



اَبُو سَيِّدِي تَيْكُو لُو كِي مَارَا  
UNIVERSITI  
TEKNOLOGI  
MARA

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

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It is recommended that the report of this practical training provided

By

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Entitled

Precast Box Culvert-Micro Pile

Accepted in partial fulfillment of requirements has for obtaining Diploma in Building

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**FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING**  
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**(PERAK)**

**MAY 2014**

**STUDENT'S DECLARATION**

I hereby declare that this report is my own work, except for extract and summaries for which the original references stated herein, prepared during a practical training session that I underwent at Pakis Emas Capital Sdn Bhd for duration of 5 months starting from 12 May and ended 29 September 2014. It is submitted as one of the prerequisite requirements of DBN307 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

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## **ACKNOWLEDGEMENT**

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Secondly, I would like to express my sincerity to Sir Muzaini as site manager, for his cooperation and endless patience in letting me ‘shadow’ his around during fieldwork. His cooperation indeed help me and my work became easier and faster.

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Last but not least, I would like to express my heartfelt gratitude to my family, friends and also lecturer for their support, constructive suggestion and also helpful criticism.

## **ABSTRACT**

This practical report mainly focuses on method and constructions of precast box culvert and micro pile. Practical training on site constructions under **Pakis Emas Capital Sdn Bhd** for total five months has given outrageous experiences uncountable knowledge in completion of this report. For beginning, this report divided to several parts that starting with company background and project description. Based on the observation, precast box culvert is ready-to-use for placing of reinforcement unit and subsequently filling the whole with grout to form micro pile. It mainly use in precast box culvert for area large such as river. It also has testing grout that will help to correct weak surface defect and resultant loss in surface land and durability within this report multi-level and complicated process will be briefly discussed on contractions. For instance advantages and methods of constructions will be explained throughout this report. Last but not least, suggestion and precaution step are taken to overcome problems that occur.

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## LIST OF ABBREVIATIONS

JKR	Jabatan Kerja Raya
PKM	Persatuan Kontraktor Melayu
PECSB	Pakis Emas Capital Sdn Bhd
CIDB	Construction Industry Development Board
KWSP	Kumpulan Wang Simpanan Pekerja
PWD	Public Work Department
SMKAJ	Sekolah Menengah Kebangsaan Abdul Jalil
MPSJ	Majlis Perbandaran Subang Jaya
SG	Sungai
S.O	Superintendent Officer
EOT	Extension of Time
TM	Telekom Malaysia
TNB	Tenaga Nasional Berhad
PDA	Pile Dynamic Load
BQ	Builder Quantities

## **APPENDIXS**

APPENDIXS A	Certificate of Pusat Khidmat Kontraktor
APPENDIXS B	Certificate of Construction Industry Development Board
APPENDIXS C	Certificate of ISO
APPENDIXS D	Certificate of JKR
APPENDIX E	Occupational Safety and Health

# CHAPTER 1

## PREFACE

### 1.1 Introduction

This project entitled Upgraded Sungai Jernih Culvert Box at main road Hulu Langat, District Hulu Langat, Selangor Darul Ehsan. It's change the culvert at below the bridge that has been the main road for villager people. This is because, the bridges always flood when raining also made trouble to villager peoples to through the way. So, Jabatan Kerja Raya (JKR) has made the decision to solve the problem by putting precast culvert box to replace the old culvert. JKR used this method and put the micro pile for the piling work.

So, this method may archive the problem because it can made the river larges and systematic works when the water throw at the box culvert also prevents the flood from happen again on that river. JKR have made an offer to any contractor to get the tender and accomplished the job. My company means my boss company PAKIS EMAS CAPITAL SDN BHD has won this tender, and he's got this award. So, JKR gave this job to my boss company and the date of job started on 9 November 2012.

## **1.2 Objectives**

Objective of this case study mainly focuses on investigating and understanding deeply regarding the constructions method of (precast box culvert and micro pile). Sungai Jernih is the main road for village peoples at Hulu Langat. Among the objectives are:-

- i. To understand an application of precast box culvert concrete at the sites.
- ii. To identify an importance and benefits of precast box culvert.
- iii. To explore the utilization of related machineries and tools during construction process.

## **1.3 Scope of Study**

The purpose of this report is to analyze and identify an alternative of precast box culvert that utilized the concrete. Production of a quality concrete box requires proper techniques and adequate planning. By the key areas that have been identifying as the most critical to achieving a satisfactory result, proper guideline needed to be followed. As received practical training for the total of five months, it also includes the usage of admixtures that can provide range of benefits.

Moreover, brief explanation given by the skilled workers regarding application of piling by micro pile method. They also mentioned about the benefits and usage of culvert box to others normal method. Not just that, as method of construction for culvert box mostly focuses on high performance pile, so most of the industrial construction need it. Similarly, equipment, machinery and shown through the entire process.

## 1.4 Methodology of Study

For overall processing of produced this practical reports, there are four main method that be used to attained the study as following approaches. There are:-

### I. Work Experiences

One of the preliminary methods is through work experiences. As we learned and gain knowledge on what we have been gone through during the period of practical training of total five months. In briefs, less or more the construction methods of precast box culvert experienced by the author in order to produce this practical reports. I get an idea from my supervisor, En. Muzaini because from the experience to it and more about the construction of precast box culvert.

### II. Observation

Based on the observation, all the information gathered from site implementation will enhance this report. Through this methods too, it helps to focus on develop main important of alternative culvert utilizing concrete as the box culvert and impact on river slab.

### III. Mass media and electronic media

The widely usage of mass media and electronic media as one of the searching tools and sharing information at a fast rate have been commonly used by the researcher since then. It is therefore also one of the applications that attribute in come out with this report. For example, I learn about the precast box culvert from video on web site (Youtube), Google to get the seen the method of precast box culvert too.

### iv. Interview and discussion

Beside the above stated methods, an interview with the workers and discussion with consultants had conceiving and contributing ideas of various types and concrete floor



hardener. Meanwhile, from this positive feedback from them, it was inferred that the presence of project team such as site supervisor, Mister luw haw yee and project manager, Sir Muzaini had responsible on task given that to produce good quality of works.

## CHAPTER 2

### COMPANY BACKGROUND

#### 2.1 Company History

Pakis Emas Capital Sdn Bhd, a member of Persatuan Kontraktor Melayu (PKM) Malaysia; Branch Wilayah Persekutuan was incorporated in 2012. Having civil and structure works, landscaping and maintenance services as its core business. Besides its current activities, PECSB is constantly in search for favorable business ventures to maintain its competitive edge. It actively focuses on both public and private sectors. Being a new entity in the challenging Malaysia Business scenario (PECSB) is constantly updating its record on the nation's business development progress.

Initially registered with the Contractor Service Centre and the Construction Industry Development Board (CIDB) in 2012 as a Contractor Class D (Bumiputera) .PECSB also registered with Department of Occupation and Health Malaysia Ministry of Finance. Lead by concentrated team of able directors and qualified staff, (PECSB) is ever ready to undertake any challenging project ahead. Venturing into a far sighted greater growth in the future, (PECSB) will always remain faithful to all its clientele in providing consistent and top quality products and services. These are the company's certificate of registration and certificates received by the company Pakis Emas Capital Sdn Bhd:-

- Pendaftaran Syarikat Malaysia (Borang 9)
- Sijil Perolehan Kerja Kerajaan (1980415-WP047123)
- Lembaga Pembangunan Industri Pembinaan Malaysia – CIDB (1980415 WP047123)
- Pusat Khidmat Kontraktor Taraf Bumiputera (1980415-WP047123)

## 2.2 Company Profile

Name of Company : PAKIS EMAS CAPITAL SDN BHD  
Registered Address : No. 10, Ground Floor,  
Taman Orkid, 43200  
Selangor Darul Ehsan.  
Address : Unit 5, Ground Floor,  
Jalan Orkid 9, Taman Orkid,  
43200 Cheras,  
Selangor Darul Ehsan.  
Contact Number :  
Fax Number :  
Date of Incorporation : 14 November 2006  
Company's Registration Number : 753083 – U  
KWSP : 15765208  
Account Number : 564100006362  
Capital : RM 100, 000. 00

### BANKERS

Maybank Complex : RM 400, 000. 00  
Dayabumi, Kuala Lumpur.

