DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

COASTAL PROTECTION

((PVD WORK)

Prepared by:

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2019266168

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

10 JANUARY 2022

It is recommended that the report of this practical training provided

By

Muhamad Hisyam Ikmal Bin Mohd Rasul
2019266168

entitled

Coastal Protection (PVD work)

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

		_____
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DEPARTMENT OF BUILDING
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
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(PERAK)

10 JANUARY 2022

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 Kerjaya Prospek Berhad for duration of 20 weeks starting from 23 August 2021 and ended on 7 January 2022. 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 : MUHAMAD HISYAM IKMAL BIN MOHD RASUL
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Date : 10 JANUARY 2022

ACKNOWLEDGEMENT

First of all, I would like to thank you Kerjaya Prospek company for giving me the opportunity to be an intern here which in Tanjung Tokong site.

I would to thanks to MR Lim Woon Yee for become my site supervisor for this internship. Thank you for giving me the opportunity to work on the barge. I am gratefull and happy to be under Mr. Lim. It will be my plesure to work and learn about this work. It gives me a lot of knowledge about theory and practical of this work. I also can make this report with the help of Mr Lim.

I want to thanks to my report supervisor, Miss Wan Nordianan binti Wan Ali, my practical training coordinator, programme cooordinator, DR. Dzulkarnaen bin Ismail from Universiti Teknologi MARA campus Seri Iskandar, Perak for the guide me to do this internship report.

Lastly, I want to thanks to my family and friends for helping and supporting me when intern.

Thank you very much.

ABSTRACT

This report in general is about the work for coastal protection in the island to make rock bund. The coastal protection is about measures to safeguard the shore against erosion and coastline retreat, as well as coastal settlement damage and hinterland floods. Hard constructions like revetments and groynes are commonly utilised in practise, while soft treatments like coastal nourishment are becoming more prevalent. Hard protection structures change erosion and sedimentation patterns along the coast, which can lead to the loss of natural coastal protection structures like beaches and marshes (so-called coastal squeeze). Also see the article Natural Barriers to Protecting the Shore. To do this coastal protection, they are use PVD work to make this rock bund. This methodology is the way that are use for the process to make the rock bund. This PVD work will short the time to make this rock bund compare to the previous way which take a long time to finish this rock bund. If use this method it will shorten the time.

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CHAPTER 1.0

INTRODUCTION

1.1 Background of Study

In this report is about the coastal protection project. This coastal protection to make rock bund. The work or way to make this rock bund is use Prefabricated Vertical Drains (PVD), also known as Wick Drains or Band Drains, are geotextile-wrapped plastic strips with moulded channels that are prefabricated. These serve as drainage channels for pore water in soft, compressible soils that consolidate more quickly when subjected to a steady surcharge load.

Typically employed in soft, saturated fine-grain soils with large pore capacity, such as silts, clays, peat, sludges, mining tailings, and dredge fills, and usually filled with water (fully saturated). Drainage should be accelerated next. Consolidate leach pads and tailing ponds.

It reduces dirt particle entry and clogging by doing so. Prefabricated vertical drains have a high flow capacity and are frequently used in conjunction with surcharging to speed up preconstruction soil compaction.

They're inserted in soft clay layers to allow for faster consolidation and increased shear strength.

The pore water pressure is increased more quickly when penetrating soft clays, which reduces preloading time, increases water dissipation, shortens pore water travel distance, and compresses soil voids.

The pressure in the pore water might have an impact on the drain flow. Pore water will flow horizontally to the nearest drain instead of vertically to an overlaying or underlying drainage layer in this situation.

PVDs are made out of a prefabricated strip that is perfect for water transport. Polypropylene is commonly used for the flexible core, which has grooves on both sides to allow water to flow freely. The core is encased in a sturdy and long-lasting geotextile filter fabric with exceptional filtering capabilities, allowing pore water to

freely enter the drain. This also prevents particles from nearby soils from clogging the pipes.

The drain is fed down a hollow mandrel fixed on an excavator or crane pole, with an expendable anchor plate at the bottom. The mandrel is inserted to the design depth using a vibratory hammer or a static technique. The wick drain is then left in place once it is removed. The mandrel is then transferred to the next site after the wick drain is cut at the ground surface and a new anchor plate is connected to it. Short drainage channels for pore water are provided by a pattern of built vertical wick drains, which speeds up the consolidation process and building timetable.

The characteristic of this PVD are designed to do two main tasks. One of it is along the drain, the plastic core acts as a longitudinal flow route. Second, the filter jacket has two purposes, it allows water to pass into the core and it keeps dirt particles out.

1.1.1 Type of soil that suitable for PVD

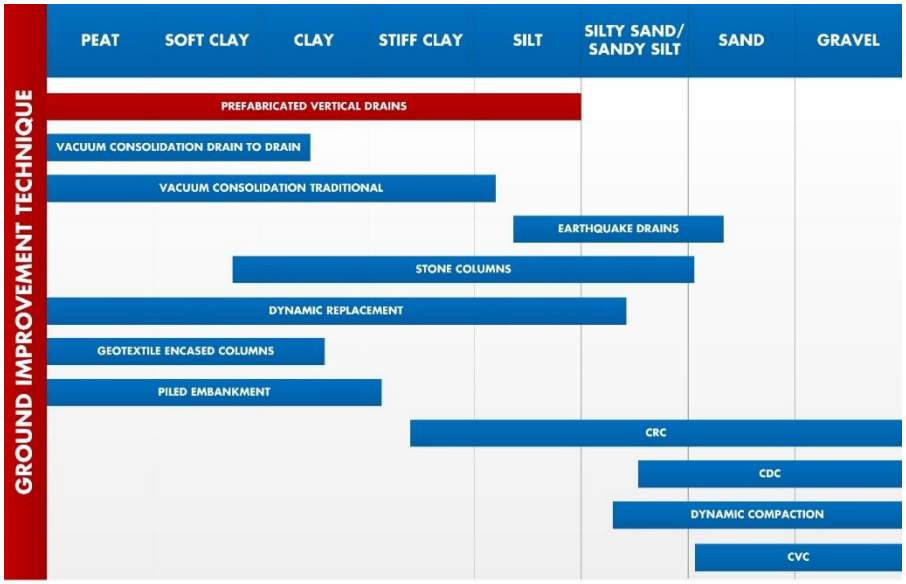


Figure 1.1.1 Type of soil use for PVD

Source: https://cofra.com/solutions/consolidation/vertical-drains.html

1.1.3 Advantages

II. Preloading reduces the amount of time it takes to complete primary consolidation.

III. Reduce the amount of surcharge needed to achieve the specified level of precompression in the time allotted.

IV. When stability is an issue, increase the rate of strength acquisition owing to soft soil consolidation.

1.1.4 Disadvantage

I. Drain installation may require predrilling, jetting, and/or the use of a vibratory hammer if the compression layer is overlain by dense fills or sands, very stiff clay, or other obstructions, or it may not be possible at all if the compression layer is overlain by dense fills or sands, very stiff clay, or other obstructions.

