DEPARTMENT OF BUILDING
UNIVERSITI TEKNOLOGI MARA
(PERAK)
FACULTY OF ARCHITECTURE,
PLANNING AND SURVEYING
DIPLOMA IN BUILDING (AP116)

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DEPARTMENT OF

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(PERAK)

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SILT TRAP CONSTRUCTION

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AUGUST 2021

By

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entitled

Silt Trap Construction

be recognized as partial fulfilment of the criterion for getting a Diploma in Building

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DEPARTMENT OF BUILDING

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

10 JANUARY 2022

STUDENT'S DECLARATION

Except for the extracts and summaries for which the original references are stated herein, I hereby declare that this practical report is my own work, prepared during a 20-week practical training session at Jabatan Kerja Raya Negeri Selangor beginning on August 23, 2021 and ending on January 7, 2022. It is presented as one of the prerequisites for BGN 310 and acknowledged as a partial fulfilment of the requirements for the Diploma in Building.

…….

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UiTM ID No : 201944456

Date : AUGUST 2021

ACKNOWLEDGEMENT

In the name of Allah, the Most Merciful and Gracious. First and foremost, I give thanks to Allah, the Almighty, the Highest, on whom I ultimately rely for nourishment and direction. I'd want to thank Allah for providing me with the chance, drive, and strength to complete this task.

With humility, I would like to express my heartfelt appreciation to some of the individuals who have assisted me in completing this semester's practical training. First and foremost, thank you to Jabatan Kerja Raya Negeri Selangor, particularly to the outstanding supervisor and firm leader, Ir Zulkhairi, for providing a roof over my head during the 20 weeks of my practical training. It was an honor to get some fresh experience with this company's great and diligent employees. Next, my heartfelt appreciation goes to Pn.Saidatul Fauziah Binti Ab Rauf as an engineer and Pn, Norhazimah bt. Burhanuddin as an assistant engineer of this firm, who taught me a lot about home design, reinforcing concrete plans, building maintenance, and always pushed me to enhance my AutoCAD abilities.

Not to mention my UiTM lectures, which provided a wealth of information and skills in this building course. It gives me great pleasure to express my heartfelt gratitude and sincere thanks to Sr. Siti Jamiah Binti Tun Jamil my Supervising Lecturer and Cik Nor Azizah Binti Talkis, Evaluation Lecturer. My gratitude goes to En. Muhammad Naim Bin. Mahyuddin, Practical Training Coordinator and Dr. Dzulkarnaean Bin Ismail, Programme Coordinator for their invaluable guidance, encouragement, and assistance in completing this experience semester.

Last but not least, my heartfelt appreciation goes to my adored parents for their unending love, prayers, encouragement, and understanding of the significance of this job. I owe everything to my family, who supported and assisted us throughout the process of completing this task. Not to mention those who donated directly or

indirectly to this assignment, your thoughtfulness means a lot to me.

ABSTRACT

If there are no water reservoirs and good rainwater catchment systems in Malaysia, the high probability of rain will result in floods. There are methods for preventing this from happening, such as installing silt traps. Nowadays, construction sites make extensive use of silt traps because to prevent waste fragments such as rocks from escaping into urban drains, water from the construction site must first be filtered through a silt trap. Before beginning excavation or fill work, sediment traps and basins should be installed in designated drainage areas. An excavation or a dike made of earth or stone can provide ponding areas containment. Low-lying areas on the downhill side of bare soil areas are ideal for constructing temporary sediment traps and basins. Sediment traps are typically designed to treat runoff from 1 to 5 acres. Sediment basins are larger and serve areas greater than 5 acres in size. Basins draining areas larger than 10 acres necessitate an engineered design and are frequently designed to function as a permanent stormwater treatment pond once construction is completed. The purpose of this report is to explore how crucial silt trap that used in construction site. The main focus on this report are located near decathlon Shah Alam for project stem museum. It also contains about safety issues and purpose the based solution for this issue based on NIOSH.

