INTERNSHIP REPORT

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QUANTITY SURVEYING STUDY PROGRAM

FACULTY OF CIVIL ENGINEERING AND PLANNING

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ANALYSIS OF THE CALCULATION OF ELECTRICAL AND ELECTRONIC WORK COSTS IN THE ALIX RESIDENCE BLOCK A CONSTRUCTION PROJECT

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ABSTRACT

This report summarizes internship activities conducted at PKT Quantity Surveying Consultant Sdn. Bhd., Kuala Lumpur, over 95 days (28 April - 31 July 2025), focusing on the quantification and administration of construction costs. The scope of work included: measurement of structural quantities for the BPNT4 Shop Office project (staircase rebar, coping, ground beam/slab excavation, RC plinth tank, and TNB CSS upstand beam), preparation of tender documents (Pre-Qualification, Appendix D List of Drawings), BIM-based modeling and takeoff (CostX, Glodon TAS/TRB/TBQ), and contract administration tasks (Interim Valuation, Variation Order, and RFVA). In addition, Chapter IV presents a case study analyzing the electrical and electronic works of Alix Residence Block A, encompassing Levels 1 to 11, located at Jalan Dutamas Raya, Segambut, Federal Territory of Kuala Lumpur (WPKL). The methodology involved quantity measurement from AutoCAD shop drawings and unit rate analysis, producing a Bill of Quantities (BQ) amounting to RM 1.382.679,57. The largest cost components were Lighting Small Power (64,27%) and Cable Routing (25,85%), which were subsequently integrated into a time schedule based on percentage of cost and duration. The internship enhanced accuracy in cost estimation, strengthened the technical administrative connection, improved audit readiness of cost documents, and reinforced the application of BIM 5D in Quantity Surveying practice.

Keywords: Internship, Quantity Surveying, BIM 5D, cost analysis, electrical works, Alix Residence

PREFACE

All praise and gratitude are extended to God Almighty, whose grace and blessing have enabled the successful completion of this internship report. The report serves as one of the requirements for graduation in the Diploma in Quantity Surveying Program at Universitas Bung Hatta.

This report is prepared based on internship activities undertaken at PKT Quantity Surveying Consultant Sdn. Bhd. The internship was conducted over a period of 95 days, from April 28, 2025, to July 31, 2025.

The completion of this report was made possible through the guidance, support, and encouragement of many parties. Deepest appreciation is hereby extended to:

1. Parents and siblings, for their prayers, affection, and moral as well as material support;
2. Dr. Putranesia, S.T., M.T., as the supervisor, for guidance and assistance throughout the preparation of this report;
3. Dr. Wahyudi P. Utama, BQS, M.T., as Head of the Quantity Surveying Study Program;
4. Sesmiwati, A.Md., BQS, M.T., as Coordinator of the Internship Program in the Quantity Surveying Study Program;
5. Vivi Ariani, S.Pd., M.T., as Coordinator of the Final Project in the Quantity Surveying Study Program;
6. Lecturers of the Quantity Surveying Study Program;
7. Colleagues and friends who provided support in various forms.

This report is recognized as still having limitations and is far from perfect. Therefore, constructive criticism and suggestions are highly welcomed for its improvement.

It is expected that this report will be beneficial to all readers and serve as a useful reference for future research.

Padang, April 22, 2025

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CHAPTER I
INTRODUCTION

1.1 Background

Internships are an integral part of the curriculum at the Diploma Quantity Surveying Program at Hatta University. The program is designed to provide practical experience in the real world of work, particularly in the construction sector. With the Internship, you can understand and apply the knowledge that has been learned during lectures into real situations in the field(Syaidaturrahmah et al., 2025). The importance of Internships lies not only in its practical aspects, but also in the improvement of technical and managerial skills. Internships help recognize the dynamics and challenges that exist in the field, such as accuracy in building quantity calculations, cost analysis, and accuracy in document preparation and examination.

Working in a professional environment such as at PKT Quantity Surveying Consultant Sdn. Bhd, provides in-depth insight into how a construction project is managed from a quantitative and administrative perspective. One of the main challenges faced is to ensure that every building quantity calculation is done with precision, avoiding discrepancies that can have an impact on cost estimates and the smooth running of the project. In addition, the use of software such as Glodon and CostX requires a strong technical understanding in order to optimize cost analysis accurately.

In addition to the technical aspects, challenges also arise in the preparation and verification of project documents. Errors or incompleteness of documents can significantly interfere with the evaluation and execution of the project. For example, a study in Ambon shows that inaccurate documentation and design are the dominant factors that cause rework that swells project costs and time, so that thoroughness and understanding of regulations are crucial aspects of a Quantity Surveyor's duties (Patimah et al., 2023) .

By facing these challenges, interns not only hone technical skills but also learn how to systematically manage work, work in teams, and understand the standards and best practices in the construction industry.

1.2 Internship Objectives

The purpose of this internship is to improve understanding and skills in the field of construction. The objectives of this internship are:

1. Application of Theoretical Science to Field Practice: Apply the concepts of quantity calculation, cost analysis, and project administration acquired during lectures to real-world situations in the field.
2. Technical capability development: Hone technical skills in project calculation and analysis. These goals include increasing accuracy and efficiency in data processing as well as cost estimation.
3. Improvement of Project Administration Skills: Understand and carry out the preparation of project documents, such as document verification processes, interim valuations, variation orders, and other documents.
4. Improved communication and collaboration skills: Learn to interact and collaborate with various parties in the work environment. These skills enable effective teamwork, problem-solving, and project management.

1.3 Scope of Internship

The scope of the internship encompasses a range of activities designed to foster the development of professional competencies in line with the field of expertise. The activities carried out include:

1. Calculation of Rebar Quantity on the Staircase of the Bukit Puchong New Town 4 Shop Office Project (BPNT4)
2. Calculation of Rebar Quantity on RC Coping Bukit Puchong New Town 4 Shop Office Project (BPNT4)
3. Calculation of Excavation Quantity in the Bukit Puchong New Town 4 Shop Office Project (BPNT4)
4. Calculation of Quantity of Concrete, Formwork, and Steel BRC A8 RC PLINTH TANK in the Bukit Puchong New Town 4 Shop Office Project (BPNT4)

5. Calculation of the Rebar Quantity of TNB Concrete Compact Substation (Upstand Beam) in the Bukit Puchong New Town 4 Shop Office Project (BPNT4)
6. Making a Pre-Qualification of Contractor for Tender on the BPNT 4 Shop Office project
7. Create an Appendix-D document list of drawings for the BPNT4 shop office project
8. CostX Software Usage
9. Glodon Software Usage
10. Meetings with teams and stakeholders
11. Assist in Creating, Checking, and Drafting IV, VO, and RFVA Documents on Alix Residence Projects

CHAPTER II
COMPANY PROFILE

2.1 General Information

PKT Quantity Surveying Consultant Sdn Bhd was established in 1991, and for over 34 years has grown to become one of the leading quantity consulting companies in Malaysia. With more than 80 professional staff, PKT has extensive expertise in 12 key sectors, ensuring each project is executed in accordance with international standards while maintaining a deep understanding of local conditions.

The main sectors served by the PKT include:

1. Residential
2. Commercial
3. Office Fit-Out
4. Data Centers
5. Retail
6. Factories
7. Infrastructure
8. Logistics
9. Entertainment
10. Hotels & Resorts
11. Education
12. Healthcare

Headquartered in Plaza Mont Kiara, Kuala Lumpur, PKT offers quality services in cost planning, project management, and construction consulting, using the latest technologies such as CAD measurement and BIM-based estimation.

The PKT is led by a team of experienced professionals, including:

1. Dato Sr Peter Tan – Founder & Managing Director

   With nearly 50 years of experience in the construction industry, and is a Fellow & CQS of AIQS, registered with BQSM & RICS, as well as a member of the Industry Advisory Panel at the University of Malaya.

2. Sr Khor Peh Sin – Director

   With more than 30 years of experience, he holds a Bachelor of Building and a Master of Project Management from UNSW, and is registered with BQSM, RISM & AIQS. His expertise includes contract administration and project cost efficiency.

3. Phillip Tan – BIM Director

   A graduate of the University of Melbourne, with a Bachelor of Environments and Masters of Construction Management, a member of the Australian Institute of Quantity Surveyors (AIQS), and played an important role in the integration of BIM systems at PKT.

Led by these experts, PKT is committed to providing efficient and innovative solutions that meet global standards, while still adapting to the needs of local industries.

2.2 Organizational structure

The company's organizational structure can be seen in Figure 2.1 below.

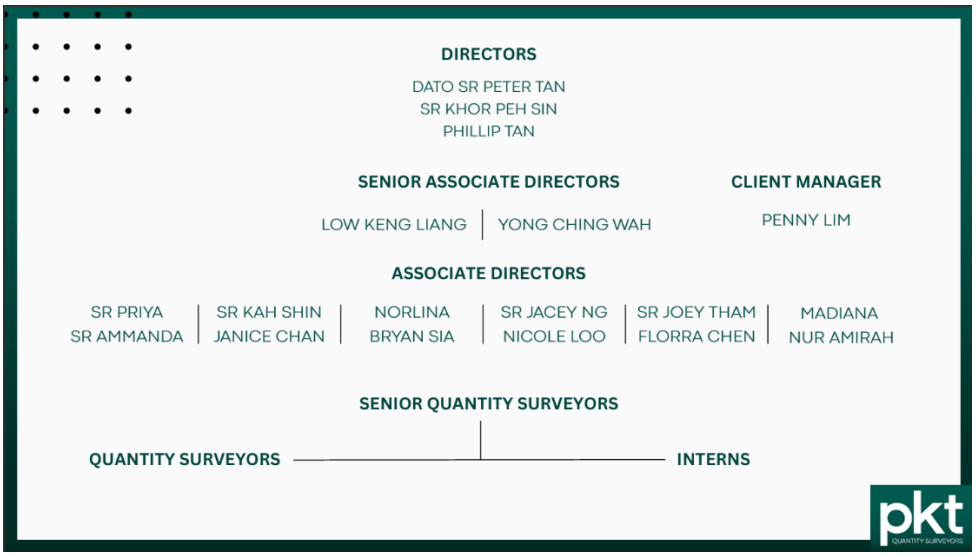


Figure 2. 1 Company Organizational Structure

2.3 Company Scope

PKT Quantity Surveying Sdn. Bhd. Offers several services, namely:

1. Feasibility Study

   Help clients establish initial budgets with limited information, as well as compare those budgets with similar projects in the surrounding area. This makes it easier for clients to prepare case studies for their respective boards or steering committees.

2. Cost Planning

   As an adherent of a highly detailed element cost planning method, PKT performs in-depth measurements with certain assumptions to develop a cost plan that minimizes the risk of variance. At this stage, PKT is also developing a 5D BIM model to support cost calculations with full transparency for clients.

3. Bill of Quantity

   BQ measurement and drafting is the Company's main expertise. By utilizing 2D & 3D measurement software, the Company strives to be as accurate as possible at all times to improve the competitiveness of tenders and complete the work according to the client's schedule.

4. Value Engineering

   Due to extensive experience in various types of projects, the company can recommend value engineering methods ranging from structural efficiency, building efficiency, specification replacement, to construction methodology.

5. Tender & Procurement

   Organizing the selection process for goods and service providers in a structured manner, starting from the preparation of tender documents and issuance of invitations, through to bid evaluation and determination of the winning bidder, to ensure that the project is executed in accordance with the allocated budget and timeline.

6. Contract Advice

   Provide technical and administrative recommendations regarding the types, conditions, and clauses of the contract, so that the client understands the risks, rights, and obligations before signing the agreement.

7. Contract Documents

   Compile and verify all legal and technical documents that are the basis for project implementation, as well as ensuring clarity in the scope of work.

8. Progress assessment

   Conduct field surveys and analyze work progress reports, then compare physical realization and contract value, to ensure the project is on schedule and specifications.

9. Contract Administration

   Manage communication flows, change requests, certificates, and neatly recorded/arranged financial documents for smooth and accountable implementation

10. Variation Assessment

    Assess and calculate the cost of addition/subtraction due to changes in the scope of work, create a VO (Variation Order), and negotiate the impact on project time and cost

11. Cost control

    Monitor budget realization through cost descriptions, cash flow reports, and forecasting, then provide recommendations for corrective actions so that total expenditure remains within the agreed limit.

12. Final account

    Prepare final accountability reports, including a summary of all costs, variations, and claims, as the basis for final handover of projects and financial administration completion.

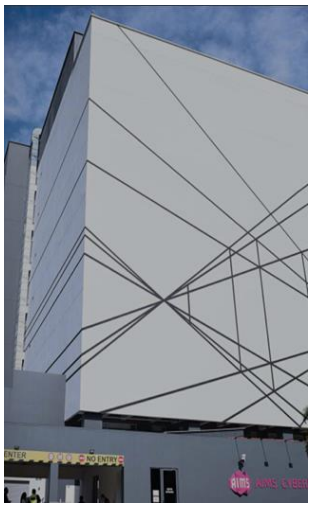
2.4 Company Experience

PKT Quantity Surveying Consultant Sdn. Bhd as a Quantity Surveyor has experience in handling various types of projects in multiple sectors, such as Data Centre, Mixed Use Development, Health Facilities, Residential, Retail, Hotel & Resort, Commercial, Industrial, Office Fit Out, Infrastructure Development,

Education, and Entertainment. The diversity of this project shows the Company's ability to provide solutions in various fields of construction. Based on Table 2.1, it shows several projects have been carried out by PKT Quantity Surveying Consultant Sdn. Bhd.

