UNIVERSITI TEKNOLOGI MARA

DEPARTMENT OF BUILDING

FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

SEPTEMBER 2014

It is recommended that the report of this practical training provided

By

Noor Shafrina Binti Samsuri

2012257666

Entitled

Construction of Concrete Structure

(Raft foundation)

Accepted in partial fulfillment has for obtaining Diploma In Building.

Report supervisor	Pn. Azira Binti Ibrahim
Practical training coordinator	Pn. Wan Nordiana Binti Wan Ali
Faculty coordinator	Dr. Mohd Rofdzi Bin Abdullah

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(PERAK)

SEPTEMBER 2014

STUDENT'S DECLARATION

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

.....

Name: NOOR SHAFRINA SAMSURI

UiTM ID No: 2012257666

Date:

ACKNOWLEDGEMENT

Alhamdulillah, all praises to Allah for the strengths and His blessing in completing this thesis. Special appreciation goes to my project coordinator Mr. Arif Bin Mahamad, for his supervision and constant support. His invaluable help of constructive comments and suggestions throughout the experimental and thesis works have contributed to the success of this research. Not forgotten, my appreciation to my quantity surveyor, Mrs. Farhana Iylia Binti Hassan for his support and knowledge regarding this topic. I would like to express my express my appreciation to the Project Manager at Perumahan Generasi Baharu Felda (PGBF) Using IBS System at Wilayah Jengka, at Felda Kampung Awah, Pahang, Mr. Mohd Radzi Bin Mat Yunus for their support and help towards my postgraduate affairs. My acknowledgement also goes to all the technician and office staffs for their co-operations. Sincere thanks to my lecture supervisor Madam Azira Ibrahim for her guidance, advice and moral support during do this report in successfully. Thanks for their concern in ensure to being success at training time. Not forget, great appreciation go to the rest Practical Training Coordinator Madam Wan Nordiana Binti Wan Ali faculty's Coordinator Dr. Mohd Rofdzi Bin Abdullah. Last but not least, my deepest gratitude goes to my beloved parents, and and also to my siblings for their endless love, prayers and encouragement. To those who indirectly contributed in this report, your kindness means a lot to me. Thank you very much.

Thanks you very much

ABSTRACT

Foundation is a base of every building, importance structure to construct a building, structure and anything else. Therefore, this report will discuss about the construction of concrete structure which is raft foundation. Raft foundations are large slabs supporting a number of columns and walls under the entire structure. Raft slab is required when the allowable pressure is low or where the columns are spaced so close that the individual footings overlap. Raft foundations are useful in reducing the differential settlements and sustaining large variations in loads on the individual columns. In conventional analysis of raft foundation the reactive soil pressures due to the loads from the structure are not considered. This reactive pressure is important as the raft is subjected to bending due to loads from the structure and also from the reactive pressure offered by the soil. These effects considerably alter the forces and the moments in the structural members. This is where soil structure interaction comes into play. The effect of soil immediately beneath and around the structure, on the response of the structure when subjected to external loads is considered in soil structure interaction. In this case, the soil and structure are considered as components of one elastic system. During the analysis soil can be modeled using many soil models such as Linear elastic soil model, Winkler's soil model etc.

TABLE OF CONTENTS

List of Tables

List of Photos

List of Figure

List of Appendices

List of Abbreviations

DPM - Damp Proof Membrane

UiTM - Universiti Teknologi MARA

TBM - Temporary Benchmarks

BRC - Steel Reinforce Fabrics

FELDA - Federal Development Authority

IBS - Industrialized Building System

TNB - Tenaga Nasional Berhad

CHAPTER 1

PREFACE

1.1 Introduction

Raft foundation is a thick concrete slab reinforced with steel which covers the entire contact area of the structure like a thick floor. Sometimes area covered by raft may be greater than the contact area depending on the bearing capacity of the soil underneath. The reinforcing bars runs normal to each other in both top and bottom layers of steel reinforcement. Sometimes inverted main beams and secondary beams are used to carry column loads that require thicker foundation slab considering economy of the structure. Both beams cast monolithically with raft slab.

The two types of raft foundation commonly used are the flat raft and the wide toe raft. From the construction site at Kampung Awah, they use flat raft. The flat slab raft is uniform thickness under the whole of the building and reinforced to spread the loads from the walls uniformly over the undersurface to the ground. This type of raft may be used under small buildings such as bungalows and two storey houses where the comparatively small loads on foundations can be spread safely and economically under the rafts.

1.2 Objective

i) To identify the construction method of raft foundation.
ii) To investigate advantage and disadvantage by using raft foundation.
iii) To identify the types of materials and machineries use to construct raft foundation.

1.3 Scope of Study

The study is about single stories terrace housing project located at Felda Kg Awah, Temerloh, Pahang Darul Makmur. The scope of study is focused on sub-structure of the building. Every building must choose a suitable foundation depends on the condition of soil. Foundation can classify into two groups which is shallow foundation and deep foundation. Many types of shallow foundation that can be use such pad foundation, strip foundation and so on. For this housing project they use a raft foundation for the building. Foundation is an important sub-structure in all building. Strong the foundation can appear the long lasting of some building.

1.4 Method of Study

The method that have been used to get information:

i. Site visit

From visiting and observe the construction site which is located at Felda Kampung Awah. Identify how the workers do a construction and method of construction.

ii. Interview

Meeting and interviewing with the parties related to the topic for the practical report is one of the method used for searching the information that is needed to prepare this report. The interview also has been made to get information from site supervisor Mr. Saiful and Mr. Muhsin and also labors at construction site.

iii. Internet

Search for additional information about raft foundation and also get some information of equipment and machineries used.

iv. Book

Use revision book about raft foundation to get more information. From this book have lot information about construction.

v. Documents and files

Refer document and files to get more detail information about this company. Such as method statement, company profile and weekly report.

CHAPTER 2

COMPANY BACKGROUND

2.1 Introduction

Cendor Cukai Trading (M) Sdn. Bhd. is a well-established construction company and hardware trading which specialize in civil engineering, infrastructure, housing development and building works. Cendor Cukai Trading (M) Sdn. Bhd. was incorporated on the 15th September 1995.The company in wholly owned by Bumiputera. It head office address which is our building is at No. 3A-1 Jalan Gombak Ria, Taman Gombak Ria, 68100 Batu Caves, Selangor Darul Ehsan.

The company was formed as part of the extension and diversification exercise of a well-established construction company, which specialized in a civil engineering, infrastructure, housing development and building works.As a hardware supplier, the company offers a wide range of building materials, hardware products and machineries. Our hardware company is situated in Kuantan, Pahang and the company concentrates most of her business in the East Coasts area especially in Pahang and Terengganu. The company also owned a cement bricks factory located near the outlet.This company serves to fulfill the needs of contractors, government and private sectors, factories, schools as well as individuals. The company is also capable of introducing new products in the market especially for the needs of the construction industries that has become more advance and sophisticated.

2.2 Company Profile

2.2.1 Corporate Information

Company Name	CENDOR CUKAI TRADING(M)SDN BHD
Main Office	No. 3A-1, Jalan Gombak Ria, Taman Gombak Ria, 68100 Batu Caves, Selangor.
Phone	
Fax	603-6185 0860
Email	cctmsb@gmail.com
Directors	Dato' Marina Binti Mahammad Azrul Bin Mat Saat
Company Registration No	359778-D
Equity & participation	Bumiputera
Activities	Civil Engineering, infrastructure, housing development and building Works
Paid-up Capital	RM4,000,000.00
Authorised Capital	RM 5,000,000.00
Gred G7	B,CE,ME
Company Account	Bank Muamalat Malaysia CIMB Bank Bank Islam Malaysia Berhad Malayan Banking Berhad

Table 2.1: Corporate Information

Source : Company Profile

2.2.2 Vision and Mission

i. To enhance Bumiputera participation in becoming a successful contractor and hardware supplier.
ii. To create employment especially for Bumiputera.
iii. To provide training for employees with the necessary skills.
iv. To offer the best quality workmanships, products, services and consultancy and concurrently provide pertinent information to the end users.
v. To be a reasonable corporate organization, committed to the highest quality standard with dedication, loyalty and integrity for all stake holders locally and nationally.