II. If necessary, general pre-excavation can be carried out under these circumstances.

III. Disturbance of the soil due to drain installation may not be bearable when sensitive soils are present or where stability is an issue.In these circumstances, non-displacement sand drains or an alternative soil improvement approach may be more viable.

1.2 Objective

There are the objective that I want to get in this project.

I. To know how PVD work is going

II. To knows the machinery, equipment and that are use in this PVD work.

III. To know the problems that will happen and the solution to solve it.

1.3 Scope of study

The scope of this study is I will . It has the reason itself if did not reach that level of depth on every line and point. Next, to know the machinery, equipment and material that are use in this project. There are material that are use in this PVD project. Lastly, I will determine the problems that are happen on site. It also have the solutions to solve the problem in that time. But in the same time the work still in the progress.

1.4 Methods of Study

There are the method of study that I use to in this report and work.

1.4.1 Observation

This the method through observation with my eyes. This is because I usually will work with them on site. So, I can see how the work is going on. Other than that, I also use camera to take the photo of the point of depth and the work itself. This give a lot of information as I know the point depth and also the machinery and material that are use in this PVD work. I can see this work going on with my own eyes.

1.4.2 Interviews

This are the second method that I use beside observe the work is going. I usually will ask the supervisor sub-con about this work is going. It is because this PVD work is do by sub-contractor itself. I as intern of main contractor, I will ask he or them about this work to know more detail. They will teach and give the information about my question. They were very expert about this PVD work because they already expert of this work. Many information that I know when I ask them about this work.

1.4.3 Documents reviews

Lastly, this method I use to make me more understand about the progress of this work. This is because I can see and learn the drawing plan of this project. It has 50 panel in this project which every panel had it own drawing plan. So, I can learn the drawing plan of this work. It also has their report that are do every two weeks once. This report has the data, progress and information about this PVD work in two weeks.

This all method really helps me to get a lot of knowledge and information to do this report.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

In 1996, Kerjaya Prospek Group Berhad ("Kerjaya" or "The Group"), originally known as Fututech Berhad, debuted on Bursa Malaysia Securities Berhad's Main Market. The Group specialises in the construction of high-end commercial and residential structures, as well as property development and lighting and kitchen solutions.

The Group has steadily enhanced its track record over the years and now has a portfolio of finished and continuing construction projects. Kerjaya was the fourth largest construction counter in the Bursa saham Malaysia in 2018.

2.1.1 Mission

In order to achieve excellence in our enterprises,

To provide consumers with high-quality products and services on a timely basis; to build human capital; and to be a caring employer

To increase shareholder value

to act as a good corporate citizen

2.1.2 Vision

To be the most trusted and desired provider of construction and property related products and services.

2.1.3 Construction

Kerjaya's construction activities are primarily carried out by Kerjaya Prospek (M) Sdn Bhd ("KPM"), a Grade 7 contractor registered with the Construction

Industry Development Board under Category B ("Building Construction"), Category CE ("Civil Engineering"), and Category ME ("Mechanical and Electrical").

KPM's primary business is the development and construction of high-rise residential and commercial structures throughout Malaysia. Eastern & Oriental Berhad, SP Setia Berhad, Eco World Development Group Berhad, BCB Berhad, Yong Tai Berhad, Nusmetro Sdn Bhd, Aspen Group, Bon Estates Sdn Bhd, and BBCC Development Sdn Bhd are some of our primary clients.

In 2007, KPM built Dua Residency, its first high-end building project in Kuala Lumpur. Following that, in 2014, KPM set a new record by erecting Malacca's tallest skyscraper, The Shore @ Malacca River, which was honoured with the Asia Pacific Property Award's Best Commercial Landscape Architecture Award Malaysia 2015-2016. The Group has also completed a number of additional high-rise projects, including the Setia Sky 88 condominium in Johor, the Eco Sky condominium in KL, and Tribecca in Kuala Lumpur. The Group also received an 83.3 for completing Setia Sky 88, which was verified by CONQUAS and issued by the Building & Construction Authority of Singapore. The Setia Sky 88 (phase 2), KPM's most recent project, received a CONQUAS accreditation with an exceptional score of 83.3.

The Group intends to grow and extend its construction segment in the future, with skills in piling, reclamation, and infrastructure projects. As the Group continues to expand and work towards its purpose as a leading industry player, the Management thinks that this will further increase the Group's competitive advantage within the industry.

