



اَبُو سَيِّدِي تَيْكُو لُو كِي مَارَا
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DEPARTMENT OF BUILDING
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA
(PERAK)

APRIL 2013

It is recommended that this Practical Training Report prepared

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Title

Pile test method

Accepted in partial fulfillment of the requirements for obtaining a Diploma in Building

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APRIL 2013

STUDENTS CERTIFICATE

It is with this, the work of writing this Practical Training Report was produced entirely by me except specified through practical training that I went through a period of 5 months from 12 November 2012 to 12 April 2013 at Tunjong Development Corporation Sdn. Bhd.. It is also one of the requirements to pass the course DBN 307 and received in partial fulfillment of the requirement for obtaining a Diploma in Building.

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ACKNOWLEDGEMENT

Alhamdulillah, thankfulness to Allah s.w.t because with His Blessing practical training report will be completed properly. Next, be spoken the gratitude and thanks goes to all individuals and all those who took the time to give guidance, guidance, cooperation and beneficial comment for me to complete this report especially to En. Nazri Bin Deraman as general manager Tunjong Development Corporation (TDC) Sdn. Bhd., En. Wan Rasdan Bin Wan Ismail as development manager, En. Ahmad Farid as executive project management, En. Noor Azam as coordinator of Practical Training, Wan Akmal Zahri Bin Wan Zaharuddin as the student's supervisor, not forgetting to all lecturer of Department of Buildings also special for the following names of my parents, Mr. Asran as executive planning, Kamarulazam TDC staff and college friends and others whose names are not be written here hopefully Allah s.w.t can return to all the kindness and sacrifices.

Thank you.

ABSTRACT

This report briefly describes the methods and planning, equipment and materials involved in the process of piling test. It is produced based on the experience of a five-month practical training in Tunjong Development Corporation Sdn. Bhd. and few times to go to the site involved. This report is divided into sections and begins with the company background and the background of the construction project. As a result of observations found pile testing method for this project is quite complicated. In the work of pile testing involves several parties, such as engineers, site supervisors and skilled workers. This report is implemented using several methods of research such as observation, interviews, electronic media and reference materials. In this report, briefly explain the types and equipment used in the process. During the piling test work is done, there are several problems associated with the piling process have been identified and the report ended with some suggestions that felt able to solve problems that have been identified. The results of this report have been able to achieve the objectives of the report of the test pile. Finally, the report will explain in more detail for piling works in practice to the readers.

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LIST OF ABBREVIATIONS

PMBK	Perbadanan Menteri Besar Kelantan
UiTM	Universiti Teknologi Mara
BBT	Bandar Baru Tunjong
MDK	Majlis Daerah Ketereh
TDC	Tunjong Development Corporation
RC	Reinforcement concrete
PDA	Pile Diving Analyzers
SEDC	State Economic Developmet Corporation
PKINK	Perbadanan Kemajuan Iktisad Negeri Kelantan
AKSB	Air Kelantan Sdn. Bhd
WWF	World Wide Fund of Nature

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Economic and technological development has cause many benefits to the construction field. This expansion was followed by demand for commercial buildings and high infrastructure increasing. So, use the pile is suitable for high building.

Piling is an important up a structure for the load carried by the structure will be transferred by the pile into the soil layer are harder. Pile moving loads of dead and live loads to the ground evenly. Besides that, pile can also avoid piling structures from sliding down to the ground.

1.2 OBJECTIVE OF STUDY

The objective is to learn and keep abreast with the work piles tests done at site. Among the objectives of the study are:

- i) To explain the piles test methods.
- ii) To identify the types of construction machinery and equipment used for piles testing works.

1.3 SCOPE OF STUDY

The scope of work includes test piles for construction of a shopping center from initial work until the end of work. The scope of this study also explains the things that must be well and better understanding of the test pile. The scope of the research explains:

- i. To know the piles test methods.
- ii. To know the type of machinery and construction equipment used for piles testing methods.

1.4 METHOD OF STUDY

Overall these reports are prepared using several methods of study as follows:

i. Interview

This method is implemented by interview or interviewed a number of individuals and parties involved as project engineer, project supervisors, project managers and workers on site

ii. Observations

This method is implemented by making observations of the construction work on construction sites and in turn be able to know about progress work for a construction project.

iii. Electronic media

This method is implemented in a way to get relevant information from reliable sources, namely from the website.

iv. Reference

This method by collecting information from books, articles, magazines and other resources on the construction industry. References in this way over the theoretical and what is contained in it depends on the facts.

CHAPTER 2

2.1 COMPANY BACKGROUND

Project Coordinator:



**Tunjong Development
Corporation Sdn Bhd
(762766-M)**

(Subsidiary of PMBK)

Figure 2.1: Company logo

Sources: <http://www.tunjongpavilion.com>

Tunjong Development Corporation is a 100% owned subsidiary of the Perbadanan Menteri Besar Kelantan (PMBK) incorporated to be the main developer of the development of Bandar Baru Tunjong (BBT) Kota Bharu, Kelantan, which covers a land area of 2,000 acres. BBT will serve as a satellite city of Kota Bharu Islamic style as a lifestyle in all aspects. It also aims to implement programs to accelerate the development and realization of the process of urbanization make Bandar Kota Bharu to get city status and Majlis Daerah Ketereh (MDK) into municipalities in 2020.

2.1.1 INCORPORATION

Tunjong Development Corporation Sdn Bhd (TDC) was established on February 14, 2007. It is registered in the category of a private limited company under the Companies Commission of Malaysia. The registered address of the office TDC at Lot PT 403 Bandar Baru Tunjong, Jalan Kuala Krai, 16010 Kota Bharu, Kelantan.

Line with the aspiration Perbadanan Menteri Besar Kelantan (PMBK) to make the TDC as the main wing for his real estate development, TDC is actively expanding its business to provide strategic planning to develop other land that is strategically located within and outside the state of Kelantan. Such as Pembangunan Bandar Baru Hj Cheng Ho at Gual Tambun Rantau Panjang on an area of 400 acres, mixed housing in Jeli, Sri Kelantan luxury condominium development in Jalan Stonor Kuala Lumpur and redevelopment Sultan Mohamed IV Stadium site.