Table 2. 1 Company Project Experience

Project Name	Total Cost	Client	Status	Sector Type
KDCM1 Sedentak	RM 170 Million	Keppel	Completed in 2020	Data Centre
IPDC TM ONE	RM 170 Million	Telekom Malaysia	Completed in 2017	Data Centre

Project Name	Total Cost	Client	Status	Sector Type
JHB1X0 	RM 3.1 Billion	Yondr	Under development	Data Centre
AIMS Data Centre phase 1 & 2 	Undisclosed	AIMS Data Centre	Phase 1 will be completed in 2021, and Phase 2 will be completed in 2024	Data Centre

Project Name	Total Cost	Client	Status	Sector Type
JPJ ICT Department	RM 50 Million	Setia Haruman	Completed in 2008	Data Centre
Oxley Towers	RM 1.3 Billion	Oxley	Under development	Mixed-use development (retail, residential, commercial, 5 Star Langham hotel, and 5 Star Sofitel hotel)
BBCC Parcel 2	RM 650 Million	EcoWorld, EPF, Uda Holdings Berhad	Under development	Mixed-use development (Retail, 4-Star Hotel, strata office, and entertainment)
I-City	RM 4.5 Billion	i-Berhad	Partially Finished	Mixed-use development (Retail, Residential, Commercial)

Project Name	Total Cost	Client	Status	Sector Type
218 Macalister	RM 306 Million	Tropicana Corporation Berhad	Completed in 2020	Mixed-use development (retail, residential, commercial, 4-Star Hotel (Courtyard by Mariott Hotel)
Penang Beach Hospital	RM 105 Million	Beach Parkway	Under development	Health Facilities
Sunway Medical Centre 3	RM 172 Million	Sunway Medical Centre	Completed in 2017	Health Facilities
Alix Residence	RM 240 Million	TA Global	Completed in 2024	Residential
The Minh	RM 480 Million	UEM Sunrise	Under development	Residential

Project Name	Total Cost	Client	Status	Sector Type
RMMJ Laman Iskandaria	RM 85 Million	Ho Hup	In planning	RMM (Revitalization and Management)
MBI Dream House in Puteri City	RM 167 Million (930Units)	Damansara Axventure Sdn Bhd	In planning	RMM (Revitalization and Management)
So Sofitel & Langham Hotel	RM 1.55 Billion	Oxley Rising	In development	Hotels & Resorts
Alamanda Mall	Phase 1: RM 4 Million Phase 2: Undisclosed	Putrajaya Holdings	Phase 1 was completed in 2014, and Phase 2 is under construction	Retail

Project Name	Total Cost	Client	Status	Sector Type
UOB Sri Petaling	RM 4 Million	UOB Properties	Completed in 2022	Office Fit-Out
The Stride Strata	RM 650 Million	EcoWorld, EPF, UDA	Completed in 2022	Commercial Developments
Mapei Factory	RM 9 Million	Mapei Malaysia	Completed in 2019	Industry
Manipal International University	RM 105 Million	Manipal Education Malaysia	Completed in 2012	Education
Zepp Hall	-	Sony Music	-	Entertainment

Project Name	Total Cost	Client	Status	Sector Type
Nusajaya Gate, Phase 1	-	UEM Sunrise	a)	Infrastructure

Source: (ZEWDIE WONDATIR, 1967)

CHAPTER III
INTERNSHIP ACTIVITIES

3.1 Introduction

This chapter discusses the implementation of internship activities carried out at PKTQS Sdn Bhd, a consulting company engaged in Quantity Surveying. Internship activities include involvement in various projects with a scope of work that focuses on the initial stages of construction to the preparation of post-construction documents. The scope includes calculating the quantity of work for structural, architectural, sanitary, and wares elements using specialized software such as CostX and Glodon.

In addition, internship activities also include involvement in the project administration process, such as making tender documents, checking prices, and updating data according to changes that occur in the field. Coordination activities with the company's internal parties and external parties of the project are carried out through technical meetings and discussions, which aim to ensure the suitability of planning with the needs of the project.

The implementation of the internship at PKTQS Sdn Bhd provides an understanding of the work process of the Quantity Surveyor consultant as a whole, both in the pre-construction and post-construction stages.

3.2 Internship activities

The implementation of the internship, which lasts from April 28, 2025, to July 31, 2025, includes various activities that are directly related to the work process in the field of quantity surveyor. These activities include quantity calculation, preparation and management of project documents, and participation in coordination meetings with the team. Details of each of these activities include:

3.2.1 Calculation of Rebar Quantity on the Staircase of the Bukit Puchong New Town 4 Shop Office Project (BPNT4)

Calculating the quantity of rebar on the stairs on the Intermediate Unit, for example, the calculation of the rebar of staircase 2 on the End Unit located at the back. The following Figure 3.1 shows the details of the rebar of staircase 2 on the End unit.

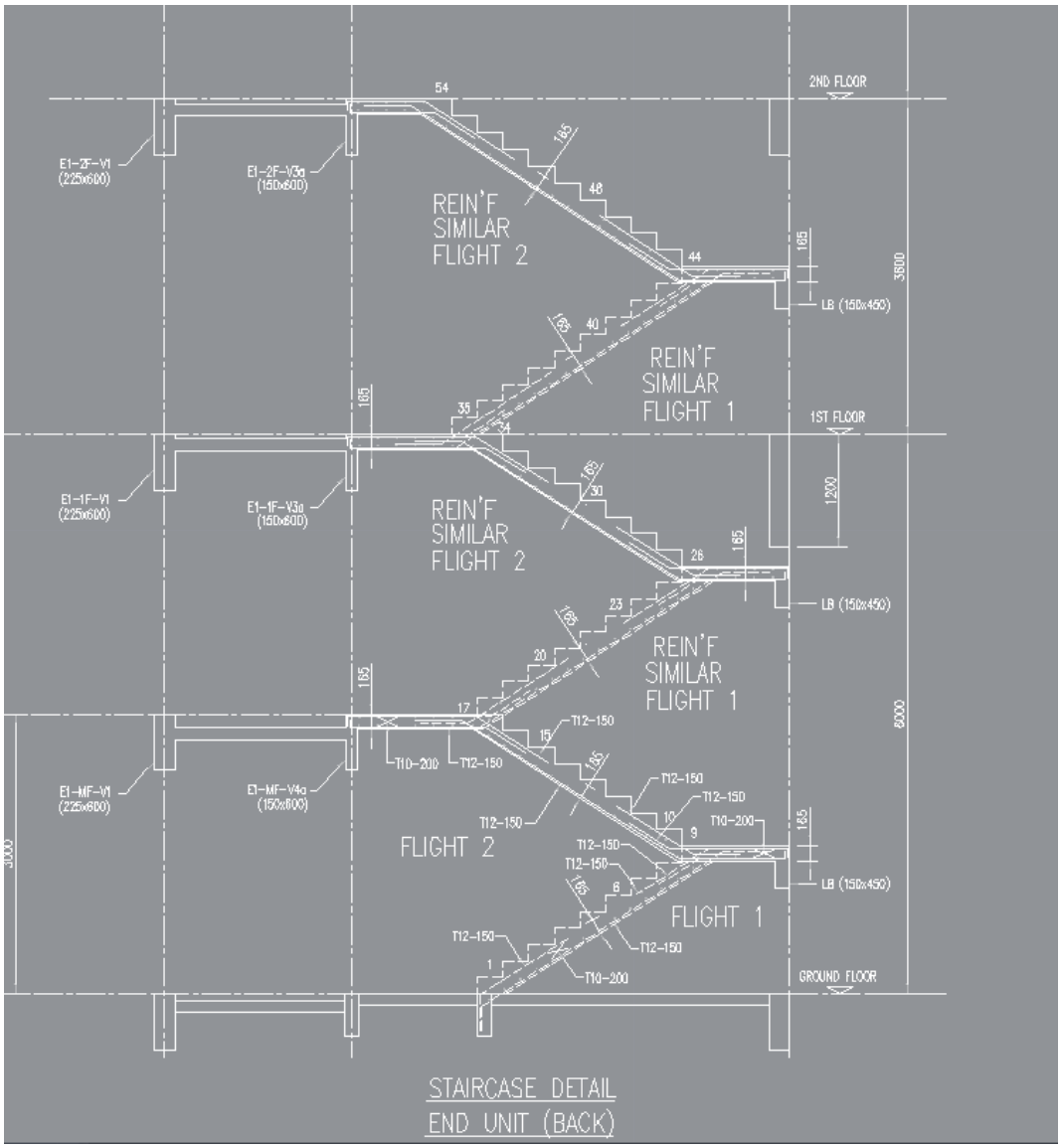


Figure 3. 1 Details of Staircase Rebar 2 End Unit

Based on detailed drawings of the staircase rebar analyzed using the AutoCAD application, information was obtained about the length of each reinforcement element. The length of the horizontal and vertical reinforcement on

the flight can be identified in detail for each section. In the working drawing, the total number of staircase flights is six, which consists of two types, namely flight types 1, 3, and 5, and flight types 2, 4, and 6. By utilizing the measurement feature in AutoCAD, it is possible to determine the length of the reinforcement for each type of flight. Table 3.1 shows the size of the width of the staircase 2 flight on the End unit.

Table 3. 1 Size of Stair Plate Width 2 End Unit

REF.	LENGTH	HEIGHT OF FLIGHT	LENGTH OF FLIGHT	WIDTH	BEAM THICK	SLAB THICK	NO
GF-M							
Flight 1,3,5							
TVOP 1				0,950	-		3
TVOP 2				0,950	-		3
THOP 1				1,501			3
THOP 2				0,920			3
BVOP				0,950			3
BHOP				3,830			3
M-L1							
Flight 2,4,6							
TVOP1				0,950	-		3
TVOP2				0,950	-		3
BVOP				0,950			3
THOP1				1,471			3
THOP2				0,908			3
BHOP				3,253			3

Based on the table above, there are several symbols used to indicate the position and direction of the reinforcement. The TVOP symbol stands for Top Vertical Bar, which indicates the upper reinforcement in a vertical direction. The THOP or Top Horizontal Bar symbol signifies the upper reinforcement in the horizontal direction. Furthermore, BVOP or Bottom Vertical Bar refers to the bottom reinforcement that is in the vertical direction, while BHOP or Bottom Horizontal Bar indicates the bottom reinforcement in the horizontal direction.

- The REF column is an abbreviation of reference that shows or references details on the staircase
- The Length column indicates the length of the staircase element
- The Height of Flight column shows the vertical height of the stair plate (the ascending distance between floors)
- The Length of Flight column shows the sloping length of a single stair plate, which is the distance along the slope of the stairs from the bottom to the top
- The width column shows the size obtained from CAD
- Beam thick column indicates the thickness of the support beam under the stair plate
- Slab thick column indicates the thickness of the slab/stairs plate
- The No column shows many staircase plates/flights

The following is Figure 3.2 regarding the details of the reinforcement of stairs 2 on the End unit.

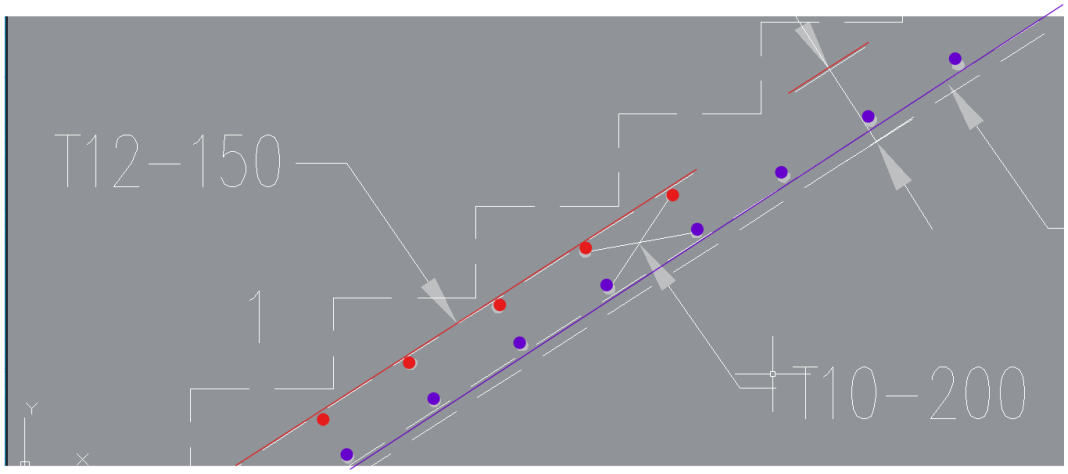


Figure 3. 2 Details of Staircase Rebar 2 End Unit

The line shows the details of the horizontal rebar, and the point shows the details of the vertical rebar. By measuring using AutoCad, the horizontal rebar can use the details of the image above, while for vertical rebar use the details in figure 3.3 regarding the details of the stairs 2 End Unit

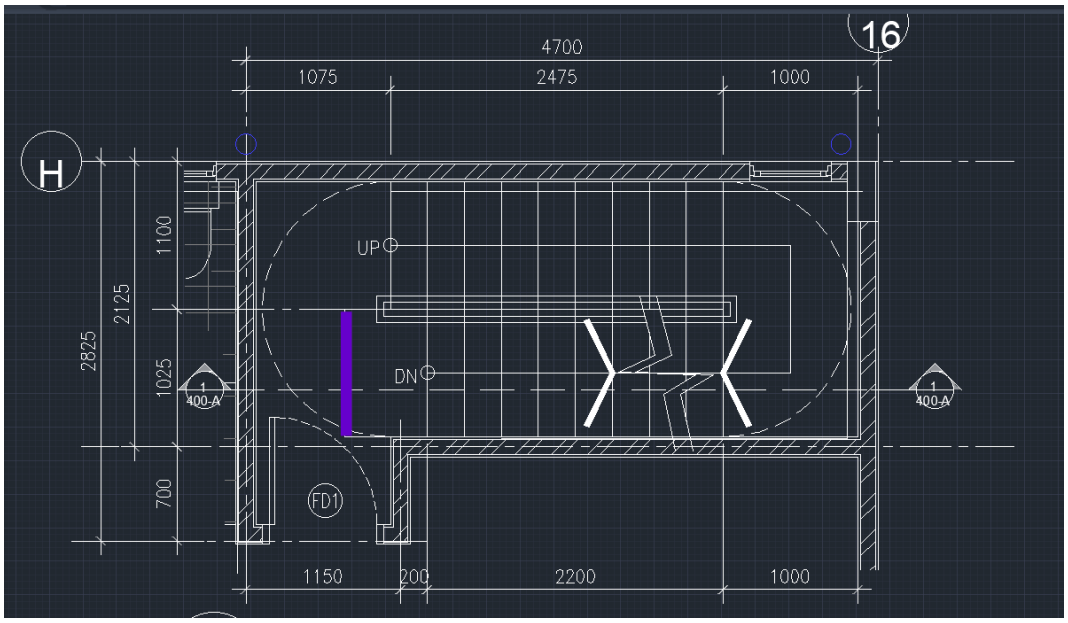


Figure 3. 3 Staircase Details 2 End Unit

The following is attached Table 3.2 for the total length of rebar on the staircase 2 flight End unit area.

