



اَبُو سَيِّدِي تَيْكُو لُو كِي مَارَا  
UNIVERSITI  
TEKNOLOGI  
MARA

**DEPARTMENT OF BUILDING**

**FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING**

**UNIVERSITI TEKNOLOGI MARA**

**(PERAK)**

**SEPTEMBER 2015**

It is recommended that the report of this practical training provided

**By**

**Nurul Hayati binti Mohamad**

**2013652714**

**entitled**

**Method Construction of Swimming Pool slab**

accepted in partial fulfillment of requirement has for obtaining Diploma In Building.

Report Supervisor : Pn. Azira ~~Binti~~ Ibrahim.

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**(PERAK)**

**SEPTEMBER 2015**

**STUDENT'S DECLARATION**

I hereby declare that this report is my own work, except for extract and summaries for which the original references stated herein, prepared during a practical training session that I underwent at Target Resources Sdn. Bhd for duration of 5 months starting from 25 May and ended 9 October 2015. It is submitted as one of the prerequisite requirements of DBN307 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

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Date : 13.10.2015

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Thank you so much.

## **ABSTRACT**

An in-situ concrete suspended floor is one constructed with reinforced concrete and designed to carry its own weight and any imposed a loading, spanning between supporting members in a structure. Supports for floors are typically beams, columns or walls. This report was conducted for the constructing the swimming pools floor slab which is place at 3rd floor of carpark buildings. The objective of this report is to explain the method of concreting the swimming pools slab. It will focus on the process of concreting the slab including tests done before pouring concrete into the formwork. This report also will explain the type of waterproofing that is used in this construction. Since they are often in permanent contact with the water contained in the pool, they must be waterproofed and protected from aggressive agents that could potentially compromise their durability over the years.



<b>TABLE OF CONTENTS</b>		<b>PAGE NO</b>
Acknowledgements		i
Abstract		ii
Table of Contents		iii
List of Tables		v
List of Figure		vi
List of Photo		vii
List of Appendix		viii
<b>CHAPTER 1.0</b>	<b>PREFACE</b>	
1.1	Introduction	1
1.2	Objective	1
1.3	Scope of Study	2
1.4	Method of Study	2
<b>CHAPTER 2.0</b>	<b>COMPANY BACKGROUND</b>	
2.1	Introduction of Company	3
2.2	Company Profile	5
2.3	Organization Chart	6
2.4	List of Project	
	2.4.1 Completed Projects	7
	2.4.2 Project in Progress	8

<b>CHAPTER 3.0</b>	<b>CASE STUDY</b>	
3.1	Introduction of Project	9
3.2	Case Study	12
3.3	Waterproofing for swimming Pool Slab	14
3.4	Method Statement of Swimming Pools slab	16
<b>CHAPTER 4.0</b>	<b>CONCLUSION</b>	
4.1	Conclusion	28
<b>REFERENCES</b>		29
<b>APPENDIX</b>		30

## LIST OF TABLES

Table 2.1	Completed projects	7
Table 2.2	Projects in progress	8

## LIST OF FIGURES

Figure 2.1	Company logo	5
Figure 2.2	Organization Chart	6
Figure 3.1	Architect Impression of the Top View (left side) of the Buildings	9
Figure 3.2	Layout of the 3 <sup>rd</sup> floor plan (rooftop) of car park Buildings	13
Figure 3.3	Method Statement of concreting swimming pool slab	16

## LIST OF PHOTOS

Photo 3.1	Project signboard	10
Photo 3.2	Front view (left side) of the elevated car park building at 70% progress	12
Photo 3.3	Formdex ADM	15
Photo 3.4	PVC water stops	17
Photo 3.5	Concrete mixer truck	19
Photo 3.6	Slump test	20
Photo 3.7	Cube test	21
Photo 3.8	Delivery order form	22
Photo 3.9	Concrete transfer into the hopper of pump truck	23
Photo 3.10	Concrete pumping	23
Photo 3.11	Concrete pouring	24
Photo 3.12	Compacting concrete	25
Photo 3.13	Screeding process	26
Photo 3.14	Curing process	27

## **LIST OF APPENDIX**

Appendix A : Project Layout Plan

Appendix B : Ground Floor Plan Parking

Appendix C : 1<sup>st</sup> Floor Plan Parking

Appendix D : 2<sup>nd</sup> Floor Plan Parking

Appendix E : 3<sup>rd</sup> Floor Plan Parking

Appendix F : Leveling and Finishes Plan at the 3<sup>rd</sup> Floor Parking

Appendix G : Family Pool layout



## **CHAPTER 1.0**

### **PREFACE**

#### **1.1 Introduction**

Slabs are used to furnish a flat and useful surface in reinforced concrete construction. It is broad, flat plate, usually horizontal, with top and bottom surfaces parallel or nearly so. It may be supported by reinforced concrete beams, by masonry or reinforced concrete walls, by structural steel members, by directly by columns or continuously by the ground.

There are two methods of fabricating reinforced concrete. The first is to pour the liquid material into forms at the building site this is so-called in-situ concrete. The other method is called precast concrete, in which building components are manufactured in a central plant and later brought to the building site for assembly.

#### **1.2 Objective**

The objective of this report are as follows:

- 1.2.1 To identify the types of waterproofing used for constructing the swimming pool slab.
- 1.2.2 To identify the method of constructing the swimming pool slab.

### **1.3 Scope of Study**

The scope for this study is focusing on the construction method of the swimming pools slab for the Tabung Haji Complex which is located at the 3<sup>rd</sup> floor of the Car park Building.

### **1.4 Method of Study**

There are several method of study for this projects :

- i) Observation
  - Observe how the workers do the constructions works, listen to the explanation from the site engineer in how the work is done.
- ii) Interview
  - Asking question and seek for more information to the site engineer and site supervisor who was in charge on the details of the construction.
- iii) Text and Reference Book
  - Find the information that was related with the slab construction project.
- iv) Internet
  - Detailed information on the specific task and construction work.

## CHAPTER 2.0

### COMPANY BACKGROUND

#### 2.1 Introduction of company

Established in 1986 with paid-up capital of RM 10,000, the TARGET RESOURCES Group has grown into a respected integrated Group with core activities in construction and Energy Sector i.e in, Oil & Gas, Marine Services. The TARGET RESOURCES Group currently total paid up capital stands at RM41.1 million with a total authorized capital of Rm47.5 million.

With humble beginnings in infrastructure construction works, the TARGET RESOURCES Group of companies now spans into Construction, Oil & Gas and Marine Services, IT and telecommunications, Precision Metal & Plastic Engineering and Manufacturing. The group is also targeting opportunities in coal Concessions and mining activities as well overseas.

This dynamic growth has led to the emergence of the subsidiaries Target Resources Sdn Bhd, TR Engineering & Plastic Sdn Bhd, SD Card Technologies Sdn Bhd, CRF Computer Recovery Facility Sdn Bhd, Target Global Ventures Sdn Bhd, Target Energy Co (M) Sdn Bhd (formerly known as Master Offshore Sdn Bhd) and Master Mulia Sdn Bhd which is a marine services company supporting the oil & gas industry, forming Target Resources Corporation Sdn Bhd.

The company is gearing itself for listing in the main Board of Bursa Malaysia with an intended market Capitalization exceeding RM 1 Billion.

Target Resources Sdn Bhd (TRSB) has gained the reputation as one of the market leaders in security-sensitive installations and has evolved as a niche construction solutions provider, after having started small in infrastructural projects.

Over Twenty years in business, TRBS is involved mainly in Malaysia government and Ministry of Defense projects, with the company's top 3 projects valued at approximately RM850 million.

The company is registered as a class 'A' contractor and has been accorded the status of "kontraktor berwibawa". Further, it is registered as G7 with CIDB and with PETRONAS. The company is also a licensee of Spantech of Australia for special building.

Incorporated on 13 May 1986, its current paid-up capital amount to RM20 million.

### **2.1.1 Aim of the company**

The aim of the company is to assure completion of each Project to the full satisfaction of their Clients, in total compliance with the contractual requirements, in safe and efficient manner and within the agreed time schedule. In this connection the department activities will be supported to the full by all available TRSB resources.

### **2.1.2 Policy of the company**

There are three policy of this company which is to implement the TRSB Quality system employing systematic, planned and cost effective procedures that determine, assess and achieve quality and value.

Next, is to require the use of appropriate Quality System by their suppliers and subcontractors.

Lastly, is to require all staff to perform their duties in in compliance with the TRSB Quality System.

