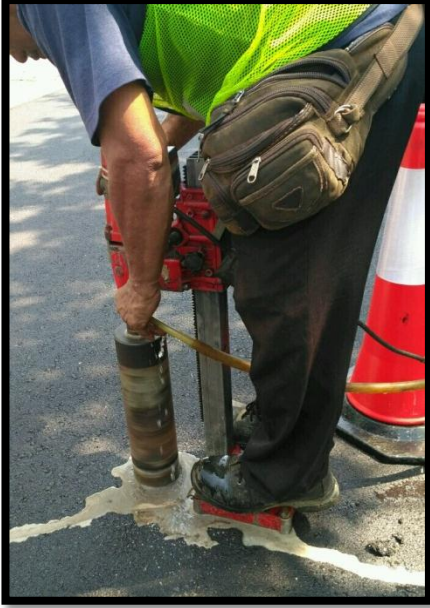
#### 4.12 CORING TEST (CHECKING THICKNESS OF PREMIX)

- The function of this test is to test the strength of a road and to test the stability of the concrete buildings.
- Coring test was test point by point. To know the total of point must calculate *area of site divide by 500m<sup>2</sup>* to get the point need to test.
- Coring test was doing use core machine to drill and get the thickness of premix. Then, the core was measure using digital caliper.
- Thickness of premix has 2 types, Asphaltic Concrete Wearing Course (ACWC) with 40mm thickness and Asphaltic Concrete Binder Course (ACBC) with 60mm thickness. So, the combine of premix thickness is 100mm.
- After that, the hole that digs to get the core was closed with a new premix and compact with compact machine.
- If the thickness of premix was less than 100mm, contractor needs to re-surface premix until get 100mm above.

#### 4.12.1 PROCEDURE CORING TEST

- i. The total point that need to do coring test same with CBR test .  
Need to divide the area of site project with  $500\text{m}^2$
- ii. After get the total that need to test, Majlis Daerah Baling staff mark the point that need to test at the plan.It because to avoid from deception occur because if developer was mark the point their will mark the point to do coring test at areas with have a thick premix only.So it can easily get approval.
- iii. Then, contractor put test equipment as a drill core machine and compact machine on the point that want to be tested.
- iv. The contractor drill the premix surface and get the core of premix
- v. Then,the premix was measure using the digital caliper.
- vi. The reading must more than 100mm.40mm Asphatic Concrete Wearing Course (ACWC) and 60mm for Asphatic Concrete Bearing Course.(ACBC).
- vii. The hole of premix was resurface with a new premix and compact using the compacting machine.
- viii. If the reading of thickness of premix less then 100mm, contractor must pave the premix until it get 100mm and above.

Table 4.3 : Process of Coring Test

NO	PICTURES	PROCESS
1.	 <p data-bbox="464 949 1018 1032">Figure 4.20 : Put equipment test on the road</p>	<p data-bbox="1043 501 1316 689">The contractor was put down the test equipment on the road from car.</p>
2.	 <p data-bbox="464 1877 938 1912">Figure 4.21: Drill the premix surface</p>	<p data-bbox="1043 1227 1316 1415">The worker was drill the premix surface using drill core machine.</p>



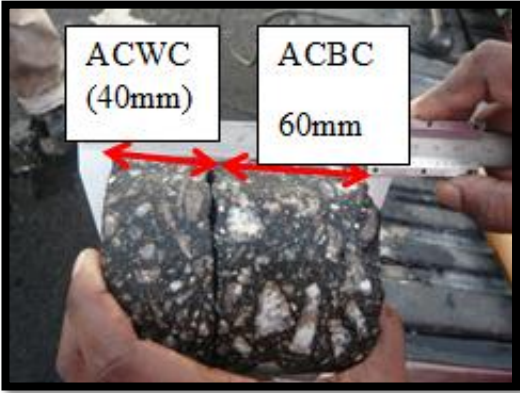

<p>3.</p>	 <p>Figure 4.22 : The core of premix that have been drill.</p>	<p>After drill the premix surface, get the premix and measure the premix. The thickness must more than 100mm . 60mm for ACBC and 40mm ACWC. Size of premix ACBC 20mm and 40mm for ACWC.</p>
<p>4.</p>	 <p>Figure 4.23 : The hole of premix</p>	<p>The hole of drill premix was compact with new premix to close the hole.</p>



Figure 4.24 : The new premix was put into the hole.

The contractor was put new premix into the hole to close the hole that has drill.

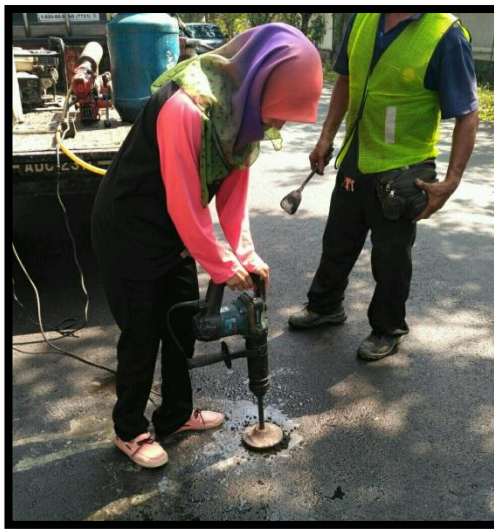


Figure 4.25 : The new premix was compact using the compacting machine

After put new premix into the hole, the premix was compact using compacter machine.




The hole that was finish compact using the compacter machine.