Table 3. 2 Total Length of Rebar flight Staircase 2 End Unit

MEMBER/ REF.	BAR MARK	REBAR C/C	NO. IN EACH	TOTAL NO	LENGTH BAR IN EACH	TOTAL LENGTH OF BAR
TVOP 1	T12	0,15	7	22	1,50	33,02
TVOP 2	T12	0,15	7	22	0,92	20,24
THOP 1	T10	0,20	9	26	0,95	24,24
THOP 2	T10	0,20	6	17	1,95	32,76
BVOP	T12	0,15	7	22	3,83	84,26

MEMBER/ REF.	BAR MARK	REBAR C/C	NO. IN EACH	TOTAL NO	LENGTH BAR IN EACH	TOTAL LENGTH OF BAR
BHOP	T10	0,20	20	60	0,95	57,43
TVOP1	T12	0,15	7	22	1,47	32,36
TVOP2	T12	0,15	7	22	0,91	19,98
BVOP	T12	0,15	7	22	3,25	71,57
THOP1	T10	0,20	8	25	0,95	23,81
THOP2	T10	0,20	6	17	0,95	15,79
BHOP	T10	0,20	17	52	0,95	49,21

Based on the table above, it can be explained as follows:

- The member/ref column shows the section or element of the stairs being analyzed
- The bar mark column indicates the type of rebar on the stairs plate,
- Rebar c/c indicates the distance between the rebars,
- No in each indicates a lot of rebar per type,
- Total No indicates the total number of rebar bars for the same unit
- Length bar in each indicates the length of one rebar,
- Total Length of Bar indicates the overall total of each type of rebar.

After the length of the rebar is obtained, then to find the number by dividing the distance between the rebars by the width that has been obtained to get the total length of the rebar. The following is attached table 3.3 for the grouping of the total length of rebar flight stairs 2 End units based on the type/diameter of rebar.

Table 3. 3 Classification of Total Length of Rebar Flight Stairs 2 End Unit based on the type of rebar

MILD STEEL BAR			HIGH TENSILE BAR						
R6	**R8**	**R10**	**T10**	**T12**	**T16**	**T20**	**T25**	**T32**	**T40**
-	-	-	-	33,02	-	-	-	-	-
-	-	-	-	20,24	-	-	-	-	-
-	-	-	24,24	-	-	-	-	-	-
-	-	-	32,76	-	-	-	-	-	-
-	-	-	-	84,26	-	-	-	-	-
-	-	-	57,43	-	-	-	-	-	-
-	-	-	-	32,36	-	-	-	-	-
-	-	-	-	19,98	-	-	-	-	-
-	-	-	-	71,57	-	-	-	-	-
-	-	-	23,81	-	-	-	-	-	-
-	-	-	15,79	-	-	-	-	-	-
-	-	-	49,21	-	-	-	-	-	-

Based on the table above, it can be explained as follows:

- The column of mild steel bar (R) shows the type of rebar that is 6mm (R6), 8mm (R8), and 10mm (R10) in diameter.
- The high tensile bar (T) column shows the types of rebar that are 10mm (T10), 12mm (T12), 16mm (T16), 25mm (T25), 32mm (T32), and 40mm (T40) in diameter.

The following is attached table 3.4 regarding the total weight of the rebar flight of staircase 2 in the End unit area.

Table 3. 4 Total Weight Rebar Flight Staircase 2 End Unit

TOTAL BAR LENGTH (m)	-	-	-	203,24	261,43	-	-	-	-	-
WEIGHT/M (Kg)	0,222	0,395	0,617	0,617	0,888	1,579	2,466	3,854	6,314	9,866
TOTAL WEIGHT/M (Kg)	**-**	**-**	**-**	**125,40**	**232,15**	**-**	**-**	**-**	**-**	**-**

The table above shows that:

- Total bar length: the total length of the entire rebar for one specific type of diameter
- Weight/m (kg): rebar weight based on its diameter, e.g. T12 (12mm diameter) weights 0.888 kg/m
- Total weight/m (kg): the result of multiplying the total length of the rebar and the weight of the rebar.

The total rebar weight for the 2 End Unit stair plate was obtained by the rebar weight for T10 of 125.40 kg and T12 of 232.15 kg. It is obtained by multiplying the total length of rebar obtained previously by the weight of rebar using the formula:

$$\frac{d \times d}{12} \times 0{,}074$$

Example:

TVOP1 on stairs plate 1,3,5 has a width of 0,95 m, with rebar type T12-150.

Finding the total weight of rebar:

1. Counting a lot of rebar

$$\frac{0,95}{0,15} + 1 = 7,333$$

Since the flight/stairs plate 1,3,5 is typical so you can use the same number multiplied by the typical lot (3), then you get a total of a lot of rebar:

= 7,333 x 3

= 22 bh

2. After getting a lot of rebar, it can be multiplied by the length of the rebar to get the total length of rebar

= 22 x 1,471 (obtained from Autocad)

= 32,36 m

3. Then the total length of the rebar is multiplied by the weight of the rebar diameter 12 (using the rebar formula)

$$= \frac{(12x12)}{12} \text{ x } 0,074$$

= 0,888 kg/m

4. So the weight of TVOP1 rebar for flights 1,3,5 was obtained:

= 32,36 x 0,888

= 28,737 kg

3.2.2 Calculation of Rebar Quantity in RC Coping Bukit Puchong New Town 4 Shop Office Project (BPNT4)

Coping is the covering of the top of a wall or parapet that aims to help remove moisture from the wall surface, prevent damage, and improve the overall appearance of the building.

The calculation of the quantity of Coping rebar in this project, using AutoCad to measure the length of the structure, for example the calculation of the quantity of rebar coping at the end of the shop office unit BPNT4, figure 3.4 shows the details of the rebar of the parapet wall and coping.

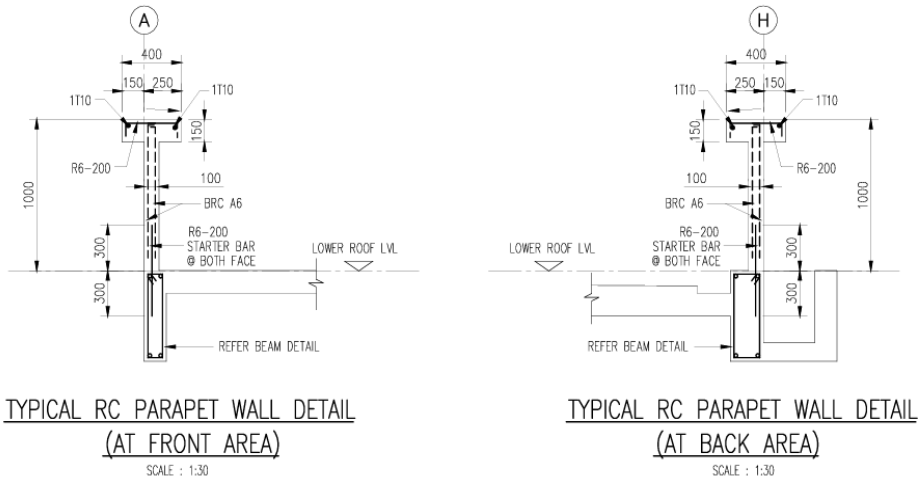


Figure 3. 4 Rebar details Parapet Wall and Coping with

Based on the picture above, it can be seen that Coping rebar has 2 types of rebar, namely 2T10 (High Tensile Bar, which is a type that has a very high tensile strength)(Materials, 2025) and R6-200 (Mild Steel Bar type that has a low carbon content, and is known for its toughness and ease in the forming and welding process.)(Unitrade, 2025) The following table 3.5 shows the calculation of the quantity of Coping rebar

Table 3. 5 Rebar Quantity Calculation Coping

Description / Annotation	Bar Size	Member	No.	Length	T10	R6
END						
2T10	T10	1	2	55,97	111,93	
R6-200	R6	1	281	0,90		252,75
				Total Length :	111,93	252,75
				Conversion (kg/m):	0,616	0,222
				Total Weight (kg) :	**68,95**	**56,11**

Based on the table above, it can be explained as follows:

- The description/annotation column shows the description of the rebar calculation,
- The bar size column indicates the size/type of the rebar,
- The member column shows many of its rebar spans,
- column No shows a lot of rebar in one stretch,
- column length indicates the length of the rebar,
- columns T10 and R6 show the result/total of the rebar length.

The length of rebar T10 and R6 was obtained from measuring using AutoCad (measuring the length of the coping area on the End Unit) of 55.97 m and 0.90 m. It is also known that there are many T10 rebars, as many as 2 pieces. For rebar R6 find many by dividing the distance between the rebars by the length of the coping area:

$$= \frac{55,97}{0,2} + 1$$

$$= 280,84 \sim 281 \text{ bh}$$

Then look for the total length of the rebar by multiplying the length of the rebar by the amount of rebar, which is obtained for T10 of 111,93 m and for R6 of 252,75 m. After obtaining the total length of rebar then multiplied by the weight of rebar:

1. Rebar weight diameter 10 (using rebar formula)

$$= \frac{(10x10)}{12} \text{ x } 0{,}074$$

$$= 0{,}616 \text{ kg/m}$$

2. Rebar weight diameter 6 (using rebar formula)

$$= \frac{(6x6)}{12} \text{ x } 0{,}074$$

$$= 0{,}222 \text{ kg/m}$$

So the weight of the Coping rebar is obtained for

1. T10 is :

$$= 111{,}93 \text{ x } 0{,}616$$

$$= 68{,}95 \text{ kg}$$

2. R6 is as follows:

$$= 252{,}75 \text{ x } 0{,}222$$

$$= 56{,}11 \text{ kg}$$

3.2.3 Calculation of Excavation Quantity in the Bukit Puchong New Town 4 Shop Office Project (BPNT4)

Calculating the quantity of excavation volume of Ground Beam and Ground Slab in the Intermediate, Corner, End Unit area. The following table 3.6 is an example of the calculation of the excavation volume of the Ground Beam End Unit.

Table 3. 6 Calculation of Ground Beam Excavation End Unit

Item	Description / Annotation	Member	No. of Beam	Area (M2)			Height / Depth / Thk (m)			Excavation (m3); with max. depth				
				Length	Width	Area	Height / Depth / Thk (m)	Lean Conc	Nett	<= 0.25	<= 1	<= 2	<= 4	<= 6
1	E1-GF-H1	1	1,0	6,592	0,225	1,48	0,60	0,05	0,65		0,96			
2	E1-GF-H2	1	1,0	6,365	0,225	1,43	0,60	0,05	0,65		0,93			
3	E1-GF-H3	1	1,0	6,365	0,225	1,43	0,60	0,05	0,65		0,93			
4	E1-GF-H5	1	1,0	6,365	0,225	1,43	0,60	0,05	0,65		0,93			
5	E1-GF-H6	1	1,0	6,365	0,225	1,43	0,60	0,05	0,65		0,93			
6	E1-GF-H7	1	1,0	6,365	0,225	1,43	0,60	0,05	0,65		0,93			
7	E1-GF-H7a	1	1,0	1,816	0,150	0,27	0,45	0,05	0,50		0,14			
8	E1-GF-H7b	1	1,0	4,401	0,150	0,66	0,45	0,05	0,50		0,33			
9	E1-GF-H8	1	1,0	6,368	0,225	1,43	0,60	0,05	0,65		0,93			
10	E1-GF-V1	1	1,0	21,024	0,225	4,73	0,60	0,05	0,65		3,07			
11	E1-GF-V2	1	1,0	5,659	0,150	0,85	0,60	0,05	0,65		0,55			
12	E1-GF-V3	1	1,0	1,824	0,150	0,27	0,45	0,05	0,50		0,14			
13	E1-GF-V4a	1	1,0	3,523	0,150	0,53	0,45	0,05	0,50		0,26			
14	E1-GF-V4b	1	1,0	0,875	0,150	0,13	0,45	0,05	0,50		0,07			
15	E1-GF-V6	1	1,0	21,574	0,225	4,85	0,60	0,05	0,65		3,16			
			14,0	105,5					**Total :**	-	**14,26**	-	-	-

Based on the table above, it can be explained as follows:

- Item: shows the number of items counted
- Description / Annotation: shows the name of the ground beam stretch at the end unit
- Member: the number of areas of the same (end unit)
- No of Beam: the number of ground beam stretches
- Area (m2): contains length, width, and area (result of the multiplication of length and width
- Height/Depth/Thk (m): contains the height/depth/thickness column indicating height/depth/thickness, lean concrete indicates the thickness of the concrete blanket, and the total nett of its height plus the thickness of the concrete blanket
- Excavation: shows the volume of excavation, the total of the multiplication of members, area, and nett.

For the length size is known from the TAS quantity, then the length is multiplied by the width to find the area, after which the area result is multiplied by the nett depth/height, for example for the excavation of the Ground Beam End Unit E1-GF-H1, here figure 3.6 shows the details of the E1-GF-H1 beam.