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CHAPTER 1.0
INTRODUCTION

Background of Study

Museum occur in a variety of sizes and shapes, ranging from big institutions that cover a wide range of topics to tiny institution that specialize in a single subject, place, or individual. Furthermore, there is a global museum whose collection symbolizes the entire globe and generally contains art, science, history and natural history. The collection is reflecting the museum's style and quality. A museum's core collection is generally the most important piece in this field

Preparing and executing an Erosion and Sediment Control Plan does not have to be time consuming, and it is best performed by utilizing and or modestly changing current project planning, design and construction operation. The finest ESCPs are those that developed as part of the usual project operations. This is due to the fact that most of the information needed for an ESCP is already included in the project design documentation, and the design may need to be amended to add controls during construction and post-construction operations

An ESCP is a plan that includes interim measures that will be applied during the construction phase, as well as permanent measures that will be in place once development is completed, to manage the environmental consequence of erosion and sedimentation. A successful ESCP seeks to minimize the negative consequence sediment transfer from on-site to off-site location. The plans can range simple plans for small sites (less than 5 hectares) to full comprehensive plans for complicated developments on big sites (more than 50 hectares) or for regions of high ecological importance. An ESCP for a development project, in general, serves to give.

Objectives

i) To investigate the installation of silt trap in historical museum

ii) To explore the advantages and disadvantages of the method used.

iii) To identify and solve any difficulties that may arise during the construction of a silt trap building

Scope of Study

The study is carried out at seksyen 12, 4000 Shah Alam, Selangor. The project was to build a historical museum of stem for Perbadanan Adat Melayu Dan Warisan Negeri Selangor (PADAT) which is a client for this project. The total area of this project is 105,978.41 sqft. This study focusses on construction of slit trap. Upper part such as roof structure will not be study as follow as the progress in the site. Next, the plan of the museum such as architectural and engineering plan on the drawing will be included in scope of studies.

Method of Study

For this case study, there are: -

i. Observation
One method of learning is to visit the construction site and observe the building. During the site visit, every activity that happened on that day will be recorded and will documented in a report. This is a persuasive strategy since it gives a work environment and individual participation in the project's building. Each observation task will be conducted twice a day, in the morning and in the evening

ii. Interview Session
An interview may be regarded crucial in order to acquire the data for do research from experienced parties such as site supervisors, site engineers, and construction workers on the working site. This is crucial for acquiring a thorough understanding of a project, such as the technique

of each included building part.

iii. Document review

Document review is also a crucial part of learning and understanding the project. I can refer to the document approved by the division council for all client and site details. We can consult a site engineer on the museum stem structure. Many aspects of the reinforcement structure, such as the size and amount of reinforcement bars, are included in the reinforcement design.

CHAPTER 2.0
COMPANY BACKGROUND

Introduction of Company

The Jabatan Kerja Raya (JKR), originally known as the Public Works Department (PWD), has a lengthy history dating back to the start of physical development in the nation by British colonialists. JKR is the country's oldest government agency. For more than a century, the Public Works Department (PWD) Malaysia has had an impact on many parts of Malaysian life. It has existed since the county began building orderly and large-scale roadways when the Malay states were brought under British colonial authority one by one following British invasion in 1784.

Perak, Selangor, Negeri Sembilan, and Pahang have PWD. Following the formation of the Federate Malay States (FMS) by British colonialists in 1895, PWD developed fast. PWD administration was merged into PWD FMS at the time. When the states of Kelantan, Terengganu, Kedah, and Perlis were turned over to the British government by the Siamese government in 1909, and Johor was brought under British authority in 1914, all Malay states were under British colonial rule. These Malay states are known as Unfederated Malay States since they are not linked with the FMS (UFMS).

When the states of Kelantan, Terengganu, Kedah, and Perlis were given over by the Siamese government in 1909, all Malay states were under the auspices of British colonialists, and Johor was brought under British auspices in 1914. The Malay states were known as Unfederated Malay since they were not linked with the FMS.

Company Profile

Company's name	: Jabatan Kerja Raya
Negeri Selangor	
Director	: Tn Ir.Hj Lokman Bin Hj Nasir
Established	: 23 April 2015
Company Address	: Kompleks Ibu Pejabat JKR Negeri Selangor, Persiaran Jubli Perak, Seksyen 17, 40200 Shah Alam, Selangor Darul Ehsan
Tel	: 03-55459800
Email	: aduansel@jkr.gov.my

Corporate Logo

- Figure 1 shows the Corporate Logo of *Jabatan Kerja Raya*

Figure 1: JKR Corporate Logo

Source: JKR Malaysia Logo

i. The logo, in general, represents the numerous domains of work that the Public Works Department is responsible for.
ii. The curving black lines at the bottom represent waterworks and also indicate the Public Works Department as a dynamic agency.
iii. The prominent black arch-shaped lines represent bridge work as well as the Public Works Department as an entity that primarily does engineering work.
iv. The straight black line that ran over the arch-shaped lines represented road construction.