### CREDITORS

WTC Hardware Trading : RM 100, 000. 00  
Company Secretary : Reez Management & Consultants

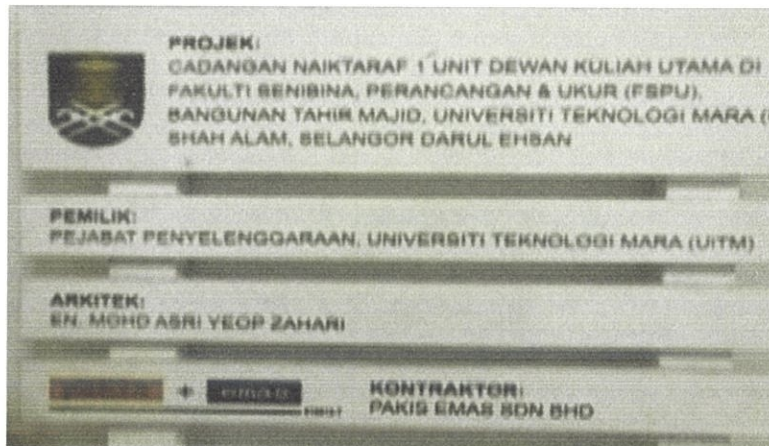


Photo 2.1 : Pakis Emas Capital Sdn Bhd Symbol

Source : Muhd Radhi (2014)



Photo 2.2 : Pakis Capital Sdn Bhd Main Office

Source : Muhd Radhi (2014)

## **2.3 Company Objectives**

Pakis Emas Capital Sdn Bhd have an objective company on achieved target as to deliver and provide the best services in transfer a quality job to client. In order to attain client's aspiration and entrust with project, each employer as well as employee both distributes their strength and skill active and maintain an excellent performance for future. Their hardworking and consistence toward responsibilities has proven as they have been awarded by Public Work Department (PWD) their excellence performance. The company vision, mission and quality objective are:-

### **2.3.1 Company Vision**

Continue to be preferred & awarded Class A and CIDB G7 (active) contractor. We as a well- established contractor and believe our ability to deliver a high quality job to our client with a strategic plan and management throughout the entire time frame.

### **2.3.2 Company Mission**

To ensure we complete and hand-over our projects on times and on budget our professional client to perform within the cost schedule, we were guiding principles of the company management system, perfect three corporation aims to maintains and further continuously improve on its well-earned reputation of being a reliable and quality services contractor in the country.

### 2.3.3 Quality Objectives

- 1) To achieve average 75% customer satisfaction per annum.
- 2) To achieve not more than 3 case of customer complaints per projects.
- 3) To achieve average 6 hours of training per employee per annum.
- 4) To achieve not more than 3 cases of supplier or sub contractor non-conformance per annum.

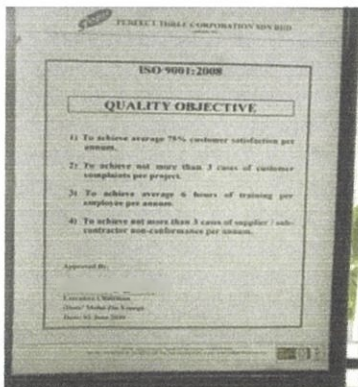


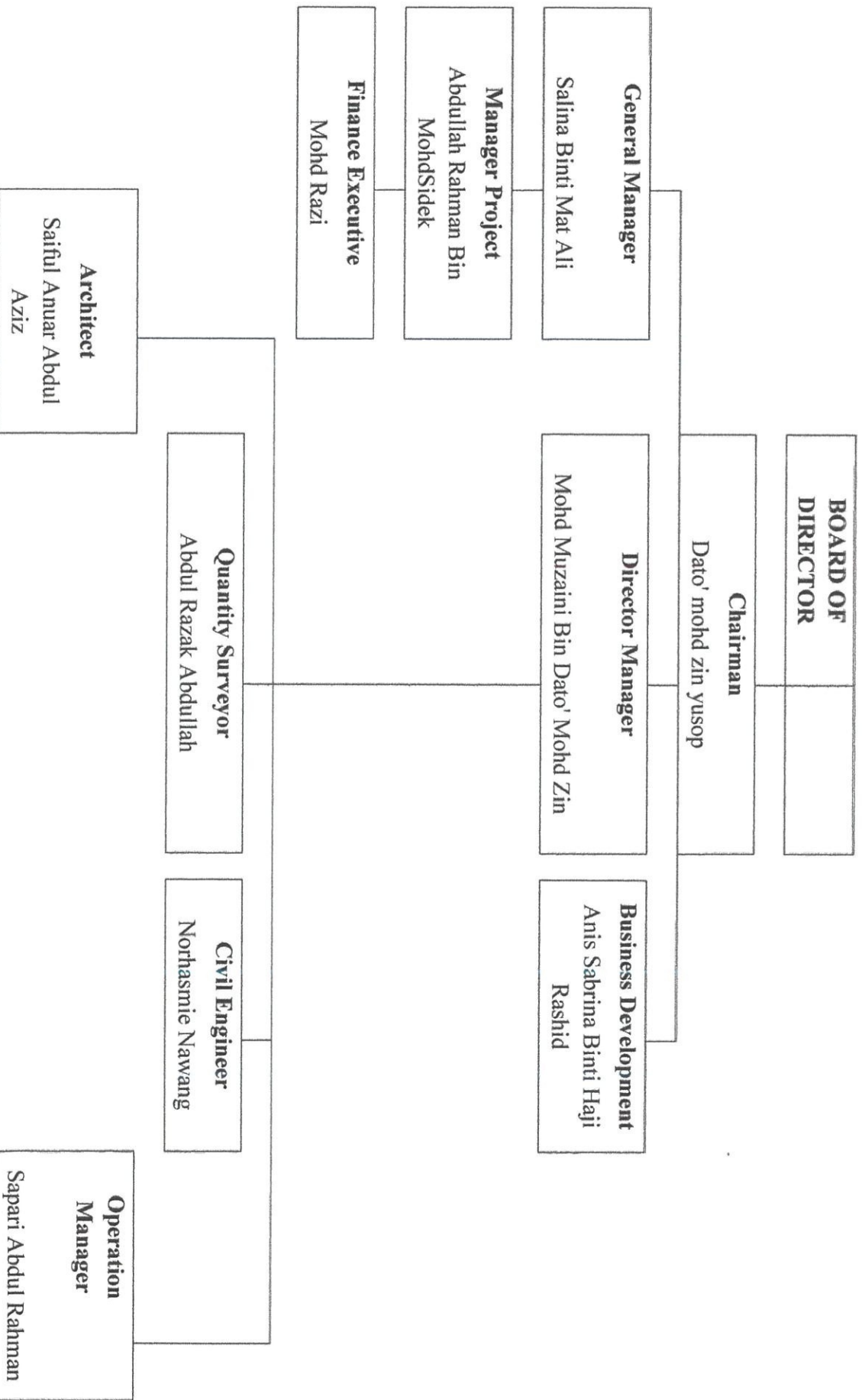
Photo 2.3: Quality Objectives Company

Photo 2.4: Quality Policy Company

Source : Muhd Radhi (2014)

