



**DEPARTMENT OF BUILDING  
UNIVERSITI TEKNOLOGI MARA  
(PERAK)**

**METHOD CONSTRUCTION OF RETAINING WALL FOR ONSITE  
STORM WATER DETENTION POND (OSD POND)**

**Prepared by:**

**IZZAH NUR IMANINA BINTI AHMAD SAFAWI**

**2017213492**

**DEPARTMENT OF BUILDING**  
**FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING**  
**UNIVERSITI TEKNOLOGI MARA**  
**(PERAK)**

**DECEMBER 2019**

It is recommended that the report of this practical training provided

by

**IZZAH NUR IMANINA BINTI AHMAD SAFAWI**  
**2017213492**

**METHOD OF CONSTRUCTION WORKS ONSITE STORM WATER DETENTION  
POND (OSD POND) RETAINING WALL**

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

Report Supervisor : \_\_\_\_\_  
Dr Sallehan Bin Ismail

Practical Training Coordinator : \_\_\_\_\_  
En. Muhammad Naim Bin Mahyuddin.

Programme Coordinator : \_\_\_\_\_  
Dr. Dzulkarnaen Bin Ismail.

**DEPARTMENT OF BUILDING**  
**FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING**  
**UNIVERSITI TEKNOLOGI MARA**  
**(PERAK)**

**DECEMBER 2019**

**STUDENT'S DECLARATION**

I hereby declare that this report is my own work, except for extract and summaries for which the original references are stated herein, prepared during a practical training session that I underwent at Wisdom Infinity Sdn. Bhd. for a duration of 20 weeks starting from 5 August 2019 and ended on 20 December 2019. It is submitted as one of the prerequisite requirements of BGN310 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

Name : Izzah Nur Imanina Binti Ahmad Safawi

UiTM ID No : 2017213492

Date : 13 December 2019

## **ACKNOWLEDGEMENT**

Alhamdulillah thank Allah for the gracious and most Compassionate, I would like to express my deepest appreciation to all those who provided me the possibility to finish this report successfully. After a few periods of working hard to finish this report, I hope that all of the efforts that have been made will be able to fulfill the objective of this report. I would like to earmark a million gratitude to all individual that participated for enriching their time and energy deliberately in accomplishing objectives and main purposes during this practical training session. The report cannot be completed without the following group of amazing individuals. After that, special gratitude I offer to Wisdom Infinity Sdn. Bhd. Who allowed me to participate in their company during this practical training session. Besides that, a superior thank to the project manager Sir Muhammad Abdul Rabbani Ja'apar whose contribution and in stimulating suggestions and encouragement and helped to coordinate in completed this practical training report. He gives support and guides on how to produce the outcome from the research. Without his guide and advice and everyone who is participated in this report, maybe I will not be able to finish this report on time. Other than that a million of thanks to the sub-contractor Mr. Teh Chee Siong. After that, I would like to thank my beloved parent who is never giving up and helped me in the form of morals and financial support consistently which contributed to our successful result for this report.

## **ABSTRACT**

Retaining wall for OSD Pond is a very important component to support soil and hold the soil to improved more strengthen to the soil, therefore this report will discuss about the method of construction works OSD Pond , Type of re-bar and the installation of OSD Pond outlet pipe, this reported was conducted for building construction of CADANGAN PEMBANGUNAN PERUMAHAN ATAS LOT 1107,1163,1330,30002 (DAHULUNYA LOT 3002) DAN LOT 31205 (DAHULUNYA LOT 234), MUKIM GALI, DAERAH RAUB, PAHANG DARUL MAKMUR UNTUL TETUAN WISDOM INFINITY SDN. BHD. The objective of this report to identify the method of construction work of retaining wall for OSD Pond, to determine the method of OSD Pond outlet pipe installation and to identify the type and size of the re-bar and link for slab and wall. These is to illustrate the function of retaining wall as an important aspect for OSD Pond can be achieve. In conclusion, findings shows the method of construction work retaining wall for OSD Pond. This report will also look at the problem that will face during the construction work and how to overcome it to give a very good works in every aspect of safety.

<b>CONTENT</b>	<b>PAGE NO</b>
Acknowledgement	i
Abstract	ii
Contents	iii
List of Tables	v
List of Figures	vii
List of Appendix	viii
<b>CHAPTER 1.0 PREFACE</b>	
1.1 Introduction	1
1.2 Objective	2
1.3 Scope of study	2
1.4 Method of study	
1.4.1 Primary Sources	3
1.4.2 Secondary Sources	3
<b>CHAPTER 2.0 COMPANY BACKGROUND</b>	
2.1 Company history	4
2.2 Company profile	
2.2.1 Company objective	5
2.2.2 Company mission	5
2.2.3 Company vision	5
2.3 Organization Chart	6
2.4 List of Project	
2.4.1 Complete Projects	7
2.4.2 Project in Progress	8

