UNIVERSITI TEKNOLOGI MARA

DEPARTMENT OF BUILDING

FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING

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(PERAK)

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This Training Report had prepared

By

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Title

Reinforcement Concrete Work on the Ground Beams and Columns

be accepted in partial fulfillment of the requirements for obtaining Diploma of Building.

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BUILDING DEPARTMENT

FACULTY OF ARCHITECTURE, PLANNING AND SURVEY

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DECLARATION OF STUDENTS

With this, the writing of this Practical Training Report was produced entirely by me except as expressed through practical training that I went through 5 months from 13th May 2013 to 29th September 2013 in the Company Muaffaq Holdings Sdn. Bhd. It is also one of the requirements to pass the course DBN 307 and received in partial fulfillment of the requirements for obtaining Diploma of Building.

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Date : 29 September 2013

ACKNOWLEDGMENT

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Thank you.

ABSTRACT

This report overall explains the steps and the elements that are related to concreting work on the columns and ground beam in the construction of twenty five blocks (25), fifety units of detached houses at PusatPenyelidikan Dan PertanianTunRazak (PPPTR), Sg. Tekam, Jerantut Pahang. Experience undergoing practical training at the construction site during the construction process gives me knowledge to serve as a guide in preparing this report.The use of reinforced concrete in a construction is no longer a new thing in construction works nowadays.Reinforced concrete which is designed based on the principles of reinforcement and concrete act in tandem to receive the load. Accordingly, the reinforced concrete workability must take seriously in the construction as it affects the strength of the load-bearing members.In this report, it also explains in brief about the formation of steel bar for the reinforcement of building. Next, explanation is given a how preparation of the formwork was conducted. This is followed by explanation of test involving concrete and their result from the laboratory. After concrete work had been done, several problems that are related with the concrete are solve and this report ends with some suggestion which can overcome the problems that occur. Conclusion, this report can explain more details about the procedures and the elements for concreting work.

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LIST OF ABBREVIATION

(MHSB)	Muaffaq Holdings SdnBhd
(ACSD)	Asaga Corporation SdnBhd
(MKI)	MuaffaqKanopiSdnBhd
(MISD)	MuaffaqInterpriseSdnBhd
(DBKL)	Kuala Lumpur City Hall
(PKK)	Contractor Services Centre
(CIDB)	Construction Industry Development Board
(SPAN)	National Water Services
(CCM)	Registry of Malaysia
(PPPTR)	PusatPenyelidikandanPertanianTunRazak
(FASSD)	Felda Agricultural Services SdnBhd
(FESSD)	Felda Engineering SdnBhd
(M&E)	Mechanical and Electrical
(ZSD)	ZahimSdnBhd

CHAPTER 1

PREFACE

1.1 Introduction

Reinforced concrete is a result of the formation of a combination concrete and steel. This combination can produce strength to withstand compressive and tensile forces. Concrete is a mixture of materials that are strong and durable to constitute a structure of the building. It can be form into different shapes and size. Concrete is a mixture of aggregate, cement and water. A mixture between cement,aggregate and water will cause it to solidify. Concrete is a hard material and brittle. Its strength depends on the mixing rate and the age of maturity. Concrete will continue to improve its strength, especially in its early stages and then slowly thereafter.

A characteristic of reinforced concrete is designed to take the tension that is transferred through two bonding surfaces of concrete and reinforcement. If the bonding surfaces of both materials failed, reinforced concrete will slip past the combination of the bond between concrete and steel is also failed. Hence, the concrete should be well compacted around the reinforcement during construction. In addition, the reinforcements used shall consist of reinforcementsthat have twisted or overlapping surfaces to get a strong grip.

1.1.1 Characteristicsof Reinforced Concrete

1. Compressive strength: The compressive strength of concrete depends on factors such as the materials used as coarse aggregate, mix ratio, age of maturity and others. Concrete will continue to increase its strength in the early stages of a few weeks and will continue slow by after that. At the age of 28 days compressive strength of the concrete has reached ¾ of the maximum strength.Concrete compressive strength called characteristic strength with and units offcu symbol N/mm2. Concrete failure also can occur as a result of compression failure, but a failure occurs with the earlier tension. Reinforcement is needed to overcome compression and placed in the compression zone

2.Tensile strength: If a beam at the fulcrum on two buffers on both ends and a load in the middle, there will be bending on the beam. When bending occurs, the top surface of the beam will compress due to the compressive stress and the bottom is tense and elongated due to tensile stresses. The maximum stress was found to occur on the bottom curve of the lower surface of the beam. If the beam is made of unreinforced concrete, the fracture will take place at the bottom of the beam and is likely to be broken. Thus reinforced concrete is designed to overcome this problem and the reinforcement must be fully protected to prevent corrosion that will occur as a result of moisture, wetting and fire.

3. Strength of shear: A beam can be made with the ability to withstand the effects of bending by holding the appropriate size for the concrete to withstand the effects ofcompressi on and installation of reinforcedsteel bars to overcome the effects of stress. But the same beam may fail as a result of the shear action. Amount action of external forces acting on the horizontal axis and the beam will extend this force called shear forces. Failure will occur 45° at both ends of the beam near the buffer.

1.2 Objectives

Objective of the research is to study moreabout concrete reinforcement work on the ground beams and column.The objectives:

1. To understand the procedures and elementsthat are related in the construction of ground beam and column.

2. To study the function of the machinery involved in the construction of casting works and how to operate it.

3. To identify method of solving problems in the reinforcement concrete.

1.3 Scope of the Study

The scope of the study of this topic is generally to explore how the used of concrete for the construction of a building. As there are three types of concrete structures which are frame walls, portal frame and the frame structure, then research is only focused on the type of frame structure.

In addition, the scope of the research also covers the key factors in the selection of concrete structures for construction by contractors or local authorities under the construction. Factors such as cost, time, skills, labour, environment-friendliness, quality work and safety should be taken seriously.

The main problems in the implementation of concrete works are also identified. Among the problems that occur are management, transportation, labor skills and safety. After scrutinizing the problem, then come out with the solutions to facilitate the development of reinforced concrete works.

1.4 Method of the Study

To produce this study, several methods are used, among them are:

1. Observation.

   As this is a home construction project, on-site observation is necessary to know the work that had been done. Pictures are taken at the project site to provide a clearer picture of the situation at the construction site. Pictures taken are of machinery, construction workers, construction methods, and conditions in the area of the site.

2. References.

   Because this project is the construction of a house, project files involved should be taken to be a reference. This is because, in this project files contain information about the project. Information obtained from the files are used to completet this report. Part of the study is to look for into from other resources such as the internet and book. This information can be used to perform theoretical research.

3. Interview.

   In addition, an interview is needed to obtain additional information that is not found in the project file. Interviews are done by interviewing the parties involved in the project that is beingcarried out. The interviewees are like site managers, engineers, owners, contractors and labour.

CHAPTER 2

COMPANY BACKGROUND

2.1 Introduction

Muaffaq Holdings Sdn. Bhd(MHSB) was established on 09th September 1999. It is a private business with registration number 493 482-A. Its formation was inspired by HjAbu Bakar Bin HjAhmad as Managing Director.This business is Bumiputra owned and is actively involved in particular in the field of construction work and renovation of public maintenance. With the experience of more than 13 years operating in the construction industry, the company has extensive experience and is viewed as a business that can be held responsible in handling the work related to it. In order to expand the company's services, MHSB also been working with various parties. Photo 2.1 is the company's logo of Muaffaq Holdings Sdn. Bhd. designed by the Directors of the Company. The organizational structure designed to facilitate and expedite the companys activities good management system, is able to reflect a company's strength and determination, every employee in carrying out assignments. The people thatare appointed to hold certain positions within a company should follow the organization. They should be working together continuously toensure the objective and goals can be achieved. This is proven by the successful completion of high value projects efficiently and effectively in line with the goals to be achieved. Therefore, it has given the customer's performance and ability to earn the trust of many companies and other other parties.To expand its business, Muaffaq HoldingsSdnBhdhas established several of subsidiaries. For example,Asaga Corporation SdnBhd (ACSB), MuaffaqKanopiInterprise (MKI) and MuaffaqInterpriseSdnBhd (MISB)

Photo 2.1: Logo of CompanyMuaffaq HoldingSdn. Bhd.

2.2 Company's Profile

Firma's Name	:	Muaffaq Holdings Sdn. Bhd
Company No.	:	493482-A
Type of Business	:	Private Business
Date of Establish	:	09 SEPTEMBER 1999
Authorized Capital	:	RM 500,000.00
Paid Capital	:	RM 250,000.00
Company Address	:	No.7, Jalan 2/118B, Desa Tun Razak, 56000 Cheras,Kuala Lumpur
Telephone No.	:	
Fax. No.	:	
Main Bank	:	CIMB Bank Berhad (1422-0011353-05-8)

2.2.1 Information of Establishment

Muaffaq Construction Company Holdings Sdn. Bhd. is a private company founded by Haji Abu Bakar bin Haji Ahmad on 9th September 1999. Before founding the company, he was a technician at Kuala Lumpur City Hall(DBKL) for ten years. Then he started his own business as a sub-contractor using the name Muaffaq Holdings Sdn. Bhd. (MHSB) and trying to get small-scale projects that have been successful through contacts in the construction industry and partners working in Kuala Lumpur City Hall (DBKL).

They have vast experience of working as a technician at Kuala Lumpur City Hall as well as additional financial resources to give space and new opportunities to the founders to build a large business empire. The Company is registered with the Contractor Service Centre (PKK) in the class C and class Bumiputra. The company is also registered with the Construction Industry Development Board Malaysia (CIDB) G5 (Specialization B04, CE21), registered with the National Water Services Commission (SPAN) Class C2, the Registry of Malaysia (CCM), registered with the Energy Commission and private bodies in accordance with its capabilities.

Registration is intended to facilitate these bodies monitor the activity of the company in the tender and also can ensure the tender process. A sound company background is very important to assure our customers of awards. Muaffaq Holdings Sdn Bhd.is 100% held by Bumiputera equity and set up to get work - the work of public and private sector contracts in the field of construction and civil engineering.

The company would also like to raise the quality of the performances and appearances by increasing productivity work more efficiently. The important parts that are seriously takenis on the quality service to the customer by the company.

Among the sectors of the works including:

i) The Construction of Building

The company also focuses on the building construction work to expand the business carried on in accordance with the time either from. Now the company is starting to expand his business by acquiring large-scale projects.

ii) Maintenance Works

In connecting the best service to customers, the company braves itself to venture into general maintenance. With this, the company not only provides the basis for the service but it's exciting as a job in Malaysia.

iii) Electrical Works

The company also has skills in providing services for electrical wiring work in a building. To ensure guaranteed quality of service the company's workforce is highly skilled. This is a great achievement for the company to ensure that it continues to grow in line with current needs.

2.3 Company's Objective

Muaffaq HoldingsSdn. Bhd had their own objective in achieving their missionto become a successful contractor's company in Malaysia.To realize these objectives the company will ensure that the services and quality work is in line with Vision 2020.

The management company is indeed working on raising the quality of work and expertise in carrying out the work. The use of high-tech tools and management systems is to ensure improved quality assured work and earn the trust of customers.

Muaffaq Holdings Sdn. Bhd. had their visionand missionso that every employee strives to achieve the target and mission. Visions are very important in an organization that wants to achieve success to compete with companies and other contractors. The vision and mission are:

Vision

Become a company known & thriving by focusing entirely on the customer.

Mission

Continue to maintain quality services to enable companies to gain competitive advantage at all levels and overall customer satisfaction.

2.4 Company's Organization Chart

Diagram2.1:Organization's ChartMuaffaq Holdings Sdn. Bhd.

Table 2.1 List of Project that has been done.

No	Projects	Contract Value	Date Own Site	Project Completion Date	Client
1	PerkhidmatanSenggaraanSistem Pam Dan PeralatanBerkaitan Di PerumahanAwam, JabatanPengurusanPerumahan, DBKL (2008 / A016).	1,000,000,00	01/08/2008	31/07/2011	DewanBandaraya Kuala Lumpur
2	PerkhidmatanSenggaraanSistem Pam Dan PeralatanBerkaitan Di PerumahanAwam, JabatanPengurusanPerumahanAwam, Jabatan, DBKL (2008 / A016)	1,000,000,00	01/08/2008	31/07/2011	DewanBandaraya Kuala Lumpur
3	TawaranUntukPerkhidmatan, Penyelenggaraan Dan NaiktararafRumah Pam SistemKawalanBanjir Di PersimpanganBertingkatJalan Raya Dan Di Sungai-Sungai Di Seluruh DBKL.(2008/A037)	1,200,000.00	01/11/2008	31/10/2011	DewanBandaraya Kuala Lumpur
4	Kerja-KerjaServisLurang Dan PaipSaluranNajis Di PerumahanAwam DBKL. (2009/A098)	1,500,000.00	01/12/2009	30/11/2011	DewanBandaraya Kuala Lumpur
5	CadanganKerja-KerjaMengecatSemula Blok 209 PerumahanAwam Taman SentulUtama,Kuala Lumpur.(2010/B021)	199,800.00	08/04/2010	30/06/2010	DewanBandaraya Kuala Lumpur

No	Projects	Contract Value	Date Own Site	Project Completion Date	Client
5	CadanganKerja-KerjaMengecatSemula Blok 209 PerumahanAwam Taman SentulUtama,Kuala Lumpur.(2010/B024)	199,200.00	08/04/2010	30/06/2010	DewanBandaraya Kuala Lumpur
6	CadanganKerja-KerjaMengecatSemula Blok 209 PerumahanAwam Taman SentulUtama,Kuala Lumpur.(2010/B022)	199,950.00	08/04/2010	30/06/2010	DewanBandaraya Kuala Lumpur
7	Kerja-KerjaPenyelenggaraanJejambat,Jejantas, PagarKeselamatanPejalan Kaki Dan Lebuhraya Dan Lain-Lain PerabotJalan Di Dalam Wilayah Persekutuan Kuala Lumpur.(2006/A051)	1,500,000.00	10/08/2006	09/08/2009	DewanBandaraya Kuala Lumpur
8	TawaranUntukKerja-KerjaMembinaBaru, Menyelenggara,Menaiktaraf, BaikpulihKawasanPersekitaranDalam Dan LuarRumahPangsa Di KawasanPerumahanAwam, DBKL. (2007/A035)	3,000,000.00	17/09/2007	16/09/2010	DewanBandaraya Kuala Lumpur
9	Kerja-KerjaServis, Membaiki, Membina Luring Dan MenukarPaipSaluran Najis Serta Kerja-KerjaSampingan di PerumahanAwam DBKL. (2006/A076)	2,250,000.00	01/09/2006	31/08/2009	DewanBandaraya Kuala Lumpur

Table 2.2 List Of Ongoing Project

No	Projects	Contract Value	Date Own Site	Project Completion Date	Client
1	Cadangan Membekal, Membina Dan Menyiapkan 25 Blok (50 Unit) Rumah Kelas L5	3,214,900.50	16/03/2013	15/03/2014	Felda Agriculture Sdn Bhd
2	Cadangan Membekal, Membina Dan Menyiapkan Sebuah Dewan Semai Bakti (Jenis A) Di Felda Sungai Nerek	736,180.50	04/03/2013	24/11/2013	Felda Sungai Nerek
3	Cadangan Membekal, Membina Dan Menyiapkan Sebuah Dewan Semai Bakti (Jenis A) Di Felda Lepar Utara 3	740,000.00	04/03/2013	10/11/2013	Felda Lepar Utara 3
4	Cadangan Membina,Menyiapkan Dan Menaiktaraf Longkang Tanah Kepada Longkang Konkrit Di Felda Jenderak Selatan	265,995.00	04/03/2013	21/07/2013	Felda Jenderak Selatan
5	Cadangan Membina Baru, Menyelengara,Menaiktaraf,Persekitaran Dalam Dan Luar Rumah Pangsa Di Kawasan Perumahan Awam, DBKL. (2010/A245)	1,000,000.00	25/07/2011	21/07/2013	Dewan Bandaraya Kuala Lumpur
6	Cadangan Kerja Penyelenggaraan, Menaiktaraf Dan Baikpulih Kerja-Kerja Elektrik Di Unit Penyelenggaraan DBKL. (2011/B088)	200,000.00	22/08/2011	21/08/2013	Dewan Bandaraya Kuala Lumpur

No	Projects	Contract Value	Date Own Site	Project Completion Date	Client
7	Perkhidmatan,Penyelenggaraan Dan Naiktaraf Sistem Pam Kawalan Banjir Di Sungai-Sungai Zon 2 DBKL.(2010/A248)	635,616.00	03/05/2011	02/05/2013	Dewan Bandaraya Kuala Lumpur
8	Membina Jalan Keluar Dari Jalan 2/10, Taman Koperasi Polis Fasa 1 Ke Lebuhraya DUKE, Kuala Lumpur.	333,434.50	15/03/2012	17/05/2012	Dewan Bandaraya Kuala Lempur
9	Membekal,Membina Dan Menyiapkan 3 Unit Rumah Kakitangan Kelas L3 Di Lepar Utara 7	355,500.00	15/06/2012	14/10/2012	Felda Global Ventures Plantations Sdn Bhd
10	Membekal,Menyiapkan Bangunan Memproses Arbuscalar Micoraza Fungus (AMF) Di PPPTR	720,000.00	01/06/2012	02/06/2013	Felda Agricultural Services Sdn.Bhd

CHAPTER 3

REINFORCEMENT CONCRETE WORK ON THEGROUND BEAM AND COLUMNS

3.1 Introduction

Before a building is constructed, a comprehensive study will be made by the engineer to ensure that the building structure is able to bear the imposed load on it. This study is important in the process of constructing a building because it will determine the safety and durability of a building structure. The applied load is different between a building with other buildings of the type and use. Therefore, it requires a thorough study of the structure and perfect for every building constructed.

