UNIVERSITI TEKNOLOGI MARA

DEPARTMENT OF BUILDING

FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

SEPTEMBER 2015

It is recommended that the report of this practical training provided

By

ABDULLAH ZAMZAMI BIN AZAIZ

2013231228

entitled

END BEARING PILE: SPUN PILE

Accepted in partial fulfilment of requirement has for obtaining Diploma In Building.

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STUDENT'S DECLARATION

I hereby declare that this report is my own work, except for extract and summaries for which the original references stated herein, prepared during a practical training session that I underwent at Tasland Corporation Sdn. Bhd. for duration 6 month starting from 25 May and ended 9 October 2013. It is submitted as one of the prerequisite requirements of DBN307 and accepted as a partial fulfilment of the requirements for obtaining the Diploma in Building.

Name : Abdullah Zamzami Bin Azaiz

UiTM ID No : 2013231228

Date : 13/10/2015

ACKNOWLEDGEMENTS

First of all, Alhamdulillah praises to Allah for give me the strength for completing this report. All praises to Allah for His blessing to completing this report on time given by University of Technology MARA Seri Iskandar. My appreciation goes to the project manager on site, Encik Khairudin Bin Ngah for the knowledge given regarding this topic. I would like to express my appreciation to the site engineer, Encik Mohd Hasmadi Bin Hassan for his contribution; support and knowledge given by him throughout my industrial training that enabled me to learn and develop many these at site include site management. Sincere thanks to my lecture supervisor, Encik Dzulkarnaen Ismail for the guidance, time, effort, advice and moral support throughout my industrial training to completing this report in successfully. Not forget to Visiting Lecturer, Puan Nurul Huda Binti Hadi for her time to visit me at site. Then, great appreciation goes to the Practical Training Coordinator Puan Noor Rizallinda Binti Ishak and Faculty's Coordinator Dr. Mohd Rofdzi Abdullah.

Next, I would like to thanks to all staffs at Tasland Corporation Sdn. Bhd. office, Mrs. Sakinah Bt Muda (Senior Account Executive), Mrs. Naimah Bt Omar (Account Executive), Mrs. Mariam Binti Musa (Admin Assistant), and Mr. Sobri Endut (Quantity Surveyor) who have been helping me with my task and problems encountered.

Last but not least, my special appreciation goes to my beloved parents,
for their endless supports on moral and financial to me.
To those who indirectly contributed in this report, your kindness means a lot on completing this report. Thank you very much.

ABSTRACT

Piling is the essential support needed for any kind of structure. So focus of this report is explains about deep foundation and end-bearing pile: spun pile. All explanation about deep foundation and end-bearing pile: Spun piles based on case study construction project propose a new mosque at Mengabang Telipot village, Kuala Terengganu, Terengganu. This report was discussed what is deep foundation and what types of deep foundation. So, this report was explained end-bearing pile as one type of deep foundation. The objective of this report is to study about installation process of deep foundation and end-bearing piles: spun pile. It will focus on how spun pile was installed in the case study by using driven hammer technique. Other than that, this study can introduce the materials, plant and machineries involved during installation process of end-bearing pile: spun pile. After that, this study also discusses about the method used to test the installation of end-bearing pile: spun pile. To collect the information about end-bearing pile: spun pile, there are many study methods were used. The study method were used are interview, observation and reference books. The interview and observation method were conducted on case study, while reference books as theoretical study. So, this report was explaining detail about deep foundation and end-bearing pile: spun pile based on case study.

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CHAPTER 1.0

PREFACE

1.1 Introduction

Tasland Corporation Sdn Bhd is a private limited company. It was incorporated under 1965 company act on July 22th, 2014. The company is registered as a 'B' Class BUMIPUTERA contractor with PUSAT KHIDMAT KONTRAKTOR (PKK) and also with the CONSTRUCTION INDUSTRIAL DEVELOPMENT BOARD (CIDB Grade 6). Accordingly, the company is looking forward to registering with other relevant bodies/authorities with the aim of developing itself more effectively and actively. The company's vision is to prosper and develop into a successful, competitive and look forward for better business organization. The site project is located at Kampung Mengabang Telipot, Kuala Terengganu, Terengganu. This report is about the construction of a mosque of Kampung Mengabang Telipot. The cost for the project worth RM 5.8 million includes all works such as landscaping work, decoration and others. The project was started on 8th January 2015 and will be complete on 19th June 2016. During finish this report, the project progress is mostly 30 % of the mosque's structures. This report was focusing about deep foundation and end-bearing pile: spun pile.

1.2 Objective

The main objective of this report is to study more detail about deep foundation and end-bearing pile: spun pile. Other objectives of this report are:

- To study about installation process of end-bearing pile: spun pile.
- To study about materials, plant and machineries involved in process installation of end-bearing pile: spun pile.
- To study about method used to test the installation of end-bearing pile: spun pile.

1.3 Scope of Study

Scope of study of this report is detail about the deep foundation and end-bearing pile: spun pile. There are many book were referred as references to a clear explanation about deep foundation and end-bearing pile: spun pile.

Pile foundations are the part of a structure used to carry and transfer the load of the structure to the bearing ground located at some depth below ground surface. The main components of the foundation are the piles and pile caps (appendix_).

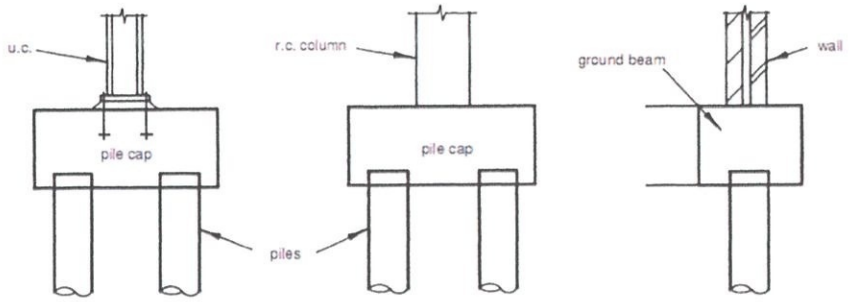


Figure1.1: Example Piles and Pile Caps

Source: google image http://www.abuildersengineer.com/

Piles are long and slender members which transfer the load to deeper soil or rock of high bearing capacity avoiding shallow soil of low bearing capacity. Then, pile caps are thick slabs used to tie a group of piles together to support and transmit column loads to the piles. Compaction piles are which piles are driven in granular soil with the aim of increasing the bearing capacity of the soil.