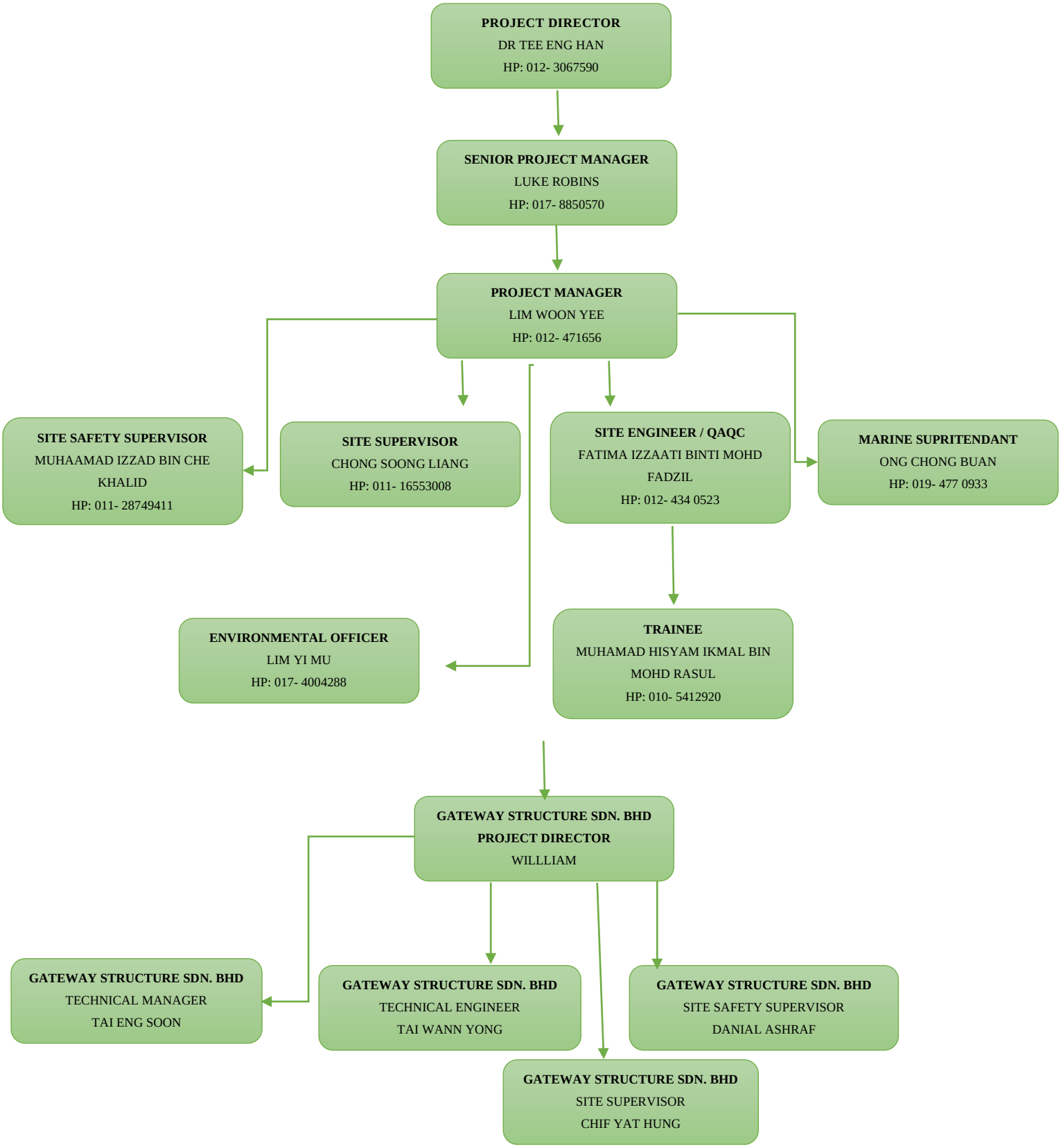
2.2 Company Profile

Company Name	KERJAYA PROSPEK GROUP
Registration Company	802, 8th Floor, Block C Kelana Square 17 Jalan SS7/26 47301 Petaling Jaya Selangor Darul Ehsan, Malaysia
Tel	603-7803 1126
Fax	603-7806 1387
Email	kerjayaprospek@yahoo.com
Website	www.kerjayagroup.com
Corporate Office	No. 1 Jalan Wangsa Permai 2nd Floor, Bangunan One Wangsa Taman Wangsa Permai 52200 Kuala Lumpur
Office in Penang	F17, Level 9, Jalan Sri Tanjong Pinang, 10470 Tanjung Tokong, Penang.
Board of Directors	Datuk Tee Eng Ho (Non-Executive Chairman) Datin Toh Siew Chuon (Executive Director) Tee Eng Seng (Executive Director) Tee Eng Tiong (Executive Director) Chan Kam Chiew (Independent Non-Executive Director) Datuk Mohamed Razeek bin Md Hussain Maricar (Independent Non-Executive Director) Maylee Gan Suat Lee (Independent Non-Executive Director)
Principal Bankers	AmBank Islamic Berhad Ambank (M) Berhad Hong Leong Bank Berhad CIMB Bank Berhad Public Bank Berhad

Table 2.2 Company Profile

2.3 Company Organisation Chart

This is the organization chart of Coastal Protection (PVD work)



2.4 List of Projects

2.4.1 Completed Projects

This are 6 latest completed projects by KERJAYA PROPSEK BERHAD.

NO.	COMPLETED PROJECTS	DEVELOPER	COMPLETE DATE
1	Eco Terraces, Paya Terubung, Penang 333 units condominium (First highrise building recognise by CIDB IBS Reusable Formwork System)	Eco Terraces Dev Sdn Bhd (Subsidiary of Eco World Development Group Berhad)	June 2019
2	The Tamarind Executive Apartments, Seri Tanjung Pinang 2 towers apartment of 552 units each	E&O Property (Penang) Sdn Bhd (Subsidiary of E&O Berhad)	June 2019
3	Ariza Seafront, Seri Tanjung Pinang 32 units of 3-storey superlink (First landed property recognise by CIDB IBS Reusable Formwork System)	E&O Property (Penang) Sdn Bhd	May 2019
4	The Parque Residences, Kota Kemuning 594 units apartment - 3 Towers	Eco Sanctuary Sdn Bhd (Subsidiary of Eco World Development Group Berhad)	April 2019
5	Vista Residences, Genting Highlands 378 units serviced apartment	Bazarbayu Sdn Bhd (Subsidiary of Kerjaya Prospek Group Berhad)	September 2018
6	Tribeca, Jalan Imbi, KL 318 units luxury serviced apartment	Bakti Dinamik Sdn Bhd (Subsidiary of Low Yat Group)	November 2017

Table 2.4.1 Completed Projects

2.4.2 Project in Progress

This are the 5 lists ongoing project by KERJAYA PROSPEK BERHAD. These projects listed are ongoing in Pulau Pinang.