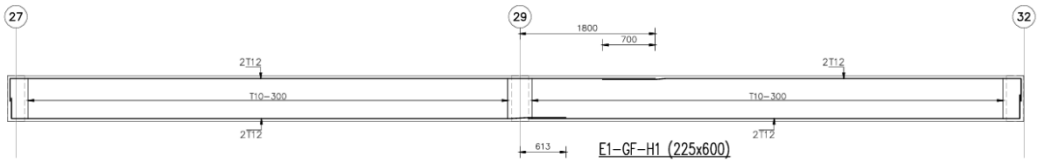


Figure 3. 5 Detail Beam E1-GF-H1

From the detailed drawing, it is known that the width of the ground beam is 225 mm and the depth is 600 mm, with a lean concrete of 50 mm. Then from the table the result is 6,592 x 0.225 = 1,48m^2, after that the area is multiplied by the nett depth by the way of the depth plus the lean concrete 0.6 + 0.05 = 0,65 m. Then look for the excavation volume for the ground beam E1-GF-H1, the area multiplied by the many ground beams multiplied by the nett depth so 1,48 x 1 x 0,65 = 0,96 m^3

3.2.4 Calculation of Quantity of Concrete, Formwork and Steel BRC A8 RC PLINTH TANK in the Bukit Puchong New Town 4 Shop Office Project (BPNT4)

Calculating the quantity of concrete, formwork, and BRC A8 in the Intermediate, Corner, End Unit area. The following figures 3.6 and 3.7 show the details of the RC Plinth Tank and the floor plan of the 2nd floor of the end unit area

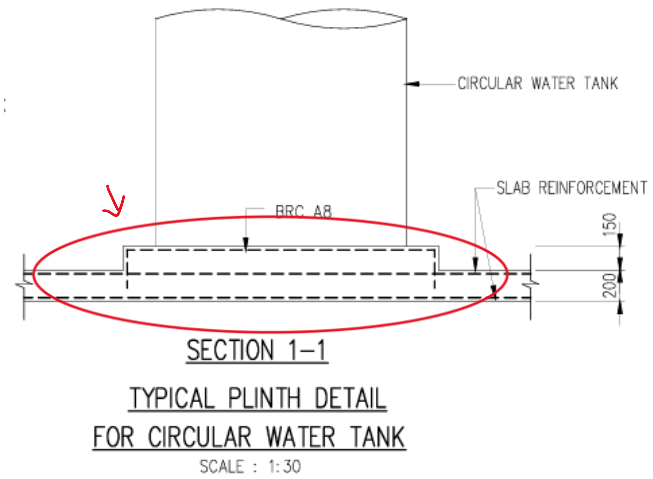


Figure 3. 6 Detail RC Plinth Tank

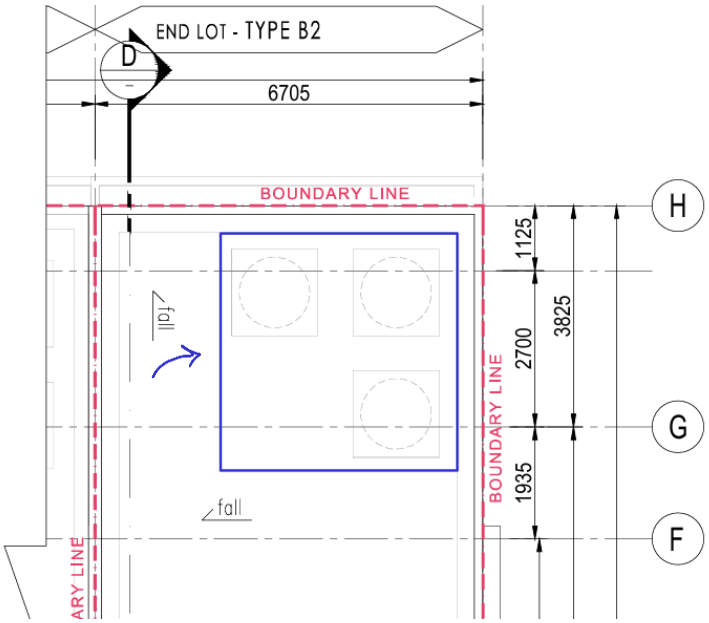


Figure 3. 7 Picture of the 2nd floor plan End Unit

Based on the image, the size of the RC Plinth Tank using AutoCAD in the form of length, width, and height. Also in the drawing of the plan it can be known the number of RC Plinth Tank on the End Unit as many as 3 units that are typical (but counted as 2 units because 1 more unit is already on the toilet ground floor). The following Table 3.7 shows the quantity calculation RC Plinth Tank End Unit.

Table 3. 7 Calculation Table of Concrete, Formwork, Steel BRC A8 RC Plinth Tank

Description / Annotation	Member	No.				Concrete	Fwk	BRC A8
			Length	Width	Height	m3	m2	m2
Roof Floor 150mm Thick Slab	2	1	1,50	1,500	0,150	0,68	1,800	4,500
						0,68	1,80	4,50

Based on the table above, it can be explained as follows:

- Description / Annotation: explanation of the calculation item
- Member: Same number of areas (RC Plinth Tank)
- No: total many slabs
- Length, Width, Height: slab dimension
- Concrete: Concrete Volume
- Fwk / Formwork: Formwork
- BRC A8 : area of BRC A8 Steel

It is known that the length obtained is 1,5 m, the width is 1,5 m, and the height is 0,150 m, so to find the concrete by multiplying the length, height, and quantity (member): 1,5 x 1,5 x 0,15 x 2 = 0,68, then for formwork because the length of the sides is the same, to find it by multiplying the number of m^3 RC Plinth Tanks with the area of the fourth formwork with a length of 1,5 m and a height of 0,15 m: 2 x (4 x (1,5 x 0,15)) = 1,8, and to find BRC A8 because of steel m^2 fabric, just look for the area/area of the RC Plinth Tank and then multiply by the amount. The size of the RC Plinth Tank with a length of 1,5 m and a width of 1,5 m: 2 x 1,5 x 1,5 = 4,5 m^2

3.2.5 Calculation of the Quantity of Rebar Ore of TNB Concrete Compact Substation (Upstand Beam) in the Bukit Puchong New Town 4 Shop Office Project (BPNT4)

TNB concrete compact substation is a precast concrete substation used by TNB (Tenaga Nasional Berhad), Malaysia's national electric utility company, for electricity distribution, particularly at medium voltage.(Berhad, 2022) These stations are distribution substations designed to be installed in a limited area, offering ease of installation and maintenance. Here are pictures 3.8 and 3.9 regarding the top view of the Compact sub-station Plinth base plan and the upstand beam details on the compact sub-station plinth.

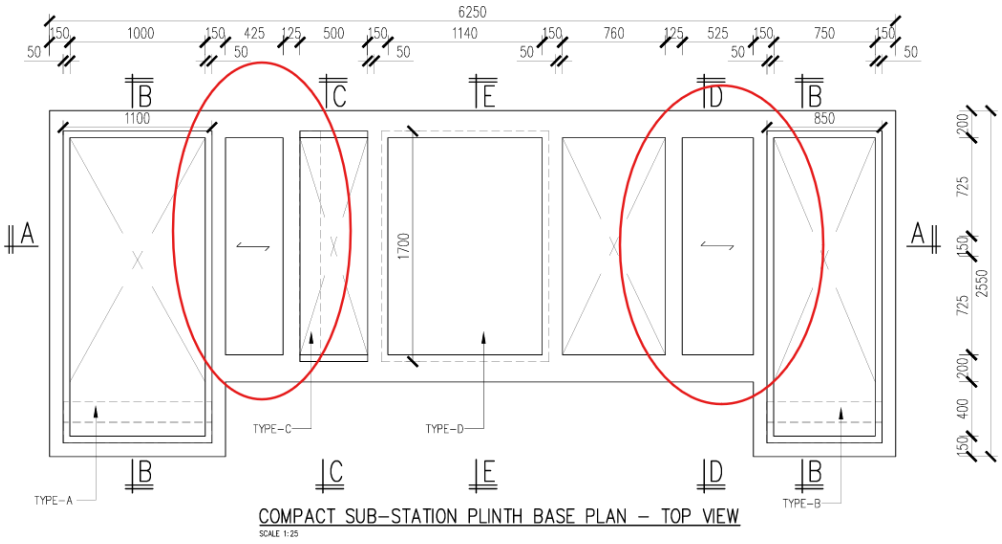


Figure 3. 8 Top view CSS Plinth Base Plan

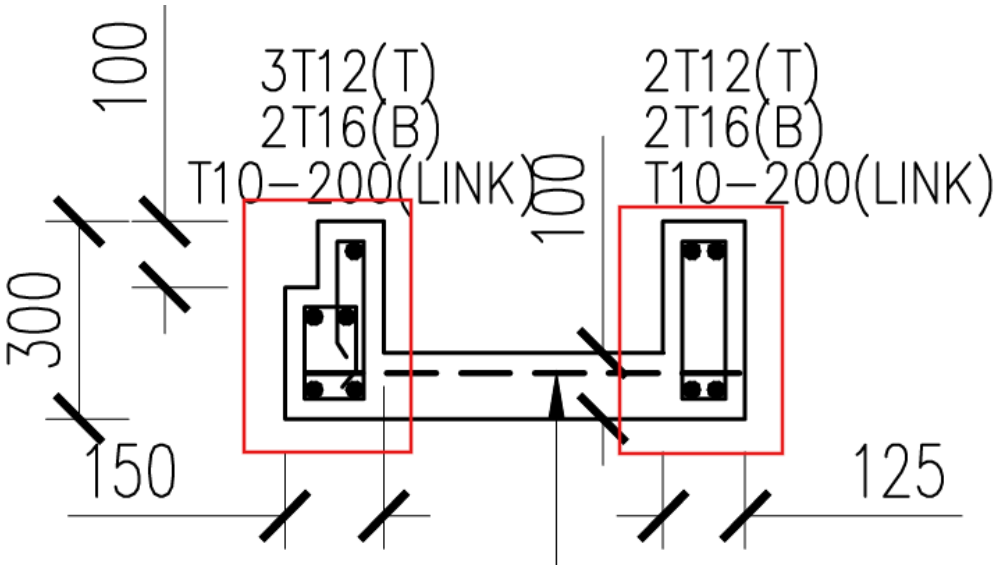


Figure 3. 9 Upstand Details Beam at CSS plinth

Based on the drawing, it is known that the type of rebar in the L-shape Upstand beam is the main rebar 3T12, 2T16, and T10-200 shank, for the main rebar beam is 2T12, 2T16, and the T10-200 shank. The following table 3.8 shows the calculation of the upstand beam rebar.

Table 3. 8 Rebar calculation Upstand Beam

Description / Annotation	Bar Size	Member	No.	Length	T8	T10	T12	T16
L SHAPE								
3T12	T12	2	3	1,60			9,60	
2T16	T16	2	2	1,60				6,40
LINK								
T10-200	T10	2	9	0,90		16,18		
125 X 300								
2T12	T12	2	2	1,60			6,40	
2T16	T16	2	2	1,60				6,40
LINK								
T10-200	T10	2	9	0,61		10,98		
				Total Length :	-	27,16	16,00	12,80
				Conversion (kg/m):	0,395	0,616	0,888	1,579
				Total Weight (kg) :	**-**	**16,73**	**14,21**	**20,21**

Based on the table, it can be explained as follows:

- Description / Annotation: explanation of the calculation item
- Bar size: rebar size
- Member: Same number of areas (RC Plinth Tank)
- No: total lot of rebar
- Length: Rebar Length
- T8, T10, T12, T16: indicates the size of the rebar (grouped)

The main rebar length measurement is obtained by measuring with AutoCAD on the image shown above the CSS Plinth Base Plan, which is 1,6 m (for both types of upstand beam). Then to calculate the length of the Sengkang is measured from the detailed image of the Upstand beam on the CSS Plinth. For many rebars in L-shaped upstand beams, the main reinforcement beam is known to be 3 for T12 rebar and 2 for T16 rebar for rectangle upstand beam reinforcement, the main reinforcement is known as 2 for T12 and T16 rebar, while for T10 rebar link find the number by dividing the distance between the rebars by the length of the upstand beam:

$$= \frac{1,6}{0,2} + 1$$

$$= 9 \text{ bh}$$

Because in the image shown above there are 2 typical upstand beams, to find the total length of rebar by multiplying many rebars, many upstand beams, and the length of one rebar, which is for example:

L- Shape Upstand Beam 3T12

= a lot of rebar x a lot of upstand beam x a lot of rebar length

= 3 x 2 x 1,6

= 9,6 m

Then multiplied by the weight of the rebar diameter 12

Rebar weight diameter 12 (using rebar formula)

$$= \frac{(12x12)}{12} \text{ x } 0{,}074$$

$$= 0{,}888 \text{ kg/m}$$

And the weight of the L-shape upstand beam rebar for T12 was 9,6 m x 0,888 kg/m = 8,525 kg

3.2.6 Making a Pre-Qualification of Contractor for Tender on the BPNT 4 Shop Office project

The Pre-Qualification of Contractor is useful for assessing the feasibility of prospective contractors based on their financial ability and competence, here Figure 3.10 shows the questions on the form given to the contractor who wants to be involved in the tender.