2.3 Organization chart

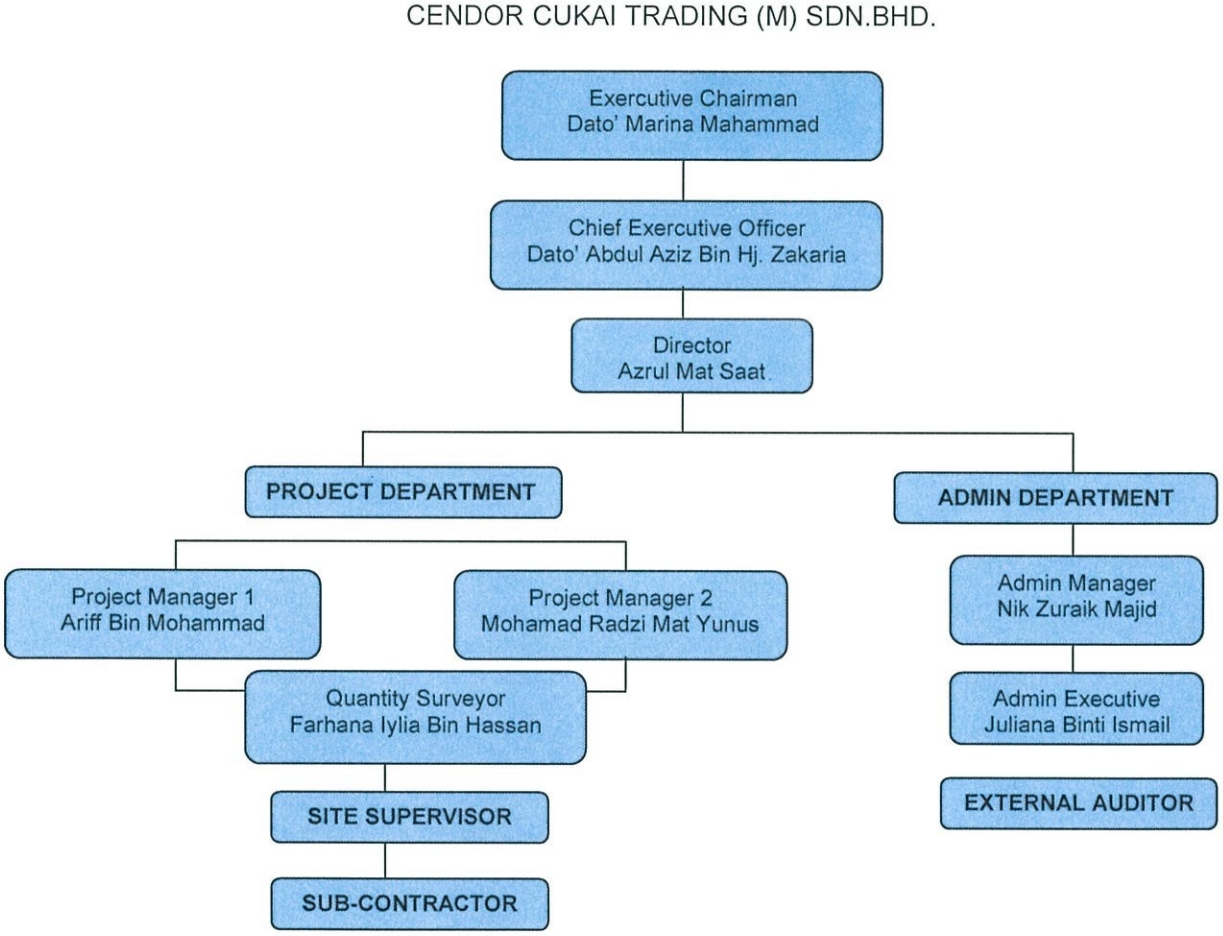

Figure2.1: Company Organization Chart

Sources: Company Profile

2.4 List of Projects

Table 2.2 List Of Completed Project

NO.	PROJECT TITLE	CLIENT/ DEVELOPER	CONTRACT VALUE(RM)	COMMENCEMENT	COMPLETION
1.	Work Clearing Trails 275kV Line	Tenaga Nasional Berhad	RM 800, 476.00	April 1999	Mac 2001
2.	Klinik Desa Type G2 at Kemaman (SUB)	Jabatan Kerja Raya Malaysia	RM 510, 234.12	January 2000	July 2001
3.	24 unit of Terrace House at Batu 2,Jalan Air Putih,24000 Kemaman, Terengganu.	Cendor Cukai Trading (M) Sdn.Bhd.	RM 1, 909,000.00	February 2000	April 2001
4.	3 Storey of Sekolah Agama, Kemaman,Terengganu Darul Iman.	Jabatan Pendidikan Negeri Terengganu.	RM 1, 190, 000.00	July 2000	May 2001
5.	6 Unit of Single Storey at Batu 2, Jalan Air Putih, 24000 Kemaman, Terengganu.	Cendor Cukai Trading (M) Sdn.Bhd.	RM 1, 256, 000.00	April 2001	February 2002

6.	Work Clearing Trails 19/2004 & 29/2004,Pahang Darul Makmur	Tenaga Nasional Berhad	RM 111,595.07	Jun 2004	August 2004
7.	8 Unit of Semi Detached Housing at Bukit Kuang, Kemaman, Terengganu.	Cendor Cukai Trading (M) Sdn.Bhd.	RM 700,000.00	November 2001	September 2001
8.	5 Unit Single Storey at Bukit Kuang, Kemaman, Terengganu	Cendor Cukai Trading (M) Sdn.Bhd.	RM 926,000.00	December 2001	September 2002
9.	Construction and Completion of Additional Buildings 6 BD at Sekolah Kebangsaan Tanjung Batu Pekan, Pahang.	Jabatan Kerja Raya Malaysia	RM 3,207,790.00	14 March 2002	25 March 2003
10.	Road Upgrading Works at Laluan 3,Pekan,Pahang Darul Makmur	Jabatan Kerja Raya Malaysia	RM 2, 668,174.00	6 September 2002	31 March 2003
11.	Construction and Completion The Federal Quarters Containing 4 Unit of Quarters Class F dan 18 Unit Quarters Class G and Others Works That Required at Temerloh,Pahang.	Jabatan Kerja Raya Malaysia	RM 2, 973, 913.40	4 July 2002	2 April 2003

12.	Proposal To Build A Complex Of Multi-Storey Car Park, Tmn Sultan Abu Bakar, Bentong, Pahang	Majlis Daerah Bentong Pahang	RM 2, 695,831.40	1 August 2002	22 Mac 2003
13.	Development of Physical Facilities Kampus Universiti Tenaga Nasional (UNITEN) Bandar Muadzam Shah, Pahang Darul Makmur.Kediaman Pelajar-Fasa 3b	Tenaga Nasional Berhad	RM 28,951,995.82	26 October 2002	20 September 2004
14.	Extension & Repair of Roof Gutter of KOOP Supermarket.	Perwaja Steel Sdn. Bhd	RM 125, 242.35	13 September 2004	20 Mac 2005
15.	20 Unit of Terrace House at Batu 2,Kampung Jaya, Jalan Air Putih, 24000 Kemaman, Terengganu	Cendor Cukai Trading (M) Sdn.Bhd	RM 1, 916,000.00	January 2005	-
16.	Extension of Maintainance Office at Cuf Gebeng.	Petronas Gas Berhad	RM 224, 800.00	3 January 2007	-

17.	The Proposed Refurbishment, Upgrading To the Existing Facilities And Landscapping Works At Instep,Mukim Batu Rakit, Kuala Terengganu.	Petronas Management Training Sdn Bhd	RM 5,203,995.15	2 January 2007	-
18.	Construction of Office Jabatan Ketua Pengarah Tanah & Galian Cawangan Pahang Darul Makmur	Jabatan Tanah & Galian, Putrajaya	RM 36,699,405.50	2 August 2008	5 March 2011
19.	Proposed Contruction of LKIM Fishery Landing Complex On Lot PT 85, Bagan Pasir Penambang, Mukim Kuala Selangor, Selangor Darul Ehsan	Lembaga Kemajuan Ikan Malaysia (LKIM)	RM 19,000,000.00	19 February 2009	CPC Stage
20.	Refurbishment and upgrading works for Gymnasium building Sukpa, Bandar Indera Mahkota, Kuantan, Pahang Darul Makmur.	Jabatan Kerja Raya	RM 13,535,591.40	28 June 2011	-

Table 2.3 List Of Ongoing Project

NO.	PROJECT TITLE	CLIENT	CONTRACT VALUE (RM)	COMMENCEMENT	COMPLETION
1.	Proposed Construction and Completion of The BOMBA and Rescue Headquarters also Related Works at Atas Plot 8 & 9, Mukim Hulu Kinta , Perak Darul Ridzuan.	Kementerian Perumahan Dan Kerajaan Tempatan	RM 15, 458,861.86	12 September 2011	11September2013 (Contract) 11 October 2014(EOT)
2.	Design And Build For Proposed Development Of "Perumahan Generasi Baharu Felda (Pgbf)" Using IBS System Phase 5 (P5) A5-2 Felda Kg. Awah, Temerloh,Pahang Darul Makmur.	FELDA	RM 7,000,000.00	17 March 2014	16 March 2015

Source: Company Profile

CHAPTER 3

CASE STUDY

3.1 Introduction

The project is Design and Built Proposed Development of "Perumahan Generasi Baharu Felda (PGBF)" at Wilayah Jengka At Felda Kampung Awah (60unit), Pahang. This project is undertaken by the Federal Development Authority (FELDA). This project involves the construction of infrastructure and housing development to FELDA new generation.

The main contractor for this project is Cendor Cukai Trading (M) Sdn Bhd. While, for the architect is Arkitek Fajar. In addition, the project includes the engineer is Felda Engineering Services Sdn Bhd and Mechanical and Electrical Consultant is YHS Associates Sdn Bhd. The housing project began in 17 Mac 2014 and was expected to be completed in 16 Mac 2015. The total cost of the project is RM7, 000, 000.