Mission and Vison of JKR

I. Mission

• As strategic partners, we can assist our clients in realizing policy information and delivering services.

i. Standardize our procedures and systems in order to achieve consistent service outcomes.

ii. Offer asset and project management services that are both efficient and creative.

iii. Improve existing engineering skillsets

iv. Develop new human resources and skills.

v. Make service integrity a top priority.

vi. Establish a positive relationship with the community.

vii. Keep the environment in mind when providing services.

II. Vision

a. To deliver a world class services and a center of excellence in asset management, project management, and engineering for the

development of national infrastructure by using creative and imaginative people resources and cutting- edge of technology

Company Organisation Chart

- Figure2 below show the list of organization chart

Figure 2: Organization Chart of Mara (Head Quarters)

Source; https://jkr.selangor.gov.my/portal/public/pages/5

List of Project

Complete Projects

Table 1 below shown the completed project

No.	Project Title	Project Value (RM)	Start Date	Completi-on Date	Project Duration	Client
1.	Cadangan Pembinaan Dewan Terbuka Pelbagai Guna di Pusat Berkuda Arena MAEPS , IP Mardi, Serdang, Selangor	RM 1,000,000.00	1.10.2019	22.7.2020	9 months	Kementerian Pertanian Dan Industri Makanan (MAFI)
2.	Cadangan Pembinaan Pejabat Baru Pertubuhan Peladang Kawasan (PPK) Klang, Selangor	RM 2,000,000.00	2.4.2018	6.12.2019	1 year 8 months	Kementerian Pertanian Dan Industri Makanan (MAFI)
3.	Pembinaan Bangunan Asrama Bangunan Siswa di Institut Kraf Negara (IKN) Rawang, Gombak, Selangor	RM 11,686,000.00	16.1.2017	15.1.2018	11 months	Kementerian Pelancongan, Seni Dan Budaya (MOTAC)

4	Pembinaan Kuarters Kakitangan Klinik Cure & Care 1Malaysia (C&C) Dengkil, Selangor	RM 13,500,000.00	18.9.2017	26.8.2020	2 years 11 month	Kementerian Dalam Negeri (KDN)

Table 1: Company's Completed Projects

Source : Laporan Kewangan Unit bangunan JKR Selangor

2.1.1 *Projects in Progress*

Table 2 below shown the ongoing project

No.	**Project Title**	**Project Value (RM)**	**Start Date**	**Completi-on Date**	**Project Duration**	**Client**
1.	Menyiapkan Baki Kerja Pembinaan Mahkamah Baharu Ampang, H.Langat	RM 28,796,822.00	9.12.2020	19.02.2023	2 years 2 month	Jabatan Perdana Menteri
2.	Pembinaan Satu Block Tambahan Yang mengandungi Asrama, Dewan Makan dan Bilik Kuliah Institut Penilaian Negara	RM 51,750,000.00	20.8.2019	02.12.2021	2 years 2 month	Kementerian Kewangan Malaysia (MOF)

	(INSPEN), Mukim Selangor					
3.	Cadangan Membina Dan Menyiapkan Sebuah Bangunan Pusat Pengumpulan Hasil Pertanian (PPHP) Di PPK Kuala Langat	RM 3,500,000.00	20.8.2019	2.7.2022	2 years 10 months	Kementerian Pertanian Dan Industri Makanan (MAFI)
4.	Meroboh Kafeteria dan Membina Bangunan Asrama Tambahan Bertingkat Lelaki dan Perempuan Di Kolej Profesional Mara (KPM) Beranang, Selangor	RM 30,000,000.00	2.6.2021	20.8.2023	2 years 2 month	Kementerian Pembangunan Luar Bandar (KPLB)

Table 2: Company's Ongoing Projects

Source: Laporan Kewangan Unit bangunan JKR Selangor

CHAPTER 3.0 CASE STUDY

Introduction to Case Study

This report's is about the establishment of a historical stem museum for the Sultan Selangor Collection. This project is taking place at seksyen 12 Shah Alam, which is next to the Decathlon Sport. This project included 8-12 workers which were sub-contractors working for JKR on the museum project Figure 3 shown the key plan of site.

