DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

THE INSTALLATION OF DEEP FOUNDATION (PILE) USING JACK IN MACHINE

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DECEMBER 2018

It is recommended that the report of this practical training provided

By

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Entitled

THE INSTALLATION OF DEEP FOUNDATION (PILE) USING JACK IN MACHINE

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 ASJ Teguh Enterprise for duration of 14 weeks starting from 3rd September 2018 and ended on 7th December 2018. It is submitted as one of the prerequisite requirements of DBG307 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

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I express my deepest thanks to all of my UiTM lecturers that have taught and nurtured me in becoming a better student and a person to be. I would also like to extend my deepest appreciation to the lecturers who are directly involved during my training stint. To En. Anas Zafirol Bin Abdullah Halim my supervising lecturer, to Mr. Muhammad Naim Bin Mahyuddin my practical training coordinator and to Dr. Ida Nianti Mohd Zain as programmer coordinator, I value the time, effort, encouragement and ideas that they have contributed towards this report and the valuable knowledge that help to successful completion of my training and the valuable knowledge that have been shared to me over the last few semesters.

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Thank you so much.

ABSTRACT

Pilings are wooden, metal, or concrete posts which are pushed into the ground and on which buildings or bridges are built . Pilings are often used in very wet areas and at the weak soil areas so that deep foundation is suitable at that type of site. The purpose of the piling is to improve the strength of the soil so that the soil will receive the load from the building. The method starts with a pile driving apparatus driving jack in piling system had two hydraulic cylinder barrels moving along two vertical support structures. An uppermost horizontal member is employed to maintain a working space in between the two vertical support structures. The actuating rods are fixed to the uppermost horizontal member. The cylinder barrels are free in guided movement, exerting a force on a working pile with the assistance of two drive heads. In a first stroke of piling action, the upper drive head is employed to drive half of the working pile into the ground. In a second stroke, the lower drive head is employed to drive the rest of the pile into the ground. Piling worked or substructure worked is the most important things in the building because piling structure will decide the strength of the building.

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CHAPTER 1.0

INTRODUCTION

A pile is basically a strong material such as concrete that is pushed into the ground to act as a steady support for structures built on top of it. The function of pile foundation is, it can be constructed in cohesion less soil by undergoing techniques of displacement and vibration methods and the pile also helps in reducing the settlement. Jack-in pile has been adopted in Malaysia since early 1990s. Currently, 600mm diameter spun pile with working load up to 3000kN adopted for high rise developments up to 45-storeys (Jack In Pile Sdn.Bhd,2016). The advantage of Jack-in pile is faster construction rate than others and more efficient with no noise so does not disturb surrounding. Jack in piling can be apply even at a crowded area.

The difference between Jack in piling system and driven pile system is probability of pile damage during installation is low for jack in pile system but high for driven pile system. Other than that is termination criteria , for jack in pile system using static load imposed onto pile head but driven pile system using dynamic load imposed onto pile head.

The jack-in piling system is a relatively modern deep foundation piling system where dead weights are used to exert pressure to drive piles into the ground. The jack-in piling system is classified as a displacement pile system whereby soil is displaced during the driving process. When the piles are hydraulically jacked into the ground, the displacement causes the surrounding soils to compress against the jack-in piles resulting in an increased load-bearing capacity.

It is also considered to be more environmental friendly compared to a replacement system, as it eliminates excavation, resulting in lower volume of waste and higher cost savings in site clean-up.

The jack-in piling system is commonly used for medium loaded structures such as residential or commercial buildings. As the jack-in piling system does not produce as much noise or vibration as compared to other piling systems, it is suitable to use for projects in urban areas where residents are sensitive to noise and vibrations.

The aim of the report is to conduct the use of Jack in piling machine and to control situation in surrounding when piling had started. There are many type of piling machines but Jack in piling machines is most suitable to build the school because Jack in piling machines is a silent machines to build substructure in a busy area.

1.1 BACKGROUND AND SCOPE OF STUDY

Based on the case study this school is under construction and it is located at Felda Seri Sendayan , Mukim Sendayan , Daerah Seremban, Negeri Sembilan Darul Khusus . Purpose of this construction is to cover the number of students. For now, SMK Seri Sendayan had 2 learning session because the students at SMK Seri Sendayan too much and the building is not enough. After completing this project, it can help school to had just 1 learning session and simultaneously help teacher to make some event for the all students.

Observation was carried out before the construction started at the project site at SMK Seri Sendayan. All problem that will occurred during the piling process were completely investigated and identified their own solution for each method. The study show how the process of piling process using jack in piling machines and identify the plant and machineries of jack in piling machines at SMK Seri Sendayan , Seremban , Negeri Sembilan. Mobile crane, Excavator, Backhoe, and Truck are the example of machineries used in this project.

This project has taken the site on 28 November 2017 and finished on 11 November 2019 with a completion period of 2 years or 24 months. This project had been awarded to Mega Imperium Sdn Bhd and totally sub to ASJ TEGUH Enterprise. This project under supervision of Jabatan Kerja Raya (JKR) Seremban.

1.2 OBJECTIVE

1.2.1 Aim

To conduct the use of Jack in piling machine and to control situation in surrounding when piling process at Seri Sendayan , Seremban , Negeri Sembilan Darul Khusus.

1.2.2 Objectives

1) To determine the method of control of jack in piling machine.
2) To identify the plant and machineries of jack in piling machines.
3) To identify the problem and solution on the site.

1.3 METHOD OF STUDY

1.3.1 Primary Data

In order to produce this report, there are some methods were used to gather all the information to conclude and make this report. The methods are :

1) Case Study / Observation

Case study were made by observation method during practical training. The information was collected based on what happen at site . The information was collected by photo and note book that used to wrote any tip or process that how to control and used some tools. The photo got from the cell phone that used everyday to record any important information such as progressing of construction, machineries and equipment.

2) Interview

Interview with some people who are conduct and responsible in charging on the site construction. Mostly of those people are the supervisor, project manager, sub-contractor, operator, skilled worker, unskilled worker and others.

3) Document from company

ASJ Teguh helps to gave some data such as procedure of Jack in piling machines, CPM , Organization chart , result of piling process , result of Maintain load test and many more .

CHAPTER 2.0

2.1 INTRODUCTION OF COMPANY

COMPANY'S BACKGROUND

2.1 Logo

ASJ Teguh Enterprise is a This company have been registered on 8th August 2002 and received the AKUAN PENDAFTARAN KONTRAKTOR CERTIFICATES 'D 'class on 11th December 2002. The company start their operation on January 2005. ASJ Teguh Enterprise starts their operation by providing their services to some small projects like extension or house renovation.