## 2.2 Company profile



Figure 2.1 : Company Logo

Company name	: Target Resources Sdn Bhd
Address	: No. 1F, 6 <sup>th</sup> floor, block 2, Worldwide Business Park 40675 Shah Alam, Selangor Darul Ehsan.
Date of incorporation	: 13 <sup>th</sup> May 1986
Authorized Capital	: RM25,000,000.00
Paid up capital	: RM20,000,000.00
Status	: 1) 100% Bumiputera : 2) License holder to spantech of Australia for spantech Technology : 3) Kontraktor wibawa
Registration	: 1) Pusat Khidmat Kontraktor – class ‘A’ : 2) CIDB – GRADE 7 : 3) Kem. Kewangan Malaysia : 4) PETRONAS : 5) Tenaga Nasional Berhad



### 2.3 Organization Chart

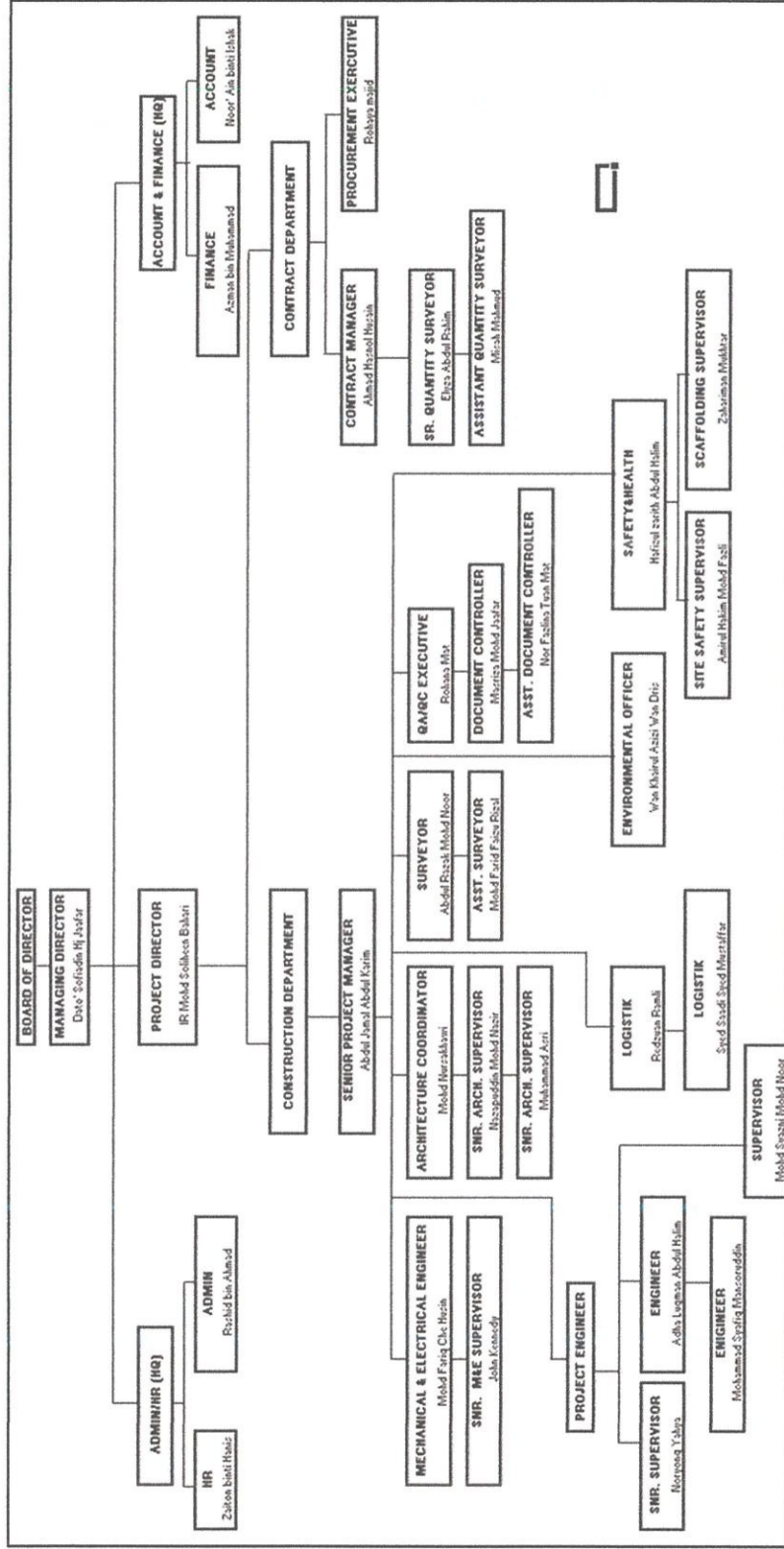


Figure 2.2 : Organization chart of Target Resources Sdn Bhd.



## 2.4 List of Project

### 2.4.1 Completed Projects

Table 2.1 : Completed Projects

NO.	PROJECT TITLE	CONTRACT VALUE	CLIENT	YEAR COMPLETED
1.	The design, Construction and Completion of Building of 9-storey Chemistry Lab Block at University Malaya.	RM 46.1m	Public Works Dept.	2012
2.	The design, Construction and Completion of Buildings of Slope Rectification Works at Taman Bukit Mewah, Bukit Antarabangsa.	RM 16.0m	Public Works Dept.	2010
3.	The design, Construction and Completion of Army depot at Mempaga, Bentong, Pahang.	RM 257.4m	Ministry of Defence	2011
4.	The Design, Construction and Completion of Malaysia Airport Berhad Corporate Office, KLIA, Sepng, Selangor.	RM 40.0m	Malaysia Airport Holdings Berhad	2010

## 2.4.2 Project in Progress

Table 2.2 : Project in Progress

NO.	PROJECT TITLE	CONTRACT VALUE	CLIENT	TARGET COMPLETION DATE
1.	Proposed Construction and Completion the Tabung Haji Complex which consists of 2 storey Convention Centre, 9th storey of hotel building (333 rooms), Pavilion (Wellness Centre), 3 storey Car Park building (Including Two Swimming Pool and Tennis Courts On the Roof) located at the Lot PT76, Town International Airport in Sepang, Labu, Sepang, Selangor.	RM 252.5m	THP Bina Sdn Bhd	February 2016
2.	Proposed Design, Construction and Completion of Joint Forces Headquarters Complex (District) in the River Panching, Kuantan, Pahang.	RM 154.2m	Ministry of Defence	August 2016

## CHAPTER 3.0

### CASE STUDY

#### 3.1 Introduction of Project

Target Resources Sdn Bhd has been appointed as contractor by TH Properties in a project to build and complete the Tabung Haji Complex which consists of 2 storey Convention Centre, 9th storey of hotel building (333 rooms), Pavilion (Wellness Centre), 3 storey Car Park building (Including Two Swimming Pool and Tennis Courts On the Roof) located at the Lot PT76, Town International Airport in Sepang, Labu, Sepang, Selangor. Figure 3.1 below show the architect impression of the top view (left side) of the buildings at the site project.



Figure 3.1 : Architect impression of the top view (left side) of the buildings.

Source : TH Properties (2014).



According to the TH Properties (2013), Lembaga Tabung Haji has appointed them as a contractor to develop and construct the new Tabung Haji and Hotel Convention Centre (“TH HCC”) in the vicinity of the Kuala Lumpur International Airport.

THHCC will replace the Hajj operations center in Kelana Jaya and will be managed by an international hotel chain with world-class convention facilities the development, the Board of pilgrims fund can generate income during Hajj to.

The architect of this project is Hijjas Kasturi Associates Sdn Bhd. While Arup Jururunding Sdn Bhd act as civil and structure Engineer and mechanical & electrical engineer. Basar & Harun Sdn Bhd is the Quantity Surveyor for this project. The lanscape architect for this project done by Shah P.K. Associate Sdn Bhd while Rezzuan, Yeoh & Ong Sdn Bhd done the interior design. In the photo 3.1 show the project signboard and have been listed all the sub-contractors jointly undertake of this project.



Photo 3.1 : Project signboard.

Target Resources Sdn Bhd is comprises generally the supply of all labours, material, tools, implement, equipment and everything else nessary for the construction and completion of main building and associate work to the project.

Generally the project is divided by the section and the works are executed by nominated sub-contractors:

- a) General conditions and preliminaries
- b) Building works consist of Work Below Lowest Floor Finish, Frame, Roof, Wall, Doors, Windows & Ironmongery, Wall Finishes, Floor Finishes & Ceiling Finishes, Sanitary Fittings and Accesories and lastly Sundries.
- c) ID Work
- d) External Work consist of Demolition Work, Earth Work, Surface Water Drainage, Road and Carpark, Sewerage, Water Reticulation and Hard Lanscape Work
- e) Mechanical and Electrical Works.