Reinforced concrete is defined as concrete containing reinforcement or steel bars to increase its tensile strength. It is an application of the properties of steel having high tensile strength. So a combination of the two materials, concrete and steel to produce a strong and stable structure from various aspects.

Beam is horizontal component bearing the loads of the roof, floor, and walls as well as live loads. The seam must of overcome and resist bending, shear and torsion. Sometimes the beam acts as a binding. The main function of this beam is to shorten the distance span slab supported by a structural or load-bearing structure in accordance with the requirements of the application. A type of beams is the main beam, the second beam, the beam fasteners and edge beams.

Columnsare the vertical component of the axial load distribution beams. Column is alsoone of the members that usually afford compressive force or tensile force. For structures, columns are members to transfer loads from the roof, beams and foundation. It is a very important member of a building structure. Thus, a greater safety factor should be given to the design of columns compared to the factor of safety for the other members, because of the failure of the must would render part of the structurefailure.

3.2 Background of the Project

Based on the research project carried out over a period of practical training, the title of the proposed project is CadanganMembinaDuaPuluh Lima(25) Blok (50 Unit) Rumah Kakitangan Berkembar Kelas L5 In Pusat Penyelidikandan Pertanian TunRazak (PPPTR), Sungai Tekam,Jerantut, Pahang. Class L5 home construction built for the purpose of settlement for PPPTR Felda staff.

Muaffaq Holdings SdnBhdsubsidiary for this tender is Asaga Corporation. The project is built on a site measuring 145 square meters; the client isFelda Agricultural Services SdnBhd with a total contract value of RM 3,214,900.50 and awarded the contract to complete the construction project for 1 year starting March 16, 2013 until March 15, 2013. Therefore, Muaffaq Holdings Sdn. Bhdwill ensure its subsidiarywork hard to do the construction work in tandem with the long setting work done by the company.

Certainly in a construction project there are parties directly involved in the completion of the construction project. The parties involved in the construction isTn.HjZaabaBin Yahya as a Manager for Felda Agricultural Services SdnBhd (FASSB) and the Consulting Engineers is Mr..MohdNazimBinMohdAzman from Felda Engineering Services SdnBhd (FESSB). While the Mechanical and Electrical for this project is Earth Peace Building (M&E) Sdn. Limited. The other party appointed for the earthwork is ZahimSdn Bhd. Photo 3.1 shows the site construction at FeldaPPPTR, Jerantut, Pahang.

Photo 3.1: Site construction at Felda PPPTR Tekam

3.3 Reinforcement Concrete Work on the Ground Beam and Column

3.3.1 Manufacturing and Installation of Formwork

Formwork is used to mould concrete and generally it is the only element that is temporary until the concrete achieve its maturity. Formwork material is made of wood and plywood. This material is very widely used in the construction of the formwork. In fact, it is readily available and easy to use. The choice of wood is also important because of very dry wood will absorb water from the concrete, and wet wood will shrink and cause changes in the size and shape of the concrete. Formwork function should be able tostand with pressure from the concrete when poured into a formwork to maintain its shape without any leakage.

Formworkcan be reused for the other members of the building structure. So this can save the cost of building construction. The surface of concrete also depends on the formwork surface. Therefore, employees must ensure that the surface is always smooth and clean before formwork assembly work is done. Peters (1991) explains that these parts should consist of formwork facing or ply facing (board), soldiers (binder) and framing (frame). Photo 3.2 shows the parts of the board should have in each formwork. All parts will be combined to produce the desired formwork with nails. For works of this formwork assembly, a skilled worker and two workers were needed.

Photo 3.2: The parts of the formwork

In Photo 3.3, boards will be cut to follow required size on thecolumns and ground beam.Cutting machine is a more economical use of time than using a handsaw in cutting the board. In addition, inspection of the function cutting machine must be checked place before starting the cutting. Photo 3.4 shows the handsaw machine used at construction site.

Photo 3.3: Worker cuts formwork with handsaw machine.

Photo 3.4:Example of a handsaw machine that is used in the construction site.

After cutting the board, the next work to be done is nailing the boards. Employees need to connect a 40mm nail over all the boards to produce a perfect formwork. Photo 3.5 shows the employeedoing the nailing work with a hammer. In fact, workers also use a lot of nails on the number of formwork assembly to ensure it is really powerful and strong. Photo 3.6 is a picture of a formwork completed before it was lifted into the building using a rope.To ensure long-lasting formwork, employees will paint black oil on the board in shows photo at 3.7.

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Photo 3.5: Nailing work on formwork.

Photo3.6: Completed formwork at construction site.

Photo 3.7: Paint black oil on the formwork

Once the work nailing formwork is complete, work formwork face socket of the will be done on the site construction. Employees need to connect a 40mm nail over all the boards to produce a perfect formwork. Photo 3.8shows the employees doing the work by using a hammer to nail formwork on the ground beams. In fact, workers also use a lot of nails on the number of board assembly dies for formwork assembly is really powerful and strong. Photo 3.9 is a picture of the formwork ground beams, which were completed before the concrete work done. Usually works on formwork assembly requires three people skilled labour.

Photo 3.8: Installation formwork on the ground beam

Photo 3.9:Formwork was complate on the ground beam

Works formwork assembly must be done carefully so as not installed cracked formwork during concrete pouring work soon. To strengthen the formwork assembly on the gorund beams, timber fasteners and spikes will be nailed on formwork as shown in photo 3.10 and sectio. The distance between each timber fasteners installed in the formwork is 300mm. Nail are used as benchmarks depth into concrete casting on formwork. To shows the true picture on the ground beam, Diagram 3.1 shows a cross section A-A taken from photo 3.10 to position this steel reinforcements on board.

Photo 3.10: Timber fasteners and spikes on ground beam and section A-A

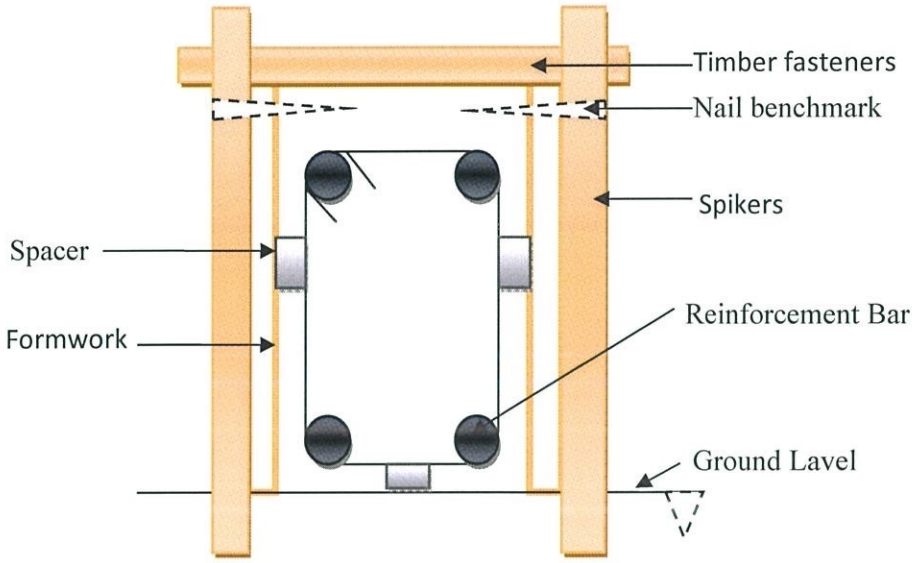

Diagram 3.1: Cross section A-A on the ground beam

Photo 3:11shows the usage of R6 steel bar with 300mm length on the fomwork for the purpose of binder brick.

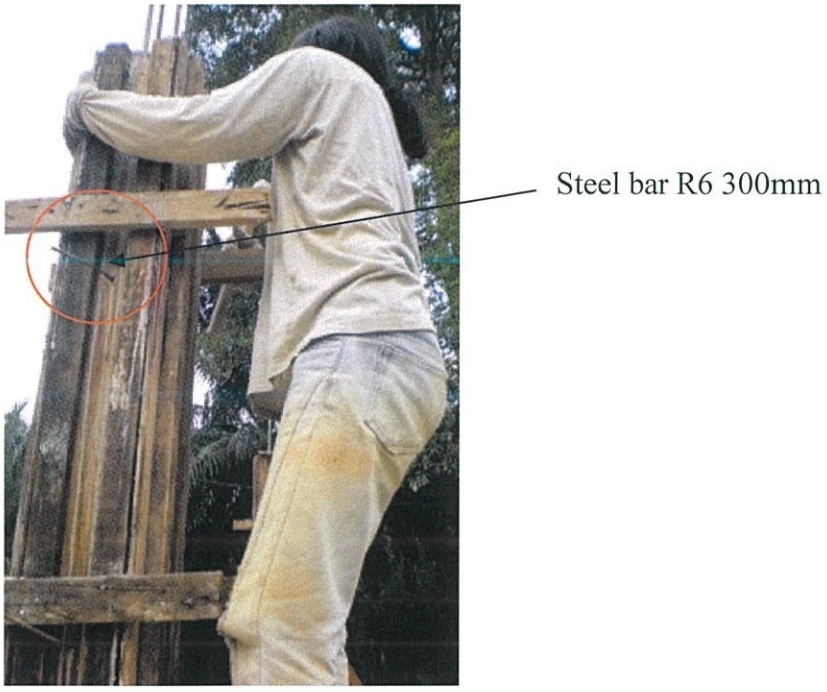

Photo 3.11: R6 300mm steel bar on the column

3.3.2 The Installation of Steel Reinforcement

Work of forming or reinforcement of structural steel construction will involve the marking and measurement work and bending work. Some things to keep in mind when the work performed is steel reinforcement must be free from oil and grease and free from dust and other dirt. In fact, the steel must be cut and bent in the form as specified in the drawings. Reference in Photo 3.12 and Photo 3.13, the type of steel reinforcement steel used for the construction of this home is the R6 and Y12, it involves two people involved in the work of cutting the reinforcement. Steel bars cutting is done with photo 3.14.

Photo 3.12: Steel bartype R6at construction site.

Photo 3.13: Steel bar type Y12at construction site.

Photo 3.14:Steel bar cutting using steel cuttermachine.

Bend reinforcement methods require high skills jobs that are not damaged steel bar and bending process also requires wide workspace. There are two methods bending of steel bars that can be done. Based photo 3.15, with the first method is to use a bending tool bar (bar bender) is used for mild steel with a diameter less than 12 mm in diameter. Completed reinforcement formed as photo 3.16 will be used in parts of the building which was designed by engineers drawing. The second method is to use a tool to bend steel bending machine types (bar-bending machine) for steel with a diameter greater than 16 mm as shown in the Photo 3.17.

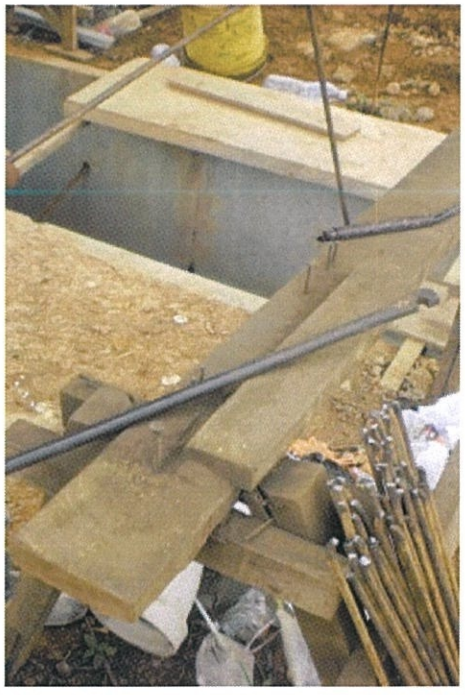

Photo 3.15:Bar benderused to bend thesteel bars.

Photo 3.16: Steel barswhich was bent at construction site.

Photo 3.17: Steel barY12 which had been bent usingmachine.

The purpose of this reinforced is designed to adjust the appearance of the building in order to control the strength of the building's structure. Diagram 3.2 shows a specification for a column, while diagram 3.3 shows a specification for the ground beam formed in the construction of this house. Thus, the formation of a proper reinforcement is very important because it affects the quality of construction of the building. A skilled worker and two workers are needed to ensure bending steel bars according to set specifications. After bending steel bars, it is added to the formwork that has been put in to produce the building structure.

