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UNIVERSITI
TEKNOLOGI
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DEPARTMENT OF BUILDING
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UNIVERSITY TECHNOLOGY MARA
(PERAK)

OCTOBER 2013

It is recommended that this Report Practical Training

By

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Entitle

Method Statement for Earthwork

Accepted as partial fulfilment as requirements in obtaining Diploma in Building.

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STUDENT'S DECLARATION

The result of practical training report writing work has been created entirely by me unless otherwise stated herein through practical training that I have been through for five months from 13th May 2013 to 28th September 2013 at JNH BINA SDN BHD Company. It is also as one of the requirement to pass the course (DBN307) and accepted in partial fulfillment of the requirement for obtaining a Diploma in Building.

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ABSTRACT

This report briefly describes the processes and methods that involves in earthwork. It is produced according to a five month experience in the construction field especially in project site. This report is divided into four sections and start with the background of the company as well as background of the construction project. The finding of earthwork process in this observation was not easy as it expected. It involves a lot of machineries and manpower. It also has specified the sequence of work starting with acceptance of tender to handover of a completed project. In this report, it is described the nature of work undertaken for earthwork. Then, this report are highlighted the machines that used in earthwork. Subsequently, this report is described in more detail about each of the sequences that involved in earthwork. During earthwork process, some of the problems associated with earthworks have been identified and the report ended with some suggestion that felt able to solve the identified problems. In conclusion, this report could explain in more detail about the process and methods used for earthwork process to readers.

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- Appendix E Notification of Imposition of Levy Form
- Appendix F Plan of Leveling Work and EGL Detail for Project at Bertam Perdana
- Appendix G Method Statement Form of Earthwork

LIST OF ABBREVIATIONS

UiTM	Universiti Teknologi MARA
CIDB	Construction Industry Development Board
LAD	Liquidated and Ascertained Damages
CAR	Contractor All Risks
WC	Workmen's Compensation
EGL	Existing Ground Level

CHAPTER 1.0 INTRODUCTION

1.1 INTRODUCTION

Earthwork is the process whereby the surface of the earth was excavated and been transported and compacted at another location. Earthwork consists of roadway excavations (cuts) and roadway embankments (fills) for highways and associated items of work. Earthwork includes all types of materials excavated and placed in embankment, including soil, granular material, rock, shale, and random material. Associated items of work considered to be in the broad range of earthwork include clearing and grubbing, removal of trees and stumps, scalping, removal of structures and obstructions, channel excavation, preparation of foundations for embankment, disposal of excavated material, borrow, preparation of sub grade, proof rolling, sub base, and temporary water pollution, soil erosion and siltation control. If pavement is to remain smooth and stable during years of service under traffic, the earthwork on which it was built must be stabled and furnish uniform support. Where roughness, settlements and other distress develop in pavement during service under traffic, the cause often is a deficiency in the stability of earthwork which supports the pavement.

Earthwork also provides strong foundation and forms for building, homes, roadways and more. Some of the major applications of earthwork are performed by heavy industrial contactors. Although earthwork can be prepared to build to a larger structure, it can also be applied to small scale like gardens. The successful of earthwork depends on an adequate site investigation. Before work being start it is a must the site should be suitable for doing anything work and does not give a problem when the earthwork starts. The types and size of plant to use in earthwork also must be inspecting based on the particular requirements. Furthermore, the surface and subsurface water must be control to avoid the soil became silt. The soil also must be maintained with optimum moisture range by drying, mixing or wetting.

1.2 OBJECTIVE

The objectives of this case study are:

- To determined the definition of earthwork
- To list the machineries and manpower that used in earthwork construction
- To study how to manage a proper earthwork construction and finish it on time.
- To describe detail about the sequence of work that involved in earthwork
- To analyze the problem that occur in earthwork construction
- To find the solution to overcome the problems and avoid the problems occur again in the earthwork construction

1.3 SCOPE OF STUDY

The project that chosen for this case study are at Bertam Perdana 1, Fasa 3 Mukim 6, Seberang Perai Utara, Pulau Pinang. This project is to complete and earthwork and associated work at Bertam Perdana. The completion period is about five month from stating date at 2nd May 2013 until 1st October 2013. The area of the site is about 20.8 acres that must be covered with soil until proposed level. All the activities and sequence of work about earthwork construction are observe and recorded. All the machineries and manpower that involved in this project are list for further information. The detail of earthwork on site as compare to the theory in books is that practically should be managed on site.

1.4 METHODOLOGY

➤ Site Inspection

Observe all activities at the site to get experience and knowledge about construction especially about earthwork. All the activities and data are collected and recorded in site diary. After that, analyze all the data with additional information from book or website.

➤ Employer's guidance

Always ask the employer of anything that does not understand about earthwork construction.

➤ Reference from book and website

Collection of additional information on the topic from external reliable sources, such as books from the library, journals, articles from magazines and newspapers and websites. This information must be chosen from a proper source with complete reference to maintain the credibility of the report and avoid plagiarism.

➤ Photograph report

All activities must be taking a photo to use in future either to put in the meeting report or individual report. The photograph report gives a more explanation about the activities at the site because we can understand if we only look to the picture. We also can able to reflect the actual activities at the site through pictures although we are not in the place.

➤ Report proposal

After all activities that related with earthwork complete, all the data are recorded and will attach in form of report proposal. The report will give a lot of information to others if they make this report as a reference.

CHAPTER 2.0 BACKGROUND COMPANY

2.1 INTRODUCTION

JNH BINA SDN BHD was registered on 15th May 2002 at No. 8a Tingkat 1, Lebuhraya Lebuhraya 2 Pusat Bandar Seberang Jaya 13700 Seberang Jaya Pulau Pinang. Now this company has their own permanent office that situated at No 8520(F) N/To Jalan Pokok Tampang, 13300 Tasek Gelugor, Butterworth, Pulau Pinang. The directors of the company are En. Junaidi Bin Husain and En. Suhaimi Bin Sabudin. As a market leader, JNH BINA SDN BHD brings together a comprehensive range of capabilities in supply of building materials, trucking services, maintenance building, road building, infrastructure projects, renovation and extension work and general cleaning work.

LOCATION PLAN JNH BINA SDN BHD OFFICE



Figure 2.0 1 Location Plan JNH BINA SDN BHD Office

This is list of category and specialization of JNH BINA SDN BHD company that approved by Construction Industry Development Board, CIDB.

GRADE	CATEGORY		SPECIALIZATION	
G7	B	Building	B04	General Building Works & Maintenance
			B13	Tiling & Plastering Works
			B14	Painting
G7	CE	Civil Engineering	CE21	General Civil Engineering Works
			CE01	Road & Pavement Construction
			CE10	Piling Work
			CE13	Sign craft Installation
			CE20	Water Pipe Lines
			CE34	Precast Concrete Installation Work
G7	ME	Mechanical & Electrical	CE36	Earthwork
			M15	Miscellaneous Mechanical Equipment

Table 2.0 1 CIDB Certificate

JNH BINA SDN BHD Company has fourteen of staff and management that have capability in doing construction work. They have different academic background and respective advantages to improve this company. Each of the staff has many experiences in construction field. This company has own machineries for make contractor can handle the project easily and became simply. The lists of machineries that belong to company are lorry tipper, concrete mixer, roller compactor, bulldozer, back pusher, and excavator. When have own machineries it will save the cost of rental and we can use the machine anytime.

2.2 COMPANY PROFILE

Company Name	:	JNH BINA SDN. BHD
Company Register No	:	580335 – W
Company Register Date	:	15 MEI 2002
Category	:	BUMIPUTERA
Register Address	:	No. 8A, TINGKAT 1, LEBUH TENGGIRI 2, PUSAT BANDAR SEBERANG JAYA, 13700 SEBERANG JAYA, PULAU PINANG.
Operation Address	:	No. 8520 (D), N/TO JALAN POKOK TAMPANG, 13300 TASEK GELUGOR, SEBERANG PERAI UTARA, PULAU PINANG.
Telephone No	:	
Fax No	:	
Authorized Capital	:	RM 500,000.00
Paid – Up Capital	:	RM 1,000,000.00
Director	:	JUNAIIDI BIN HUSAIN
Assistant Director	:	RUZINA BINTI ABD SAMAD
Principle Bankers	:	AM BANK BERHAD CAWANGAN SUNGAI DUA : CIMB BANK BERHAD CAWANGAN SEBERANG JAYA

2.3 ORGANIZATION CHART

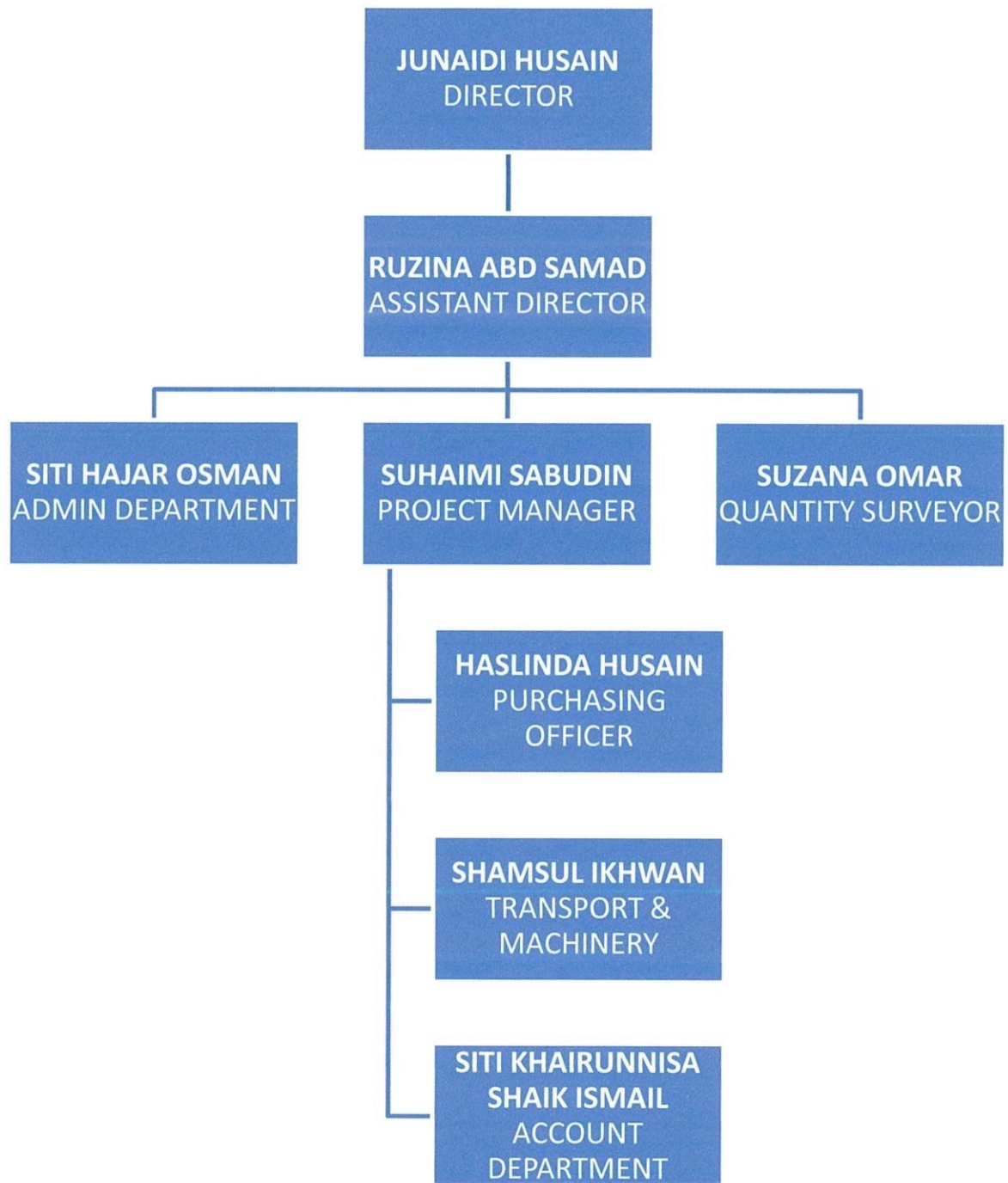


Figure 2.0 2 Organization Chart JNH BINA SDN BHD

2.4 LIST OF PROJECT

2.4.1 COMPLETE PROJECT

NO	PROJECT	CONTRACT AMOUNT	PERIOD	CLIENT
1	Building Work (Part 3-Pyscho Geriatrics, Convalescent Wards, Infirmary, Medical Support And Cafeteria Hospital Permai, Johor	10,875,288.60	18 month	MRCB Engineering Sdn. Bhd. Level 3, Stesen Sentral Kuala Lumpur, 50470 Kuala Lumpur
2	Building Work (Part 5-H.D. & CBW Wards, Admission wards, Admission Dept. And Central Occ. Therapy Rehab Hospital Permai, Johor	9,154,262.00	18 month	
3	Cadangan Menaiktaraf Bangunan Jeti Point Pulau Aman, Pulau Pinang	537,954.00	22 week	ICU JPM, Tingkat 11, Menara Boustead 39, Jln Sultan Ahmad Shah, P.Pinang
4	Cadangan Pengubahsuaian Bangunan E37 Untuk Pusat Pengajian Ilmu Pendidikan, Universiti Sains Malaysia, Pulau Pinang	564,319.00	18 week	Jabatan Bendahari 11800 USM Pulau Pinang