Source : Muhd Radhi (2014)

**2.4 ORGANIZATION CHART**



## 2.5 List of Project

### 2.5.1 Completed Projects

No	Name of Project / Procurement	Department / Ministry	Value of Contract	Contract Period
1	Proposed work installing aluminum windows Casement and related work in college Mawar toilet, UTM Shah Alam.	University Technology Mara.	85,080.00	20.09.2013- 28.11.2013
2	Proposed renovation and upgrading of the mosque and associated works in blocks 1 and 2 Teratai ,Teratai College , UTM Shah Alam , Selangor .	University Technology Mara.	120,680.00	02.09.2013-22.12.2013
3	Proposed Upgrading of Toilet and Bathroom Students at Block E, Tunku Abdul Rahman College (First College), University of Malaya.	University Malaya.	167,517.00	03.06.2013-14.08.2013



4	Proposed Upgrading and Renovation EWX Research Laboratory, Level 1, Building Blocks Old Engineering, Shah Alam Institute of Science, University Technology Mara (UiTM) Shah Alam , Selangor Darul Ehsan .	University Technology Mara.	453,650.00	08.06.2013-27.10.2013
5	Renovation House Pn. Liza At Address No. 30, Jalan Aman Perdana 8D, Taman Perbandaran Meru, Klang.	Aman Perdana.	54,270.00	28.10.2013-07.02.2014



Photo 2.5: Installing an Aluminum Window Casement

Source : University Technology Mara (2013)

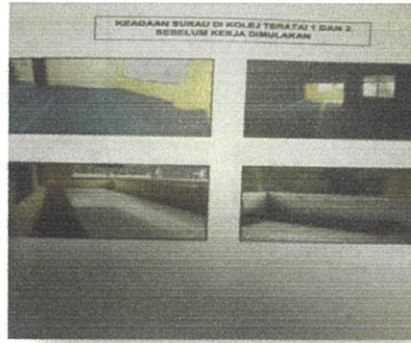


Photo 2.6: Proposal to Modifying and Upgrading the mosque

Source : University Technology Mara (2013)

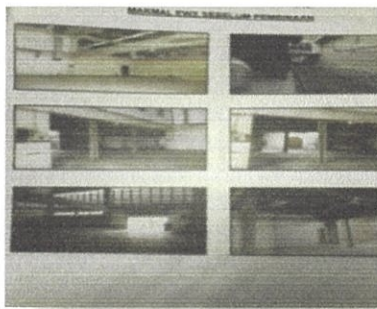


Photo 2.7: Renovate research laboratories

Source : University Technology Mara (2013)

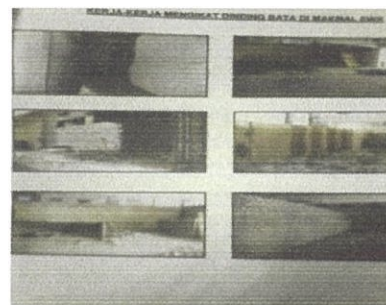


Photo 2.8: Madam Liza renovation house

Source : Aman Perdana (2013)

## 2.5.2 Project in Progress

No.	Projects	Department / Agencies Control The Project	Value Of Contract (RM)	Completion Date
1	Upgrading the culvert Sungai Jernih on the main road, District Hulu Langat, Selangor	Jabatan Kerja Raya	2,944,458.00	09.11.2012 –26.04.2013
2	Building a mosque in School Secondary Abdul Jailil, Hulu Langat.	Jabatan Perdana Menteri	220,050.00	04.08.2014- 24.11.2014
3	Additional construction (1) Building block at branch office and store also related work at the area BP. (2) Taman Perindustrian UEP, Subang Jaya, Selangor Darul Ehsan.	Majlis Perbandaran Subang Jaya	693,475.20	16.06.2014- 25.01.2015



Photo 2.8 : Construction of mosque at SMKAJ

Source : Muhd Radhi (2014)



Photo 2.9 : Block building MPSJ construction

Source : Muhd Radhi (2014)



Photo 3.0 : Upgrading the Culvert at Sg.Jernih

Source : Muhd Radhi (2014)

## **CHAPTER 3**

### **CASE STUDY**

#### **PRECAST BOX CULVERT-MICRO PILE**

##### **3.1 INTRODUCTION**

Precast box culvert is ready-to-use surface large and strong, durability for which imparts greater and longer service life to high-traffic concrete floors on the road. The gradations limits for asphaltic concrete clause. It has proven to produce wearing course 4.5 – 6.5%. To ensure successful installation of a precast box culvert project, the site must be first being prepared. Precast concrete box culverts need to have special site preparation for the foundation on which it will rest. The box culvert foundation is typically referred to as bedding. Box culvert installation should be done by an experienced contractor who understands the importance of bedding the structure properly.

A micro pile is a small pile with diameter ranging 3-1/2" (90mm) to 9-7/8" (250). Micro piles are generally used underpinning and retrofitting structures. This work shall comprise the drilling of a hole, placing of reinforcement unit and subsequently filling the hole with grout to form micro pile. In the past micro pile was only used when the ground conditions warranted it because of consideration of the drilling and flushing process, it might takes Minutes or hours to complete.



### 3.2 PROJECT BACKGROUND

Contract Number : JKR/PER/SEL/401/2012  
Original Contract Sum : RM 2,944,458.20  
Original Contract Date : 24 Weeks  
Original Completion Date : 26 April 2013  
Extension of Time Number 1 : 13 September 2013  
Extension of Time Number 2 : 26 January 2014  
Extension of Time Number 3 : 13 September 2014 until now

#### Insurance

1. Contractor's All Risks : W-E-B3-AG-000038
2. Sum Insured : RM 2,944,458.20
3. Period Of Insurance : 9 November 2012- 13 September 2013

#### Workmen Compensation

- a) Policy Number : W-W-B3-AG-000038
- b) Sum Insured : RM 294,445.82
- c) Period of Insurance : 9 November 2012- 13 September 2013

Superintending Officer : Engineer district of JKR hulu Langat, Office of  
Engineer, Jabatan Kerja Raya Hulu Langat,  
Persiaran Wawasan Seksyen 14, 43650 Bandar  
Baru Bangi, Selangor Darul Ehsan.



Consultant : Engineer of consultant Mega CT-06-04,  
Corporate Tower, Subang Square,  
Jalan SS.15/4G 47500 Subang Jaya,  
Selangor Darul Ehsan.