MANDATORY

		Please Circle	
1	**Black Listed by BHD**	YES	NO
2	**Registration with CIDB**		
a	CIDB (Grade 1 - 2)	YES	NO
b	CIDB (Grade 3 - 6)	YES	NO
c	CIDB (Grade 7)	YES	NO
3	**Experience with Projects (Last 5 Years)**		
a	Below RM 1 Million	YES	NO
b	RM1 - RM3 Million	YES	NO
c	RM3 - RM5 Million	YES	NO
d	Above RM5 Million	YES	NO

FINANCIAL CAPABILITY

		Please ✓
4	**Current Assets**	
a	Less than RM3.5 Million	
b	Between RM3.5 - RM5.0 Million	
c	More than RM5.0 Million	
5	**Net Worth of Company (Capital and Reserves)**	
a	Less than RM5 Million	
b	Between RM5 - RM10 Million	
c	More than RM10 Million	
6	**Company Working Capital (Current Asset - Curent Liability)**	
a	Less than RM2 Million	
b	Between RM2 - RM5 Million	
c	More than RM5 Million	
7	**Cash in Hand**	
a	Less than RM1 Million	
b	Between RM1 - RM3 Million	
c	More than RM3 Million	
8	**Available Bank Facilities**	
a	Less than RM1 Million	
b	RM1 Million to RM4 Million	
c	Above RM4 Million	

9	**Current Credit Facilities from Suppliers**	
a	Less than RM100,000	
b	RM100,000 to RM500,000	
c	More than RM500,000	
	TECHNICAL INFORMATION	
10	**Status of Firm**	
a	Public Listed Company	
b	Private Limited Company	
c	Sole Proprietor	
11	**Years in Business**	
a	Above 10 years	
b	5 - 10 years	
c	1 - 4 years	
12	**Total Company Staffing (including Professional Personnel)**	
a	Up to 10	
b	10 – 20	
c	20 – 30	
d	More than 30	
13	**No. of Personnel to be Employed for the Project (both Technical and Supervisory)**	
a	Less than 5	
b	5 – 10	
c	More than 10	

Figure 3. 10 Pre-Q Form

Based on the Pre-Qualification of Contractor assessment drawing, the evaluation criteria are divided into three main groups. First, the mandatory criteria include free blacklisting status by BHD (an abbreviation for berhad that indicates the surname of the Company), registration rating with the Construction Industry Development Board (CIDB) as the official regulatory body of the construction industry in Malaysia, as well as a track record of experience with similar projects (Construction of Shop Office) in the last five years. Second, the contractor's financial capabilities are evaluated through the current asset component, the value of working capital, available cash, banking facilities owned, and credit facilities from suppliers. Third, the technical aspects include the status of the business entity, the length of operation, the total number of the company's workforce, and the number of personnel that will be placed for the implementation of the project.

In conclusion, the quantity surveyor recommends that Pre-Q contractors who have at least CIDB Grade 7, have experience in shop office projects for the last 5 years, and have a Pre-Q point score above 60%. However, the final selection of contractors is completely left to the owner, namely Bukit Hitam Development Sdn. Bhd.

3.2.7 Create an Appendix D document list of drawings of BPNT4 shop office project

The Appendix-D List of Drawing document is one of the documents prepared in the tender process. This document aims to make it easier for the parties involved to quickly identify each image, check the completeness of the image, and know and track the version and revision of the image. The following Figure 3.11 shows the appendix-d list of drawings.

APPENDIX "D"

SITE CLEARING & EARTHWORKS, MAIN BUILDING WORKS, EXTERNAL WORKS, M&E SERVICES WORKS AND LANDSCAPE WORKS FOR:
A) 8 UNIT KEDAI PEJABAT 3 TINGKAT DI ATAS LOT 59066, 59078, 59079, 59092, 59093, 59106, 59107, 59119
B) 46 UNIT KEDAI PEJABAT 2 TINGKAT DI ATAS LOT 59067-59077, 59080-59091, 59094-59105, 59108-59118
C) 3 UNIT PENCAWANG ELEKTRIK PADAT (CS)

JALAN BP 7/7 DAN JALAN BP 7/9, BANDAR BUKIT PUCHONG, PUCHONG, MUKIM PETALING, DAERAH PETALING, SELANGOR DARUL EHSAN UNTUK TETUAN BUKIT HITAM DEVELOPMENT SDN BHD

APPENDIX D – LIST OF TENDER DRAWINGS

DESCRIPTION	DRAWING NO.
ARCHITECTURAL:	

ARCHITECTURAL:

200 - DOOR DETAIL

DOOR SCHEDULE	DTLM204/BPNT4/P1/TENDER/A/200/R3
DOOR DETAILS - D1	DTLM204/BPNT4/P1/TENDER/A/210/R0
DOOR DETAILS - D3, D3a	DTLM204/BPNT4/P1/TENDER/A/211/R0
DOOR DETAILS - D4	DTLM204/BPNT4/P1/TENDER/A/212/R0
DOOR DETAILS - FD1	DTLM204/BPNT4/P1/TENDER/A/213/R0
THRESHOLD DETAIL	DTLM204/BPNT4/P1/TENDER/A/214/R0

250 - WINDOW DETAILS

Figure 3. 11. Appendix D list of drawing

Based on the document, Appendix D List of Drawings contains the project title, list of drawings, detail drawing pages, and revision columns. The list of images is arranged in order of disciplines, namely architectural, civil, mechanical, and electrical (ME), as well as landscape. Image numbering refers to the angle of each image, as shown in the following Figure 3.12.

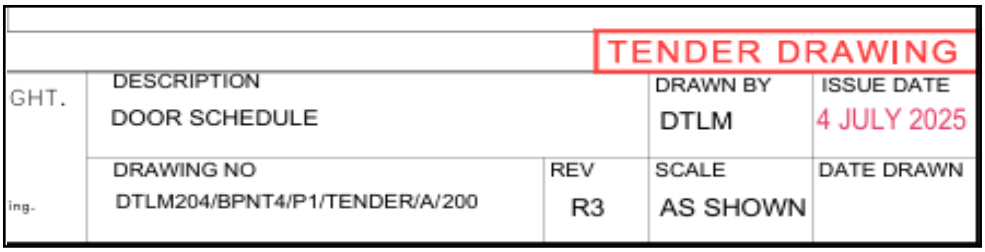


Figure 3. 12 By Schedule

3.2.8 Use of the CostX Software

CostX software is used in construction work quantity measurement activities. CostX is a BIM-based application (Building Information Modeling) that supports digital retrieval of quantity data from working drawings in PDF and DWG formats. The initial stage of using cost X is to enter the username and password that has been provided by IT as seen in Figure 3.13.

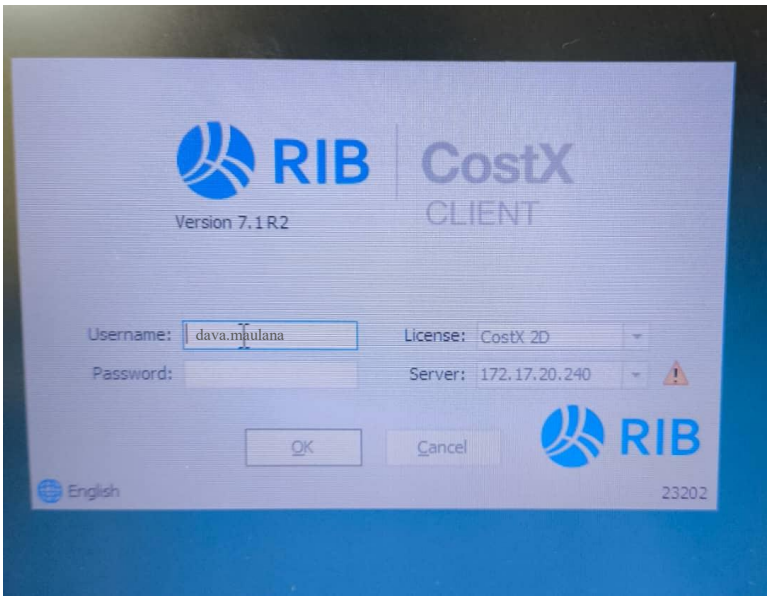


Figure 3. 13 log in screen costX

After the login process using the username and password that have been provided, the next stage is to import the work drawings in CAD or PDF format into the system. Then the scale of the image is calibrated to ensure the accuracy of the measurement results to be carried out. In CostX software, measurements can be made in length, area, as well as number of work items that include structure, architecture, and mechanical, electrical, and plumbing (MEP) systems. For example, the process of measuring the length of the rebar element on the ground beam of BPNT3 is carried out, as shown in Figure 3.14.

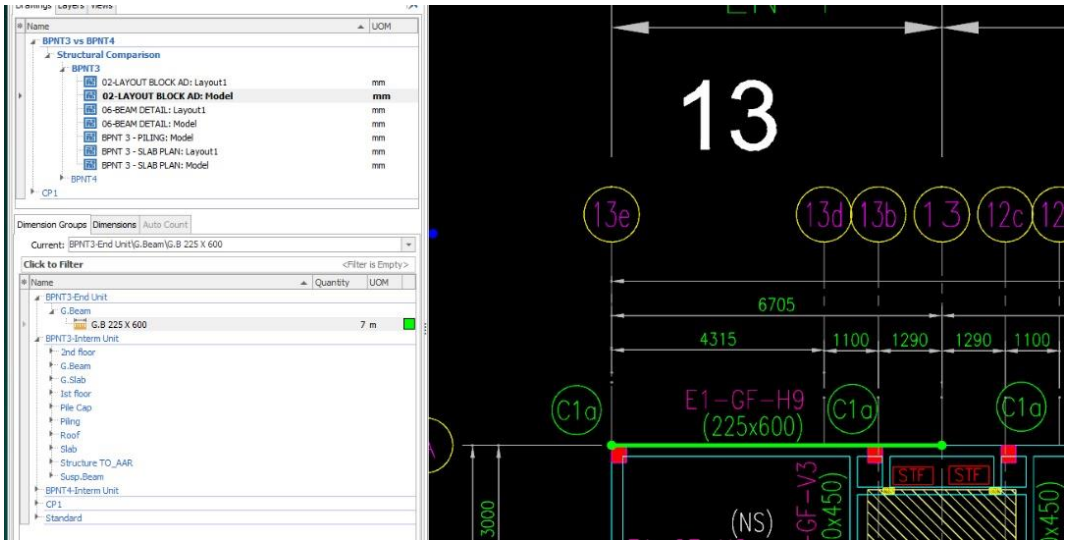


Figure 3. 14 Length measurement ground beam End unit with CostX

Based on the image, it is known that the length of one span of the ground beam (code E1-GF-H9) is 7 meters. Based on the data on the length of the ground beam span that has been obtained, the calculation of the volume of concrete and the surface area of the formwork required for one stretch of sloof can be carried out. The volume is calculated based on the cross-sectional dimensions of the beam multiplied by the length of the span, while the formwork area is calculated based on the outer surface area of all sides of the block to be printed. This process is done systematically using the dimension group feature available in CostX, which allows for automatic classification of elements and quantity tracking. For types of work with unit area (m^2), such as floor plate work, measurements can be made using area measurement tools on CostX. For example, the measurement of the floor plate area in the BPNT3 shop office project is carried out based on the plan drawing as shown in Figure 3.15.

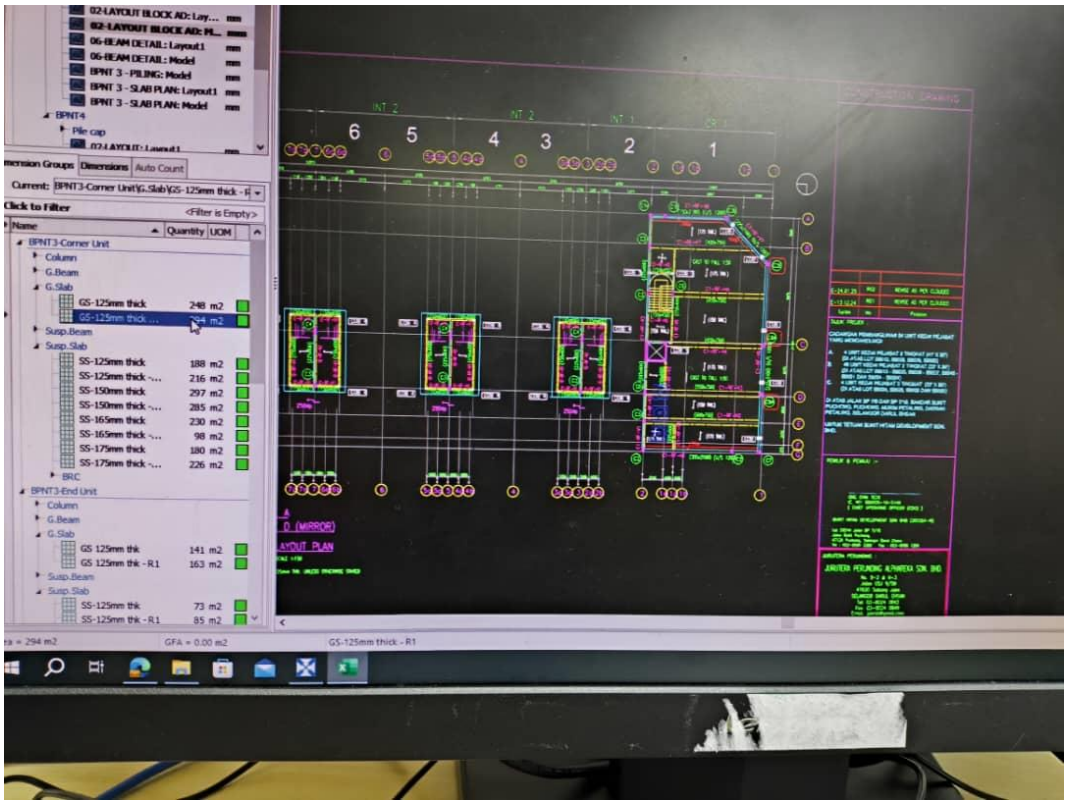


Figure 3. 15 Measurement of the area of the floor plate on corner unit

The initial step begins with selecting the floor plane you want to measure, then determining the measurement limit according to the edge of the plate, and the

system will automatically calculate the total area based on the pre-set calibration. The measurement results are then classified based on the type of plate and floor concerned to facilitate the calculation process.

In addition to length and area, CostX also has a measurement feature based on the number of units (count) using the count tool. This feature is used for work with units, such as sanitary fixtures, MEP fittings, or other architectural equipment. For example, the calculation of the number of sanitary items in the BPNT4 project is done by marking each item location point on the work drawing, and the system will automatically display the total number of units that have been marked. This process is shown in Figure 3.16, which shows the total of the points of sanitary items that have been calculated.