NO	PROJECT	CONTRACT AMOUNT	PERIOD	CLIENT
5	Road and Drainage (Part 1- External Road & Drainage) at Hospital Permai, Johor	4,160,825.80	50 month	MRCB Engineering Sdn. Bhd. Level 3, Stesen Sentral Kuala Lumpur, 50470 Kuala Lumpur
6	Road and Drainage (Part 4- Internal Road & Drainage) at Hospital Permai, Johor	1,426,511.09	48 month	
7	Road and Drainage (Part 5- Internal Road & Drainage) at Hospital Permai, Johor	2,381,793.87	48 month	
8	Site Clearance And Earthworks at Hospital Permai, Johor	1,561,975.00	5 month	
9	Proposed Eastern Dispersal Link (EDL) Expressway, Johor Bahru	7,648,600.00	51 month	JKP SDN. BHD. No. 114-F Bangunan JKP, Jln Sungai Pinang 10150 P.Pinang
10	Cadangan Pembersihan Tapak dan Kerja Tanah Di Atas Sebahagian Lot 132,134,748, dan 786, Mukim 19, Penanti, Seberang Perai Tengah, Pulau Pinang	650,486.00	16 week	
11	Cadangan Menaiktaraf Jalan Dan Kerja-Kerja Berkaitan Di Hadapan Institut Kemahiran Tinggi Perda (PERDA-TECH), Mukim 8, Bukit Panchor, Seberang Perai Selatan, Pulau Pinang	988,269.70	4 month	Lembaga Kemajuan Wilayah Pulau Pinang No. 1 Lorong Kampung Gajah 2, Jalan Kg Gajah, 12200 Butterworth

NO	PROJECT	CONTRACT AMOUNT	PERIOD	CLIENT
12	Cadangan Menaiktaraf Jalan Dan Lain-Lain Kerja Berkaitan Di Atas Lot 1693, 1655 dan 12733, IKS Bukit Minyak, Seberang Perai Tengah, Pulau Pinang	2,808,852.80	4 month	Lembaga Kemajuan Wilayah Pulau Pinang No. 1 Lorong Kampung Gajah 2, Jalan Kg Gajah, 12200 Butterworth
13	Menaiktaraf Jalan Air Itam Di Bahagian Persimpangan Jalan Masjid Negeri/ Jalan Scotland/ Jalan Air Itam	2,242,636.10	7 months	Majlis Perbandaran Pulau Pinang Jabatan Kejuruteraan Paras 13, KOMTAR Jalan Penang 10675 Pulau Pinang
14	Cadangan Kerja-Kerja Tanah Dan Kerja-Kerja Pembangunan Di Atas Lot PT 1611, HS (D) 1964 (Lot Baru 5070, GN116868) Taman Pauh Jaya, Fasa 8, Mukim 6, Seberang Perai Utara, Pulau Pinang	5,347,932.60	8 month	Mekar Industries Sdn. Bhd No. 4B, Lorong Bertam Indah 12, Taman Bertam Indah, 13200 Kepala Batas
15	Kerja-kerja Tanah Pembinaan Rumah Mampu Milik Di Indera Timbalan Kepala Gajah, Seberang Perai Selatan, Pulau Pinang (Fasa 1)	761,141.20	5 month	JKR Pulau Pinang Tingkat 18 & 19 KOMTAR, P.Pinang

NO	PROJECT	CONTRACT AMOUNT	PERIOD	CLIENT
16	Cadangan Pembersihan Tapak Dan Kerja-kerja Di Atas Sebahagian Lot 132, 134, 748, 749, 785 dan 786, Mukim 19, Penanti Seberang Perai Tengah, P.Pinang	1,724,347.36	12 week	JKP SDN. BHD No.114-F Bangunan JPK, Jalan Sungai Pinang, 10150 Pulau Pinang
17	Cadangan Untuk Kerja-kerja Tanah Dan Kerja-Kerja Yang Berkaitan Di atas Lot 5477 (Lot Baru 5490) Taman Sri Serdang Fasa 7, Mukim 6, Kepala Batas	1,378,000.00	4 month	MAM Teguh Enterprise 35-D, Jalan Pandan 10/12, Pandan Perdana, 53000 Kuala Lumpur
18	Cadangan Kontrak Tahunan Untuk Kerja-kerja Penyelenggaraan Jalan Dalam Taman Perumahan (Turap Semula, Tampak Potholes, Mengecat Jalan, Bonggol, Patil Nama Jalan, Papan Tanda Nama Taman dan Kampung) Di Kawasan Parlimen Tasek Gelugor	2,000,000.00	2 years	Majlis Perbandaran Seberang Perai, Jalan Perda Utama, Bandar Perda, 14000 Bukit Mertajam

Table 2.0 2 Complete Project JNH BINA SDN BHD

2.4.2 CURRENT PROJECT

NO	PROJECT	CONTRACT AMOUNT	PERIOD
1	Cadangan Kerja Tanah serta kerja-kerja yang bersangkutan dengannya di Plot E (Lot 723-726) Mukim 13, Bukit Minyak Utara Science Park, Seberang Perai Tengah Pulau Pinang (Phase 2)	RM 36,136,521.60	12 MONTH
2	The Proposed Construction and Completion of Roadwork, Bridge Drainage, Utilities and Landscape Works at Precinct 7 & 8 (Phase 2) For Pusat Pentadbiran Kerajaan Persekutuan Putrajaya	RM 2,264,284.00	5 MONTH
3	Proposed Up Grading Work of Storage Length (Ingress) At Sg. Perak RSA (Northbound) Section N5 Northsouth Expressway	RM 1,342,725.10	12 MONTH
4	Cadangan Kerja-Kerja Tanah dan Kerja-kerja Berkaitan di atas sebahagian PT 434, Bagi Pembangunan Taman Ilmu, Mukim 9, Daerah Seberang Perai Selatan, Pulau Pinang.	RM 10,027,530.00	11 MONTH
5	Cadangan Jalan dan Parit Serta Lain-lain Kerja Yang Bersangkutan Dengannya untuk Lingkaran Cassia Selatan ke Sambungan Lebuhraya Bandar Cassia Sebahagian Lot 282, Mk 13, Batu Kawan, Seberang Perai Selatan, Pulau Pinang	RM 18,886,224.90	12 MONTHS

Figure 2.0 3 Current Project JNH BINA SDN BHD

CHAPTER 3.0 CASE STUDY

(METHOD STATEMENT OF EARTHWORK)

3.1 INTRODUCTION FOR EARTHWORK

3.1.1 Definition

Earthwork is the surface of the earth that are excavated and transported to and compacted at another location. (Misnan S. D.). Earthwork also known as engineering works created through the moving or processing of parts of the earth's surface involving quantities of soil or unformed rock. The earth may be moved to another location and formed into a desired shape for a purpose. Much of earthworks involve machine excavation and fill and backfill.

Earthwork also provides strong foundation and forms for building, homes, roadways and more. Some of the major applications of earthwork are performed by heavy industrial contractors. Although earthwork can be prepared to build to a larger structure, it can also be applied to small scale like gardens. The successful of earthwork depends on an adequate site investigation. Before work being start it is a must the site should be suitable for doing anything work and does not give a problem when the earthwork starts. The types and size of plant to use in earthwork also must be inspecting based on the particular requirements. Furthermore, the surface and subsurface water must be control to avoid the soil became silt. The soil also must be maintained with optimum moisture range by drying, mixing or wetting.

3.1.2 Background of Project

Project Title	: Cadangan Kerja Tanah Dan Kerja Berkaitan Di Atas Sebahagian Lot 20022, Bertam Perdana 1, Fasa 3, Mukim 6, Seberang Perai Utara, Pulau Pinang
Contract No	: BPSB/PROJ/2013/02
Price Contract	: RM 2,819,483.40
Completion Period	: 22 Weeks
Date For Possession	: 2 nd May 2013
Date For Completion	: 1 st October 2013
Performance Bond	: Bank Guarantee
Project Insurance	: CAR & WC Policy Progressive Insurance Berhad
Client	: BERTAM PROPERTIES No 1, Jalan Dagangan 1, Pusat Bandar Bertam Perdana, 13200 Kepala Batas, Pulau Pinang.
Engineer	: MASTECH CONSULT No 21a, Lorong Perda Selatan 1, Bandar Perda, 14400 Bukit Mertajam, Pulau Pinang.
Quantity Surveyor	: KPK QUANTITY SURVEYOR SDN BHD No 22, Jalan Irrawadi 10050 Pulau Pinang

LOCATION PLAN:

LOCATION PLAN JNH BINA SDN BHD SITE PROJECT



Figure 3.0 1 Location Plan JNH BINA SDN BHD Site Project

The site project is near with infrastructure that usually use for public people. It will make difficult for machine or lorry to enter and exit from the site. This area also busy with people because it have a lot of shop, bank, and other facilities. Therefore people usually used it for their daily life. So, contractor must make sure this project does not disturb resident around. The site plan for site project at Bertam Perdana was attach in Appendix A.

3.1.3 Scope of Work

The scope of works shall include but limited to the followings:

- Preliminaries
 - Performance Bond, Insurance, CIDB
 - Site Office, Setting Out, Signboard
 - Temporary works
 - As-Built Survey

- Earthworks
 - Site Clearance approximates 20.68 acres.
 - Construct Washing bay
 - Erect permanent metal deck hoarding
 - Excavate unsuitable material 12,553m³.
 - Filling with imported laterite earth 178,066m³.
 - Temporary earth drains
 - Temporary earth bank
 - Construct sedimentation basin and slit trap

- Turfing
 - Closed turfing with black soil

3.2 METHOD, MACHINERIES, MAN POWER AND MANAGEMENT

3.2.1 Method

Method of earthwork is different with other. It depend on client or consultant that state in Bill of Quantities and tender document. Earthworks usually have two method which are cutting and filling.

- Cutting
 - Cutting is the process of excavating earth material from a work location to achieve the desired topography.
- Filling
 - Filling is the process of moving the excavated material or additional earth material to a work location to achieve the desired topography.

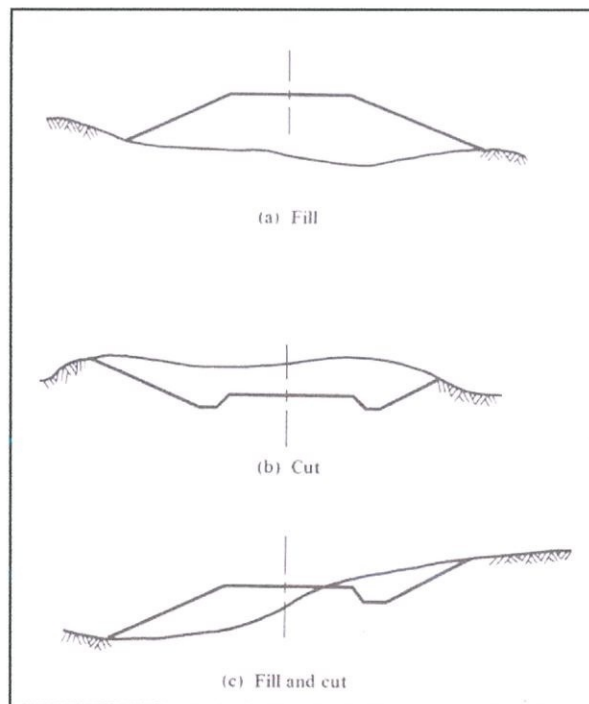


Figure 3.0 2 Example of Cut and Fill Earthwork

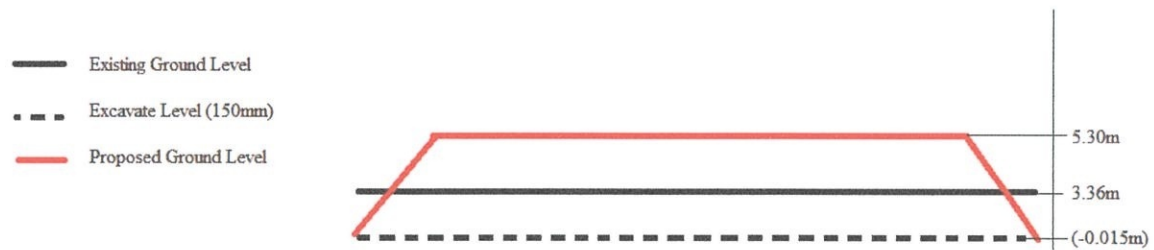


Figure 3.0 3 Cross Section for project at Bertam Perdana

Method that used in project at Bertam Perdana only excavates work and earth filled work until proposed level. The purpose levels that must achieve are RL5.30m from original ground level. The areas that must achieve until purpose level are about 20.8 acres or 83795 m².