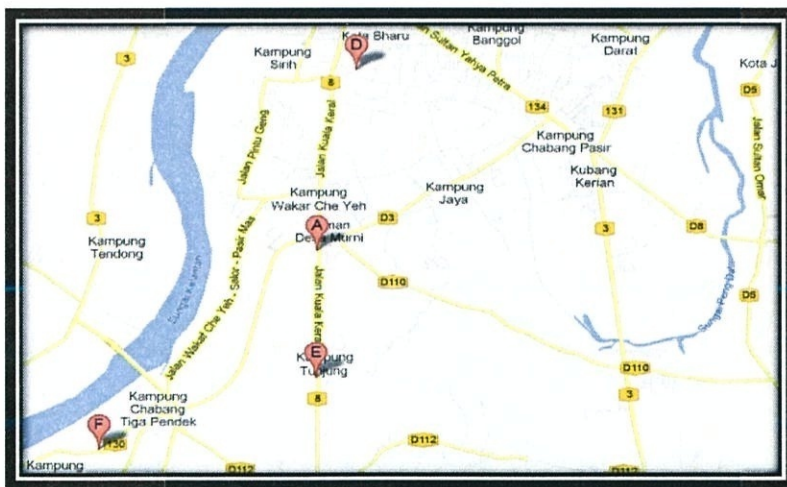


Figure 2.2: Tunjong Development Corporation Sdn Bhd location plan

Sources: google map

YB Dato 'Paduka Husam Bin Musa, aged 52, is the chairman and director of the TDC. He was formerly the Setiausaha Akhbar Menteri Besar Kelantan (1990-1993) and later as the Setiausaha Akhbar Menteri Besar Kelantan (1993-1999). He currently serves as a Member of Parliament for Kubang Kerian, as well as Chairman of the Public Administration, Economic Planning, Finance and Community Development of Kelantan state, apart from ADUN Kijang.

Datuk Rameli bin Musa, aged 63, is a director of TDC. The Chief Vice Chairman and Independent Non-Executive Director (Independent Non-Executive Director) of the Company Ingress Corporation Bhd since October 23, 2000. She holds a Masters Degree in Telecommunications Engineering and a Masters in Micro Communications which are both from the University of Sheffield, United Kingdom. He began his career as a lecturer in the field of Electronics and Telecommunications at the University of Microwave Technology Malaysia in 1972. He ended his career at the University of Technology Malaysia in 1975, subsequently worked with Pemas NEC Telecommunications Sdn Bhd, from 1976 until 1980 and after that he joined Sapura Holdings Sdn Bhd and held the position of Executive Vice Chairman. In 1997, he joined the Tap Resources Berhad as Executive Chairman before his resignation in 1998. He is currently also a director of several other private companies.

IR. Haji Fauzi Bin Abdullah, born on 16 September 1955 (aged 56 years), is a director of TDC. He started his career in 1979 as Project Officer at Development Bank of Malaysia, Kuala Lumpur next as a Civil Engineer Company MARA Engineering Division. In 1983, he held the position of Project Manager in a subsidiary of the Kelantan State Economic Development Corporation (SEDC), which Binaraya PKINK Sdn Bhd in 1989 as Development Manager at Kelkon Sdn Bhd is a subsidiary of SEDC and at that time served as Director Binaraya PKINK Inc.. In subsequent years he has held the position of director of other subsidiaries including Keloil PKINK Inc. and Mega Megah Sdn Bhd. He also served as Managing Director of a subsidiary Perbadanan Menteri Besar Kelantan (PMBK) of Air Kelantan Sdn Bhd (AKSB) in 1999-2008. To date he has held office as a

Director of several subsidiaries PMBK including Tunjong Development Corporation Sdn. Ltd., AKSB, Majaari Services Sdn Bhd, Sihhat - expanding Program Sdn Bhd and Intaaj Pipes Industries Limited.

YB. Dato' Haji Takiyuddin Bin Hassan, born on 24 November 1961 in the Kampung Kemelong, Sik, Kedah, is a director of TDC. Once a degree in law he started work as a magistrate in Pasir Mas, Kelantan. In 1990, Dato' Haji Takiyudin opened his own law firm in Kota Bharu. Currently he is the Chairman of the Local Government, Tourism and Culture Kelantan.

YB. Mejar (B) Md Anizam Bin Abd Rahman, born on May 5, 1954. She is a Kampung Cina, Salor, Kelantan, a director of TDC. At the age of 21, he was the Army Officer (Major) subsequently as Director Radicare, Hospital Daerah Tanah Merah. Currently he is a Member of the Council of State Government (Chairman of Housing, Public Works, Utilities and Environment) and holds directorships in several subsidiaries of the Perbadanan Menteri Besar Kelantan (PMBK) between Air Kelantan Sdn Bhd, Majaari Services Sdn Bhd, Kelantan Mubarakan Utilities Holding Co., Ltd., Tunjong Development Corporation Sdn Bhd and Intaaj Pipes Sdn Bhd as Chairman.

IR Haji Mustafa Bin Salleh, aged 45, is the executive director of the TDC. He had previously been the position of Project Engineer, Project Manager and Construction in Kelkon Sdn Bhd (a subsidiary of the Kelantan State Economic Development Corporation (SEDC)). Subsequently, he was appointed as Deputy Chief Executive PKINK from April 1999 to January 2010 and is currently the Chief Executive of the Perbadanan Menteri Besar Kelantan (PMBK) and also as Executive Director of each subsidiary PMBK others.

Dato' Seri Tengku DR. Zainal Adlin Tengku Bin Tengku Mahamood, aged 71, is the director of the TDC. He was appointed as Non-Executive Deputy Chairman (Non-Executive Deputy Chairman) in NPC Resource Limited on 31 January 2002. He later converted to Non-Executive Deputy Chairman on 12 July 2004. He obtained a Certificate of Advanced Course of Local Government Administration from the University of Birmingham, United Kingdom and the Institute of Local Government Studies, Sigtuna, Sweden in 1967. In 1981, he obtained the Top Management Programme Certificate from the Asian Institute of Management, and in 1995 he was awarded a PhD (Hon.) from the National University of Malaysia. He served in the Kelantan Civil Service and the Malaysian Home and Diplomatic Service. He has also served as Assistant District Officer, Acting District Officer and Assistant Secretary of State from 1961-1967 next year he was transferred from the Home and Diplomatic Service to the State Government for five (5) years (1968-1973) as CEO State Housing Executive. From 1974 before he retired from government service in 1996, he served in the Sabah Foundation in various positions including Group Manager Project Development, Deputy Director, Deputy Group Managing Director and Corporate Counsel. He is also the Chairman of Sabah Tourism Board, the State Government since May 2000 to the present. He is President Emeritus and former Chairman of the World Wide Fund for Nature (WWF) Malaysia.