3.2 Project Background

3.2.1 Project Development Team

Project name's	:60 Unit "Perumahan Generasi Baharu Felda (PGBF)" Using IBS System Wilayah Jengka at Felda Kampung Awah, Pahang.
Client	: Federal Land Development Authority (FELDA)
PMC	: Felda Engineering Services Sdn Bhd(FES)
Main Contractor	: Cendor Cukai Trading (M) Sdn Bhd
Architect Consultant	: Arkitek Fajar
C&S Consultant	: Prima Reka Konsultant
M&E Consultant	: YHS Associates Sdn Bhd
Q.S Consultant	: Kaf Consult
Planner Consultant	:Sidmann Planning & Management Sdn Bhd
Licensed Surveyor	:Sahabat Ukur Consultants

3.2.2 Contract Information

Contract Value	: RM 7, 000,000.00
Contract Period	: 12 Months (52 Weeks)
Site Possession Date	: 17 March 2014
Completion Date	: 16 March 2015
Defect Liability Period	: 24 Months
Liquidated & Ascertained Damage	: RM 10,000/Day

Lad (Mock-Up / Sample Unit): RM 200/Day

3.3 Site Organization Chart

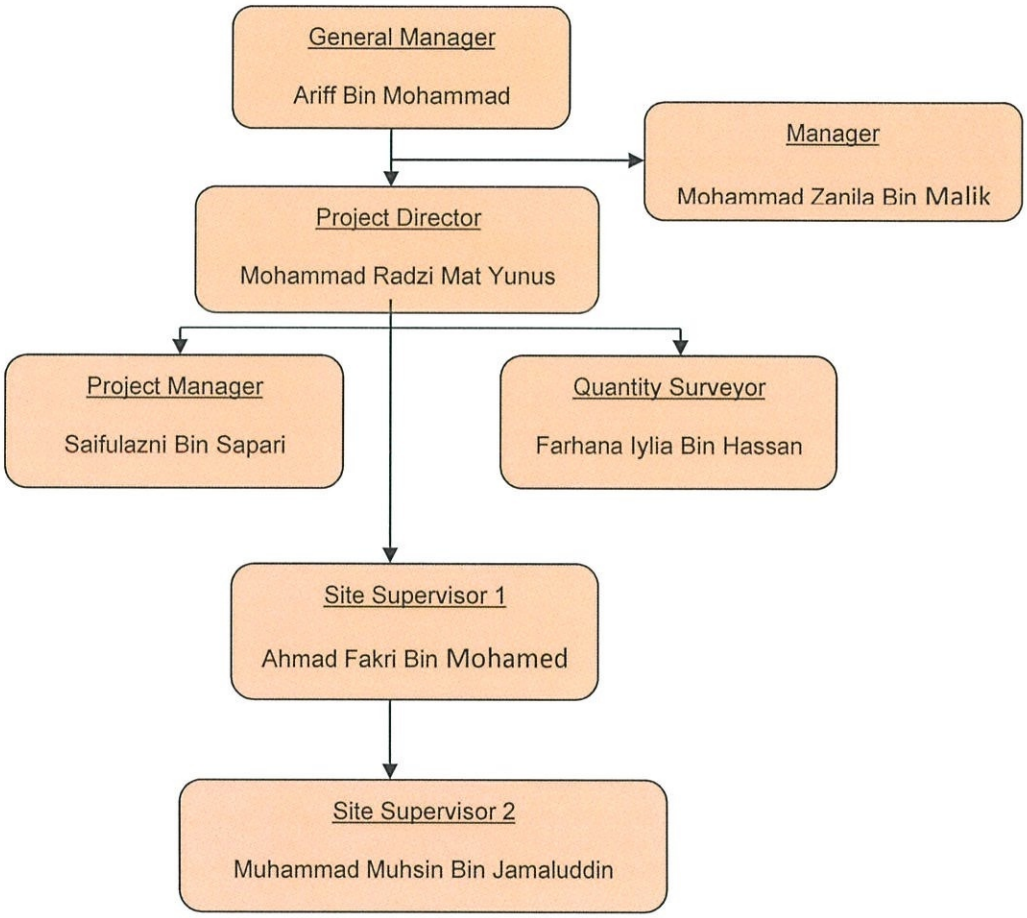

Figure 3.1: Site Organization Chart

Source: Weekly Report

3.4 Construction method of raft foundation

3.4.1 Construction method of earthwork

i. Setting out

Before commencement the works, traversing will be carried out from intermediate point to intermediate to check the accuracy of their position. If any discrepancy happens, Engineer will be notified and proposal for resolving of any discrepancies will be submitted.

Temporary benchmarks (TBM) will be established for the construction of works base on the bench mark provided. The TBM would be tied back to a permanent Bench Mark provided by the client. The boundary will be pegged and all the structures, trees, and any obstacle will be marked.

During the stage of construction, the site engineer will inform the surveyor of type of survey to be carried out. Person who involve in setting out are Surveyor, Engineer, Site Engineer and five workers. Setting out process took about a week to settle it. The machineries that required are tipper lorry and backhoe.

Photo 3.1: Setting Out

ii. Site clearing

All the trees will be felled and the roots grubbed by hydraulic excavator. The tree trunks will be cut off in to smaller sections and heaped together with grass and vegetation. All the rubbish, trees, logs, strut and structure above ground will be demolished by using excavator and also manual by workers if required.

All the cleared material that have been stacked and heaped together would be load onto the tipper lorries for the disposal at the designated area.

Site clearing also took a week to settle it and person that involve are site supervisor and five workers. Addition, machineries used are hydraulic excavator, four tipper lorries.

Photo 3.2: Site Clearing

iii. Excavation works

Excavation of works shall be carried out in accordance with the drawing to the line and level show in the construction drawing. Before start the excavation, the 150mm thick of original ground level (OGL) surface will be stripping as per specification. Surveyor will peg in interval of 20 meters and marked on the peg the depth of excavation required.

The hydraulic excavator would excavate to the required level and the excavated material would be loaded on to tipper lorries for transport to the fill areas. The excavated slope will be trimmed to grade by an excavator and would be turf.

Excavation work took a long period to finish it. More than one week to settle it. Machineries that required are the hydraulic excavator, back pusher, dump track and backhoe. A site supervisor holds an important role at construction site. Site supervisor supervise all the machineries and workers during excavations works.

Photo 3.3: Excavation Works

iv. Backfill

The material will be spread and leveled by bulldozer or back pusher to the required thickness. The compactor will be used to compact the loose material to the required passes. Before proceed filling to the next layer, the field density test shall be carry out to determine the degree of compaction.

The maximum compacted thickness for fill shall be limited to 600mm per layer with required number of passes. Backfill works took a week to finish. The machineries are required are compactor roller, back pusher and backhoe. Person involve are site supervisor and eight workers.

Photo 3.4: Backfill

3.4.2 Construction method of raft foundation

i. Piping utilities

Installation of piping utilities and related services such as sanitary pipe will be done according to the proposed building design.

Person that involve are site supervisor to supervise the plumber and five workers during installing the piping utilities. Took three weeks to install the piping utilities for 60 unit.

Photo 3.5: Piping Utilities

ii. Formwork

Formwork fixed in perfect alignment, propped and braced to with stand the weight of concrete and movement of person working. Formworks are plywood with timber bracing and supports. Formwork surface will be applied with release agent such as mould oil prior to fixing. Form tie utilized to prevent bulge or breakage in formwork. Formwork shall be sufficiently rigid to maintain the form in their correct position, shape, profile and dimension.

Person that involve to installs the formworks are site supervisor, five workers and two carpenters. The equipment that used to form formworks is a saw, hammer and nails. The installation of raft foundation formwork will be done in a one week.

Photo 3.6: Formwork

iii. Spray Anti-termite

Before pour concrete mixture for raft foundation, anti-termite will be sprayed and applied at all area of the building base. The anti-termite supplied by Prima Pest Control & Services. Works spraying anti-termite required equipment such as air compressor and pump spray.

This works took a day for per unit of houses. Site supervisor needed to supervise two workers during spraying anti-termite.

Photo 3.7: Anti-termite Spray

iv. Lean Concrete

A layer of 50mm thickness lean concrete will be applied on top of the compacted crusher run which was sprayed with anti-termite.

Use a ready mix concrete grade 15 (G15N) for lean concrete supplied by LCS Marketing Sdn Bhd. Site supervisor needed to supervise eight of workers for one unit. After the lean concrete is hardened or cured, a layer of damp proof plastic will be installed on top of the lean concrete.

Photo 3.8: Lean Concrete

v. Reinforcement and DPM layer

A layer of damp proof plastic will be installed on top of the lean concrete before installation of reinforcement bar was done. Steel bars are cut and bend together with the required BRC accordingly before the steel bars are placed within the building perimeter shape.

A reinforcement bar supplied by Masteel (M) Sdn Bhd and the BRC are supplied by Engtex Metals Sdn Bhd. During bending works, bar cutter and bending machine are used to shaping the reinforcement bar.

Photo 3.9: Reinforcement and DPM Layer

vi. Concreting floor

Before concrete the foundation, the foundation shall be prepared as shown in the Engineering drawings and the joint inspection by the clients. Formwork and reinforcement shall be kept clean and free from debris and water prior to concreting works.

The concrete shall be deposited in horizontal layers to a compacted depth not exceeding 450mm and shall be compacted with internal vibrator to produce a dense homogenous mass. All concrete shall be applied continuously during the placing of each batch of concrete.

The equipments that used when mixing and moving a ready mix concrete such as wheelbarrow, shovel, and trough. Concreting works will commence using ready mix concrete and mobile crane until all works are completed. Site supervisor needed to supervise more than five workers during concreting works and plastering works for floor. The ready mix concrete for concreting foundation use a grade 25(G25N) and also supplied by LCS Marketing Sdn Bhd.