Figure 4.26: The hole that finish compact

The core that has measure was bringing to lab to compress it using compressor test equipment to test the strengths of core and also to measure amount of bitumen use for premix ACWC and ACBC. Then, the result of compress the core was submitted to Local Authorities by developer. And Local Authorities will give approval for this project. These activities not do under Majlis Daerah Baling because their only take a basic of road testing and only do for project under Local Authority and for the detail of road testing was doing by Jabatan Kerja Raya.(PWD)

4.13 RESULT OF ROAD TESTING WORK FOR CASE STUDY

	UNIT PUSAT SETEMPAT (OSC) MAJLIS DAERAH BALING, 09100 BALING, KEDAH DARUL AMAN. TEL : 04-4701800 FAX : 04-4701306
<b>BORANG 1</b>	<b>LAPORAN PEMERIKSAAN ( THICKNESS/ CBR TEST / FDT TEST )</b>
NO. RUJUKAN FAIL	: _____ KELUASAN TAPAK : _____
NAMA PEMAJU/ NO. TEL	: _____
TAJUK PERMOHONAN	: _____
JURUTERA PERUNDING	: _____
JALAN-JALAN YANG DIBUAT PEMERIKSAAN (tanda di dalam pelan)	: _____

JALAN ( THICKNESS/ CBR TEST / FDT TEST )	HASIL PEMERIKSAAN / UJIAN
<b>1. KETEBALAN</b> - Tandakan diatas pelan dan ambil gambar. - 300MM / 12" / 1 KAKI	Lokasi 1 : <u>111</u> mm Lokasi 6 : <u>110</u> mm Lokasi 2 : <u>107</u> mm Lokasi 7 : <u>111</u> mm Lokasi 3 : <u>99</u> mm Lokasi 8 : <u>99</u> mm Lokasi 4 : <u>110</u> mm Lokasi 9 : <u>105</u> mm Lokasi 5 : <u>105</u> mm Lokasi 10 : <u>100</u> mm
<b>2. CBR TEST (CALIFORNIA BEARING RATIO)</b> Not Less Than 80 1 Test / 1000 Tons	Lokasi 1 : <u>109</u> mm Lokasi 6 : <u>106</u> mm Lokasi 2 : <u>88</u> mm Lokasi 7 : _____ mm Lokasi 3 : <u>121</u> mm Lokasi 8 : _____ mm Lokasi 4 : <u>100</u> mm Lokasi 9 : _____ mm Lokasi 5 : <u>96</u> mm Lokasi 10 : _____ mm

Figure 4.28: Result Of Road Testing Work For Case Study 1

<b>3. FDT TEST (FILL DENSITY TEST)</b> 1 Test/500m <sup>2</sup> More Than 95%	Lokasi 1 : <u>95</u> mm    Lokasi 6 : _____ mm Lokasi 2 : <u>98</u> mm    Lokasi 7 : _____ mm Lokasi 3 : <u>96</u> mm    Lokasi 8 : _____ mm Lokasi 4 : <u>99</u> mm    Lokasi 9 : _____ mm Lokasi 5 : <u>97</u> mm    Lokasi 10 : _____ mm
---	---

*Nota: segala ujian lain boleh dilakukan bagi menentukan kekuatan dan kualiti binaan. Jurutera perunding adalah bertanggungjawab sepenuhnya ke atas binaan.*

Ulasan Keseluruhan : \_\_\_\_\_  
\_\_\_\_\_


Jurutera Perunding/Wakil : T.T \_\_\_\_\_ Nama: \_\_\_\_\_

Wakil MDB : 1. ) T.T \_\_\_\_\_ Nama: \_\_\_\_\_  
2. ) T.T \_\_\_\_\_ Nama: \_\_\_\_\_

Tarikh : \_\_\_\_\_

Figure 4.29 : Result Of Road Testing Work For Case Study 2





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Tel: (04) 5075505 / 04-5086278 Fax: (04) 5081568 E-mail: sales.pg@smi-lab.com.my

Your Ref: \_\_\_\_\_ Date: \_\_\_\_\_

Our Ref: **GT/BM/11547** Date: **09/12/2016**

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**LABORATORY TESTING**

Client : Sri Tunas Sdn. Bhd.  
No. 122, Jalan Dato Ismail Hashim,  
11900 Bayan Lepas, Penang.

Project : Cadangan Membina Dan Menyiapkan 24 Unit Rumah Berkembar  
2 Tingkat, 39 Unit Rumah Teres 1 Tingkat Dan 5 Unit Rumah Kedai  
2 Tingkat Di Atas Lot 9787 (GM2661), Rambong, Mukim Pulaui,  
Daerah Baling, Kedah Darul Aman.

Type of Material : Crusher run

Sample Marking : ST/DKLSQS/CR

Source : DKLS Quarry Sik.

Test Requested by Client : Laboratory Compaction Test (B.S. 1377 : Part 4 : 1990)

Note : One bag of soil sample was received from the client on  
07/12/2016 for the above test. The test results are as  
attached and summarized as follow.

Summary of test results :

Sample Marking Type of material	ST/DKLSQS/CR Crusher run
<b>Laboratory Compaction Test :</b>	
Maximum Dry Density Mg/m <sup>3</sup>	2.21
Optimum Moisture Content (%)	6.4

Submitted by,

SOILS & MATERIALS LABORATORY (PG) SDN. BHD.  
(Company No: 807432-W)

*b/p. J.P.*

.....  
YEOW CHAI LAI  
(General Manager)