YB Azami Bin Mohd Nor, aged 55, is the director of the TDC. The Deputy Chairman of the Economic Planning, Finance & Welfare of Kelantan state. He is also a Member of the Legislative Assembly (DUN Kadok, Kota Bharu, Kelantan). Experienced in the field of valuation under which his company Azami & Co.

2.2 COMPANY PROFILE

Table 2.1: Information of Tunjong Development Corporation Sdn. Bhd.

Board of Directors	<ol style="list-style-type: none"> 1. YB Dato' Paduka Husam Bin Musa (Chairman) 2. Datuk Rameli Bin Musa 3. IR. Haji Fauzi Bin Abdullah 4. YB Dato' Haji Takiyuddin Bin Hassan 5. YB Mejar (B) MD Anizam Bin Abd Rahman 6. IR. Haji Mustafa Bin Salleh (Executive director) 7. Dato' Seri Tengku Dr. Zainal Adlin Bin Tengku Mahamood 8. YB Azami Bin Mohd Nor
General Manager	En. Nazri Bin Deraman
Development Manager	En. Wan Rasdan Bin Wan Ismail
Company Secretary	Wan Roselawati Binti Wan Hassan (LS0008436) HJH. Azizah Binti Daud, SCIS (MAICSA 0743778)
Company address	Lot 403, Bandar Baru Tunjong, Jalan Kuala Krai, 16010 Kota Bharu, Kelantan.
Registration No.	762776-M
Date of incorporation	14 February 2007
Paid-up Capital	RM 1,000,000.00

2.2.1 Company Vision

To be a major leader in real estate development in Kelantan

2.2.2 Company mission

- Provides real estate services and products of high quality and innovative line with the current trend for beyond the requirements of our customers.
- Attract a regular basis, keeping and developing human capital as the main asset of the organization.
- Achieve targets as a market leader and excel in the operations of each of the underlying business segments.

2.3 COMPANY ORGANIZATION

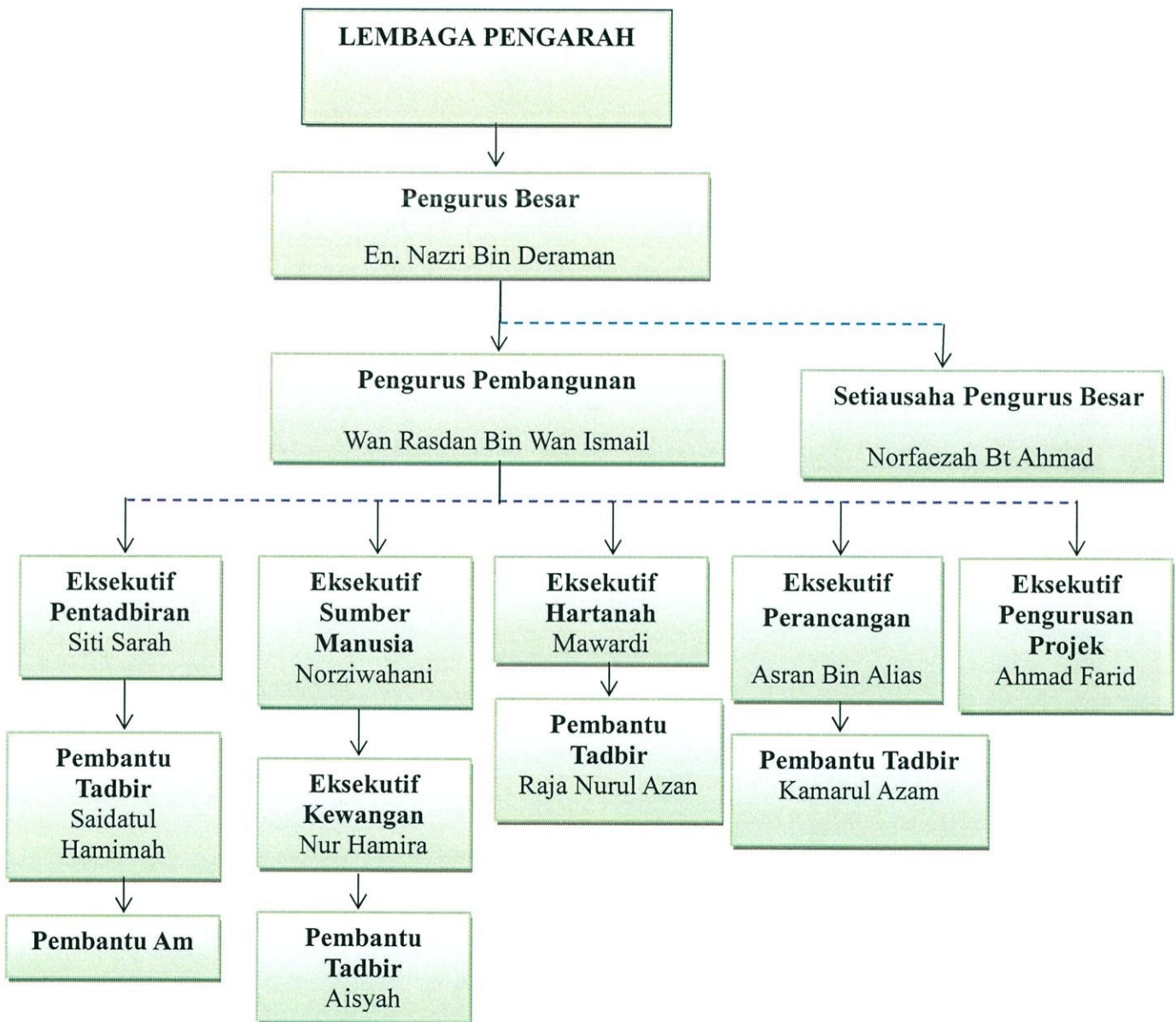



Figure 2.3: Tunjong Development Corporation Sdn Bhd organization chart

2.4 LIST OF PROJECTS

2.4.1 COMPLETED PROJECT


Table 2.2: Projects that have been completed



PROJECT	INFORMATION
<p data-bbox="268 689 724 723">BANGUNAN KEDAI 3 TINGKAT</p> 	<p data-bbox="815 689 1310 869">CADANGAN PEMBANGUNAN PUSAT PERNIAGAN FASA I SELUAS 13.8 EKAR DI BANDAR BARU TUNJONG, JALAN KUALA KRAI, KOTA BHARU, KELANTAN.</p> <p data-bbox="815 904 1267 938">PROJECT VALUE: UNKNOWN</p> <p data-bbox="815 974 1147 1008">STATUS: COMPLETED</p> <p data-bbox="815 1043 1190 1077">PROJECT COMPONENT:</p> <p data-bbox="815 1113 1123 1146">3 STOREY BUILDING</p> <p data-bbox="815 1182 1023 1216">DEVELOPER:</p> <p data-bbox="815 1252 1270 1285">NOBLE RESIDENCE SDN. BHD.</p>

Sources: Tunjong Development Corporation Sdn. Bhd.