Photo 3.10: Concreting Floor

3.5 Advantages and disadvantage by using a raft foundation method in building constructions

Raft foundation is a simple method foundation that usually use in building constructions. Raft foundation is a thick concrete slab reinforced with steel which covers the entire contact area of the buildings. Raft foundation is a really suitable for the IBS System buildings constructions. Same as construction project that located at Kampung Awah, Temerloh. Raft foundations have their own advantages. Firstly, raft foundation is more economical due to combination of an others types of foundation and floor slab. Raft foundation does not use a big budget in construction works. It is because raft foundation does not require a lot of excavation works.

Generally, the factor of selecting a suitable foundation is depends on weak or high compressible soils, but raft foundation can accommodate poor or mixed soil conditions. Raft foundation also can reduce differential settlement as the concrete slab resists differential movement between loading positions. Raft foundations are often needed on soft or loose soils with low bearing capacity as can spread the load over a larger area.

Raft foundation has disadvantages as well. Raft foundation requires specific treatment for weak point loads while supporting a building. The edge erosion can be occurs if not treated properly. Raft needs a very good protection against differential ground settlement, earthquakes and heave due to the design. Raft would traditionally not suit a famed building. Raft foundations are ideal foundation choice to support light building such as single storey terrace houses. it cannot be more than five storey.

3.6 Type of materials, equipment and machineries for construct raft foundation

3.6.1 Type of materials

i. Ready mix concrete

Photo 3.11: Ready Mix Concrete

For raft foundation, they use grade 15 (G15N) for lean concrete and grade 25 (G25N) for the floors.

ii. Reinforcement bar

Photo 3.12: Reinforcement Bar

Size of reinforcement bars use for install at raft foundation is Y12. It also used BRC at raft foundation.

iii. Plywood

Photo 3.13: Plywood

Plywood is use to be a formworks for made a raft foundation platform. Use saw, hammer and nails to cut, shape and joint it.

iv. Nails

Photo 3.14: Nails

Nails to joins the plywood makes formworks. Nails are made from steel and normally the workers use 2 inch length of nail.

3.6.2 Type of equipment

i. Measuring tape

Photo 3.15: Measuring Tape

Measuring tapes are used for taking measurement of formwork of raft foundation. Tapes may be made from steel, fiberglass or other material.

ii. Scoop

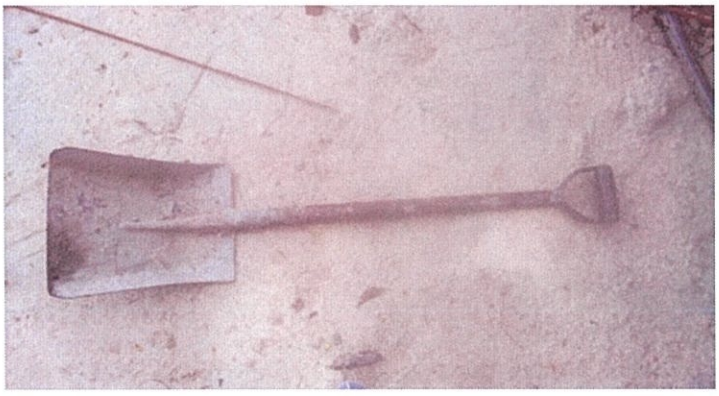

Photo 3.16: Scoop

Function of scoop is to lift and move material from one location to another. Generally, it used to move a concrete mixture from one place to another place. Especially use for concreting works.

iii. Hammer

Photo 3.17: Hammer

Hammer is use to nailing work, especially for make formwork. The head of hammer is made by heavy steel and the handle made by wood.

iv. Saw

Photo 3.18: Saw

Saw is use to cut off a plywood and to make formwork or timber roof structure. It has a teeth-like edge which sorts of giving it an ability to cut the plywood.

3.6.3 Type of machineries

i. Hydraulic Excavator

Photo 3.19: Hydraulic Excavator

Excavators are used for soil excavation work such as digging holes, during backfill and other. The excavators are available in various types.

ii. Back pusher

Photo 3.20: Back Pusher

The function of back pusher is to convert a rough terrain into flat terrain. It also used to push unwanted soil or rocks.

iii. Backhoe

Photo3.21: Backhoe

A backhoe is a piece of excavating equipment or digger consisting of a digging bucket on the end of a two-part articulated arm. Backhoe use to excavate and digs the soil at construction site.

iv. Dump truck

Photo3.22: Dump Truck

Dump trucks or production trucks are those that are used for transporting loose material such as sand, dirt and gravel for construction. The typical dump truck is equipped with a hydraulically operated open box bed hinged at the rear, with the front being able to be lifted up to allow the contents to fall out on the ground at the site of delivery.

v. Compactor roller

Photo 3.23: Compactor Roller

Function of compactor roller is for compact the road at site to easy the road exit and entrance at construction site.

vi. Coring Machine

Photo 3.24: Coring Machine

Coring machine is use to make holes and installs TNB columns. The Coring machine also used to install lampposts.

vii. Mobile crane

Photo 3.25: Mobile Crane

This type of tire wheels crane used in construction site is simple, easy transferred from one place to another place. The crane is used to lift and place materials and equipments to construction site.

CHAPTER 4

CONCLUSION AND RECOMMENDATION

4.1 Conclusion

Therefore, the conclusion that can be said here about this report is the raft foundation is very economical and is often used in buildings less than five stories. It is also highly compatible with all types of soil conditions particularly in this country Malaysia. Here also can be said all of the objectives contained in this report have been achieved. The statement about the raft foundation presented in this report an also be easily understood.

Starting from construction method, their advantages and disadvantages and machineries and equipments used in the construction of raft foundation, all the statement about these can be easily understood.

4.2 Recommendation

Based on knowledge and observations over five months practical training, I found on a construction site is construction work organization not move smoothly on site. That all happens is all because of the obstacle at construction site which is a TNB substation are stands at site. The contractors have to thinks first how to handle these problems and at that same time, the periods of construction are also pending.

During excavation works, the workers have to avoid the TNB substation and must be carefully the excavation works. After that, all works continue as usually. The conditions at construction site all in good conditions, supervised by Mr. Saiful and Mr. Muhsin.

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a) Book

i. Sharat Chandra, 2007. Raft Foundation Design and Analysis with A Practical Approach. UK: New Age International Publishers.

b) Internet

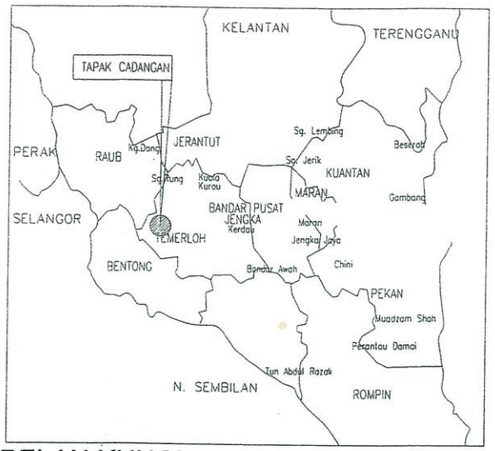
i. Civil Engineering Portal. (2014). Construction Machineries and Equipments. www.engineeringcivil.com /theory/construction-equipments.

c) Interview

i. Mr. Saifulazni Bin Sapari, Site Supervisor 1
ii. Mr. Muhammad Muhsin Bin Jamaluddin, Site Supervisor 2
iii. Mr. Mohamad Radzi Bin Mat Yunus, Project Director

d) Drawing

i. Layout plan, Design and Built Proposed Development of "Perumahan Generasi Baharu Felda (PGBF)" at Wilayah Jengka At Felda Kampung Awah (60unit).



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1494

1495

1496 (PA 61334)

1497

5666

5665 (PA 79402)

3480 (PA 61334) LUAS 2.355 HA

RUMAH KAYU

RUMAH BATU

KANDANG KAMBING

PENCAWANG SEMBAHYANG

BANGSAL

STP 514sm

KAWASAN PAYA

JALAN TAR

JALAN TANAH

PARIT

LONGKANG

WAKAF

TNB

N

PELAN TAPAK

SKALA 1: 450

Bil	Tarikh	Keterangan	Initial

Tajuk Projek

CADANGAN MEREKABENTUK DAN MEMBINA PEMBANGUNAN PROJEK PERUMAHAN GENERASI BARU FELDA (PGBF) SECARA INDUSTRIAL BUILDING SYSTEM' (60 UNIT RUMAH TERES 1 TINGKAT 20' X 70') FASA 5(P5)-PAKEJ(A5-2) DI RANCANGAN FELDA KAMPUNG AWAH, WILAYAH JENGKA, PAHANG MUKIM BUKIT SEGUMPAL, DAERAH MARAN, PAHANG

UNTUK TETUAN:
LEMBAGA KEMAJUAN TANAH PERSEKUTUAN (FELDA)

PEMILIK

LEMBAGA KEMAJUAN TANAH PERSEKUTUAN
IBU PEJABAT FELDA
WISMA FELDA, JALAN PERUMAHAN GURNEY,
54000 KUALA LUMPUR.
TEL: FAX: 03-26920087

PEMAJU

FELDA PROPERTIES SDN. BHD. (353987-X)
TINGKAT 2, BALAI FELDA,
JALAN GURNEY SATU,
54000 KUALA LUMPUR.
NO. TEL: NO. FAX: 03 26936717

PENGURUS PROJEK

FELDA ENGINEERING SERVICES SDN BHD (299557-X)
TINGKAT 6, BALAI FELDA,
JALAN GURNEY SATU,
54000 KUALA LUMPUR.
NO. TEL: NO. FAX: 03 26936717

Tajuk Lukisan

EARTHWORK LAYOUT PLAN

Tandatangan Jurutera:

JURUTERA PROFESIONAL AWAM IR. MOHD NASIR B. KAMAL MOKHTAR 9749 MALAYSIA

"I certify that the design for the complete set of Drawings follows DID Urban Stormwater Management Manual For Malaysia (Manual Saliran Mesra Alam Malaysia) by the Department of Irrigation and Drainage Malaysia, 2000. I will bear full responsibility for the design and supervision of the works. If it is found that the proposed drain is too small, the developer will have to enlarge the drain section accordingly so that there will not be any local flooding in this housing scheme."