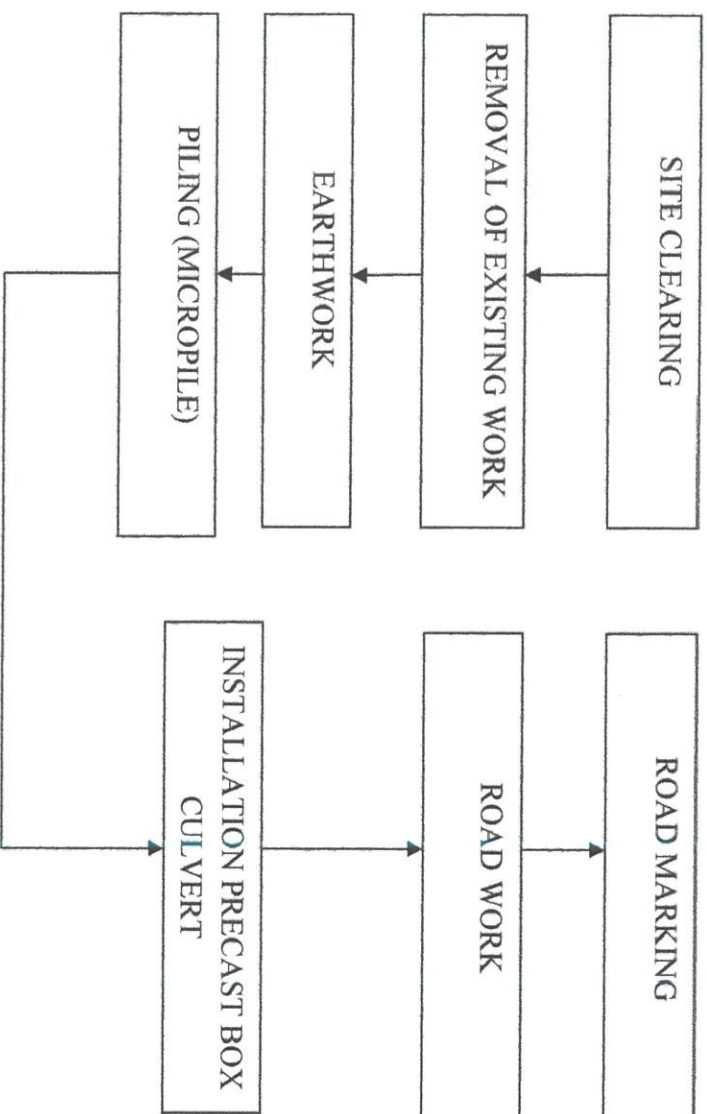
Contractor : Lazim Purnama Sdn Bhd,  
No 3 Jalan Perindustrian USJ ½,  
Taman SJ 1, 47500 Subang Jaya,  
Selangor Darul Ehsan.



Photo 3.1 : Signage Upgrading the Culvert Sungai Jernih at Main Road, Hulu Langat, District Hulu Langat Selangor Darul Ehsan.

Source : Muhammad Radhi (2014)

### 3.3 Chart of Precast Box Culvert Work



### 3.4 Precast Box Culvert-Micro Pile

#### 3.4.1 Site Clearing

##### Clearing

Clearing shall consist of the cutting and taking down, removal and disposal of everything above ground level, including objects overhanging the areas to be cleared such as tree branches, except such trees, vegetation, structures or parts of structures. Such as utilities (TNB, SYABAS, TM AND MAXIS), and other things which are designated in the Contract to remain, or be removed by others, or which the Superintendent Office directs are to be left undisturbed.



Photo 3.2 : Site Clearing

Source : Muhd Radhi (2014)

### **3.5 Removal of Existing Work**

No excavated material shall be removed from the site except on the direction or with the approval of the Superintendent Officer. So, when we were need to do anything work at the site we had get the permission from Superintendent Officer first. The contractor be permitted to remove suitable materials from the site to suit his operational procedure, then he shall make good any consequent deficit of fill material arising there from, at his own expense. Unless designated dump sites have been shown on the drawings, the contractor shall dispose of surplus suitable material at his own dump areas outside the site as approved by the Superintendent Officer



Photo 3.3 : Removal of Existing Work

Source : Muhd Radhi (2014)

## **3.6 Earthworks**

### **3.6.1 Top Soil**

#### **(a) Formation Level**

Formation level means the top surface of the sub grade. We had leveling the ground.

#### **(b) Sub grade**

Sub grade means part of the embankment or existing ground in cutting which is immediately below the sub base or lower sub base of the road pavement and shoulders.

#### **(c) Unsuitable Materials**

Unsuitable materials shall include:-

- (i) any material
  - consisting of highly organic clay and silt;
  - which is susceptible to spontaneous combustion; (Plastic burning, scrap metal)
  - containing large amounts of roots, grass and other vegetable matter



Photo 3.4 : Excavation for Piling Work

Source : Muhd Radhi (2014)



Photo 3.5 : Excavation for leveling

Source : Muhd Radhi (2014)



Photo 3.6 : Excavation of Pavement

Source : Muhd Radhi (2014)

### **3.7 Piling Work**

#### **3.7.1 Piling Work**

This work shall consist of the supply, installation and testing of pile in accordance with this specification and the lines, levels, grades and cross-section shown on the Drawings.

#### **3.7.2 Method of Micro Pile**

Works recent on the construction site until 22<sup>th</sup> November 2013 and a statement of the method that we will pursue:-

1. Drying water works / diversion of water flow (segment A) was performed using a corrugated pipe, sandbags and water pumps.
2. Excavation works at the work area by using heavy machinery (excavator) to enable further work being done.
3. Drilling operation, drilling the pile with micro pile set.
4. Works to test concrete cube.
5. Cutting works of micro pile by using oxy cutter.
6. Addition of micro pile had to be done at the areas that can't be done due to the limited space working and finding concrete at riverbed.
7. Excavation works of land and sand being done followed by deep surveyor.





Photo 3.7 : Drilling Pile Work

Source : Muhd Radhi (2014)



Photo 3.8 : Additional Pile Work

Source : Muhd Radhi (2014)

### 3.7.3 Installation of Precast Box Culvert

- 1 Works connection on-site with a thickness of 50mm concrete after excavation and leveling is complete.
- 2 Installation of reinforcement bar.
- 3 Build the concrete base with a thickness 600mm.
- 4 Installation of box culvert 1.8m highest will pursue on the top base concrete had be done before this.



Photo 3.9 : Installation of Precast Box Culvert

Source : Muhd Radhi (2014)



Photo 4.0 : Carry out the Precast Box Culvert

Source : Muhd Radhi (2014)

### **3.8 Road Work**

#### **3.8.1 Clearing Up Of Site**

The Contractor shall make every effort to keep the site in a reasonably clean and tidy condition for the duration of the works. The contractor shall remove all rubbish or any material that can overcome dangerous for user such as temporary barrier, tools and machineries at site.



Photo 4.1 : Clearing Up Of Site

Source : Muhd Radhi (2014)

### **3.9 Road Marking**

#### **3.9.1 Road Marking Work**

This work shall consist of the supply of road marking material and its application to form continuous or intermittent lines, letter, arrows, symbols or figures. The markings shall be white or yellow lay to the dimension. The work includes the supply of all labor, tools, equipment, materials, and traffic guidance sign as necessary for the safe and efficient completion of the entire work.