Construction works has commenced in 2013 and is expected to be completed within 3 years.

Contract No.	MP Sepang : 10/P/KLIA/02-2010/PK
Date of Award	28th September 2013
Contract period	28 months from the date of site possession
Site possssion	07th October 2013
Completion date	06th February 2016
Defect liability period	18 months
Liquidated & ascertained damages (LAD)	RM 64,500.00 per calendar day
Contract sum	RM 252,500,000.00

### 3.2 Case Study

In this chapter it will discuss and illustrate the types of waterproofing and the method that were undertaken by the constructing the swimming pool slab for Tabung Haji Project.

Base on the photo 3.2 it show the front view (left side) of the elevated carpark buildings at 70% progress work done and the swimming pools is actually located on the 3rd floor(rooftop) at that building.



Photo 3.2 : front view (left side) of the elevated carpark buildings at 70% progress.

The case study of swimming pool is specified on the site plan as 1 unit of family pool and 1 unit of male pool as show in the figure 3.2. This case study only focus at the family pool area that is located next to the tennis court. The shape of swimming pool is not a square shape. The thickness of the slab is 250mm.



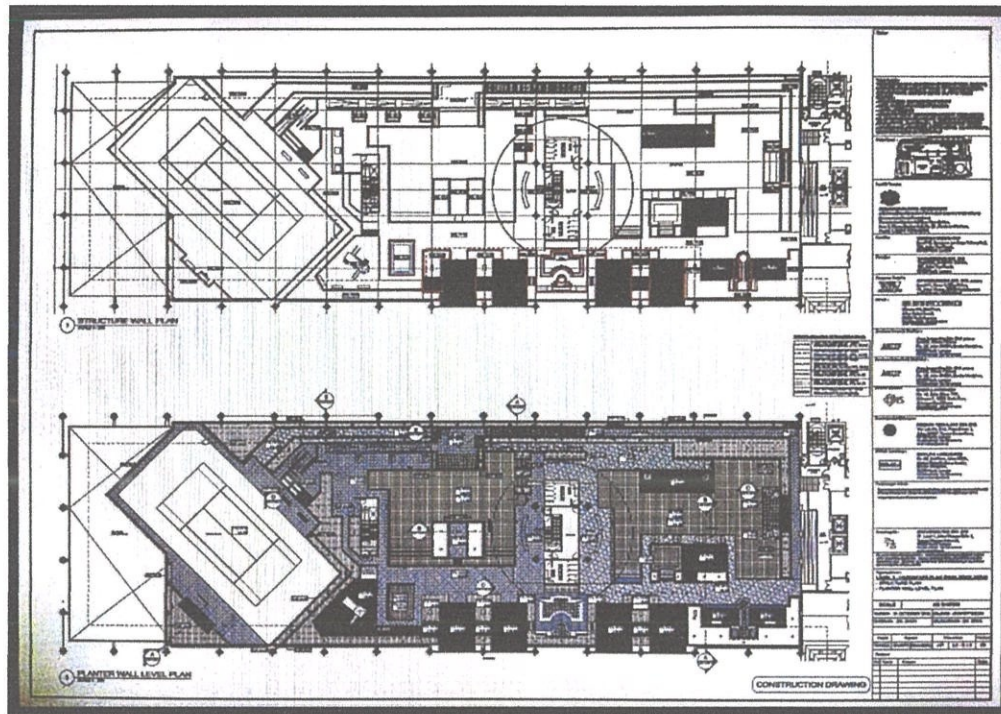


Figure 3.2 : Layout 3rd floor plan (rooftop) of Car Park Buildings.

Sources : Target Resources Sdn. Bhd.

This project used the ready mixed concrete that was supply by Ace Ready Mix Sdn Bhd company. The quantity of the concrete used to cover the surface slab of swimming pool is about  $180\text{m}^3$ . The grade of the concrete is grade 35 without waterproofing, 35A mixing with waterproofing, and 35P which is waterproofing and pump.

Concrete waterproofing products are used to waterproof joints and service penetrations to concrete elements. Before the concrete is place in the concreting area, the PVC waterstop will be install around the edges of swimming pool wall. It is prevents the loss of water from cement paste which affects the strength of concrete slab.

### 3.3 Waterproofing for Swimming Pool Slab

Swimming pools are one the more extended constructions element in these days that require the use of products with the highest to waterproofing and mechanical properties. Starting with the clause that a right waterproofing and protection of the concrete will assure a longer last of the structure. Water proofing systems are composed of material that comply the more restrictive requirements for durability and reliability.

Unfortunately, errors and omissions during the design phase often lead to unpleasant consequences in terms of watertightness and durability of the structure over the years. The most important points to take into consideration when designing a hydraulic structure such as swimming pools be as follows:

- Correct mix design.
- Protection and waterproofing of the external parts of the structure.
- Sealing second pours and components for water circulation and filtration units and light fitting.
- Preparation and waterproofing of the internal surfaces of the pool.
- Choosing the right materials to finish off the surfaces.

Photo 3.3 show the hydrophobic waterproofing which is Formdex ADM type that was supply by Hichins (M) Sdn Bhd for constructing the swimming pools slab.

Formdex ADM can be used for all kinds of concrete and reinforced concrete according to DIN 1048, but not pre-stressed concrete.

The direction of use Formdex ADM :

- a) Shall be sprinkled over the concrete prior to or during the mixing process. The concrete mixture shall be mixed for at least one minute after the last components have been added.

- b) If required, the amount of gauging water may be reduced by 10%.
- c) The quantity of Formdex ADM added is minimum 1% of cement weight, but never less than 3 kg/m<sup>3</sup> ready mixed concrete.

The proper curing is very important to achieve its properties. Curing process is needed to ensure that the concrete is kept from drying out too rapidly.

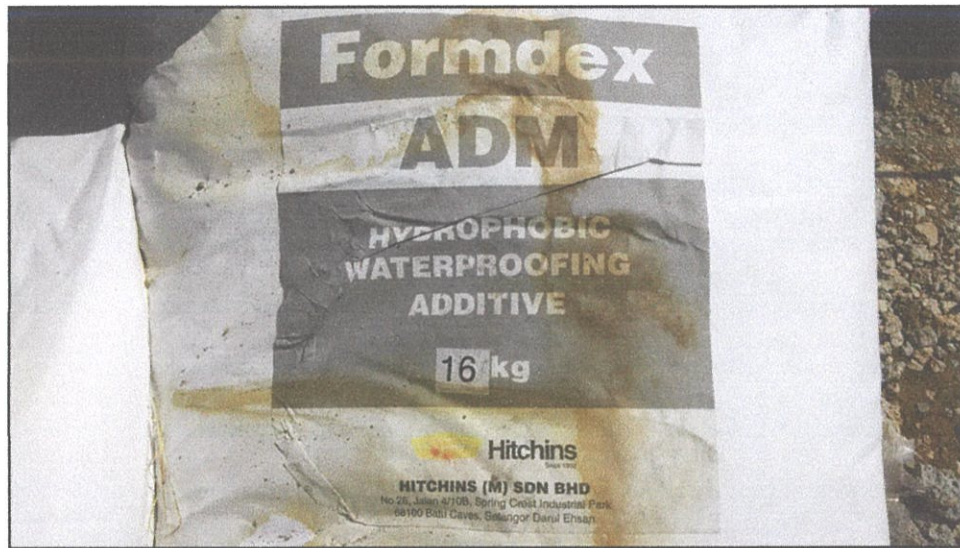


Photo 3.3 : Formdex ADM

According to Hitchin (2015), Formdex waterproofing is 100% compatible with all masonry structures. formdex is a two component cementitious waterproofing system. it is an effective component and permanent waterproofing solution to concrete structure is suitable to structure such as Swimming pools and water features, Decks and patios, Driveways and lift pits, Retaining walls and underground shafts, Foundation walls and footings.

There are 2 type of formdex, which is :

- i) Formdex Uniflex
  - a heavy duty waterproofing membrane that has excellent flexibility and strength. It is used in situations where movement



or cracking of the substrate is occurring or anticipated. It can be used as a concealed system.

ii) Formdex Uni

- a heavy duty waterproofing membrane that seals water, rain, ground water and masonry, concrete, plaster and similar substrates. It is high build nature enables it to absorb shock transmitted through the topping material and allow some flexing between it and the substrate. Can be used as a concealed system.