"Deep foundation can be used to improve marginal sites for stability, liquefaction, and settlement applications. They have been employed extensively in Japan for many years to improve land reclaimed from the sea. They are compared with other vibrio-compaction techniques such as stone columns". (Esrig, 1991)

Dr. B. C. Punmia (2005) said that, "the use of piles as a foundation can be traced since olden times. Today, pile foundation is much more common than any other types of deep foundation. Modern pile driving started with the first steam pile drivers, invented by Nasmyth in 1845.

Classification based on the function. Based on the function or the use, piles may be classified as":

1) End bearing pile
2) Friction pile
3) Compaction pile
4) Tension pile or uplift pile
5) Anchor pile
6) Fender pile and dolphins

"When piles extend through deep strata of limited bearing capacity and develop their carrying capacity by friction on the sides of the pie, they are called friction piles. The friction pile derives its support mainly from the surrounding soil through the development of friction between the soil and the pile. A very small percentage of the load is carried by the soil near the lower tip of the pile. Friction piles are used when hard strain or bedrock is at a very large depth. The length of a friction pile depends on the type of soil, amount of load and size of the pile. (D.L. Shah, 2003)

Schwartz (1993) explained what the friction factor of the soil is. The friction factor of a soil is the amount of resistance it has to the surface of a pile. The total load-carrying capacity of a friction pile is equal to the friction factor of the soil times the total surface area of the pile.

Lastly about explanation of deep foundation is by Michael Tomlinson (2014), "the conditions which govern the supporting capacity of the piled foundation are quite different. No matter whether the pile is installed by driving with a hammer, jetting, vibration, jacking, screwing or drilling, the soil in contact with the pile face, from which the pile derives its support by shaft friction and its resistance to lateral loads, is completely disturbed by the method of installation."

1.4 Method of Study

There are many method of study used to complete this report. For example are an interview, observation and book reference.

1.4.1 Interview

Do an interview session with site supervisor, Mr. Hasmadi Hassan about the topic of report. Then, take note the important data and information relate.

1.4.2 Observation

Go to the site project, Mengabang Telipot Mosque which as case study to do the observation.

1.4.3 References

Went to library and borrow some book as the references to do the report about the topic selected. Collect related data and information that helped to finish the report. Furthermore, search data and information related to topic from internet.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

Tasland Corporation Sdn Bhd is a private limited company. It was incorporated under 1965 company act on July 22th, 2014. The company is registered as a 'B' Class BUMIPUTERA contractor with PUSAT KHIDMAT KONTRAKTOR (PKK) and also with the CONSTRUCTION INDUSTRIAL DEVELOPMENT BOARD (CIDB Grade 6). Accordingly, the company is looking forward to registering with other relevant bodies/authorities with the aim of developing itself more effectively and actively. The company's vision is to prosper and develop into a successful, competitive and look forward for better business organization.

The company's personnel have wide experience and optimist and also supported with several experienced professionals. With supporting by banking facilities and several local building material suppliers and machineries rental companies, we will continue to evaluate and venture in prospective and feasible operation for a more diversified base.

A 123232

CIDB MALAYSIA

Sijil Perolehan Kerja Kerajaan

NO. SIJIL PENDAFTARAN
0120050625-TR105039

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 : 25/08/2005

NAMA DAN ALAMAT BERDAFTAR

TASLAND CORPORATION SDN. BHD.
LOT 2743, TINGKAT 1
WISMA SUMAI
JALAN HILIRAN
20300 KUALA TERENGGANU
TERENGGANU

TEMPOH SAH LAKU :

DARI : 20/07/2014
HINGGA: 19/07/2016

GRED	KATEGORI	
G6	B	(Pembinaan Bangunan)
G6	CE	(Pembinaan Kejuruteraan Awam)
G6	ME	(Mekanikal Dan Elektrikal)

PEGAWAI SYARIKAT YANG DITAUJUHKAN	NO. K/P	Jawatan
NUR RAHIFAH BINTI NGAH	790428-11-5466	PENGARAH
SAKINAH BINTI MUDA	670618-11-5022	PENGARAH URUSAN

(AHMAD FARRIN BIN MOKHTAR)
b.p. Ketua Eksekutif
Bertarikh: 20 JUL 2014

Photo2.1: Government Work Acquisition Certificate

126282 A

CIDB MALAYSIA

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 : **0120050625-TR105039**

Nama Kontraktor : **TASLAND CORPORATION SDN. BHD.**

Alamat Berdaftar : **LOT 2743, TINGKAT 1**
WISMA SUMAI
JALAN HILIRAN
20300 KUALA TERENGGANU
TERENGGANU

Gred, kategori dan pengkhususan berdaftar

G6 B B14 B24 B04 B12 B02 B13
G6 CE CE01 CE02 CE03 CE21 CE10 CE13 CE20 CE34 CE36
G6 ME M01 M15

Tarikh Mula Berkuatkuasa : **20 JUL 2014**
Tarikh Habis Tempoh Perakuan : **19 JUL 2016***

*Perakuan ini hendaklah diperbaharui selewat-lewatnya 90 hari sebelum tarikh habis tempoh