Figure 4.2 : Road Marking Work



Source : Muhd Radhi (2014)





Photo 4.3 : Road marking work at the night

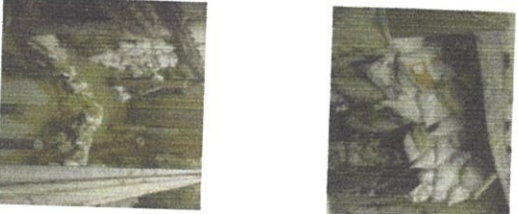
Source : Muhd Radhi (2014)

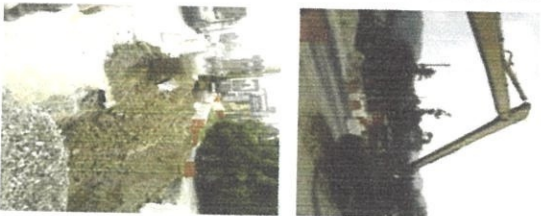
### 3.9.2 Heavy Machineries for Culvert Box Work

No.	Machineries	Function
1	<p data-bbox="277 577 544 607">Drilling Machine Set</p> 	<p data-bbox="778 584 1337 1043">This hydraulic multifunctional drilling rig is in integral type, equipped with crawler chassis and holding shackle. It can be utilized to drill holes combined with drilling tools, it can drill until 50 meters deep of soil also can rotary jet grouting function is added to be suitable for ordinary jet grouting pile construction and under reamed anchor construction.</p>
2	<p data-bbox="277 1064 635 1144">Excavator Machine( Crawler Excavator</p> 	<p data-bbox="778 1070 1337 1267">This machine can dig hard ground surface. This machine will break hard structures such as soil conditions at the surface at the Sg. Jernih road Hulu Langat.</p>

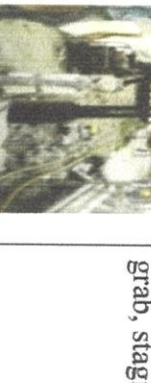
### 3.9.3 Method Statement of Precast Box Culvert-Micro Pile


No	Operation	Method	Diagram	Equipment	Manpower	Duration
1	Setting out	Carrying out using the data and reference point. The pile position shall be marked with suitable identifiable pins, peg or markers at least 300 mm and we had marked the point for the work.		Measurement tape, pencil and note book.	A surveyor and a labor	24 hours
2	Site clearing	Clearing work at the site, removal and disposal of everything above ground level, including object overhanging the area to be cleared and we had put the temporary site office (cabin) at the site.		Hand gloves, boots, and safety helmet.	Two(2) labor and one(1) supervisor	1 Days

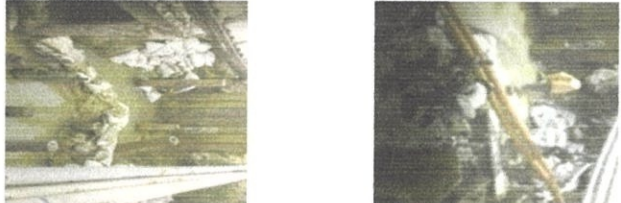
3	Drying water	<p>Drying water works /          Diversion of water flow.          We have blocked the water to drying the place for excavation and grout the place. We blocked it with sand bag and put the corrugated pipe. So, the water can flow with normal without disturbed the pilling work.</p>		Corrugated pipe, Sand bag and water pump.	Three(3) labor	Half day
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4	Excavation work	Excavation sand work and wrecked the road at the areas for makes sure other work is going on. Fission rock for		Excavator, lorry	Driver lorry, operations man guide man road and supervisor.	5 Days
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5	Piling work (Boring)	Normally it can be drilling into 50 meters deep of soil. We have coring the soil until we meet the underground phase. Then, knocked / buried the micro pile into underground.		Bored piling machine tool bucket and grab, staging.	Four(4) labor	1 Days
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6	Grouting Operations	Steel reinforcement included, cement is poured into the mixer. Water is poured into the machine and sand once placed into the machine. After completion of this admixture it will be poured into the pile. After that, the concrete is poured until full.		Cement, water, pipe and mixer machine.	Two(2) mixer, One(1) pump operator, one(1) hose man, One(1) Agitator Tank One(1) supervisor .	1 Day.
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7	Cut-off-level	<p>Micro cutting pile, pile head. Before the cut, pile head is marked with red paint. Pile head will be cut using oxy cutter with high temperatures.</p>		<p>Oxy cutter, Generator machine.</p>	<p>Two (2) labors and One (1) welder.</p>	<p>1 Day</p>
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8	Concrete slab	<p>Connection works on site concrete with 50mm thickness after excavation and leveling is complete. Steel erection work will be done to enable the work to be done concrete base. Concrete base will be built with a thickness of 600mm above concrete connection has been built previously by the concrete mix according to the agreed specifications.</p>		Mobile crane, measurement tape	Operator operation machine, three(3) workers, one(1) supervisor	5 Days
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9.	<b>Box Culvert Work (Installation)</b>	<p>Installation of box culvert measuring 1.8 meters in height will be on a concrete base that done before. Box culvert lifted one by one using a mobile crane. Supervisors must ensure that the installation is in accordance with specifications laid down.</p>	 	<p>Mobile crane, measurement tape.</p>	<p>Operator operation machine, three(3) workers, one(1) supervisor</p>	<p>1 Days</p>
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### **3.9.4 Advantages of Precast Box Culvert**



#### **A High Quality Product**

Fabrication of box culvert units by experienced crews in controlled an environment ensures is high quality product. Units are cast in the plant under comprehensive quality control eliminating the drawbacks imposed by weather and site conditions also long-lasting or durability.

#### **Economy**

Precast box culverts are cost competitive with cast in place structures. This means that the precast box culvert is good although the priced is higher than in- situ place.

#### **Quick and Easy On-Site Installation**

The installation of a box culvert involves preparation of the site, placement and backfilling of box culvert sections. This preparation work may be scheduled for immediately prior to delivery of the precast culverts to the site. Placement of the culvert units is usually carried out with a crane and is a straightforward and rapid operation.

#### **Schedule**

Precast fabrication of box culvert units reduces the amount of work on-site and possible impact of weather on project schedules. The culvert sections can be installed, backfilled and placed into service immediately upon delivery to the site. Box culvert units can be preordered to allow projects to proceed on-site in early spring.

## CHAPTER 4

### 4.1 Conclusion

A precast box culvert is good for quick construction because it's had been manufacturing. So, we were installing when it arrived at site. However, with any new products the problem was encountered during the design, construction, and installation processes.

Firstly, the detail construction has been detected while the progresses which are from the beginning of construction site clearing until the end of installation precast box culvert process. Besides that, it's also found out the schedule of specialist that involved and others. Not just that, each of the equipment and machineries that used has their own role and importance contribute towards the construction of precast box culvert.

Consequently, it's included an objectives of the research presented that has been satisfied. Also even something new and enhancement can be produced related micro pile construction methods. Among the proper method and boring the pile, the advance usage of machinery and equipment can be applied. Therefore, the information that compiled less or more have given extra knowledge to parties that involved. Although many believe that the possibility of failure does exist, with the proper site investigation, design, construction, installation, and inspection of these precast box culverts, the probability of failure should remain very low.

## **4.2 Construction of Precast Box Culvert Problem**

Refer to the above I would like to clarify the statements as under section 43.0 Delay and Extension of Time, clause 1:

The utility was taking a long time to complete this work at the site and more than the duration that was wrote in contract. Although the JKR Hulu Langat give 'EOT' 3 times, but it still not enough time needed to complete the work until now. This is because 'EOT' no.1 (13/09/2013-140 day) and 'EOT' no.2 (27/12/2013-105 day) given by the master of 70% of the time it used to SYABAS, TM, TNB and MAXIS. We can only re mobilize our work has long been stalled in mid-November 2013 and we were given a very short period of time and does not cause for the completion of this project, on January 26, 2014 with the rainy season uncertain.