Figure 4.31: Result Of Road Testing Work For Case Study 4

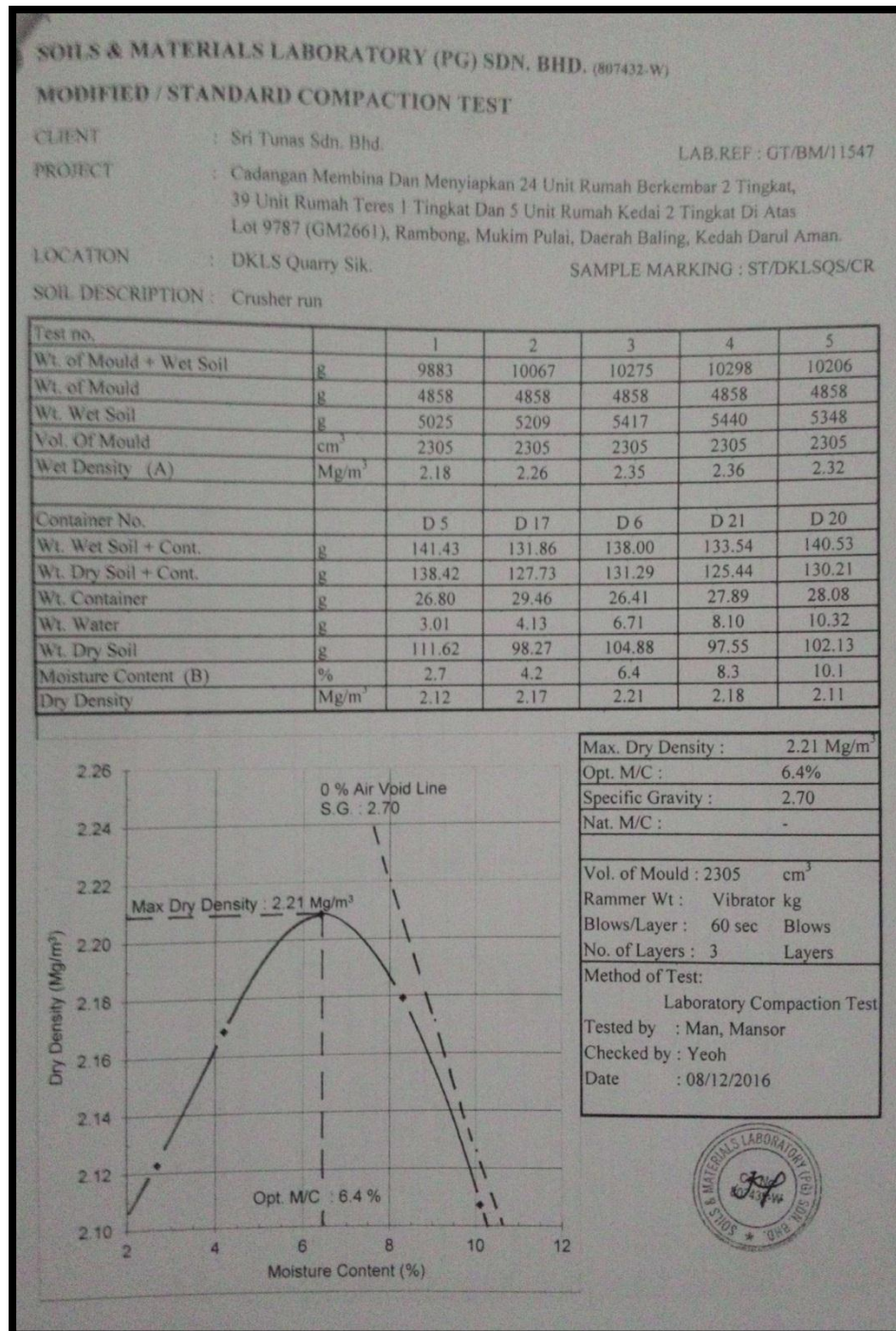


Figure 4.32: Result Of Road Testing Work For Case Study 5



SOILS & MATERIALS LABORATORY (PG) SDN. BHD. (807432-W)

**IN-SITU DENSITY-SAND REPLACEMENT METHOD**  
(B.S. 1377 / PART 9 / 1990 Method 2.1)

Client : Sri Tunas Sdn. Bhd.  
Project : Cadangan Membina Dan Menyiapkan 24 Unit Rumah Berkembar 2 Tingkat, 39 Unit Rumah Teres 1 Tingkat Dan 5 Unit Rumah Kedai 2 Tingkat Di Atas Lot 9787 (GM2661), Rambong, Mukim Pulau, Daerah Baling, Kedah Darul Aman.

Ref : GT/BM/11546  
Date : 07/12/2016  
Density of Sand : 1.25 Mg/m<sup>3</sup>  
Technician : Hisham, Shamsul

Test No		1	2	3	4	5
Material Under Test		Crusher run	Crusher run	Crusher run	Crusher run	Crusher run
Wt. of Wet Soil From Hole	(g)	10393	10498	12123	12727	10881
Wt. of sand in cly. before pouring	(g)	14000	14000	14000	14000	14000
Wt. of sand in cly. after pouring	(g)	5016	5139	4068	3916	4849
Wt. of sand in Hole and Cone	(g)	8984	8861	9932	10084	9151
Wt. of sand in Cone	(g)	3106	3106	3106	3106	3106
Wt. of sand in Hole	(g)	5878	5755	6826	6978	6045
Wet Density	Mg/m <sup>3</sup>	2.21	2.28	2.22	2.28	2.25
Max Dry Density	Mg/m <sup>3</sup>	2.21	2.21	2.21	2.21	2.21
Container No.		E 13	E 5	E 10	E 4	E 14
Wt. of Wet soil & container	(g)	138.89	139.66	168.78	168.25	151.24
Wt. of Dry soil & container	(g)	132.32	133.46	161.59	161.38	144.25
Wt. of Container	(g)	8.89	9.02	9.46	10.06	9.69
Wt. of Moisture	(g)	6.6	6.2	7.2	6.9	7.0
Wt. of Dry Soil	(g)	123.4	124.4	152.1	151.3	134.6
Moisture Content	%	5.3	5.0	4.7	4.5	5.2
In-Situ Dry Density	Mg/m <sup>3</sup>	2.10	2.17	2.12	2.18	2.14
Relative Compaction Achieved	%	95	98	96	99	97





Figure 4.33: Result Of Road Testing Work For Case Study 6



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Tel: (04) 5075505 / 04-5086278 Fax: (04) 5081568 E-mail: sales.pg@smlab.com.my

Your Ref: \_\_\_\_\_ Date: \_\_\_\_\_

Our Ref: **GT/BM/11548** Date: **09/12/2016**

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**IN-SITU CALIFORNIA BEARING RATIO**

Client : Sri Tunas Sdn. Bhd.  
No. 122, Jalan Dato Ismail Hashim,  
11900 Bayan Lepas, Penang.

Project : Cadangan Membina Dan Menyiapkan 24 Unit Rumah Berkembar  
2 Tingkat, 39 Unit Rumah Teres 1 Tingkat Dan 5 Unit Rumah Kedai  
2 Tingkat Di Atas Lot 9787 (GM2661), Rambong, Mukim Pulau,  
Daerah Baling, Kedah Darul Aman.

Test Requested by Client : In-Situ California Bearing Ratio (CBR)  
(BS 1377: Part 9 1990)

Type of Material : Crusher run

Note : A total of 6 numbers In-Situ CBR test were carried out at the above  
site on 07/12/2016. The test results are as attached and summarized  
as follow.