PRIMA REKA KONSULTAN

Ir. Mohd. Nasir Bin Kamal Mokhtar
BSc (Civil) PEng. MIEM

PRIMA REKA KONSULTAN
30A, JALAN AMPANG BARU 6A,
AMPANG BARU,
31550 IPOH, PERAK.
Tel: 05-3122209 Fax: 05-3122345

DIREKA : NZR	UKURAN : 1:500
DILUKIS : NZR	TARIKH : 05 2013
DISEMAK :	No. LUKISAN :

TA:

Segala pengorekan, peratlaan, penimbusan adalah dengan menggunakan teknik biasa iaitu jentera-jentera pengorekan, perataan dan penimbusan.

Sebagai langkah pertama kerja-kerja pengorekan dan peratlaan pada aras tanah yang tinggi, langkah kedua kerja-kerja penimbusan dan peratlaan dijalankan sekali mengambil masa 2 bulan.

Langkah-langkah yang diambil untuk menghalang kenderaan yang membawa tanah daripada mengotorkan jalan-jalari bersebelahan:

a) Memastikan bahawa badan kenderaan itu dalam keadaan yang baik dan tidak ada celah atau tubang dari mana bahan-bahan boleh jatuh.
b) Memastikan bahawa bahan tidak diisi dalam kenderaan itu melebihi ketinggian sisi-sisi kenderaan.
c) Menutup bahan-bahan dengan kain tarpat plastik, kanvas atau lain-lain jenis yang sesuai.
d) Memastikan bahawa roda-roda dan tayar-tayar kenderaan itu dibersihkan sebelum kenderaan dibawa masuk ke mana-mana jalan atau tempat awam.
e) Menggunakan jalan-jalan yang telah diletapkan oleh Majlis Bandaraya Ipoh.
f) Sebarang kenderaan unutk mengangkat bahan-bahan kepada atau dari Tapak Kerja Tanah hendaklah mendapat Permit daripada MBI.
g) Satu Silt Trap telah diperuntukkan seperti yang ditunjukkan di dalam Pelan Tapak.

Permohonan berasingan bagi sebarang kerja pemecah batu perlu didapatkan dari pihak berkuasa.

Pokok-pokok tidak boleh ditebang sehingga tapak sedia untuk diusahakan.

Spesifikasi untuk jenis cerucuk dan cara kerja cerucuk hendaklah dinyatakan di dalam pelan struktur.

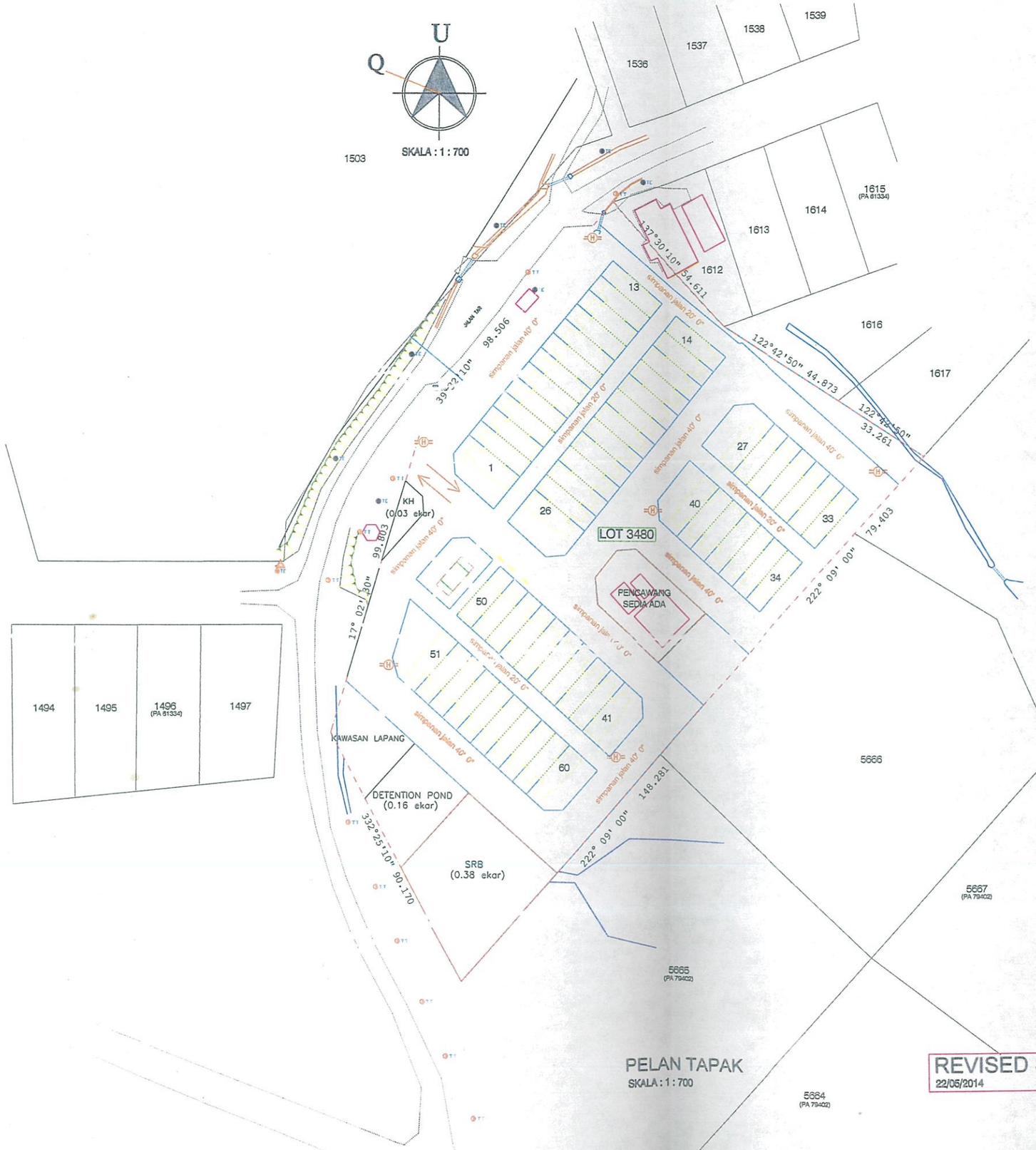
Pengesahan jurutera hendaklah diperolehi bersabit dengan tahap gangguan bunyi disebabkan oleh kerja-kerja cerucuk tidak akan memberi apa-apa kesan buruk terhadap penduduk di kawasan sekeliling.

Pagar sementara hendaklah diadakan di sekeliling "sedimentation basin".

Pemaju akan mengambil tindakan sepatutnya untuk mengelakkan pembiakan nyamuk di "sedimentation basin".

a) Jumlah pengorekan = 137,121.00 m^3
b) Jumlah penambakan = 79,981.00 m^3

Pili air/"water jet" sementara mestilah di adakan di kawasan "washing bay bagi mencuci tayar-tayar lori yang keluar/masuk.



PELAN TAPAK
SKALA : 1 : 700

REVISED SITE PLAN
22/05/2014

UNTUK KEGUNAAN MAJLIS

NOTA

TARIKH	PEMBETULAN	CATTAN

TAJUK PROJEK

CADANGAN MEREKABENTUK DAN MEMBINA PEMBANGUNAN PROJEK PERUMAHAN GENERASI BAHARU FELDA (PGBF) SECARA 'INDUSTRIAL BUILDING SYSTEM' (60 UNIT RUMAH TERES 1 TINGKAT 20' X 70') FASA 5 (P5) - PAKEJ (A5-2) DI ATAS LOT 3480 DI RANCANGAN FELDA KAMPUNG AWAH, MUKIM BUKIT SEGUMPAL, DAERAH MARAN, PAHANG DARUL MAKMUR.

UNTUK TETUAN :
LEMBAGA KEMAJUAN TANAH PERSEKUTUAN (FELDA)

PEMILIK

MENARA FELDA
PLATINUM PARK, NO. 11, PERSIARAN KLCC,
50088 KUALA LUMPUR.
TEL: FAX: 03-26920067

NO. 3A-1, JALAN GOMBAK RIA,
TAMAN GOMBAK RIA,
68100 BATU CAVES,
SELANGOR DARUL EHSAN.

NO. 39A, JALAN AMPANG BARU 6A,
AMPANG BARU,
31350 IPOH,
PERAK DARUL RIDZUAN

NO. 33B, JALAN PANDAN 2/2,
PANDAN JAYA,
55100 KUALA LUMPUR.