NO	ONGOING PROJECT	DEVELOPER	FIGURE
1	STP 2 Marine Link Bridge, Seri Tanjung Pinang Penang 4 lane witdh marine bridge, connecting Tanjung Pinang and reclaimed land	Tanjung Pinang Dev. Sdn Bhd	 Figure 2.4.1 Project STP 2 Marine Link Bridge, Seri Tanjung Pinang Source: http://www.kerjayagroup.com/project.php
2	Triuni Residences of The Sanctuary, Batu Uban, Penang Tower 1 - 22 storey 176 units Tower 2 - 24 storey 192 units Tower 3 - 23 storey 184 units	BU Developments Sdn Bhd	 Figure 2.4.2 Project Triuni Residences of The Sanctuary, Batu Uban, Penang Source: http://www.kerjayagroup.com/project.php
3	Vertu Resort, Batu Kawan, Penang 1,246 condominium units in five tower blocks ranging from 20 to 36 storeys above nine-storey		 Figure 2.4.3 Project Vertu Resort, Batu Kawan, Penang Source:

	podiums with common facilities.		http://www.kerjayagroup.com/project.php
4	Straits Residences, Seri Tanjung Pinang 246 units of luxury serviced apartment	Kerjaya Prospek Property Sdn Bhd	 Figure 2.4.4 Project Straits Residences, Seri Tanjung Pinang Source: http://www.kerjayagroup.com/project.php
5	STP 2 Rock Bund, Seri Tanjung Pinang Sub-contract of 750 Acre Reclaim Land rock bund	Tanjung Pinang Development Sdn Bhd (Subsidiary of E&O Berhad)	 Figure 2.4.5 Project STP 2 Rock Bund, Seri Tanjung Pinang Source: http://www.kerjayagroup.com/project.php

Table 2.4.2 Project in Progress

CHAPTER 3.0

CASE STUDY COASTAL PROTECTION (PVD WORK)

3.1 Introduction PVD Work

This report is more focusing to PVD work. PVD work for this project is 50 panels in total that are in contract. This PVD work have Future Rock as main contractor, Kerjaya Prospek (KP) and sub-contractor, Gateway Structure Sdn. BHD (GSSB). In contract, this project done until January 2022. This pandemic greatly disrupted the progress of this work but it slowly get back on the track. This PVD work had 50 panels in total to finish. Each panel did not have the same total point, which are that had panel that had 1,060 point and that had 540 points which is in the last panel, Panel 50. Each panel had their line which every line contains maximum 14 point minimum 1 point. This point that will be pricked with the PVD. This line had their own GPS coordinate that must to set. That are two tablet which is R1 and R2 that have their coordinate to position the barge in the correct position. Right now, when I write this report, that already more than half 50 panels. This PVD work is done to save time to compact the soil. it will less time to do a rock bund like this project.

Figure 3.1.1 PVD work project Tanjung Tokong STP 2

Source: https://www.facebook.com/GatewayStructure/photos/a.1948710561866645/5184354074968928/

3.1.1 Project Background

PVD work for this project is 50 panels in total that are in contract. This company (GSSB), they are really specialized in PVD work. But I this project it is a bit different with others site or project that they usually did. It is because this project is to make an island, so this PVD work is to make a rock bund for the island. This PVD project is done on the sea so it a bit different compare the project before. Usually, this PVD work are doing at landsite which soft soil surface. Because this work is done on the sea, it has a barge to place the PVD machines to work. This PVD work is 1kilomtere long. As had told above that the panel point and the line did not same very panel because of this project did not in straight line. It had curve or bend in this PVD project. So, the architect had made the drawing plan and it show that every panel did not have the same point and line on every panel. Based on the project progress, every day they must get 180 points. Due to many delays, they do 24 hours which had morning and night shift. The depth of the PVD work is had their depth justification that already calculate. This is based on the height water tide that are already calculate when surveying this PVD work before. If the depth does not exceed the estimated depth already calculated, there it must have a reason. One of the reasons is because the soil down there really hard and reach the limit. So, I as representative of the main contractor on the barge, I had to supervise the GPS coordinate to make sure the barge in the correct position to PVD. I also write the depth data in every single point.