<b>CHAPTER</b>	<b>3.0</b>	<b>CASE STUDY (CONSTRUCTION OF OSD POND)</b>	
	3.1	Introduction to case study	9
	3.2	Project Background.	
		3.2.1 Project detail	11
		3.2.2 Project information	12
		3.2.3 Parties involved	13
		3.2.4 Main contractor organizational chart	14
	3.3	Introduction to the OSD Pond	
		3.3.1 Function of OSD Pond and retaining wall	15
	3.4	Onsite Storm water Detention Pond retaining wall	16
		3.4.1 Type of OSD Pond retaining wall	17
		3.4.2 OSD Layout 1	18
		3.4.3 OSD Layout 2	19
	3.5	Method of the construction works flow chart	20
		3.5.1 Construction works of retaining wall OSD Pond	21
	3.6	Problem facing and preventive action	30
<b>CHAPTER</b>	<b>4.0</b>	<b>CONCLUSION</b>	
	4.1	Conclusion	31
<b>REFERENCEES</b>			32
<b>APENDIXES</b>			33

## **LIST OF TABLES**

Table 1.0	List of incomplete project
Table 1.1	List of project in progress
Table 3.0	Schedule of re-bar for retaining wall
Table 3.1	Chaining schedule for retaining wall



## LIST OF FIGURES

Figure 3.1	Site location	9
Figure 3.2	Company logo	9
Figure 3.3	Site signboard	10
Figure 3.4	Taman Mentari Raub	11
Figure 3.5	Main contractor organizational chart	14
Figure 3.6	Onsite Storm Water Detention Pond layout 1	18
Figure 3.7	Onsite Storm Water Detention Pond layout 2	18
Figure 3.8	Flow chart process	20
Figure 3.9	Setting out / levelling works	21
Figure 3.10	Excavations work	22
Figure 3.11	Roller compacter	23
Figure 3.12	Formwork installation	24
Figure 3.13	Reinforcement bar installation works for wall base	25
Figure 3.14	Reinforcement bar installation for wall	26
Figure 3.15	concreting works	27
Figure 3.16	Dismantling formwork	28
Figure 3.17	Pipe culvert installation	29

## **CHAPTER 1.0**

### **PREFACE**

#### **1.1 INTRODUCTION**

The building is some to extent determined by the availability of materials and skilled operatives, therefore local, regional and national factors will also be responsible for some variation. Supplementary study material and detail can be obtained from professional journals, legislative paper, manufactures product literature, the many cross-references in the text and attending exhibits and seminars. The most valuable learning resource is observing and monitoring construction in progress. (Roy Chudley, 1982).

As all of people know that building construction is the techniques and industry involved in the assembly and erection of structures, primarily those used to provide shelter against catastrophe. Building construction began from an ancient days by human. They constructed a shelter to protect themselves to a wide variety of climates.

However, in the construction site whether a development involves a high rise building and low rise terrace house, for example, residential area. As people can see nowadays the population of people increasing so it is not surprising that construction works are rapidly developed due to the high demand. Any planning in the construction work should be considered in terms of local weather, cost, environment, site condition for example whether the area you want to work in is rugged or not. The project manager should be aware of water flows from the hills or the highland area down to the site, so OSD Tank was created to facilitate all the people.

In a simple meaning OSD Tank (onsite storm water detention tank) which is a placed to keep a huge amount of water. There are two types of water storage which are OSD Tank and OSD Pond. The advantage of OSD Pond is low capital cost and low maintenance cost rather than OSD Tank. The difference between Tank and Pond is Pond can retain a huge amount of water rather than Tank.

## **1.1 Objective**

The objectives of this report are:

- i. To identify the function of OSD Pond for the residential area
- ii. To determine the method of construction work of retaining wall for OSD Pond
- iii. To investigate the problem facing during the construction works of OSD Pond

## **1.2 Scope of study**

This report provides information regarding Cadangan Pembangunan Perumahan of 44 unit Double Storey Terrace House, OSD Pond, Water Tank and Pump House, and Sewerage Treatment Plant located in Raub, Pahang. In a 5 months of observation this report also consist information of OSD Pond construction works from the first stage to the final stage. This stage involves the planning and development activities associated with building construction and consists of two closely related processes:

- i. The function of OSD Pond to the residential area
- ii. Preparing and carrying out the construction works.

### 1.3 METHOD OF STUDY

The method of conducting this study are:

#### Primary data

- i. Observation  
Observation session of the construction works for OSD Pond about a month and the data recorded using taking a pictures and writing a note.
- ii. Interviews  
Interview sessions with several people who are responsible in charging on the site construction. Several of those people are the project manager, sub – contractor, skilled worker, unskilled worker and more.
- iii. Documents review  
Documents review based on the architectural drawing, construction drawing and the progress report from the company

#### Secondary data

The main reason for literature review is can study and find out regarding the building construction about the step of roof installation, the material used and how to install it through the relevant books, articles and thesis at National library and UiTM Seri Iskandar library, Perak.

Several of the literature studies are from the drawing project on the generosity of the En. Muhammad Abdul Rabbani Ja'apar, project manager. This drawing project shows details of OSD Pond and Drainage.

## **CHAPTER 2.0**

### **COMPANY BACKGROUND**

#### **2.1 Company history**

Wisdom Infinity Sdn. Bhd. known as a private company in early of its establishment, this company in cooperated officially in Malaysia on 29 June 2019 with the headquarters located in Bandar Baru Klang. The main activities of this company is properties development and project management consultancy services. Wisdom infinity Sdn. Bhd. start up with capital RM 5000,000.00. Before this Wisdom Infinity known as Sparkle Wisdom Sdn. Bhd.