3.2.2 Machineries

Machineries are important item that regularly use for any construction works. Each of machineries has their own function and responsibilities to conduct and accomplish any project that have been given. Earthwork cannot be conduct if there are lacks of machineries. These are an example of machineries that needed in earthwork.

A) Excavator



Photo 3.0 1 250G LC EXCAVATOR

Sources: (Misnan S.D)

DEFINITION	TYPES	FUNCTION	ADVANTAGE/ DISADVANTAGE
A heavy construction equipment consisting of a boom, stick, bucket and cab on a	1. Compact excavator - Weighing at least 0.7 tones 2. Crawler excavator	<ul style="list-style-type: none">• Digging of trenches, holes, foundations• Material handling	Advantages - Makes the construction easier for the workers since it can dig, move,

rotating platform (known as the 'house').The house sits atop an undercarriage with tracks or wheels.	<ul style="list-style-type: none"> - Release heavy work <p>3. Dragline excavator</p> <ul style="list-style-type: none"> - Are used in mining and engineering <p>4. Long reach excavator</p> <ul style="list-style-type: none"> - Able to reach the top of building 	<ul style="list-style-type: none"> • Brush cutting with hydraulic attachments • Forestry work • Demolition • General grading/landscaping • Heavy lift 	<p>transport earth, gravel in a shorter period of time with less energy use.</p> <p>Disadvantages</p> <ul style="list-style-type: none"> - Cost of labor and diesel are higher per day
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B) Backhoe



Photo 3.0 2 Backhoe
Sources: (Misnan S.D)

DEFINITION	TYPES	FUNCTION	ADVANTAGE/ DISADVANTAGE
Also called a rear actor or back actor is a piece of excavating equipment or digger consisting of a digging bucket in the end of a two-part articulated arm.	<ol style="list-style-type: none"> 1. Caterpillar 2. Bobcat 3. Case 4. Ingersoll-Rand 	<ul style="list-style-type: none"> • Used for moving material such as debris or dirt, from one place to another. • Used for smaller project such as breaking asphalt and digging holes 	<p>Advantages</p> <ul style="list-style-type: none"> - Has the ability to pull heavy things that cannot be done by other multi-tasking equipment <p>Disadvantages</p> <ul style="list-style-type: none"> - The chances of accidents and injuries are more if it is not handled carefully

D) Back pusher



Photo 3.0 4 Back Pusher
Sources: (Misnan S.D)

DEFINITION	TYPES	FUNCTION	ADVANTAGE/ DISADVANTAGE
Back pusher is actually a Ford500 tractor, which is assembled with the bucket and would work in reverse gear,		<ul style="list-style-type: none"> Used to push large quantities of soil, sand, rubber and gravel on a wide range of small scale and large construction sites, mines and quarries, heavy industries factories. 	<p>Advantages</p> <ul style="list-style-type: none"> - Rental fee and spare parts of back pusher are much cheaper than the bulldozer. <p>Disadvantages</p> <ul style="list-style-type: none"> - Less power than the bulldozer

E) Roller Compactor



Photo 3.0 5 Roller Compactor
Sources: (Misnan S.D)

DEFINITION	TYPES	FUNCTION	ADVANTAGE/ DISADVANTAGE
A machine or mechanism used to reduce the size of waste material or soil through compaction. Any of various cylindrical or spherical devices that roll or rotate.	<ol style="list-style-type: none"> 1. Single Drum Vibratory Rollers 2. Double Drum Vibratory Roller 3. Combi Rollers 4. Steel Drum Rollers 5. Pneumatic Roller 6. Tamping Compactor 	<ul style="list-style-type: none"> • Used to compact soil, gravel, concrete or asphalt in the construction of roads and foundation. • Used for compression of the surface required to be compacted 	<p>Advantages</p> <ul style="list-style-type: none"> - The size of material can reduce easily - Work became easily <p>Disadvantages</p> <ul style="list-style-type: none"> - Cost of diesel are higher

F) Low Loader Trailer



Photo 3.0 6 Low Loader Trailer
Sources: (Misnan S.D)

DEFINITION	TYPES	FUNCTION	ADVANTAGE/ DISADVANTAGE
A rail vehicle for heavy loads with a low platform for ease of access	<ol style="list-style-type: none"> 1. Fliegl Low Loader 2. Four and five axle low loader trailers 3. One and two axle low loader semi-trailer 4. The lift master from fliegl 	<ul style="list-style-type: none"> Used to transport such equipment have been supported on a multiplicity of tires small enough in diameter to fit beneath the platform 	<p>Advantages</p> <ul style="list-style-type: none"> - Can transport any heavy material such as cabin of site office <p>Disadvantages</p> <ul style="list-style-type: none"> - The equalization system cannot function over sufficient range of wheel travel to accommodate severe road.

G) Dump Truck/Tipper



Photo 3.0 7 Dump Truck/Tipper
Sources: (Misnan S.D)

DEFINITION	TYPES	FUNCTION	ADVANTAGE/ DISADVANTAGE
A truck used for transporting loose material (such as sand, gravel, or dirt) for construction.	<ol style="list-style-type: none"> 1. Standard dump truck 2. Transfer dump truck 3. Superdump truck 4. Haul truck 	<ul style="list-style-type: none"> • Used to haul rock, sand gravel, asphalt, trash and anything else that needs hauling and dumping. 	<p>Advantages</p> <ul style="list-style-type: none"> - Can transport may thing in a big amount and it will save the time for construction <p>Disadvantages</p> <ul style="list-style-type: none"> - Difficult in going in reverse for bigger truck

3.2.3 Manpower

Manpower or professional person must employ to make sure all project are went well and smooth. There are a lot of manpower in construction work such as carpenter, electrician, plumber, labor and others. In earthwork, less of skilled worker that needed to finish the work except for handle the machine.

NO	TRADE DESRPTION	ROLE	RESPONSIBILITIES
1	Project Manager	A professional in the field of project management.	<ul style="list-style-type: none">- Managing and leading the project team- Managing co-ordination of the partner and working groups engaged in project work.- Detailed project planning and control.- Managing project training within the defined budget- Monitoring project progress and performance
2	Surveyor	A professional person with academic qualification, technical expertise, interpretative ability and management skill to practice the discipline of surveying for the benefit of society	<ul style="list-style-type: none">- Acquiring, interpreting and manipulating geodetic data t- Determining, locating and define boundaries of public and private land- Collecting, analyzing and managing geographic data- Producing for clients, plan maps, files, data bases, models, charts and report

NO	TRADE DESCRIPTION	ROLE	RESPONSIBILITIES
3	Clerk of Work	Is employed by an architect or a client on a construction site to represent the interest of the client in regard to ensuring that the quality of both materials and workmanship.	<ul style="list-style-type: none"> - Performing regular inspection of the work on site and comparing completed work in drawing and specifications - Identifying defect and suggesting way to correct r]them - Liaising with other construction staff, such as contractor, engineers and surveyors - Monitoring and reporting progress to construction manager
4	Site Supervisor	Completes construction project by planning, organizing and controlling the project, completing quality inspection, supervising sub-contractor and staffs	<ul style="list-style-type: none"> - Maintain safe, secure and healthy work environment by following and enforcing standards and procedure complying with legal regulation - Manage sub-contractors by locating, evaluating and selecting sub-contractors, monitoring and controlling performance - Accomplishes construction project results by defining project propose and scope - Resolving design problems, evaluating and implementing change order - Obtaining approvals from buyers

NO	TRADE DESCRIPTION	ROLE	RESPONSIBILITIES
5	Machine Operator	Is a person who in charge for smooth running of machine production	<ul style="list-style-type: none"> - Establish machinery and ensure entire production materials are obtainable - Operate and supervise equipment along with replenish material as required - Ensure to perform all duties safe and secured manner - Convey hazards relayed with equipment to staff working near and with machines
6	Lorry Driver	Is a person who earns a living as the driver of the lorry or truck	<ul style="list-style-type: none"> - Ensuring goods are safely secured - Keeping vehicle in good condition - Loading and unloading the vehicle - Taking the quickest route to destination - Deliver load with good attention to customer services and safety
7	General Workers	Who works at a particular occupation or activity	<ul style="list-style-type: none"> - Ensuring carry out construction work that are given only - Reporting obvious risks - Co-operating with other as to ensure for own health and safety - Following site health and safety rules and procedure - Clean up construction sites, move material and equipment

3.2.4 Management

Management in all business and organizational is the act of coordinating the effort of people to accomplish desired goals and objectives using available resources efficiently and effectively. A good management gives a good impact to project such as the project finish early from completion date. Therefore, project team must organize a good and efficient management to conduct it. For earthwork, many items can do simultaneously. For example if one area are complete with site clearing, the area can start for excavate work. Contractor does not have to wait the work completed before starting to another job.

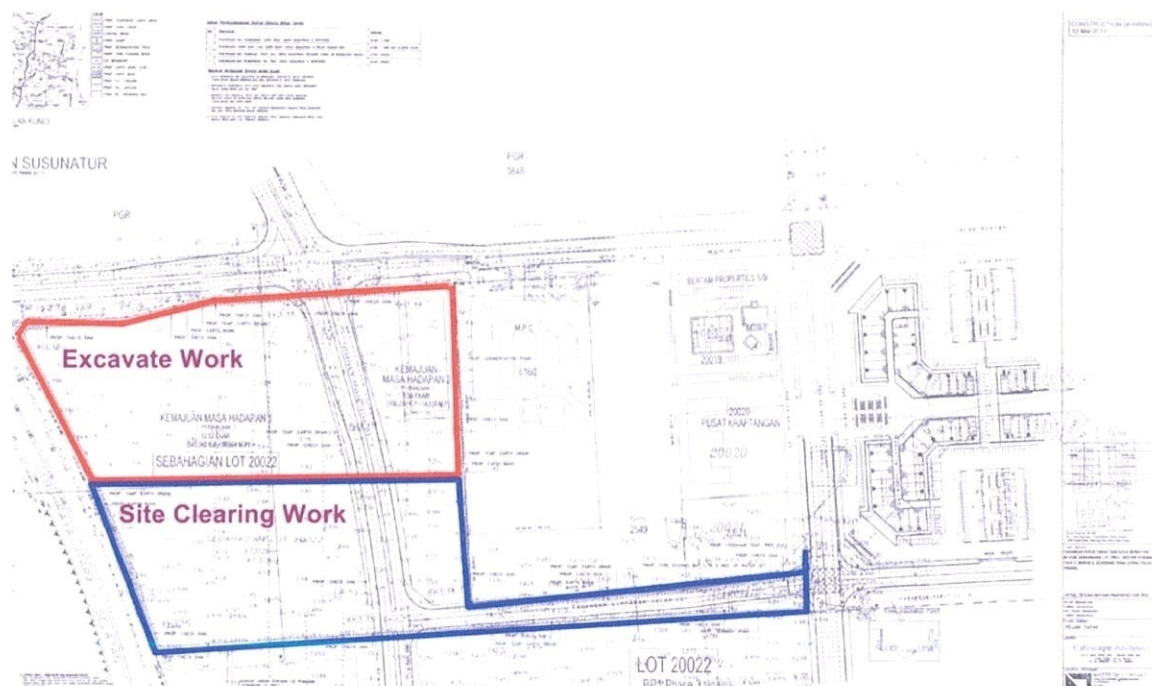


Figure 3.0 4 Site Management

In Bertam Perdana project, the upper layer are doing the site clearing work, after it complete, the area will continue with excavate work. On the same time the below area proceed with site clearing work. Therefore, we can save the time by doing two works in the same time. The machine also can easily enter or exit.

For earth fill work, the upper area must be completed early than below area. This is because to avoid any machine through the area after it achieved the proposed level.



Figure 3.0 5 Site Management for Earth fill Work

The Bertam Perdana Project are divide into four zone which are the area that needed to achieved earth filled at 5.00m, 5.20m, 5.30m and road area 4.95m.. Firstly all area must covered earth filled about 4.50m to standardize it. After complete earth fill in current level 4.5m, we can continue finish the upper area with 5.00m and it will continue with other area with the same method and different purpose levels.

Besides that, this project has own work programmed that must be followed. Every week the project have schedule that must be completed. If the percentage of the project was contra from percentage current schedule, it will make this project will delay. The work programmed guide contractor to complete all the activities on time. The example of work programmed for Project Earthwork at Bertam Perdana was attached in Appendix B.

3.3 SEQUENCE OF WORK

3.3.1 Preliminaries

3.3.1.1 Letter of Acceptance

Letter of Acceptance means the letter of formal acceptance by the Employer of the Letter of Tender, including any annexed memoranda comprising agreements between and signed by both parties. (Letter of Acceptance Definition, 2009) Therefore client should give a letter of acceptance to contractor and must be signature from company director. All the contract agreement must be stated in letter of acceptance for proven. Example of important data that stated in Letter of Acceptance are completion period, date for possession, date for completion, amount contact, liquidated & ascertain damages and other. The example Letter of Acceptance for Project Earthwork at Bertam Perdana was attached in Appendix C.