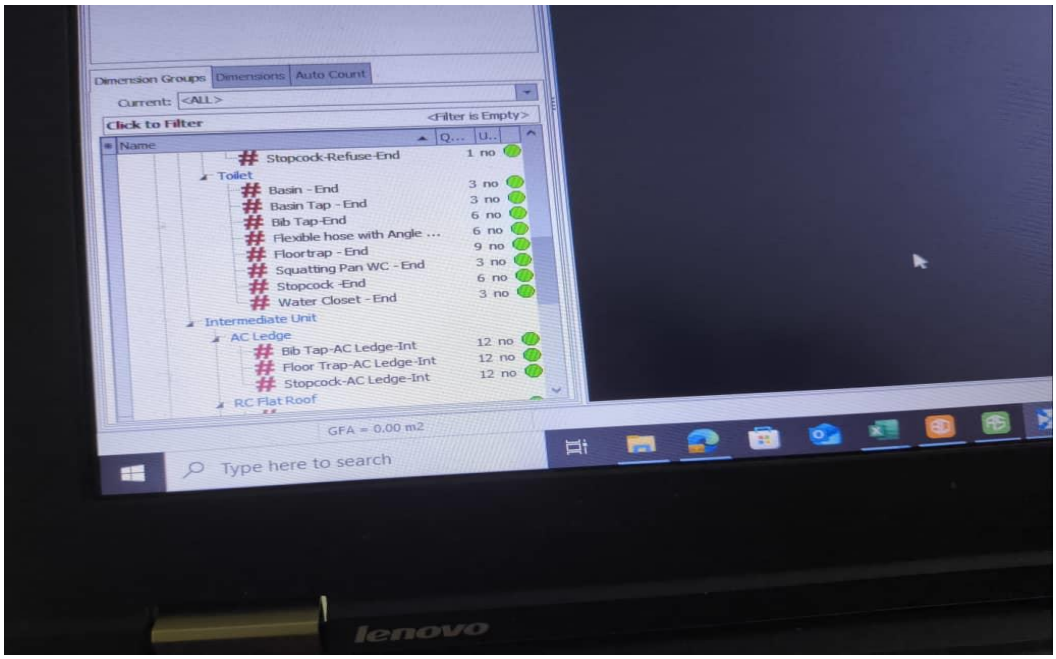


Figure 3. 16 Multiple units of sanitary wares and fittings BPNT4

3.2.9 Use of the Glodon Software

Glodon Cubicost software, in particular the TAS (Takeoff Architecture & Structure) and TRB (Takeoff Rebar) modules, is used for the measurement of the quantity of structural and rebar work based on planning drawings. Glodon enables automatic modeling from 2D working drawings into 3D representations to facilitate take-off and visual verification. As well as TBQ to manage and prepare the Bill of

Quantity digitally. It can be seen from Figure 3.17 regarding the Glodon software logo

Figure 3. 17 Glodon Cubicost software

3.2.9.1. Model generation/calculation using TAS

The first step in the operation of the TAS software is with the account login that has been provided. Figure 3.18 shows the initial appearance of the Glodon application login

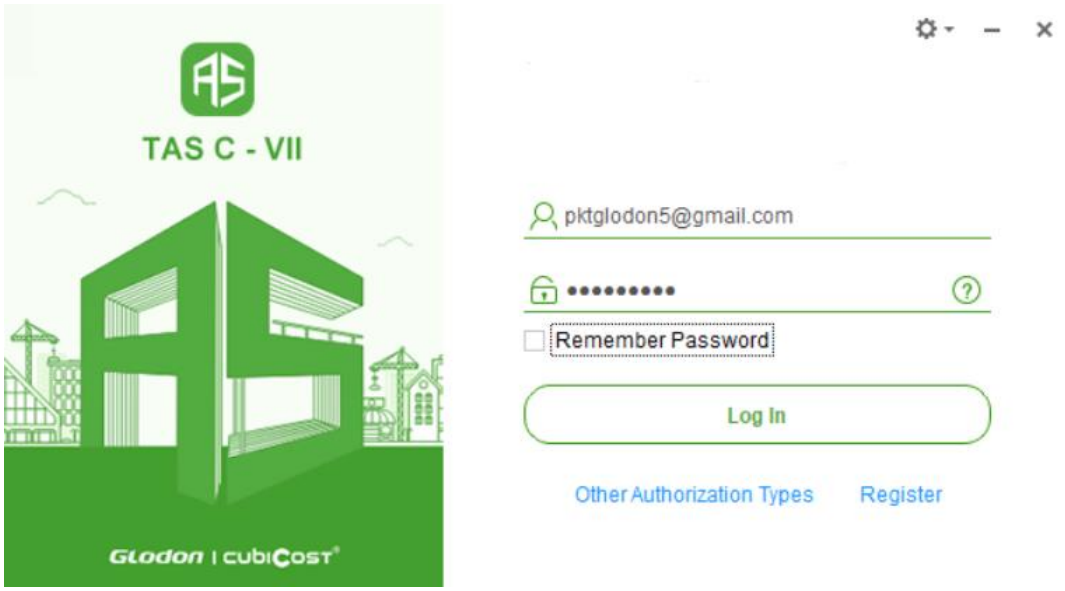


Figure 3. 18 Log in to TAS

After the login process, the first step is to select the Create New Project menu on the left side of the application, then create a project name and set a measurement rule according to the country where the project is implemented. The next stage is to set up Project Information, Floor Elevation, and Concrete Grade.

Once the initial setup is complete, the next step is to create an Axis Grid, which can be done manually or automatically (Auto Identify). The Auto Identify process begins with importing the working drawings in CAD or PDF format, then calibrating the scale to ensure measurement accuracy. Next, the image is split into several parts, then each part that has been split is repositioned (relocated) to fit the Axis Grid that has been created.

The next stage is to draw the items needed for the creation of the model, such as beams, columns, foundations, and other elements. In the TAS module, modeling can include both structural and architectural elements. When drawing each item, specifications and naming should be clearly listed in the Attribute Editor for easy identification and management of the model. Figure 3.19 shows the look and model of TAS for the BPNT4 Shop Office project for the End Unit and Intermediate Unit sections

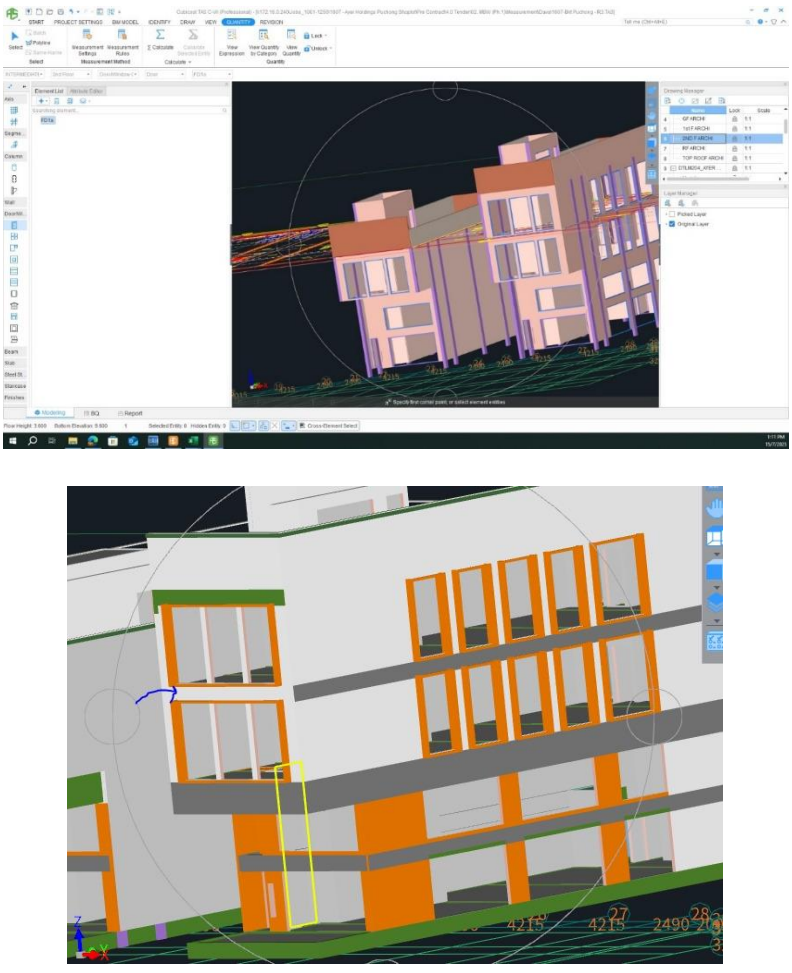


Figure 3. 19 Type TAS BPNT4 End Unit and Int Unit

After the model is completed, the TAS application can automatically generate quantity data in the form of volume, formwork area, and number of items on the model that has been calculated. Table 3.9 shows the calculation results for column items in the BPNT4 End Unit Project.

Table 3. 9 Column TAS quantity BPNT4 End Unit

Classification Condition					Quantity		
Floor	Material	Concrete Grade	Entity Type	Name	Volume(m3)	Area of formwork(m2)	Number(pc)
Foundation Floor	In-situ Concrete	C30	Vertical	C2	0,425	5,139	7
				C2A	0,203	2,380	3
				C2B	0,176	1,909	2
Ground Floor	In-situ Concrete	C30	Vertical	C2	4,253	56,021	7
				C2A	2,025	25,832	3
				C2B	1,755	20,852	2
				COB 1	0,450	10,038	2
1st Floor	In-situ Concrete	C30	Vertical	C2	2,552	33,409	7
				C2A	1,094	14,359	3
				C2B	0,729	9,593	2
				COB 2a	0,182	3,209	1
2nd Floor	In-situ Concrete	C30	Vertical	C2	2,552	33,350	7
				C2A	1,215	15,386	3
				C2B	0,729	9,520	2
				COB2	0,365	4,785	1
Roof	In-situ Concrete	C30	Vertical	COB5	0,319	5,533	2
				COB6	0,236	5,281	2
Total					19,257	256,598	56

Based on the table, it can be explained as follows:

- Classification condition: contains floor indicates the floor level, material indicates the type of concrete material, namely in-situ concrete (casting in the field), concrete grade indicates the quality of concrete such as C30, Entity type indicates the type of model vertical (column), and name indicates the name/type of column
- Quantity: contains volume indicating the volume quantity of the column, area of formwork indicates the area of formwork, and number indicates the quantity of the column

The table details the quantity of column elements for the BPNT4 End Unit shop office project based on data from the TAS system. The information is organized by building floor, from foundation to roof, with a focus on grade C30 grade in-situ concrete materials and vertical entity (column) types.

On the foundation floor, there are three types of columns (C2, C2A, and C2B) with a total volume of about 0,804 m^3 and a formwork area of 9,428 m^2. The number of column units on this floor is 12. The ground floor has four types of columns, including COB 1, with a total volume of 8,483 m^3 and a formwork area of 112,743 m^2, consisting of 14 units. The 1st floor includes columns C2 to COB 2a with a volume of 4,557 m^3 and a formwork area of 60,570 m^2, totaling 13 units. The 2nd floor has a total volume of 4,861 m^3 and a formwork area of 63,041 m^2 of 13 column units. Finally, on the roof there are two columns (COB5 and COB6) with a combined volume of 0,555 m^3 and a formwork area of 10,814 m^2, each amounting to two units.

Overall, the total volume of concrete used is 19,257 m^3, the total formwork area reaches 256,598 m^2, and the total number of columns is 56 units. This data provides a detailed overview of the material requirements and formwork for each floor in the project.

3.2.9.2. Calculation of rebar quantity using TRB

The rebar calculation is carried out using the TRB application. Since the structural model has been pre-built on the TAS module, the rebar calculation

process can be done by importing the model directly from the TAS to the TRB. By exporting the model from TAS and then importing the model into TRB, after the model has been imported, the rebar can be calculated. Steps in calculating rebar on the TRB application:

1. Calculating the rebar on the columns, for example the C2 ground floor column in the BPNT4 shop office project. First, look at the column schedule image to find out the rebar specifications, seen in Figure 3.20.

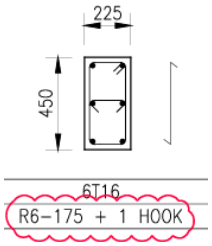


Figure 3. 20 Column details C2 Ground Floor

Based on the image, it can be seen that column C2 is specified for the main bar 6T16, and for links R6-175 + 1 hook, in the TRB application we see in the element list section for column C2 click right and then select search entity, after that click 2 times and enter the attribute editor for column C2 can be seen in figure 3.21.

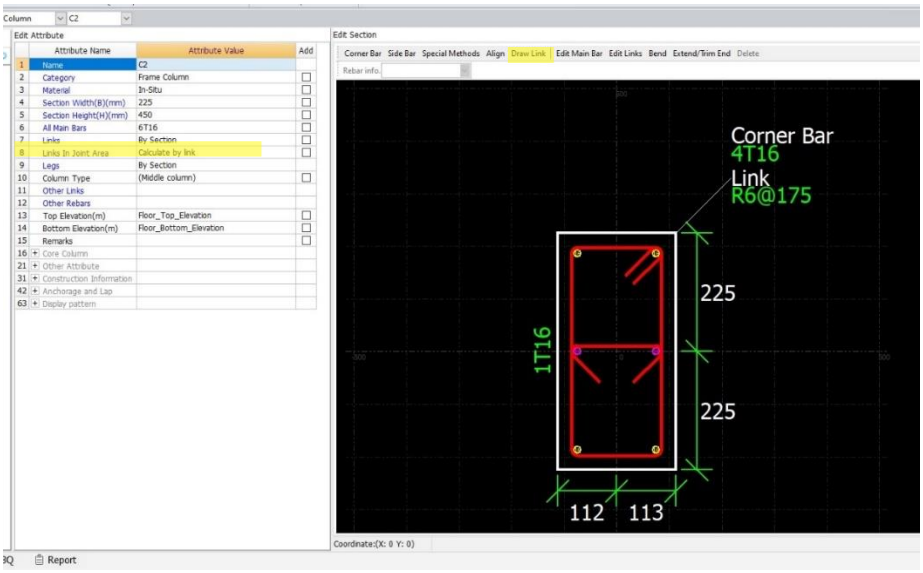


Figure 3. 21 TRB Display Attribute Editor Column C2

It can be seen in the image to insert the main bar, insert it in the yellow part of all main bars, and insert the hook on the yellow part of the draw link. After entering the rebar size, then at the top select the quantity section and then click calculate selected entity, then the rebar will be calculated by the system. To make sure that the rebar has been calculated, click on the 3D rebar section and you can see the rebar on the model as shown in Figure 3.22.