In early of its establishment Wisdom Infinity Sdn. Bhd. only provide the properties and services, due to the their main activities they do not have any CIDB license as a constructions company to manage any construction project, Wisdom Infinity Sdn. Bhd. brought in another subsidiary working under their management which is Dynamic Design Sdn. Bhd.

Dynamic design Sdn. Bhd. known as a private construction company in early of its establishment and this company working under the Wisdom Infinity Sdn. Bhd. This company in cooperated officially in Malaysia on 29 October 2009, in early of its joining Wisdom Infinity Sdn. Bhd. department this company officially under Wisdom Infinity companies. Dynamic design main activities are heavy and civil engineering construction sector. They share the same headquarters which is located at Bandar Baru Klang.

Dynamic Designed Sdn. Bhd. reported a net sales revenue drop of 57.15% in 2017. Its' total assets recorded negative growth of 26.57% and the Wisdom Infinity Sdn. Bhd. reported a net sales revenue drop of 50.25% in 2017. Its' total assets recorded a negative growth of 43.25%. The net profit margin of Wisdom Infinity Sdn. Bhd. increased by 43.59% in 2017.

## **2.2 Company Profile**

### **Owner**

Wisdom Infinity Sdn. Bhd.

### **Company reported net Sales**

50.25% in 2017

### **Total assets**

43.25%

### **Net profit margin**

43.59%

### **Company Vision**

To be one of dominant property developer around.

### **Company Mission**

“ this wisdom infinity promise wisdom is committed to property owners or investor to enjoy asset appreciation and resale value. It is quality **Workmanship**, **Innovative** design, exemplary **Services** provided timely completion and **Delivery** is the ultimate **Obligation** for our **Management**.