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

(AHMAD FARRIN BIN MOKHTAR)
b.p. Ketua Eksekutif
Bertarikh: **20 JUL 2014**

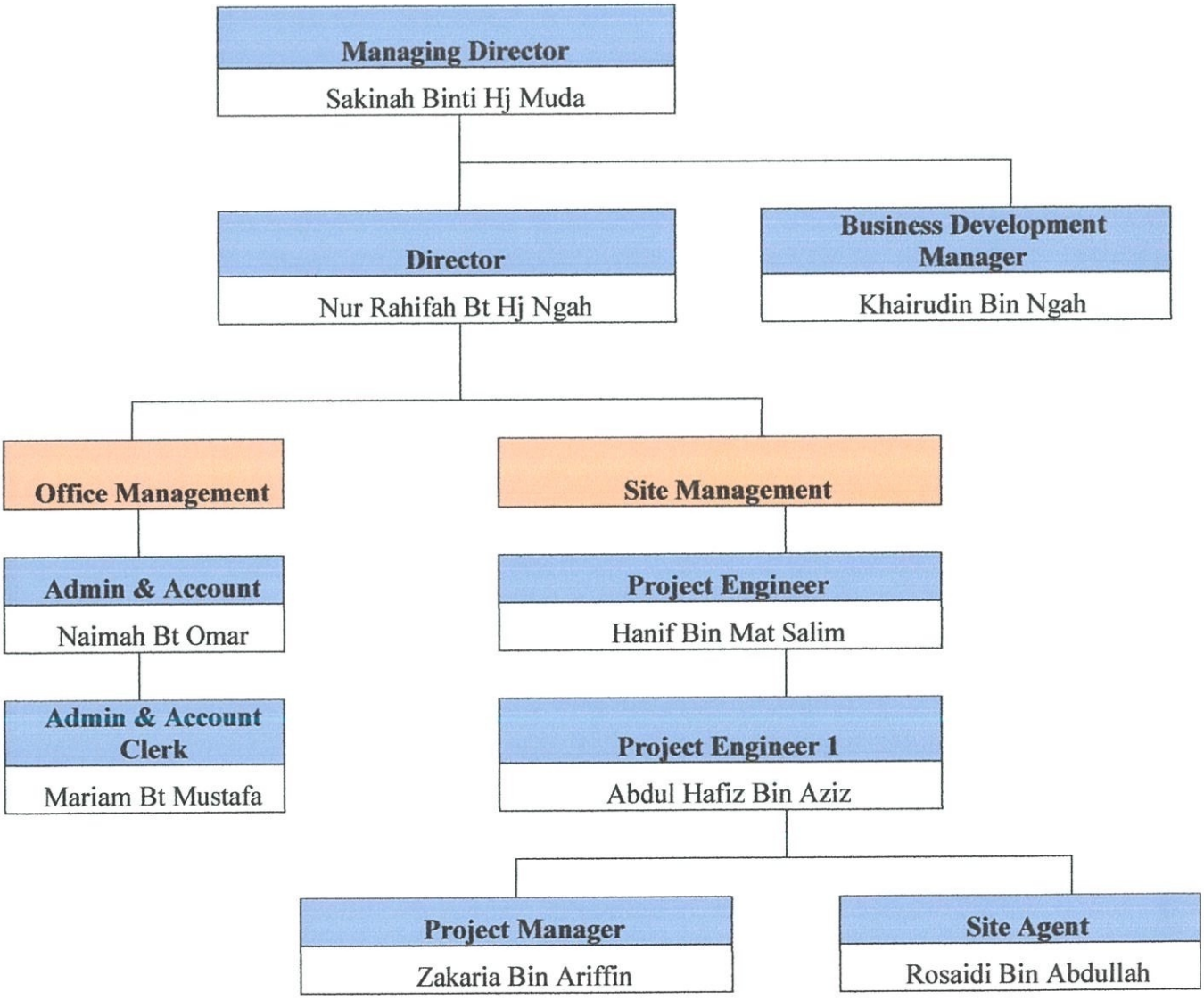
Photo 2.2: Registration Certificate

2.2 Company Profile

Company Name	: TASLAND CORPORATION SDN BHD
Company No	: 323892-K
Incorporated	: July 22, 2004
Address	: Lot 2743, Tingkat 1, Wisma SUMAI, Jalan Hiliran, 20300 Kuala Terengganu, Terengganu Darul Iman.
Telephone	:
Facsimile	:
Authorized Capital	: RM 500,000.00
Paid Up Capital	: RM 500,000.00
Board of Director	: Sakinah Binti Muda Nur Rahifah Binti Ngah
PKK Registered	: Pusat Khidmat Kontraktor (Class B)
CIDB Registered	: CIDB (Grade 6)
Company Secretary	: ZUKI & RASHID TAX ACCOUNTANTS 66/21, Tingkat Mezzanine, Taman Seri Intan, Jalan Sultan Omar, 20300 Kuala Terengganu, Terengganu Darul Iman.
Auditor	: Kuzaimi & Co., (AF 1492) 42B-B, Jalan 6/21D, Medan Idaman, Jalan Gombak, Selangor Darul Ehsan.
Bank	: Affin Islamic Bank Berhad 63 & 63A, Jalan Sultan Ismail, 20200 Kuala Terengganu, Terengganu Darul Iman.

2.3 Organization Chart

Chart 2.0: Tasland Corporation Sdn. Bhd. Company Organization Chart



Source: Tasland Corporation Sdn. Bhd

2.4 List of Project

2.4.1 Completed Projects

Table 2.1: Table of Completed Projects

No	Name Of Project	Client / Main Contractor	Contract Value	Duration	Name And Address Of S.O/Consult
1	***Sub Kontrak*** Untuk M & M Balai Bomba Dua (2) Petak, Tiga (3) Unit Kuarters Kelas 'F' -2 Tingkat, Enam Belas (16) Unit Kuaters G5' – 5 Tingkat, Menara Kawad Dan Lain-Lain Kerja Yang Berkaitan Dengannya Di Jertih, Besut, Terengganu. (NO. Kontrak: JKR/P/T/60/1999)	Syarikat Penempatan Muara Sdn Bhd	RM1,550,000.00	01.12.2004-01.07.2005	Jabatan Kerja Raya, Besut, Terengganu
2	***Sub Kontrak*** Untuk M & M Satu (1) Blok Tiga (3) Tingkat Bangunan Tambahan Dewan Perhimpunan Dan Lain-Lain Kerja Yang Berkaitan Di Sek. Men. Keb. Pengkalan Berangan, Marang, Terengganu. (NO. Kontrak: JKR/P/T/10/2001).	Syarikat Penempatan Muara Sdn Bhd	RM1,805,000,.00	01.05.2005-15.03.2006	Jabatan Kerja Raya, Besut, Terengganu
3	Membina Dan Menaiktaraf Jalan Pintas Gong Tok Nasek Ke Jalan Pasir Panjang, Kuala Terengganu	Tasland Corporation Sdn Bhd	RM6,900,223.14	14.01.2008-04.12.2009	Jabatan Kerja Raya, Kuala Terengganu
4		Tasland Corporation Sdn Bhd	RM9,014,764.07	07.01.2008-30.05.2011	Jabatan Kerja Raya, Kuala Terengganu