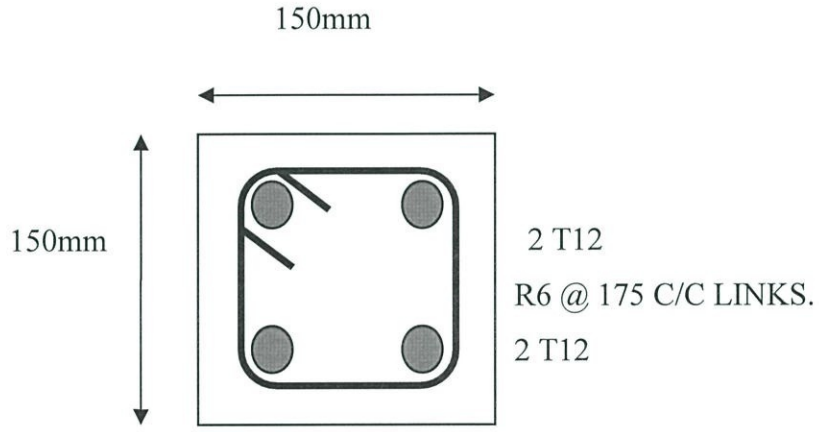

Diagram3.2:Spesification of reinforment bar for column according by Engineer

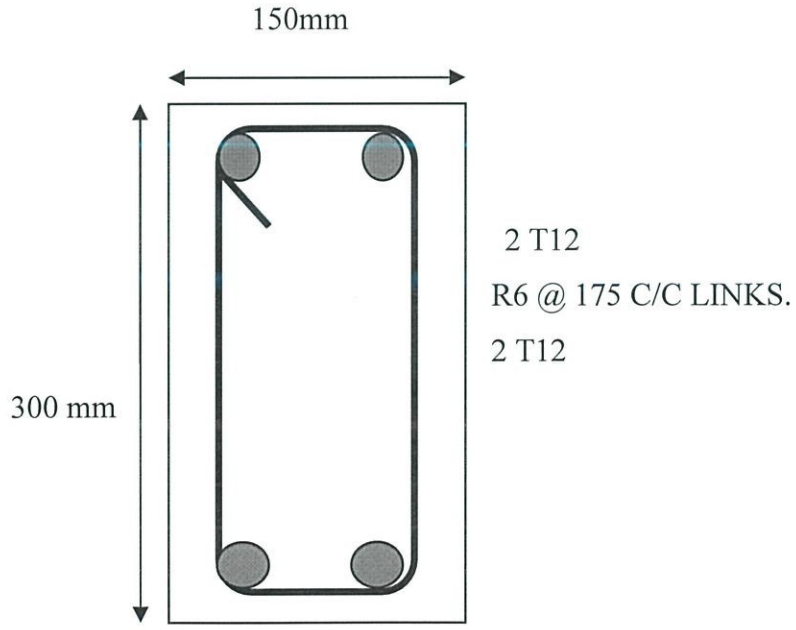

Diagram3.3: Spesification of steel bar for ground beam according by Engineer.

Steel bars Y12 marked using a chalk marker to mark distances for R6 steel bar installation. Photo 3.18 refers to the type of bonding used to connect the bond between Y12 steel bars and R6 is Slash Ring bond. This type of bond is used in steel bar to prevent from slipping on the vertical and horizontal. Slash Ring using only one bond in a row either horizontally or vertically. After bonding reinforcement for column, it will be connected together with floor reinforcement.Based on the photo 3:19 the installation process reinforcement in the floor beams is continued, installation work must be done carefully so as not meeting the reinforcement steel formwork, If steel reinforcement attached to the formwork will look after the work of opening formwork after the concrete work done. The workers took a four-day period to ensure the reinforcement installed completely according to design specifications that have fixed. Employees are prohibited altogether by the employer from doing the work when it is raining. This is because wet work conditions will result in to employee slips and fall due to slippery environments.

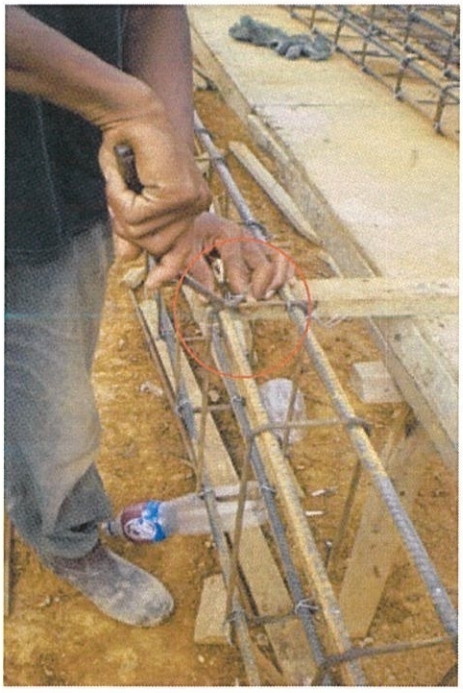

Photo 3.18: Slash Ring Bond that connects Y12 steel bars (horizontal) and R6 steel bar (vertical).

Photo 3.19:The installation ofreinforcement on ground beam at construction site.

Photo 3.20: The installation of reinforcement on column at construction site

3.3.3Concreting Work

1. Introduction

Concrete is a composite material commonly used in construction. It is a combination of cement and aggregates such as sand, fine and coarse aggregates. These materials are added at the rate of mixing was specific as a fixed. Is one of the most important building materials to and most used in a construction project.Therefore, the techniques used to produce good concrete must be understood and be carefully investigated. Quality of concrete produced depends on the quality of raw materials used such as cement, aggregate, water, rates and ways of mixing, ways of transport and compressive.

If the raw materials used are of low quality, then the resulting concrete will have low standards and give result the concrete is not strong and does not meet specifications. Therefore, concrete technology improves that all materials to be used should be tested and get the approval standards set before it can be used for construction work. Concrete strength is also generally between 23.34 N/mm2 (300 psi) for concrete reinforcement types. Therefore, some mix trial (Trial Mix) should be provided in advance of the concrete factory to inspect selected mix rate can achieve the required grade.

Abdul Rahman (1983) describes the important things that affect the mixing process is the water content because it involves the workability of the mixed concrete. High water content,low workability of concrete. Therefore, to obtain a high concrete workability and high strength, the cement content should be added and cut-stone aggregate content.

2. Concrete Mixer

Normally concrete can be mixed by using two methods of mixing using the mixer machines and supplies ready stock from factory. Normally mix mixer mixing machines is use only for small quantities. Measures of cement should be added 10% to facilitate the process of the concrete mix. During the mixing of concrete in this way, the material will be mixed dry mix in advance and then the water will gradually mixed with the correct set up of materials that blend well.

Concrete mix ratio set by the engineers in the contract is the ratio (1:1:2) of grade 30 by using the mixture using a mixer machines. Photo 3.21 shows the mixer machines used in the concrete mix. While the consultant has determined the grade 30 syllabus mixing ratio using a measuring basket of a cement box basket, a basket sandbox, two basket stone box used.Basket measuring is 12mm × 12mm × 12mm like phoho 3:22 to the concrete mix. Concrete work can only be done if prior permission from the project consultant and concrete work should be monitored. Photo 3.23 shows work undertaken concrete mix performed at the construction site.

Photo 3.21: Mixer machine on construction site.

Photo 3.22:Measuring basket that is used.

Photo 3.23:Mixing of concrete

3.The Concrete Work on Formwork.

Concrete works equipment and machinariesneed to enable work to be done. Based on photo 3.24, the workers transport the concrete on the ground beam by push carts. After finished mixed concrete, site manager will give instruction to employees to start work on the concrete casting formwork.

Photo 3.24: Push carts on the site construction

Concreting work requires building technicians, one supervisor, four workers are pouring concrete in formwork ground beams and column. Based on the photo 3.25, concreting work on the ground beam, after dry concrete formwork it will open and work on mold opening took four days. Further work on the concrete ground beam formwork proceed as shown in photo 3.26 and bucket to be used well into the concrete on formwork at the column. Before the concrete work done on column, site manager will be ensure that the concrete structure building is completely dry and perfect it was meant to get a strong building structure.

Photo 3.25:Process of pouring concrete on the ground beam at construction site.

Photo 3.26: Process of pouring concrete into the column at the construction site.

4. Compaction Concrete

Compaction process is an important process in a concrete mix. If the concrete is not fully compacted, then it will result in the pores and airway, or better known as honeycomb. The presence of these cavities can cause the concrete strength decreases. According to information from the engineers' buildings, 2% air cavity can reduce by more than 10% of the concrete strength. The airway is occurring in concrete with low workability. Picture 3.27 shows workers using the stuffing machine to avoid the presence of air cavities. Two workers were needed for compaction work on this house. Employees must be careful when doing this compaction because they have to handle a heavy compacting machine on tall buildings.Photo 3.28 shows the process compacting work concrete on the column to use machines.

Picture 3.27:Compaction work done after the concrete put in a formwork using the poker vibrator machine.

Photo 3.28: Compacting work on column

There are a few guidelines to ensure compaction was done perfectly. Among them is the air bubbles rise to the surface when compacting concrete. When air bubbles are no longer visible then it is deemed to have solid concrete. Next, the concrete surface can also be used as a guide in the concrete to be compact if there is water on the concrete surface.Photo 3.29 is the presence of water on the concrete surface after compacting work is done at the construction site.

Photo 3.29:Water found on the surface of the concrete indicatesthat concrete is compact.

5.Concrete Preservative

Concrete shall be in a moist condition for several days after the concrete work done so that they respond to the concrete hardening process. Concrete curing is a process that allows the concrete to be stronger and durable. If uncured concrete is allowed to dry thoroughly and quickly, then the concrete surface to be less rugged and crack, thereby reducing the strength of concrete.

Preservation a method is to provide water to the concrete was poured for formwork posts and beams of the building, the mold should be moistened board because it is one of the effective moisture retainer. Photo 3.30 shows the preservation of buildingsmade of concrete at least 1-4days for the concrete to achieve the desired level of maturity but this site requires only 4 days to open the formwork. This is because the contractor had to race against time to ensure timely completion of projects.

Photo 3.30:Concrete curing work left for 1-4 days at the construction site.

3.3.4 Concrete Test

1. Compression test

Compression test is another important test in concrete work. The purpose of this test is to determine concrete strength of concrete. Results from these tests will give the impression that it is the right mix and permanent. It will also give a clear picture to be made of concrete.

Size of concrete cube commonly used for this test is 150 mm x 150 mm x 150 mm. Cube mould material is made of steel or cast iron. Each mould must have a flat plate and a clean landing. Then, cubes rubbed with releasing agent on the mold inside so that the already hardened concrete will not stick and easy to remove.

According to photo 3.31, six cube moulds filled with three layers ofGrade 30 concrete with each layer of pounded 35 times with steel rods. The upper surface of the concrete should be leveled so flush with mould. As soon as the test examples were finished, it should be preserved in the laboratory for further testing. Table 3.1 describes the first stage of the cube marked 1, 2 and 3 are soaked in water for 7 days and in the second stage, the cube marked 4, 5 and 6 soaked for 28 days for results concrete on ground beam. A concrete cube commonly used for this test is 150 mm x 150 mm x 150 mm. Cube mold material is made of steel or cast iron. Each mould must have a flat plate and a clean landing. Then, cubes rubbed with releasing agent (mould oil) on the inside so that the already hardened concrete will not stick and easy to remove for example at photo 3.32.

Photo 3.31:The concrete was poured into the mould for test cubes.

Photo 3.32: Oil black sweep to cubes mould

Table 3.1 Results of concrete compression testing in the laboratory

Cubes Marks	Date Tested	Age at Tested (days)	Cubes Weight (kg)	Compressed Load (kN)	Compressive Strength (N/mm2)	Average (N/mm^2)
1	11.6.13	7	8.024	580.50	25.800	26.050
3	11.6.13	7	8.114	557.40	24.773	
4	11.6.13	7	8.025	620.40	27.578	
2	2.7.13	28	7.922	729.10	32.404	33.966
4	2.7.13	28	8.022	779.90	34.662	
6	2.7.13	28	8.056	783.70	34.831	

Source: Perumus Lab Konkrit (2013)

Count concrete strength grade 30

Dimensional cube is loaded

: 150 mm x 150 mm = 22500 mm2

Average cube marked 1, 3 and 5 = 26 050 N/mm2

= 26 050 N/mm2 / 30 grade concrete

= 0.868

= 86%

Average cube marked 2, 4 and 6 = 33.966 N/mm2

= 33 966 N/mm2 / 30 grade concrete

= 1.132

= 113%

3.3.5 Problem on the Concrete Works and How to Overcome

1. The state of formwork cooling

Concreting works should be done carefully to avoid formwork pushed or kicked out when pouring concrete pressure and thus can cause formwork loose or apart. In addition, the use of the machine must be operated with good stuffing because it can also piles on the formwork can because it cracked. Photo 3.33 shows the concrete is poured into the formwork to flow out through space formwork pieces that do not close. To overcome this problem, after completion of concrete work, an employee is required to inspect the concrete to flow out through space on board die. Employees will use the wet paper to be inserted in the interstitial concrete formwork to prevent further flow out.

Photo 3.33:Flow out through the cracks of concrete formwork.

2. Honey comb

Honeycomb is a problem that arises in the concrete has hardened after mold board removed. Based on photo 3.34, honeycomb look at the concrete surface appeared aggregate stones and photo 3.35 show that there been posted honeycomb. This problem occurs due to vibration that exceeds limits leaving the impression that there is water in the concrete to flow out of the mold board. Honeycomb presence will cause the concrete strength decreases. Based on information from the building site manager, 2% honeycomb existence can reduce up to 10% of the concrete strength. Way to overcome this problem is that workers will be scaling back the use of cement in concrete honeycomb available.

Photo 3.34:Honeycombis there on the concrete.

Photo 3.35:Honeycomb which has been plastered on concrete.

CHAPTER 4

CONCLUSION AND RECOMENDATION

4.1 Suggestion

4.1.1 Provide a sufficient store.

The small store space provided would cause other materials such as steel reinforcement to be scattered and exposed to the weather that can cause it to rust easily. While the doors are made of wood can also cause damage to the wood structure, thus this condition will result in a poor quality of construction. Therefore, the contractor should provide a bigger space to store building materials to keep the quality of the material is in good condition.

4.1.2 Skilled Labor

The labor force is very important in the construction industry because construction work depends on their skills. Therefore, the contractor must hire workers who are committed to working with the necessary experience. If the employee is still new in the construction field, they should provide job training for more skilled workers and produce quality work. Employers should pay attention to the workers to avoid anything unexpectedto happen and can result in delayed construction work.

4.1.3 Machinery inspection

Mechanical damage can cause a work in progress to stall. For example, when doing concrete work on the pole, stuffing machine suddenly breaks down. This will result in concrete that is not satisfactory if no replacement is made available. Thus, inspection of the machine to be used is very important before the work is done.

4.1.4 Provide Dustbin for Rubbish

Based on observations made during the practical training, found garbage thrown away by employees because there is no dustbin provided. Therefore, the recommendations provided are making special landfills for overcoming this problem so that the site is not built like a garbage dump.

4.2 Conclusion

Based on practical experience on site, it can be stated that the reinforced concrete work is an important element in building construction. Through concrete work done on construction sites, important elements in the construction of reinforced concrete beams and poles can be seen more clearly in line with the theory learned. Among them is a reinforced concrete work started with the selection of steel bars to be used for the installation of steel reinforcement in ground beam and columns. The use of steel bar reinforcement involves the formation of iron, the type of bond that is used and the installation of steel reinforcement in building structures. Next is the installation of formwork made according to specifications drawings columns and beams provided by the building engineer. A neat formwork assembly is very important to produce quality concrete.

New experience gained while implementing practical training is to learn and see real atmosphere closer to the construction procedure of reinforced concrete beams and columns. Along with the theoretical work done after the installation of concrete formwork board, by pouring concrete into a formwork at construction sites involving machinery and machine also has new knowledge related to the function and the way management machinery. Concrete work done in the first pillar formwork, followed on formwork concrete ground beam. Then, the concrete is compacted by using vibrating machine to avoid the existence of honeycomb. Next, the concrete will be tested through the run of the test, compression test and test to see the strength of the concrete strength and the ability to accommodate the load it receives. Concrete cured at least 28 days to achieve the desired level of concrete maturity. Furthermore, the problems that arose after the concrete work can be known and its solution can be seen up close and clear.

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ALLOW 18000 OUTLET DRAIN TO BE DECIDED AT SITE.

ALLOW 18000 OUTLET DRAIN TO BE DECIDED AT SITE.

6THK. FIXED OBSCURE GLASS LOUVRES WINDOW ON H/HW. WINDOW FRAMES C/W. M.S SECURITY BAR & ALUM. MOSQUITO PROOF NETTING TO MANUF. DETAILS.

230 WIDE P.C DRAIN LAID TO FALL.

PLYWOOD FLUSH DOOR TO MANUF. DETAILS.

115 THK. BWK. WITH 'EX-MET' AT EVERY 4TH. COURSE & 20 THK. CEMENT PLASTERING ON BOTHSIDES.

6THK. ADJ. 'NACO' OBSCURE GLASS LOUVRES WINDOW ON H/HW. WINDOW FRAMES C/W. M.S SECURITY BAR & ALUM. MOSQUITO PROOF NETTING TO MANUF. DETAILS.