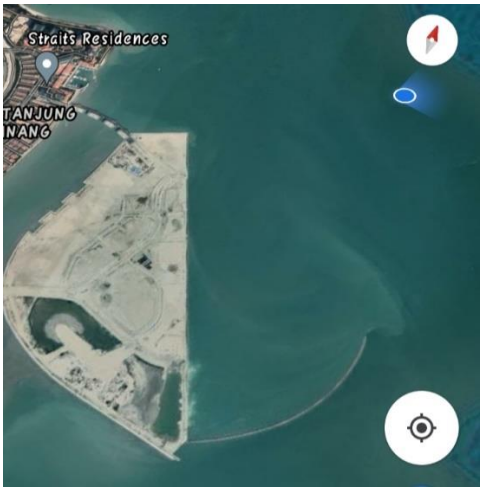


Figure 3.1.2 Location PVD Progress latest

Source: Google Maps

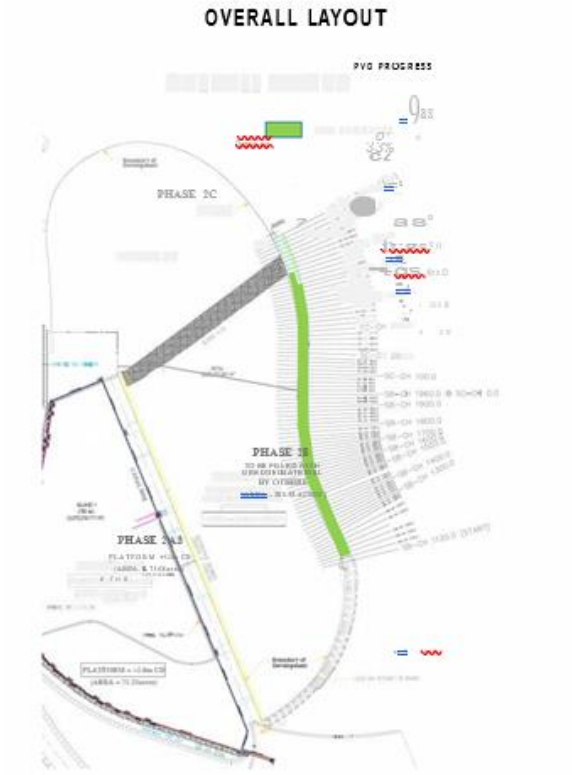


Figure 3.1.3 Plan Layout PVD Work

Source: Document

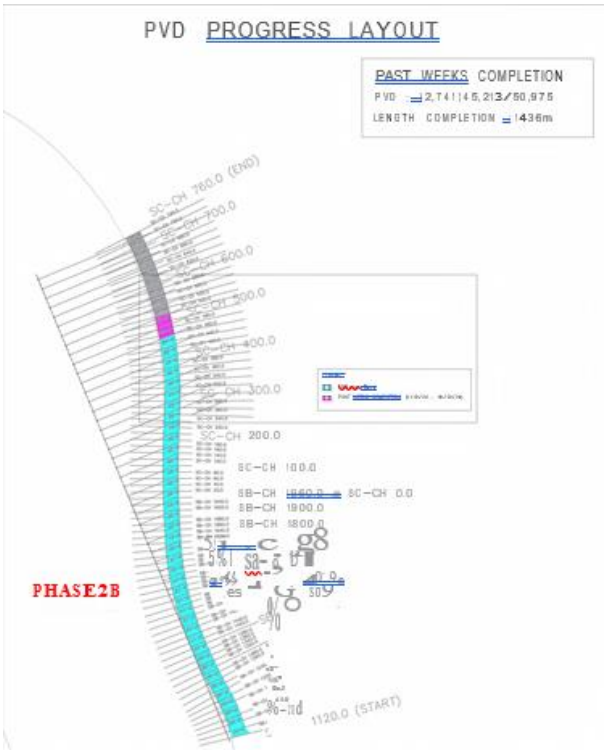


Figure 3.1.4 Plan Progress PVD Work

Source: Document

3.2 Process PVD Work

3.2.1 Set up the Home Base GPS

When arrive on site, this is the first thing to set up. This thing is important before do the PVD work. The main function of this home base GPS is to be a connector to the GPS to coordinate the barge in the right position. There's a question that "why did not use a satellite as the base for the GPS to set the coordinate". This is because the satellite is always move. That will cause the coordinate may did not same place every day. So, when set up our own home base GPS, the satellite will follow the home base GPS and the coordinate will be the same every day. To activate this home base GPS, there is a battery that will supply power to the GPS. The battery usually can stay for 12 hours. When this battery out of power, it will affect the home base GPS because the GPS will shut down immediately. This will cause the GPS coordinate will follow the satellite. After finish PVD work, every day they will take the battery to charge.

Figure 3.2.1 Home Base GPS

Source : Observation (camera phone)

3.2.2 Set Grid Shift GPS

The function is to reset the GPS coordinate. So, it will reset and follow the home base GPS. This grid shift must to set in both of tab which is R1 and R2. The worker has to hold the GPS pole, R1 and R2. Then, set grid shift in the tab using 'Survey Master' app. It is because to make the barge in the right position. That's why it must to have two tab and coordinates.

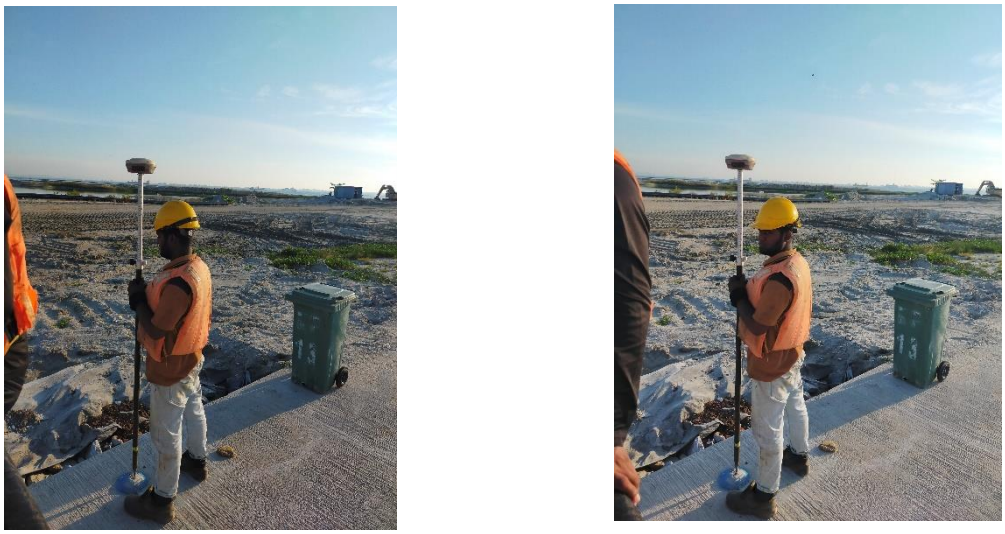


Figure 3.2.2 Set Grid Shift in R1 and R2

Source: Observation (camera phone)

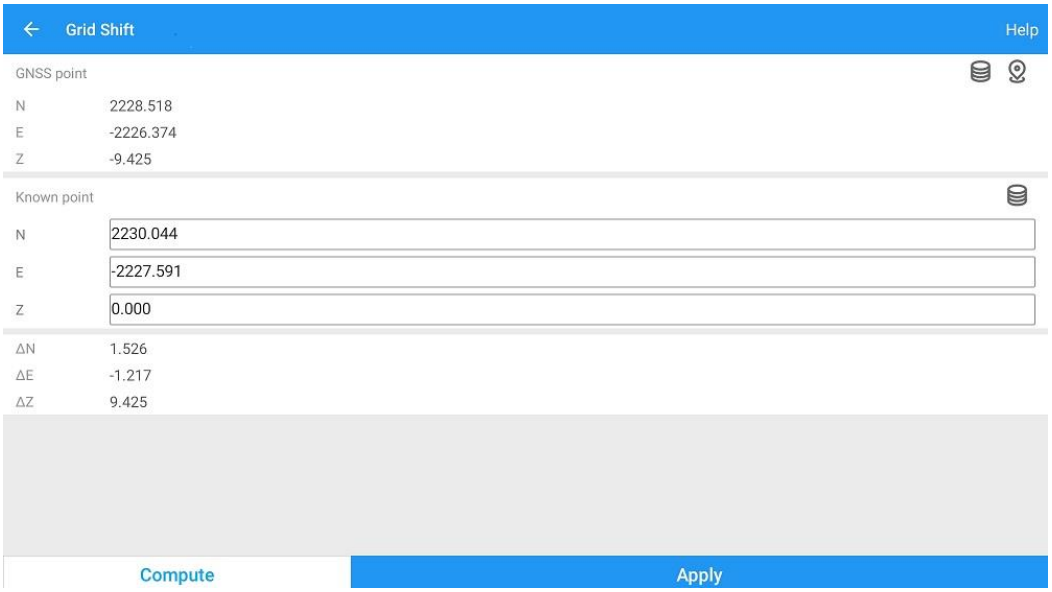


Figure 3.2.3 Grid Shift in R1 and R2 tablet.