5	Membina Dan Menyiapkan Sebuah Masjid Dan Lain-Lain Kerja Berkaitan Di Kampung Chendering, Kuala Terengganu. Projek Bekalan Air Luar Bandar (BALB) Sistem Retikulasi 2011/2012 Bagi Negeri Terengganu ZON 3A	Tasland Corporation Sdn Bhd	RM10,579,480.20	22.07.2011-06.07.2012	Kementerian Kemajuan Luar Bandar Dan Wilayah

6	Projek Bekalan Air Luar Bandar (BALB) Sistem Retikulasi 2012/2013 Bagi Negeri Terengganu ZON 2C	Tasland Corporation Sdn Bhd	RM7,012,806.90	08.08.2012-07.02.2013	Kementerian Kemajuan Luar Bandar Dan Wilayah
7	Membekal, Memasang dan Menguji Paip Air 300mm Dia. Multi-layer UPVC dan 300mm Dia. Ductile Iron dan Lain-lain Kerja Yang Berkaitan Dengannya Dari Kampung Batu Hampar ke Kuala Telemong, Kuala Terengganu.	Tasland Corporation Sdn Bhd	RM5,900,000.00	26.12.2013-27.08.2014	Syarikat Air Terengganu
8	Cadangan Membina Dan Menyiapkan Bangunan Plaza Tol Di Persimpangan Bertingkat Chukai Di Lebuhraya Pantai Timur Fasa 2	Tasland Corporation Sdn Bhd	RM7,900,000.00	24.02.2013-24.05.2014	Jabatan Kerja Raya, Kuala Terenggau

2.4.2 Project in Progress

Table 2.2: Table of Project in Progress

No	Name Of Project	Client / Main Contractor	Contract Value	Duration	Name And Address Of S.O/Consult.
1	Cadangan Membina Dan Menyiapkan 18 Unit Kedai Pejabat 3 Tingkat Di Atas Lot PT 17624 – PT 17639, PT 17650 & PT 17651 Dan 10 Unit Kedai Pejabat 2 Tingkat Di Atas Lot PT 17640 – PT 17649, Di Taman Industri Paka, Mukim Kuala Paka, Dungun, Terengganu Darul Iman.	Tasland Corporation Sdn Bhd	RM11,330,000.00	10.02.2014-11.08.2015	Kemaman Technology And Industrial Park Sdn Bhd
2	Membina Dan Menyiapkan Sebuah Masjid Baru Dan Lain-lain Kerja Berkaitan Di Kampung Mengabang Telipot, Kuala Terengganu, Terengganu.	Tasland Corporation Sdn Bhd	RM5,800,000.00	08.01.2015-19.06.2016	Jabatan Kerja Raya, Kuala Terengganu

CHAPTER 3.0

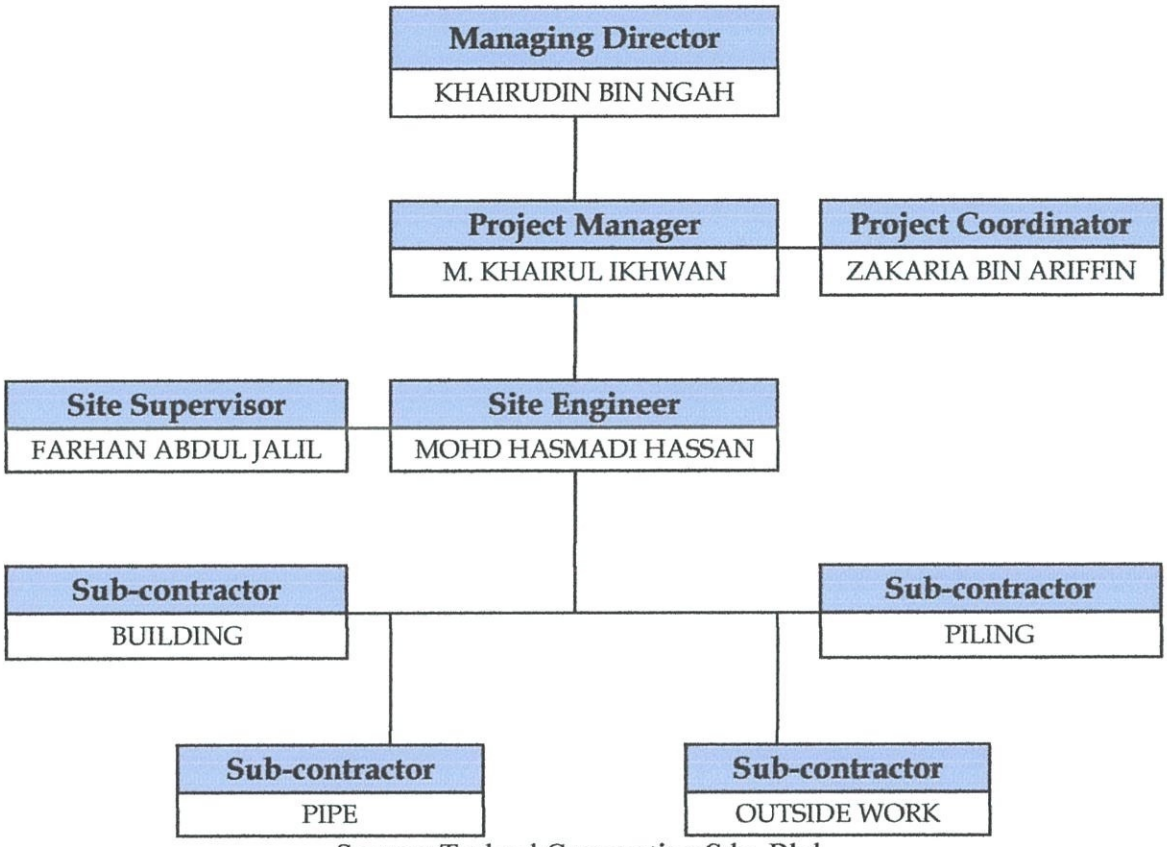
CASE STUDY

3.1 Introduction of Project

The site project is located at Kampung Mengabang Telipot, Kuala Terengganu, Terengganu. The site location of Mengabang Telipot mosque located nearby of the beach and on the same way goes to Kelantan. The cost for the project worth RM 5.8 million includes all works such as landscaping work, decoration and others. The project was started on 8th January 2015 and will be complete on 19th June 2016.