2.4.2 PROJECT IN PROGRESS

Table 2.3: Project in progress

PROJECT	INFORMATION
<p data-bbox="347 598 647 629">TUNJONG PAVILION</p> 	<p data-bbox="826 598 1310 734">CADANGAN PEMBINAAN PUSAT BELI-BELAH DI BANDAR BARU TUNJONG, JALAN KUALA KRAI, KOTA BHARU, KELANTAN.</p> <p data-bbox="826 775 1198 842">PROJECT VALUE: RM 91 MILLION</p> <p data-bbox="826 882 1166 916">STATUS: IN PROGRESS</p> <p data-bbox="826 956 1198 990">PROJECT COMPONENT:</p> <p data-bbox="826 1030 1078 1064">SHOPPING MALL</p> <p data-bbox="826 1104 1289 1137">CORPORATE BUILDING BLOCK</p> <p data-bbox="826 1178 1321 1211">UNDERGROUND PARKING SPACE</p> <p data-bbox="826 1252 1034 1285">DEVELOPER:</p> <p data-bbox="826 1326 1262 1382">MAARIJ DEVELOPMENT SDN. BHD.</p>

<p>BAZAAR RAKYAT & BANGUNAN KEDAI</p> 	<p>CADANGAN PEMBANGUNAN PUSAT PERNIAGAN FASA II SELUAS 17.2 EKAR DI BANDAR BARU TUNJONG, JALAN KUALA KRAI, KOTA BHARU, KELANTAN.</p> <p>PROJECT VALUE: UNKNOWN</p> <p>STATUS: IN PROGRESS</p> <p>PROJECT COMPONENT:</p> <p>OFFICE & SHOP BUILDING</p> <p>BAZAAR RAKYAT</p> <p>DEVELOPER:</p> <p>NOBLE RESIDANCE SDN.BHD.</p>
<p>PERUMAHAN KG.TANAH PUTEH</p> 	<p>CADANGAN PEMBINAAN PERUMAHAN MAMPU MILIK DAN PEMBAGUNAN BERCAMPUR DI ATAS TANAH SELUAS 62.217 EKAR DI KG. TANAH PUTEH, DAERAH GALAS, GUA MUSANG, KELANTAN.</p> <p>PROJECT VALUE: RM 116 MILLION</p> <p>STATUS: IN PROGRESS</p> <p>DEVELOPER:</p> <p>ML SYNERGY SDN. BHD.</p>

Sources: Tunjong Development Corporation Sdn. Bhd.

CHAPTER 3

INTRODUCTION

3.1 INTRODUCTION

The purpose of this pile test is to ensure that the sediment pile on the work load does not exceed the limit and have a satisfactory bearing capacity also ensures that the design and implementation of selected pile is sufficient.

Pile load test is usually given additional at least 50% of the actual load. Tests were carried out to pile the failure and if any load is not reached to shake the pile then be left for 24 hours.

Generally this test is performed to detect and prove the pile will not fail when overworked. In addition, it can also be used to check the calculations in pile design and determine the ultimate bearing capacity of the soil. Also, run the load test for the relationship between sediment load and determine and equating workmanship.

3.2 PROJECT BACKGROUND

Perbadanan Menteri Besar Kelantan (PMBK) as a major land owner and main developer has set up a subsidiary that Tunjong Development Corporation Sdn. Bhd. as project manager for projects that want to be planned by the Kelantan state government. To make the Bandar Baru Tunjong as a satelit city or KB Center that emphasizes its urban concept. Perbadanan Menteri Besar Kelantan (PMBK) proposed construction of a shopping center at Bandar Baru Tunjong.

Tunjong Development Corporation Sdn. Bhd. has appointed Maarij Development Sdn. Bhd. as the developer for the project. The project is known as Tunjong Pavilion. Tunjong Pavilion will be constructed on land owned by the state of employment. The project area is very strategic because the site beside the main road from Kuala Lumpur to Kota Bharu and near the city of Kota Bharu.

Project for the proposed construction and completion of a shopping center that includes:

- i) Pavilion Garden Resort Suites I
- ii) Pavilion City Resort Suites II
- iii) Pavilion Mall
- iv) Basement & Multi-Storey Car parks

on the lot PT 775 Mukim Kota, Daerah Kota, Jajahan Kota Bharu, Kelantan.



Picture 3.1: Tunjong Pavilion project

Sources: <http://www.tunjongpavilion.com>

The construction and completion of this Tunjong Pavilion is one of the projects currently under construction. Location of the project site is located in an area Mukim Kota, Daerah Kota, jajahan Kota Bharu Kelantan. Construction work Tunjong Pavilion had conducted preliminary work in 2012 and the project will be officially launched “*majlis pecah tanah*” on the end of March 2013.