ASJ Teguh Enterprise organizational management consists of skill workers and each of the employee has their own professional certificates. This is because ASJ Teguh Enterprise need to make sure that the workers take their job with responsible and finished their job with excellence. ASJ Teguh Enterprise also ensure that the safety and health always be priority and guaranteed quality of work.

PROGRESS OF COMPANY THROUGH THE YEAR :

Year 2015 :-

- The work of repairing the damage road at Jalan Dangi Station-Kepis-Bahau (N17), Negeri Sembilan Darul Khusus.
- The work of renewing road's surface and work related at Linggi-Pedas (N9), Port Dickson, Negeri Sembilan Darul Khusus.
- The work of maintenance of road and drainage in Jalan KG. Petaseh Hilir (N133) (Phase2), Jelebu, Negeri Sembilan Darul Khusus.
- Appointing suppliers for work of repairing the roof and replace the gutter at Hotel Seri Malaysia Seremban.
- The work of maintaining the roads and drainage system at jalan Pedas-Linggi (N9), (Phase2) and other related works at Rembau, Negeri Sembilan Darul Khusus.
- Work on repairing, maintaining and cleaning at PPR Bersepadu Senawang flat house, Seremban, Negeri Sembilan Darul Khusus.

Year 2016 :-

- Upgrading drains system and roads in Lubok China-Sawah Raja (N103) and other related work at District of Rembau, Negeri Sembilan Darul Khusus.
- Works of maintenance Jalan Batu Kikir-Padang Lebar-Pertang (N19) and other related works in Kuala Pilah.
- Maintenance of road and drains system at Jalan Panchang-Chengkau (N10) and other related works at Rembau, Negeri Sembilan Darul Khusus.
- Planning to build parking lots and other facilities at Nilai commuter station.
- Repairs and upgrading alternative roads from Kampung Baru Sirusa to Polytechnic Port Dickson, Negeri Sembilan Darul Khusus.
- Maintenance of roads and drainage in jalan Rembau-Pedas(N105) and other maintenance work at district of Rembau, Negeri Sembilan Darul Khusus.
- Maintenance of road and drains system at Jalan Kerangai-Air Baning (N23), Jelebu, Negeri Sembilan Darul Khusus.

Year 2017:-

- Upgrading works and the Petaling Gagu (N132) channel system of Jelebu Negeri Sembilan Darul Khusus.
- Proposed new building of Linggi, Linggi Mosque, Port Dickson Negeri Sembilan Darul Khusus.
- Maintaining roads and sewers on Astana Raja-Legong Jaya (N106) KM 3-8 and other related works in Rembau Negeri Sembilan Darul Khusus.
- Construction of mosque towers and related work at Masjid Jamek Tanah Datar district of Rembau, Negeri Sembilan Darul Khusus.
- Maintenance project from Ampang Tinggi-Kuala Pilah (N3) and other related works in district of Kuala Pilah, Negeri Sembilan Darul Khusus.
- Work on school fence maintenance and related work at Senawang high school.
- Proposal to build a single level surau above LOT 12895 at National High School Seremban Jaya 2.

Year 2018:-

- Project maintenance of state roads from Guntur-Padang Lebar (N124) and other related works in the district of Kuala Pilah, Negeri Sembilan.
- Road maintenance work in section 21 and drainage system in section 27 on Dangi-Bahau road (N17) of Jempol Negeri Sembilan Darul Khusus.
- Road maintenance work in section 21 and drainage system in section 27 on Dangi-Bahau road (N17) of Jempol district, Negeri Sembilan Darul Khusus.
- Road maintenance work and drainage and other related works on the road of Felda Jelai 2 - Pasir Besar (N53) of Tampin, Negeri Sembilan Darul Khusus.
- Work on road maintenance and drainage from KM9-11.8 at Rantau - Ulu Kanchong - Chembong Road (N102) and other related works in Rembau Negeri Sembilan Darul Khusus
- Proposed slope repair and related works at Taman Bukit Ampangan Seremban, Negeri Sembilan Darul Khusus.
- Road maintenance work and other related works on the road of Mambau-Kayu Ara-Gadong (N179) Seremban District, Negeri Sembilan Darul Khusus.
- Work on road maintenance and other related work in Linggi-Rantau-Mambau (N7) of Port Dickson of Negeri Sembilan Darul Khusus.
- Jalan Baru Kok Foh-Kg Sg Kelai-Felda Palong District of Jempol Negeri Sembilan
- Bridge repair work at Kg Rawa-Lenggeng Negeri Sembilan.
- Replacement works of mild steel 150mm pipes and related work at Chembong houses of the Negeri Sembilan Rembau District.
- Upgrading existing Library and Port Dickson Polytechnic's Green Energy Lab.
- The proposed interior renovation of a 2 storey and 1 mezzanine business building turns to office space on 24392 245947 grants Forest Forest Height Mukim Bandar Seremban Negeri Sembilan Darul Khusus for the exhibition of Seremban Municipal Council and Nilai Municipal Council.
- Construction of 8 classrooms fiber and other facilities at SMK SERI SENDAYAN Negeri Sembilan Darul Khusus.

2.2 COMPANY PROFILE

COMPANY PROFILE

Mr Mohd Nazri bin Abdul Hashim is a Project manager and the owner of ASJ Teguh Enterprise since 2002. He was born in Rembau, Negeri Sembilan. He studied his high school at SMK Rembau. Then he continued his study in advanced diploma in Civil Engineering at Institute Teknologi MARA (iTM). He was very active in sport activities such especially football. His first job after he graduated was as a staff at the consultant company for almost 1 years and then he was promoted to work at construction company as a site supervisor. He also became project manager with 2 others company before he registered his own company. Now already have his own company and handle a big projects with a professional workers.

Year Established

In the year 2002 started with doing extension house and now made a million project.