The construction of the mosque predicted to occupy around 1500 people at the peak time especially for Jumaat prayers. Mengabang Telipot mosque project own by Public Work Department (JKR). Public Work Department (JKR) Terengganu had been appointed Tasland Corporation Sdn. Bhd as a main contractor to construct and complete the project of Mengabang Telipot mosque includes all the related works of mosque at the Mengabang Telipot village, Kuala Terengganu, Terengganu Darul Iman.

Khairudin Bin Ngah as the managing director to company Tasland Corporation Sdn. Bhd. that responsible as the main contractor to construct and complete the project. Next, the project manager is Muhammad Khairul Ikhwan Bin Ngah and Zakaria Bin Ariffin as the project coordinator. Then, the persons who directly involved at site are Mohd Hasmadi Bin Hassan as the site engineer and Farhan Abdul Jalil as the site supervisor. Another parties involved at site are sub-contractor of building, sub-contractor of piling, sub-contractor of pipe and sub-contractor of outside work. The company that as sub-contractor of piling is Kelpile (Terengganu) Sdn. Bhd. Next is site organization chart.



Source: Tasland Corporation Sdn. Bhd.

Scope of work for Mengabang Telipot mosque in building works are one mosque building including place to take ablution for men and balcony, one toilet building and place to take ablution for women, one Inap Desa building and hall including toilets and one tower building. For outdoor works are site clearing and earthwork, internal water supply and water tank, sewage system, surface drainage system's work, local septic tanks system and reticulation pipe system. Before the construction began, main contractor was responsible to demolish the old mosque of Kampung Mengabang Telipot.

3.2 Installation Process of End-Bearing Pile: Spun Pile

a) Mark the pile points according to Pile Foundation Key Plan (appendix A).

Photo 3.1: One of Area for Piling Work

The persons who involved during this process are site engineer and site supervisor. They were marking the pile points based on Pile Foundation Key Plan (appendix A). They marked the points by using steel rod as marker points. Objective this process is to ensure that the points were marked correctly on their grid line according to the Pile Foundation Key Plan. This process is also important because it will be eased the piling work.

b) Use the correct size of spun pile.

Photo 3.2: Spun Pile Used For This Case Study

All specification of spun pile had designated by JKR and set in the document contract. Diameter size of one unit spun pile is 300mm while length of one unit spun pile is 1200mm. Almost of the points of piling had driven with two unit of spun pile.

c) Start drive the starter pile using the correct force.

Photo 3.3: Driven Hammer Machine Started the Piling Work

Site supervisor had direct involved during this process. The site supervisor must ensure that the piling work is on correct point. He also record the number of hammer

drop for each 0.3mm of spun pile embedded in land. He record the number of hammer drops on Pile Driving Record Sheet (appendix B).

d) Continue drive the extension pile

Photo 3.4: Driven Hammer Machine Continued the Piling Work

When the first unit of spun pile had fully driven in the land, the second unit of spun pile connect with the first spun pile by welded it. Then, the pile driven hammer machine continues drive the spun pile.

e) Conduct the load test.

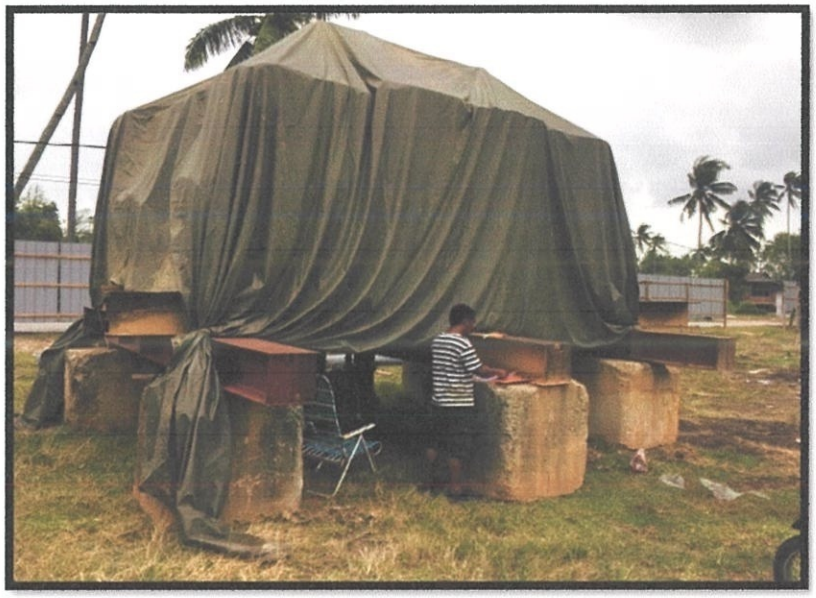


Photo 3.5: Type of Load Test Used

Choose one of the points to do load test after 28 days. The load test is conducted by sub-contractor piling. The site supervisor or site engineer was representatives to main contractor. Each 15 min of time interval, take the reading each numbers of dial gauge (mm), settlement (mm) and note the remarks. The load test conducted until 24 hours. After that, make a conclusion from the load test result.

3.2.2 Materials, Plant and Machineries

1) Spun pile

Photo 3.6: The Spun Pile Ready to Install in the Case Study

Spun pile is certainly in cylinder shape. Diameter size of the spun pile used in the case study is 300mm based on JKR specification and document contract. Length of the spun pile is 1200mm or 12m per unit. Total numbers of spun pile used in the case study is 438 points.

2) Pile driven hammer machine

Photo 3.7: Example of Pile Driven Hammer Machine Used In the Case Study

The weight of hammer used is 5 tons. The hammer was set at 26mm and it drop distance is 300mm. All the details must note on each Pile Driving Record Sheet.

3) Steel rod

Photo 3.8: Example of Steel Rod Use in the Case Study

For this case study, steel rod use as the marking for the piling point. The function is to ensure that the piling points are in correct position according to Pile Foundation Key Plan (appendix A). It also can ease the process installation of spun pile in the case study.

3.2.3 Static Pile Load Test

The Static Loading Test (SLT) involves the direct measurement of pile head displacement in the response to a physically applied test load. It is the most fundamental form of pile load test and is considered as the bench-mark of pile performance. Testing has been performed in the load range 10ton to 2000ton. The compression test using either the reaction frame or Kentledge system is undertaken on a test pile concurrent with the construction of the main piling works or for a preliminary pile outside the site. The test is used to validate the pile design.

3.2.3.1 Method Installation of Pile Load Test Using Kentledge System

The pile head shall be prepared usually with casing to be above the ground by a sufficient length or a minimum of 300mm.