115 THK. BWK. WITH 'EX-MET' AT EVERY 4TH. COURSE & 20 THK. CEMENT PLASTERING ON BOTHSIDES.

115 THK. BWK. WITH 'EX-MET' AT EVERY 4TH. COURSE & 20 THK. CEMENT PLASTERING ON BOTHSIDES UP TO ROOF LEVEL.

6THK. ADJ. 'NACO' OBSCURE GLASS LOUVRES WINDOW ON H/HW. WINDOW FRAMES C/W. M.S SECURITY BAR & ALUM. MOSQUITO PROOF NETTING TO MANUF. DETAILS.

TIMBER SOLID DOOR TO MANUF. DETAILS.

150 X 150 R.C COLUMN TO ENGR'S DETAIL.

BEDROOM 3 CEM. RENDER.

BEDROOM 2 CEM. RENDER.

BEDROOM 1 CEM. RENDER.

KITCHEN CERAMIC TILE

DINING CEM. RENDER.

LIVING CEM. RENDER.

PORCH CEM. RENDER.

bath C.T

WC C.T

F.T

SH

WB

TAP

G.T

50 dp.

MH.1

W1 W2 D1 D1a D2 H/V

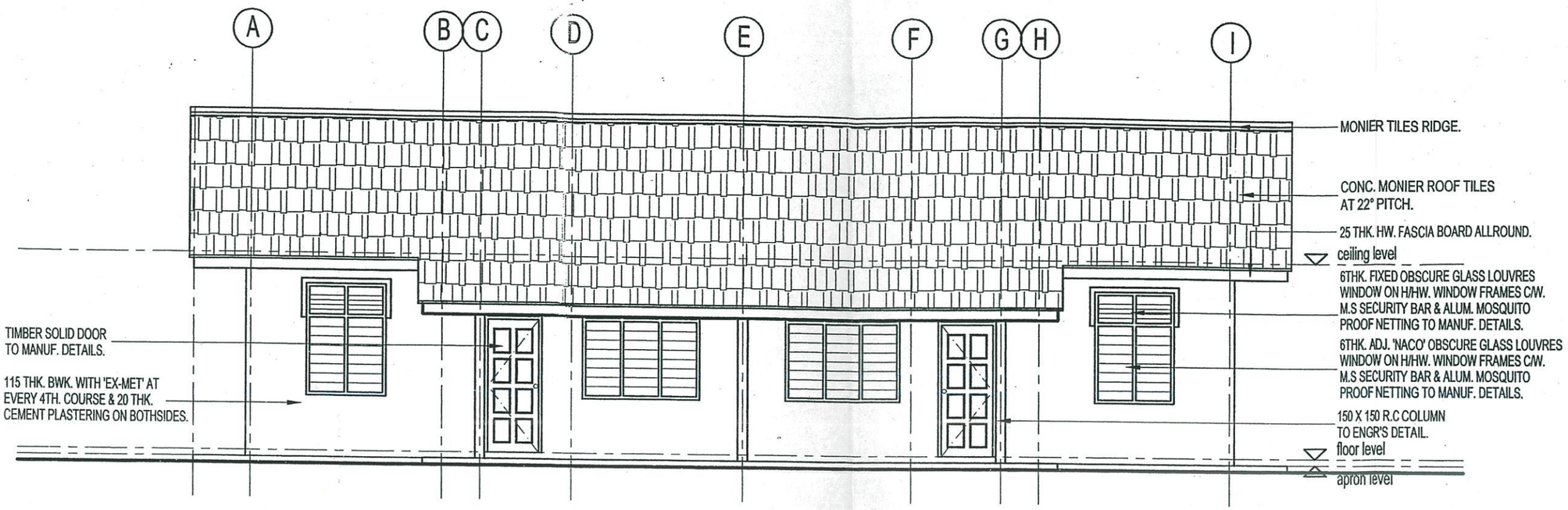
A B C D E F G H I

5 4b 4a 4 3 2 1

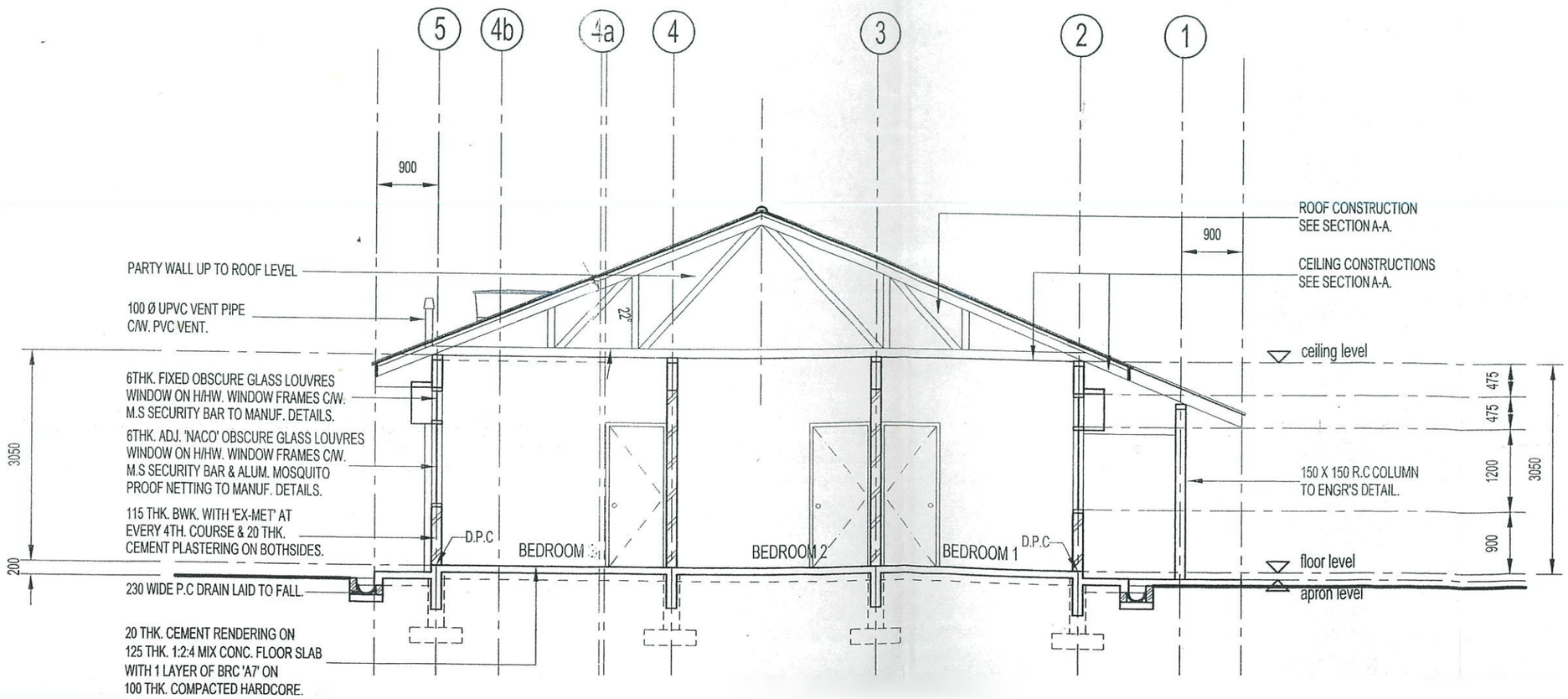
15400 7700 7700 3000 2000 2700 2700 2000 3000 600 1400

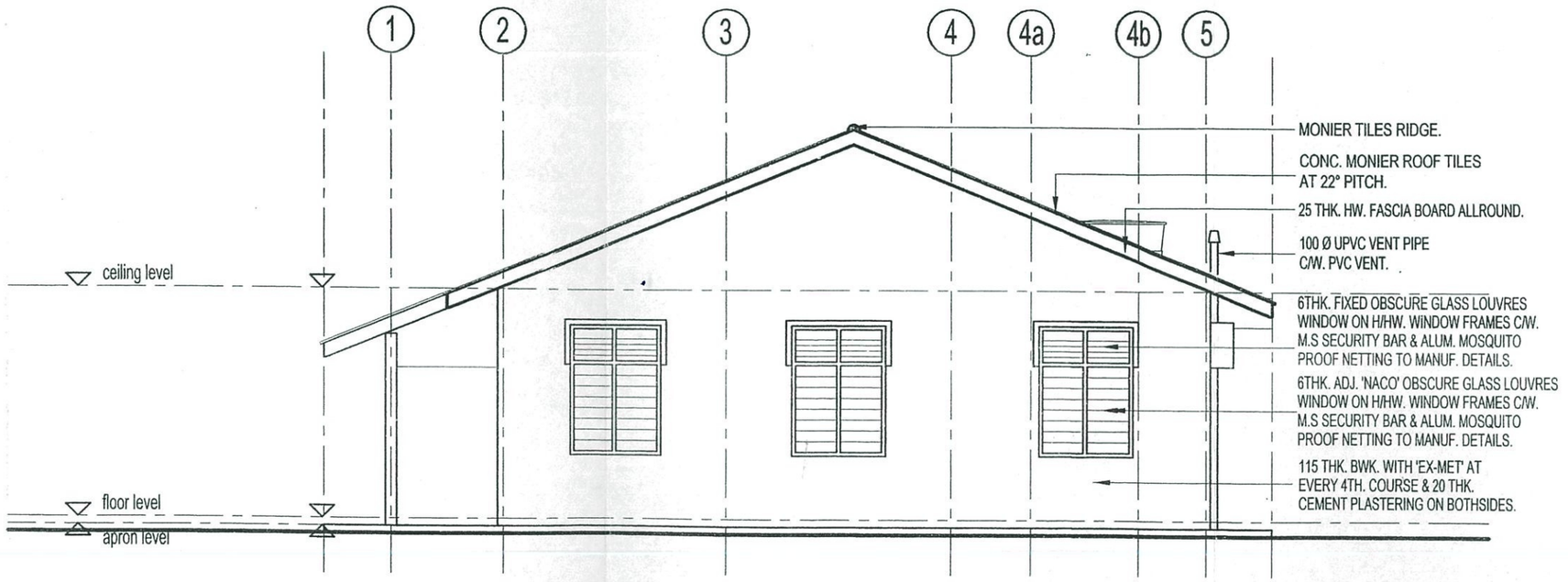
9400 3000 3000 1500 900 900 900 3400 1435 1065