Company Vision

'MAINTAIN QUALITY TO IMPROVE ECONOMY OF MALAYSIA'

Company Mission

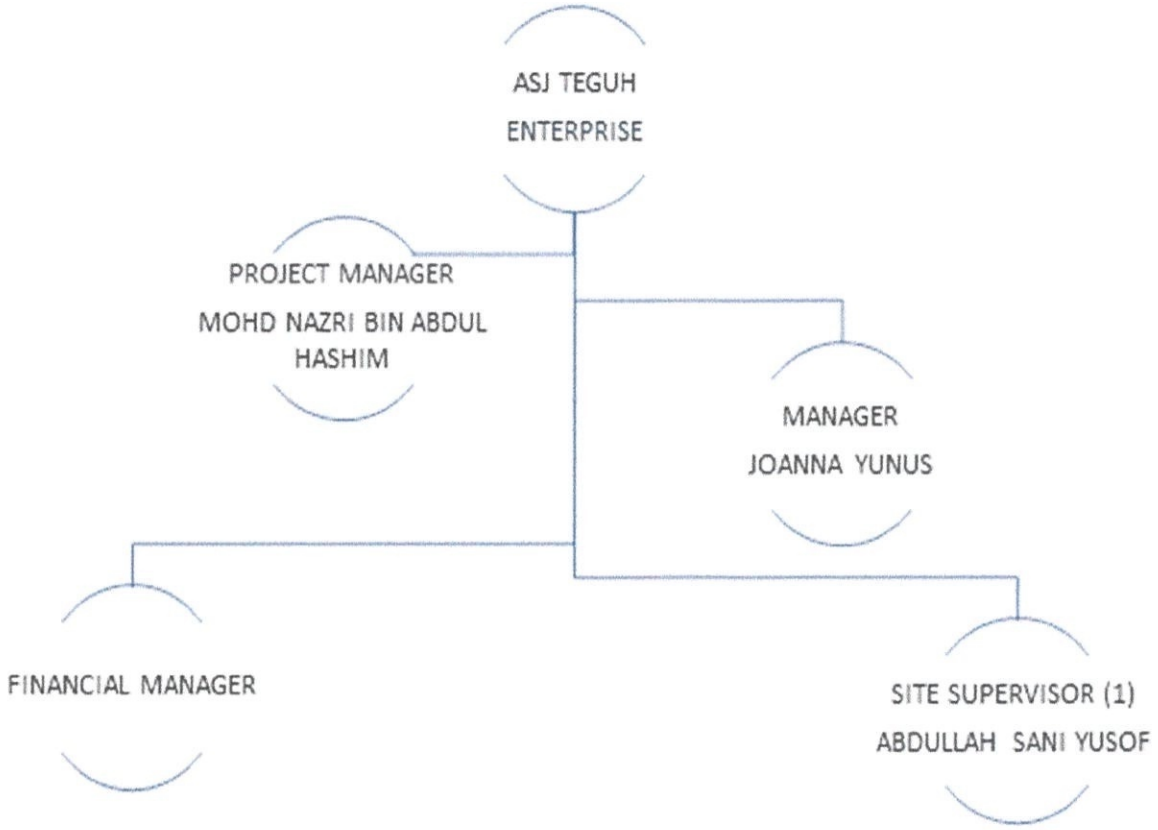
'RESPONSIBLE TO FULFILL THE MANDATE GIVEN FROM GOVERNMENT OR PRIVATE AND GUARANTEE THE GOOD RETURNS'

LOCATION OF THE COMPANY

Figure 2.2: Location of ASJ TEGUH Enterprise

ASJ TEGUH Enterprise, No 53-1 , Jalan Coco Drive 2 , Taman Bandar Senawang , 70450 , Senawang , Negeri Sembilan

2.3 ORGANIZATION CHARTS



2.4.1 LIST OF PROJECT

COMPLETE PROJECT

Table 2.4.1: List of Complete Project

DATE	REMARKS	COST OF PROJECT	LIST OF CONTRACTOR
March 2015		300k	
May 2015		3M	
July 2015		400k	
September 2015		300k	
December 2015		400k	
February 2016		1.8M	
August 2016		380k	
June 2016		2.9M	
October 2016		4.3M	
October 2016		3.6M	
November 2016		11.4M	
December 2016		1.4M	
February 2017		3.29M	
June 2017		250k	
July 2017		160k	
July 2017		1.9M	
August 2017		2.9M	
October 2017		2.8M	
October 2017		238k	
November 2017		180k	
December 2017		275k	
February 2018		1.7M	
January 2018		1.47M	

2.4.2 PROJECT IN PROGRESS

Table 2.4.2: List of Project in Progress

DATE	REMARKS	COST OF PROJECT	LIST OF CONTRACTOR
January 2018		3.09M	
February 2018		1.2M	
August 2017		2.89M	
November 2017		6.71M	
February 2018		21.42M	
March 2018		42.13M	
May 2018		816k	

CHAPTER 3.0

3.1 INTRODUCTION CASE STUDY

This project has taken the site on 28 November 2017 and finished on 11 November 2019 with a completion period of 2 years or 24 months.

The main work for this project is to build 4 Storey of Building with 8 Classes and other convenience such as Administrative Room at SMK Seri Sendayan , Seremban, Negeri Sembilan Darul Khusus that cost RM 6,719,403.60 .This building was designed by the consultant which is Jabatan Kerja Raya (JKR).This building consists of class , pump house , septic tank , Hose reel and firefighting equipment , male and female toilet for student and teacher and utility room.

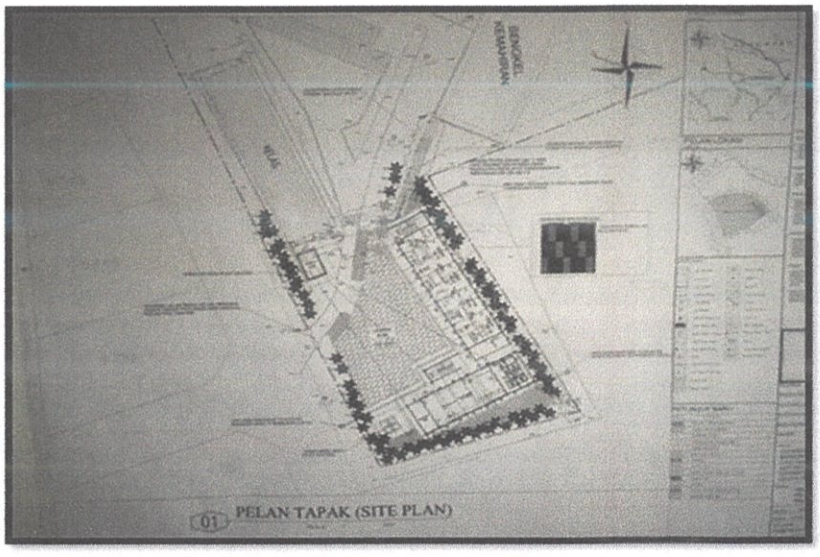
This project was proposed by Kementerian Pelajaran Malaysia (KPM) as a client and being done by consultant Jabatan Kerja Raya (JKR) as an architect, engineer, quantity surveyor and Mega Imperium Sdn Bhd as a contractor. After Mega Imperium Sdn Bhd had been awarded, they put fully sub to ASJ Teguh Enterprise to running this project until complete means ASJ Teguh responsible for this project. Assistant Engineer Mr Azreen from JKR been selected to conduct and supervise the progress of the project.