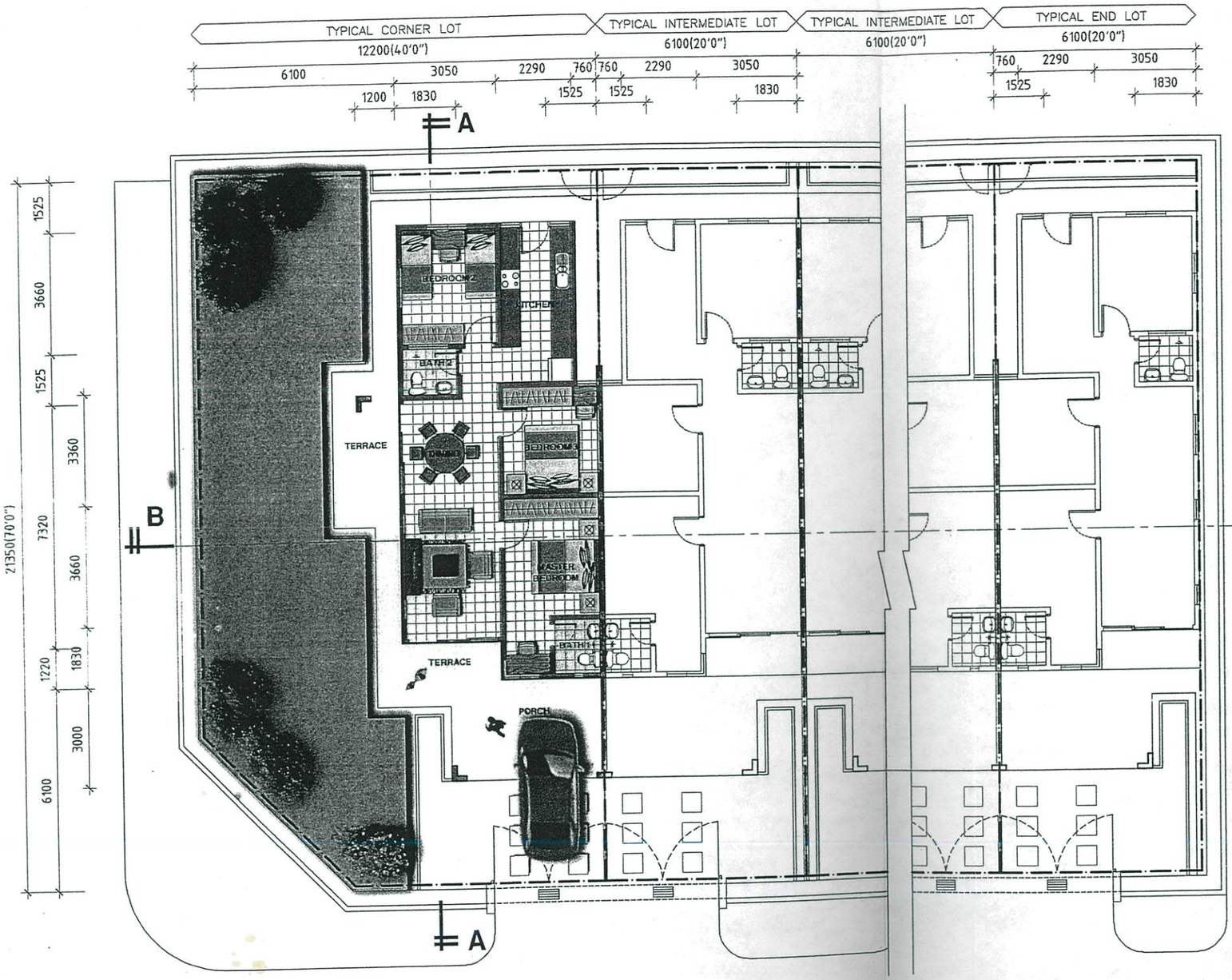
NO. 36, 1st FLOOR,
JALAN BAGINDON 13/36,
SEKSYEN 13, 40100 SHAH ALAM.

Ar. Mohd Nasri Ab. Aziz
No Pendaftaran LAM : A/A1 176

ARKITEK FAJAR
17A, FIRST FLOOR, JALAN BAHDAR 2,
PUSAT BANDAR MELAWATI, 53100 KUALA LUMPUR,
MALAYSIA TEL: 03 41051008 FAX: 03 41051708
e-mail:arkitekfajar@gmail.com

TAJUK LUKISAN
PELAN TAPAK
PELAN LOKASI
PELAN KUNCI

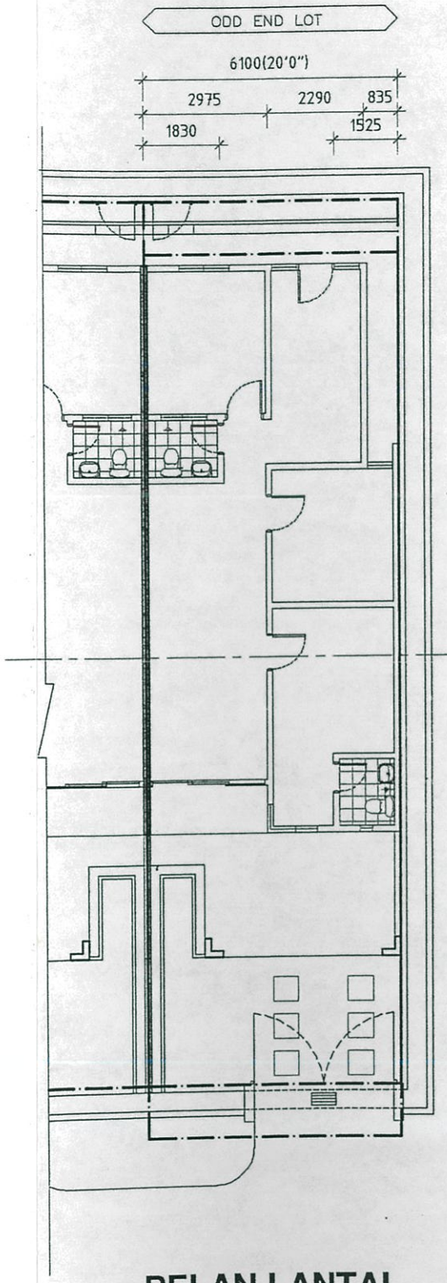
NO. LUKISAN
AF13/012/WD/01



PELAN LANTAI

skala 1 : 150

BUILT UP AREA : 93 SM (1001 SF) INTERMEDIATE LOT
: 96 SM (1033 SF) CORNER LOT
: 92 SM (990 SF) TYPICAL END LOT

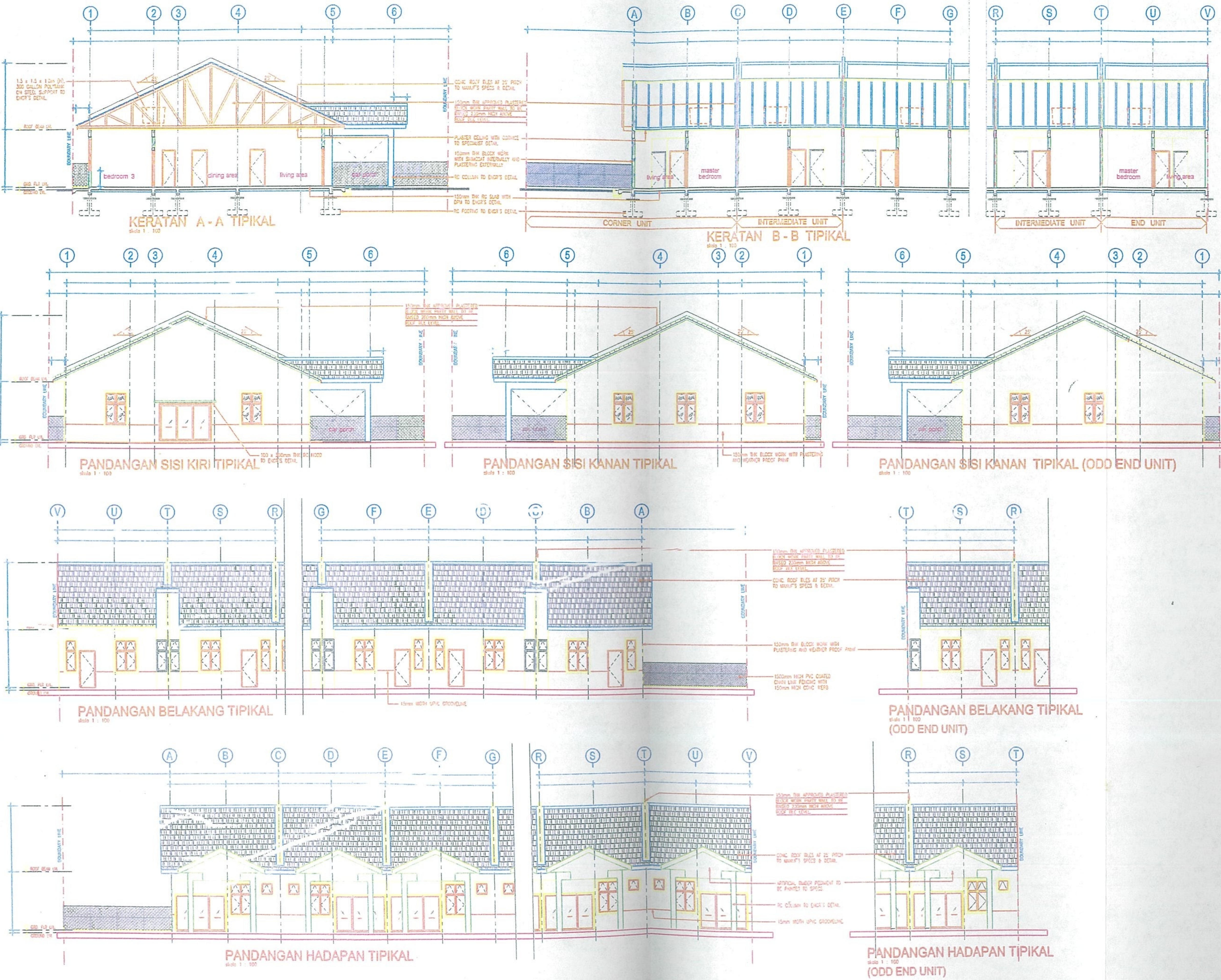


PELAN LANTAI
(ODD END LOT)