Figure 3: Key Plan of the site from satellite

Source: https://www.google.com/maps/place/Muzium+Setem+Selangor

INTRODUCTION

This chapter will be covering the detail about the proposal design of Erosion Sediment Control Plan (ESCP). The details regarding to design work of Silt Trap during employment days will be further explained in this section.

SILT TRAP

A sedimentation trap is a small temporary pond area with a gravel outlet created by excavation and building or an earth embankment. The goal of a silt trap is to hold runoff from disturbed regions for an extended period of time, allowing the bulk of the coarser suspended soil particles in the runoff to settle away. The silt trap was designed to be utilized in a small catchment area with no complex drainage features, where construction can be accomplished in a reasonable amount of time

Figure 4: Silt Trap on Site

SIZE OF SILT TRAP

The silt trap should have disturbed no more than 2 hectares of land. The length of the silt trap may vary depending on the computation. As a result, the designer must be cognizant of sediment-laden runoff that might invade and destabilize natural areas of streams. As a result, as inlet protection measures, the silt trap in should be installed around or upstream drainage. The silt trap in this example was installed near existing concrete drainage. The silt trap's maximum area may be up to 2 hectares, which includes the conduit pipe, gravel filter, concrete base, and stand pipe. Because the primary contractor used a backhoe to dig the space for the silt trap. As a result, the maximum area of the silt trap is 0.01 hectare. If the actual maximum area is not met, the area required for the silt trap must be redesigned

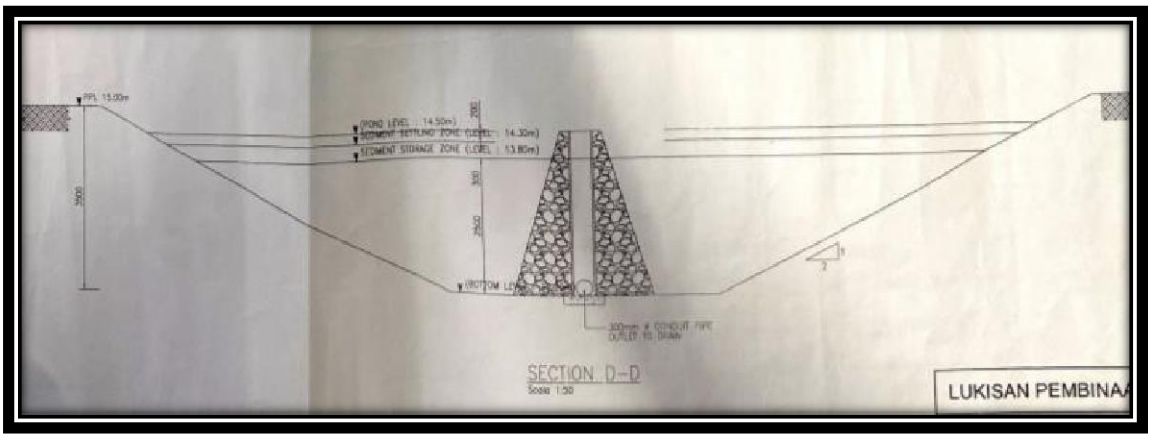

Figure 5: Shows the cross section of Silt Trap at site

Design Requirement of Silt Trap

3.2.1 Design of Silt Trap

Silt trap can be built using the design parameters and requirements listed below

Design Parameter	Requirement
Runoff Quantity Design	Up to 10 years Average Rainfall Intensity (ARI)
Runoff Quality Design	Water Quality Design Storm for ESCP I. First 40mm rainfall for site < 2 years construction period. II. First 50mm rainfall for site ≥ 2 years construction period.
Overspill	All flow up to 10 years ARI shall safely bypass the trap.
Runoff Retention	All flow up to runoff quality design flow shall be retained within basin. Extended drawdown can be permitted by authority when deems necessary.
Flood Protection	Ensure upstream/ downstream flooding condition not Aggravated
Maximum Contributing Area	2 hectares
Storage Volume	I. Total Storage: 125 m^3/ha of contributing area II. Permanent Pool: half to total storage
Basin Dimension	I. Minimum length to width ratio 2:1 II. Minimum depth of 1m III. Depth exceeding 2m are not recommended. In unavoidable circumstances, provide perimeter fencing for safety.
Embankment	I. Inside embankment 2:1 or flatter II. Outside embankment 3:1 or flatter III. Maximum embankment height should not exceed 1.5m
Lining Materials	I. Suitable size rocks/ rip raps
Erosion Protection	Outlet protection shall be provided for the emergency spillway.