LOCATION OF THE PROJECT

The location for this project is at Felda Seri Sendayan , Mukim Sendayan , Daerah Seremban, Negeri Sembilan Darul Khusus. It's a new building construct beside of the existing school of SMK Seri Sendayan. This school is opposite with new Tentera Udara Diraja Malaysia (TUDM) base camp in Sendayan.

3.1.1:Location of SMK SERI SENDAYAN

SITE PLAN OF THE PROJECT



3.1.2:Site plan of the project at SMK SERI SENDAYAN

LIST OF CONSULTANTS

Figure 3.1.3 : Signboard of the Project

3.2 METHOD OF CONSTRUCTION

The data about the soil will be collected from the authorization and did some test such as Probe Mackintosh and collect that amount of soil to send to the laboratory to make a moisture test, so that the size of the pile will be specified. In this project, engineer will ask to use the 200mmx200mm size of pile.

Before process of pilling start, the authorization such as Tenaga Nasional Berhad (TNB) and Syarikat Air Negeri Sembilan (SAINS) will come to the site and analyses the underground utility cable, drain, and pipe on the site and re-positioned the utility.

Piling works shall only commence upon satisfaction of the platform and clearance requirements. In this project, Jack in piling machines need 3m radius open space from the piling point area so that 3m radius from the point cannot have any obstacle such as walkway and tree so the clerk already demolished all of the thing that made obstacle to the jack in piling machines.

The survey is done by the licensed surveyor (Figure 3.2.1) that had been awarded. The surveyor survey the control points, find the piling point, and determined the right of way (ROW).The location of these points shall be sited at a place unlikely to be disturbed and are clearly marked using timber pegs with nail head to pile position will be pegged using mild steel bar with red spray paint. Setting out had been done using timber and nail to make a grid line .The string, which were pulled from the point that already marked by the surveyor to the other point . String is used to confirmed the straightness of the grid line.

First of all , Jack- in pile machines and cranes will be operated and ensure that the machines is correctly maintained by trained and authorized operator. After checking a pile layout drawing and confirm point of the pile the process will started.

Next, insert pile into the Jack-In system clamp (Figure 3.2.3) by using the on-board crane and then clamped the pile and detach the crane cable (Figure 3.2.2). After that, final vertical check and positioning in the X and Y direction. Commence jacking pile by applying jacking force onto clamp device to press does the pile (Figure 3.2.5). If pile jointing is necessary then the pile will be joined by using welding (Figure 3.2.4). When the jacking pile reaches certain depth the refuses penetration at the desired corresponding pressure, the pile may have set.

At last, recording shall be done by machine operator and will be checked by site supervisor. The recording sheet shall be approved by the JKR.

Figure 3.2.1: Surveyor survey the site

Figure 3.2.2:Pull pile using crane on board

Figure 3.2.3:Insert the pile into the clamp

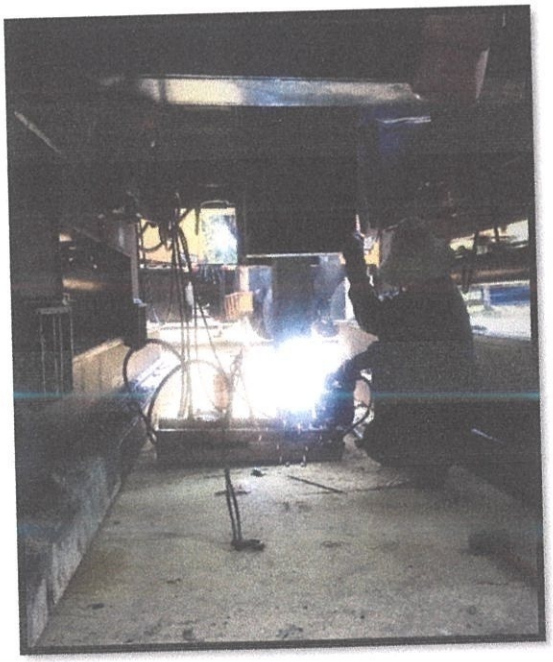


Figure 3.2.4:Welding

Figure 3.2.5:Press down the pile

3.2.1 METHOD STATEMENT

Table 3.2.1 Method Statement

NO	OPERATION	SEQUENTIAL DIAGRAM	MACHINERY & PLANT	LABOUR	EQUIPMENT	DURATION
1.	Installation process and position the jack in piling machine.	 Figure 3.2.1.1	- Crane - 2 truck	-1 operators - 1 unskilled labour		-1 days
2.	Pull and position the square pile on the case.		- Crane on board	-1 operators - 1 unskilled labour		-2 weeks

		Figure 3.2.1.2				
3.	Make sure it fit and straight with the point that marked by surveyor.	 Figure 3.2.1.3		-1 operators - 1 unskilled labour		-2 weeks
4.	Get pressed by the jack in piling machine.	 Figure 3.2.1.4		-1 operators - 1 unskilled labour		-2 weeks