#### 2.1.4 ORGANIZATIONAL CHART

Organizational chart on site figure

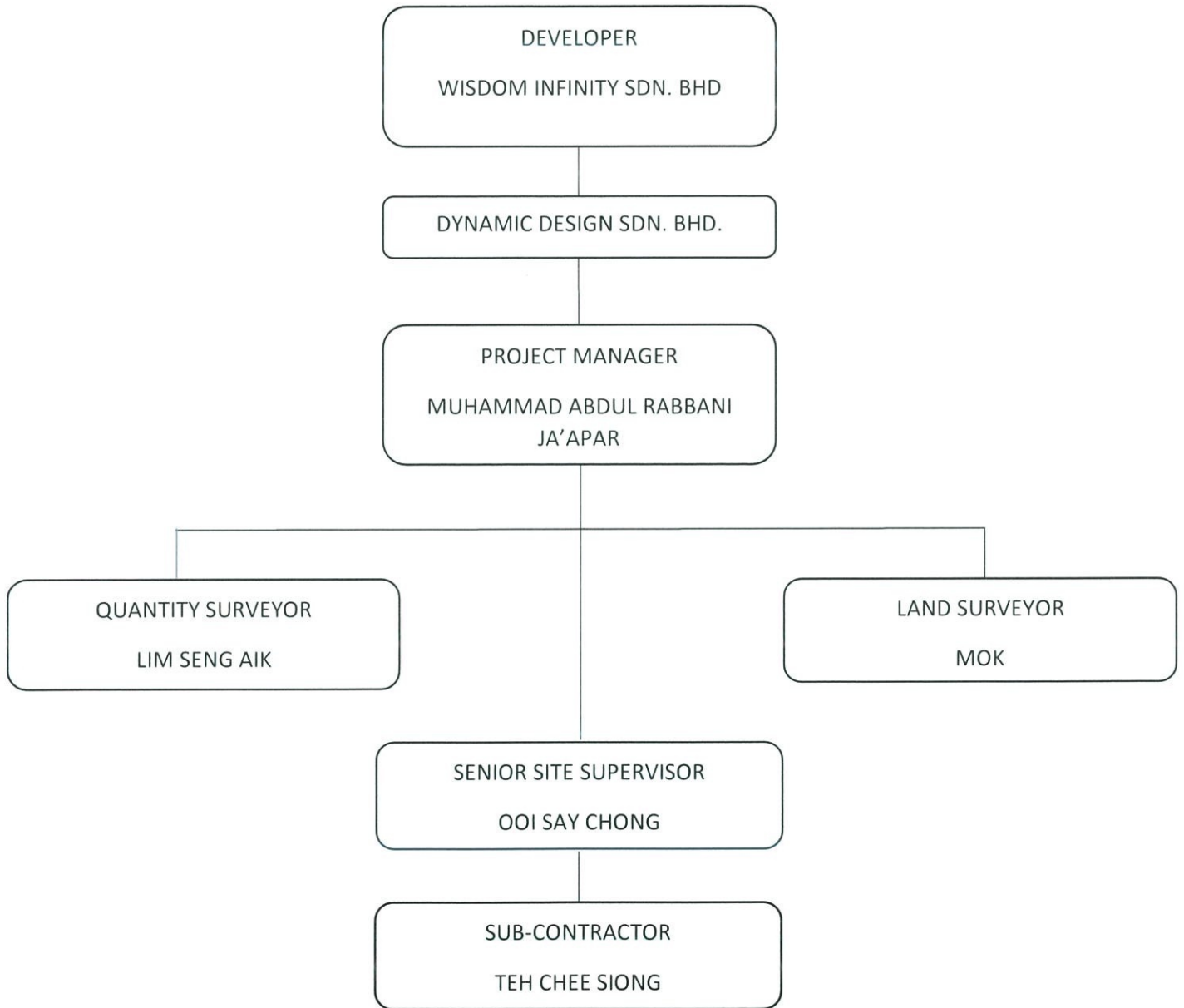


Figure 2.1: organizational chart on site

## 2.2 LIST OF PROJECT

### 2.2.1 Completed Projects

The list of complete project was stated in the Table 1.0

Table 1.0: List of complete project

<b>Bil</b>	<b>Location</b>	<b>complete date</b>	<b>Amount (RM)</b>
1	Wisdom 30 series Park Lorong Sungai Puloh, Klang,42100, Selangor.	8 Sept 2016	55,000,000.00
2	Wisdom 8 industrial Park Jalan Kapar Batu 3, Klang 42100, Selangor.	31 July 2015	27,000,000.00
3	Lembayung Residences Taman Bentara, 41200 Telok Panglima Garang, Selangor.	16 May 2017	27,000,000.00
4	Sparkle Industrial Park Port Klang, Selat Klang, Sg Puloh industrial, Sg Kapar Indah Selangor.	30 December 2011	43,000,000.00
5	Taman Bayu Sijangkang Telok Panglima Garang 42500, Selangor.	21 August 2013	7,500,000.00



### 2.2.2 Project in progress

The list of project in progress was stated in the Table 1.1

Table 1.1: List of project in progress

<b>Bil</b>	<b>Location</b>	<b>Complete Date</b>	<b>Amount (RM)</b>
1	Taman Menteri Raub Lot 1107, 1163, 1330, 30002 (Dahulunya lot 3002) dan Lot 31205 (Dahulunya Lot 234), Mukim Gali, Daerah Raub, Pahang Darul Makmur.	31 December 2019	8,990,000.00
2	Karak Indah Residences Diatas Lot 669 and 126984, Mukim Sabai, Daerah Bentong, Pahang Darul Makmur.	31 May 2020	4,480,000.00

## CHAPTER 3.0

### 3.1 Introduction of case study

This construction of 44 units double-story terrace for CADANGAN PEMBANGUNAN PERUMAHAN. The duration to complete this project is from 3 September 2018 until 31 December 2019. It is located near to the TF supermarket, BHP Petrol oil station and a few construction material shops and factory, in front of the main access road. So the access to the site is quite complicated and busy due to the movement of a heavy and light vehicle. To overcome this problem, we will use different types of machinery on different days to avoid the difficulty of access to the road and noisy environment. Figure 3.1 shown the site location.



Figure 3.1: Site location

Sources: Google maps 2019



Figure 3.2: Company Logo

Sources: Wisdom Infinity Sdn. Bhd. website

The project took place during the period of undergoing practical training. The construction project, which in total was estimated to cost RM8,990,000.00 Malaysia. This project was made for the client Wisdom Infinity Sdn. Bhd. The main contractor is Dynamic Design Sdn. Bhd, the sub-contractor SL CON Sdn. Bhd. The other parties involved during the completion of this project is the architect firm CYSE Architect Sdn. Bhd.architect, the consultant engineer KH Perunding, Mechanical and Engineering Engineer who is GDE Associates Sdn. Bhd. This project parties involved was state on the site signboard. Figure 3.3 shows the project signboard



Figure 3.3: Site signboard

For this case study, the focus will be on the construction work as a suitable topic due to the process of construction is not very complex and heavy. The superstructure work is the only works easy to conduct and manage due to the duration of my practice.

The project was done for a purpose 44 units double-story house, TNB station, OSD Pond, Water tank the construction fully managed by the project manager of Dynamic Design Sdn. Bhd. while the sub-contractor SL CON Sdn. Bhd. was handling the construction of TNB station, Water tank, OSD Tank and Suction station.

### 3.2 Project Background

The wisdom infinity 44 units double storey terrace house began on 3<sup>rd</sup> September 2018. This construction is to build more residential due to the increasing of occupant in Raub, Pahang. This new residential area is to give more opportunity to further developing of building industry.

This construction consists TNB Sub-station, pump house and suction tank, also 6 level of elevated water tank, sewerage treatment plant and Onsite Storm water Detention Pond. This public housing and infrastructure project by Wisdom Infinity Sdn. Bhd. and supposed to complete on December 2019, but due to the several problem the project was delay, supposed to be finish on 2019 because of the delay problem the estimating date extend on early years 2020, because of Wisdom infinity is a private company all cost incurred by their own company, this construction focus more on the quality and put aside of cost. Figure 3.4 shows the illustrations of the finish project



Figure 3.4 Taman Mentari Raub in 2020

Sources: Wisdom Infinity Sdn. Bhd website

### 3.2.2 Project Information

#### a) Project location

The project consists of the construction of a 44 units double storey terrace house, TNB sub station and infrastructure works at Lot 1107,1163,1330,3002 (Dahulunya lot 3002) and Lot 31205 (Dahulunya Lot 234), Mukim Gali Daerah Raub, Pahang. Which location is shown on the location plan at the end of this section.