Source: Document

3.2.3 Positioning the Barge

Before start to pull the barge, the coordinate must have to set in the R1 and R2 tab. The status must be fixed before it ready to position the barge. There is two color that can see in the figure which is black and red color. The black color is label for the coordinate. This label refers the drawing plan itself. For the red color is the coordinate that must to be position. This coordinate is auto generated by the apps it self which know as ‘survey master’. It has two poles each side with two different colors, red poles and blue poles. This poles as a place to put the GPS. After the coordinate that have set, the workers will pull the barge to the setup coordinate use hydraulic vessel. To set the coordinate with the GPS, the GPS must have in their position. This barge haves 4 anchor to lock the barge position being move. So, two front and two back. The workers pull the anchor barge based on the coordinates. There are the distance that must the barge in the position which is, it must to be <0.150m. So, I must to check if the barge in the right position with the coordinate is less than 0.150m. If the coordinate is wrong or more than 0.150m, it must to reposition again.

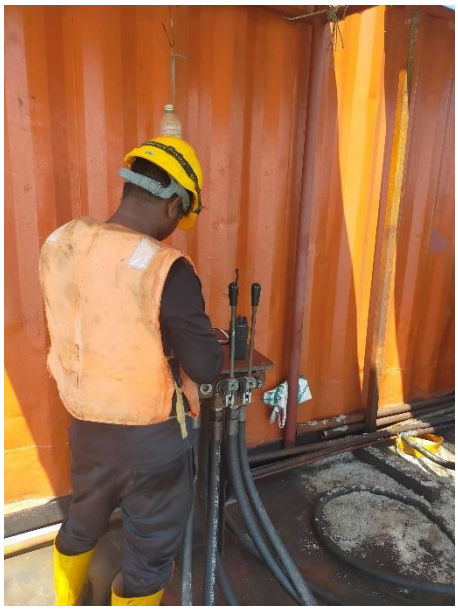


Figure 3.2.3 The worker pull the barge to the position

Source: Observation (camera phone)

3.2.4 Pricked PVD Work

After the coordinate are set and the barge in the right position, the PVD machine ready to prick the PVD material under the sea. This PVD work have their certain line point to do. This is based on the drawing plan that are arranged by the supervisor sub-contractor. This is because that are two machine PVD, so it can work simultaneously with their line point itself. So, the supervisor will arrange depends with the anchor barge so that the two machines can work in the same time. Not all the panel have the same line and PVD point. In example, in panel 40 have 81 line and 1025 total points. Because of the PVD work in the straight line and have the curve so not all the line haves the same point. There is a line with 1 point which is in line 81. But the maximum of every panel is 14 points. So, it occurs at the edge of the panel due of the curve of this PVD project. Due, the two machine is side by side of the barge, so there is 24 points to one machine (EH26) to one machine (EH23). In example, if EH26 start from line 01 means the EH23 start in line 25. But sometimes have some line that one machine only works cause of the machine side did not have the line more or cause of the anchor that had cannot position the barge to both of machine work together. But if there are some accidents happen like broken mandrel or machine broke down, the supervisor will decide the new plan so that the works keeps going even it only just one machine. After they have finished the lines it will reposition the barge with new coordinate that have already arranged. Usually, this PVD work take 30 minutes for one line side by the other side with maximum 14 point each line including pull the barge.

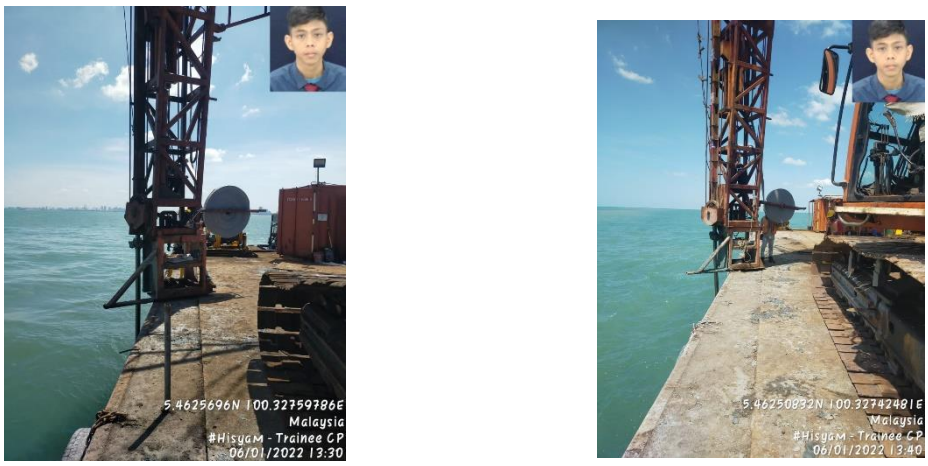


Figure 3.2.5 Process PVD work going, EH23 and EH26

Source: Observation (camera photo)

3.2.5 Cut and Stapler PVD Material

After the PVD material is prick down th sea, the mandrel will go up and left the PVD material down there. The worker than cut the PVD material using cutter PVD material and left the PVD material down there. When the PVD material is at the end of the roll, the will connect the other PVD material roll with the stapler. It will combine the old roll and the new roll.

Figure 3.2.5 The worker cut and stapler PVD material

Source : Observation (camera phone)

3.2.6 Change Position Anchor Barge

This barge had 4 anchors, two at side back and two at front. This length of anchor is 200 meters length, 40 meters for the tension and 20 meters balance of the anchor. This anchor must have to change because this barge must to move of every panel to other panel. Cause of the length of the anchor has their limit, so it must to move because the coordinate cannot reach. The anchor are change by the anchor tug boat to lift the anchor and drop the anchor in its new position. There have the calculation that do by the sub-contractor to get the anchor in its new position. Usually, this anchor suitable for use with up 3 panels.

Figure 3.2.6 Change Anchor Barge to New Position with Tug Boat

Source: Observation (camera phone)

3.3 Machineries, Equipment and Materials

3.3.1 Barge

This project use barge to do work because it on the sea. This barge named as ‘Beautiful 9’. On this barge have 4 anchor to move this barge. It also had one toilet. On this barge, it has two container which are office container and storage container. The office is to do work or it can be shelter if had bad weather like rain. The storage container is place to keep machinery tools like cable lum spare, wrench and other equipment tools. There are also have three power pack engines as power supply to pull the barge. Two hydraulic vessels to pull the anchor barge. One genset as power supply electric in the container. This barge puts two machine PVD on it to do work. The two machines are at each side by side. The PVD material and diesel also are on this barge. If the PVD material and diesel have been used up, so the tug boat will pickups the PVD material and diesel at the landsite. There are have 9 people on barge which is Supervisor sub-contractor, Supervisor main contractor, two operator, one mechanic (fomen) and 4 workers (each machine two workers).