Figure 3.1: Key plan of Tunjong Pavilion project

Sources: Google map

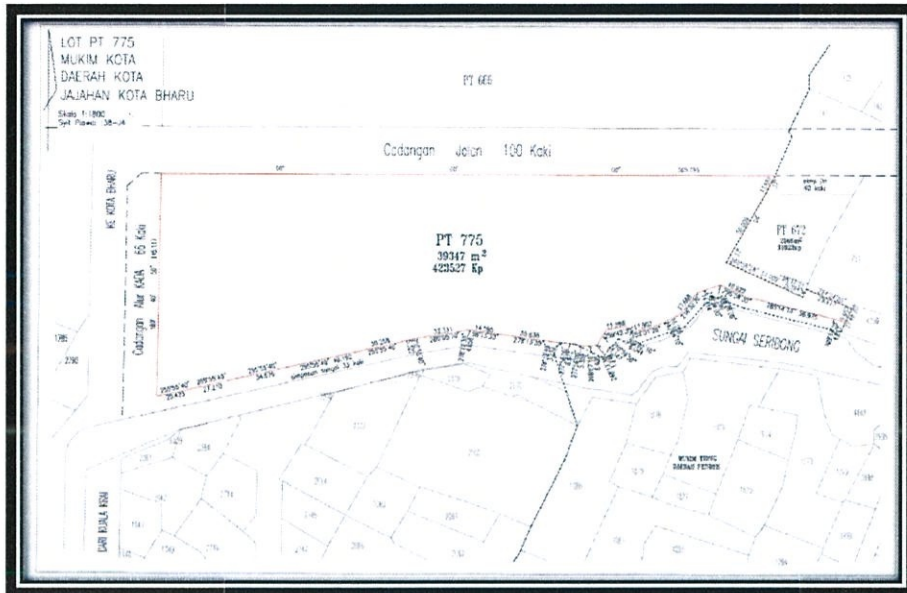


Figure 3.2: Site plan of Tunjong Pavilion project

Sources: Tunjong Development Corporation Sdn.Bhd



Figure 3.3: Use plan area of Tunjong Pavilion project

Sources: Tunjong Development Corporation Sdn. Bhd

3.3 CASE STUDY

Piling is a structure that transfers loads to wake up the rest with a hard layer under the soil. Pile capacity in crops is often confirmed by making the pile load test. This test is to ensure that the sediment pile piling on loads do not exceed the limit and have the appropriate bearing capacity.

According Ken Fleming, Austin Weltman, Mark Randolph, Keith Elson. (2009). Pre-cast concrete piles are now usually of the jointed type, unless a large contract with a more or less constant depth of piling makes it economical to pre-cast the piles on site, thus overcoming a potential difficulty in transport.

This project of Tunjong Pavilion is using the spun pile and reinforcement concrete (RC) pile as the pile test at the project construction site which was once the former paddy land. Pile of this type was chosen because the land area consists of land slightly reactive and has little movement caused by humidity groundwater. At the end of this test spun pile with 350 of size was chosen and this progressed.

3.3.1 The main function of the pile test

Pile capacity often planted verified on a test pile. Testing will be done by selecting a few piles that will give results most feared of all, the main functions of the test pile is:

- i) To determine the ability of the maximum liability to be obtained.
- ii) To ensure that the pile is acceptable from the point of buried structures.
- iii) To determine the relationship between the deposition of the pile with a load carrying.

3.3.2 Factor using piling

Pilings serve as structural supports and tools to transfer the load from the structure to the ground. Use the pile due to the following factors:

- i) Difficult to get a suitable bearing layer. Land under the structure is not able to bear the burden of the structure when used shallow foundations.
- ii) Compressibility of the soil which causes sediment.
- iii) Non-uniform distribution of the land under the land surface.
- iv) Block the action of the thrust from the ground surface.
- v) Getting a strong strata excavation of soil.

3.3.3 Method statement of piling test

Step 1: Site clearance



Picture 3.2: site clearance work

Areas that will do the work test pile will be cleaned. Machinery will be used in an attempt to clean up on-site work to facilitate the work of pile test runs without any problems and simplify the process.

Step 2: Mark the point



Picture 3.3: Marking the point

Areas which are done working pile tests must be marked to facilitate employees find point of peeling test. Different areas use different signs, because not all point to use size and type of the same pile it according to soil conditions.

Step 3: Marking the pile rod



Picture 3.4: Marking pile rod work

Pile will be marked using paint every 3 meters. Marking work is done for ease of reading number of blow.

Step 4: Lift and blow the pile



Picture 3.5: Pile lifting work to piling machine



Picture 3.6: Blow the pile

Join the steel cable on the pile shaft. After reading the spirit level on the reading of 90 degree the pile will continue to blow into the ground and passed right over the pile shaft 500mm above the ground. It is to facilitate the work connectivity to the next pile.

Step 5: Reading of blow



Picture 3.7: Reading blow

Reading of blow must be counted and recorded by the site supervisors who manage the work of the test pile on site.

Step 6: Connection on Pile



Picture 3.8: Connection on pile work

Piling works to connect performed using welding. This is to avoid piling sway and away from its original position during the blow made. Methods used where welding butt weld done around the pile. After that, part of the weld should be covered with paint. Paint used to avoid this part from the rust.

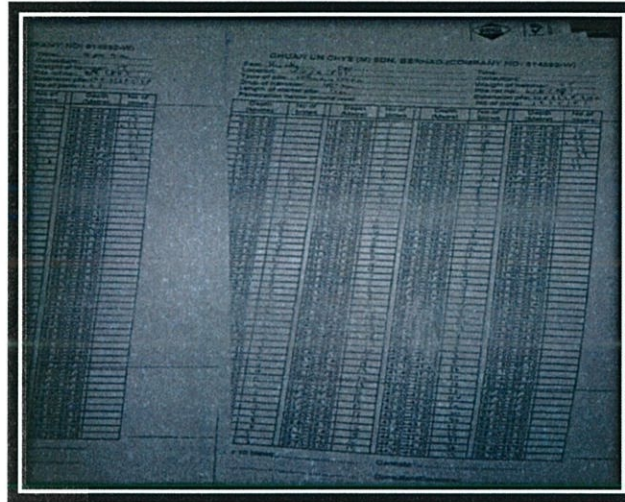
Step 7: Reading set



Picture 3.9: Take readings set

Site supervisor will place a timber or as a marker to the stable on the graph paper placed on the pile. First and second graph will blow their own pile 10 times. Before the third graph is done and to ensure that the pile into the hard rock pile will hit 25 times, after the third graph will blow 10 times. Upon completion of readings will be assessed whether the pile reached the prescribed set.

Step 8: Record the reading on the piling form



Picture 3.10: Record the reading on the piling form

Readings will be recorded in the form piling which all relevant information piling. Information recorded during piling works are:

- i) Pile refers number.
- ii) Time, Date and day.
- iii) Type of pile.
- iv) Drop of hammer.
- v) Length of starter pile.
- vi) Penetration below ground level.
- vii) Consultant, weight of hammer, extension pile and no. of joint.

Step 9: Pile Driving Analyzers (PDA) test



Picture 3.11: Wires of PDA devices put on the pile



Picture 3.12: Reading set on the PDA device

PDA test is to determine the rate of strength on the pile hammer knock. This process indicates whether or not the pile stable. To get a reading on some PDA devices connected to the wireless set receiver to the master device in a closed circuit, after all confirmed to be in good condition will blow pile. During this test run, the graph of reading compared to reading the instructions set issued through PDA devices.