3.3.1.2 Work Programmed

Before starting the project, contractor should give a work programmed to the client for explain the period of time for each activity. The work programmed also gives a guideline for contractor to make the project runs smoothly. Weekly report for present to client also depends on the work programmed. Furthermore, s-curve can be making from work programmed. The s-curve can show the difference between actual schedule and current schedule. The work programmed and s-curve for project earthwork at Bertam Perdana was attached in Appendix D.

3.3.1.3 Performance Bond

A contract surety bond is a three-part agreement where the surety guarantees to the project owner that the contractor will perform the contract in accordance with the contract document (Cyber). Construction can be a risky investment, but by requiring a performance bond from general contractor, the project owner can increase the likelihood of successful project completion. Therefore, performance bond acts as an insurance policy for owner in the event that the contractor does not fulfill the terms of the construction contract. For project at Bertam Perdana, contractor required deposit to the employer the performance bond amounting RM140, 974.17 (being 5% of the Contract Sum) in the form of an approval Banker's Guarantee (CIMB Bank).

3.3.1.4 Insurance (Contractor All Risk, CAR and Workmen Compensation WC)

Contractor's All Risks Insurance that covers civil construction project above or below ground such as residential and office building, roads, railways, bridges and tunnels. (Dunning) In addition the CAR Insurance also is covered preparatory work at the construction site such as site facilities, excavation, leveling work and temporary structure. This policy is extremely useful for contractors because it contribute to reducing the overall construction expenses offering them protection against unforeseen accidents leading to financial losses under a single policy. Otherwise, Workmen Compensation is insurance paid by companies to provide benefits to employees who become ill or injured on the job. (Murray, 2013). Through this program, workers are provided with benefits and medical care, and employers have the assurance that they will not be sued by the employee. Project at Bertam Berdana get insurance from Progressive Insurance Bhd.

3.3.1.5 Levy on Contractor from CIDB

A registered contractor must notify the CIDB of any contract which he has executed having a contract sum of more than RM 500,000.00. Non-notification is an offence that shall on conviction be liable to a fine of RM 5,000.00. CIDB will impose, before the commencement of such construction works, a levy calculates as a percentage of the contract. The example of notification of imposition of levy form for Project Earthwork at Bertam Perdana was attached in Appendix E.

3.3.1.6 Setting Out

Before start the project, setting out are need to set out the exact position of a proposed structure within the legal boundaries of a piece of land. The kind of survey is very important when preparing for any type of construction work. These surveys are important for several reasons such us they allow for the construction to be done within the legal boundary, which is vital to ensure no boundary disputes later on and they also enable the constructions team to build exactly to plan as markers are physically laid out in front of them. Besides that, setting out also will when project are complete for give to the client and consultant. The setting out must be carried out by a qualified land surveyor that have a license. The plan of leveling work and EGL detail for Project at Bertam Perdana was attached in Appendix F.

3.3.1.7 Install Site Office

Site office buildings are fundamental for smooth-running operations in any industry. Whether permanent or portable an on-site office portable cabin must be durable and functional in order to accommodate the intricate demands of daily work. At the same time, it needs to be comfortable and inviting for workers and visitor. This is especially important in remote locations where modular transportable offices are places for both working and living through long hours and in unpredictable environment.

Based on bill of quantities, contractor required to install two site offices at site project. The size required area about 40' X 20'. One of the site offices is use for consultant to meeting and other one for contractor staff. It also have toilet for worker used. The cabin of site office is transported by low loader trailer. The office are temporary and it will use until project finish.

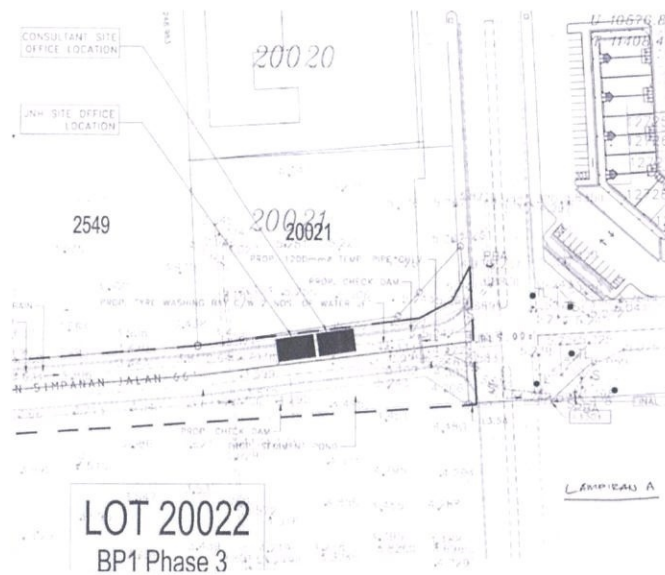


Figure 3.0 6 Proposed Location of Site Office



Photo 3.0 8 Site Office Project at Bertam Perdana

Signboard is a board carrying a sign or notice. Contractor shall erect a signboard showing the project, consultant's name and contractor's name together with all necessary supports including maintaining in good order, paying all fees, adapting, shifting, subsequent changes to signage, writing and dismantle and clear away on completion of contract or as directed by the Engineer. The detail of signboard is shown in construction drawing.



Temporary Works means all temporary works of every kind required on site for the execution and completion of the permanent works and the remedying of any defects. Project at Bertam Perdana only have temporary work for electric and water because this project not use many temporary works. An electric is used for site office while temporary water used for washing bay.

3.3.2 Earthworks

3.3.2.1 Site Clearance

The clearing or removal the vegetative cover and other obstruction at the project site prior to undertaking the construction work. (James, 1996). Contractor must take down or pull out existing tree or palm tree including grubbing out root, and cart way from site to Contractor's own dumping ground. Site clearing work also including clear, demolish and clean the entire site of all rubbish, grass, weeds, shrubs, bushes, other vegetations, remove all dumped or natural spoils, rubbish, debris, deserted structures, disused fencing and gate, toilet, unwanted material etc. including demolishing of unwanted structures, utilities, load and cart away everything as specified above and dispose off site to the Contractor's own dumping ground.

The site clearing method begins with cutting down the trees on the piece of land. These trees are often moved to a processing location, but the stumps are left in the ground. These stumps can be ground into mulching material or pulled out of the ground using a large piece of construction machinery. Finally, all the trees are removed to dumping ground by using dump truck. The manpower used for carry out site clearing work is skilled work such as operator machine and tree cutter. While, the machineries that involved in site clearing work are backhoe, chainsaw, dump truck, bulldozer, and excavator.

The precautions in the process of site clearance work are the area to be cleaned should be marked, so that cleaning is not entering the border area. If the project is in the region that have been developed, the direction of alignment of water pipe, underground duct and other services should be determined so that special attention is given when the cutting or digging work are near with the alignment. It is very important that tree roots need it be dismantled out especially on a building site. If tree roots left in the soil, it will eventually rot and cause soil deposition.

This example of picture in site clearing work process:



Photo 3.0 9 Palm Tree at project site



Photo 3.0 10 The Palm Tree are cutting down



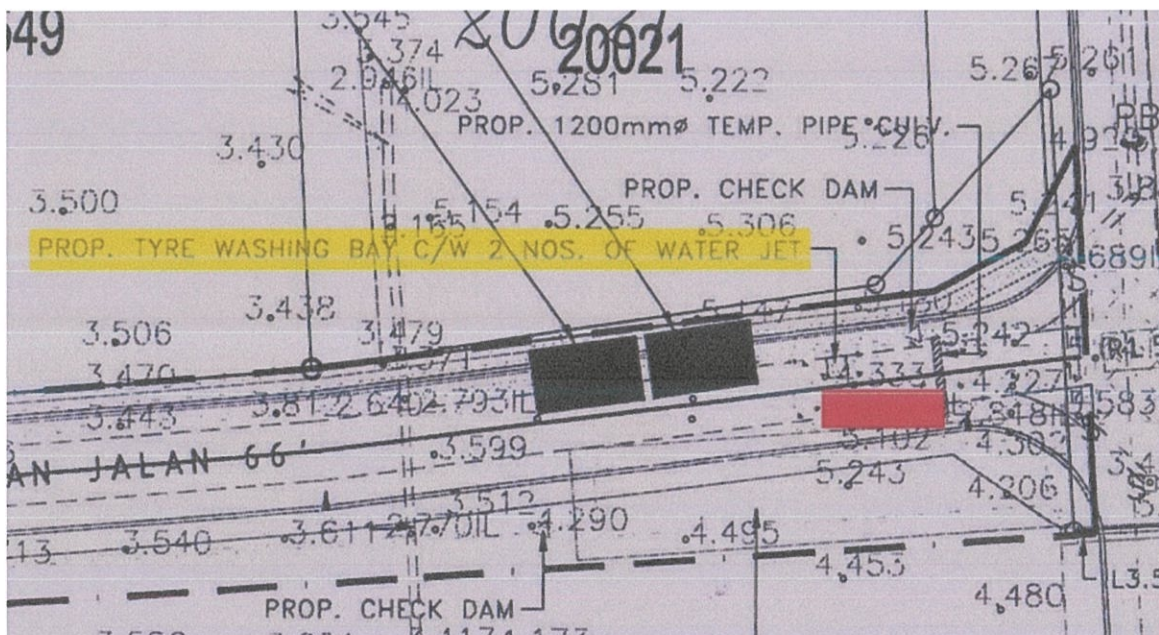
Photo 3.0 11 Tree are grubbing using bulldozer



Photo 3.0 12 Site clearing work are completed

Washing Bay is designed to wash truck and heavy equipment. Contractor must construct and maintain washing bay overall size 39.6m x 6.1m and temporary concrete road including all necessary excavation, loose crusher run, trimming to falls, reinforcement, concrete, formwork, shallow water pond (tyre washing basin) etc including all necessary desilting, watering, 2 nos. of water jetting throughout the Contract Period and construct and maintain crusher run road. Washing system is used to remove sediment from both the vehicle body and tyres. The location for washing bay should be set back from the public roadway to reduce water tracking onto the road. The number of site exit points should be minimized, preferably to one.

1. Refer to approved plan for location and dimension details. If there are questions or problems with the location, dimension or method of installation, contact the engineer or responsible on-site officer for assistance.



40

2. Clear the location of the wash bay, removing stumps, roots and other vegetation to provide a firm foundation s that the rock is not pressed into soft ground.



Photo 3.0 13 Place for construct Washing Bay

3. Loose crusher run will be placed on route exit and entrance of the site for avoid the main road will dirty.



Photo 3.0 14 Loose Crusher Run

4. Install and construct reinforcement, formwork and concrete to prevent the washing bay will crack if lorry entrance or exit to the site.



Photo 3.0 15 Washing Bay are install reinforcement and formwork



Photo 3.0 16 Washing bay are install formwork and concrete

5. If the vehicle are to be washed by manual hosing, then ensure a hose (long enough to reach around any vehicle leaving the site) is connected a suitable pressurized water source.



Photo 3.0 17 Completed Construct Washing Bay

Manpower such as carpenter, barbender and concreter are needed for construct washing bay. While, machineries does no need for construct washing bay. The washing bay must construct based on drawing because to avoid the washing bay will crack. It will happen because the lorry tippers are quite heavy and bigger.

3.3.2.3 Erect permanent metal deck hoarding

Construction hoarding is a temporary fencing used to secure a job site. Fencing may be required by law for safety reasons in some areas and is also used by contractors in others to limit theft and liability. Hoardings are installed around the perimeter of a building site and have vehicle and/or pedestrian access point. Their primary function is to keep the site secure, but many are used as temporary signage boards to keep the public aware of what's behind them. Site hoardings are also used to maintain the privacy of the site and therefore the clients' interests safe.