A. Assemble the Kentledge system as shown in the diagram below with sufficient care when stacking and placing the I-beams the geometry of the arrangement should also aim to minimize interaction between the test pile, reaction system and reference beam supports.

B. A hydraulic jack (appendix C) and reacting against a set of steel beams tied to anchor piles is placed.

C. Fix 4 or 2 nos. Dial gauges (appendix C) on an independent 'frame' to measure the pile head displacement.

D. Movement of the pile head shall be measured using the dial gauge and checked with a leveling instrument and scale rules fixed to their holders. The scale rule shall have an accuracy of 1mm, visually interpretable to 0.5mm.

E. All testing equipment shall be protected from unnecessary disturbance prior to and throughout the load test.

F. The loading sequence shall follow the client's specification including the step and duration.

G. Records shall be kept promptly throughout the testing period. A copy shall be extended to the Superintending Officer at the end of the test.

Source: AL-LIQA'A BUREAU

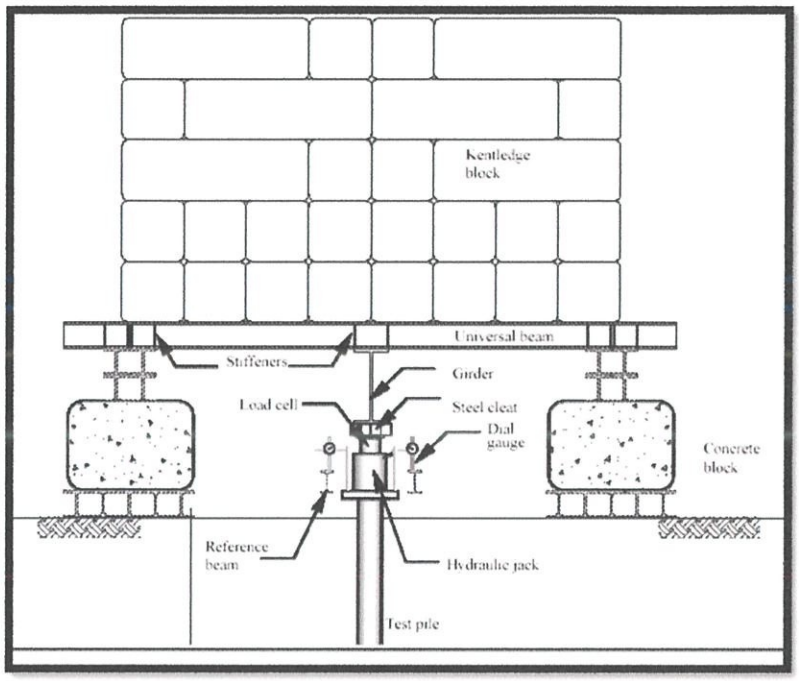


Figure 3.2: Diagram of Compression Load Test Setup using Kentledge System (appendix E)

Source: AL-LIQA'A BUREAU FOR PILING TETS

CHAPTER 4.0

CONCLUSION

4.1 CONCLUSION

There were many things that can be concluded after finish the report industry practical training. This report had achieved all the objectives. The trainee had learned and understands the installation process of end-bearing pile: spun pile. Then, the trainee can saw and know what materials, plants and machineries involved during the installation process. Other than that, the trainee had study the method used to test the installation of end-bearing pile: spun pile.

As a site supervisor trainee, all works that related with the site must be handling correctly. Every day the project manager will give order about the works that were will conduct on the day. For example, during concreting work, the project manager gave order to the site supervisor trainee to conduct the slump test for the concreting work. After that, the site supervisor trainee must report to project manager about all works handled on the day at the site.

At office, the student practical had involved in company management work and quantity surveying work. For company management work, the trainee had explained and introduced by the managing director. The managing director responsible managed the administration and financial company. He also conducted the preparation of progress project report. The trainee had responsible by the managing director to prepare and sort every progress project report of the company. The accountant and clerk also indirectly explained and introduced all works in office. For example, the accountant explained how to pay the workers' salaries.

For quantity surveying work, the trainee had explained and introduced by the quantity surveyor. The quantity surveyor responsible managed the project claimed and document tender. He responsible to fill up bill of quantities (BQ) and variation order (VO). The trainee had conducted by the quantity surveyor to enter a tender project. He conducted the trainee from first step to enter a tender until achieve a document contract.

4.2 SUGGESTION

As suggestion, after five month of industry practical training, the trainee had learned many value things that he cannot learn during lecture time. The trainee can apply all subjects and topics what he was learning during semester 1 until semester 4. The trainee also gained much new knowledge from industry practical training session. What knowledge that had learned by the lecturers during lecture time is not totally 100% same with what happen in site or office. Furthermore, each site project has different situation and also different management depending on the Project Network Diagram (CPM).

Lastly, as suggestion, the trainee must take part in all company's activities. From that, the trainee can have many benefits. For example, the trainee can interest the company to offer a job in the company after the trainee finish the study.