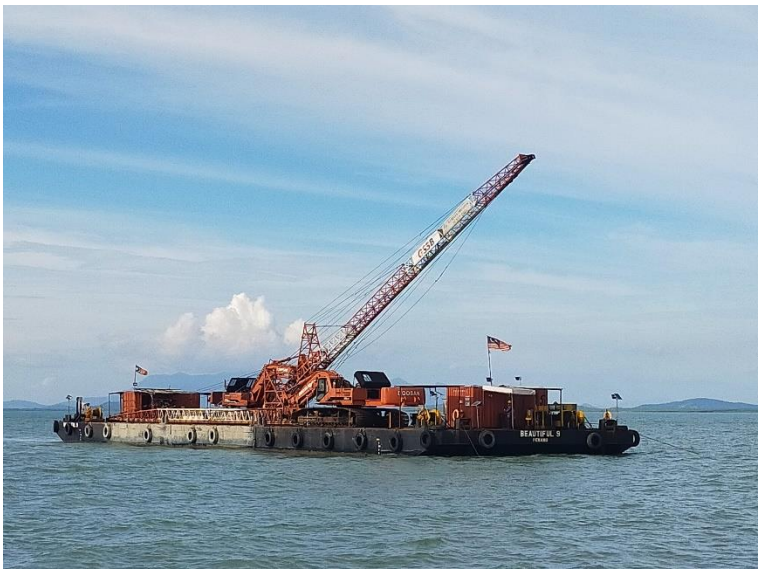


Figure 3.3.1 Barge ‘Beautiful 9’

Source: Observation (camera phone)

3.3.2 Anchor Barge

On this barge have 4 anchors which is W1, W2, W3 and W4. The length of these anchor is 200 meters long, 40 meters for tension and 20 meters balance to pull and push the barge. This anchor is really important because it is the way to move the barge. In PVD work this anchor is important to move this barge to the position that are set by the coordinate. There are two anchors in front and two more at back. These two anchors are control by one hydraulic vessel.

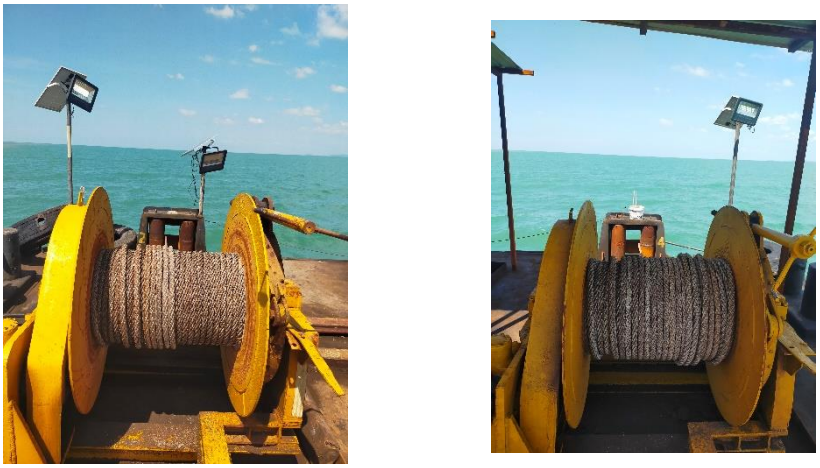


Figure 3.3.2 Anchor Barge W1, W2, W3 and W4.

Source: Observation (camera phone)

3.3.3 Hydraulic Vessel

There are two hydraulic vessels on this barge. These vessels are function to push and pull the anchor barge to the position that have been set. The worker will push and pull these hydraulic vessels to make sure the barge in the position. These hydraulic vessels use power pack engine as power supply.

Figure 3.3.3 Hydraulic Vessel R1 and R2

Source: Observation (camera phone)

3.3.4 Power Pack Engine

This power pack engine as a power supply to hydraulic vessel. There are three power pack engine which is P1, P2 and P3. But there are just two power pack engine that are uses to hydraulic vessel. The other one is a spare if had anything happen. These power pack engine uses diesel and hydraulic oils as the power supply source. Usually, they will refill this power pack engine 1 barrel of diesel each before start work every day.

Figure 3.3.4 Power Pack Engine P3 (spare), P1 and P2

Source: Observation (camera phone)

3.3.5 Genset

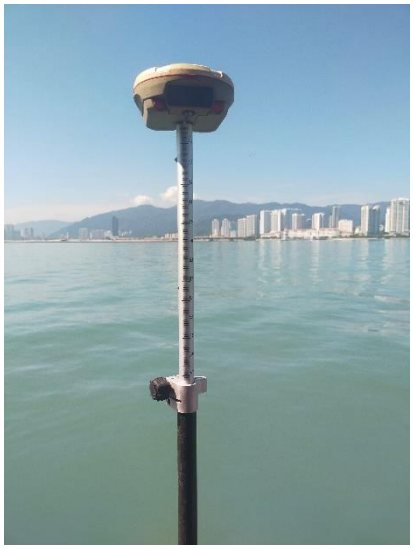
This genset is use as power supply to the office container on this barge. It supplies the electricity on this barge. This genset use diesel as power source to run it. Usually, this genset need two barrel of diesel every day if this genset run from 10.00 a.m. until 09.00 p.m.

Figure 3.3.5 Genset as power supply

Source: Observation (camera phone)

3.3.6 GPS Pole

In this PVD work it have two poles of GPS. This GPS is the signal to locate the coordinate. The GPS have their name which is R1 and R2. The GPS signal will be received to the tablet, which are also have two R1 and R2 tablet. These GPS have two colors of poles to be placed. It have blue and red colors poles. The GPS must in the right poles to make sure the coordinate is in the right position.