#### b) Project Description

The purpose of this construction is to develop a new residential area and there are:

- Phase 1 = 44 units
- Phase 2 = 27 units
- Phase 3 = 34 units

Which phase 1 is ongoing and for phase 2 and 3 in the upcoming year and they also include in this project a few facilities:

- TNB sub station
- Sewerage treatment plant (STP)
- Elevated water tank, pump house and suction tank.
- Onsite Storm water Detention Pond (OSD).

#### c) Project site

The site area is located near the main road from Raub town to Kuala Lipis Terengganu, surrounded by the hardware shop and Bee's Farm.

#### d) Project Justification

The project manager, En. Muhammad Rabbani Bin Ja'apar detailed that this project is about to develop a new residential area based on the requirement from the client. This project will be continued to the next phase if getting a high demand from the buyer.

### 3.2.3 Parties Involved

Client : Wisdom Infinity Sdn. Bhd.  
Architect : CYSE Architect Sdn. Bhd.  
Consultant Engineer : KH Perunding  
M&E Engineer : GDE Associates Sdn. Bhd.  
Main contractor : Dynamic Design Sdn. Bhd.  
Project Manager : Muhammad Rabbani Bin Ja'apar

### 3.2.4 Main Contractor Organizational Chart

Figure 3.5 shows the main contractor organizational chart

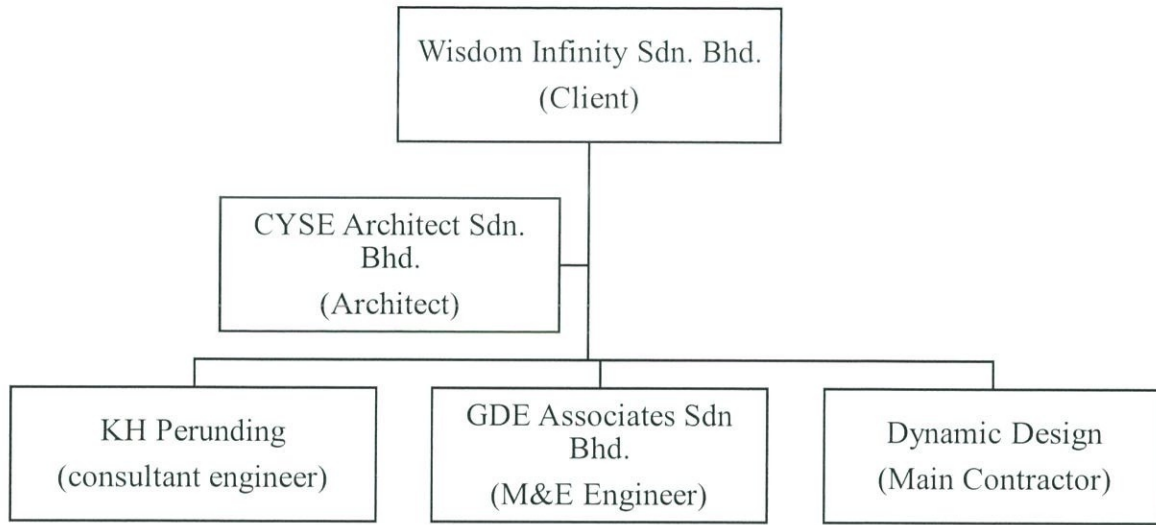


Figure 3.5 Main contractor organizational chart

### **3.3 Introduction to the OSD Pond.**

Onsite storm Water Detention Pond is refer to the water catchment area, the ability of this reservoir can support a huge amount of water from any sources such as rainwater, residential drainage and also water from water flows from the hill. Onsite Stormwater Detention Pond functioned as a water pond to accelerating irrigation and drainage system of the residential area. This OSD Pond have 1 water outlet and and 2 water inlet, for the inlet it was connecting from the cascading drain at both side of the OSD Pond wall and for the outlet pipe was connecting straight to the OSD Pond and connected at the nearest sump.

The outlet pipe used to flows water from the OSD out of the pond, water must be flows out from the pond to avoid water overflow exceeding the retaining wall. It can occurred dangerous situation. In the construction industries there have two types of OSD which is OSD Tank and OSD Pond. Given information that water from OSD Tank will ber recycled and reused but for water for OSD Pond flowing out directly to the main drain road, for these project they constructed OSD Pond due to the future big residential area and mountaining area can occurred a heavy flood.



### **3.4 Onsite Storm Water Detention Pond retaining wall.**

Onsite Storm water Detention Pond is a place that keep a huge amount of water that flow from the hill and residential drains before direct to the main drain. There are three method of construction works in OSD Pond which is the first stage is structure works, second stage infrastructure works and for the last stage is internal works. In the structure works, it is started from the construction of the retaining wall.

There are four types of retaining wall which is Type A, Type B, Type C and Type D. The differences between this type of retaining wall is based on the height of the wall, quantity and type of re-bar and thickness of the retaining wall, to build the retaining wall, the contractor must refer to the schedule of rebar based on the chain level and types of the retaining wall.

This Onsite Storm Water Detention Pond also known as water tank, located near to the main entrance of this residential area, these water tank functioned in a heavy rain, water from height place will flows down through the existing drain and flow into the OSD Pond. When the level of the water getting higher water will flow out from the pond through the outlet pipe and direct to the main drain. Due to a few problem the actual function as OSD Pond has been changed to a medium to flows the water only and not the storage to keep the water. This OSD Pond can be referred to the figure 3.5 OSD Pond layout 1 and figure 3.6 OSD Pond layout 2.