Summary of test results :

Location	CBR Value (%)
No. 1	109
No. 2	88
No. 3	121
No. 4	100
No. 5	96
No. 6	126

Submitted by:

**SOILS & MATERIALS LABORATORY (PG) SDN. BHD.**  
(Company No: 807432-W)

*[Signature]*

.....  
**YEOH CHAI LAI**  
(General Manager)

Figure 4.34: Result Of Road Testing Work For Case Study 7

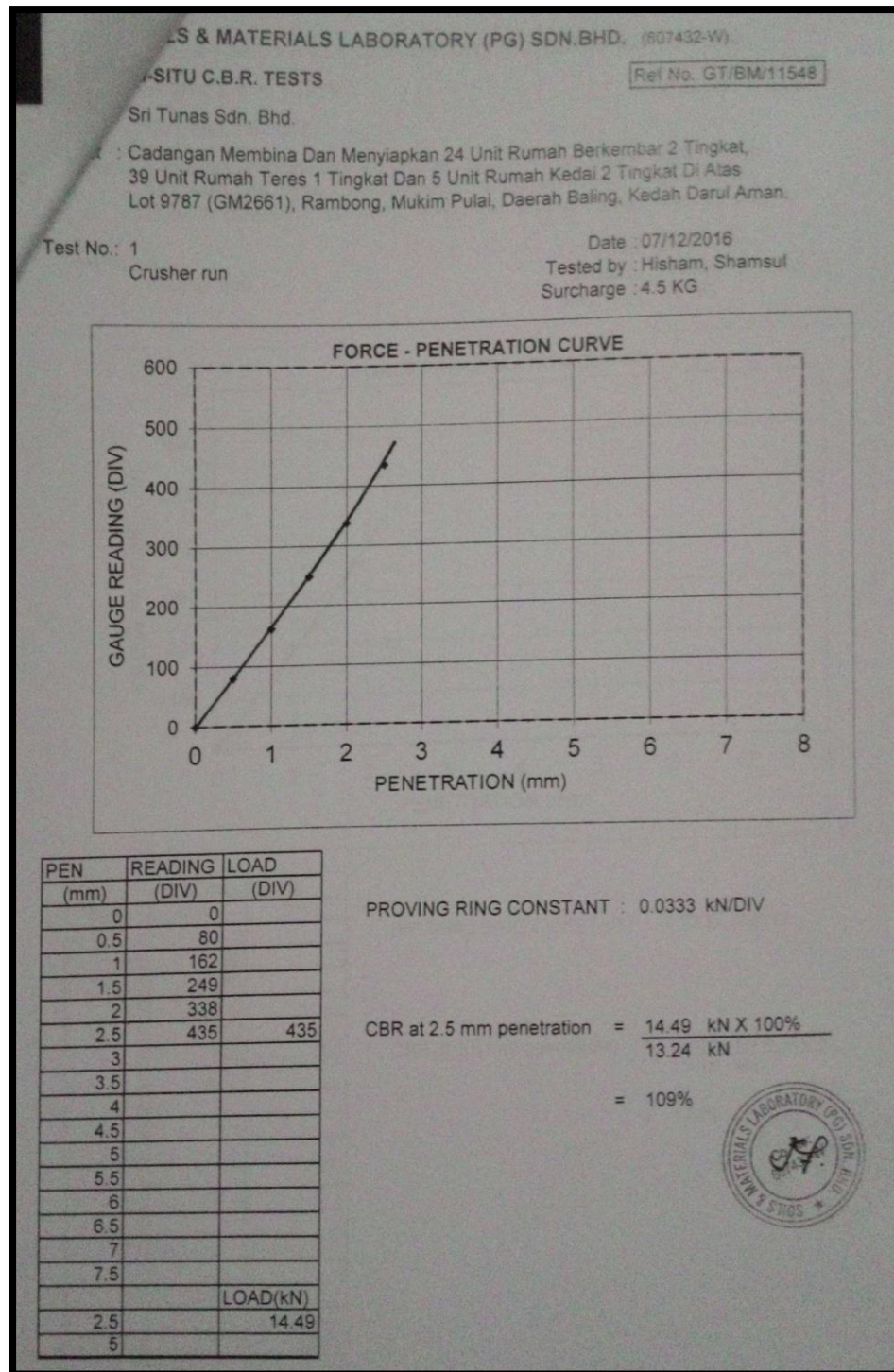


Figure 4.35: Result Of Road Testing Work For Case Study 8