### 3.4 Method Statement of Swimming Pool Slab

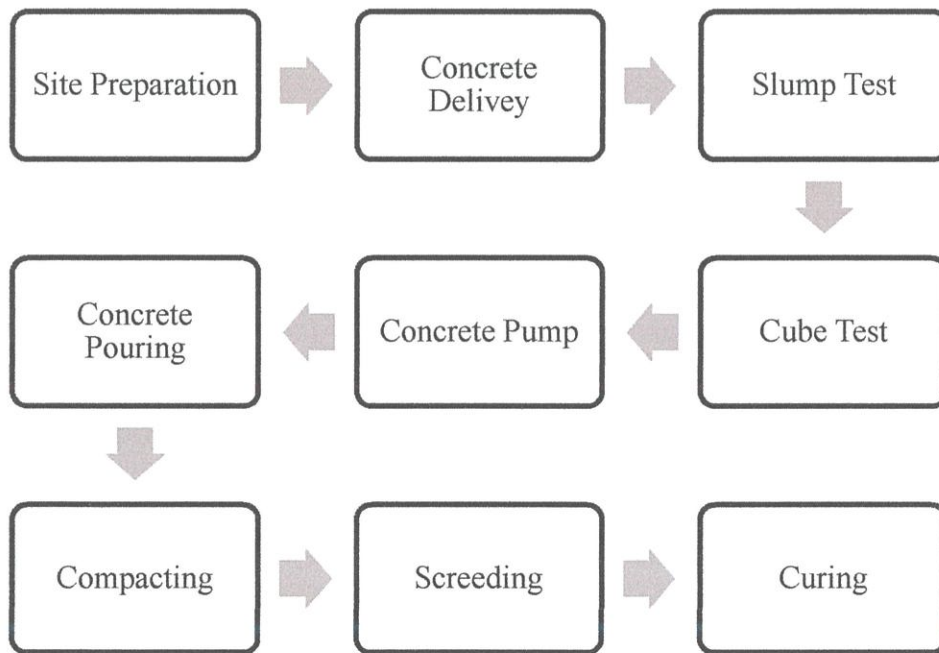


Figure 3.3 : Method statement of swimming pool slab.

### 3.4.1 Site Preparation

The process of concreting slab swimming pool is started with site preparation. The site must be done installed with the formwork and rebar before concrete was placed. Besides that, waterstop also installed around the edges of the pool wall as show in the photo 3.4. The main usage of waterstop is to prevent the passage of liquids in concrete.



Photo 3.4 : PVC waterstop.

### 3.4.2 Concrete delivery

In the first pouring of the concrete on a project, a Quality Engineer and a consultant was present to supervise or to check the concrete delivered on site. A Quality Engineer shall prepare a concrete pour card to list down each concrete delivery at the site, including slump, temperature, location of placement and quantity of concrete.

When a concrete mixer truck reached the checkpoint the Quality Engineer shall check the delivery note to ensure if the concrete delivered is in compliance with the concrete grade required for the concrete element to be casted. Those material were added in order is cement, aggregate and water.

- i) Cement :
- Cement can be described as a material with adhesive and cohesive properties which make it capable of bonding mineral fragment into a compact whole.
  - The bonding materials used with stones, sand, bricks, building blocks etc.
  - The function of cement is to bind the sand and coarse aggregate together and to fill voids in between sand and coarse aggregate particles to form a compact mass.
- ii) Aggregate :
- The term aggregate is used to described the gravel, crushed stones and other materials which are mixed with cement and water to make concrete.
  - The function of aggregate in concrete is as a mass of particles which are suitable for resisting action of applied load, abrasion and percolation of moisture and the action of weather.
  - It is also to reduce the volume changes resulting from setting and hardening of concrete.
- iii) Water :
- Water is an important ingredient for concrete. The principal reason for using water with cement is causes hydration of cement.
  - Water added in excess of hydration.
  - The functional of water in concrete is to fold.
  - To enable the chemical reaction which cause setting and hardening.
  - To lubricate the mixture of gravel, sand and cement in order to facilitate placing.

Photo 3.5 below show the process of rolling the drum for a certain time to completely mix the concrete inside. Place the wheel barrow below the chutes to take some of the fresh concrete for the slump test and cube test.





Photo 3.5 : Concrete Mixer Truck.

### 3.4.3 Slump Test

Slump tests was performed by two times. For the first slump test. It was made to test the fresh concrete that has just arrived at the construction site, while the second test, it is made by mixing the water proofing type formdex into the concrete mix in the concrete mixer truck. concrete truck is rotated once again to ensure water proofing mixes it thoroughly with fresh concrete.

The slump test is started. Firstly, make sure that the steel plate and cone are damp. Place the frustum cone on plane surface to make sure it does not vibrate during placing the concrete. Place the slump cone onto the steel plate and stand on the foot-pieces built-in with the cone.

Next, fill the cone with concrete to 3 equal height, the first layer shall be rodded 25 times with 16mm diameter rounded steel. Fill the cone again for the second layer and do rodding as first layer. Fill the cone again for the last layer make sure that the cone is completely filled with concrete. Rod the concrete 25 times make sure that the rod just penetrates the surface of the preceding layer.

Before lifting the cone make sure that the table around the cone is clean, remove the concrete debris. While cleaning, do not move foot pressure on the foot-pieces. Lift up the cone straight up to a count between 5 to 10. Place the upturned cone just beside the slumped concrete and lay the rod above it then measure the slump from the underside of the rod to the topmost portion of the concrete.

Record the distance to the nearest 10mm and also check and record the kind of slump either it is true slump, shear slump or collapse slump. The result for the slump test is shear slump with 130mm without water proofing and 125mm with water proofing. Photo 3.6 show the step of slump test.



Photo 3.6 : Slump test.



### 3.4.4 Cube Test

The step of making cube test is same like making the slump test but the tool only different. For the slump test it is use frustum cone but for the cube test is it used cube mold. Firstly, clean the moulds and apply oil. Fill the concrete in the moulds in layers approximately 5cm thick. Compact each layer with not less than 25 strokes per layer using a tamping rod. Level the top surface and smoothen it with a trowel. The test specimens are stored in moist air for 24hours as in photo 3.7. After this period the specimens are marked and removed from the moulds and kept submerged in clear fresh water until taken out prior to test.

each set of cube consist of 6 cubes, 3 cubes to be tested on 7th days and 3 cubes to be tested for 28th days. Extra three cubes can be made for re-checking if in case circumstances may happen.



Photo 3.7 : cube test

All data for testing on fresh concrete at site shall be recorded on the Delivery order concrete as show on the photo 3.8.

①  
cube

slump ① : 130mm  
② : 150mm

**ACE READY MIX SDN BHD**  
5-38-2, Business Park 1,  
Pusat Perniagaan Anggerik Vanilla,  
40460 Kota Kemuning, Shah Alam,  
Selangor Darul Ehsan.  
Tel: 03-5525 5795 / 019-277 0097  
Fax: 03-5525 5751  
Email: ace.readymix@yahoo.com

DATE : 19/07/15  
CUSTOMER : TARIK REQUISITE RM, BHD.  
DELIVERY SITE : TARIK PART, SEREMBAN

D.O. NUMBER :  
SERIAL NUMBER : 41287

MIX CODE	MAX SIZE (mm)	GRADE	SLUMP (mm)	TOTAL ORDER (m <sup>3</sup> )	LOAD (m <sup>3</sup> )	PROGRESSIVE TOTAL (m <sup>3</sup> )

TRUCK NO.	TIME BATCHED	TIME ARRIVED	TIME DEPARTED	WAITING TIME	DELAY
		15:13		min	min

WATER ADDED AT SITE : \_\_\_\_\_ LIT. OTHERS: \_\_\_\_\_ CUSTOMER SIGNATURE : \_\_\_\_\_

ADDITIONAL CHARGES	AMOUNT
ADMIXTURE II	
SUPERPLASTICIZER	
CARTAGE	
DELAY TIME	

REMARKS :  
30kg - 40kg  
ark arr

Driver : \_\_\_\_\_ Issued by : \_\_\_\_\_ Acknowledge Receipt

DRIVER'S SIGNATURE \_\_\_\_\_ PLANT PERSONNEL \_\_\_\_\_

All prices and conditions are subject to terms and conditions of sale.

Customer Copy

Photo 3.8 : Delivery Order form.