### 3.4.1 Type of OSD Pond retaining wall

Retaining wall usually to be functioned as a unit of comparative rigid wall it is use to support soil from decay laterally so that it may be protect in overall differents levels on the both sides. Retaining wall structure was design to prevent soil from falling down to a slope that might not naturally keep to a typical steep, near vertical and vertical slope. Reataining wall not only for restrain soil but also a huge amount of water. This retaining wall constructed based on the type of the retaining wall, for this Onsite Stormwater Detention Pond (OSD) the company do not use a tank because of future residential area to accommodate a big area, this OSD Pond need to use retaining wall for the structure.

Table 3.1 Chaining Schedule for retaining wall

Type	Chaining
A	CH 68.0
	CH 44.0
B	<b>Left</b>
	CH 28.5
	<b>Right</b>
C	CH 76.2
	<b>Left</b>
	CH 20.6
D	<b>Right</b>
	CH 86.90
	<b>Left</b>
D	CH 0.0
	<b>Right</b>
	CH 96.9

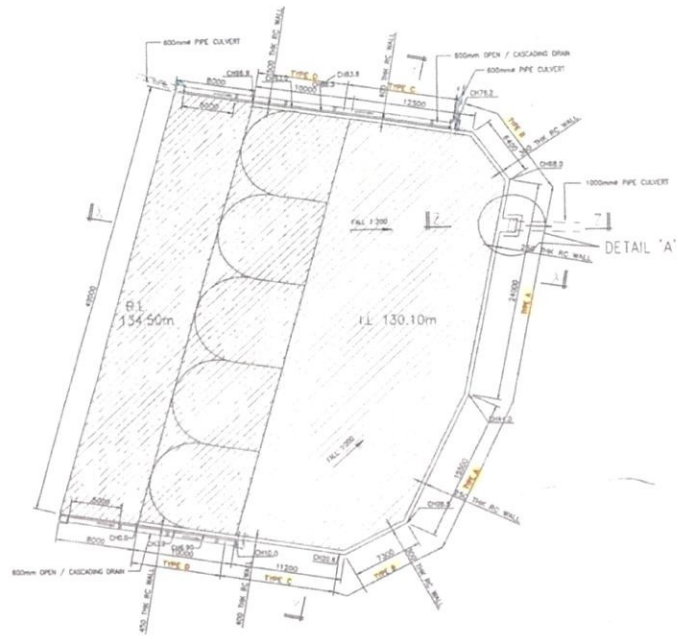


Figure 3.6 Onsite Storm Water Detention Pond layout 1

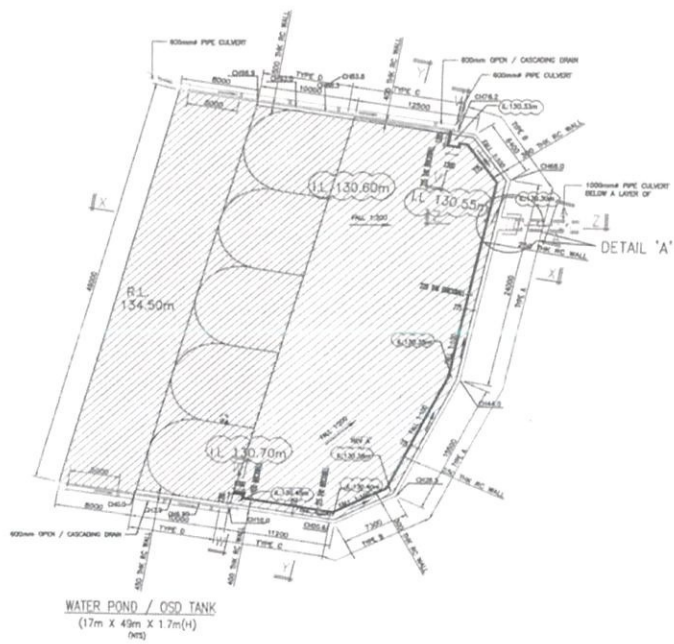


Figure 3.7 Onsite Storm water Detention Pond Layout 2

Due a few problem the actual layout has changed, there are a few improvement part added on the OSD which is before this in the drawing there is no drainaige but a new drawing was released came with the drainage. This OSD Pond not only water pond but also the playgorund. This two layout can be referred to the figure 3.4 Onsite Storm water Detention Pond Layout 1 and Figure 3.5 Onsite storm water Detention Pond layout 2.

### 3.5 Method of construction works retaining wall flow chart process

Flow chart above shown the method of construction works for retaining wall process from the beginning to the end. Figure 3.8 shows the flow charts process of construction works for retaining wall.