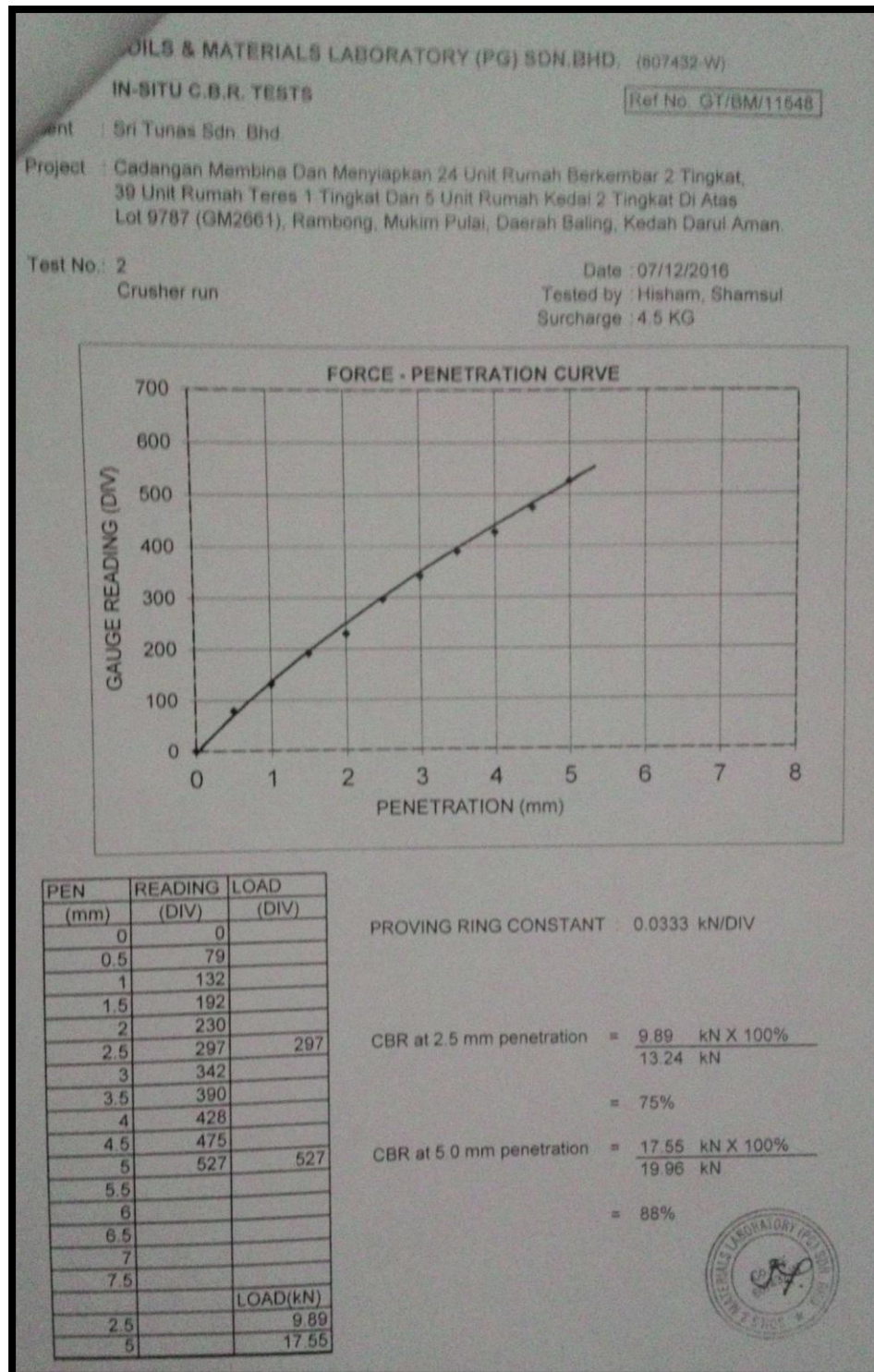


Figure 4.36: Result Of Road Testing Work For Case Study 9

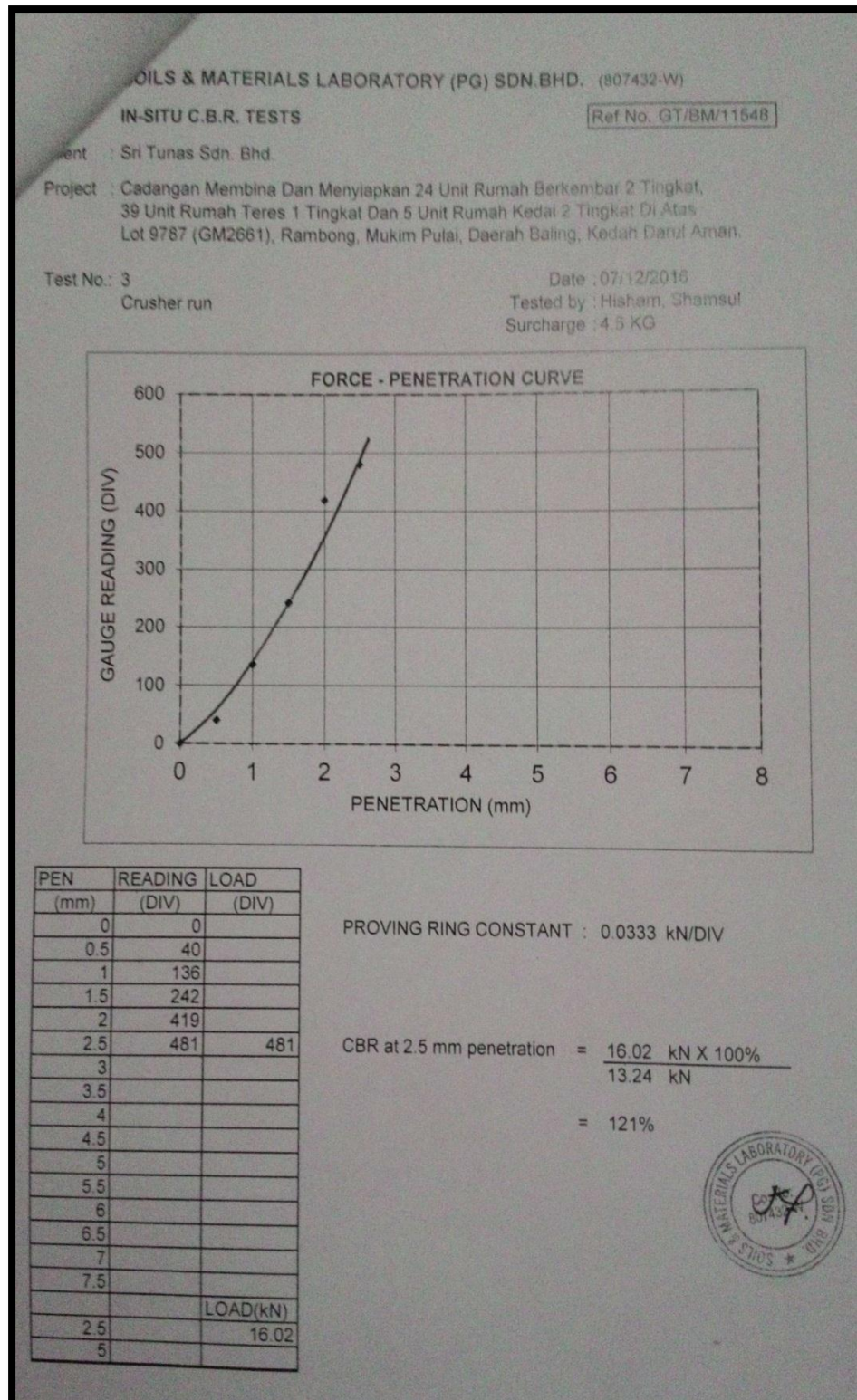


Figure 4.37: Result Of Road Testing Work For Case Study 10

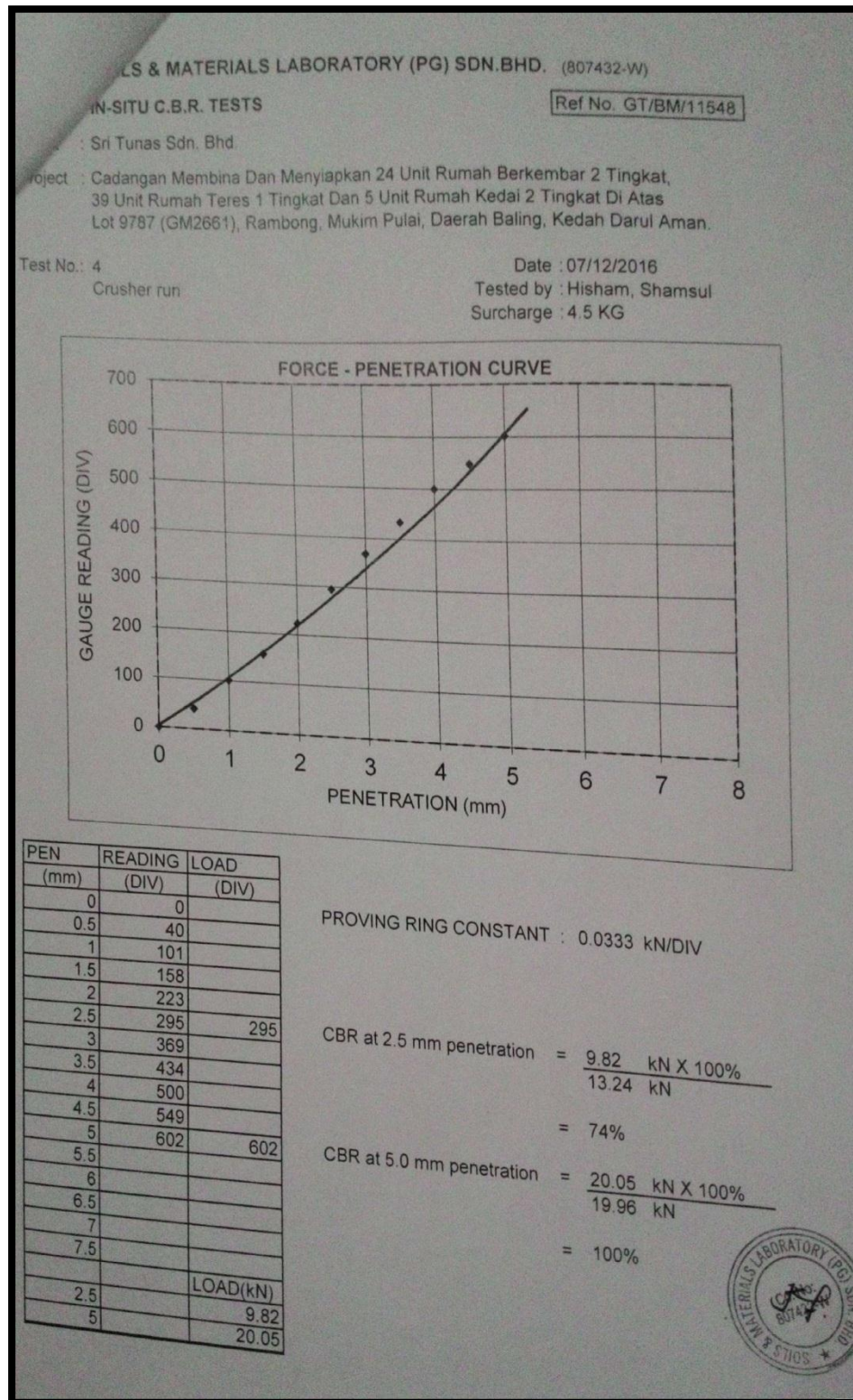


Figure 4.38: Result Of Road Testing Work For Case Study 11

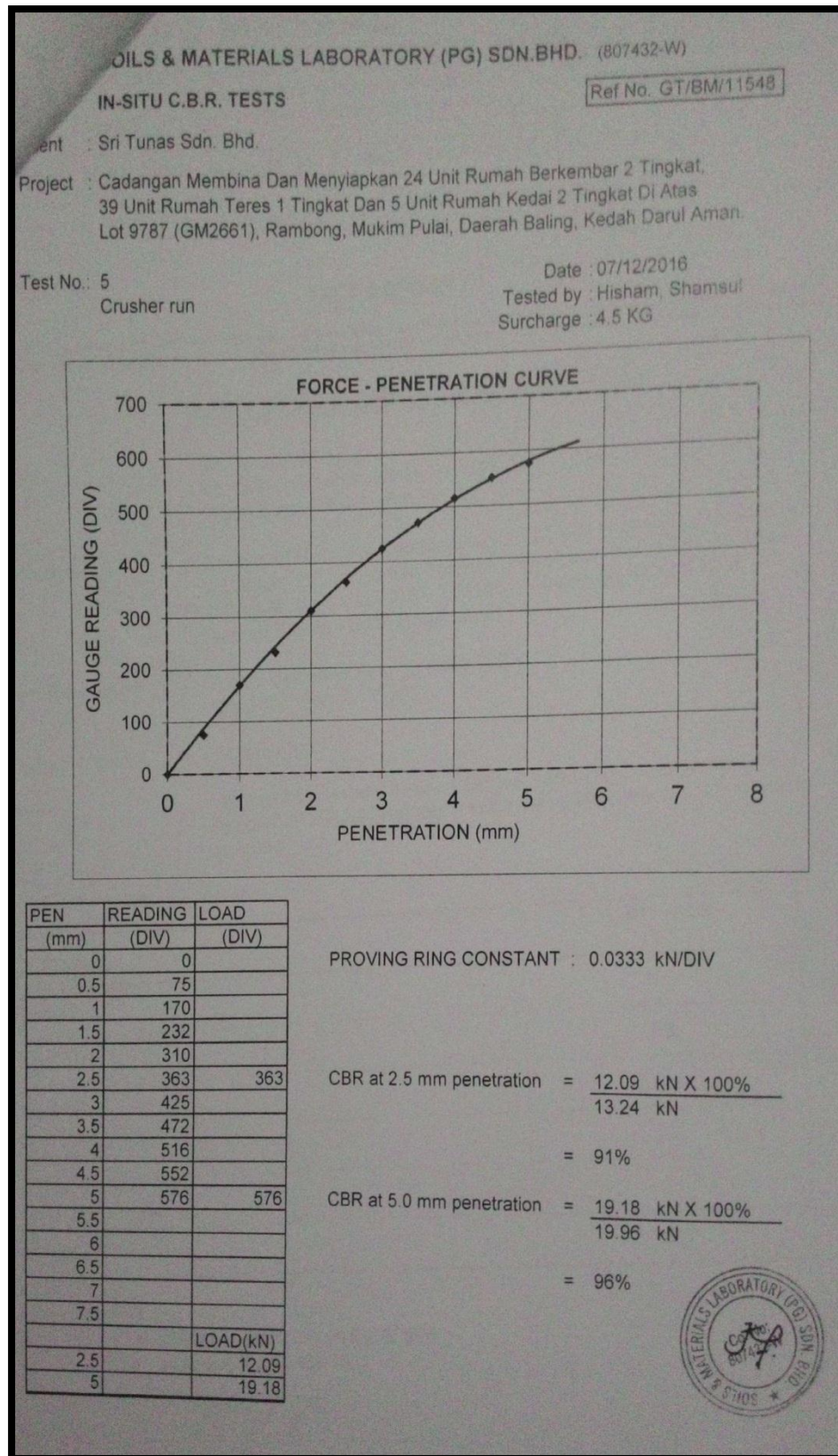


Figure 4.39: Result Of Road Testing Work For Case Study 12