900 3600 900 4100 4100 3600 900 7700 7700

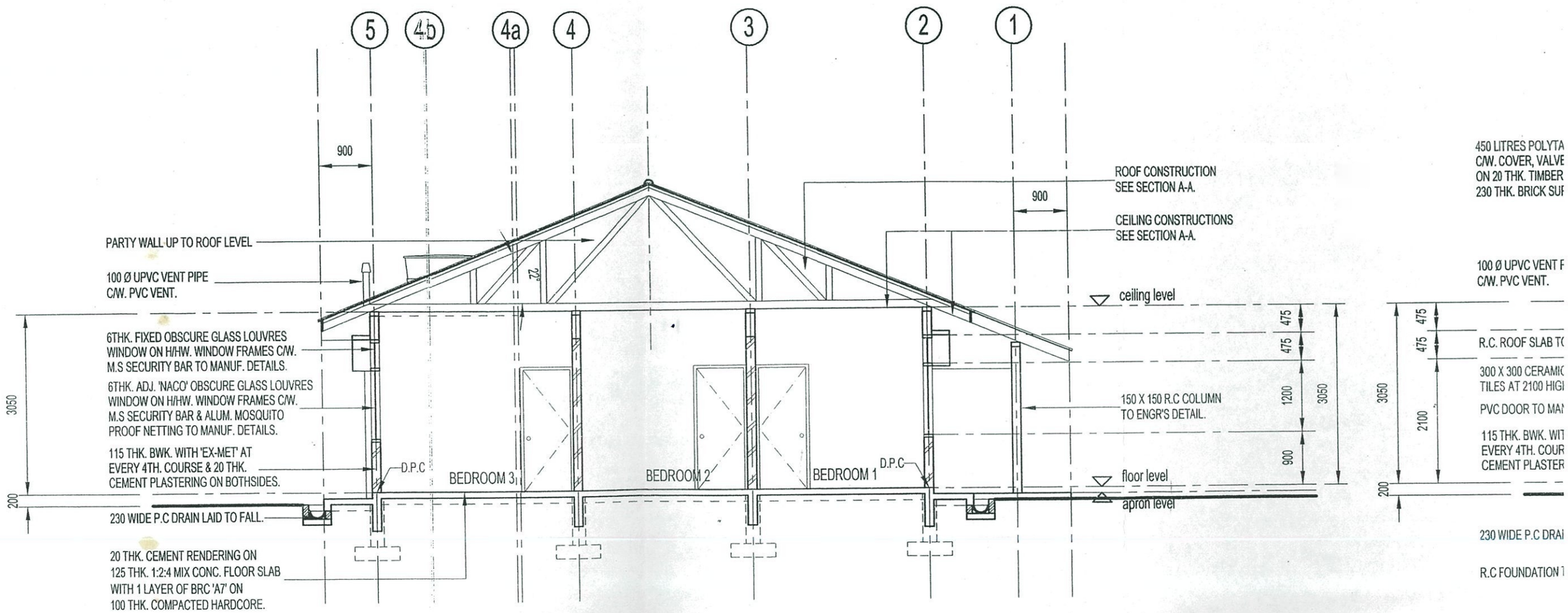


FRONT ELEVATION

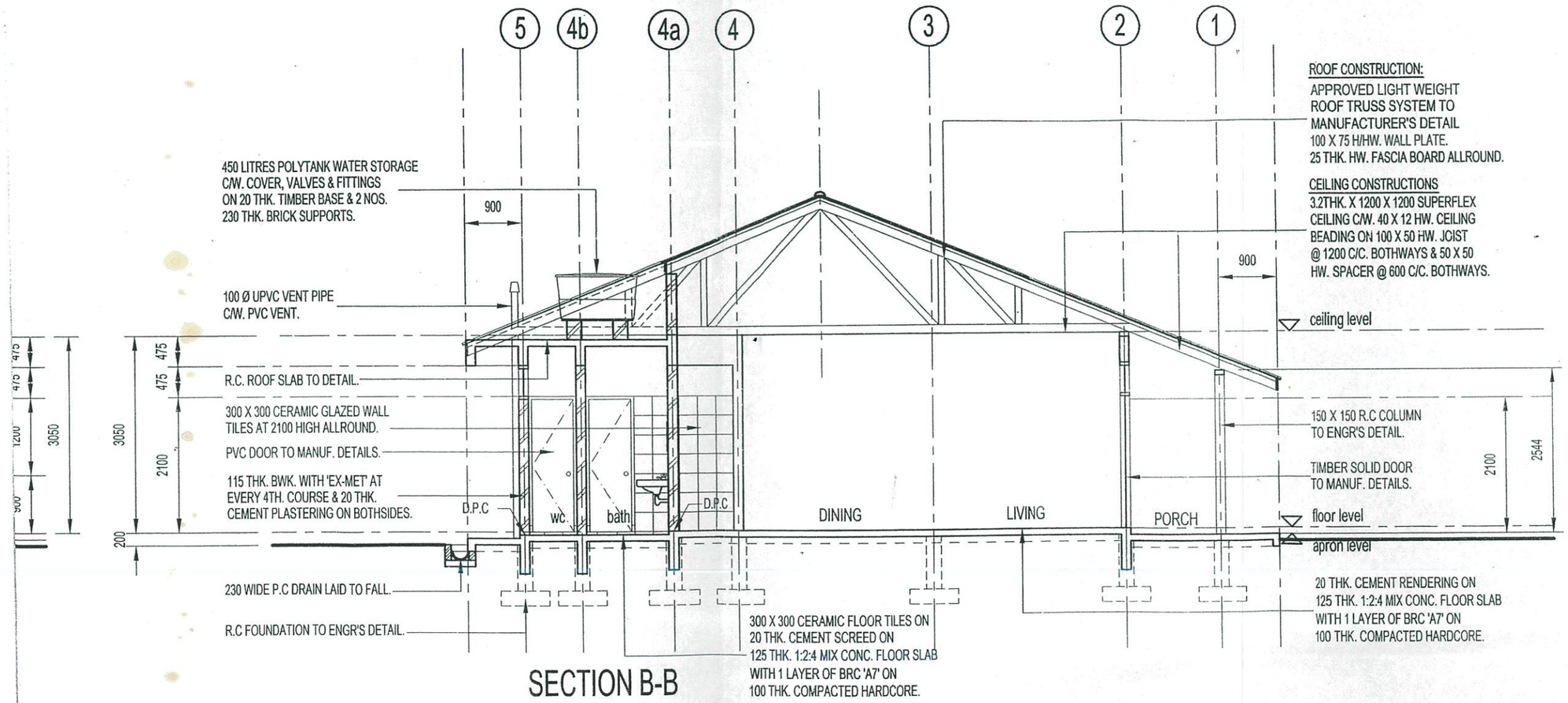




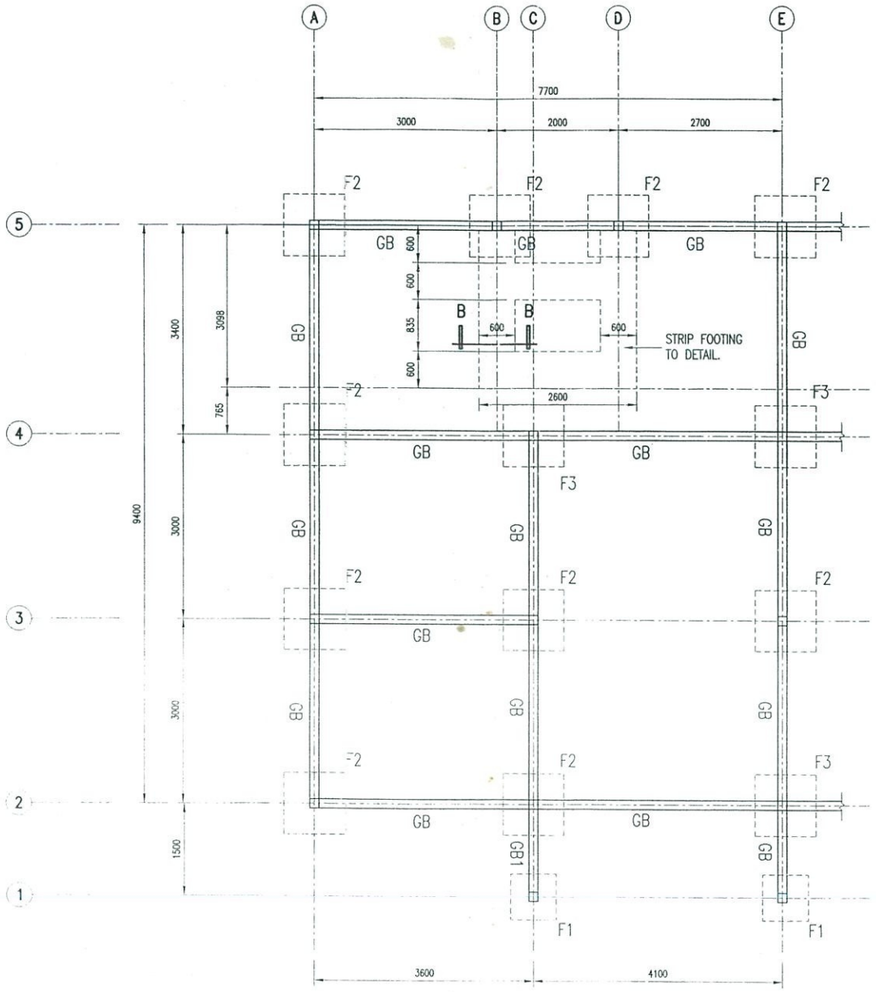
RIGHT ELEVATION


5
4b
4a
4
3
2
1
900
900
PARTY WALL UP TO ROOF LEVEL
100 Ø UPVC VENT PIPE
C/W. PVC VENT.
6THK. FIXED OBSCURE GLASS LOUVRES
WINDOW ON H/HW. WINDOW FRAMES C/W.
M.S SECURITY BAR TO MANUF. DETAILS.
6THK. ADJ. 'NACO' OBSCURE GLASS LOUVRES
WINDOW ON H/HW. WINDOW FRAMES C/W.
M.S SECURITY BAR & ALUM. MOSQUITO
PROOF NETTING TO MANUF. DETAILS.
115 THK. BWK. WITH 'EX-MET' AT
EVERY 4TH. COURSE & 20 THK.
CEMENT PLASTERING ON BOTHSIDES.
230 WIDE P.C DRAIN LAID TO FALL.
20 THK. CEMENT RENDERING ON
125 THK. 1:2:4 MIX CONC. FLOOR SLAB
WITH 1 LAYER OF BRC 'A7' ON
100 THK. COMPACTED HARDCORE.
3050
200
22°
D.P.C
D.P.C
BEDROOM 3
BEDROOM 2
BEDROOM 1
ROOF CONSTRUCTION
SEE SECTION A-A.
CEILING CONSTRUCTIONS
SEE SECTION A-A.
ceiling level
150 X 150 R.C COLUMN
TO ENGR'S DETAIL.
floor level
apron level
475
475
475
1200
900
3050
450 LITRES POLYTA
C/W. COVER, VALVE
ON 20 THK. TIMBER
230 THK. BRICK SUF
100 Ø UPVC VENT F
C/W. PVC VENT.
475
475
475
2100
3050
200
R.C. ROOF SLAB TO
300 X 300 CERAMIC
TILES AT 2100 HIGI
PVC DOOR TO MAI
115 THK. BWK. WIT
EVERY 4TH. COUR
CEMENT PLASTER
230 WIDE P.C DRAI
R.C FOUNDATION T

SECTION A-A


5
4b
4a
4
3
2
1
450 LITRES POLYTANK WATER STORAGE
C/W. COVER, VALVES & FITTINGS
ON 20 THK. TIMBER BASE & 2 NOS.
230 THK. BRICK SUPPORTS.
900
100 Ø UPVC VENT PIPE
C/W. PVC VENT.
R.C. ROOF SLAB TO DETAIL.
300 X 300 CERAMIC GLAZED WALL
TILES AT 2100 HIGH ALLROUND.
PVC DOOR TO MANUF. DETAILS.
115 THK. BWK. WITH 'EX-MET' AT
EVERY 4TH. COURSE & 20 THK.
CEMENT PLASTERING ON BOTHSIDES.
D.P.C
wc
bath
D.P.C
DINING
LIVING
PORCH
230 WIDE P.C DRAIN LAID TO FALL.
R.C FOUNDATION TO ENGR'S DETAIL.
300 X 300 CERAMIC FLOOR TILES ON
20 THK. CEMENT SCREED ON
125 THK. 1:2:4 MIX CONC. FLOOR SLAB
WITH 1 LAYER OF BRC 'A7' ON
100 THK. COMPACTED HARDCORE.
ROOF CONSTRUCTION:
APPROVED LIGHT WEIGHT
ROOF TRUSS SYSTEM TO
MANUFACTURER'S DETAIL
100 X 75 H/HW. WALL PLATE.
25 THK. HW. FASCIA BOARD ALLROUND.
CEILING CONSTRUCTIONS
3.2THK. X 1200 X 1200 SUPERFLEX
CEILING C/W. 40 X 12 HW. CEILING
BEADING ON 100 X 50 HW. JOIST
@ 1200 C/C. BOTHWAYS & 50 X 50
HW. SPACER @ 600 C/C. BOTHWAYS.
900
ceiling level
150 X 150 R.C COLUMN
TO ENGR'S DETAIL.
TIMBER SOLID DOOR
TO MANUF. DETAILS.
floor level
apron level
20 THK. CEMENT RENDERING ON
125 THK. 1:2:4 MIX CONC. FLOOR SLAB
WITH 1 LAYER OF BRC 'A7' ON
100 THK. COMPACTED HARDCORE.
475
475
3050
2100
200
2100
2544

SECTION B-B



LAYOUT PLAN OF FOOTINGS
AND GROUND BEAM KEY PLAN.

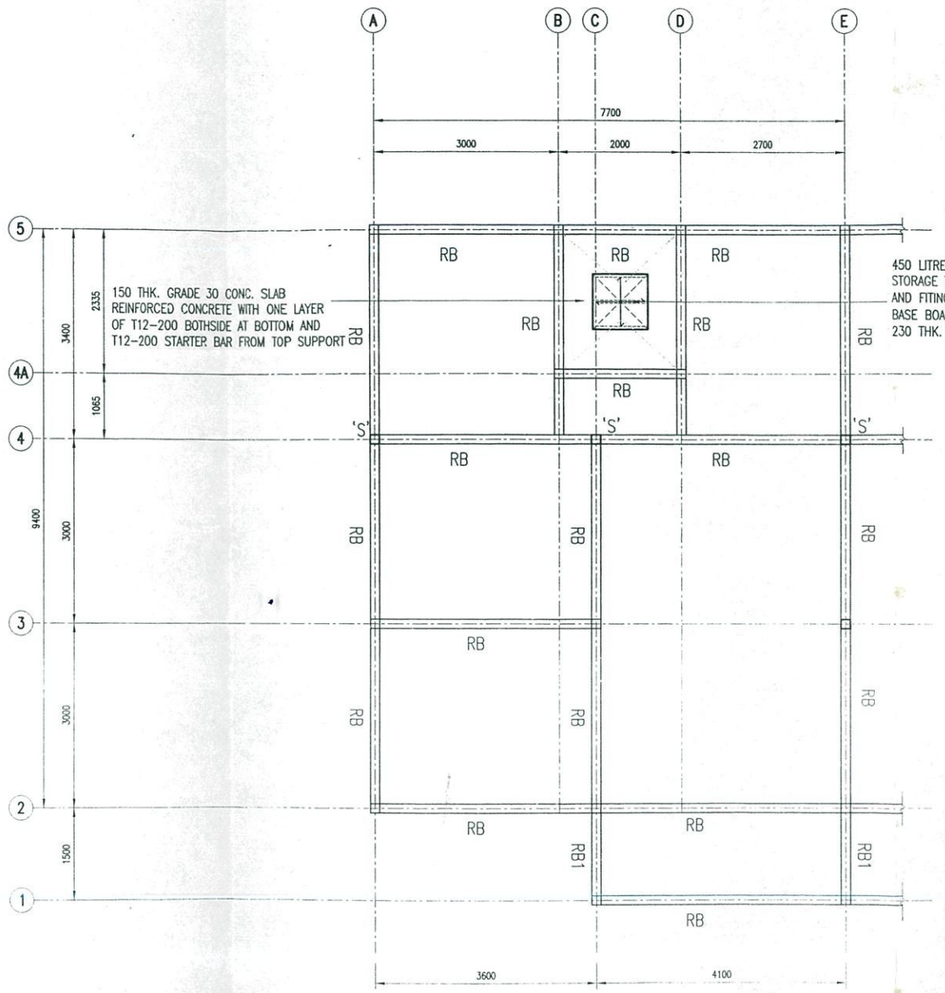
SCALE : 1 TO 50

SIZES OF FOOTING.

F1 = 750 x 750 x 175 THK.
F2 = 1000 x 1000 x 175 THK.
F3 = 1200 x 1200 x 175 THK.

SIZES OF GROUND BEAM.

GB = 150 x 375.
GB1 = 150 x 325.



ROOF BEAM KEY PLAN

SCALE : 1 TO 50

SIZES OF ROOF BEAM.

RB = 150 x 475.

SIZES OF STIFFERNER.

'S' = 100 x 100

ISSUE NO.	REVISION	BY CHK'D	DATE APP'D
T	FOR TENDER	JOO	31.10.12
0	FOR CONSTRUCTION	JOO	14.11.12

REINFORCED CONCRETE

1. The design is generally in accordence to BS 8110.
2. Concrete to be conc. 1 : 1 : 2 mix with aggregate of 20mm maximun size and crushing strength to be 30 N/mm² at 28 days after casting unless otherwise stated.
3. All reinforced concrete to be vibrated.
4. All coarse fine aggregate should comply with requirements for quality and grading to BS 882.
5. Water used for mixing of concrete shall be clean and free from harmful matter.
6. Concrete cover to main bars unless otherwise stated:-
   40 mm min. for footing, stumps and ground beams
   25 mm min. for beams, columns and retaining walls
   13 mm min. for slabs.
7. Laps in reinforcements:-
   42 Dia. in tension Mild-steel bars.
   50 Dia. in tension High Tensil bars.
   30 mm Dia. compression Mild Steel bars.
   30 mm Dia. in compression High Tensile bars.
8. Where there is more than one layer of reinforcement bars in beams 25 mm dia. spacer bars must be provided at 1.5 m c/c
9. Mild Steel bars is denoted by "R" or "M.S." High Tensile bars is denoted by "Y" or "H.T.S."

DWG. NO. | REFERENCE DRAWINGS

PROJECT

CADANGAN PEMBINAAN DUA PULUH LIMA (25) BLOK (50 UNIT) RUMAH KAKITANGAN BERKEMBAR KELAS 'L5' DI PPPTR, SG. TEKAM, JERANTUT, PAHANG DARUL MAKMUR
UNTUK TETUAN:
FELDA AGRICULTURAL SERVICES SDN. BHD.

TAJUK / TITLE

KELAS 'L5'

LAYOUT PLAN OF FOOTING
GROUND BEAM KEY PLAN
ROOF BEAM KEY PLAN

TANDATANGAN PEMILIK / OWNER'S SIGNATURE

FELDA AGRICULTURAL SERVICES SDN BHD (353791-M)
TINGKAT 7, BALAI FELDA,
JALAN GURNEY SATU,
54000 KUALA LUMPUR.

ISSUE FOR BID | APPROVED FOR CONSTRUCTION DATE PROJECT MANAGER

PENGURUS PROJEK / PROJECT MANAGER

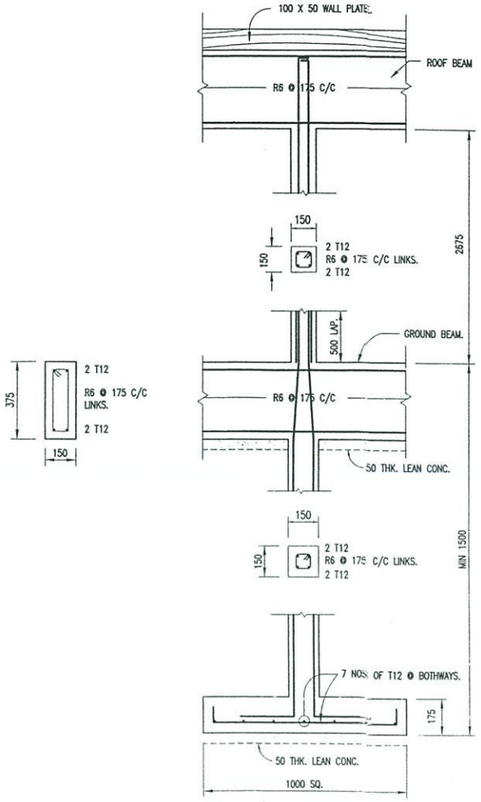
FELDA ENGINEERING SERVICES SDN BHD (299557-X)
TINGKAT 6, BALAI FELDA,
JALAN GURNEY SATU,
54000 KUALA LUMPUR.