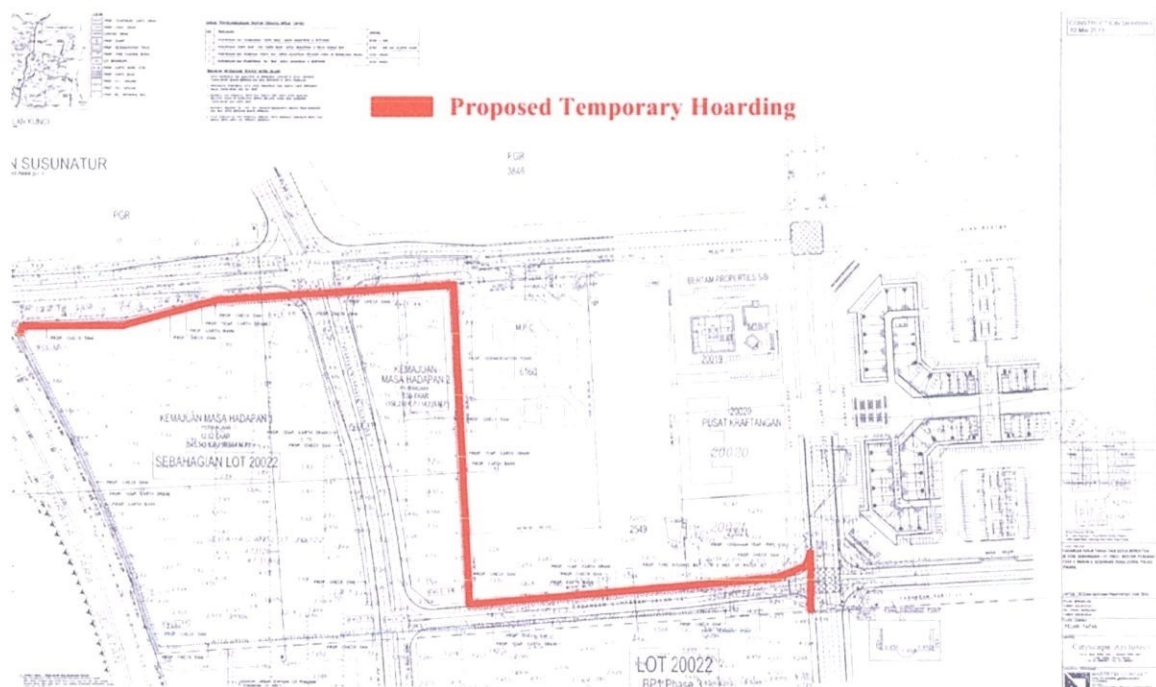


Figure 3.0 9 Proposed Temporary Hoarding

Proposed temporary hoarding only erect at area marked because that area are near with people surrounding and will disturb them. While area that unmarked does not need to erect temporary hoarding because this area have highway and people does not through it.

2. Put a concrete to the column of the temporary hoarding.



Photo 3.0 19 Frame of temporary Hoarding

3. Install frame of the temporary hoarding at all the marked area.



Photo 3.0 20 Frame are installing along the marked area

3.3.2.4 Excavate unsuitable material

Excavate unsuitable material means remove all the unsuitable material such as running silt, peat, logs, stumps, perishable or toxic material, slurry or mud. The machinery that use in excavate work are Excavator, Lorries and Back pusher. Contractor need excavate of 150mm high unsuitable material as described, get out, transport and dispose off site to the Contractor's own tip.

Method of excavate unsuitable material are:

1. Obtain relevant approved construction drawing from client.
2. Carry out soil investigation to determine the depth of unsuitable material and submit the results of the client for decision on depth of unsuitable material that needs to be replaced.
3. Excavate the unsuitable material to the required depth as specified by the client and disposed at approved disposal area.
4. Transport, fill and spread suitable material in layer. The loose for each layer of fill shall be determined from the trial compaction.
5. Submit request for inspection form for joint inspection and joint measurement with client using Earthwork Inspection Checklist.



Photo 3.0 23 Stripping Topsoil Excavation

3.3.2.5 Filling with imported laterite earth

Contractor need approved selected imported laterite earth filling to make up the formation levels obtained from Contractor's own source, deposit, and spread and leveled in areas to be filled and thoroughly compacted with 25 tones every 600mm layers to the required formation level as the work proceeds. Before transport the soil, contractor must know the soil behavior where are soil density, soil compaction, consolidation, moisture content, stability, compressible soils and expansive clay.

The methods of earth filled work are:

1. Prior to filling activities, all the material that is going to be use as filling material shall be tested for the suitability. Marking peg for the purpose of filling layer thickness shall be established.
2. After setting out of the fill area, the filling activities than shall started. The filling activities shall be done in layer. Each layer shall be properly compacted and tested before subsequence layer is lay.



Photo 3.0 24 Earth Filled Work

3. The process shall be repeated until it reaches the proposed finish platform level as per construction drawing.



Photo 3.0 25 Area that covered with earth filled

4. All filling shall confirm to the approved construction drawings. Each area has own proposed level. All the level is shown in construction drawing.



Photo 3.0 26 Different Level of Proposed Level

3.3.2.7 Temporary earth drains and earth bank

Temporary earth drains are function to direct the flow of surface water to the silt trap or sediment basin. Contractor needs construct 457mm wide earth drains and 914mm high X 488 wide top of earth bank with slopping of flatter at boundary as shown in construction drawing. The client or contractor must maintain the temporary drain regularly

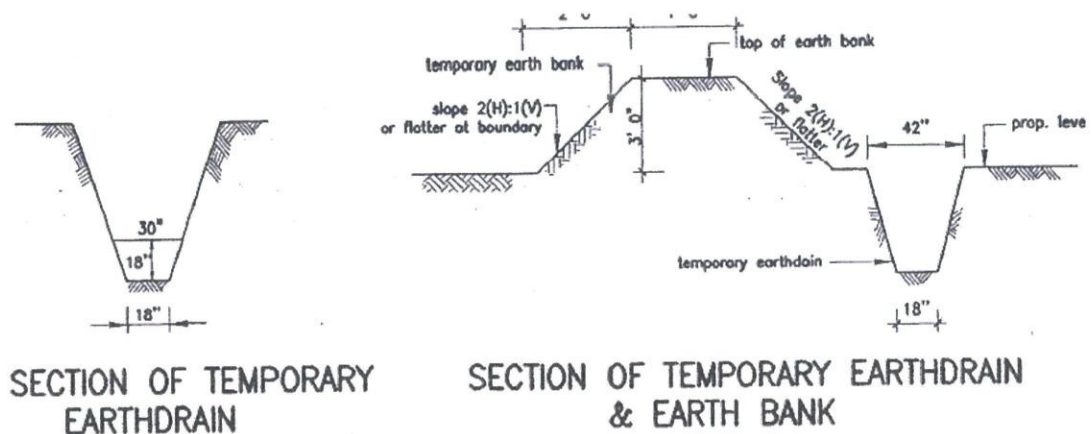


Figure 3.0 11 Cross Section of Temporary Earth Drain and Earth Bank that shown in construction drawing

3.3.2.8 Construct sedimentation basin and slit trap

A sediment basin is a temporary pond built on a construction site to capture eroded or disturbed soil that is washed off during rain storms, protect neighboring properties, and protect the water quality of a nearby stream, river, lake, wetland or bay. Contractor must construct and maintain sedimentation basin clear size 71m x 26m x 1.2m deep including 1no. of 450mm diameter pile culvert to be discharge to existing concrete drain, 50mm diameter orifice pipe, gabion and all necessary excavation, trimming to slope, reinforcement, concrete, crusher run, formwork, maintenance and other for project at Bertam Perdana. The sedimentation basin has advantages such as cost effective measure for treating sediment laden runoff and relatively easy to construct. While their disadvantages are there must be adequate space and topography for the basin to be constructed and for it to function properly.

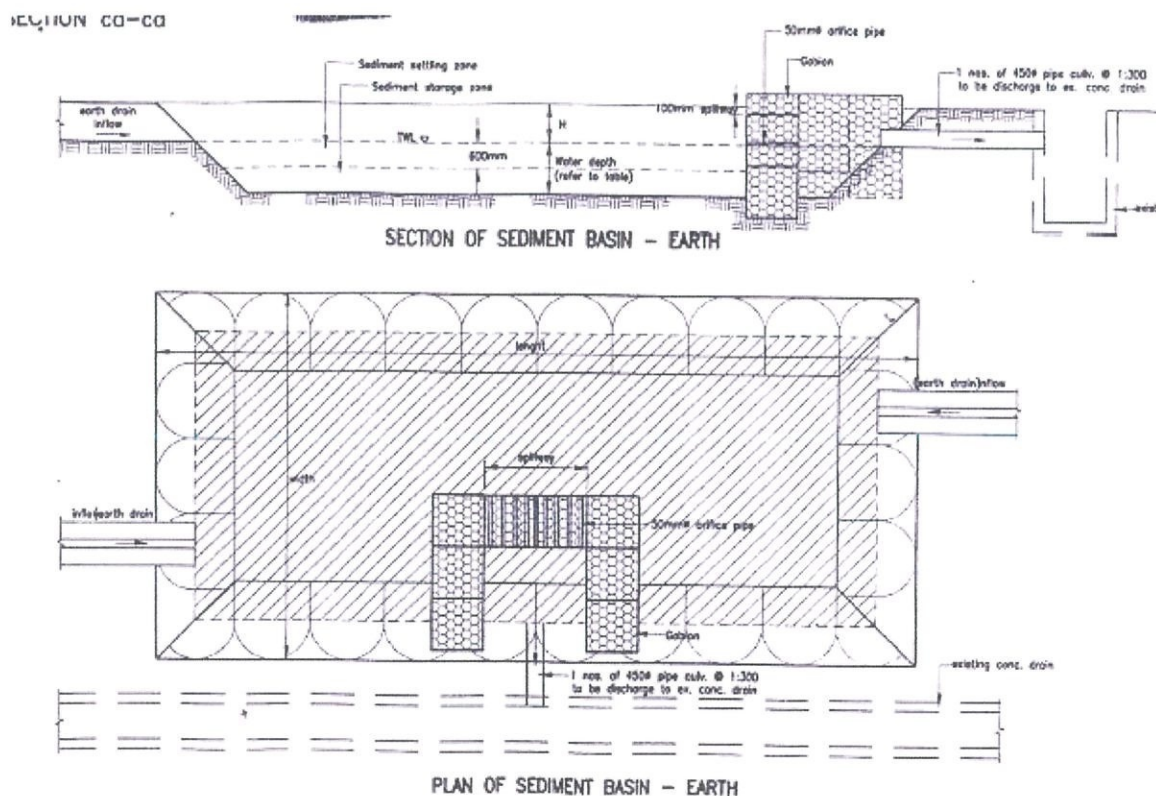


Figure 3.0 12 Cross Section of Sediment Basin as shown in drawing

3.3.3 Turfing

3.3.3.1 Closed turfing with black soil

A surface layer of earth containing a dense growth of grass and provide essential nutrients for early grass development and a strong root system. Contractor needs 50mm thick (minimum) layer of approved black soil well mixed with steremeal black label fertilizer at the rate of 0.3kg per square meter spread and leveled on sloping surfaces including trimming, leveling, compacting and preparing area to be turfed as described receive turfing. Monthly maintenance during construction and during Defects Liability Period including replacement turf, watering, weeding, tending, cutting, additional fertilizing and other as described.

All the sequence of work in earthwork is combined to Method Statement Form that attached in Appendix G.

3.5 PROBLEM THAT OCCUR ON SITE

1. The road is dirty because the tyre of the lorry does not clean very well. At entrance way also became dirty because the soil at the site. If contractor does not clean the way, the client will give a warning to contractor. Resident that through the road wills complaint about it because it will make their tyre also became dirty.



Photo 3.0 28 Crusher run at entrance way are dirty



Photo 3.0 29 Dirty road that used by resident

2. Roads become damaged due to heavy Lorries that have been through it. The road made a hole and it will disturb the other user that used the road. An accident can happen if the road does not repair.



Photo 3.0 30 Road Damages



Photo 3.0 31 The Road was repaired

3. The site a lot of dust because the lorry tipper in and out from the site. The dust will appear if the site no has rainfall. Dust will give e a health problem especially to the workers that work at the site. Dust does not give huge problem to the workers only, but for local resident as well.



Photo 3.0 32 Site is full with dust



Photo 3.0 33 Lorry Tipper cause dust occur on site

4. Lorry tipper is drive out of limit at school area and it gives danger for residents.

5. Party of Majlis Pemandaran Seberang Perai and Jabatan Kerja Raya give a warrant to contractor that state the lorry pass through the wrong way. The soil that brought by lorry had fallen on the road and cause dirty street.

6. When the weather is rainy all day, earth fill work cannot be carried out due to wet soil at the site. This will cause a hazard if the lorry tipper and other machine in and out.

3.6 SOLUTION TO OVERCOME THE PROBLEM

1. The tyre of the lorry tipper must clean properly after them out from the site. The entrance also must be clean every day to avoid the road became dirty. The site supervisor must make sure the Lorries are entering to washing bay. Water in washing bay need to be replaced constantly to make the road is clean.



Photo 3.0 34 Tyre of the Lorries are washing with water jet



Photo 3.0 35 Road that been cleaned by worker

2. Contractor must repaired the road with own cost. The lorry drivers need drive slowly. If Lorries are drive slowly, it does not to brake immediately and the road does need to support heavy load.



Photo 3.0 36 Road was repaired by put the new premix



Photo 3.0 37 Road was repaired by put crusher run

3. The site that full will dust can be prevent if the lorry enter to the site with slowly. All movement of the machineries must be controlled. The workers need to wear safety must to protect their health.

4. Give instruction and warning to lorry drive and make sure them drive properly. Driver who are fails do not comply should be given appropriate action.

5. The contractor needs to submit and ask permission to the party for using the road.

6. Try to complete the activities before rainfall and avoid doing any work after rainfall.



Photo 3.0 38 Condition of site after rainfall

CHAPTER 4.0 CONCLUSION

After five month experience in practically at Construction Company and project site, many things can be learn especially about earthwork. Furthermore, experience to handle the project starting with acceptance of tender until handling over cannot get easily. Results of earthwork observation are found us not easy as it looks. Many machines that involve in earthwork project such as backhoe, excavator, back pusher, bulldozer and other. Each of machines has their functions that help to complete this project. For man power, site supervisors, project manager, surveyor who are take responsibility for earthwork. Earthwork have own sequence that must we followed. During earthwork, some of the problems associated with earthworks have been identified and must be solved. Therefore, contractor should find out the solution to overcome the problems.