### **4.2.1 Delay and Extension of Time**

1. Utility diversion work took too long and was completed by TNB is in the middle of November 2013, the work of box culvert installation can only be started after completion of the utility TNB. To your knowledge, there is an underground structure under existing drains too deep and large. We take the time (14 Days) for us to break up into the bottom of the structure by using breaker excavator and different.
2. We also had to make underground mapping because not made out by the consultants and utilities(TNB,SYABAS,TM AND MAXIS)
3. TNB and SYABAS have confirmed that the removal was completed fully utilities in the work area but unfortunately in February 2014, when we carry out dredging works for create a diversion road, we found the TNB cables are disconnected the pipe that is buried too shallow to hit the excavator. Work to be interrupted while TNB wait and SYABAS cables repaired.
4. Current build diversion road, the level found in the drawings provided by the consultants should not be applied. Here, we have to wait for confirmation and call the surveyor to mark and got the confirmation from the consultant.



5. For your information too, in the construction of micro piles are unsuitable drawings from consultants and forcing us to alter his own paintings and get confirmation from him also to speed up the time.
6. Demand from consultant to test PDA for micro pile four times also contributed to the delay in the work. The BQ only two times.
7. Besides that, in early March 2013, place the water reservoir on the diversion road in front of the restaurant Tom Yum due to rain and leaking pipe. Work to be deferred to complete the diversion road.
8. Busy traffic, the narrow "ROW" and flash floods make slow work on site.
9. When a flash flood diversion road surface is broken and damaged by heavy vehicles through the area. We had resurfacing of the road to make the road safe and comfortable.
10. We are only able to devote full-time work on 16 May 2014 to start excavations in section C.
11. The work was completed planting micro pile in this area having been commenced on 26.May.2014 until now.

### 4.3 Recommendation

Subsequent from the research that carried out in method of construction precast box culvert have a lot of pros and cons. So, here I want to be pressing shortage solved together during the process grout. The grout shall be non-shrink cement grout. Its means the grout mix design such as the water-cement ratio, the minimum cement and grout strength at 7 and 28 days shall be shown as on drawing. The grout shall be mixed on site and shall be free from segregation, slumping and bleeding. On the site, we shall grout and pumped into its final position in one continuous operation as soon as possible.

Generally, we can saw the problem always happen at the concrete test cube. So, we have done three (3) test cubes that shall be made from the concrete as used in the preliminary test pile. The concrete pile is always extended and capped when the testing operations. So, when we did the test, we had done the admixture of concrete followed by correctly ratio. Furthermore, we had deal with consultant and make sure that the consultant given the drawing with detail and correctly.

The setting up of pile equipment shall be carried out under competent supervision and the equipment shall be checked to ensure that the setting-up is satisfactory before the commencement of load test. All tests shall be out under the direction of an experienced and competent supervisor conversant with the test equipment. We shall give protection of testing equipment such as protection from weather. Besides that, prevention of disturbance, the grouting shall be kept at a sufficient distance from the test to avoid disturbance to any activity and its effect.

## REFERENCES

1. Ketua Pengarah Kerja Raya. (1988).Standard Specification for Road Work.(Section1&2) Shah Alam, DC: Author.
2. Pilling work (2004).11.July.2014.Retrieved from [https:// pile-driving. Com/what- is piling](https://pile-driving.com/what-is-piling).
3. Micro pile work (2006).14.september .Retrieved from <https://>



SURUHANJAYA SYARIKAT MALAYSIA  
COMPANIES COMMISSION OF MALAYSIA

BORANG 9  
AKTA SYARIKAT 1965

[Seksyen 16(4)]

No. Syarikat

753083

U

**PERAKUAN PEMERBADANAN SYARIKAT SENDIRIAN**

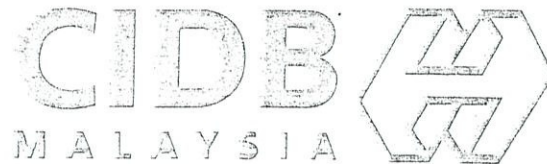
Adalah diperakui bahawa

**PAKIS EMAS CAPITAL SDN. BHD.**

telah diperbadankan di bawah Akta Syarikat 1965, pada dan mulai dari  
14 haribulan November 2006, dan bahawa syarikat ini adalah sebuah syarikat  
berhad menurut syer dan bahawa syarikat ini adalah sebuah syarikat sendiri.

Dibuat di bawah tandatangan dan meterai saya di Kuala Lumpur  
pada 14 haribulan November 2006.

UserID: haya... 11/14/2006 2:21:30 PM



# Sijil Perolehan Kerja Kerajaan

NO. SIJIL PENDAFTARAN

0120070323-SL112908

Adalah disahkan Syarikat/Firma seperti butir-butir berdaftar dengan Lembaga Pembangunan Industri Pembinaan Malaysia dan tertakluk kepada syarat-syarat termaktub di belakang sijil.

Tarikh Mula Berdaftar Dengan CIDB : 23/03/2007

NAMA DAN ALAMAT BERDAFTAR

PAKIS EMAS CAPITAL SDN. BHD.  
NO. 10, JALAN ORKID 8  
TAMAN ORKID  
43200 CHERAS  
SELANGOR

TEMPOH SAH LAKU :

DARI : 04/07/2013  
HINGGA: 25/07/2015

GRED

KATEGORI

G5	B	( Pembinaan Bangunan )
G5	CE	( Pembinaan Kejuruteraan Awam )
G5	ME	( Mekanikal Dan Elektrikal )

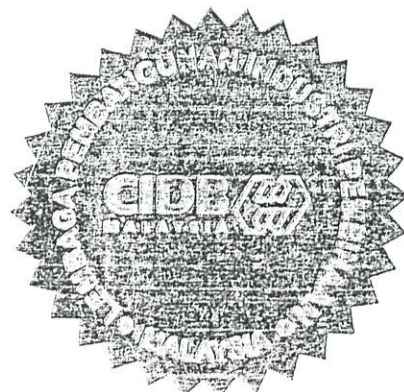
PEGAWAI SYARIKAT YANG DITAUHIAHKAN

NO. K/P

Jawatan

MOHD MUZAINI BIN MOHD ZIN  
SALINA BINTI MAT ALI

PENGARAH URUSAN  
PENGURUS



b.p. Ketua Eksekutif

Bertarikh: 04 JUL 2013

## SYARAT-SYARAT SIJIL PEROLEHAN KERJA KERAJAAN

### 1. SYARAT AM

- 1.1 Sijil ini dikeluarkan berdasarkan maklumat-maklumat yang telah diberikan oleh Pemohon/Syarikat.
- 1.2 Sijil ini tidak boleh digunakan sebagai perakuan bagi memulakan/mengakujajani untuk melaksanakan kerja-kerja pembinaan. Sijil ini hanya boleh digunakan untuk menyertai perolehan kerja Kerajaan atau agensi yang berkaitan dengan kerajaan sahaja.
- 1.3 Sijil ini akan terbatal dengan sendirinya jika Perakuan Pendaftaran Kontraktor telah tamat tempoh sahlaku atau dibatal/ditarikbalik/digantung menurut Peraturan 15, Peraturan Pendaftaran Kontraktor (Industri Pembinaan) 1995.

- 1.4 Sijil ini hendaklah dikemukakan bersama-sama Perakuan Pendaftaran Kontraktor semasa menyertai tender kerja Kerajaan atau agensi yang berkaitan dengan kerajaan sahaja.

Sijil ini hendaklah diperbaharui bersama-sama dengan Perakuan Pendaftaran yang dikeluarkan oleh Lembaga Pembangunan Industri Pembinaan Malaysia (CIDB).

- 1.6 Sijil Perolehan Kerja Kerajaan yang tidak diperbaharui dalam tempoh enam (6) bulan dari tarikh tamat Perakuan Pendaftaran Kontraktor akan dikeluarkan dari senarai daftar CIDB. Mana-mana permohonan yang dibuat selepas tempoh tersebut akan dianggap sebagai permohonan baru dan perlu mematuhi syarat-syarat pengeluaran Sijil Perolehan Kerja Kerajaan bagi permohonan baru.