3.3.4 LIST OF EQUIPMENT AND MACHINERY USED IN PILE TEST

Table 3.1: List of equipment and machinery used in pile test

Equipment and machinery	Use
Backhoe	Used to clean the construction site. To facilitate the work of piling.
Piling machine	Used to blow pile rod into the ground.
Spun pile & RC pile	Main components used in the process of piling.
Welder	Welder is used to connect the pile rod during the piling process.
Paint	Paint used for painting portion of welding to prevent rust.
PDA devices	Used for set reading.
Wood stick	Used to mark the piling area.

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions and Recommendations

In conclusion, the report piling on Tunjong Pavilion can provide accurate information about installation methods of spun pile and RC pile. The pile is an element known as poles used in construction as an alternative to transfer the load to the soil layer. This is because the layer of soil that can take on the burden is too deep under the ground.

In addition, the method can also be studied piling tests during the period of this practical training. Selection of pile type is also very important to ensure that buildings constructed in a prolonged state stable. Use of spun pile and RC pile as basic building structure is important to ensure that the building is built in a stable and strong.

Piling process is a complicated process. Any piling work must be done carefully to avoid any negligence during piling work done that will affect the whole structure of the building to be built.

As suggestion, the driving process of piling need to choose the tools and the appropriate type to ensure piling works are done according to the specifications set.

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APPENDIX 1



FIELD SHEET FOR PDA TESTING

PROJECT	TUNJONG PAVILLION , KELANTAN
CLIENT	CHUAN UN CHYE S/B

PILE DETAILS

Identification #	Ea/28
Location	
Driven/ Casted Date	27/11/2012
Pile Type	SPUN PILE
Grade	80
Pile Size (mm)	400x80
Total Length (m)	36.0
Combination (top-bottom)	12+12+12

TRANSDUCER DETAILS

Gauges	F1	F2	A1	A2
Serial #	H801	H815	26910	25389
Calibration	92	92	930	935

PDA DETAILS

PAK/ PAL Serial #	3284L
Pilename, PN	Ea/28
Length Below Gauge (m), LE	35.6
Length of Penetration (m), LP	35.4
Area (cm ²), AR	804.25
Density (T/m ³), SP	2.60
Modulus (T/cm ²), EM	513
Wave Speed (m/s), WS	4400
CASE Damping Factor, Jc	0.5
Type of Testing	(RES) EOD/ MON

HAMMER DETAILS

Hammer Type	HYD
Ram Weight (tonne)	7.0T

LOAD DETAILS

Working Load (tonne)	100T
Test Load (tonne)	200T

PDA FIELD RESULTS

* RMX is indicative only. The data shall be subjected to CAPWAP analysis for final capacity.

BLOW #	RMX (tonne)	FMX (tonne)	CSX (MPa)	EMX (tonne-m)	VMX (m/s)	DFN (mm)	SET (mm)			Drop Ht (m)	Integrity
9	201	143	17.5	2.30	2.36	1mm	18mm	10		0.7	BTA=100%
12	219	164	20.0	2.94	2.68	2mm				1.0	BTA=100%

REMARKS:

Integrity - O.K., Damaged, Broken or for further analysis	For Analysis: DATA VERIFIED <input type="checkbox"/> Yes <input type="checkbox"/> No Remarks:
---	--

CLIENT'S REPRESENTATIVE

WITNESSED BY

For DYNAMIC PILE TESTING SDN BHD

certified that the test has been conducted satisfactorily)

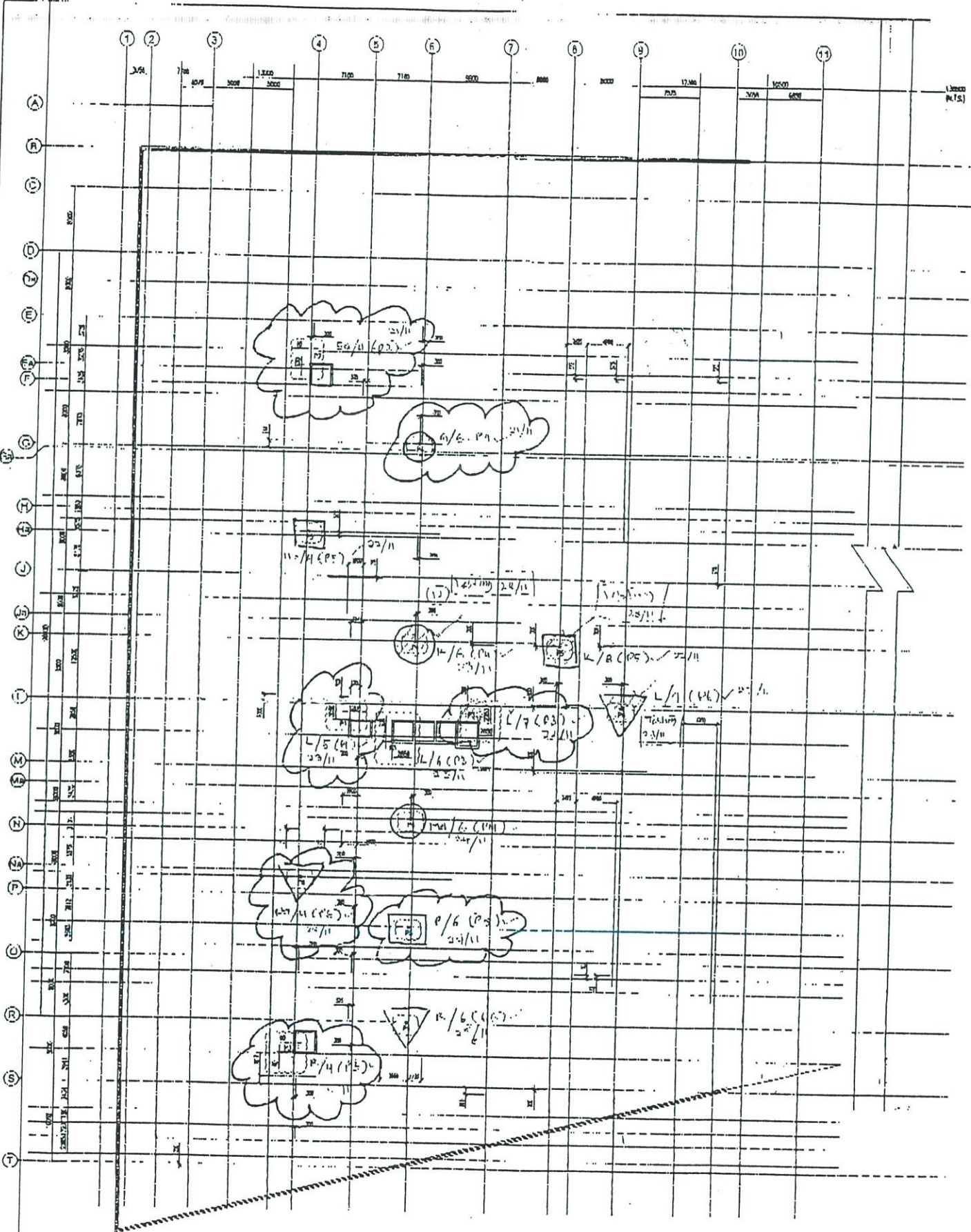
Signature
 Name: MOHD FARIDZUL
 Position: Supervisor