### 3.4.5 Concrete Pumping

After all the test is finished, the photo 3.9 shows the concrete mixer truck discharging its concrete into a hopper on the back of the pump truck. The hopper has a mesh grate through which the concrete falls, preventing any large rocks or chunks from plugging the pump truck hoses. The hopper also has an auger that churns the concrete, keeping it liquid and flowable.

Once the concrete is in the hopper, it gets sucked into a valve system in small intervals or strokes. As some of the concrete is being sucked into the valve, the concrete before it is being simultaneously pushed through the concrete pipe on the pump truck boom until it reaches the end of the concrete hose and is placed into the swimming pool slab area as shown in photo 3.10.





Photo 3.9 : The concrete transfer into the hopper of pump truck.



Photo 3.10 : pumping concrete to the concreting area.

### 3.4.6 Concrete pouring

Photo 3.11 show the concrete was pouring into the mold. In this situation the worker has control the hose pipe pump. At the same time, one of the worker will give the

instruction to the driver of concrete pump truck at the ground floor. This process need to be done quickly.

Make sure the concrete not enter into the drain pipe during concreting work. It is to prevent the pipe from choke.



Photo 3.11 : concrete pouring.



### 3.4.7 Compacting

Compaction is the process adopted for expelling the entrapped air from the concrete. In the process of mixing, transporting and placing of concrete air is likely to get entrapped in the concrete. The lower the workability, higher is the amount of air entrapped. Compaction must be done as concrete is placed by using vibrator poker as show in the photo 3.12. Never let concrete dry-out and stiffen because it will be too hard to compact.



Photo 3.12 : compacting concrete.

### 3.4.8 Screeding

Base on the photo 3.13, it is show the screeding process. Screeding is the key to producing a true flat surface. It removes excess concrete and brings the top surface to proper grade. Use a piece of 2x4 lumber specially selected for its' straightness. The straight edge should be 1 to 2 feet longer than the slab is wide so that it is always resting on a form on each side. To "screed level" the slab you pull the straight edge forward in a side-to-side sawing motion across the tops of the side forms. At the same time, tilt the top of the straight edge slightly away from the direction of travel. The sawing motion helps prevent tearing of the concrete surface and produces a

relatively smooth and level surface. Tilting the straight edge produces a single cutting edge. To fill in low spots, keep a roll of concrete about an inch high ahead of the straight edge at all times. When you reach the end of the slab, pull excess concrete into, not away from the end edge forms.



Photo 3.13 : screeding process



### 3.4.9 Curing

Photo 3.14 show the sprinkling of water continuously on the concrete surface to provides an efficient curing. It is mostly used for curing floor slabs. The concrete should be allowed to set sufficiently before sprinkling is started. The spray can be obtained from a perforated plastic box. On small jobs sprinkling of water may be done by hand. Vertical and sloping surfaces can be kept continuously wet by sprinkling water on top surfaces and allowing it to run down between the forms and the concrete. For this method of curing the water requirement is higher.



3.14 : curing process.

The concrete normally hardening in about 28 days but sometimes it hardens earlier than 28 days. The inspections will be make after 28 days to check if there is any defect at the slab of swimming pool. After the concrete was hardens, it will be continue by concretin the wall of the swimming pools.

## **CHAPTER 4.0**

### **CONCLUSION**

#### **4.1 Conclusion**

In construction world, every work needs to be done in detail and specific to ensure a strong and long lasting work. Even to a construction of swimming pool need to be done in order and using the right method and process to ensure it can last long and enough to hold the capacity of water volume and pressure.

Various tests are being done to ensure the right and exact mixtures of concrete were used in the slab's construction. The test was important to ensure the concrete is safe to use for construct the structure and strong enough to carry the load. It also to ensure good outcome of the swimming pool and to guarantee the safety of people using the pool later. A layer of waterproof also important in constructing the building structure. It prevents the loss of water from cement paste which affects the strength of concrete slab.

About 15-30 of total project cost has been account towards machinery and equipment. It was urgently needed in all types of construction to facilitate and speed up the work process at construction site.

In conclusion, every construction work have a procedure that we need to follow to make sure the works goes smoothly without any problem.

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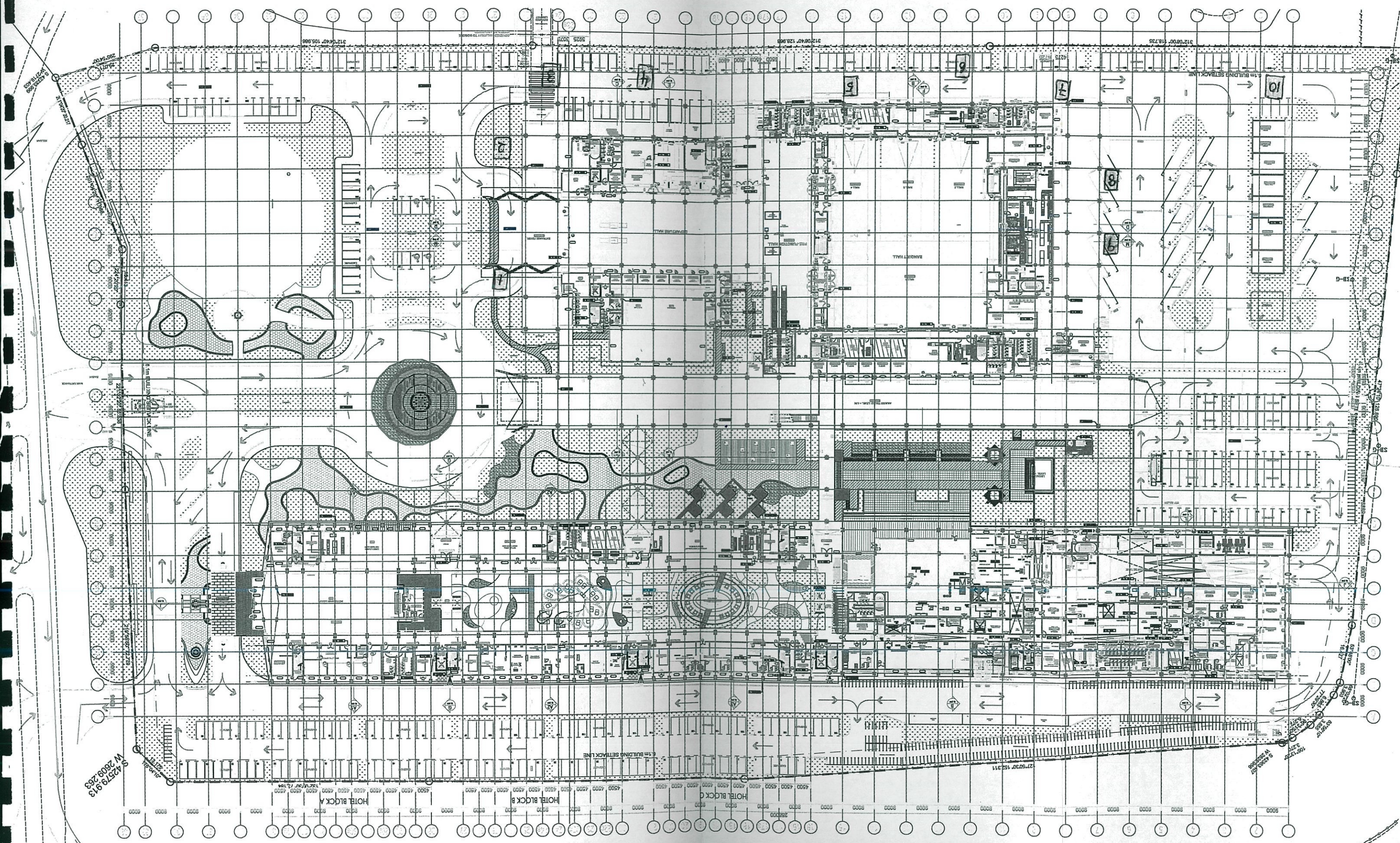
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## APPENDIX