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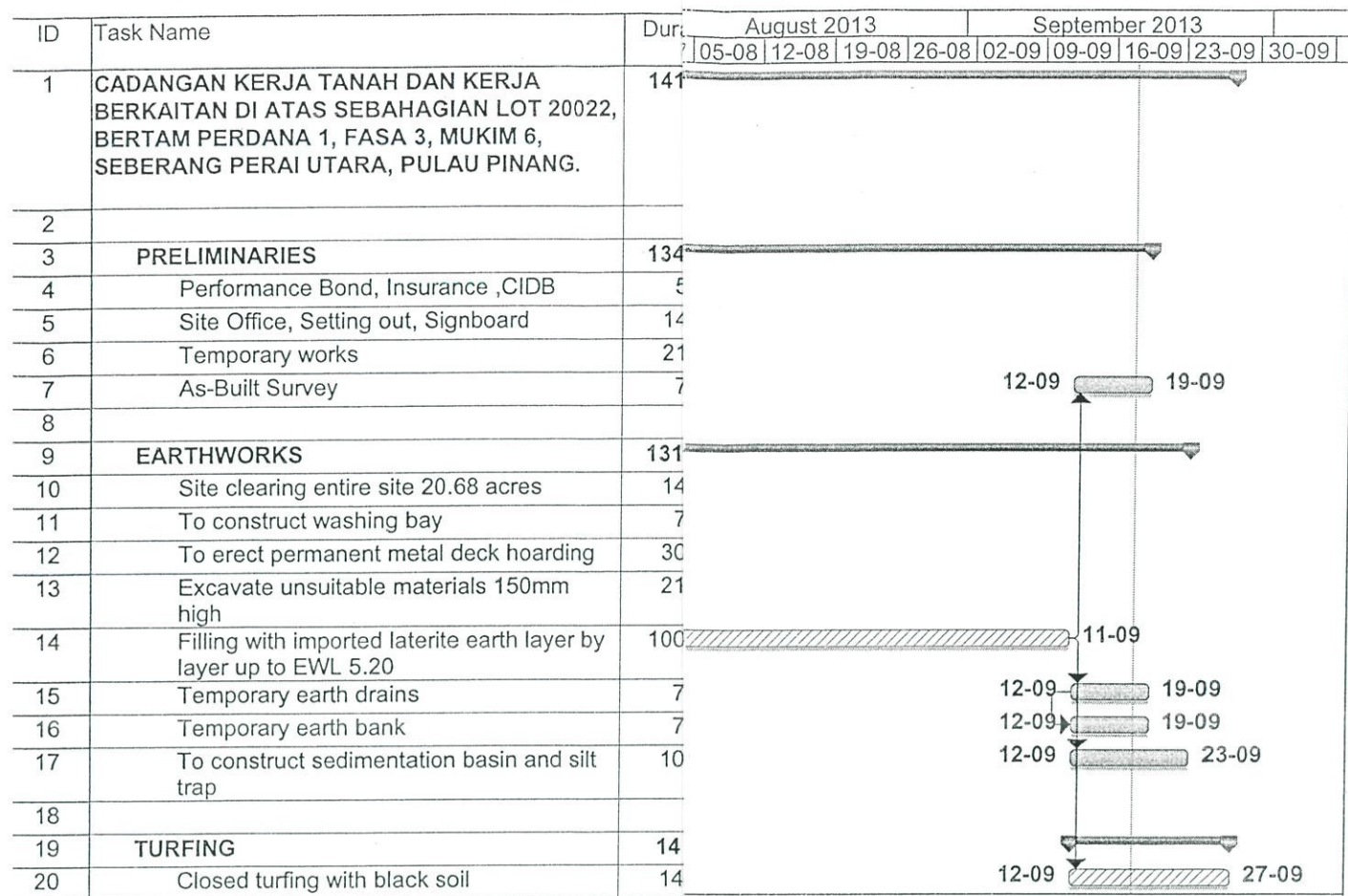
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APPENDIX A

Site Plan Project Bertam Perdana, Fasa 3, Mukim 6,
Seberang Perai Utara

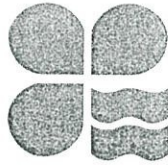
APPENDIX B

Work Programmed Project Earthwork At Bertam Perdana



APPENDIX C

Letter of Acceptance of Project Earthwork At Bertam Perdana

**BERTAM PROPERTIES SDN BHD**

(No Syarikat : 227909-V)

Our ref : (259)BPSB/pro-JNH/LA/EWbp1ph3

Date : (23) April 2013

JNH BINA SDN BHD
No. 8520 (D) N/T0
Jalan Pokok Tampang
13300 Tasek Gelugor
Pulau Pinang

Dear Sir/Madam,

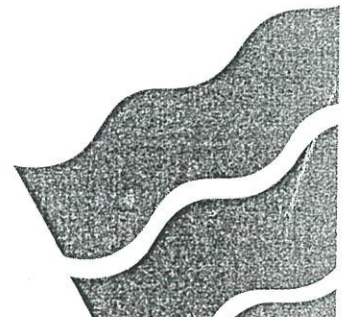
CONTRACT NO: BPSB/PROJ/2013/02

CADANGAN KERJA TANAH DAN KERJA BERKAITAN DI ATAS SEBAHAGIAN LOT 20022,
BERTAM PERDANA 1, FASA 3 MUKIM 6, SEBERANG PERAI UTARA, PULAU PINANG.

- Letter of Acceptance.

We are pleased to inform you that your Tender for the above mentioned works in the amount of RINGGIT MALAYSIA: TWO MILLION EIGHT HUNDRED NINETEEN THOUSAND FOUR HUNDRED EIGHTY THREE AND SEN FORTY ONLY (RM2,819,483.40) is accepted subject to the terms, conditions and stipulations of the Tender Documents upon which the tender is based and of this Letter of Acceptance.

- 2.0 You will be required to execute in due course a formal Contract Agreement. However until the formal Contract Agreement is executed your Tender together with this Letter of Acceptance shall constitute a binding contract between yourselves and Bertam Properties Sdn Bhd.
- 3.0 You will be informed when the contract documents are ready for your signature. However, before the signing of the Contract Documents, the prices and rates in the Bills Of Quantities, as the case may be, shall be scrutinized and adjusted by the Superintending Officer (S.O) or his Agent as to their reasonableness but the Contract Sum as mentioned above shall remain unaltered.
- 4.0 You shall arrange for all Contract Documents to be stamped and shall bear all expenses in respect to the stamping fee.



5.0 We wish to draw your attention to the stipulations of the Tender Documents, whereby as a condition precedent to the commencement of the works, you are required to deposit with the Employer the following :-

- a) Performance Bond amounting to **RM140,974.17** (being 5% of the Contract Sum) in the form of an approved Banker's Guarantee.
- b) Insurance Policy for Public Liability (i.e. insurance against injury to persons and damage to property) of **RM1,000,000.00** per claim for unlimited number of claims or the Cover Notes together with receipt of premium paid.
- c) Insurance Policy for Insurance of the amounting to **RM3,101,431.74** being the full of contract sum plus Professional Fee equivalent to 10% of the Contract Sum or the Cover Notes together with receipt of premium paid.
- d) Registration number under Employee's Social Security (SOCSO) Scheme; and/or
- e) Insurance Policy for Workmen Compensation equivalent to **RM422,922.51** being 15% of the Contract Sum or Cover Notes together with receipt of premium paid.

Provided that for the purpose of commencement of the works and no other, you are required to produce to the S.O. initially, the Performance Bond and Original Cover Notes of the said insurance policies and the receipts of premiums paid. The Performance Bond should cover the whole contract period plus **Defects Liability Period of Twelve (12) months** and a further of one year. For the Insurance Policies should cover the whole contract period plus **Defects Liability Period of Twelve (12) months** and a further period of three months and fourteen days.

6.0 The dates of Commencement and Completion are as follows :-

DESCRIPTION	COMPLETION PERIOD	DATE FOR POSSESSION [CLAUSE 38 (b)]	DATE FOR COMPLETION [CLAUSE 39]	LIQUIDATED & ASCERTAINED DAMAGES (LAD)
The Whole of the Works	Five (5) Months	2 nd May 2013	1 st October 2013	RM600.00 per day

In the event of any delay, you shall pay the Employer L.A.D in the amounts as shown above. For the avoidance of doubt, the computation of the L.A.D shall account for the full period of delay i.e. including all Sundays and Public Holidays.

The Contractor agrees that the Liquidated Damages is a genuine pre-estimate of the loss and/or damage which Bertam Properties Sdn Bhd will suffer in the event that the Contractor is in delay. The Contractor agrees to pay to Bertam Properties Sdn Bhd in the amount due without the need for Bertam Properties Sdn Bhd to prove his loss and/or damage unless the contrary is proved by Contractor.

No works under this Contract shall commence unless and until you have complied with the provisions of paragraph 5.0 of this letter and you shall not be entitled to claim for any loss or damage caused by compliance to the requirement of this paragraph.

- 7.0 The contents of the documents referred to within this Letter of Acceptance shall be deemed mutually complimentary to this Letter of Acceptance which shall take precedence over any other document in the event of a dispute as to the construction of the Contract until the format contract is executed. The S.O. shall decide any issues raised as discrepant and his decision is final and binding upon the Contractor at no additional cost to the employer.
- 8.0 You shall comply to Part VIII of the Lembaga Pembangunan Industri Pembinaan Malaysia Act 1994 and the Construction Industry (Levy Collection) Regulations 1996, and shall submit a notification on Form CIDB L1/96 to the Lembaga not later than 14 days after the issuance of the Letter of Acceptance or any document that constitutes acceptance of a contract of works, or not less than 14 days before the commencement of the works, whichever date is earlier. You are responsible to pay the levy imposed by LPIPM.
- 9.0 You shall comply with the following Conditions at no additional cost or time to the Employer: -
- 9.1) You shall identify and resolve discrepancies (if any) in the Tender Drawings and Documents.
- 9.2) The Public Liability Insurance covers all Consultants, their representatives including those residing on site.
- 9.3) You are required to submit complete site layout plan for site facilities for approval prior to the commencement of the works. You shall erect and provide all the necessary site facilities and hoarding as required by the contract and to comply with the requirements of the Local Authorities including all safety requirements.
- 9.4) You are required to take all necessary measures to prevent nuisance from noise and vibrations from all plant and equipment in compliance with the Local Authorities requirements and increase all necessary instruments as instructed if the S.O considers the measures provided is insufficient.
- 9.5) You shall be fully responsible for ensuring that when crossings are made through the access roads and/or existing drains during the course of your works, alternative continuous access is provided and that on completion of such crossings the access road and/or drains are reinstated to its original condition at no additional cost to the Employer.



**BERTAM
PROPERTIES**
SDN BHD

- 9.6) You shall regularly carry out dewatering of site (within and around) by pumping and keeping site dry.
- 9.7) You are required to submit the source of fill materials and carry out all testing for S.O approval before commencing any imported earth filling.
- 9.8) You shall take down / pull out the palm tree including grubbing out the roots and cart it away from site to Contractor's own dumping ground.
- 9.9) All imported laterite earth filling to make up the formation level must be well compacted every 600 mm layers and inspected and accepted by the S.O. before proceeding the next layers.
- 9.10) You shall be deemed to have allowed for any settlement, consolidation and extra filling caused by the same in your rates.
- 9.11) Your Contract sum shall be deemed to have included all construction and maintenance of temporary earth drains, sedimentation pond and other temporary works including turfing maintenance during Defects Liability Period until issuance of Certificate of Completion of Making Good Defects.
- 9.12) You shall ensure that all debris and superfluous materials due to your works are to be periodically cleared and cart away from the site and shall not in any way hinder the progress of the work.
- 9.13) You shall provide at your own cost and to your own tip for dumping unsuitable materials as and when directed by the S.O.
- 9.14) Before commencing any Site Clearing or any Works on site, you shall carry out joint site survey and check actual levels and dimensions with the Employer Licensed Surveyor and drawing including establishment of Temporary Bench Mark (T.B.M) and Co-ordinates (refer Preliminaries Item 1.6). Produce survey drawings (based on grid-lines showing co-ordinates), agreed and endorsed jointly by Contractor's and Employer Licensed Surveyor before Commencement of Work. In addition, you shall be responsible to protect and maintain the boundary pegs and T.B.M.
- 9.15) Upon completion of the works, you shall employ Licensed Land Surveyor to carry out further site survey and produce as-built survey drawings.

The whole of the Works will only be considered complete upon achieving the required level and submission of the six (6) copies of endorsed as-built drawings by a Licensed Land Surveyor showing the finish level, position of building, external structures and other pertinent details and accepted by the S.O., which shall be prepared to detailed specified and submitted to the S.O. and carry out any extra filling to the required level including production of the final as-built drawings (by Licensed Land Surveyor) as specified to the satisfaction of the S.O.