Table 3:Design requirement of Silt Trap based on JPS Guideline

3.3 The Advantages and Disadvantages

The silt trap is commonly built in utilizing concrete material with a class strength of C30 for the construction. Nonetheless, the silt trap has advantages and disadvantages when compared to concrete. Thus, before making any selection about silt trap structure, the benefits must be studied in order to make a better option.

Silt Trap Advantages

The advantages of silt trap are:

i. Prevent an ecological disaster

- This could happen if these streams were suddenly filled with suspended silt as a result of construction activities. As a result, these particles are easily picked up by water runoff moving at a specific speed, but when the water's current is slowed or stopped by the silt trap, the heavier sediment particles naturally fall to the trap's bottom

ii. Provide proper erosion protection

- Due to the fact that if left unchecked, silty soil and suspended sediment can travel long distances in fats-moving water, posing a serious threat to aquatic animals

iii. Construction may be completed in a short amount of time

vi. One of the greatest management practices available

Disadvantages

The disadvantages of silt trap are:

i. Only suitable for drainage areas of up to 2 hectares

ii. Removes only coarse sediment (medium silt size and larger).

iii. Cannot be found in the live feed

iv. Protective fence is required, and children may be at risk

To identify and solve any difficulties that may arise during the construction of a silt trap

3.4.1 SAFETY ISSUE

This Erosion Sediment Control Plan (ESCP) is actively involved in the development site's building phase. This engagement is further subdivided into two stages: bidding and mobilization and construction operation completion. During the building process, the developer should make certain that the chosen contractor is accountable for applying best management practices (BMPs) that include safety in accordance with ESCP and NIOSH. This is due to the fact that the site conditions would inevitably change throughout construction.

Figure 6: Shows poor safety compliance at site

During the excavation of the lower ground beam, silt trap, trenches, pad footing, and slope cutting. The absence of the safety officer is due to the irresponsible behavior and commitment that occurred. As a result, during these sorts of work in confined spaces, workers/labors must be closely supervised in order to avoid any casualties caused by workers/labors who may fall into the dug pit/hole, causing significant harm to the person's body. Furthermore, the facility was filthy due to a lack of housekeeping. Following the completion of the concreting job, a variety of materials and trash are placed on the walkway for workers/labor to walk on.

Figure 7: Shows the worker does not wear safety helmet and boots at site

To ensure a safe working environment, the contractor must follow the Guidelines for Public Safety and Health at Construction Sites, DOSH and other Occupational Safety and Health requirements stated and listed in the JKR specification for Occupational Safety and Health in Engineering Construction works at all times.

Furthermore, the contractor is expected to supply a full First Aid Kit as specified in the Factory and Machinery (Safety, Health and Welfare) Regulation 1970, which must be kept and properly maintained in the contractor site office. The first aid kit shall be under the control of either the contractor representative or the safety officer, who shall be present on the site during all working hours to guarantee that first aid services are accessible without delay at all times when construction activity is in progress. Contractor employees must have at least one designated individual trained in first aid skills

Figure 8: Shows an illustration of First Aid Place

Pumping, bailing or other operations must be used to keep all excavations and portion of the site dry. This was to ensure that the site would not be flooded and would not be a breeding ground for mosquitoes. The contractor would be accountable by the Local Authority or the Ministry of Health (MOH) if the measure implemented is illegal.

Figure 9: Shows the important of housekeeping and managing site

The primary contractor must guarantee that all subcontractors and nominated subcontractors that employ more than 20 people designated a Contractor Safety Supervisor (CSS) who will be stationed for at least

5 hours per week to verify that all labor/workers are following NIOSH safety regulations. The Contractor must additionally present a written Safety and Health Plan (S-Plan) approved by the company's director within one month of receiving the Letter of Acceptance. The S-Plan must comply with the JKR Specification for Occupational Safety and Health in Engineering Construction.

In the event of COVID19 pandemic, the contractor must offer and maintain Standard Operating Procedures (SOP) during the National Recovery Plan, which includes providing hand sanitizer, facemasks, temperature detectors, and QR Code MySejahtera for site staff to scan and record as a new norm. A adequate amount of water efficient temporary toilet in a suitable position on the site, as permitted by S.O.