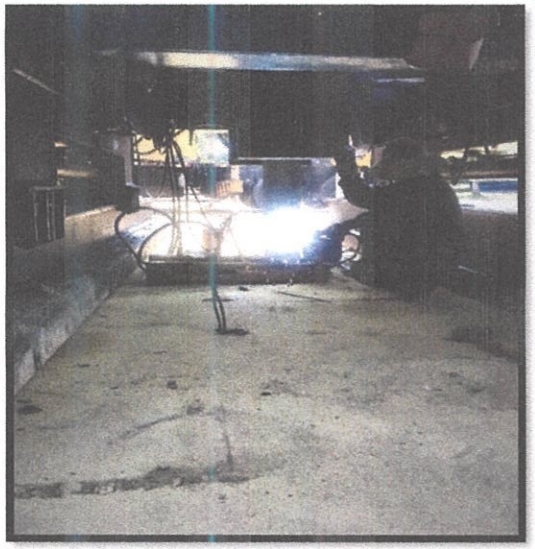
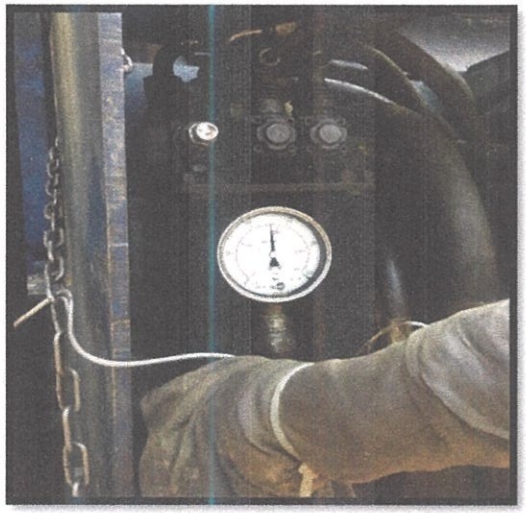
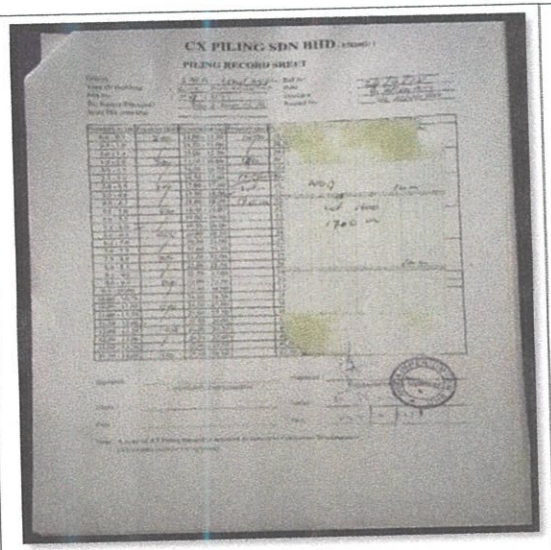
5.	Welding when need new extension pile for extend the length of square pile.	 Figure 3.2.1.5		-1 operators - 1 unskilled labour	- Welding set - Welding rod	-2 weeks
6.	Wait 5/6 seconds before stop when the pile is already set .			-1 operators - 1 unskilled labour	-Gauge meter	-2 weeks

		Figure 3.2.1.6				
6.	Using graph paper to confirm the straightness of the square pile.	 Figure 3.2.1.7		-1 operators - 1 unskilled labour	-Graph paper -String -Load	-2 weeks
7.	Cut off the pile using cutter that already install in jack in piling machines.	 Figure 3.2.1.8		-1 operators - 1 unskilled labour	-Cutter	-2 weeks

8.	Record the result of piling.	 Figure 3.2.1.9		-1 operators - 1 unskilled labour	-Record paper -Pen -Graph paper	-2 weeks
9.	Repeat with another point.	 Figure 3.2.1.10		-1 operators - 1 unskilled labour		-2 weeks

3.3 Plant and machineries

PILING WORK USING JACK IN PILING MACHINES.

TABLE 3.3: Plant and Machineries

Plant And Machineries	Name and Discription
 Figure 3.3.1	**JACK IN PILING MACHINES** -Jack in piling machines is the main machines use in this part. This machines is so modern and efficient to do piling works

Figure 3.3.2

TRUCK

-Truck had been used to delivery the Jack in piling machine and others. Examples steel bar , excavator and others

Figure 3.3.3

MOBILE CRANE

-Mobile crane had been used to install jack in piling machine.

-Mobile crane also is used to bring reinforcement bar or others to another side or free area.

Figure 3.3.4

BACKHOE

-Backhoe is use when cut and fill process.

-Backhoe is important when pile cap installation process.

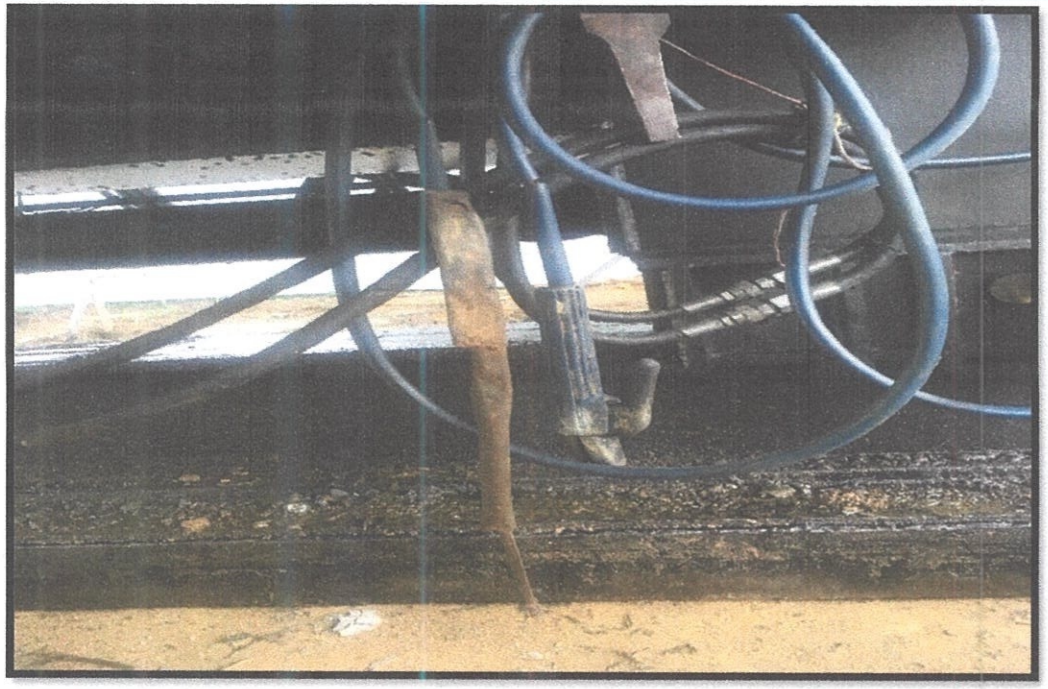


Figure 3.3.5

WELDING SET

-Welding set is use when to joint the extension pile and starter pile.

-If jointing pile is necessary then the pile will be joined in accordance to conventioned method by way welding