### 2 TANGGUNGJAWAB SYARIKAT/PEMEGANG SIJIL

- 2.1 Syarikat/Pemegang sijil tidak boleh meminjamkan, memajak, memindahmilik, membenarkan atau menyebabkan apa-apa perkara yang menyebabkan sijil ini digunakan oleh seseorang yang tidak dinamakan untuk menggunakan sijil ini bagi tujuan mendapatkan perolehan Kerajaan.

- 2.2 Hanya pegawai-pegawai syarikat yang dinamakan di dalam sijil ini dibenarkan untuk menandatangani dokumen kontrak syarikat dan mengambil atau memberi kuasa kepada kakitangan syarikat untuk mengambil dokumen tawaran.

- 2.3 Syarikat/Pemegang sijil hendaklah memastikan semua syarat-syarat yang ditetapkan bagi mendapatkan sijil ini dipatuhi disepanjang tempoh sahlaku sijil ini.

- 2.4 Sebarang perubahan maklumat hendaklah dimaklumkan kepada Lembaga Pembangunan Industri Pembinaan Malaysia (CIDB) dalam tempoh 21 hari dari tarikh perubahan tersebut itu berlaku.

- 2.5 Syarikat/Pemegang sijil hendaklah mematuhi semua arahan dan ketetapan yang dikeluarkan oleh Kerajaan melalui Arahan Perbendaharaan, Surat Pekeliling Perbendaharaan dan Surat Pekeliling yang dikeluarkan oleh Jabatan Teknikal (Jabatan Kerja Raya/Jabatan Pengairan dan Saliran) darimasa kesemasa.

- 2.6 Syarikat/Pemegang sijil hendaklah mematuhi semua arahan dan ketetapan yang dikeluarkan oleh Lembaga Pembangunan Industri Pembinaan Malaysia (CIDB) dari masa kesemasa.

### 3 TINDAKAN ATAS KEINGKARAN

- 3.1 Syarikat/Pemegang sijil yang gagal mematuhi perkara 2; **TANGGUNGJAWAB SYARIKAT/PEMEGANG SIJIL** akan dikenakan tindakan tata tertib sebagaimana yang ditetapkan di dalam Peraturan 15, Peraturan Pendaftaran Kontraktor (Industri Pembinaan) 1995.

- 3.2 Lembaga ini berhak mengambil tindakan tata tertib dan mengenakan apa-apa hukuman yang sewajarnya terhadap kontraktor berdaftar.

- 3.3 Syarikat/Pemegang sijil yang dijatuhi tindakan senarai hitam, gantung, batal atau tarik balik Sijil Perolehan Kerja Kerajaan melalui prosiding tata tertib tidak boleh menyertai tender atau terlibat dengan perolehan Kerajaan.

- 3.4 Syarikat/Pemegang sijil yang dikenakan tindakan batal/tarik balik Sijil Perolehan Kerja Kerajaan akan dikeluarkan dari senarai daftar CIDB. Syarikat/Pemegang sijil berkaitan yang ingin mendapatkan semula Sijil Perolehan Kerja Kerajaan akan dikenakan tindakan penghapusan Sijil Perolehan Kerja Kerajaan bagi permohonan baru. Pegawai pengurusan utama syarikat yang disenarai hitam akan dihalang untuk mendapatkan Sijil Perolehan Kerja Kerajaan untuk tempoh 3 tahun.

- 3.5 Syarikat/Pemegang sijil yang dikenakan tindakan senarai hitam/gantung melalui prosiding tata tertib tidak akan dikeluarkan dari senarai daftar CIDB. Syarikat/Pemegang sijil berkaitan hanya dibenarkan menyertai tender atau terlibat dengan perolehan Kerajaan selepas tempoh senarai hitam/penggantungan selesai.

### 4 HAD KEWANGAN (KOS KERJA)

- 4.1 Kontraktor yang berdaftar di bawah Sijil Perolehan Kerja Kerajaan hanya dibenarkan menyertai tender yang dipelawa bagi Gred pendaftaran yang ianya didaftarkan.

Gred Pendaftaran	Had Kewangan (RM)
G1	Sehingga 200,000
G2	200,001 hingga 500,000
G3	500,001 hingga 1,000,000
G4	1,000,001 hingga 3,000,000
G5	3,000,001 hingga 5,000,000
G6	5,000,001 hingga 10,000,000
G7	10,000,001 dan keatas

# PERAKUAN PENDAFTARAN

Adalah dengan ini diperakui bahawa kontraktor yang dinyatakan di bawah ini telah berdaftar dengan Lembaga mengikut Bahagian VI Akta Lembaga Pembangunan Industri Pembinaan Malaysia 1994. Pendaftaran ini adalah tertakluk kepada syarat-syarat yang telah ditetapkan di belakang Perakuan ini

No Pendaftaran: ; 0120070323-SL112908

Nama Kontraktor : PAKIS EMAS CAPITAL SDN. BHD.

Alamat Berdaftar : NO. 10, JALAN ORKID 8  
TAMAN ORKID  
43200 CHERAS  
SELANGOR

Gred, kategori dan pengkhususan berdaftar

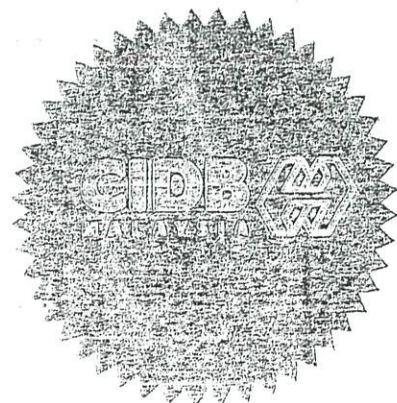
G5	B	B04	B12	B02	B13	B24	B07	B26	B28	B14
G5	CE	CE21	CE34	CE36	CE20	CE01	CE03	CE10	CE13	CE02
G5	ME	M15	E11	M01						

Tarikh Mula Berkuatkuasa : 04 JUL 2013

Tarikh Habis Tempoh Perakuan : 25 JUL 2015\*

*\*Perakuan ini hendaklah diperbaharui selewat-lewatnya 60 hari sebelum tarikh habis tempoh.*

**STATUS : AKTIF** - Kontraktor yang diawardkan projek semasa perakuan pendaftaran ini dikeluarkan.



## SYARAT-SYARAT PENDAFTARAN

### 1. Syarat Am

- a) Perakuan ini tidak boleh dipindahmilik.
- b) Lembaga mempunyai hak mengkaji semula gred pendaftaran kontraktor dari semasa ke semasa.