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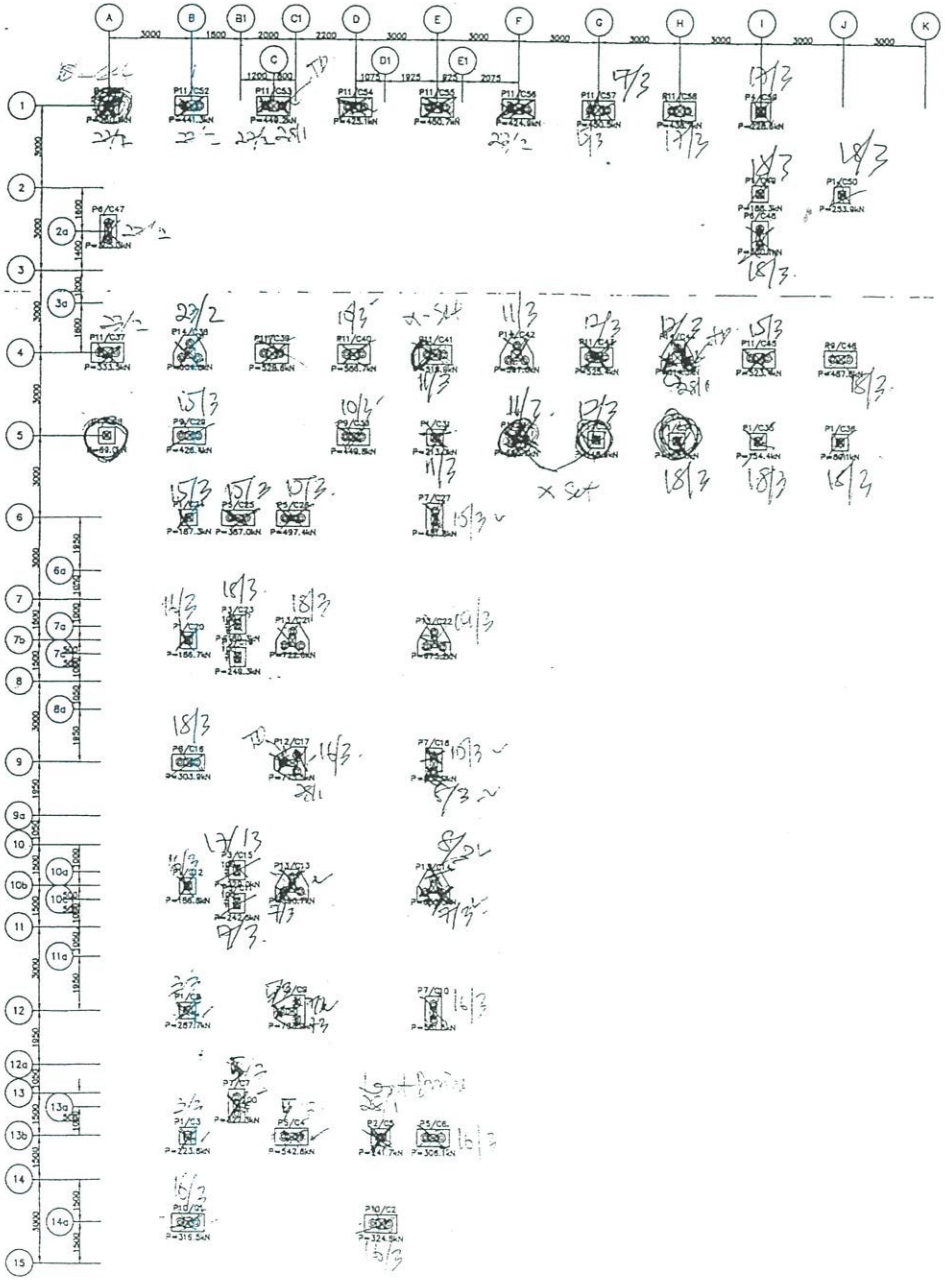
APPENDIX

Appendix A: Pile Foundation Key Plan



PILE FOUNDATION KEY PLAN

NOTA AM KONKRIT

1. SEMUA LUKISAN RC MESTILAH DIBACA BESERTA DENGAN LUKISAN ARKITEK YANG BERKAITAN DENGANNYA.
2. SEMUA UKURAN YANG DITUNJUKAN DALAM LUKISAN ADALAH DALAM MILIMETER (MM)
3. BANGUNAN KONKRIT YANG DICADANGKAN ADALAH DARI GRED 35 ATAU YANG SETARAF DENGANNYA.
4. KEKUATAN MINIMA KIUB KONKRIT BERUKURAN 150mm x 150mm ADALAH 35N/mm2 PADA 28 HARI.
5. SEMUA LAPIS KEDAP KONKRIT YANG DICADANGKAN ADALAH DARI GRED 15 ATAU YANG SETARAF DENGANNYA 75mm UNTUK ASAS CERUCUK, 50mm UNTUK ASAS PAD.
6. DALAM MAKSIMA PENAPAK ADALAH 1500mm DARI PERMUKAAN ARAS TANAH YANG DICADANGKAN.
7. MINIMA PENUTUP KONKRIT TETULANG ADALAH SEPERTI DINYATAKAN:
   a) 75mm bagi penapak dan tetapi cerucuk
   b) 35mm bagi tiang
   c) 35mm bagi rasuk tanah
   d) 25mm bagi lain-lain rasuk berkaitan
8. KEBANYAK TETULANG T ADALAH DARI JENIS TEGANGAN TINGGI (460N/mm2) MANAKALA TETULANG R ADALAH DARI JENIS TEGANGAN SEDERHANA (250N/mm2)
9. PANJANG TINDIHAN ADALAH SEPERTI DINYATAKAN:
   KELULI TEGANGAN TINGGI,
   TENSION & COMPRESSION = 44D
   KELULI TEGANGAN SEDERHANA,
   TENSION & COMPRESSION = 48D
10. KEUPAYAAN TANGGUNG GALAS MINIMA TANAH ADALAH 75KN/m2

PINDAAN

BIL.	TARIKH	PINDAAN	OLEH

PENGESAHAN:

Bahagian Bangunan
JKR Terengganu

Pengarah:

Dato' Haji Shafi Bin Mohamed D.P.M.T, A.M.P, P.J.K
B.S.C (Hons) Civil Engineering (Loughborough UK)

Ketua Pen Pengarah (Bangunan)

Ir. Ismail Bin Mohamad

Pen Pengarah (Bangunan)

Engr. Wan Mohd Nasrul Bin Wan Ismail

TAJUK PROJEK
CADANGAN MEMBINA DAN MENYIAPKAN SEBUAH MASJID BARU DI KG. MENGABANG TELIPOT, KUALA TERENGGANU, TERENGGANU.

PILE FOUNDATION KEY PLAN

-DEWAN INAP DAN DESA-

Lukisan:	1:100
Tarikh:	JUNE 2014
Diwakili oleh:	Ir.Ismail Bin Ali
Disedang oleh:	Hm
Diluluskan oleh:	Hm

LUKISAN TENDER

KELPILE (TERENGGANU) SDN BHD

(Company No : 561115-V)

PILE DRIVING RECORD SHEET

OBSITE : Masjid Menggabang Telipot

OCATION : 13B - D1

LE SIZE : 300mm Ø

LE LENGTH : 12m

LE PENETRATION : 29.1m (Ft. / Met.)