TANDATANGAN JURUTERA / ENGINEER'S SIGNATURE

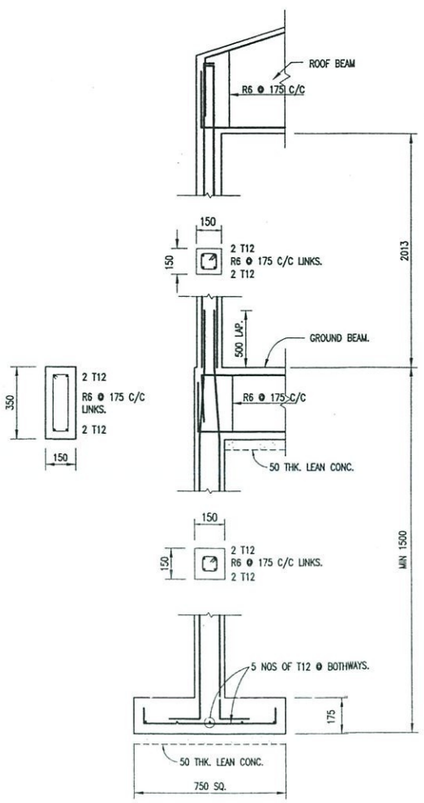
ALLIED ENGINEERING CONSULTANCY SERVICES SDN BHD (236756-D)
TINGKAT 6, BALAI FELDA,
JALAN GURNEY SATU,
54000 KUALA LUMPUR.

DESIGNED BY	W. ZAIM	DATE	14.11.12
DESIGN CHK'D BY	Ir. MOHD FARIZOL	DATE	14.11.12
DRAWN BY	ZAILANJOO	DATE	14.11.12
DWG. CHK'D BY	M.NAZLI	DATE	14.11.12
SCALE	1=50		

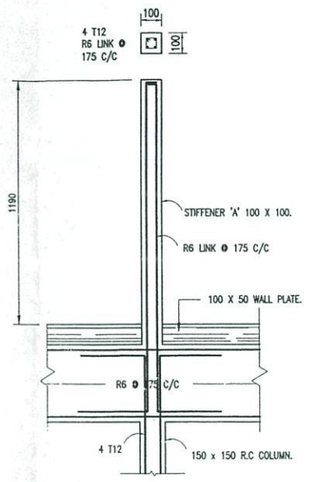
JOB NO.	DRAWING NO.	ISSUE
13/163	C4-1-1	0



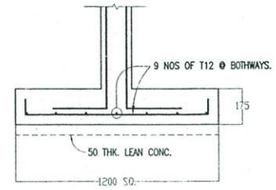
DETAILS OF R.C COLUMNS
AND DETAIL OF FOOTING 'F2'



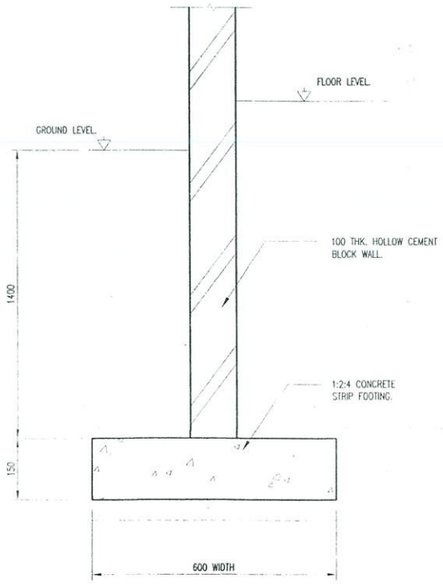
DETAILS OF R.C COLUMNS
AND DETAILS OF FOOTING 'F1'



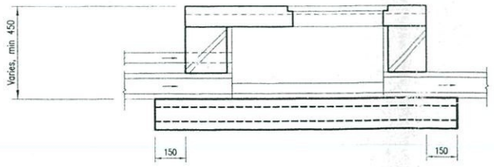
DETAIL OF STIFFERNER 'A'



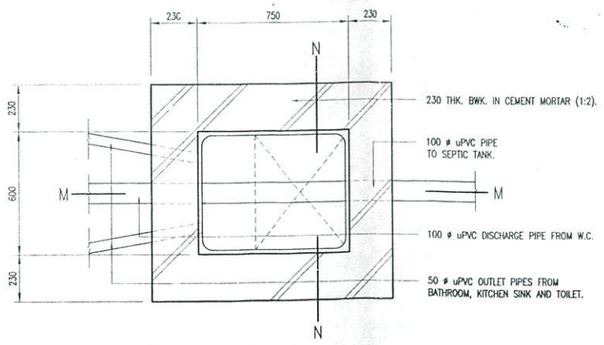
DETAIL OF FOOTING 'F2'



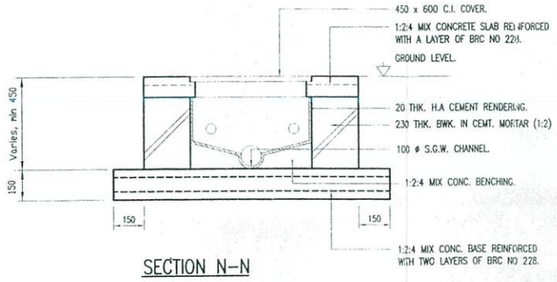
SECTION B–B
DETAIL OF STRIP FOOTING
1 : 75



SECTION M–M



PLAN OF MANHOLE
1 : 15



SECTION N–N

ISSUE NO.	REVISION	BY CHK'D	DATE APP'D
T	FOR TENDER	JOO	11.10.11
0	FOR CONSTRUCTION	JOO	14.11.12

NOTE :–

1. ALL CONCRETE TO BE 1:1:2 MIX.

PROJECT

CADANGAN PEMBINAAN DUA PULUH LIMA (25) BLOK (50 UNIT) RUMAH KAKITANGAN BERKEMBAR KELAS 'L5' DI PPPTR, SG. TEKAM, JERANTUT, PAHANG DARUL MAKMUR
UNTUK TETUAN:
FELDA AGRICULTURAL SERVICES SDN. BHD.

TAJUK / TITLE

KELAS 'L5'

DETAIL OF COLUMNS, FOOTINGS, STRIP FOOTING, STIFFENER, AND MANHOLE.

TANDATANGAN PEMILIK / OWNER'S SIGNATURE

FELDA AGRICULTURAL SERVICES SDN BHD (353791-M)
TINGKAT 7, BALAI FELDA,
JALAN GURNEY SATU,
54000 KUALA LUMPUR

ISSUE FOR BID | APPROVED FOR CONSTRUCTION DATE | PROJECT MANAGER

PENGURUS PROJEK / PROJECT MANAGER

FELDA ENGINEERING SERVICES SDN BHD (299557-X)
TINGKAT 6, BALAI FELDA,
JALAN GURNEY SATU,
54000 KUALA LUMPUR

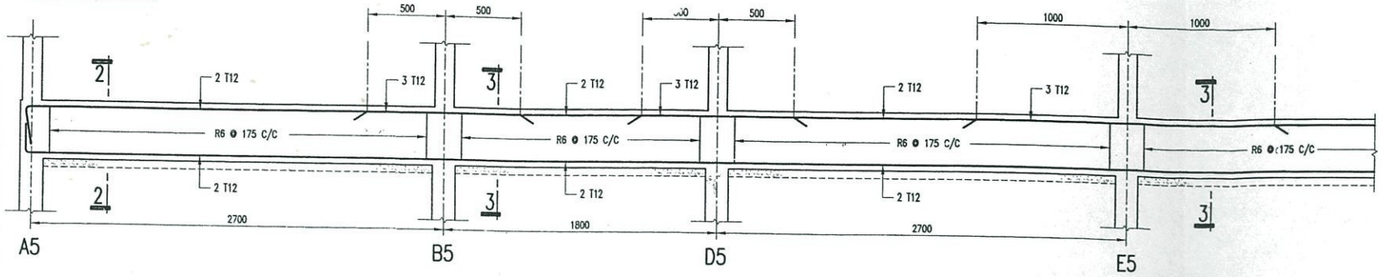
TANDATANGAN JURUTERA / ENGINEER'S SIGNATURE

ALLIED ENGINEERING CONSULTANCY SERVICES SDN BHD
(236756-D)
TINGKAT 6, BALAI FELDA,
JALAN GURNEY SATU,
54000 KUALA LUMPUR

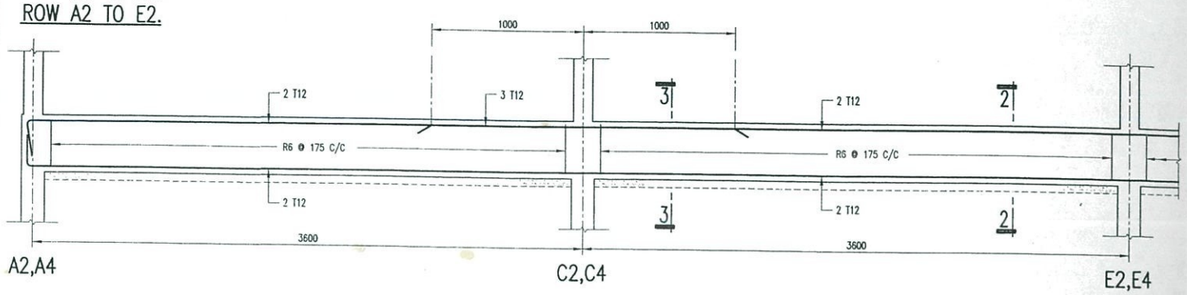
DESIGNED BY	W. ZAIM	DATE	14.11.12
DESIGN CHK'D BY	Ir. MOHD FARIZOL	DATE	14.11.12
DRAWN BY	ZAILANIJOO	DATE	14.11.12
DWG CHK'D BY	M.NAZLI	DATE	14.11.12
SCALE	1=15		

JOB NO	DRAWING NO	ISSUE
13/163	C4-1-2	0

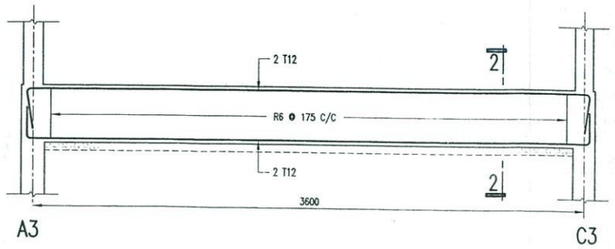
ROW A5 TO E5.



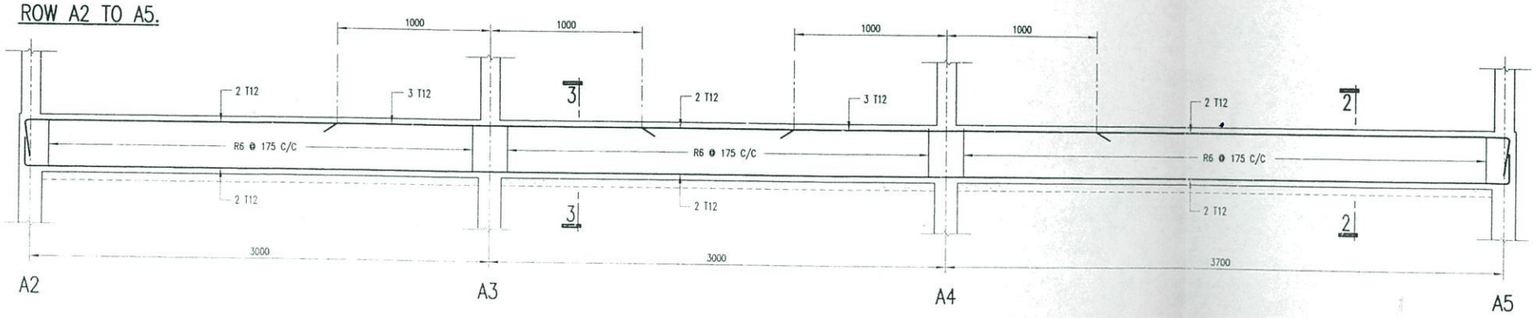
ROW A4 TO E4.
ROW A2 TO E2.



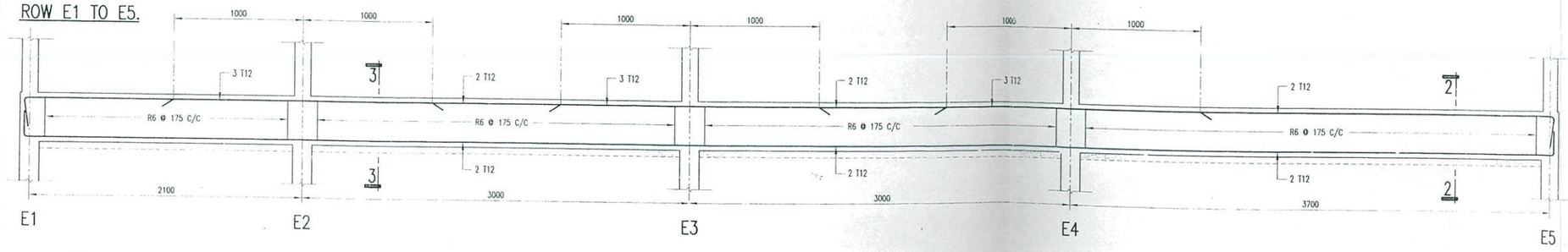
ROW A3 TO C3.



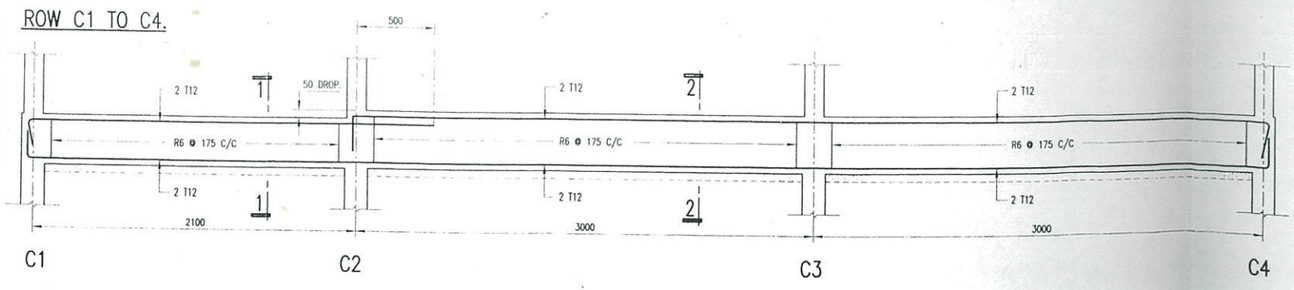
ROW A2 TO A5.

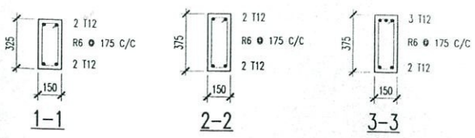


ROW E1 TO E5.



ROW C1 TO C4.





ISSUE NO.	REVISION	BY CHK'D	DATE APP'D
T	FOR TENDER	JOO	31.10.12
0	FOR CONSTRUCTI...	JOO	14.11.12

DWG. NO.	REFERENCE DRAWINGS

PROJECT

CADANGAN PEMBINAAN DUA PULUH LIMA (25) BLOK (50 UNIT) RUMAH KAKITANGAN BERKEMBAR KELAS 'L5' DI PPPTR, SG. TEKAM, JERANTUT, PAHANG DARUL MAKMUR
UNTUK TETUAN:
FELDA AGRICULTURAL SERVICES SDN. BHD.

TAJUK / TITLE

KELAS 'L5'

GROUND BEAMS DETAIL.

TANDATANGAN PEMILIK / OWNER'S SIGNATURE

FELDA AGRICULTURAL SERVICES SDN BHD (353791-M)
TINGKAT 7, BALAI FELDA,
JALAN GURNEY SATU,
54000 KUALA LUMPUR.