skala 1 : 150

CADANGAN MEREKABENTUK DAN MEMBINA PEMBANGUNAN PROJEK PERUMAHAN GENERASI BARU FELDA (PGBF) SECARA 'INDUSTRIAL BUILDING SYSTEM' (60 UNIT RUMAH TERES 1 TINGKAT 20' X 70')
FASA 5 (P5) - PAKEJ (A5-2) DI RANCANGAN FELDA KAMPUNG AWAH. WILAYAH JENGKA, PAHANG MUKIM BUKIT SEGUMPAL, DAERAH MARAN PAHANG DARUL MAKMUR
UNTUK TETUAN: LEMBAGA KEMAJUAN TANAH PERSEKUTUAN (FELDA)

ARKITEK FAJAR
04 DISEMBER 2013



Semua rekaan adalah hakmilik Arkitek Fajar dan tidak boleh digunakan atau ditiru tanpa kebenaran bertulis.
Semua spesifikasi tercetak dan hakcipta adalah terpelihara dan hakmilik Arkitek Fajar.
Segala perbezaan dan perselisihan dimensi, spesifikasi dll yang terdapat dilukisan-lukisan dan dokumen yang berkenaan hendaklah dilapurkan segera kepada Arkitek sebelum sebarang kerja-kerja pembinaan yang berkenaan dilaksanakan

NOTA

TARIKH	PEMBETULAN	CATITAN

TAJUK PROJEK

CADANGAN MEREKABENTUK DAN MEMBINA PEMBANGUNAN PROJEK PERUMAHAN GENERASI BAHARU FELDA (PGBF) SECARA ' INDUSTRIAL BUILDING SYSTEM ' (60 UNIT RUMAH TERES 1 TINGKAT 20' X 70') FASA 5 (P5) - PAKEJ (A5-2) DI ATAS LOT 3480 DI RANCANGAN FELDA KAMPUNG AWAH, MUKIM BUKIT SEGUMPAL, DAERAH MARAN, PAHANG DARUL MAKMUR.

UNTUK TETUAN :
LEMBAGA KEMAJUAN TANAH PERSEKUTUAN (FELDA)

PEMILIK

LEMBAGA KEMAJUAN TANAH PERSEKUTUAN (FELDA)
JABATAN TANAH FELDA
TINGKAT 34, MENARA FELDA, PLATINUM PARK,
NO.11, PERSIARAN KLCC,
50088 KUALA LUMPUR.
TEL: FAX: 03-21912191

KONTRAKTOR REKA & BINA
CENDOR CUKAI TRADING (M) SDN. BHD
NO. 3A-1, JALAN GOMBAK RIA,
TAMAN GOMBAK RIA,
68100 BATU CAVES,
SELANGOR DARUL EHSAN.

PERUNDING SIVIL & STRUKTUR
PRIMA REKA KONSULTANT
NO. 39A, JALAN AMPANG BARU 6A,
AMPANG BARU,
31350 IPOH,
PERAK DARUL RIDZUAN

PERUNDING MEKANIKAL & ELEKTRIKAL
YHS ASSOCIATES SDN BHD
NO. 338, JALAN PANDAN 2/2,
PANDAN JAYA,
55100 KUALA LUMPUR

PERUNDING UKUR BAHAN
KAF CONSULT
NO. 36, 1st FLOOR
JALAN BADMINTON 13/36,
SEKSYEN 13, 40100 SHAH ALAM.

TANDATANGAN ARKITEK

LEMBAGA ARKITEK MALAYSIA

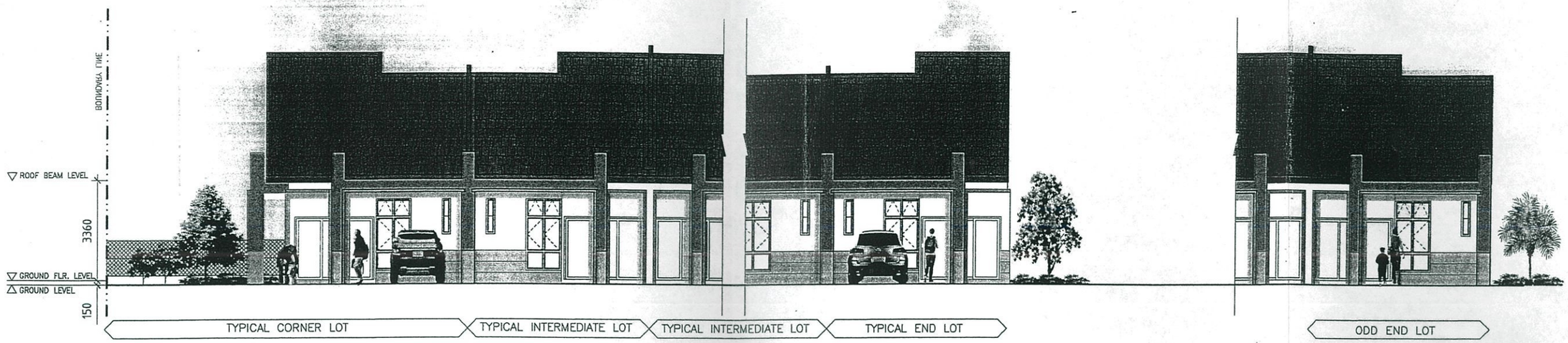
Ar. Mohd Nazri Ab. Aziz
No Pendaftaran LAM : A/M 176

DILUKIS
DISEMAK
TARIKH
SKALA
FAIL RUJ. KOMP.

ARKITEK FAJAR
17A, FIRST FLOOR, JALAN BANDAR 2,
PUSAT BANDAR MELAWATI, 53100 KUALA LUMPUR,
MALAYSIA. TEL: FAX: 03.41051708
e-mail:arkfajar@gmail.com

TAJUK LUKISAN
- RUMAH TERES 1 TKT
KERATAN A-A, B-B
PANDANGAN HADAPAN
PANDANGAN BELAKANG
PANDANGAN SISI KANAN & KIRI

NO. LUKISAN
AF13/012/WD/03

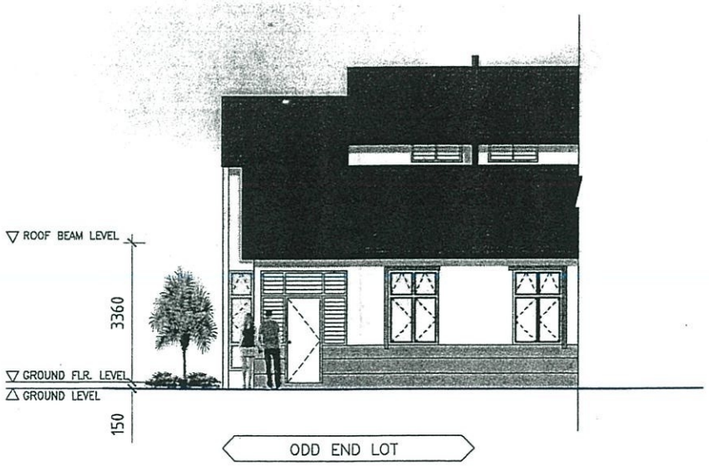


PANDANGAN HADAPAN

skala 1 : 150

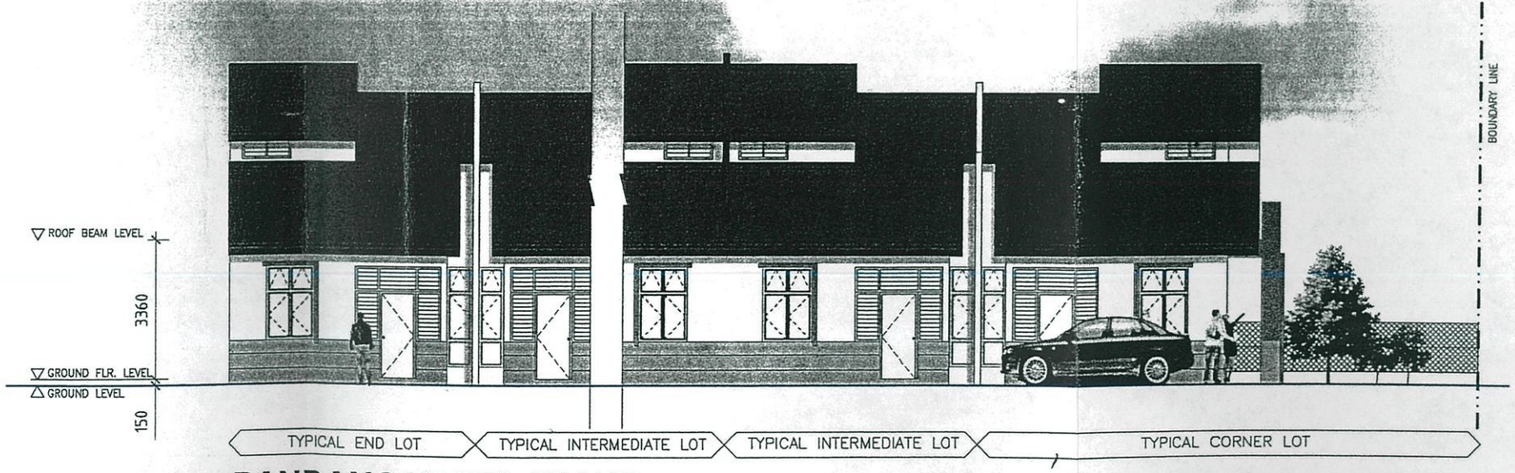
PANDANGAN HADAPAN
(ODD END LOT)