**BERTAM
PROPERTIES**
SDN BHD

- 9.16) The accuracy of the site setting out shall be entirely at your own responsibility and that you shall make good at your own expense to the Employer's satisfaction for any error that may arise from any cause.
- 9.17) Your contract sum shall be deemed to include any payment or deposit required by the relevant Authorities.
- 9.18) You shall observe and comply with the regulations of Environmental Protection requirement in accordance with Jabatan Alam Sekitar. Any penalties, charges or fines imposed by the relevant authorities due to your negligence shall be borne by you and you shall indemnify us from any such case.
- 9.19) No Open Burning is allowed at all times. Severe penalties will be imposed by us on you.
- 9.20) You shall undertake to furnish shop drawings as and when instructed by the S.O.
- 10.0 You shall allow at your own costs for the possible presence of other contractors on the site. You shall be required to liaise with the S.O with regards to the use of roadways and temporary access, storage etc. so as to avoid any inconvenience on site. The S.O's decision shall be final on all matters of dispute between the main contractor and other contractors on site.
- 11.0 You shall arrange for the conveyance of material, plants, etc. so as to cause minimum damage to existing roads and culverts. You shall be responsible for any damage caused by your lorries or workmen to any existing roads, culverts etc. from whatsoever cause arising and shall maintain, repair and reinstate same to their original condition to the satisfaction of the S.O and authorities concerned or alternatively shall bear the cost of such maintenance and restoration as a deductions from monies due or to become due to you under this contract.
- 12.0 You shall avoid obstruction or damage to buildings, roadways and footpaths, drains and watercourses and public utility and other services on or adjacent to the site. You shall repair any damage at your own cost, failing which the Employer may employ and pay others and the charges and cost shall be recoverable from you.
- 13.0 You agree that the Employer reserve the right to end this contract mutually due to unforeseeable circumstances. In the event of a mutual termination of this Contract, the Contractor shall be reimbursed the actual cost of works executed under this contract and the Contractor is not entitled to any other claims whatsoever.

14.0 You shall submit the followings for Superintending Officer's comment and approval before commencing work on site.

- a) A site management and supervisory personnel organization chart indicating the name, qualification, experience and position of each of the key personnel.
- b) A detailed method statement and construction program showing earth filling source, haul route diagram, number of lorries and machineries required and number of trips which shall form the basis of monitoring the progress of the works.

Your failure to adhere strictly to the above organization chart, program or any amendments, variation agreed there to be Superintending Officer may constitute breach of contract and the Client (Bertam Properties Sdn Bhd) shall reserve the right to invoke Clause 51 of the conditions of Contract.

15.0 In the event of any of the above-mentioned contradicting similar terms to the Contract Documents, the terms mentioned herewith shall take precedence.

16.0 Five (5) copies of this letter are sent to you. Please return the original and three (3) copies duly signed and witnessed where indicated to this office before **2nd May 2013** and retain one copy for your record.

Thank you.

c.c KPK Quantity Surveyors (Sem) Sdn Bhd

Our ref : (259) BPSB/pro-JNH/LA/EWbp1ph3

Date : (23) April 2013

CONTRACT NO: BPSB/PROJ/2013/02

CADANGAN KERJA TANAH DAN KERJA BERKAITAN DI ATAS SEBAHAGIAN LOT 20022,
BERTAM PERDANA 1, FASA 3 MUKIM 6, SEBERANG PERAI UTARA, PULAU PINANG.

- Letter of Acceptance.

We, the undersigned hereby acknowledge receipts of the above Letter (Pages 1 to 7 inclusive) a copy of which has been retained and confirm our agreement to the contents of this letter.

Name in Full: JUNAIDI B. HUSAIN

Name in Full: SUZANA BT. OMAR

In The Capacity of: MANAGING DIRECTOR

Occupation: QUANTITY SURVEYOR

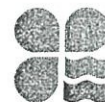
duly authorized to sign for and on
behalf of

Date : 27/4/2013



Contractor's Seal or Chop

Date : 27/4/2013



**BERTAM
PROPERTIES**
SDN BHD

APPENDIX D

Work Programmed and S-Curve for Project Earthwork at Bertam Perdana

JNH BINA SDN. BHD.

CADANGAN KERJA TANAH DAN KERJA BERKAITAN DI ATAS SEBAHAGIAN LOT 20022, BERTAM PERDANA 1, FASA 3, MUKIM 6, SEBERANG PERAI UTARA, PULAU PINANG.

Legend:

On Schedule Performance

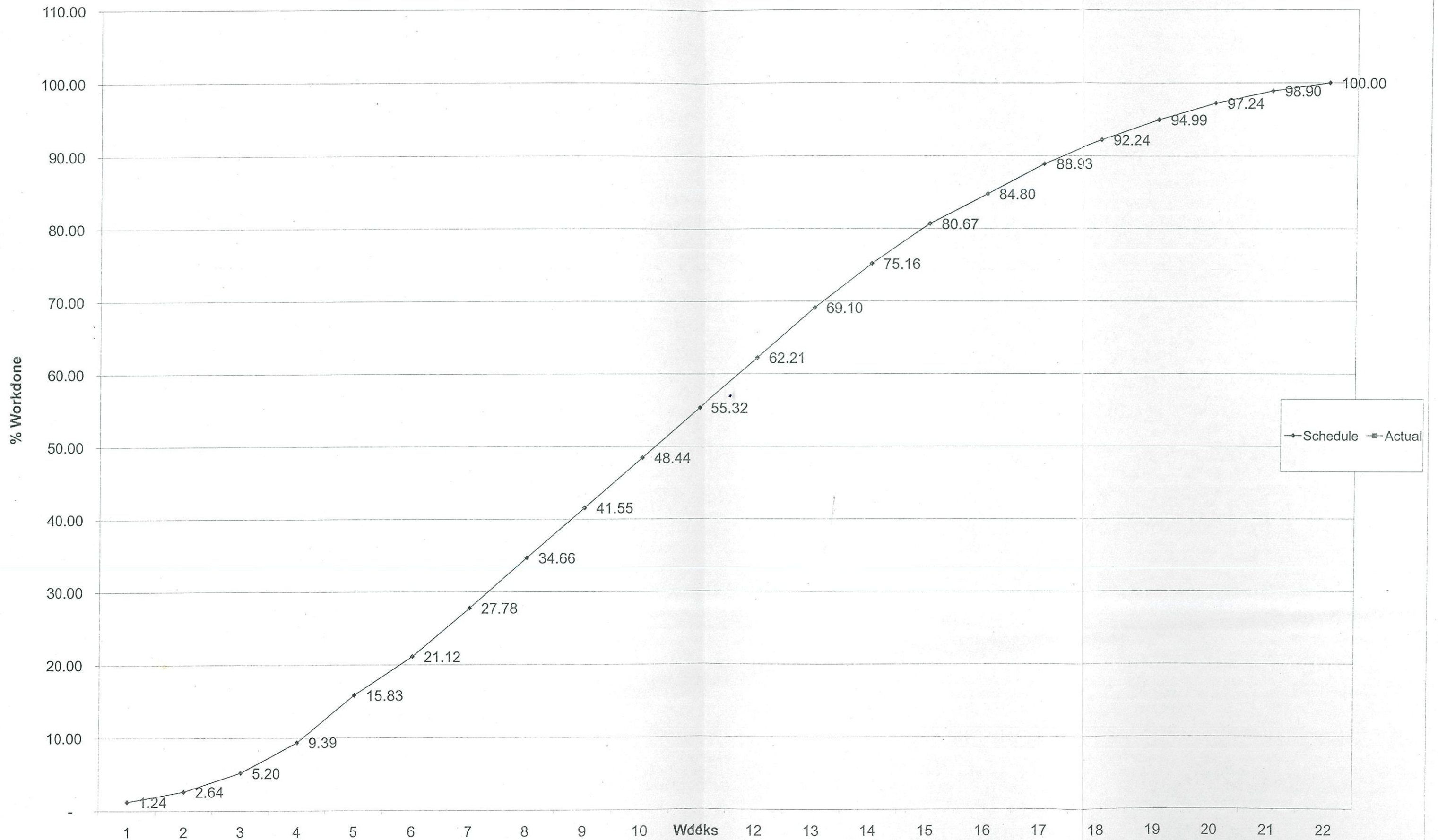
Actual On Site

TART DATE : 2ND MAY 2013
OMPLETION DATE : 1ST OCTOBER 2013
URATION CONTRACT : 22 WEEKS (5 MONTHS)

O. KONTRAK : BPSB/PROJ/2013/02

				SCHEDULE PROGRAMME										22 WEEKS - DATED 2ND MAY 2013 UNTIL 1ST OCTOBER 2013													
				MAY 2013				JUNE 2013					JULY 2013				AUGUST 2013					SEPTEMBER 2013					
S/L	DESCRIPTION OF WORKS		%	PERIOD (WEEKS)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	TOTAL
					2-May	9-May	16-May	23-May	30-May	6-Jun	13-Jun	20-Jun	27-Jun	4-Jul	11-Jul	18-Jul	25-Jul	1-Aug	8-Aug	15-Aug	22-Aug	29-Aug	5-Sep	12-Sep	19-Sep	26-Sep	
					8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun	3-Jul	10-Jul	17-Jul	24-Jul	31-Jul	7-Aug	14-Aug	21-Aug	28-Aug	4-Sep	11-Sep	18-Sep	25-Sep	1-Oct	
1	PRELIMINARIES																										
	(A)	Performance Bond, Insurance ,CIDB	0.53	1	0.533																					0.53	
	(B)	Site Office, Setting out, Signboard	1.07	3	0.355	0.355	0.355																			1.07	
	(C)	Temporary works	1.42	4	0.355	0.355	0.355	0.355																		1.42	
	(D)	As-Built Survey	0.18	1																				0.178		0.18	
2	SITE CLEARANCE AND EARTHWORKS																										
	(A)	Site clearing entire site 20.68 acres	1.38	2		0.690	0.690																			1.38	
	(B)	To construct washing bay	0.15	1				0.151																		0.15	
	(C)	To erect permanent metal deck hoarding	4.60	4				1.150	1.150	1.150	1.150															4.60	
	(D)	Excavate unsuitable materials 150mm high	3.48	3			1.159	1.159	1.159																	3.48	
	(E)	Filling with imported laterite earth layer by layer up to	82.64	17				1.377	4.132	4.132	5.510	6.887	6.887	6.887	6.887	6.887	6.887	6.061	5.510	4.132	4.132	3.306	2.755	0.275		82.64	
	(F)	Temporary earth drains	0.27	1																				0.266		0.27	
	(G)	Temporary earth bank	0.23	1																				0.228		0.23	
	(H)	To construct sedimentation basin and silt trap	0.76	2																				0.381	0.381	0.76	
3	TEMPORARY WORKS																										
	(A)	Closed turving with black soil	3.30	3																				1.100	1.100	1.100	3.30
		TOTAL	100.00																								
		% Of Weekly Completion			1.24	1.40	2.56	4.19	6.44	5.28	6.66	6.89	6.89	6.89	6.89	6.89	6.89	6.06	5.51	4.13	4.13	3.31	2.75	2.25	1.66	1.10	100.00
		% Of Cumulative Scheduled Completion			1.24	2.64	5.20	9.39	15.83	21.12	27.78	34.66	41.55	48.44	55.32	62.21	69.10	75.16	80.67	84.80	88.93	92.24	94.99	97.24	98.90	100.00	
		% Of Cumulative Actual Completion																									

CADANGAN KERJA-KERJA TANAH DI ATAS SEBAHAGIAN LOT 20022, BERTAM PERDANA, FASA 3, MUKIM 6, SPU, P.PINANG.



APPENDIX E

Notification of Imposition of Levy Form

BORANG CIDB L2/96
 FORM CIDB L2/96
 BORANG PEMBERITAHUAN PENGENAAN LEVI
 NOTIFICATION OF IMPOSITION OF LEVY FORM

Peraturan-Peraturan Industri Pembinaan (Pungutan Levi) 1996
Construction Industry (Collection of Levy) Regulations 1996

(Peraturan 7 dan 10)
 (Regulation 7 and 10)

No.Pendaftaran Kontraktor: 0120030603-PP084688
 Contractor's Registration No:

Nama Kontraktor Berdaftar: JNH BINA SDN. BHD.
 Registered Contractor's Name:

Alamat: NO. 8520 (D) N/T0
 Address: JALAN POKOK TAMPANG
 13300 TASEK GELUGOR
 PULAU PINANG

Pengenaan Levi mengikut peruntukan subseksyen 34(2)
 Imposition of Levy according to subsection 34(2)

Jajuk Kontrak: PP334688-12
 Contract's Title: Contract No: BPSB /PROJ/2013/02 -Cdgn. Kerja Tanah & Kerja Berkaitan Di Atas Sbhg. Lot 20022, Bertam Perdana 1, Fasa 3 Mk. 6, SPU., Pulau Pinang.