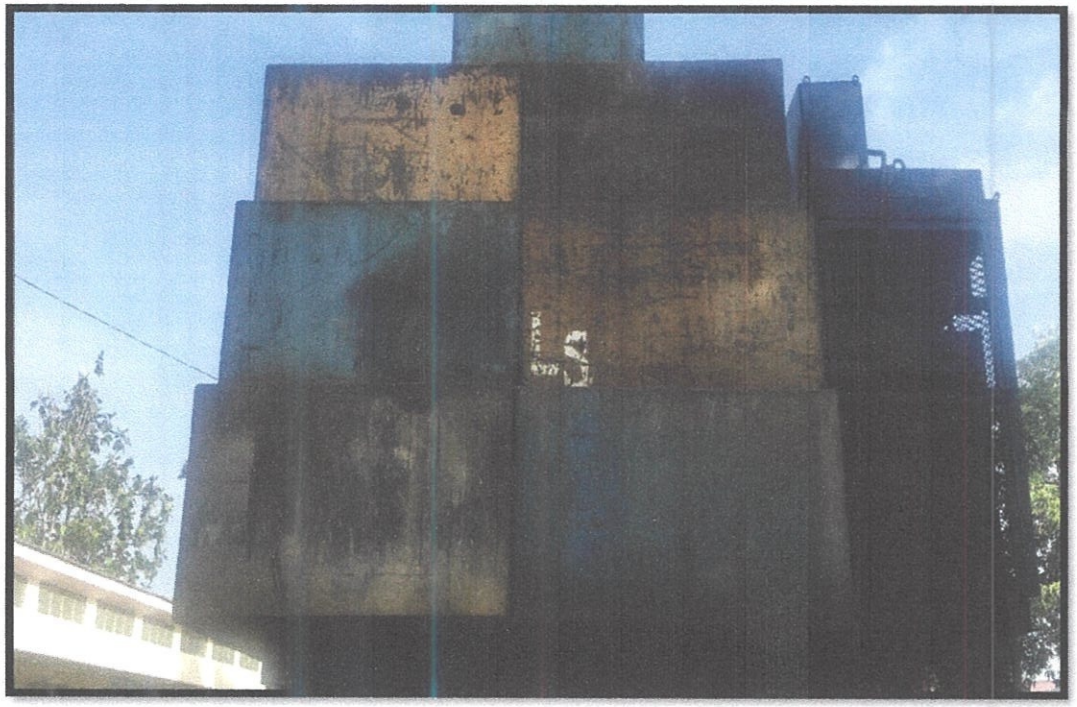


Figure 3.3.6

LOAD

-Load is use as a weight for the jack in piling machine

Figure 3.3.7

HYDRAULIC CUTTER

-Hydraulic cutter is use when wanted to cut excess pile

PROBLEM AND SOLUTION

3.4 Problem and Solution

Table 3.4.1: Problem and Solution (Precast concrete pile)

PRECAST CONCRETE PILE	
PROBLEM	SOLUTION
When using Jack in piling machines the risk of the pile damage will decrease but it will still happen because the strength of precast concrete pile might not strength.	Precast concrete pile had been arranged properly when the pile arrive to avoid the pile to crack and lose their strength.
The condition of the soil strata	Every pile point had different penetration of pile, sometimes pile does not achieve convincing penetration so that the consultant did some calculation and asked the operator to increase the pressure.

Table 3.4.2: Problem and Solution (Soil)

SOIL	
PROBLEM	SOLUTION
Construction will work with the soil and other features in the earth, there is an element of the unknown, and things don't always go as planned.	The consultant instructs the contractor to did some test and collect data to know the type of the soil, cohesiveness and the moisture of the soil to make sure the progress will run smoothly.

CHAPTER 4.0

CONCLUSION

4.1 Conclusion

In conclusion, there are many new things to learn not only about method of construction of deep foundation using jack in machine and maintain load test but also basic knowledge to build a construction. Piling or foundation is the most important things in the building because foundation will receive the load from the building and will transfer to the ground. If the foundation is weak the risk of the building may collapse is high.

The results of the piling using jack in system (refer results in appendix) will be filled by the operator need to be correct and need to get approval from the engineer. This is important because the result need to make documentation and evidence if anything happen.

In addition, this project is very meaningful because it can change the student's understanding and gave some experience about piling or substructure of building. After collect all of the data to make this report, the procedure of piling and construction can be understood clearly in the way to complete this report. Many different ways have been used to describe in detail about the piling using jack in machine. In completing this report, all the effort has been fully worked out from the searching the title of this report, searching the project, interview with company staff, skilled workers, contractor, clerk and site supervisor and obtain the document from many books, files and searching in the internet.

Last but not least, the topic of piling using jack in machines, the process and procedure, study the structure and architecture drawing can fully understand about construction. Through the duration of this project, there are a lot of important skills and knowledge that had been learned completing this report. It's very important because it will be used in the future career as a contractor or site supervisor.

REFERENRES

Environmental friendly and efficiently piling system (2016)

Available from:

http://jackinpile.com.my/images/download_pdf/JIP_Company%20Brochure-2016.pdf

Jack in piling system (2012)

Available from:

https://www.jstage.jst.go.jp/article/jgssp/2/41/2_MYS-01/_pdf/-char/en

Definition of piling (2014)

Available from:

https://www.collinsdictionary.com/dictionary/english/piling

APPENDIX

CX PILING SDN BHD (878200U)

(DAILY SUMMARY OF JACKED - PILE RECORD)

OJECT :

BLOCK NO :		FRAME :	
PILE TYPE :	RC SQ pile	DATE :	24 / 25 / 9 / 2015
PILE SIZE :	200 x 200	PAGE :	6

NO.	PILE NO.	PILE LENGTHS (METER)	JOINT (NO)	PENETRATION (METER)	SET	REMARKS
1	45	6 + 6 + 6 m	2	17-0 m	✓	
2	9	6 + 6 + 6 m	2	17-0 m	✓	
3	3	6 + 6 + 6 m	2	16.5 m	✓	
4	124	6 + 6 + 6 m	2	17-0 m	✓	
5	98	6 m	0	5-0 m	✓	
6	102	6 + 6 m	1	8-5 m	✓	
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
		TOTAL	7	81-0 m		

PILING RECORD SHEET

Project	: SMK Sinaruyung (?)		Ref No	:	
Type Of Building	: [illegible]		Date	: 24/9/18	
Pile No	: P9 (NT?)		Operator	: [illegible]	
RC Square Pile (mm)	: 200 x 200 mm		Record By	: [illegible]	
Spun Pile (mm Dia)	:				