CHAPTER 4.0

CONCLUSION

For conclusion, a silt trap is a device used to keep silt from entering and clogging a soak way, attenuation, or sewer system. These systems are intended to collect and remove surface water, either by draining it into the sewer system or allowing it to drain back into the ground below. Silt can clog pipes and fill soak way and attenuation system, reducing their capacity to hold water and interfering with a drainage system's ability to remove surface water. As silt accumulates, the risk of water not draining away increases, resulting in surface flooding and the need to replace the drainage system.

Despite the fact that newer modular/create soak way system are much better at avoiding silt problems, they are still prone to blockages and damage. Silt traps continue to be the most effective method of protecting soak ways by capturing silt further up the drainage system.

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d) Mr Azmi Bin Harun, Senior Assistant Engineer (JA36)
e) Ir Sulaiman Bin Ahmad, Senior Design Engineer (JA48)
f) Ahmad Fadhlillah Bin Mukhtar, Assistant Engineer (JA29)
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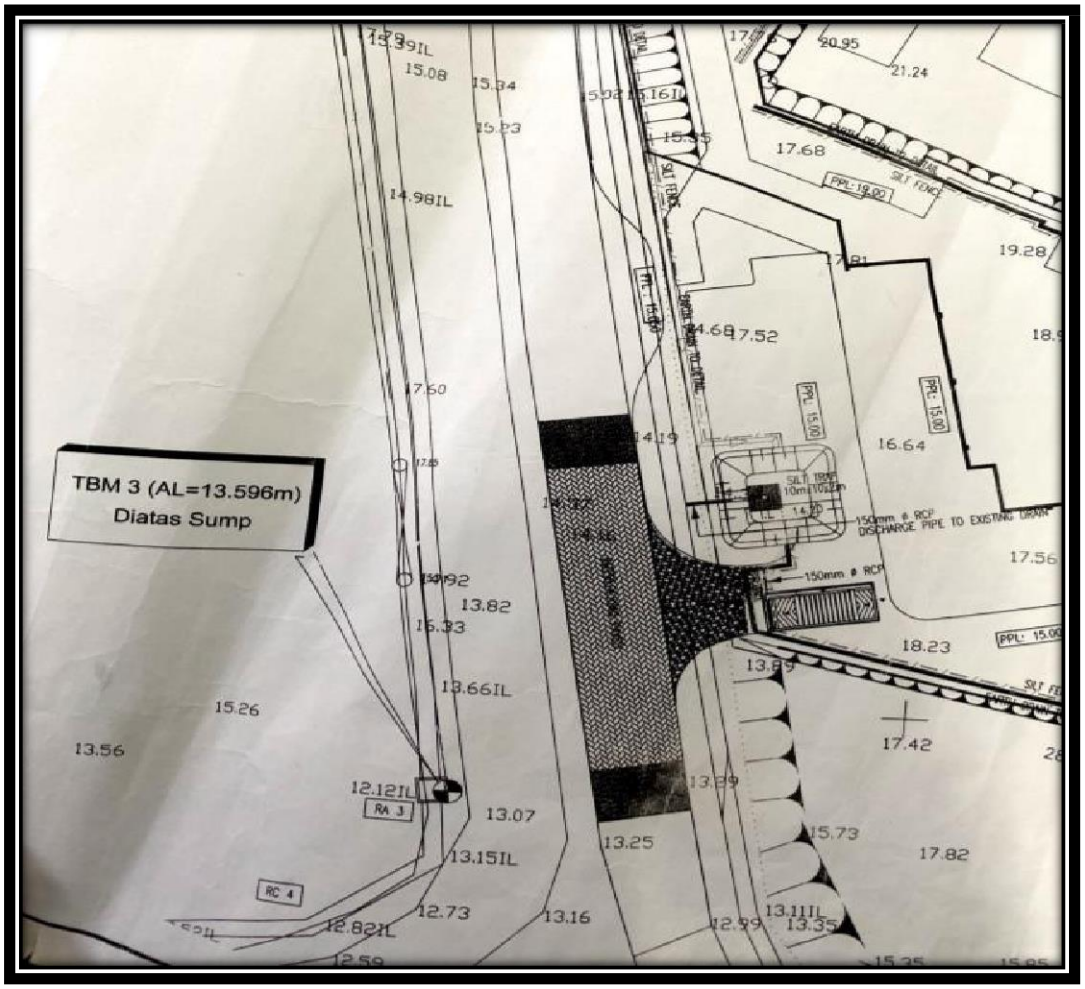
APPANDICES



appendices 1:Shows key location of silt trap that was to be develop at site.