42579 913  
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HOTEL BLOCK A

HOTEL BLOCK B

HOTEL BLOCK C

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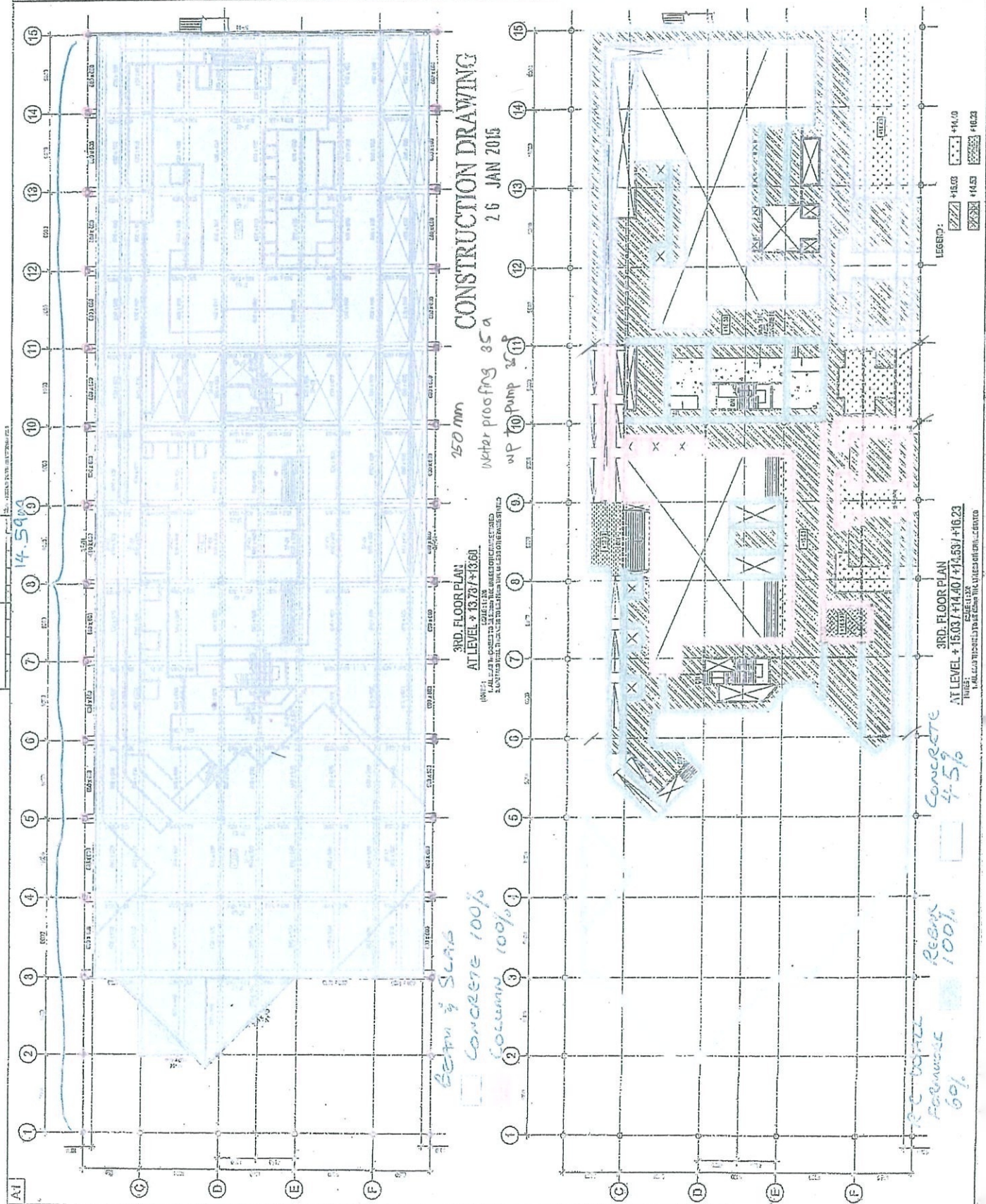
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**CONSTRUCTION DRAWING**  
26 JAN 2015

150 mm  
water proofing 85 a  
wp 10 Pump 35 a

3RD FLOOR PLAN  
AT LEVEL ± 13.78 / ± 13.00

Beam & Slab  
Concrete 100%  
Column 100%

3RD FLOOR PLAN  
AT LEVEL ± 15.03 / ± 14.40 / ± 14.53 / ± 16.23

Concrete 4.5%  
Beam Concrete 100%  
Column 60%

LEGEND:

150 mm	150 mm
Water proofing 85 a	Water proofing 85 a
wp 10 Pump 35 a	wp 10 Pump 35 a
Concrete 4.5%	Concrete 4.5%
Beam Concrete 100%	Beam Concrete 100%
Column 60%	Column 60%

<p>1.27</p> <p>1.28</p> <p>1.29</p> <p>1.30</p> <p>1.31</p> <p>1.32</p> <p>1.33</p> <p>1.34</p> <p>1.35</p> <p>1.36</p> <p>1.37</p> <p>1.38</p> <p>1.39</p> <p>1.40</p> <p>1.41</p> <p>1.42</p> <p>1.43</p> <p>1.44</p> <p>1.45</p> <p>1.46</p> <p>1.47</p> <p>1.48</p> <p>1.49</p> <p>1.50</p> <p>1.51</p> <p>1.52</p> <p>1.53</p> <p>1.54</p> <p>1.55</p> <p>1.56</p> <p>1.57</p> <p>1.58</p> <p>1.59</p> <p>1.60</p> <p>1.61</p> <p>1.62</p> <p>1.63</p> <p>1.64</p> <p>1.65</p> <p>1.66</p> <p>1.67</p> <p>1.68</p> <p>1.69</p> <p>1.70</p> <p>1.71</p> <p>1.72</p> <p>1.73</p> <p>1.74</p> <p>1.75</p> <p>1.76</p> <p>1.77</p> <p>1.78</p> <p>1.79</p> <p>1.80</p> <p>1.81</p> <p>1.82</p> <p>1.83</p> <p>1.84</p> <p>1.85</p> <p>1.86</p> <p>1.87</p> <p>1.88</p> <p>1.89</p> <p>1.90</p> <p>1.91</p> <p>1.92</p> <p>1.93</p> <p>1.94</p> <p>1.95</p> <p>1.96</p> <p>1.97</p> <p>1.98</p> <p>1.99</p> <p>2.00</p>	<p>1.1</p> <p>1.2</p> <p>1.3</p> <p>1.4</p> <p>1.5</p> <p>1.6</p> <p>1.7</p> <p>1.8</p> <p>1.9</p> <p>2.0</p> <p>2.1</p> <p>2.2</p> <p>2.3</p> <p>2.4</p> <p>2.5</p> <p>2.6</p> <p>2.7</p> <p>2.8</p> <p>2.9</p> <p>3.0</p> <p>3.1</p> <p>3.2</p> <p>3.3</p> <p>3.4</p> <p>3.5</p> <p>3.6</p> <p>3.7</p> <p>3.8</p> <p>3.9</p> <p>4.0</p> <p>4.1</p> <p>4.2</p> <p>4.3</p> <p>4.4</p> <p>4.5</p> <p>4.6</p> <p>4.7</p> <p>4.8</p> <p>4.9</p> <p>5.0</p> <p>5.1</p> <p>5.2</p> <p>5.3</p> <p>5.4</p> <p>5.5</p> <p>5.6</p> <p>5.7</p> <p>5.8</p> <p>5.9</p> <p>6.0</p> <p>6.1</p> <p>6.2</p> <p>6.3</p> <p>6.4</p> <p>6.5</p> <p>6.6</p> <p>6.7</p> <p>6.8</p> <p>6.9</p> <p>7.0</p> <p>7.1</p> <p>7.2</p> <p>7.3</p> <p>7.4</p> <p>7.5</p> <p>7.6</p> <p>7.7</p> <p>7.8</p> <p>7.9</p> <p>8.0</p> <p>8.1</p> <p>8.2</p> <p>8.3</p> <p>8.4</p> <p>8.5</p> <p>8.6</p> <p>8.7</p> <p>8.8</p> <p>8.9</p> <p>9.0</p> <p>9.1</p> <p>9.2</p> <p>9.3</p> <p>9.4</p> <p>9.5</p> <p>9.6</p> <p>9.7</p> <p>9.8</p> <p>9.9</p> <p>10.0</p>
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**TAK PROJEK**  
 CADANGAN MEMBINA DAN MENYAPKAN  
 KOMPLEKS TABUNG HAJI YANG TERDIRI  
 DARIPADA PUSAT OPERASI HAJI 2 TINGKAT,  
 HOTEL TABUNG HAJI 9 TINGKAT (333 BILIK),  
 ASTAKA (WELLNESS CENTRE), BANGUNAN  
 TEMPAT LETAK KERETA 3 TINGKAT  
 (TERMASUK DUA KOLAM RENANG DAN  
 SELANGGANG TENIS DI APAS BUMBUNG) DI  
 DI ATAS LOT PT76, BANDAR LAPANGAN  
 TERBANG ANTARABANGSA SEPANG, MUKIM  
 LABU, DAERAH SEPANG, SELANGOR DARUL  
 EHSAN