Penetration (m)	Pressure (psi)	Penetration (m)	Pressure (psi)	Pe
0.0 - 0.5	300	14.00 - 14.50	1400	28.0
0.5 - 1.0		14.50 - 15.00	/	28.5(
1.0 - 1.5	/	15.00 - 15.50	/	29.0
1.5 - 2.0	300	15.50 - 16.00	1500	29.:
2.0 - 2.5		16.00 - 16.50	/	30.(
2.5 - 3.0	/	16.50 - 17.00	1600	30..
3.0 - 3.5	400	17.00 - 17.50	[illegible]	31.
3.5 - 4.0	/	17.50 - 18.00		31.
4.0 - 4.5	/	18.00 - 18.50	1700 m	32.
4.5 - 5.0	500	18.50 - 19.00		32.
5.0 - 5.5	/	19.00 - 19.50		33.
5.5 - 6.0	/	19.50 - 20.00		33
6.0 - 6.5	600	20.00 - 20.50		34
6.5 - 7.0	/	20.50 - 21.00		34
7.0 - 7.5	/	21.00 - 21.50		35
7.5 - 8.0	700	21.50 - 22.00		35
8.0 - 8.5	/	22.00 - 22.50		36
8.5 - 9.0	/	22.50 - 23.00		36
9.0 - 9.5	[illegible]	23.00 - 23.50		37
9.5 - 10.00	/	23.50 - 24.00		37
10.00 - 10.50	/	24.00 - 24.50		38
10.50 - 11.00	[illegible]	24.50 - 25.00		38
11.00 - 11.50	/	25.00 - 25.50		39
11.50 - 12.00	/	25.50 - 26.00		3
12.00 - 12.50	[illegible]	26.00 - 26.50		40
12.50 - 13.00	/	26.50 - 27.00		40
13.00 - 13.50	/	27.00 - 27.50		41.00
13.50 - 14.00	[illegible]	27.50 - 28.00		41.50

ile:

NVQ 1min

set 1600

1700 m

1min

Signature :

Consultant's Representative

Name :

Date :

Note : A copy of All Piling Record is required to submit to Consultant/Site Engineer (All related person) for signatory

PILING RECORD SHEET

[illegible]	:	[illegible]	Ref No :
[illegible]	:	[illegible]	Date : 24/9/18
[illegible]	:	31 [illegible]	Operator : [illegible]
[illegible]	:	[illegible]	Record By : [illegible]
[illegible]	:		

Penetration (m)	Pressure (psi)	Penetration (m)	Pressure (psi)	Penetration (m)
0.0 - 0.5	300	14.00 - 14.50	1400	28.00 - 28.50
0.5 - 1.0		14.50 - 15.00	/	28.50 - 29.00
1.0 - 1.5		15.00 - 15.50	/	29.00 - 29.50
1.5 - 2.0	300	15.50 - 16.00	[illegible]	29.50
2.0 - 2.5		16.00 - 16.50	1600	30.0
2.5 - 3.0	/	16.50 - 17.00	[illegible]	30.5
3.0 - 3.5	400	17.00 - 17.50		31.0
3.5 - 4.0	/	17.50 - 18.00		31.5
4.0 - 4.5	/	18.00 - 18.50		32.0
4.5 - 5.0	500	18.50 - 19.00		32.5
5.0 - 5.5	/	19.00 - 19.50		33.0
5.5 - 6.0	/	19.50 - 20.00		33.5
6.0 - 6.5	600	20.00 - 20.50		34.0
6.5 - 7.0	/	20.50 - 21.00		34.5
7.0 - 7.5	/	21.00 - 21.50		35.0
7.5 - 8.0	600	21.50 - 22.00		35.5
8.0 - 8.5	/	22.00 - 22.50		36.0
8.5 - 9.0	/	22.50 - 23.00		36.5
9.0 - 9.5	700	23.00 - 23.50		37.0
9.5 - 10.00	/	23.50 - 24.00		37.5
10.00 - 10.50	/	24.00 - 24.50		38.0
10.50 - 11.00	500	24.50 - 25.00		38.5
11.00 - 11.50	/	25.00 - 25.50		39.0
11.50 - 12.00	/	25.50 - 26.00		39.5
12.00 - 12.50	[illegible]	26.00 - 26.50		40.00 - 40.50
12.50 - 13.00	/	26.50 - 27.00		40.50 - 41.00
13.00 - 13.50		27.00 - 27.50		41.00 - 41.50
13.50 - 14.00	[illegible]	27.50 - 28.00		41.50 - 42.00

Remarks:

NC 31

1mm

Set 1600

18.5 m

1mm

Signature :

(Client's Representative)

Name :

Date :

Note : A copy of All Piling Record is required to submit to Consultant/Site Engineer (or related person) for signatory.

PILING RECORD SHEET

Project : SMK [illegible]
Type Of Building : [illegible]
Pile No : [illegible] 45 [illegible]
RC Square Pile (mm) : 200 x 200 [illegible]
Spun Pile (mm Dia) :

Ref No :
Date : 24/9/18
Operator : [illegible]
Record By : [illegible]

Penetration (m)	Pressure (psi)	Penetration (m)	Pressure (psi)	Penetration (m)	Pressure (psi)	Remarks:
0.0 - 0.5	300	14.00 - 14.50	1200	28.00 - 28.50		Total Length Of Pile:
0.5 - 1.0	/	14.50 - 15.00	/	28.50 - 29.00		
1.0 - 1.5	/	15.00 - 15.50	/	29.00 - 29.50		
1.5 - 2.0	300	15.50 - 16.00	1400			
2.0 - 2.5	/	16.00 - 16.50				
2.5 - 3.0	/	16.50 - 17.00	1600			
3.0 - 3.5	400	17.00 - 17.50				
3.5 - 4.0	/	17.50 - 18.00	[illegible]	NC 45		1mm
4.0 - 4.5	/	18.00 - 18.50	17.0m			
4.5 - 5.0	400	18.50 - 19.00				
5.0 - 5.5	/	19.00 - 19.50		3x4 1600		
5.5 - 6.0	/	19.50 - 20.00				
6.0 - 6.5	500	20.00 - 20.50		17.0 m		
6.5 - 7.0	/	20.50 - 21.00				
7.0 - 7.5	/	21.00 - 21.50				
7.5 - 8.0	600	21.50 - 22.00				1mm
8.0 - 8.5	/	22.00 - 22.50				
8.5 - 9.0	/	22.50 - 23.00				
9.0 - 9.5	700	23.00 - 23.50				
9.5 - 10.00	/	23.50 - 24.00				
10.00 - 10.50	/	24.00 - 24.50				
10.50 - 11.00	800	24.50 - 25.00				
11.00 - 11.50	/	25.00 - 25.50				
11.50 - 12.00	/	25.50 - 26.00				
12.00 - 12.50	[illegible]	26.00 - 26.50				
12.50 - 13.00	/	26.50 - 27.00		40.50 -		
13.00 - 13.50		27.00 - 27.50		41.00 -		
13.50 - 14.00	[illegible]	27.50 - 28.00		41.50 - [illegible]		

Signature : ______________________
Consultant Representative

Name : ______________________

Date : ______________________

Note : A copy of All Piling Record is required to submit to Consultant/Site Engineer
[illegible] all related person for signatory.