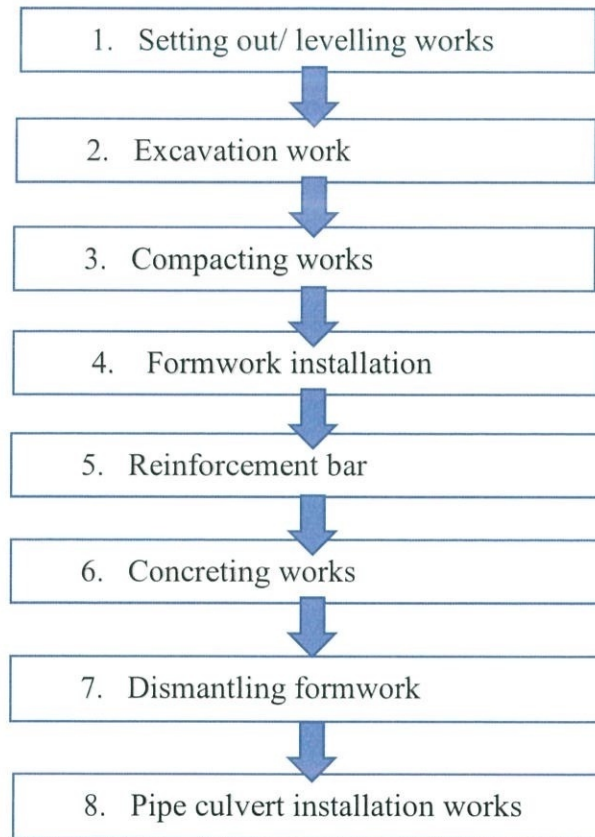


Figure 3.8 Flow chart process

### 3.5.1 Method of Retaining wall OSD Pond construction works

#### 1. Setting Out/ levelling works

Marking on site before excavation works, surveyor checked the onsite level and referred to the surveyor drawing, a few calculation works needed in this setting out stage, the actual measurement will be mark on site using a marker, levelling works continued repeatedly for every chainage this process happen before continued to the next stage. Level taken by surveyor using a levelling equipment which is dumpy level, tripod and levelling staff.



Figure 3.9 Setting out/ levelling works

## 2. Excavations work

Excavation of top soil, the soil was excavated using a backhoe, the operator responsible to follow the instructions from the main contractor, the measurement of the soil depth required for this excavation works was taken in the engineering drawings. The measurement was remarks by surveyor before the excavations work began. Machineris that involved in this stage is backhoe. This excavation works continued repeatedly for every chaining with the same method. The depth of the trench is about 2.5 M from the soil level



Figure 3.10: Excavations work

### 3. Compacting works

Compacting works, due to the excavations work will be affected to the strength of soil, the soil was compacted by the general workers before continued the next stage, soil must be compact to avoid future defect to the wall, this compacting process doing by roller compacter machine. The compactor machine vibrated and compress the soil. Compacting works will continued repeatedly for every chainage of wall using the same processes work.



Figure 3.11: Roller compacter



#### 4. Formwork installation

Formwork installation works, the formwork installed by general workers, this formwork installation happen before reinforcement bar installation, in this stage workers used a few tools to implement the installation works, such as hammer, nails, timber and plywood. The step to install the wall base formwork is install the plywood on the both side of the wall base pinned the plywood using a timber nailed it to make sure the plywood are not moving this step continued repeatedly for every chainage and the same method were used for wall.

For retaining wall (wall) the method of formwork installation quiet same with the wall base but for wall plywood were tie up by the tie rod to make sure the plywood not moving, the rest still the same method.



Figure 3.12 Formwork installation

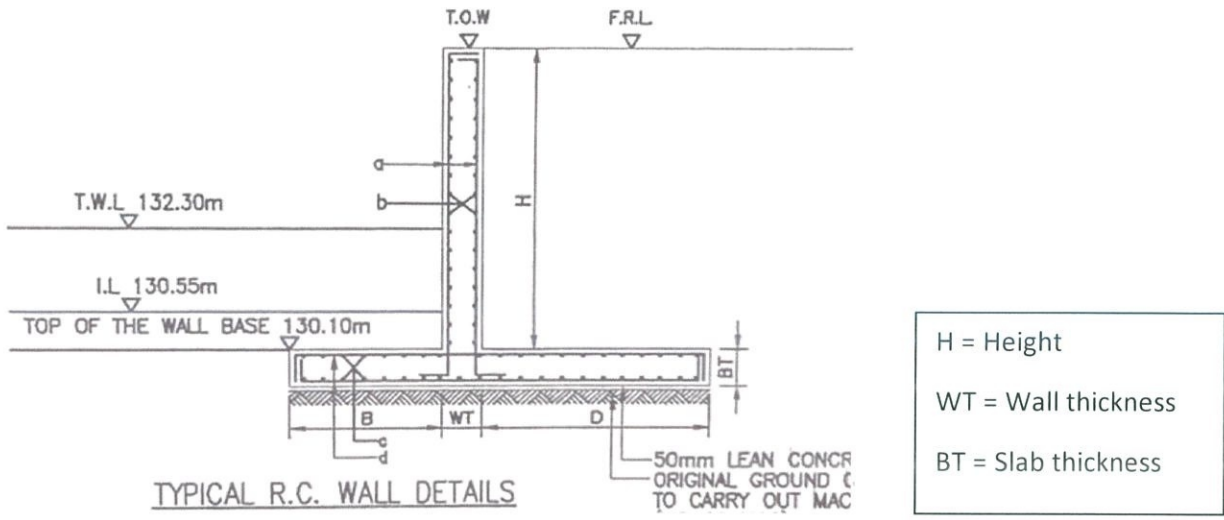
## 5. Reinforcement bar installation

Reinforcement bar installation works for wall base, the re-bar was install by the general workers, this stage happen before concreting works, a few needed in this processed which is wire iron, re-bar based on the drawing measurement, reinforcing bar tie up hooks. Workers tie up the reinforcement bar using a wire iron cross the bar and tie up using a hooks after all the reinforcement bar was finish tie together workers will put chair bar to leave a space between 2 layers of brc. While spacer block under the reinforcement bar to avoid the bar touching the lean concrete. This wall base use T10-200



Figure 3.13: Reinforcement bar installation works for wall base

Reinforcement bar installation works for wall, this process used the same installations method as wall base but not included chair bar and used only spacer block to avoid re-bar touching the formwork. For the tie up process workers use the same method for the wall base. These wall using T16-250.