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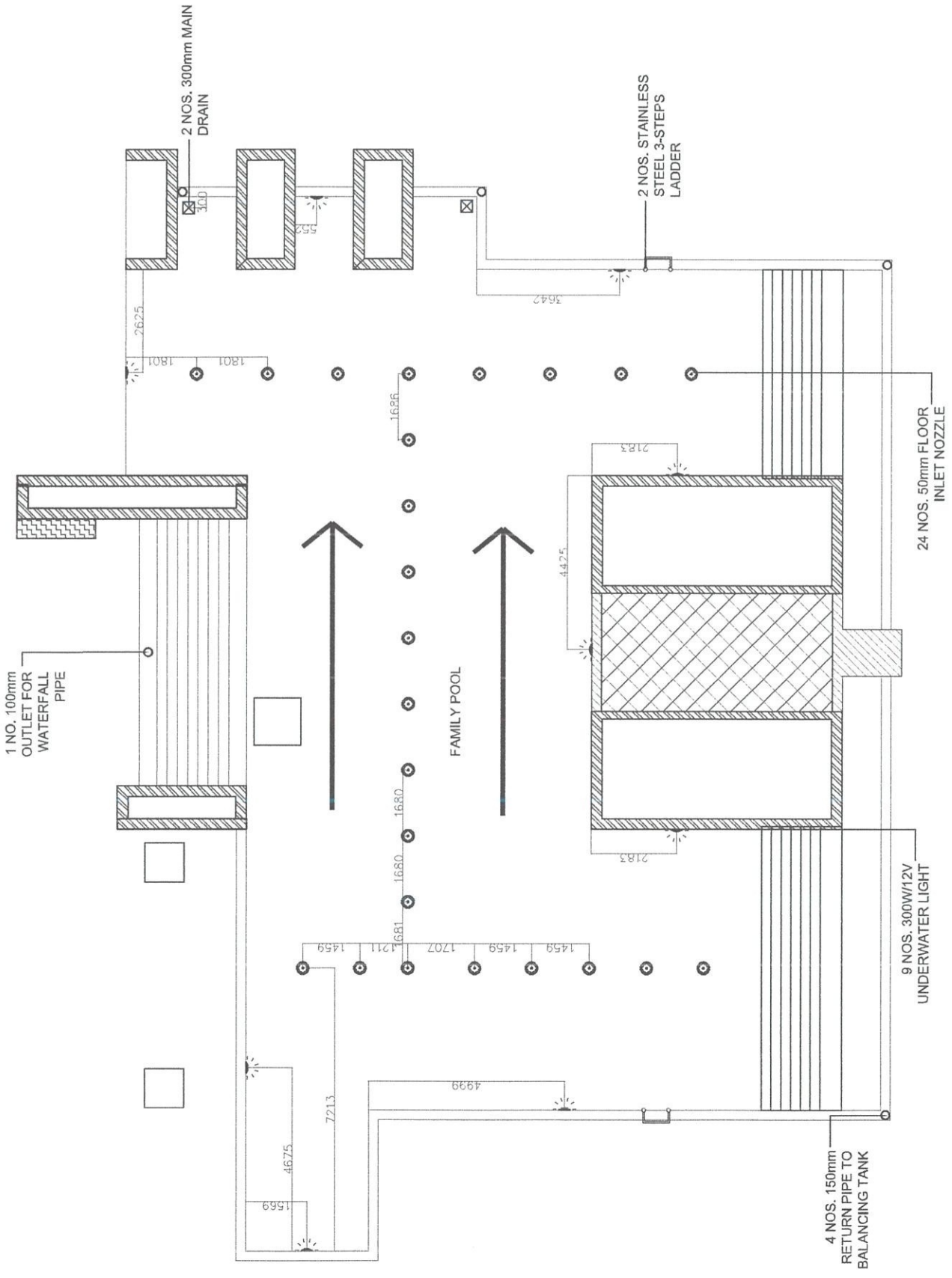
**PERANCANG MAE**  
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 Fax : +603-6253 7719  
 http://www.aseng.com.my

NO	REVISION	DATE

TAK / PROJECT		FAMILY POOL LAYOUT PLAN	
DATE	NO	REVISION	NO
DRAWING NUMBER		SCALE : 80%	



NOTE: ALL CIVIL, STRUCTURAL AND FINISHES WORK ARE BY OTHERS

LAYOUT PLAN FOR FAMILY POOL



1. REFER TO THE GENERAL NOTES ON SHEET 1 OF THIS DRAWING FOR THE CONSTRUCTION OF THE FOUNDATION WORK AND OTHER NECESSARY WORKS TO BE DONE BY THE CONTRACTOR.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL NECESSARY SERVICES AND MATERIALS TO BE USED IN THE CONSTRUCTION OF THE FOUNDATION WORK AND OTHER NECESSARY WORKS TO BE DONE BY THE CONTRACTOR.

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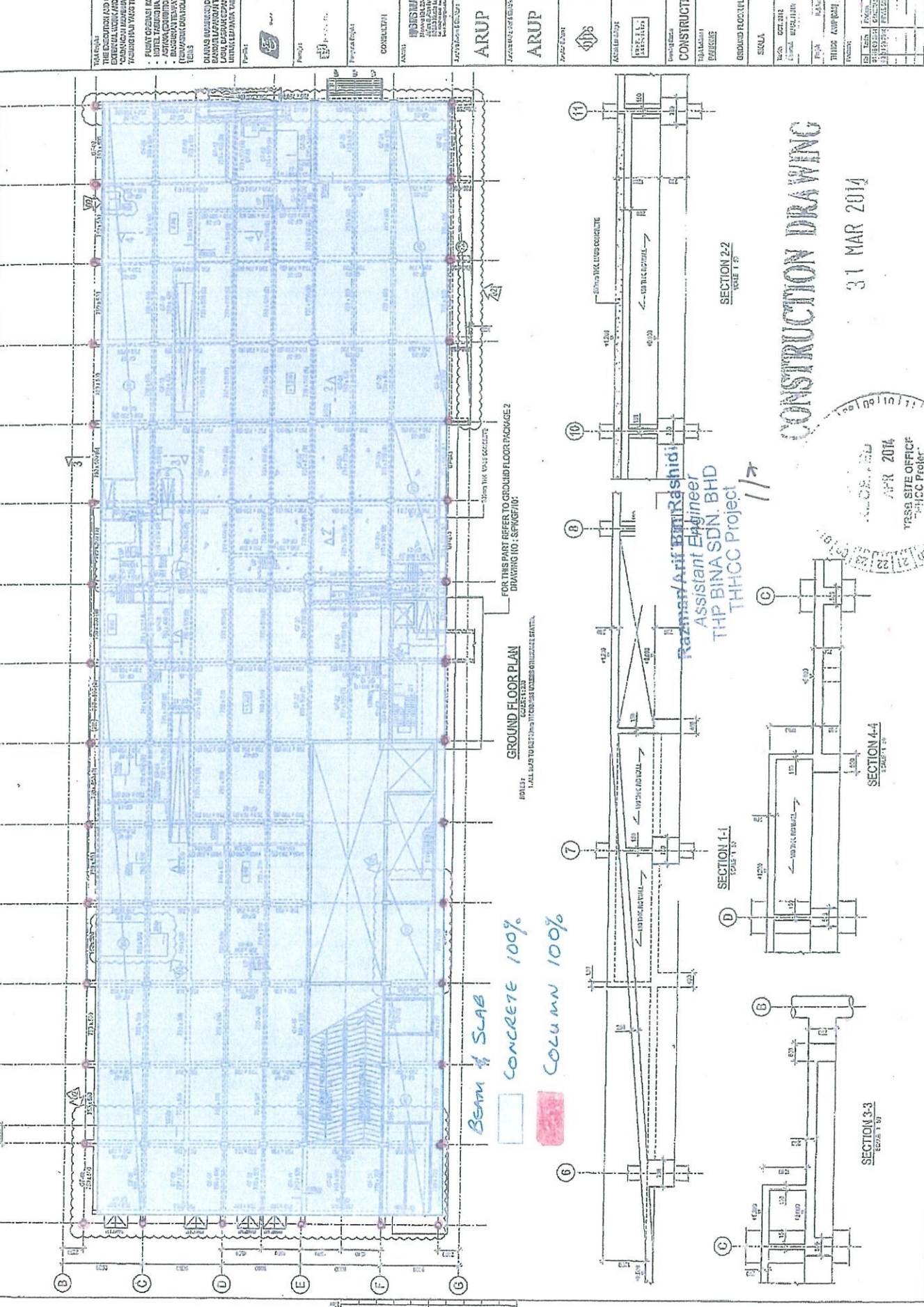
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FOR THIS PART REFER TO GROUND FLOOR PACKAGE 2 DRAWING NO : SPM/07/10