3. Tarikh Kerja-kerja Pembinaan Bermula: 02 MAY 2013
 Date of Commencement of Construction works:

4. Tarikh Pengenaan Levi: 14 MAY 2013
 Date of Imposition Levy:

Jumlah Kontrak: RM 2,819,483.40
 Contract's sum(RM):

6. Tempat Pembayaran Levi: LPIPM
 Place of Payment of Levy:

Jumlah Levi yang dikenakan: RM 3,524.35
 Amount of Levy imposed:

Tekad liabiliti bagi pembayaran levi di bawah Akta: 13 JUN 2013
 Date of liability for payment of levy under the Act:

TIS:
 TICE:

Bayaran Levi hendaklah dibuat sebelum atau pada tarikh tersebut di atas. Sekiranya gagal untuk berbuat demikian, sebarang proses berkaitan pendaftaran kontraktor akan dikenakan tindakan 'PENAHANAN SEMENTARA' sehingga bayaran levi dijelaskan sepenuhnya kepada pihak Lembaga.

Payment of Levy must be made not later than or on the abovementioned date. Otherwise any process pertaining to the registration of contractor with CIDB will be 'TEMPORARILY BLOCK' until full settlement of levy amount is received by the Lembaga.

Kegagalan membuat bayaran Levi adalah suatu kesalahan yang boleh disabitkan di bawah subseksyen 34(5) Akta Lembaga Pembangunan Industri Pembinaan Malaysia 1994.

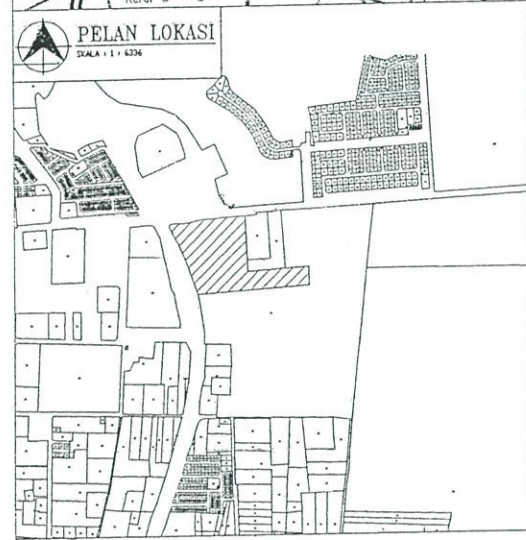
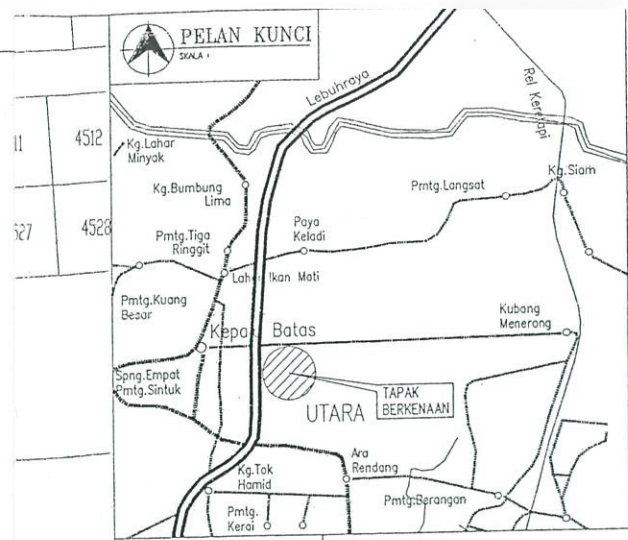
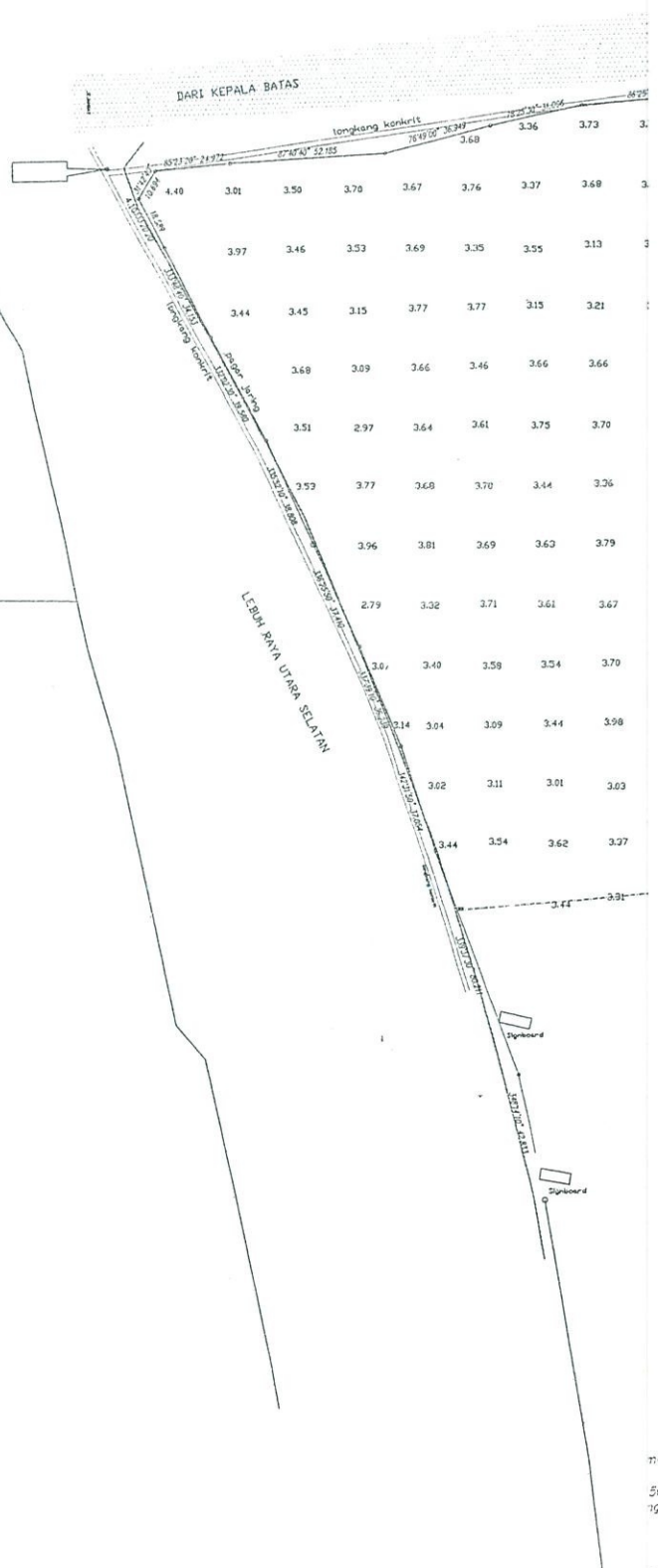
Failure to make the payment of Levy shall be an offence under subsection 34(5) of the Lembaga Pembangunan Industri Pembinaan Malaysia Act 1994.

APPENDIX F

Plan of Leveling Work and EGL Detail for Project at
Bertam Perdana



00 m



TAJUK :
KERJA-KERJA UKUR ARAS DAN BUTIRAN
EGL
DIATAS SEBAHAGIAN LOT 20022, BERTAM PERDANA 1,
FASA 3, MUKIM 6,
SEBERANG PERAI UTARA,
PULAU PINANG.

PETUNJUK

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

INTERSURVEY CONSULTANTS



Handwritten signature and stamp of the surveyor.

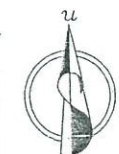
Sr ABDUL SAMAD BIN BAHARI AMN., BCK., PJK.
JURUUKUR TANAH BERLESEN
DI BAWAH AKTA 458 (DISEMAK 1991)

SKALA	1:1250
DILUKUR OLEH	BAKAR
DILUKIS OLEH	AZMEE ALI
DISEMAK OLEH	SAHAD
TARIKH	JULAI 2013

NO. PELAN : ISCPP/Pw/01/2013/EGL

APPENDIX G

Method Statement Form of Earthwork



SEBERANG PERAI UTARA
MUKIM 6

00 m

3846

KE TASEK GELUGOR

NPC
6160

2549

6163

4465	4495
4466	4496
4467	4497
4468	4498

PELAN KUNCI
SKALA : 1 : 1000

PELAN LOKASI
SKALA : 1 : 1000

TAJUK :

KERJA-KERJA UKUR ARAS DAN BUTIRAN
EGL
DIATAS SEBAHAGIAN LOT 20022, BERTAM PERDANA 1,
FASA 3, MUKIM 6,
SEBERANG PERAI UTARA,
PULAU PINANG.

PETUNJUK

	Batu Aras Sementara		Lurung		Manhole (Sewerage)
	Parit Kankrit		Guardrail		Manhole (STM)
	Pematangan/Tebing		Tiang Elektrik		Manhole (TNB)
	Sungai/Parit Tanah		Tiang Lampu		Pipeline (JBA)
	Jalan Tanah		Tiang Telefon		Pipeline (STM)
	Jalan Berturap		Kotak Elektrik		JBA Marker
	Pagor		Railing		GAS Marker
	Pili Bomba		Culvert		TNB Marker
	Pondok Telefon		Jambatan		STM Marker
	Papan Tanda		Bangunan		Pakak

INTERVIEW CONSULTANTS

Sr ABDUL SAMAD BIN BAHARI AMN., BCK., PJK.
JURUUKUR TANAH BERLESEN
DI BAWAH AKTA 458 (DISEMAK 1991)

SKALA	1:1250
DILUKIS OLEH	BAWAR
DILUKIS OLEH	AZMEE ALI
DISEMAK OLEH	SAMAD
TARIKH	JULAI 2013

NO. PELAN : ISCPP/Pw/01/2013/EGL

NOTA:

Semua jarak dan aras bumi adalah dalam ukuran meter

Semua Aras Laras adalah berdasarkan dari BM P 1501
(Aras Laras : 4.878m) Dari Kepala Batas ke simpang 3,
Lahar Ikan Mati berhampiran Tokong Cina



APPENDIX G



TITLE : METHOD STATEMENT FORM FOR EARTHWORK




PROJECT : CADANGAN KERJA TANAH DAN KERJA BERKAITAN DI ATAS SEBAHAGIAN LOT 20022,



BERTAM PERDANA 1, FASA 3, MUKIM 6, SEBERANG PERAI UTARA, PULAU PINANG

PERIOD : 22 WEEKS

NO	OPERATION	QUANTITY	METHOD	DIAGRAM	PLANT & MANPOWER	DURATION
1	Preliminaries		All the work before starting the project			1 week
2	Setting Out	20.68 acres	Survey the original ground level		Surveyor	1 week
3	Site Office	2 unit	Install site office at proposed location that approved by engineers		Site Supervisor Workers Low Loader Trailer	1 week
4	Signboard	1 unit	Erect a signboard at entrance of site project		Site Supervisor Workers Lorry	1 week

NO	OPERATION	QUANTITY	METHOD	DIAGRAM	PLANT & MANPOWER	DURATION
5	Temporary Work		Install a temporary work such as electrical and water to the project		Site Supervisor Skilled Worker (Electrician)	1 week
6	Site Clearing	20.68 acres	Cutting down all the palm tree in marked area Removed all the rubbish, shrubs and other vegetation to dumping site		Site Supervisor Operator Machine Workers Chain Saw Excavator Backhoe Dump Truck	2 week
7	Washing Bay	1 unit	Install reinforcement bar at washing bay based on drawing		Site Supervisor Barbender Worker Lorry Tools	1 week

NO	OPERATION	QUANTITY	METHOD	DIAGRAM	PLANT & MANPOWER	DURATION
	Washing Bay (cont'd)		Construct formwork for both side of washing bay Put the concrete at washing bay with Grade 20		Site Supervisor Carpenter Concreter Workers Lorry Tools	1 week
8	Metal Deck Hoarding	905.70 m	Erect temporary metal deck hoarding along the marked area which is in front of site project		Site Supervisor Skilled Worker Workers Lorry Tools	4 week
9	Excavate Unsuitable Material	12,533 m3	All the area must excavate unsuitable material about 150mm high before earth fill work is entered.		Site Supervisor Worker Lorry Driver Excavator Lorry tipper	3 weeks

NO	OPERATION	QUANTITY	METHOD	DIAGRAM	PLANT & MANPOWER	DURATION
10	Earth filled	178,066 m3	<p>20.68 acres are imported with laterite earth until achieved the purposed level</p> <p>The laterite earth are imported layer by layer</p> <p>The entire layer must be compact to make sure the soils are dense.</p>	 	<p>Site Supervisor</p> <p>Lorry Driver</p> <p>Workers</p> <p>Lorry Tipper</p> <p>Roller</p> <p>Compactor</p>	17 weeks
11	Temporary earth drain and earth bank		Along the site area must construct temporary earth drain and earth bank to make sure the surface water can flow to the sediment basin		<p>Site Supervisor</p> <p>Workers</p> <p>Backhoe</p>	1 week
12	Sedimentation basin	1 nos.	Construct sedimentation basin based on construction drawing			2 week