PILING RECORD SHEET

Project	: SMK Sendayan		Ref No	:
Type Of Building	: [illegible]		Date	: 25/9/15
Pile No	: F98 (A4)		Operator	: M[illegible]
Pile Size	: 300 x 300 mm		Record By	: [illegible]
Spun Pile Dia	:			

Penetration (m)	Pressure (psi)	Penetration (m)	Pressure (psi)	Remarks:
0.0 - 0.5	300	14.00 - 14.50		Of Pile:
0.5 - 1.0	/	14.50 - 15.00		
1.0 - 1.5	/	15.00 - 15.50		
1.5 - 2.0	600	15.50 - 16.00		
2.0 - 2.5	/	16.00 - 16.50		
2.5 - 3.0		16.50 - 17.00		NO98
3.0 - 3.5	600	17.00 - 17.50		mm le:
3.5 - 4.0	/	17.50 - 18.00		
4.0 - 4.5	1000	18.00 - 18.50		set 1800
4.5 - 5.0	1800	18.50 - 19.00		5.0 m
5.0 - 5.5	set	19.00 - 19.50		e:
5.5 - 6.0		19.50 - 20.00		mm
6.0 - 6.5	4.0 m	20.00 - 20.50		
6.5 - 7.0		20.50 - 21.00		
7.0 - 7.5		21.00 - 21.50		e:
7.5 - 8.0		21.50 - 22.00		
8.0 - 8.5		22.00 - 22.50		
8.5 - 9.0		22.50 - 23.00		
9.0 - 9.5		23.00 - 23.50		
9.5 - 10.00		23.50 - 24.00		
10.00 - 10.50		24.00 - 24.50		
10.50 - 11.00		24.50 - 25.00		
11.00 - 11.50		25.00 - 25.50		
11.50 - 12.00		25.50 - 26.00		
12.00 - 12.50		26.00 - 26.50		
12.50 - 13.00		26.50 - 27.00		
13.00 - 13.50		27.00 - 27.50		
13.50 - 14.00		27.50 - 28.00		

Signature: [illegible]

Consultant's Representative

Name:

Date:

Note: A copy of All Piling Record is required to submit to Consultant Site Engineer (or related person) for signatory.

PILING RECORD SHEET

Project : [illegible]
Type Of Building : [illegible]
Pile No : [illegible]
RC Square Pile (mm) : [illegible]
Spun Pile (mm Dia) :

Ref No :
Date : 25/9/[illegible]
Operator : [illegible]
Record By : [illegible]

Penetration (m)	Pressure (psi)	Penetration (m)	Pressure (psi)	P
0.0 - 0.5	300	14.00 - 14.50		2.
0.5 - 1.0	/	14.50 - 15.00		28..
1.0 - 1.5	/	15.00 - 15.50		
1.5 - 2.0	300	15.50 - 16.00		
2.0 - 2.5	/	16.00 - 16.50		
2.5 - 3.0	/	16.50 - 17.00		
3.0 - 3.5	600	17.00 - 17.50		
3.5 - 4.0	/	17.50 - 18.00		
4.0 - 4.5	/	18.00 - 18.50		
4.5 - 5.0	500	18.50 - 19.00		
5.0 - 5.5	/	19.00 - 19.50		
5.5 - 6.0	/	19.50 - 20.00		
6.0 - 6.5	700	20.00 - 20.50		
6.5 - 7.0	/	20.50 - 21.00		
7.0 - 7.5		21.00 - 21.50		
7.5 - 8.0	900	21.50 - 22.00		
8.0 - 8.5	1800	22.00 - 22.50		
8.5 - 9.0	[illegible]	22.50 - 23.00		
9.0 - 9.5	[illegible]	23.00 - 23.50		
9.5 - 10.00	[illegible]	23.50 - 24.00		
10.00 - 10.50		24.00 - 24.50		
10.50 - 11.00		24.50 - 25.00		
11.00 - 11.50		25.00 - 25.50		
11.50 - 12.00		25.50 - 26.00		
12.00 - 12.50		26.00 - 26.50		
12.50 - 13.00		26.50 - 27.00		
13.00 - 13.50		27.00 - 27.50		
13.50 - 14.00		27.50 - 28.00		

Remarks:
...gth Of Pile:
...Pile :
...Pile :
...Pile :

[illegible] 1800
8 m

Signature :
(Consultant / Representative)

Name :

Date :

Note : A copy of All Piling Record is required to submit to Consultant/Site Engineer
(All related person) for signatory.

PILING RECORD SHEET

Project	: [illegible]	Ref No	:
Name Of Building	: [illegible]	Date	: 24/9/07
Pile No	: P126 (1st)	Operator	: [illegible]
Type Of Pile (mm)	: [illegible]	Record By	: [illegible]
Type Of Pile (mm Dia)	:		

Penetration (m)	Pressure (psi)	Penetration (m)	Pressure (psi)	Penetration (m)	Pressure (psi)	Remarks:
0.0 - 0.5	300	14.00 - 14.50	440	[illegible]		Pile:
0.5 - 1.0	/	14.50 - 15.00	/			
1.0 - 1.5	/	15.00 - 15.50	/			
1.5 - 2.0	300	15.50 - 16.00	450	29.50		
2.0 - 2.5	/	16.00 - 16.50		[illegible]		
2.5 - 3.0	/	16.50 - 17.00	1000			
3.0 - 3.5	400	17.00 - 17.50	540			
3.5 - 4.0	/	17.50 - 18.00				
4.0 - 4.5	/	18.00 - 18.50	1700			
4.5 - 5.0	400	18.50 - 19.00				
5.0 - 5.5	/	19.00 - 19.50				
5.5 - 6.0	/	19.50 - 20.00				
6.0 - 6.5	500	20.00 - 20.50				
6.5 - 7.0	/	20.50 - 21.00				
7.0 - 7.5	/	21.00 - 21.50				
7.5 - 8.0	/	21.50 - 22.00				
8.0 - 8.5	600	22.00 - 22.50				
8.5 - 9.0	/	22.50 - 23.00				
9.0 - 9.5	/	23.00 - 23.50				
9.5 - 10.00	700	23.50 - 24.00				
10.00 - 10.50	/	24.00 - 24.50				
10.50 - 11.00	/	24.50 - 25.00				
11.00 - 11.50	800	25.00 - 25.50				
11.50 - 12.00	/	25.50 - 26.00				
12.00 - 12.50	/	26.00 - 26.50				
12.50 - 13.00	900	26.50 - 27.00				
13.00 - 13.50	/	27.00 - 27.50				
13.50 - 14.00	900	27.50 - 28.00				

HO 126

1st 1600

17.0 m

Signature :

(Consultant's Representative)

Name :

Date :

Note : A copy of All Piling Record is required to submit to Consultant/Site Engineer (All related person) for signatory.