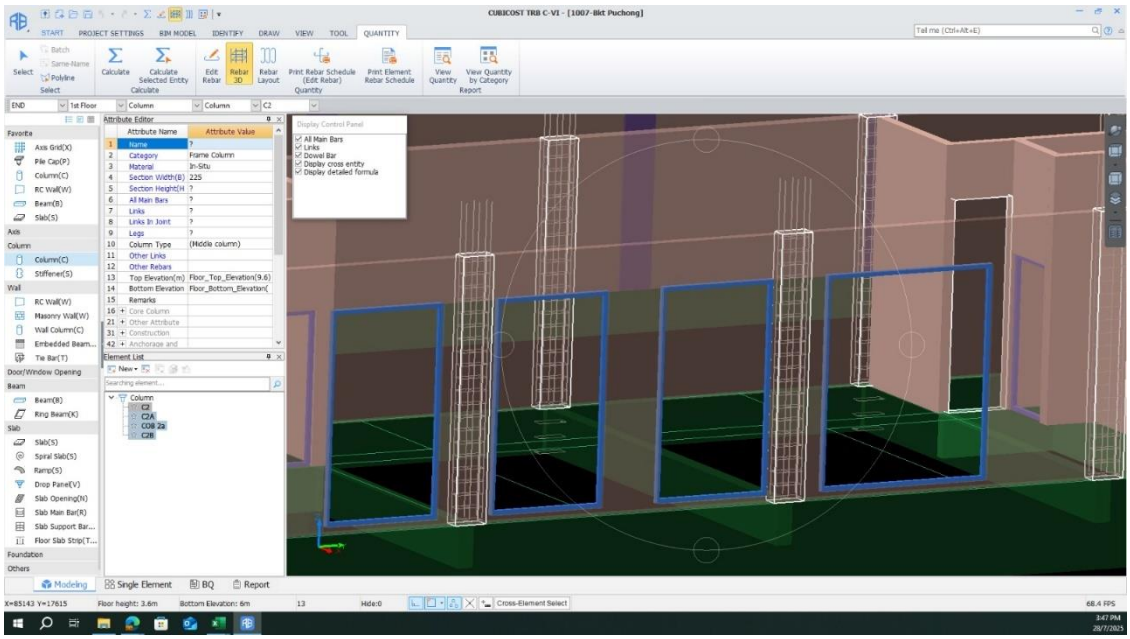


Figure 3. 22 Column rebar model on TRB

2. Calculating the rebar on the beam/sloof, for example the ground beam intermediate unit of the BPNT4 shop office project (I2-GF-H7), the first step is to click on the element list section, then right-click on I2-GF-H7, then click select entity, after that right-click on the ground beam model, and then select the rebar layout as seen in figure 3.23.

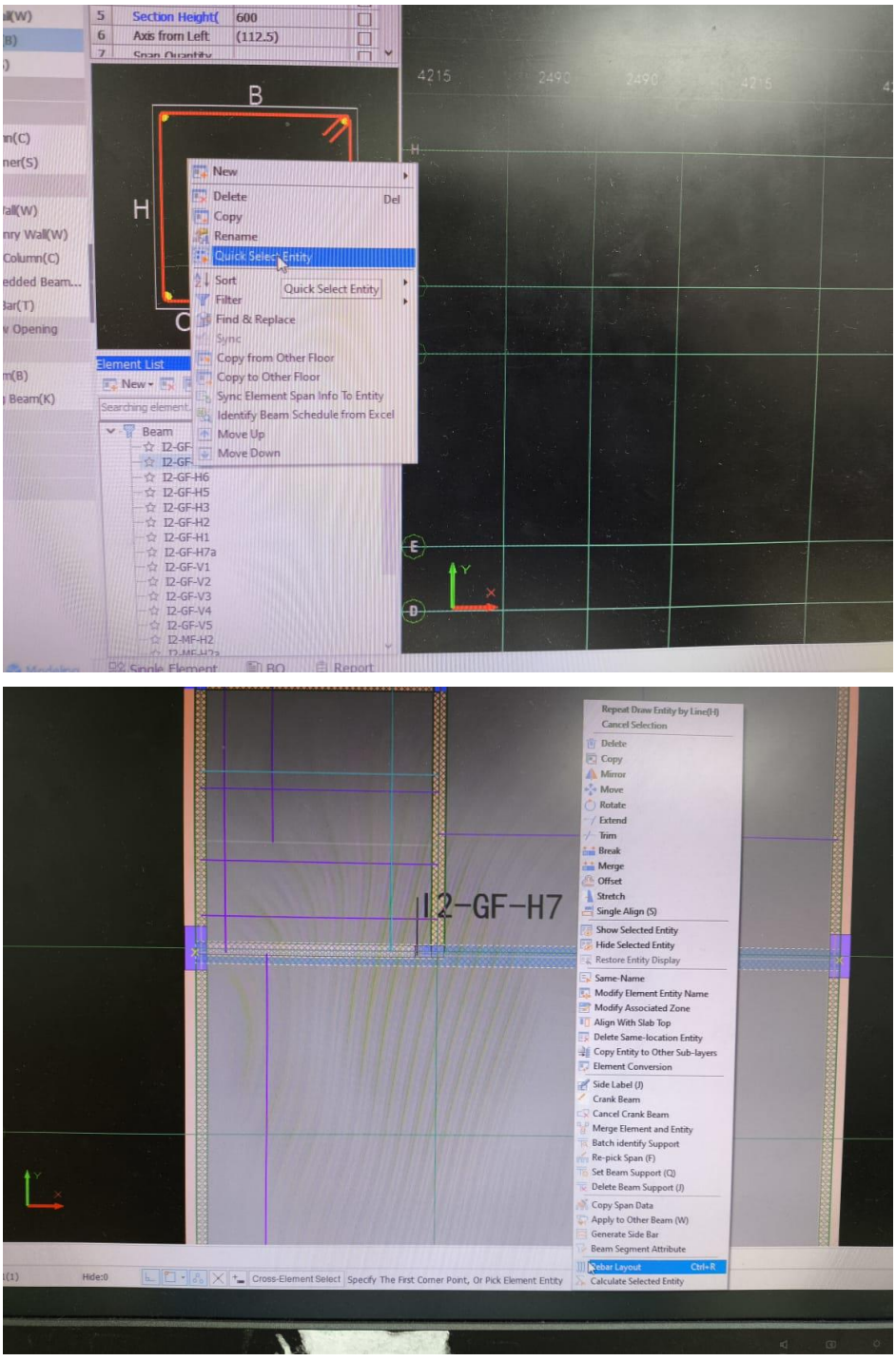


Figure 3. 23 Display TRB for beam

After entering the rebar layout view, the next step is to input the drawing beam detail/schedule in the drawing manager section for the beam rebar calculation process as shown in Figure 3.24.

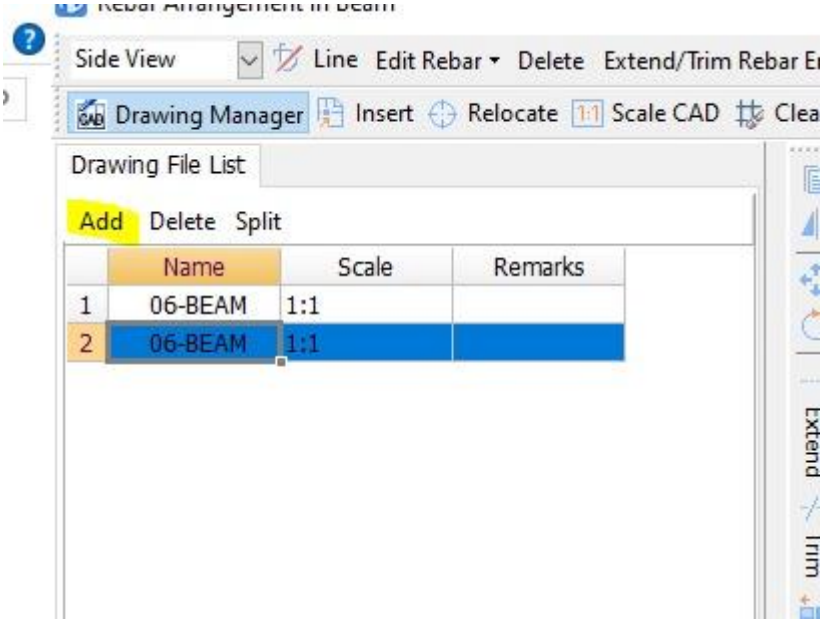


Figure 3. 24 Input Drawing Beam Detail on TRB

After that, calculations can be made for the main bar and links. Seen in Figure 3.25. Regarding the Rebar Layout Display

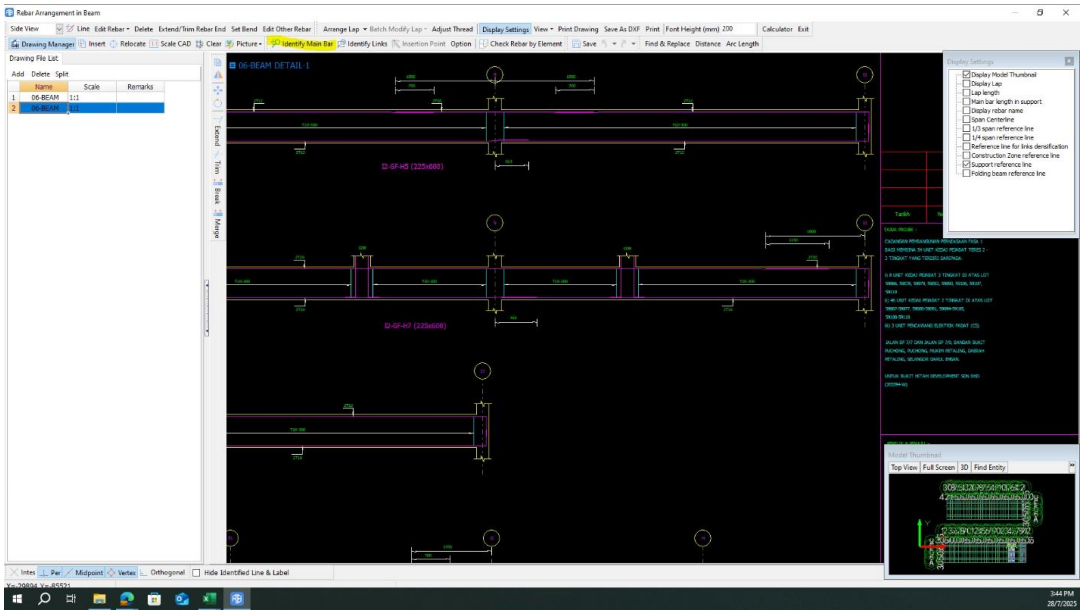


Figure 3. 25 Identify main bar in TRB

To measure the main reinforcement, click on the identify main bar, then select the detail image/information of the main reinforcement according to the selected item (I2-GF-H7) then right-click to confirm the info, then click on the Cad line for the main reinforcement, then right-click after that specify the anchorage on the main reinforcement part, then right-click and a pop up window will appear to

enter the details whether it is continuous top, bottom, or middle reinforcement. Then for the measurement of the links, click on the identify links section as seen in Figure 3.26.

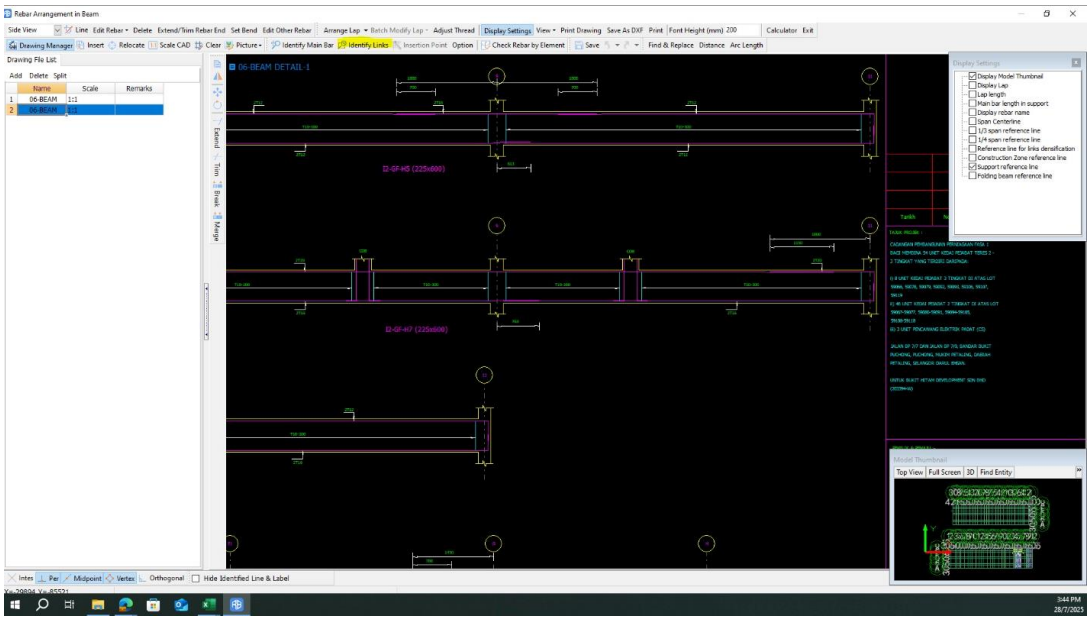


Figure 3. 26 Identify links in TRB

Then select the detail image/link information according to the selected item (I2-GF-H7), then right click to confirm the info, then select the link distance in the details as in Figure 3.27.