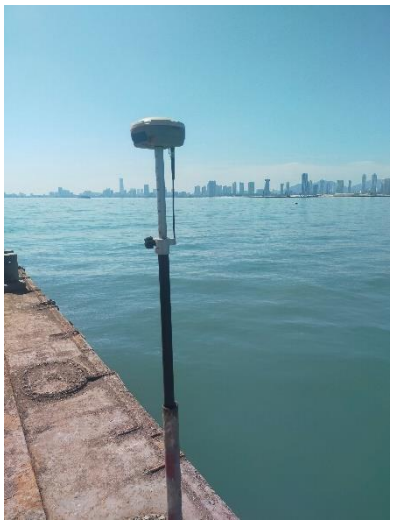


Figure 3.3.6 GPS Pole, R1 and R2

Source: Observation (camera phone)

3.3.7 PVD Machine

In this project have two machines which is EH23 and EH26. Before this, this PVD work have morning shift and night shift, so they have 4 operators. But when the geo tube project is started, they only work one shift only which 8.00 a.m. to 10.00 p.m. The operator that still in PVD work is Azmi (EH23) and Nazrin (EH26). They will do this PVD work. The machines have their components which is ladder, mandrel, lump cable and other components. It also has the data box computer to do work which is will save the depth data every single point they pricked the PVD in the sea. The ladder is about 40 meters long before it has to cut it down to 30 meters for some reason. Cause of the PVD machine is 30 meters long, so on the steel plate there are some pieces of tires to prevent the machine from slipping on the track. This machine also has their checklist before start the work every day. It also has their service time to change the engine oil or other else.

Figure 3.3.7 EH23 machine

Source: Observation (camera phone)

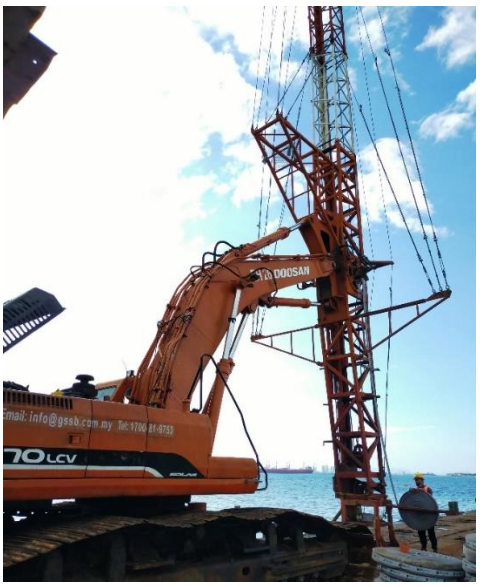


Figure 3.3.7.1 EH26 machine

Source: Observation (camera phone)

3.3.8 Mandrel

The mandrel serves to poke the PVD material into the sea. When it reaches the bottom of the sea or reach the limit, the mandrel will go up and leave the PVD material down there. the mandrel is 30+ meters long. The mandrel can be welding with others mandrel if anything happens like the mandrel broke. The mandrel also can be bent cause of the surface under the water that are hard.

Figure 3.3.8 Mandrel

Source: Observation (camera phone)

3.3.9 PVD Material

The PVD material size 200 meters long in one roll. If one line average 25 meters depth one point, so one line needs more than one roll. At the PVD machine had two roll PVD material. If the PVD material already reached the end, to connect with other roll PVD material, it just uses the stapler to connect the PVD material. When the PVD material has been pricked down, the worker will cut the PVD material. These steps will be repeated.

Figure 3.3.9 PVD Material

Source: Observation (camera phone)

3.3.10 Cutter PVD Material

This cutter is function to cut the PVD material after the PVD material has been pricked and the mandrel has been lifted. The worker will cut this PVD material about 1m. It uses zorro knife to cut it.

Figure 3.3.10 Cutter PVD Material

Source: Observation (camera phone)

3.3.11 Stapler PVD Material

This stapler will combine the old roll and the new roll of PVD material. It is because when the material roll at the end, it will combine the other rool, that the PVD material will go down continuously.

Figure 3.3.11 Stapler PVD Material

Source: Observation (camera phone)

3.3.12 Jack Machine

This jack machine is use to jack the mandrel to be straight. This is because the mandrel will be bent cause of some reasons. One of the reasons is because when the mandrel is pricked downwards, the uneven ground surface will make the mandrel bent. It will be worst like the mandrel will crack and broke.

Figure 3.3.11 Jack Mandrel Machine

Source: Observation (camera phone)

3.4 Problems and Solution

Every work on site has their own problem depends with the project. So, PVD project work also have it problem and the solution to solve the problem.

PROBLEM	SOLUTION
Bad weather. This problem cannot be handles and it the laws of nature. The bad weather is really dangerous to do work. Moreover, when this project on the sea so many possibilities or bad things can happen. The bad weather like raining, strong wind and strong wave will cause unwanted accident will happens. When it works with the height PVD machine with not in the stable surface which is on the sea, will dangerous the operator machine and the PVD machine itself can collapse.	Check weather forecast. Usually after finish work on that day, the supervisor or safety will check and look at weather forecast for the next day. The weather information will be delivered to the group before the next day so the supervisor can arrange the work. But sometimes anything can be happen so if the raining heavily downpour and the PVD work is ongoing. The ladder of the PVD machine must to take down and the work must to stop immediately.
PVD machine broke down. There are some accidents that can be happen like the lump cable broke or the mandrel broke. This accident did not expect will happen. There are the reason why this is happen. One of the reasons is the lump cable rust. This problem will affect the progress work.	Repair the broken things. There are at least one mechanic to repair it. On barge there are extra lump cable and mandrel if anything happens. The equipment tool also provided on the barge. So, it can be repair on the barge at the time.
The GPS did not status fixed. The GPS tablet must to status fixed if want to position the barge according to coordinate that have set. Usually this happens because of the battery the base GPS has run out.	Change the battery. There are one more battery pr spare battery that they have if anything happens like the battery run out. This battery must change at landsite.

Table 3.4 Problem and Solution PVD Work

CHAPTER 4.0

CONCLUSION

In the conclusion, this PVD work is one of the methods to do the coastal protection, rock bund. It can say that it is the fisrt step before do construction. It is because this project is start from the water, sea until it transforms to be land area. This PVD work is the fastest method to compact the soil. It will shorten the time to do this project. Before this, when did notuse PVD work, it take time like 4 – 5 years to make the rockbund. But if use this PVD work is will short the time to 1.5 – 2 years to make this rock bund. It more faster and easy method to do compare with did not PVD work.

This PVD work use barge to do this work. It also must use coordinate GPS to position the barge in the right position. The PVD material will pricked into the ground. It is the method that can use in surface that have more contains of water in it.

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