Signature
 Name: Choo W.J.
 Consultant/ Others: ICON

Signature
 Date: 06/02/2013
 Time:

APPENDIX 2

APPENDIX 3



PIILING LAYOUT PLAN

LEGEND:

- P1 - 200mm x 200mm
- P2 - 400mm x 400mm
- P3 - 1000mm x 1000mm
- P4 - 200mm x 200mm
- P5 - 400mm x 400mm
- P6 - 1000mm x 1000mm

APPENDIX 4

PROJECT: CADANGAN MEMBINA DAN MENYIAPKAN BAGI PROJEK PEMBANGUNAN TUNJON PAVILLION YANG MENGANDUNGI KOMPLEKS PERNIAGAAN 3 TINGKAT BESERTA 1 TINGKAT BESMEN TEMPAT LETAK KERETA (TLK), TAMAN ATAS BUMBUNG (RUANG MUSOLLA DAN RIADAH) DAN 2 BLOK PANGSAPURI SERVIS 13 DAN 15 TINGKAT, DIATAS TANAH MILIK PERBADANAN MENTERI BESAR KELANTAN, MUKIM KOTA, DAERAH KOTA DAN MUKIM TIONG, DAERAH PENDEK, JAJAHAN KOTA BHARU, KELANTAN DARUL NAIM.

Hiley's Formula For Set Calculation Of 275mm x 275mm R.C Pile

- Type of pile : 275mm x 275mm Reinforced concrete pile
- Weight (pile) per m : 182 kg/m
- Working Load of pile : 80 tonnes
- Estimated Pile Length : 48 meter
- Proposed Pile Combination (12m x 4m) : 48 meter
- Driving Hammer : Hydraulic Hammer
- Weight of Ram, W : 7.0 tonnes
- Weight of pile, P : 8.736 tonnes
- Drop height, H : 22.4 inch 560 mm
- Coefficient of Restitution, N : 0.25
- Temporary Compression, C : 0.75 inch

EFFICIENCY FACTOR

$$f = \frac{W + (P \times N \times N)}{W + P}$$

0.4795

ULTIMATE RESISTANCE

$$R = \frac{W \times H \times f}{S + C/2}$$

Using factor of safety = 2 times working load of pile

required R = 160 tonnes

$$S = \frac{W \times H \times f}{R} - \frac{C}{2}$$

S = 0.469947 - 0.375

S = 0.0949 inch

set/10 blow required = 0.949 inch or 24 mm

CADANGAN MEMBINA DAN MENYIAPKAN BAGI PROJEK PEMBANGUNAN TUNJONG PAVILION YANG MENGANDUNGI KOMPLEKS PERNIAGAAN 3 TINGKAT BESERTA 1 TINGKAT BASEMENT TEMPAT LETAK KERETA, TAMAN ATAS BUMBUNG, DAN 2 BLOK PANGSAPURI SERVIS 13 DAN 15 TINGKAT DI ATAS TANAH MILIK PERBADANAN MENTERI BESAR KELANTAN; MUKIM KOTA, DAERAH KOTA DAN MUKIM TIONG, DAERAH PENDEK, JAJAHAN KOTA BHARU, KELANTAN

Hiley's Formula For Set Calculation Of 350mm dia Spun Pile

Type of pile	:	350mm spun pile	
Weight (pile) per m	:	160	kg/m
Working Load of pile	:	90	tonnes
Estimated Pile Penetration	:	48	meter
Proposed Pile Combination (12m x 4 nos)	:	48	meter
Driving Hammer	:	Hydraulic Hammer	
Weight of Ram, W	:	7.0	tonnes
Weight of pile, P	:	7.7	tonnes
Drop height, H	:	18.8	inch 470 mm
Coeff. of Restitution, N	:	0.25	
Temp. compression, C	:	0.56	inch

EFFICIENCY FACTOR

$$f = \frac{W + (P \times N \times N)}{W + P}$$

0.5095

ULTIMATE RESISTANCE

$$R = \frac{W \times H \times f}{S + C/2}$$

Using factor of safety = 2 times working load of pile

required R = 180 tonnes

$$S = \frac{W \times H \times f}{R} - \frac{C}{2}$$

S = 0.372528 - 0.28

S = 0.0925 inch

set/10 blow required = 0.925 inch or 24 mm

CADANGAN MEMBINA DAN MENYIAPKAN BAGI PROJEK PEMBANGUNAN TUNJONG PAVILION YANG MENGANDUNGI KOMPLEKS PERNIAGAAN 3 TINGKAT BESERTA 1 TINGKAT BASEMENT TEMPAT LETAK KERETA, TAMAN ATAS BUMBUNG, DAN 2 BLOK PANGSAPURI SERVIS 13 DAN 15 TINGKAT DI ATAS TANAH MILIK PERBADANAN MENTERI BESAR KELANTAN, MUKIM KOTA, DAERAH KOTA DAN MUKIM TIONG, DAERAH PENDEK, JAJAHAN KOTA BHARU, KELANTAN

Hiley's Formula For Set Calculation Of 400mm dia Spun Pile

Type of pile	:	400mm spun pile	
Weight (pile) per m	:	209	kg/m
Working Load of pile	:	100	tonnes
Estimated Pile Penetration	:	48	meter
Proposed Pile Combination (12m x 4 nos)	:	48	meter
Driving Hammer	:	Hydraulic Hammer	
Weight of Ram, W	:	7.0	tonnes
Weight of pile, P	:	10.0	tonnes
Drop height, H	:	24	inch 600 mm
Coeff. of Restitution, N	:	0.25	
Temp. compression, C	:	0.56	inch