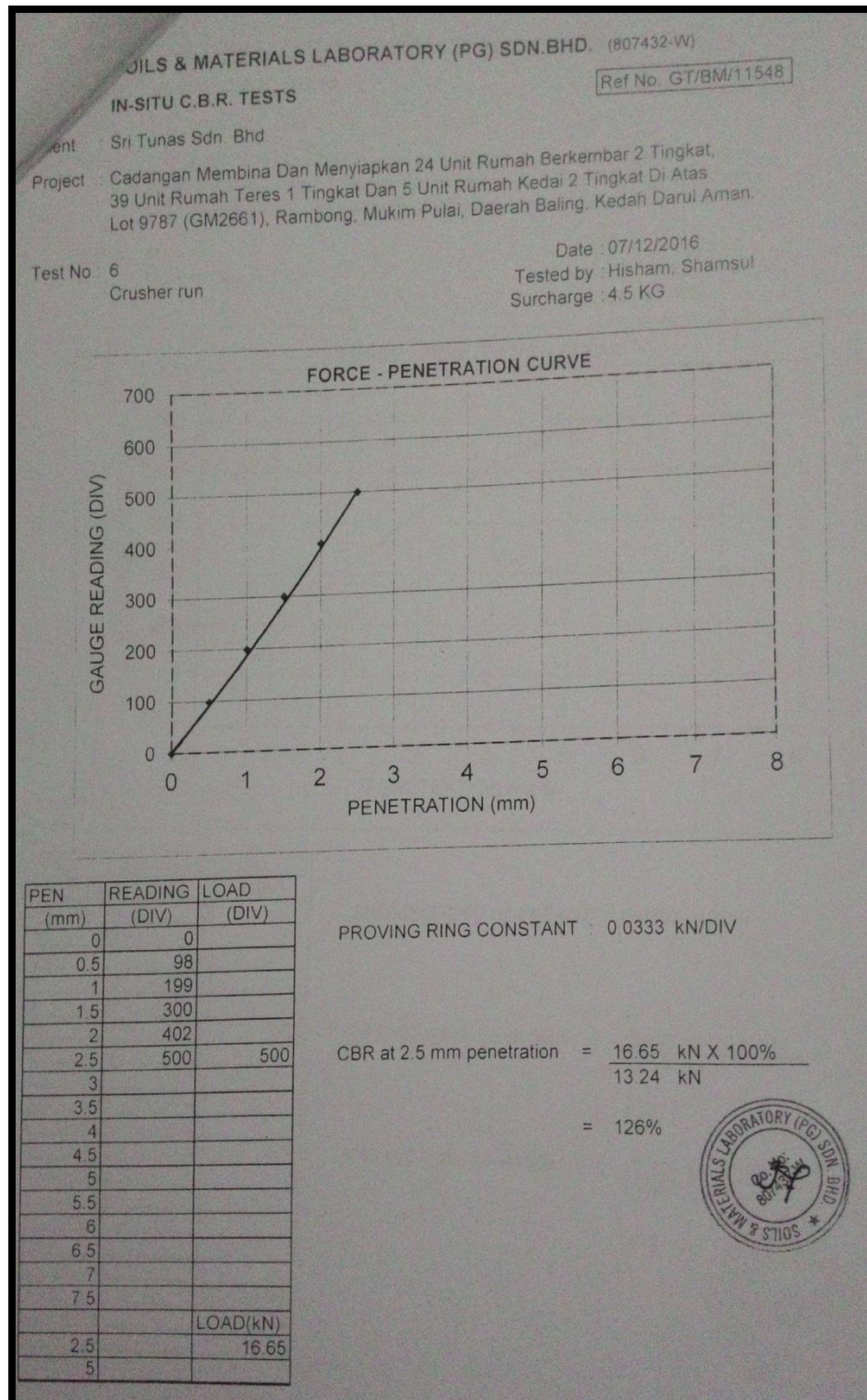



Figure 4.40: Result Of Road Testing Work For Case Study 13



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**PREMIX CORING TO DETERMINE  
THE CORE THICKNESS**

Client : Sri Tunas Sdn. Bhd.  
No. 122, Jalan Dato Ismail Hashim,  
11900 Bayan Lepas, Penang.

Project : Cadangan Membina Dan Menyiapkan 24 Unit Rumah Berkembar  
2 Tingkat, 39 Unit Rumah Teres 1 Tingkat Dan 5 Unit Rumah Kedai  
2 Tingkat Di Atas Lot 9787 (GM2661), Rambong, Mukim Pulau,  
Daerah Baling, Kedah Darul Aman.

Type of Material : Premix core

Test Requested  
By Client : Premix coring to determine the core thickness.

Note : A total of 12 numbers 100mm diameter premix core sample were  
drilled at the above site on 28/12/2016 for the above test.

Test Results : Please refer to the following pages.