Type	Height	Wall thk.	B	D	Slab thk.	a	b&c	d
A	$H < 2.3$	250	1000	1500	250	T12-200	T10-200	T12-200
B	$2.3 < H < 3.0$	300	1000	1500	300	T16-250	T10-200	T16-250
C	$3.0 < H < 4.0$	400	1000	2000	400	T16-200	T12-200	T16-200
D	$4.0 < H < 4.8$	450	1000	2500	450	T16-125	T12-200	T16-125

Table 3.2: Schedule of re-bar for Retaining wall



Figure 3.14: Reinforcement bar Installation for wall

## 6. Concreting works

Concreting works for retaining wall base, this concreting works involved 3 general workers and 1 operator machine, which is 2 of the workers manage pouring the concrete while the other one manage the vibrator poker. In this stage there are few plant and machineries involved which is backhoe with concrete bucket and vibrator, a few tools also involved in this concreting work which is hoe, floats, glove and shovel. Concrete fill in the concrete bucket moved by the backhoe to the point area and workers pulled the handle to pour the concrete into the wall base. The concrete left about 1 days to dry. The same method used for the wall but different machineries involved which is mobile crane. Concrete Gred 35 N used for both process which is wall base and wall.



Figure 3.14: Concreting works

## 7. Dismantling formworks

Dismantling formworks for wall base, this process involved 2 general workers to remove the formwork, removing formwork happen when the concrete already dry, in this stage there are a few tools needed to remove the formwork which is hammer and sledge hammer, for this process workers use a hammer thrumming the plywood to remove the formwork.

Dismantling formwork for wall also using the same equipment but different method for removing the formwork, workers need to loose up the tie rod that attached to the plywood first then plywood will be remove using the same method for wall base which is thrumming the formwork.



Figure 3.16 Dismantling formwork

**8. Pipe culvert installation**

Pipe culvert installations works, surveyor mark the level on the site before excavation works, after finished mark the level excavations works started, the depth of the trench for the pipe culvert referred to the drawing, the culvert size 1000 mm, a precast concrete culvert from OKA Concrete industries. Putting 725 mm height of crusher run and install the culvert pipe and fill in with the sand after that making a slab on top of the culvert pipe.



Figure 3.17: Pipe culvert installation

### **3.6 PROBLEMS AND PREVENTIVE ACTION DURING THE CONSTRUCTION WORKS.**

#### **i) Lack of Personal Protective Equipment (PPE)**

A certain parts of our human body such as hands, eyes, head and breathing need a protection that involves the use of PPE. Without all these safety equipment, the workers could be careless and increase the chance of getting accident at the site such as falling to the re-bar or a hard things falling from the constructed building.

The employer must be more cautious all the time to make sure they all wear, the equipment such as safety helmet, boots, gloves and more. The employer should be aware and consulting a perfect practical training before applying them for construction works.

#### **ii) Climate changing**

There are certain construction works that depending on weather such as concreting works, if that day is rainy all the workers must stop doing any works that related to the water such as excavation works may be affected to the area that excavated such as water ponding or others example is concreting works if concreting works continued in raining concrete may be bleeding which is high water content and may affected to the strengthen of the concrete.

Before the construction began workers must do a temporary irrigation to avoid any water ponding, all the workers must be prepared and stop working in the raining, it is to avoid any accident to the structure or all the workers itself.

## **CHAPTER 4.0**

### **CONCLUSION**

#### 4.1 Conclusion

Collectively, after personally taking part at the construction site for Wisdom Infinity Sdn. Bhd, it can be concluded that retaining wall and the infrastructure works is the most important elements in the process of constructing Onsite Storm water Detention Pond (OSD Pond). It is important to determine the function of OSD Pond and how important OSD Pond for the residential area. Precautions must also be kept in mind when handling this construction works to ensure that they'll reach the purpose for a long period time.

One of the main thing to be kept in mind is to identify the method of the construction works of retaining wall OSD Pond which is from the setting out and levelling works, excavation works, compacting works, formwork installation, reinforcement bar installation, concreting works, dismantling formworks and pipe culvert installations as the infrastructure part.

While completing this practical training, it is surely that the things that had been learned theoretically in the class is very different from the real environment at the construction site. A lot of new local terms are learned in substitute of the actual words used in books and in the class. The method that had been learn also various when it is come to the real environment but it is still keeping in tracks on the law and regulations that are necessary when constructing a building or any other civil structure concept.

During this practical training there are a few problem faced such as incomplete personal equipment and climate changing both of this problem come out with the best solutions produce by a great manpower and skilled form each person which is employer must be more cautious with this problem and take it as a serious problem.



## REFERENCES

## APPENDICES