GROUND FLOOR PLAN  
SCALE 1:50

SECTION 1-1  
SCALE 1:50

SECTION 2-2  
SCALE 1:50

SECTION 3-3  
SCALE 1:50

SECTION 4-4  
SCALE 1:50

Beam & Slab  
CONCRETE 100%

Column  
CONCRETE 100%

RAZMAN/ARIF BINTI RASHIDI  
Assistant Engineer  
THP BINA SDN. BHD  
THHCC Project

CONSTRUCTION DRAWING  
31 MAR 2014

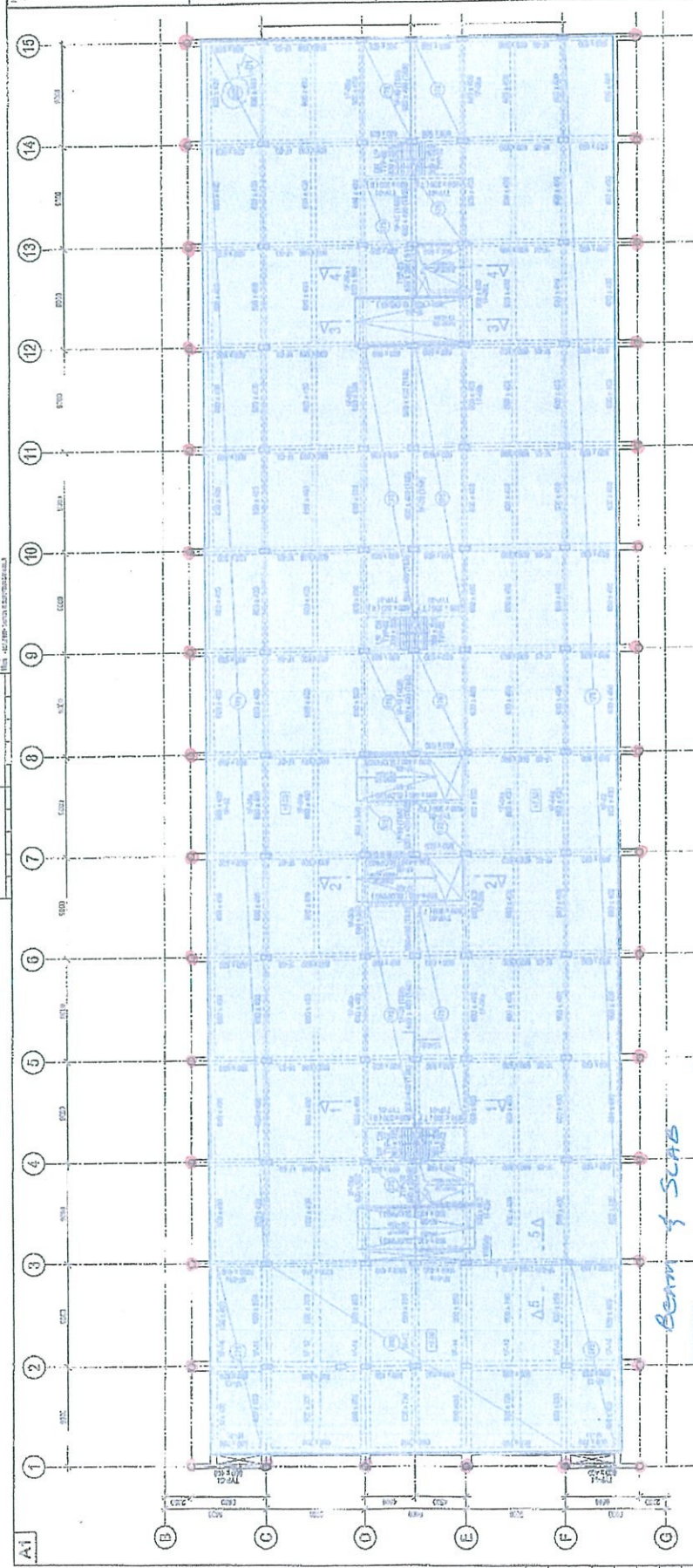
APR 2014  
THP SITE OFFICE  
THHCC Project

NO.	REVISION	DATE	BY
01	ISSUE FOR PERMIT TO CONSTRUCT	31 MAR 2014	RAZMAN/ARIF BINTI RASHIDI
02	ISSUE FOR CONSTRUCTION	31 MAR 2014	RAZMAN/ARIF BINTI RASHIDI
03	ISSUE FOR AS-BUILT DRAWING	31 MAR 2014	RAZMAN/ARIF BINTI RASHIDI

THP BINA SDN. BHD  
THHCC Project



<p>1. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p> <p>2. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p> <p>3. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p>	<p>1. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p> <p>2. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p> <p>3. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p>
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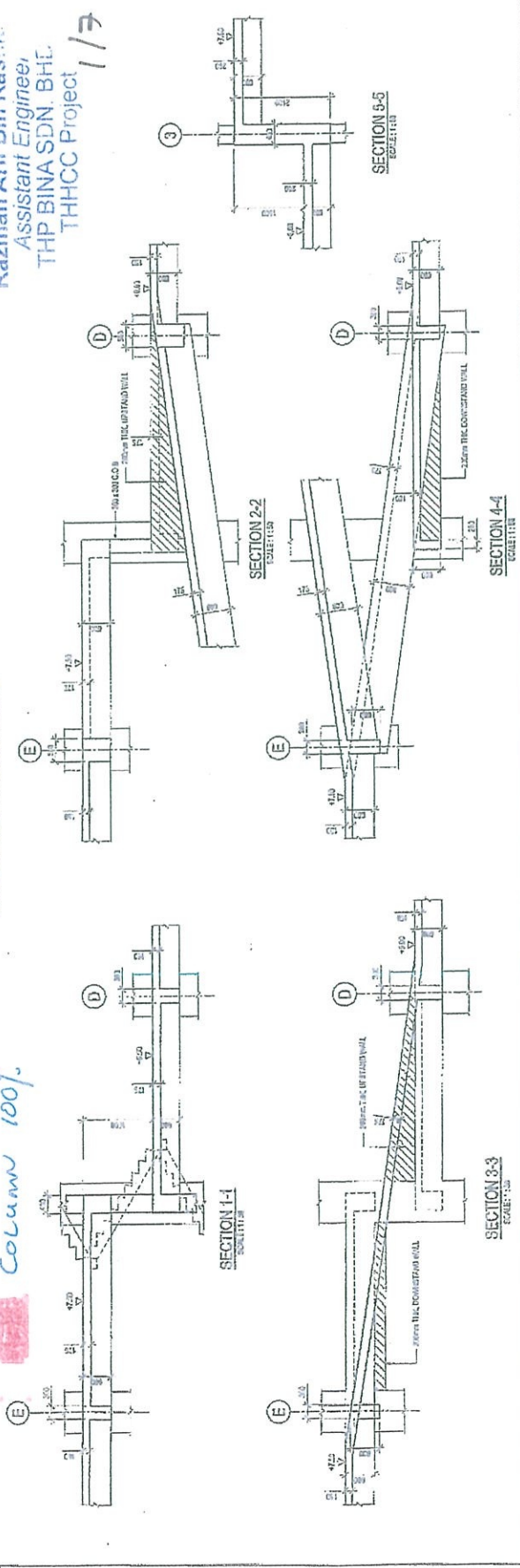


1ST FLOOR PLAN  
SCALE: 1:200

NOTE: ALL DIMENSIONS TO BE TAKEN TO THE UNLESS OTHERWISE STATED.

*Beam & Slab  
concrete 100%  
Column 100%*

**Razman Anif Bin Rasidi**  
Assistant Engineer,  
THP BINA SDN. BHD.  
THHCC Project 1/7



SECTION 1-1  
SCALE: 1:20

SECTION 2-2  
SCALE: 1:20

SECTION 3-3  
SCALE: 1:20

SECTION 4-4  
SCALE: 1:20

<p>1. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p> <p>2. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p> <p>3. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p>	<p>1. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p> <p>2. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p> <p>3. THE GENERAL WORKS REFER TO GENERAL CONTRACTS-1 (REVISIONS) AND GENERAL CONTRACTS-2 (REVISIONS) FOR THE BUILDING WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS PROVIDED BY THE ARCHITECT.</p>
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