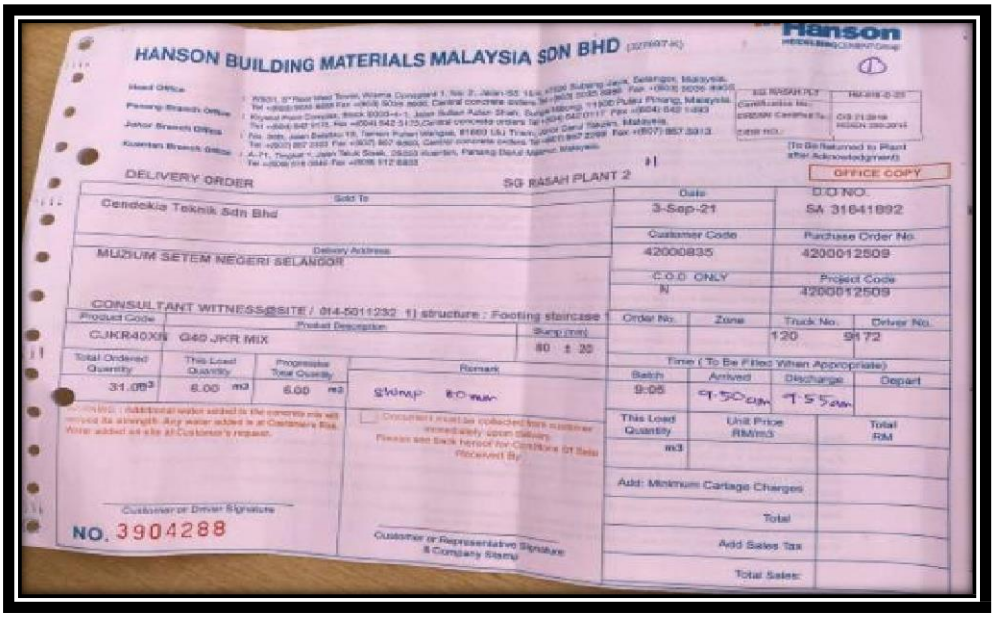
appendices 2:Shows the inspection for steel works prior to formwork installation

appendices 3:Shows the worker cutting the hardwood for making formwork for work lower ground

appendices 4:Shows concreting process for retaining wall

appendices 5:Checking of raw material (Steel bars) arrived at site according to their standard and quantity

appendices 6:: Checking of raw material (Steel bars) in bundles arrived at site according to their standard and quantity.


HANSON BUILDING MATERIALS MALAYSIA SDN BHD

DELIVERY ORDER

SG RASAH PLANT 2

OFFICE COPY

Sold To: Cendekia Teknik Sdn Bhd

Delivery Address: MUZIUM SETEM NEGERI SELANGOR

CONSULTANT WITNESS@SITE / 014-5011232 1) structure : Footing staircase

Product Code: CJKR40XN

Product Description: G40 JKR MIX

Slump (mm): 80 ± 20

Total Ordered Quantity: 31.0 m³

This Load Quantity: 6.00 m3

Progressive Total Quantity: 6.00 m3

Remark: SLump: 80 mm

Date: 3-Sep-21

D.O NO.: SA 31841892

Customer Code: 42000835

Purchase Order No.: 4200012509

C.O.D ONLY: N

Project Code: 4200012509

Order No. | Zone | Truck No.: 120 | Driver No.: 9172

Time (To Be Filled When Appropriate)

Batch: 9:05 | Arrived: 9:50am | Discharge: 9:55am | Depart

This Load Quantity: m3 | Unit Price RM/m3 | Total RM

Add: Minimum Cartage Charges

Total

Add Sales Tax

Total Sales:

NO. 3904288

Customer or Driver Signature

Customer or Representative Signature & Company Stamp

appendices 7:: Shows the Delivery Order (DO) for concrete according to their time, batch and concrete class

appendices 8:: Shows final inspection for steel and formwork prior to concreting staircase base.

appendices 9:Shows the slump test for concrete

appendices 10:: Shows the dismantle of formwork after 7 days after concreting.

appendices 11:: Shows the activities for spraying Iglo Reflex (a waterproofing

material to preserve the retaining wall structure.

appendices 12:Shows discussion regarding the site claim and defects of structure.