EFFICIENCY FACTOR

$$f = \frac{W - P \times N \times N}{W + P}$$

0.478

ULTIMATE RESISTANCE

$$R = \frac{W \times f}{S + C}$$

Using factor of safety = 2 times working load of pile

required R = 200 tonnes

$$S = \frac{W \times H \times f}{R} - \frac{C}{2}$$

S = 0.376155 - 0.28

S = 0.0962 inch

set/10 blow required = 0.962 inch or 24 mm

PROJECT: CADANGAN MEMBINA DAN MENYIAPKAN BAGI PROJEK PEMBANGUNAN TUNJONG PAVILLION YANG MENGANDUNGI KOMPLEKS PERNIAGAAN 3 TINGKAT BESERTA 1 TINGKAT BESMEN TEMPAT LETAK KERETA (TLK), TAMAN ATAS BUMBUNG (RUANG MUSOLLA DAN RIADAH) DAN 2 BLOK PANGSAPURI SERVIS 13 DAN 15 TINGKAT, DIATAS TANAH MILIK PERBADANAN MENTERI BESAR KELANTAN, MUKIM KOTA, DAERAH KOTA DAN MUKIM TIONG, DAERAH PENDEK, JAJAHAN KOTA BHARU, KELANTAN DARUL NAIM.

Hiley's Formula For Set Calculation Of 300mm x 300mm R.C Pile

Type of pile : 300mm x 300mm Reinforced concrete pile
 Weight (pile) per m : 216 kg/m
 Working Load of pile : 90 tonnes
 Estimated Pile Length : 48 meter
 Proposed Pile Combination (12m x 4Nos) : 48 meter
 Driving Hammer : Hydraulic Hammer
 Weight of Ram, W : 7.0 tonnes
 Weight of pile, P : 10.368 tonnes
 Drop height, H : 27.56 inch 700 mm
 Coefficient of Restitution, N : 0.25
 Temporary Compression, C : 0.75 inch

EFFICIENCY FACTOR

$$f = \frac{W + (P \times N \times N)}{W + P}$$

0.4404

ULTIMATE RESISTANCE

$$R = \frac{W \times H \times f}{S + C/2}$$

Using factor of safety = 2 times working load of pile

required R = 180 tonnes

$$S = \frac{W \times H \times f}{R} - \frac{C}{2}$$

S = 0.471957 - 0.375

S = 0.0970 inch

set/10 blow required = 0.970 inch or 25 mm

PROJECT: CADANGAN MEMBINA DAN MENYIAPKAN BAGI PROJEK PEMBANGUNAN TUNJOI PAVILLION YANG MENGANDUNGI KOMPLEKS PERNIAGAAN 3 TINGKAT BESERTA 1 TINGKAT BESMEN TEMPAT LETAK KERETA (TLK), TAMAN ATAS BUMBUNG (RUANG MUSOLLA DAN RIADAH) DAN 2 BLOK PANGSAPURI SERVIS 13 DAN 15 TINGKAT, DIATAS TANAH MILIK PERBADANAN MENTERI BESAR KELANTAN, MUKIM KOTA, DAERAH KOTA DAN MUKIM TIONG, DAERAH PENDEK, JAJAHAN KOTA BHARU, KELANTAN DARUL NAIM.

Hiley's Formula For Set Calculation Of 250mm x 250mm R.C Pile

Type of pile : 250mm x 250mm Reinforced concrete pile
 Weight (pile) per m : 150 kg/m
 Working Load of pile : 70 tonnes
 Estimated Pile Length : 48 meter
 Proposed Pile Combination (12m x 4m) : 48 meter
 Driving Hammer : Hydraulic Hammer
 Weight of Ram, W : 7.0 tonnes
 Weight of pile, P : 7.2 tonnes
 Drop height, H : 18 inch 450 mm
 Coefficient of Restitution, N : 0.25
 Temporary Compression, C : 0.75 inch

EFFICIENCY FACTOR
$$f = \frac{W + (P \times N \times N)}{W + P}$$

 0.5246

ULTIMATE RESISTANCE
$$R = \frac{W \times H \times f}{S + C/2}$$

Using factor of safety = 2 times working load of pile
 required R = 140 tonnes

$$S = \frac{W \times H \times f}{R} - \frac{C}{2}$$

S = 0.472183 - 0.375

S = 0.0972 inch

set/10 blow required = 0.972 inch or 25 mm

CADANGAN MEMBINA DAN MENYIAPKAN BAGI PROJEK PEMBANGUNAN TUNJONG PAVILION YANG MENGANDUNGI KOMPLEKS PERNIAGAAN 3 TINGKAT BESERTA 1 TINGKAT BASEMENT TEMPAT LETAK KERETA, TAMAN ATAS BUMBUNG, DAN 2 BLOK PANGSAPURI SERVIS 13 DAN 15 TINGKAT DI ATAS TANAH MILIK PERBADANAN MENTERI BESAR KELANTAN, MUKIM KOTA, DAERAH KOTA DAN MUKIM TIONG, DAERAH PENDEK, JAJAHAN KOTA BHARU, KELANTAN

Hiley's Formula For Set Calculation Of 450mm dia Spun Pile

Type of pile	:	450mm spun pile	
Weight (pile) per m	:	242	kg/m
Working Load of pile	:	110	tonnes
Estimated Pile Length	:	48	meter
Proposed Pile Combination (12m x 4 nos)	:	48	meter
Driving Hammer	:	Hydraulic Hammer	
Weight of Ram, W	:	7.0	tonnes
Weight of pile, P	:	11.6	tonnes
Drop height, H	:	28	inch 700 mm
Coeff. of Restitution, N	:	0.25	
Temp. compression, C	:	0.56	inch

EFFICIENCY FACTOR

$$f = \frac{W + (P \times N \times M)}{W + P}$$

0.4150

ULTIMATE RESISTANCE

$$R = \frac{W \times H \times f}{S + C/2}$$

Using factor of safety = 2 times working load of pile

required R = 220 tonnes

$$S = \frac{W \times H \times f}{R} - \frac{C}{2}$$

S = 0.369745 - 0.28

S = 0.0897 inch

set/10 blow required = 0.897 inch or 23 mm