ISSUE FOR BID

APPROVED FOR CONSTRUCTION
DATE PROJECT MANAGER

PENGURUS PROJEK / PROJECT MANAGER

FELDA ENGINEERING SERVICES SDN BHD (299557-X)
TINGKAT 6, BALAI FELDA,
JALAN GURNEY SATU,
54000 KUALA LUMPUR.

TANDATANGAN JURUTERA / ENGINEER'S SIGNATURE

ALLIED ENGINEERING CONSULTANCY SERVICES SDN BHD (236756-D)
TINGKAT 5, BALAI FELDA,
JALAN GURNEY SATU,
54000 KUALA LUMPUR

DESIGNED BY	W. ZAIM	DATE	14.11.12
DESIGN CHK'D BY	Ir. MOHD FARIZOL	DATE	14.11.12
DRAWN BY	ZAILANJOO	DATE	14.11.12
DWG CHK'D BY	M.NAZLI	DATE	14.11.12
SCALE	1=20		

JOB NO	DRAWING NO	ISSUE
13/163	C4-1-3	0

PERUMUS SOIL LAB
CA 010100422 - M

PERUMUS SOIL LAB

TEST REPORT

ISSUED BY DATE : 20.3.2013 REPORT NO: PRSL/JT/03/13/TO 2006

PROJECT : KERJA TANAH BAGI CADANGAN PEMBANGUNAN PERUMAHAN JENIS 'L5' DI PUSAT PENYELIDIKAN PERTANIAN TUN RAZAK SG. TEKAM, DAERAH JERANTUT, PAHANG.

KONTRAKTOR: ZAHIM SDN. BHD.

CLIENT :

METHOD TESTING : C/RUN ATAU TANAH BS1377: part 4 & part 9 : 1990, BS : 598 : part 3 1985, part 104,1989 & BS 410 : 1377

BIL	DESCRIPTION OF SUMMARY TESTING	REFERENCE	DATE TESTING
	TANAH		
1	PROCTOR(REMMER METHOD STD.COMPACTION 4.5KG)	PR 3498/1 - 2	20.3.2013

Certified By :
PERUMUS SOIL LAB

REF. NO: PR / 3498/1

PERUMUS SOIL LAB

NO. 30 TINGKAT BAWAH BAWAH, TAMAN WAWASAN, JALAN TEMERLOH
27000 JERANTUT, PAHANG DARUL MAKMUR.
TEL/ FAX :

DRY DENSITY / MOISTURES CONTENT RELATION

(REMMER METHOD STD.COMPACTION) BS :1377)

Description of soil :	RED + YELLOW	Date Sample: 19.3.2013	Total mass of sample : 10 Kg	MDD :	1.520 Mg/m³
Source :	SITE	Date Testing : 20.3.2013	Remmer : 4.5 Kg		
OPERATOR :	RAFIQ	Blow : 27 5 Layer	Vol. of mould (Vc) : 1000cm³	OMC:	21.80 %

Nama Projek : KERJA TANAH BAGI CADANGAN PEMBANGUNAN PERUMAHAN JENIS 'L5' DI PUSAT PENYELIDIKAN PERTANIAN TUN RAZAK SG. TEKAM, DAERAH JERANTUT, PAHANG.

Nama Kontraktor : ZAHIM SDN. BHD.

CLIENT :

Test Number			1	2	3	4
Mass of mould + Base + Compacted	(m2)	gm	5105.0	5272.0	5373.0	5282.0
Mass of mould + Base	(m1)	gm	3515.7	3515.7	3515.7	3515.7
Mass of compaction specimen	(m2- m1)	gm	1589.3	1756.3	1857.3	1766.3
Bulk Density $\frac{m2 - m1}{1000(Vc)}$ mg / m³		P	1.589	1.756	1.857	1.766
Moistures Conten	(w)	%	12.37	18.27	22.57	27.47
Dry Density (Pd) $\frac{100p}{100 + W}$ mg / m³			1.414	1.485	1.515	1.386

MOHD NUR RAFIQ B. MOHD SAID
Lab Technician
PERUMUS SOIL LAB (CA 0095254-M)
JERANTUT

Sample No.			1		2		3		4	
Container No.			FB	FA	J6	G7	A3	A4	H7	B2
Mass of west soil + Container	(m2)	gm	116.20	131.40	159.80	166.30	172.70	190.00	190.10	185.40
Mass of dry soil + Container	(m3)	gm	109.60	122.70	143.40	148.90	151.10	164.50	162.30	155.40
Mass of container	(m1)		55.60	53.20	53.80	53.50	53.60	53.60	53.80	53.10
Mass of Moistures	(m2-m3)	gm	6.60	8.70	16.40	17.40	21.60	25.50	27.80	30.00
Mass of dry soil	(m3 - m1)	gm	54.00	69.50	89.60	95.40	97.50	110.90	108.50	102.30
Moistures Content (W) $\frac{m2 - m3}{m3 - m1}$ X 100		%	12.22	12.52	18.30	18.24	22.15	22.99	25.62	29.33
	AV		12.37		18.27		22.57		27.47	

Moisture content	%	12.37	18.27	22.57	27.47
Dry density	Mg/m³	1.414	1.485	1.515	1.386

PROFESSIONAL ENGINEER ... MOHAMAD ... MALAYSIA

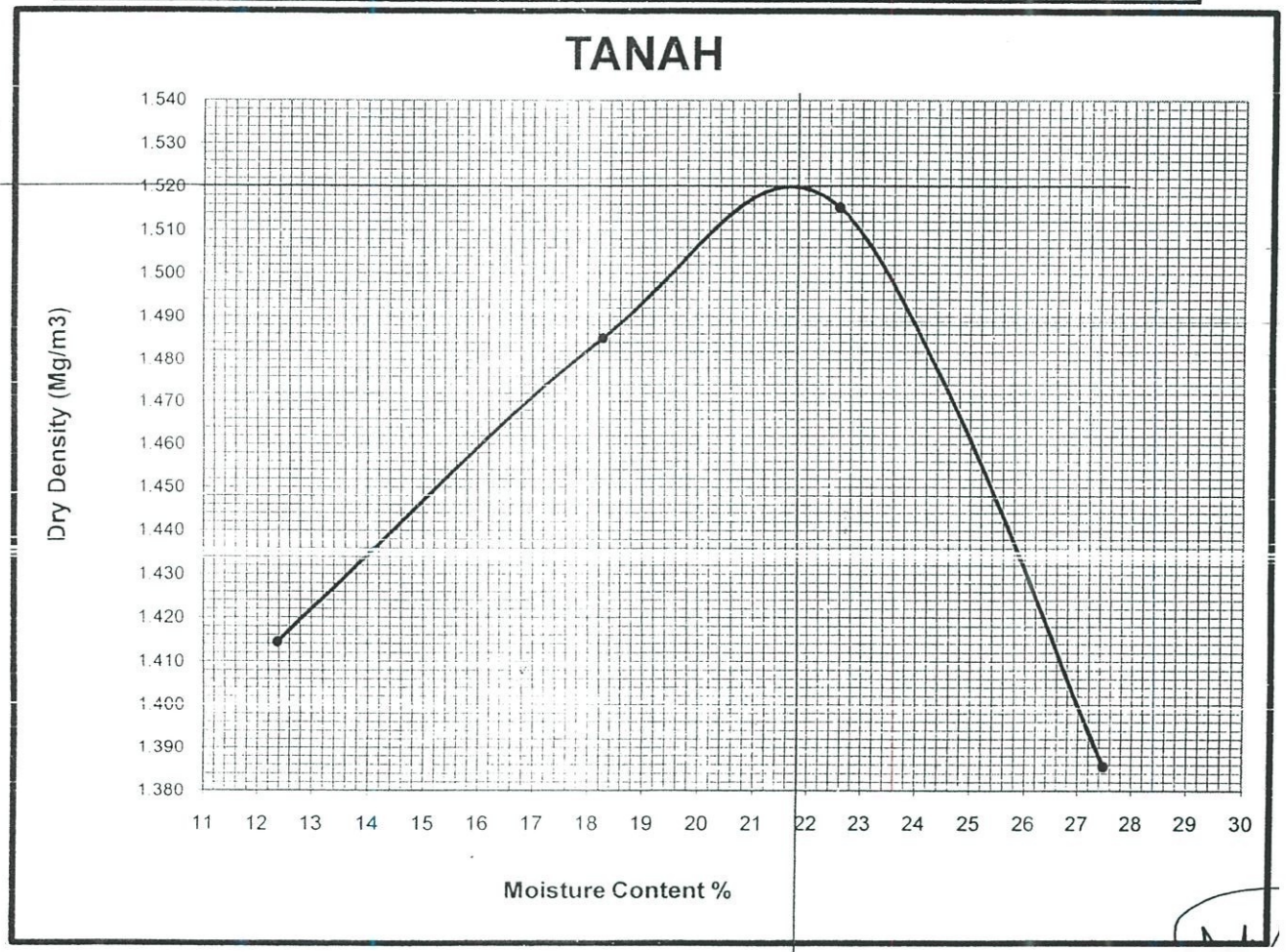
REF. NO: PR / 3498/2

PERUMUS SOIL LAB

NO. 30 TINGKAT BAWAH BAWAH, TAMAN WAWASAN, JALAN TEMERLOH
27000 JERANTUT, PAHANG DARUL MAKMUR.
TEL/ FAX : 019 9310504 / 09-2663707

Moisture content	%	12.37	18.27	22.57	27.47		
Dry density	Mg/m³	1.414	1.485	1.515	1.386		

TANAH



MDD
1.520
Mg/m3

MDD : 1.520 Mg/m3

OMC : 21.80 %

OMC : 21.80 %

PERUMUS SOIL LAB
CA 010100422 - M

PERUMUS SOIL LAB

TEST REPORT

SSUED BY DATE : **26.3.2013** REPORT NO: **PRSL/JT/03/13/TO 2006/A**

PROJECT : **KERJA TANAH BAGI CADANGAN PEMBANGUNAN PERUMAHAN JENIS 'L5' DI PUSAT PENYELIDIKAN PERTANIAN TUN RAZAK SG. TEKAM, DAERAH JERANTUT, PAHANG.**

CONTRAKTOR: **ZAHIM SDN. BHD.**

CLIENT :

METHOD TESTING : **BS1377: part 4 & part 9 : 1990, BS : 598 : part 3 1985, part 104,1989 &**
C/RUN ATAU **BS 410 : 1377**
TANAH

BIL	DESCRIPTION OF SUMMARY TESTING	REFERENCE	DATE TESTING
	TANAH		
1	INSITU DRY DENSITY TEST(SAND REPLACEMENT METHOD)	SRM 4455 - 4456	26.3.2013

Certified By :
PERUMUS SOIL LAB

REF. NO : SRM/ 4455

PERUMUS SOIL LAB

PERUMUS SOIL LAB

NO. 30 TINGKAT BAWAH, TAMAN WAWASAN, JLN TEMERLOH,
27000 JERANTUT, PAHANG DARUL MAKMUR.
TEL / FAX :

IN SITU DRY DENSITY TEST

(Sand Replacement Method) BS1377 :Part 9 :1990)

POURING CYLINDER METHOD 100mm Dia.

Tajuk Projek : KERJA TANAH BAGI CADANGAN PEMBANGUNAN PERUMAHAN JENIS 'L5' DI PUSAT PENYELIDIKAN PERTANIAN TUN RAZAK SG. TEKAM, DAERAH JERANTUT, PAHANG.

Nama Kontraktor : ZAHIM SDN. BHD.

Operator : ELLMIEZAN / SAMSUL — Date Testing : 26.3.2013

Description Of Soil : RED + YELLOW — Source : SITE

Calibration		1		2
Mean mass of in cone(of pouring cylinder)	(M2)	445	gm	gm
Volume of calibrating container	(V)	1167	cm^3	cm^3
Mass of sand (+ Cylinder) before pouring	(M1)	6185	gm	gm
Mass of sand (+ Cylinder) after pouring	(M3)	4167	gm	gm
Mass of sand to fill calibrating container = (M1 - M2 - M3) =	(Ma)	1573	gm	gm
Bulk density of sand = $\frac{Ma}{V}$	(Ps)	1.348	Mg / m^3	Mg / m^3

Bulk density of sand = AV : (Ps) 1.348 Mg / m^3

Testing No.	NO	1	2	3	4
Location testing :	CH/BIL				
Mass of wet soil from hole gm	(MW)	2137	1911	2123	2103
Mass of sand before pouring gm	(M1)	3000.0	3000.0	3000.0	3000.0
Mass of sand after pouring gm	(M4)	811	1014	878	851
Mass of sand in hole = (M1 - M4 - M2) = gm	(Mb)	1744.0	1541.0	1677.0	1704.0
Ratio = $\frac{MW}{Mb}$	=	1.225	1.240	1.266	1.234
Bulk density = $\frac{MW}{Mb}$ X Ps (mg/m^3)	(P)	1.652	1.672	1.706	1.664
Container No.					
Moisture Content (Speedy / Oven dry)	(W)	13.00	13.00	15.00	14.00
Dry Density = $\frac{100P}{100 + W}$ (mg/m^3)	(D)	1.462	1.479	1.484	1.459
Mix. Dry Density (Lab) (mg/m^3)	(MDD)	1.520	1.520	1.520	1.520
Insitu Density = D / MDD(Lab) %	% COMPACT	96.16	97.32	97.62	96.00
REMARKS:					

Tested By :

Prepared By:

REF. NO : SRM/ 4456

PERUMUS SOIL LAB

PERUMUS SOIL LAB

NO. 30 TINGKAT BAWAH, TAMAN WAWASAN, JLN TEMERLOH,
27000 JERANTUT, PAHANG DARUL MAKMUR.
TEL / FAX :

IN SITU DRY DENSITY TEST

(Sand Replacement Method) BS1377 :Part 9 :1990)

POURING CYLINDER METHOD 100mm Dia.

Tajuk Projek : KERJA TANAH BAGI CADANGAN PEMBANGUNAN PERUMAHAN JENIS 'L5' DI PUSAT PENYELIDIKAN PERTANIAN TUN RAZAK SG. TEKAM, DAERAH JERANTUT, PAHANG.

Nama Kontraktor : ZAHIM SDN. BHD.