ROUND LEVEL :

UT-OFF LEVEL :

PERATOR :

TEMPORARY COMPRESSION :

SET : 26 mm

HAMMER WEIGHT : 5 Tons

HAMMER DROP : 300 ~~3006~~ mm

DATE : 28/12/2015

TIME START : 11.20 am

TIME FINISH : 12.15pm

RIG. NO. :

Penetration (Ft/M)	No. of Blow	Penetration (Ft/M)	No. of Blow	Penetration (Ft/M)	No. of Blow	Penetration (Ft/M)	No. of Blow	Penetration (Ft/M)	No. of Blow	Penetration (Ft/M)	No. of Blow	Penetration (Ft/M)	No. of Blow	Penetration (Ft/M)	No. of Blow
0.3	3	9.3		18.3	4	27.3	17	36.3		45.3		54.3		63.3	
0.6		9.6		18.6	5	27.6	16	36.6		45.6		54.6		63.6	
0.9		9.9		18.9	4	27.9	22	36.9		45.9		54.9		63.9	
1.2		10.2		19.2	6	28.2	18	37.2		46.2		55.2		64.2	
1.5	6	10.5	2	19.5	11	28.5	18	37.5		46.5		55.5		64.5	
1.8	6	10.8	1	19.8	17	28.8	23	37.8		46.8		55.8		64.8	
2.1	10	11.1	1	20.1	23	29.1	27	38.1		47.1		56.1		65.1	
2.4	10	11.4	1	20.4	25	29.4		38.4		47.4		56.4		65.4	
2.7	12	11.7	1	20.7	20	29.7		38.7		47.7		56.7		65.7	
3.0	13	12.0	1	21.0	21	30.0		39.0		48.0		57.0		66.0	
3.3	5	12.3	6	21.3	16	30.3		39.3		48.3		57.3		66.3	
3.6	5	12.6	5	21.6	13	30.6		39.6		48.6		57.6		66.6	
3.9	6	12.9	4	21.9	10	30.9		39.9		48.9		57.9		66.9	
4.2	4	13.2	5	22.2	7	31.2		40.2		49.2		58.2		67.2	
4.5	2	13.5	4	22.5	7	31.5		40.5		49.5		58.5		67.5	
4.8	1	13.8		22.8	8	31.8		40.8		49.8		58.8		67.8	
5.1		14.1		23.1	7	32.1		41.1		50.1		59.1		68.1	
5.4		14.4		23.4	7	32.4		41.4		50.4		59.4		68.4	
5.7		14.7		23.7	7	32.7		41.7		50.7		59.7		68.7	
6.0		15.0		24.0	7	33.0		42.0		51.0		60.0		69.0	
6.3		15.3		24.3	12	33.3		42.3		51.3		60.3		69.3	
6.6		15.6		24.6	18	33.6		42.6		51.6		60.6		69.6	
6.9		15.9	2	24.9	13	33.9		42.9		51.9		60.9		69.9	
7.2	1	16.2	2	25.2	11	34.2		43.2		52.2		61.2		70.2	
7.5	1	16.5	1	25.5	10	34.5		43.5		52.5		61.5		70.5	
7.8		16.8		25.8	8	34.8		43.8		52.8		61.8		70.8	
8.1		17.1		26.1	8	35.1		44.1		53.1		62.1		71.1	
8.4		17.4		26.4	12	35.4		44.4		53.4		62.4		71.4	
8.7		17.7	2	26.7	15	35.7		44.7		53.7		62.7		71.7	
9.0	1	18.0	3	27.0	16	36.0		45.0		54.0		63.0		72.0	

Remarks

Pile	Length (m)	Serial No	D. Casting
Initial	12	106T2	211214
1st Ext	12	113T2	040115
2nd Ext	12	114T2	090115
3rd Ext			
4th Ext			
5th Ext			

~~Engineer's Rep.~~
MOHD FAIZ BIN MEGAN
Penolong Jurutera
JKR Kuala Terengganu

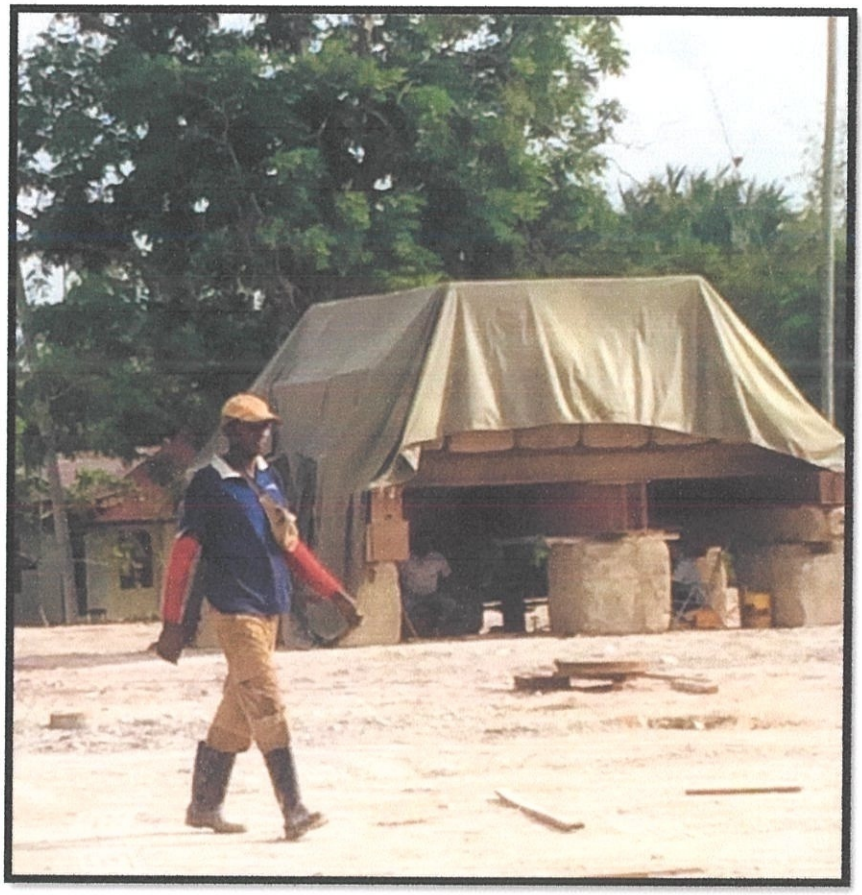
Constractor's Rep.

.....
Client's Rep.

Appendix C: Hydraulic Jack and Dial Gauge

Source: Kelpile (Terengganu) Sdn. Bhd.

Appendix D: Compression Load Test Setup using Kentledge System



Source: Kelpile (Terengganu) Sdn. Bhd.