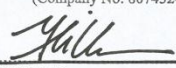
Submitted by,  
  
SOILS & MATERIALS LABORATORY (PG) SDN. BHD.  
(Company No: 807432-W)  
  
.....  
YEOH CHAI LAI  
(General Manager)

Figure 4.41: Result Of Road Testing Work For Case Study 14

807432-W GT/BM/11605  
SOILS & MATERIALS LABORATORY (PG) SDN. BHD.

**Test results :**

Core Mark	Core Thickness (mm)
No. 1	111
No. 2	107
No. 3	99
No. 4	110
No. 5	105
No. 6	110
No. 7	111
No. 8	99
No. 9	105
No. 10	100
No. 11	135
No. 12	98




Figure 4.42: Result Of Road Testing Work For Case Study 15

**CHAPTER 5**  
**(PROBLEM AND**  
**RECOMMENDATION)**

## **5.1 INTRODUCTION**

This chapter describes about the problems and recommendations, it is about focusing on identifying a problem that occurs during road testing work and also focusing on how to overcome the problem with looking for a recommendation to that problem that has occurred at a case study that I have selected to survey.

The objective of identifying the problem and recommendation that has been overcome is to make sure the road was strong enough to support the burden and was safe to use for everyone. Then, it can be used for a longer time and to avoid accidents, also a better view. That's why it is important to identify the problems and overcome them.

## 5.2 PROBLEM



Figure 5.1 : Premix was wrecked



Figure 5.2 : Core less than 100mm

For my case study area at Taman Desa Camelia, based on my survey conducted during coring test works, there are some problems that have occurred.

Among the problems encountered were premix not hardened and when drills premix it being ruined and wrecked because premix was pavement less than 24 hours or 48 hours.

The second problem had occurred is the thickness of design premix less than 100mm and not comply with criteria from Majlis Daerah Baling.

It occurs because developers want to take advantage by not leveling premix according to the actual amount of premix. For example, the area requires 50 tons of premix developers just levelling 48 tons of premix. So, developers have committed irregularities and take advantage of 2 tons.

### 5.3 RECOMMENDATION

The recommendation to handle this problem is Local Authorities was ordered the contractors to redo levelling premix and after finished paving works, developer was submitting a form to Local Authorities to make re-coring test.

So, when do a coring test and have problems such as premix wrecked and the design of thickness road not follow the requirement of Majlis Daerah Baling. Contractor should redo levelling premix and do re-coring test until it gets actual reading with 100 mm. And it can get the approval.

Then, after get a correct measurement of design thickness premix with 100mm. This project was finish of road testing work under Majlis Daerah Baling.

# CHAPTER 6



## 6.1 CONCLUSION

As my conclusion for my case study title “Road Testing Work Under Majlis Daerah Baling As Local Authorities” is new knowledge that I get during practical training because I could not learn before this. When I choose and survey about this title I was known the function and important of this test road for everyone. I also know that test road method and the layer design road. I also know steps for new project until it get an approval. Then, if have a problem I also know how are responsible to manage it. Besides that, I can get many information and new experience about this road test by saw all this testing at the site that I was not known before this. Even though this scope was more to Civil Engineering but I was get new knowledge that was very meaningful to me.

“Alhamdulillah” and thank you to Allah because with his bless I can finish my report until it complete. It was prepared for Uitm Perak party. Finally, I was finishing my industrial training at Engineering Department Majlis Daerah Baling with successful. I had undergo industrial training for 4 months from 1<sup>st</sup> December 2016 until 31<sup>th</sup> March 2017 at Engineering Department Majlis Daerah Baling, Kedah.

I would said thank you to Engineering Department of Majlis Daerah Baling because give me a chance and permission to do industrial training in this firm. A lot of thanks also to all staff and worker for helping and teach me and share knowledge and experience. Without them I could not finish my report industrial training.

This industrial training had given me a lot of knowledge and new experiences towards my work after I finish my study afterwards. The valuable 4 months of training was very meant to me as I had exposed to the real works like preparing the reports, go to inspections, and keep in the data into computer. With the guidance from the staffs, I

have learned many new technologies applied at the site that I can't be found in the formal lectures at the university.

With those experiences, I can share with my friends about new technologies in Malaysia. From this industrial training also, I had known how to apply all the knowledge I gained in the class previously since I'm in the diploma stage until now in the real works. Besides that, I can refresh my mind about what I had learnt before and improve my understanding about the applications of those engineering software's like AutoCAD. Without this experience, I would not know how to utilize these software's that will make our works easier and even faster.

Last but not least, I can improve my communication skills through the industrial training, the communication with the staffs, persons from other department and with the community as this is one of the important skills to the real work.

## 6.2 COMMENTS AND SUGGESTIONS

After undergoing industrial training for 4 months, there are many things I have learned from Engineering Department Majlis Daerah Baling placed in Charuk Nau, Baling, Kedah. As always, whatever happens, there's good and bad, as well as the industrial training. The training is very good for students because it is more beneficial than badness.

With this industrial training, I was exposed to real working environment. Other than that I can learn how to mix with different people and this increases my confidence in communicating and making me a more mature when you can share opinions, advice while mixing and etc. The training was also an opportunity for me to communicate directly with the management of the company and so can pave the way for me to become one of the employees of this company upon graduation. It is easy for me to find a job upon graduation. Insha'Allah.

I have suggestions to improve the industrial training in the future. The suggestion is the faculty should provide lists of good companies or consultants or contractors for the students to do their industrial training as their reference because some students had go to the places that don't give them much knowledge, and some students do have lot of knowledge but some do not. So, the students need the guide from the faculty.

Then, expose students by doing works related with Building Surveyor especially works in the lab. The aim is to add skilful of students during their practical or in the work future.

Industrial training is a good platform for the students to gain knowledge and experiences as much as they can. Without all these, they will not ready to face the real works and become a professional surveyor as wished by the faculty and the university.

In addition, if a company is seen now more look up someone who has experience compared to someone who has no experience or education of a person who has a high grade point examination.

With this we can conclude that for practical education is something that is as important as education in theory and it can be a stepping stone for students to go further because the training industry is a paradigm leap to the development of the mind.

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f. Retrieved January 6, 2017

# APPENDICES