### 2. Tanggungjawab dan Obligasi Kontraktor

- a) Kontraktor hendaklah mematuhi peruntukan- peruntukan Akta Lembaga Pembangunan Industri Pembinaan Malaysia 1994 ("Akta"), peraturan-peraturan yang dibuat di bawahnya dan apa-apa terma, syarat-syarat atau sekatan yang dikenakan oleh Lembaga dari semasa ke semasa.
- b) Kontraktor tidaklah boleh menyertai mana-mana tender atau melaksanakan apa-apa kerja pembinaan selepas habis tempoh Perakuan ini dan sehingga ianya diperbaharui.
- c) Kontraktor tidaklah boleh mengakujajangi membina apa-apa projek pembinaan yang melebihi nilai kerja pembinaan yang dinyatakan di bawah gred pendaftarannya dan tidaklah boleh melaksanakan apa-apa projek pembinaan di luar kategori pendaftarannya.
- d) Kontraktor hendaklah mengemukakan maklumat mengenai apa-apa kerja pembinaan atau kontrak dalam tempoh satu bulan diaward.
- e) Kontraktor hendaklah mengemukakan apa-apa maklumat yang dikehendaki oleh Lembaga dari semasa ke semasa.
- f) Kontraktor hendaklah mempamerkan Perakuan Pendaftarannya yang dikeluarkan oleh Lembaga atau salinan Perakuan Pendaftaran yang diperakui oleh Lembaga di tempat perniagaannya.
- g) Kontraktor hendaklah mempamerkan nombor pendaftaran atas papan tanda di setiap tapak pembinaannya.
- h) Kontraktor hendaklah memohon untuk membaharui pendaftaran dalam tempoh enam puluh hari sebelum tarikh habis tempoh yang dinyatakan dalam Perakuan itu. Apa-apa permohonan yang diterima oleh Lembaga lewat daripada tiga puluh hari sebelum tarikh habis tempoh perakuan pendaftaran hendaklah dikenakan fee sebanyak RM200.00 kerana lewat membaharui.
- i) Kontraktor hendaklah mematuhi semua kehendak dan ketetapan di dalam Kod Etika Kontraktor.

### 3. Tindakan Tatatertib

Pendaftaran kontraktor hendaklah dibatal, digantung atau ditarik balik jika:-

- a) kontraktor tidak mematuhi kehendak mana-mana undang bertulis yang lain;
- b) kontraktor telah dihukum menjadi bankrap;
- c) petisyen penggulungan berhubung dengan kontraktor telah diserahkan;
- d) kontraktor melanggar atau tidak mematuhi mana-mana peruntukan Akta;
- e) kontraktor telah mendapat Perakuan dengan membuat atau menyebabkan dibuat apa-apa akuan, pemerakuan atau representasi palsu atau fraud secara bertulis atau selainnya;
- f) kontraktor meninggalkan apa-apa kerja pembinaan yang diakujajangi tanpa apa-apa sebab yang munasabah;
- g) kontraktor telah didapati bersalah kerana cuai oleh mahkamah atau mana-mana lembaga penyiasatan yang ditubuhkan di bawah mana-mana undang-undang bertulis berhubung dengan apa-apa kerja pembinaan yang diakujajangi; atau
- h) kontraktor telah melanggar mana-mana terma dan syarat-syarat Tanggungjawab dan Obligasi Kontraktor yang dinyatakan dalam perenggan 2.

Jadual Gred & Had Tender

1	2
Gred	Keupayaan Menender/ Menjalankan Kerja (RM)
G7	Tiada Had
G6	Tidak melebihi 10 juta
G5	Tidak melebihi 5 juta
G4	Tidak melebihi 3 juta
G3	Tidak melebihi 1 juta
G2	Tidak melebihi 500,000.00
G1	Tidak melebihi 200,000.00





No. Siri TB 164707

**PUSAT KHIDMAT KONTRAKTOR**  
KEMENTERIAN KERJA RAYA MALAYSIA

**SIJIL KONTRAKTOR KERJA**  
**TARAF BUMIPUTERA**

Adalah dengan ini syarikat tuan seperti tercatat di dalam Sijil ini diiktiraf sebagai kontraktor kerja bertaraf Bumiputera. Pemberian pengiktirafan ini adalah tertakluk kepada syarat - syarat termaktub di belakang sijil.

NO. SIJIL PENDAFTARAN  
120070323-SL112908

GREED PENDAFTARAN  
G5 (Bumiputera)

TEMPOH SAH LAKU  
DARI : 15/10/2012  
HINGGA : 25/07/2015

NAMA DAN ALAMAT BERDAFTAR  
PAKIS EMAS CAPITAL SDN. BHD.  
NO. 10, JALAN ORKID 8  
TAMAN ORKID  
43200 CHERAS  
SELANGOR

PEGAWAI SYARIKAT YANG DITAUHIAHKAN  
MOHD MUZAINI BIN MOHD ZIN  
SALINA BINTI MAT ALI  
\*\*\*\*\*

NO K/P  
\*\*\*\*\*

JAWATAN  
PENGARAH URUSAN  
PENGARAH  
\*\*\*\*\*

(YAHAYA BIN HASAN)  
PENGARAH  
Pusat Khidmat Kontraktor  
Kementerian Kerja Raya Malaysia

Tarikh Cetak: 29/07/2013

## SYARAT-SYARAT PENGIKTIRAFAN TARAF BUMIPUTERA

### 1. SYARAT-SYARAT AM

- 1.1. Pemberian taraf ini adalah berdasarkan kepada maklumat-maklumat yang telah diberi oleh syarikat;
- 1.2. Sebarang perubahan ke atas maklumat-maklumat hendaklah dimaklumkan kepada PUSAT KHIDMAT KONTRAKTOR dalam tempoh 21 hari dari tarikh perubahan tersebut berlaku;
- 1.3. Syarikat hendaklah mengemukakan segala maklumat dalam tempoh yang ditetapkan apabila diminta oleh pegawai-pegawai PUSAT KHIDMAT KONTRAKTOR; dan
- 1.4. Syarikat adalah dinasihatkan untuk mengemukakan permohonan lanjutan tempoh kuasa pengiktirafan sekurang-kurangnya 3 bulan sebelum luputnya tarikh kuasa tersebut.

### 2. SYARAT-SYARAT MUTLAK

- 2.1. Syarikat hendaklah sentiasa menjamin pada setiap masa memenuhi kriteria seperti berikut:-
  - 2.1.1. Sekurang-kurangnya 51% daripada pemilikan saham syarikat dimiliki oleh Bumiputera;
  - 2.1.2. Pemilikan individu Bumiputera hendaklah melebihi saham individu bukan Bumiputera;
  - 2.1.3. Sekurang-kurangnya 51% daripada Ahli Lembaga Pengarah syarikat dipegang oleh Bumiputera;
  - 2.1.4. Jawatan Ketua Eksekutif, Pengarah Urusan atau Pengurus Besar dan jawatan penting lain (key post) hendaklah dipegang oleh Bumiputera;
  - 2.1.5. Sekurang-kurangnya 51% daripada pekerja syarikat hendaklah terdiri dari Bumiputera;
  - 2.1.6. Pengurusan kewangannya hendaklah dikuasi oleh Bumiputera;
  - 2.1.7. Carta organisasi dan fungsi pengurusan syarikat hendaklah menunjukkan penguasaan oleh Bumiputera;
  - 2.1.8. Tidak mengsubkontrakkan keseluruhan kerja atau menyerahkan keseluruhan pengurusan sesuatu kontrak kepada pihak-pihak lain; dan
  - 2.1.9. Menjamin penyertaan kaum Bumiputera merupakan perkongsian aktif dan memainkan peranan utama dalam urusniaga syarikat seperti digambarkan di sub para 2.1.1 hingga 2.1.8.

### 3. PERINGATAN

- 3.1. PUSAT KHIDMAT KONTRAKTOR berhak membatalkan, menggantung atau menarik pengiktirafan taraf Bumiputera syarikat jika didapati:
  - 3.1.1. Maklumat yang diberi tidak benar atau palsu;
  - 3.1.2. Syarikat enggan dan gagal mengemukakan maklumat apabila diminta; dan
  - 3.1.3. Melanggar mana-mana syarat-syarat am dan mutlak yang dinyatakan di para (1) dan (2).