skala 1 : 150



PANDANGAN BELAKANG
(ODD END LOT)

skala 1 : 150



PANDANGAN BELAKANG

skala 1 : 150

CADANGAN MEREKABENTUK DAN MEMBINA PEMBANGUNAN PROJEK PERUMAHAN GENERASI BARU FELDA (PGBF) SECARA 'INDUSTRIAL BUILDING SYSTEM' (60 UNIT RUMAH TERES 1 TINGKAT 20' X 70')
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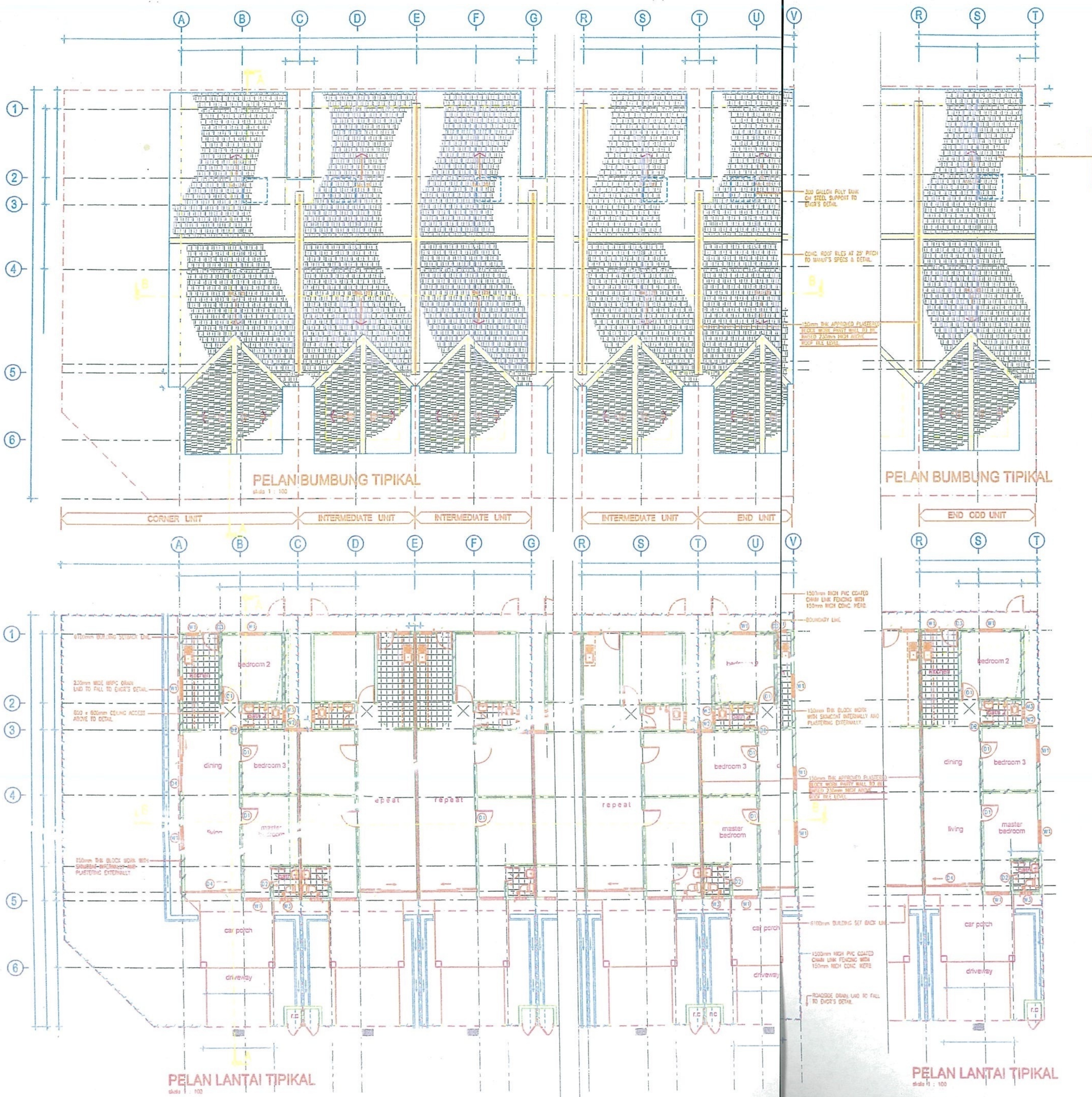
UNTUK TETUAN: LEMBAGA KEMAJUAN TANAH PERSEKUTUAN (FELDA)

ARKITEK FAJAR
04 DISEMBER 2013



UNTUK KEGUNAAN MAJLIS

SCHEDULE OF FLOOR AREA, LIGHTING AND VENTILATION
GROUND FLOOR PLAN

SPACE	SQ M	SQ FT	10% of AREA (sq.m)	GLAZED AREA (SQ M)	VENTILATION
CAR PORCH	13.00	139.90	1.30	N/A	NATURAL
LIVING & DINING	28.50	307.00	2.85	6.20	NATURAL
MASTER BEDROOM	13.40	144.00	1.34	2.16	NATURAL
BATH 01	2.50	27.10	0.25	0.36	NATURAL
BEDROOM 2	11.90	128.00	1.19	2.16	NATURAL
KITCHEN	10.30	110.10	1.03	1.08	NATURAL
BEDROOM 3	10.20	110.30	1.02	1.08	NATURAL
BATH 02	3.10	33.30	0.31	0.36	NATURAL
TYPICAL LOT TOTAL	93.00	1,001.00			

DOOR SCHEDULE

	DESCRIPTION
D1	900(w) x 2100mm METAL FRAME PLYWOOD FLUSH DOOR TO MANUF'S DETAIL
D2	750(w) x 2100mm METAL FRAME MARINE PLYWOOD FLUSH DOOR WITH 100mm HIGH KERB STONE TO MANUF'S DETAIL
D3	900(w) x 2100mm METAL FRAME MARINE PLYWOOD FLUSH DOOR TO MANUF'S DETAIL
D4	2550(w) x 2100mm ALUMN FRAME SLIDING DOOR TO MANUF'S DETAIL

NOTE : METAL FRAME SIZE SHALL BE 175mm

WINDOW SCHEDULE

	DESCRIPTION
W1	1200(w) x 1800mm ALUMN FRAME CASEMENT WINDOW WITH TOP HUNG WINDOW ABOVE TO MANUF'S DETAIL
W2	600(w) x 1800mm ALUMN FRAME CASEMENT WINDOW WITH TOP HUNG WINDOW ABOVE TO MANUF'S DETAIL
W3	600(w) x 600mm ALUMN FRAME TOP HUNG WINDOW TO MANUF'S DETAIL

GENERAL BUILDING NOTES

1.0 ALL 115mm THK BRICKWALL TO BE REINFORCE WITH 'EXMET' AT EVERY 4th COURSE.

WATERPROOFING APPLICATIONS

TARIKH	PEMBETULAN	CATATAN

TAJUK PROJEK

CADANGAN MEREKABENTUK DAN MEMBINA PEMBANGUNAN PROJEK PERUMAHAN GENERASI BAHARU FELDA (PGBF) SECARA 'INDUSTRIAL BUILDING SYSTEM' (60 UNIT RUMAH TERES 1 TINGKAT 20' X 70') FASA 5 (P5) - PAKEJ (A5-2) DI ATAS LOT 3480 DI RANCANGAN FELDA KAMPUNG AWAH, MUKIM BUKIT SEGUMPAL, DAERAH MARAN, PAHANG DARUL MAKMUR.

UNTUK TETUAN :
LEMBAGA KEMAJUAN TANAH PERSEKUTUAN (FELDA)

PEMILIK

ARKITEK FAJAR
17A, FIRST FLOOR, JALAN BANDAR 2, PUSAT BANDAR MELAWATI, 53100 KUALA LUMPUR, MALAYSIA TEL: FAX: 03 41051708
e-mail: arkfajar@gmail.com

TAJUK LUKISAN
- RUMAH TERES 1 TKT
PELAN LANTAI
PELAN BUMBUNG

NO. LUKISAN
AF13/012/WD/02