Operator : ELLMIEZAN / SAMSUL **Date Testing :** 26.3.2013

Description Of Soil : RED + YELLOW **Source :** SITE

Calibration		1		2	
Mean mass of in cone(of pouring cylinder)	(M2)	445	gm		gm
Volume of calibrating container	(V)	1167	cm^3		cm^3
Mass of sand (+ Cylinder) before pouring	(M1)	6185	gm		gm
Mass of sand (+ Cylinder) after pouring	(M3)	4167	gm		gm
Mass of sand to fill calibrating container = (M1 - M2 - M3) =	(Ma)	1573	gm		gm
Bulk density of sand = $\frac{Ma}{V}$	(Ps)	1.348	Mg / m^3		Mg / m^3

Bulk density of sand = AV : (Ps) 1.348 Mg / m^3

Testing No.	NO	5	6	7	
Location testing :	CH/BIL				
Mass of wet soil from hole gm	(MW)	1815	2006	2051	
Mass of sand before pouring gm	(M1)	3000.0	3000.0	3000.0	
Mass of sand after pouring gm	(M4)	1113	937	882	
Mass of sand in hole = (M1 - M4 - M2) = gm	(Mb)	1442.0	1618.0	1673.0	
Ratio = $\frac{MW}{Mb}$	=	1.259	1.240	1.226	
Bulk density = $\frac{MW}{Mb}$ X Ps (mg/m^3)	(P)	1.697	1.671	1.652	
Container No.					
Moisture Content (Speedy / Oven dry)	(W)	15.00	14.00	14.00	
Dry Density = $\frac{100P}{100 + W}$ (mg/m^3)	(D)	1.475	1.466	1.450	
Mix. Dry Density (Lab) (mg/m^3)	(MDD)	1.520	1.520	1.520	
Insitu Density = D / MDD(Lab) %	% COMPACT	97.06	96.44	95.36	
REMARKS:					

PERUMUS SOIL LAB
CA 010100422 - M

PERUMUS SOIL LAB

TEST REPORT

ISSUED BY DATE : **23.5.2013** REPORT NO: **PRSL/JT/05/13/TO 2083**

PROJECT : **MEMBINA DAN MENYIAPKAN 25 BLOK RUMAH KAKITANGAN JENIS L5 DI PPPTR JERANTUT PAHANG DARUL MAKMUR**

CONTRACTOR : **ASAGA CORP**

CLIENT :

METHOD TESTING : **BS1377: part 4 & part 9 : 1990, BS : 598 : part 3 1985, part 104,1989 &**
C/RUN ATAU **BS 410 : 1377**
TANAH

BIL	DESCRIPTION OF SUMMARY TESTING	REFERENCE	DATE TESTING
1	SIEVE ANALYSIS - JKR/QC/A02/89 (AGGREGATE FOR CONCRETE)	SA 2083	23.5.2013

Certified By :
PERUMUS SOIL LAB

PERUMUS SOIL LAB

NO. 30 TINGKAT BAWAH, TAMAN WAWASAN, JLN TEMERLOH
27000 JERANTUT, PAHANG DARUL MAKMUR.
TEL / FAX:

SIEVE ANALYSIS

JKR/QC/A02/89 (AGGREGATE FOR CONCRETE)

PROJEK : MEMBINA DAN MENYIAPKAN 25 BLOK RUMAH KAKITANGAN JENIS L5 DI PPPTR JERANTUT PAHANG DARUL MAKMUR

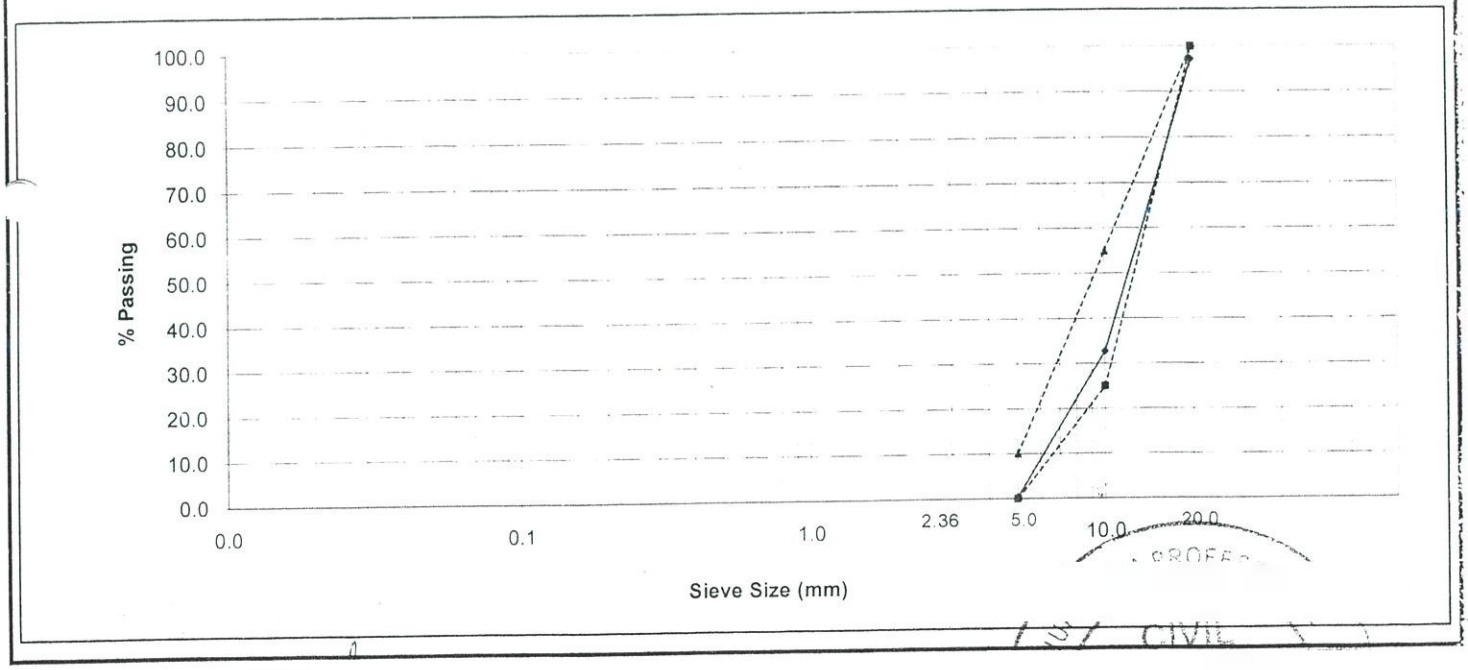
NAMA KONTRAKTOR : ASAGA CORP

SAMPLE NO. : 1
LOCATION :
SOURCE : SG. JAN QUARRY

DATE OF SAMPLING : 23.5.2013
DATE OF TESTING: 24.5.2013
TESTED BY : RAFIQ

Sieve Saiz (mm/um)	Wt.Rtained (gm)	% Retained	% Passing	Spec Limit (JKR/QC/A02/89)	
			100.0		
20.00	42.30	2.82	***97.2***	**100.0**	**100.0**
10.00	964.20	64.38	***32.8***	**25.0**	**55.0**
5.00	485.20	32.40	***0.4***	**0.0**	**10.0**
PAN	6.00	0.40	***0.0***		
Total Wt.	**1497.70**	**100.00**			

Berat kering sebelum Diayak : 1500.00 Kg



PERUMUS SOIL LAB

PERUMUS SOIL LAB

NO 30 TINGKAT BAWAH, TAMAN WAWASAN, JALAN TEMERLOH,
27000 JERANTUT, PAHANG DARUL MAKMUR.
TEL / FAX :

CA0095254-M

UJIAN KIUB KONKRIT

JKR / QC / A05 / 04

NAMA PROJEK : MEMBINA DAN MENYIAPKAN 25 BLOK RUMAH KAKITANGAN JENIS L5 DI PPPTR JERANTUT PAHANG DARUL MAKMUR

KONTRAKTOR : ASAGA CORP

ELEMEN STRUKTUR KONKRIT : COLUMN (BLOK 1)

KADAR CAMPURAN / GRED : G30

KAEDAH PEMADATAN YANG DIGUNAKAN : DENGAN TANGAN

KEBOLEHKERJAAN YANG DIKEHENDAKI (PENURUNAN / FAKTOR PEMADATAN) : 75 ± 25

KEKUATAN KIUB MINIMUM YANG DIKEHENDAKI : 7 HARI : 22.5 N/mm² 28 HARI : 30.0 N/mm²

TANDA KIUB	TARIKH PENUAGAN	TARIKH UJIAN PERLU DIJALANKAN	SAIZ KIUB	KEBOLEHKERJAAN (PENURUNAN / FAKTOR PEMADATAN)	CATATAN
NO.1	14.6.13	21.6.13	150 x 150 x 150mm		
NO.3	14.6.13	21.6.13	150 x 150 x 150mm		
NO.5	14.6.13	21.6.13	150 x 150 x 150mm		

KIUB DISERAH OLEH : .....

(Nama & Jawatan)

BAHAGIAN II : (PERINCIAN KEPUTUSAN YANG DIPERLUKAN)

TANDA KIUB	TARIKH DITUANG	TARIKH UJIAN PERLU DIJALANKAN	TARIKH DIUJI	UMUR PADA TARIKH DIUJI (HARI)	BERAT KIUB (Kg)	KETUMPATAN (Kg/m³)	BEBAN MAMPAT (Kn)	KEKUATAN MAMPATAN (N/mm²)	CATATAN
NO.1	14.6.13	21.6.13	24.6.13	10	8.065	2390	515.10	22.893	AV : 23.036 N/mm2
NO.3	14.6.13	21.6.13	24.6.13	10	8.076	2393	531.20	23.609	
NO.5	14.6.13	21.6.13	24.6.13	10	8.182	2424	508.60	22.604	

Diuji oleh : Disaksikan oleh : Disahkan oleh :

REF. NO : PSL / 3604

PERUMUS SOIL LAB

PERUMUS SOIL LAB

NO 30 TINGKAT BAWAH, TAMAN WAWASAN, JALAN TEMERLOH,
27000 JERANTUT, PAHANG DARUL MAKMUR.
TEL / FAX : 09 2663707 / 019 9310504

CA0095254-M

UJIAN KIUB KONKRIT

JKR / QC / A05 / 04

NAMA PROJEK : MEMBINA DAN MENYIAPKAN 25 BLOK RUMAH KAKITANGAN JENIS L5 DI PPPTR JERANTUT PAHANG DARUL MAKMUR

KONTRAKTOR : ASAGA CORP

ELEMEN STRUKTUR KONKRIT : COLUMN BLOK 1

KADAR CAMPURAN / GRED : G30

KAEDAH PEMADATAN YANG DIGUNAKAN : DENGAN TANGAN

KEBOLEHKERJAAN YANG DIKEHENDAKI (PENURUNAN / FAKTOR PEMADATAN) : 75 ± 25

KEKUATAN KIUB MINIMUM YANG DIKEHENDAKI : 7 HARI : 22.5 N/mm² 28 HARI : 30.0 N/mm²

TANDA KIUB	TARIKH PENUAGAN	TARIKH UJIAN PERLU DIJALANKAN	SAIZ KIUB	KEBOLEHKERJAAN (PENURUNAN / FAKTOR PEMADATAN)	CATATAN
NO.2	14.6.13	12.7.13	150 x 150 x 150mm		
NO.4	14.6.13	12.7.13	150 x 150 x 150mm		
NO.6	14.6.13	12.7.13	150 x 150 x 150mm		

KIUB DISERAH OLEH :

(Nama & Jawatan)

BAHAGIAN II : (PERINCIAN KEPUTUSAN YANG DIPERLUKAN)

TANDA KIUB	TARIKH DITUANG	TARIKH UJIAN PERLU DIJALANKAN	TARIKH DIUJI	UMUR PADA TARIKH DIUJI (HARI)	BERAT KIUB (Kg)	KETUMPATAN (Kg/m³)	BEBAN MAMPAT (Kn)	KEKUATAN MAMPATAN (N/mm²)	CATATAN
NO.2	14.6.13	12.7.13	12.7.13	35	8.145	2413	753.10	33.471	AV : 30.467 N/mm2
NO.4	14.6.13	12.7.13	12.7.13	35	8.016	2375	680.20	30.231	
NO.6	14.6.13	12.7.13	12.7.13	35	8.010	2373	623.20	27.698	

Diuji oleh : Disaksikan oleh :

REF. NO : PSL / 3515

PERUMUS SOIL LAB

PERUMUS SOIL LAB

NO 30 TINGKAT BAWAH, TAMAN WAWASAN, JALAN TEMERLOH,
27000 JERANTUT, PAHANG DARUL MAKMUR.
TEL / FAX :

CA0095254-M

UJIAN KIUB KONKRIT

JKR / QC / A05 / 04

NAMA PROJEK : MEMBINA DAN MENYIAPKAN 25 BLOK RUMAH KAKITANGAN JENIS L5 DI PPPTR JERANTUT PAHANG DARUL MAKMUR

KONTRAKTOR : ASAGA CORP

ELEMEN STRUKTUR KONKRIT : GROUND BEAM 1

KADAR CAMPURAN / GRED : G30

KAEDAH PEMADATAN YANG DIGUNAKAN : DENGAN TANGAN

KEBOLEHKERJAAN YANG DIKEHENDAKI (PENURUNAN / FAKTOR PEMADATAN) : 75 ± 25

KEKUATAN KIUB MINIMUM YANG DIKEHENDAKI : 7 HARI : 22.5 N/mm² 28 HARI : 30.0 N/mm²

TANDA KIUB	TARIKH PENUAGAN	TARIKH UJIAN PERLU DIJALANKAN	SAIZ KIUB	KEBOLEHKERJAAN (PENURUNAN / FAKTOR PEMADATAN)	CATATAN
NO.1	4.6.13	11.6.13	150 x 150 x 150mm		
NO.3	4.6.13	11.6.13	150 x 150 x 150mm		
NO.5	4.6.13	11.6.13	150 x 150 x 150mm		

KIUB DISERAH OLEH :

(Nama & Jawatan)

BAHAGIAN II : (PERINCIAN KEPUTUSAN YANG DIPERLUKAN)

TANDA KIUB	TARIKH DITUANG	TARIKH UJIAN PERLU DIJALANKAN	TARIKH DIUJI	UMUR PADA TARIKH DIUJI (HARI)	BERAT KIUB (Kg)	KETUMPATAN (Kg/m³)	BEBAN MAMPAT (Kn)	KEKUATAN MAMPATAN (N/mm²)	CATATAN
NO.1	4.6.13	11.6.13	14.6.13	10	8.024	2377	580.50	25.800	AV : 26.050 N/mm2
NO.3	4.6.13	11.6.13	14.6.13	10	8.114	2404	557.40	24.773	
NO.5	4.6.13	11.6.13	14.6.13	10	8.026	2378	620.50	27.578	

Diuji oleh :

Disaksikan oleh :

PERUMUS SOIL LAB

PERUMUS SOIL LAB

NO 30 TINGKAT BAWAH, TAMAN WAWASAN, JALAN TEMERLOH,
27000 JERANTUT, PAHANG DARUL MAKMUR.
TEL / FAX :

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UJIAN KIUB KONKRIT

JKR / QC / A05 / 04

NAMA PROJEK : MEMBINA DAN MENYIAPKAN 25 BLOK RUMAH KAKITANGAN JENIS L5 DI PPPTR JERANTUT PAHANG DARUL MAKMUR

KONTRAKTOR : ASAGA CORP

ELEMEN STRUKTUR KONKRIT : GROUND BEAM BLOK 1

KADAR CAMPURAN / GRED : G30

KAEDAH PEMADATAN YANG DIGUNAKAN : DENGAN TANGAN

KEBOLEHKERJAAN YANG DIKEHENDAKI (PENURUNAN / FAKTOR PEMADATAN) : 75 ± 25

KEKUATAN KIUB MINIMUM YANG DIKEHENDAKI : 7 HARI : 22.5 N/mm² 28 HARI : 30.0 N/mm²

TANDA KIUB	TARIKH PENUAGAN	TARIKH UJIAN PERLU DIJALANKAN	SAIZ KIUB	KEBOLEHKERJAAN (PENURUNAN / FAKTOR PEMADATAN)	CATATAN
NO.2	4.6.13	2.7.13	150 x 150 x 150mm		
NO.4	4.6.13	2.7.13	150 x 150 x 150mm		
NO.6	4.6.13	2.7.13	150 x 150 x 150mm		

KIUB DISERAH OLEH :

(Nama & Jawatan)

BAHAGIAN II : (PERINCIAN KEPUTUSAN YANG DIPERLUKAN)

TANDA KIUB	TARIKH DITUANG	TARIKH UJIAN PERLU DIJALANKAN	TARIKH DIUJI	UMUR PADA TARIKH DIUJI (HARI)	BERAT KIUB (Kg)	KETUMPATAN (Kg/m³)	BEBAN MAMPAT (Kn)	KEKUATAN MAMPATAN (N/mm²)	CATATAN
NO.2	4.6.13	2.7.13	2.7.13	28	7.922	2347	729.10	32.404	AV : 33.966 N/mm2
NO.4	4.6.13	2.7.13	2.7.13	28	8.022	2377	779.90	34.662	
NO.6	4.6.13	2.7.13	2.7.13	28	8.056	2387	783.70	34.831	

Disaksikan oleh :

Disahkan oleh :