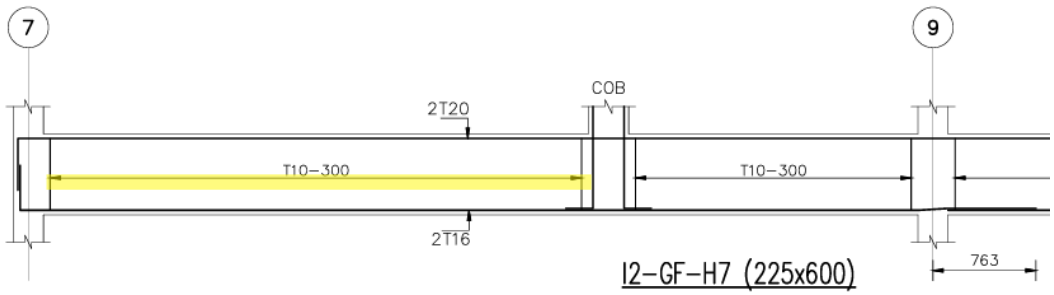


Figure 3. 27 Detail Images ground beam intermediate H7

Then right-click and a pop-up window will appear to enter the details of the links that has been measured by the system, then check whether it is appropriate or not if you have clicked ok, and exit the rebar layout, the beam model display will change like a mesh which indicates that the model has been calculated. Once the

calculation is complete, the TRB application can automatically generate the rebar quantity data on the calculated model. Table 3.10. shows the calculation results for ground beam items in the BPNT4 Int Unit Project.

Table 3. 10 TRB quantity on ground beam Intermediate Unit

Classification Condition			Rebar Weight (kg)						Summary (kg)
Floor	Name	Rebar Type	Rebar Diameter(mm)						
			6	10	12	16	20	25	
Ground	I2-GF-H1	T	0	23,963	27,289	0	0	0	51,253
	I2-GF-H2	T	0	23,963	24,161	5,683	0	0	53,807
	I2-GF-H3	T	0	22,921	13,168	0	40,237	0	76,326
	I2-GF-H5	T	0	23,963	24,255	5,683	0	0	53,901
	I2-GF-H6	T	0	23,963	27,296	0	0	0	51,26
	I2-GF-H7	T	0	23,963	0	24,451	40,849	0	89,263
	I2-GF-H7a	T	0	6,88	9,743	0	0	0	16,623
	I2-GF-H8	T	0	71,89	10,726	24,34	8,879	0	115,836
	I2-GF-V1	T	0	70,496	75,445	12,454	43,522	0	201,917
	I2-GF-V2	T	0	18,039	11,438	20,18	0	0	49,657
	I2-GF-V3	T	0	6,116	10,433	0	0	0	16,549
	I2-GF-V4	T	0	9,938	21,982	0	0	0	31,92
	I2-GF-V5	T	0	70,496	82,498	0	44,04	0	197,034

Based on the table above, it can be explained as follows:

- Classification condition: contains floor indicates floor level, name indicates name/sloof type, rebar type indicates rebar type T (high tensile bar)
- Rebar weight: contains the weight of rebar grouped according to its diameter
- Summary (kg): contains the total weight of rebar

The table presents data on the weight of rebar (rebar) on the ground beam located on the Ground Floor of the project, with groupings based on the name of the structural element, the type of reinforcement, and the diameter of the reinforcement. The Floor column shows that all data is on the ground floor, while the Name column contains element codes such as I2-GF-H1, I2-GF-H2, and I2-GF-V5, which represent the name of the beam type on the ground floor intermediate

unit. The Rebar Type column has a "T" code for all elements, which is interpreted as the type of rebar, which is the high tensile bar.

Furthermore, the Rebar Weight (kg) column is further divided based on the diameter of the rebar, namely 6 mm, 10 mm, 12 mm, 16 mm, 20 mm, and 25 mm. Each value in this column indicates the weight of the reinforcement in kilograms for a specific diameter on each element. For example, the I2-GF-H1 element does not have a 6 mm diameter reinforcement, but it has 23,963 kg of 10 mm diameter reinforcement and 27,289 kg of 12 mm diameter reinforcement, with a total weight of 51,253 kg. In element I2-GF-H3, the use of reinforcement with a diameter of 10 mm reaches 22,921 kg, a diameter of 12 mm of 13,168 kg, and a diameter of 20 mm of 40,237 kg, so the total weight of the bone is 76,326 kg.

Some elements show more diverse combinations of reinforcement diameters. For example, the I2-GF-H7 has 23,963 kg of reinforcement of 10 mm diameter, 24,451 kg of 16 mm diameter, and 40,849 kg of 20 mm diameter, for a total of 89,263 kg. The element with the largest total weight is the I2-GF-V1, which uses 70,496 kg of reinforcement of 10 mm diameter, 75,445 kg of 12 mm diameter, 12,454 kg of 16 mm diameter, and 43,522 kg of 20 mm diameter, resulting in a total of 201,917 kg. Meanwhile, the smallest reinforcement weight is seen in the I2-GF-V3 with a total of only 16,549 kg, consisting of 6,116 kg of 10 mm diameter reinforcement and 10,433 kg of 12 mm diameter. The last column, Summary (kg), is the sum of the total steel reinforcement weights for each element based on all diameters used.

3.2.9.3. Preparation of Bill of Quantity using TBQ

The process of preparing the Bill of Quantity using TBQ Cubicost Glodon began with the collection of raw project files and draft job descriptions that had been prepared by the senior quantity surveyor as an initial reference. The TBQ structure has been equipped with a job description format for each Bill, so most of the work done at this stage focuses on filling in the quantity columns. The quantity of work is obtained from the calculation results on TRB, TAS, and CostX, or from manual calculations, then input into the Quantity column by pressing the F8 key and decomposing the calculation results. In some types of work, such as the BPNT4

Shop Office project, the calculation results in TAS and TRB are carried out for one unit, so that the total number of units is entered in the Times column (e.g., End Unit is 4 and Intermediate Unit is 46), while the quantity value per unit is entered in the Factor column. As seen in Figure 3.28.

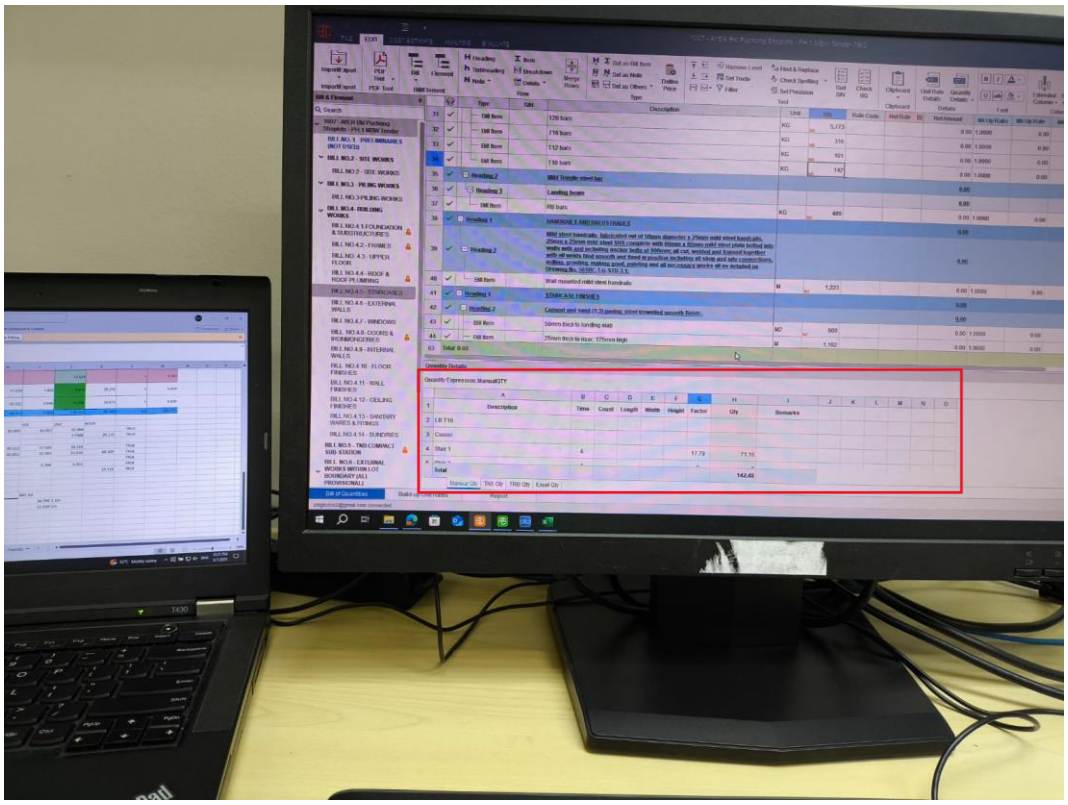


Figure 3. 28 TBQ Display

Although most of the job descriptions in TBQ have been prepared by senior quantity surveyors, there are several sections that require the preparation of new descriptions, namely Bill 4 Building Works in the sub-section of Bill 4.8 Windows, Bill 4.9 Doors and Rebarmongery, and Bill 5 TNB Compact Sub-Station. The preparation of descriptions in these sections is carried out by referring to existing project TBQ documents, such as the Alix Residence project, and then adjusting them to the working drawings, as well as the technical specifications that apply to the project being worked on.

During quantity input, a re-check of the value entered is carried out to ensure the compatibility between the volume of work in TBQ and the results of the initial calculation, including unit verification and total quantity. This check is necessary

to maintain the accuracy of the data that will be used at the project cost calculation stage.

3.2.10 Meetings with teams and stakeholders

Meeting activities with teams and stakeholders are one of the important processes in the management of construction projects, which aim to equalize perceptions, validate planning, and ensure that all parties understand the scope of work and targets to be achieved. In the implementation of the internship, the meeting activities that were followed included discussions at the pre-construction stage and the construction stage involving various parties such as Quantity Surveyors, main contractors, Nominated Subcontractors (NSC), representatives of project owners, and planning consultants.

The first meeting was held on the first day of the internship, located at the location of the Bukit Puchong Shop Office project plan , more precisely at Bukit Hitam Development's Sales Gallery. This project is still in the pre-construction stage so the discussion of the meeting is focused on discussing the working drawings that have been prepared by the planning consultant. The Quantity Surveyor is asked to prepare a more detailed cost calculation based on the drawing.

The second meeting was held in an office meeting room, focusing on the Alix Residence project. This meeting involved the project team, NSC representatives who handled the interior work. The main agenda of the meeting was to discuss the request for changes in work specifications, especially in the elevator lobby area, which is a change in paint color requested by the project owner. The discussion included a review of the proposed material specifications, as well as an analysis of the impact of the changes on the cost and schedule of the work. The Quantity Surveyor provides input related to the estimated additional costs (Variation Order / VO) that may arise due to the change.

The third meeting that was held was an internal team meeting in the office. The focus of the discussion at this meeting was the analysis and recalculation of the dimensions of the structural columns in the Bukit Puchong Shop office project. The following figure 3.29 shows the meeting activities with the team

Figure 3. 29 Meetings with the team

Through these three meetings, the coordination process between the team and project stakeholders can run more effectively. Each meeting has a different focus and scope of discussion, but all of them have an important role in supporting the smooth running of the project, both in the planning and implementation stages. The documentation of the meeting and the results of the discussion are important references for the follow-up of work and decision-making at the next stage.

3.2.11 Assist in Creating, Checking, and Drafting Documents IV, VO, and RFVA on the Alix Residence Project

During the internship activity, one of the tasks carried out was to assist in the process of creating, checking, and preparing documents related to Interim Valuation (IV), Variation Order (VO), and Request for Variation Approval (RFVA) in the Alix Residence project. Each type of document has its own functions and procedures that are interrelated in the management of construction project administration.

The Interim Valuation (IV) document is a document used to calculate the value of the progress of work that has been carried out by the contractor in a certain period, which then becomes the basis for payment from the project owner to the

contractor. The IV preparation process began with the collection of data on the progress of work in the field, both based on site engineer reports and physical measurement results. After the data is collected, a check is carried out on the suitability of the volume of work with the initial contract. Corrections are made if there is a discrepancy between field data and contract data. The calculation of the progress value is then made using the applicable IV format by including the description of the work, volume, unit price, and total value.

The Variation Order (VO) document is used to record any changes to work that are not listed in the original contract, whether in the form of additions, subtractions, or changes in work specifications. The process of making a VO begins with the identification of the need for the change, followed by an explanation of the reason for the change, the calculation of the additional volume or reduction, and the estimated cost due to the change. Changes can be caused by the project owner's request, field conditions that differ from the plan, or specific technical needs.

The Request for Variation Approval (RFVA) document is an official document submitted to the project owner to obtain approval for the change in the work that has been calculated in the VO. The RFVA contains a summary of the changes to the work, the total proposed costs, and the technical and administrative justifications. The RFVA verification process includes verifying the conformity of cost details with the calculations on the VO and ensuring all supporting data is complete before submitting it for approval.

Involvement in the creation, checking, and preparation of these three documents requires high precision, understanding of the employment contract, and good coordination between the Quantity Surveyor team, the field team, and the project management. The three documents have a strategic role in regulating payment flows, controlling changes in work, and maintaining the regularity of project administration in accordance with applicable contract agreements and procedures.

CHAPTER IV
CASE STUDY

This chapter discusses a case study of the analysis of electrical and electronic work in the Alix Residence Block A construction project located at Jalan Dutamas Raya, Segambut, Mukim Batu, Federal Territory of Kuala Lumpur, Malaysia. The discussion included a series of information and analysis that was systematically compiled to provide a comprehensive overview ranging from the general condition of the project to the estimated cost and scheduling of the implementation of the work.

In the initial part, general project data, technical data, materials and equipment, construction methods, quantity calculations, cost estimates, and work scheduling are presented as a guide for an effective and efficient implementation sequence, adjusted to the target project completion time.

4.1 General Project Data

The following figure 4.1 shows a perspective image of the Alix Residence project

Figure 4. 1 Perspective View 4 Alix Residence Block A

The Alix Residence project is a high-rise apartment complex construction located in the strategic area of Dutamas, Kuala Lumpur, Malaysia. This project consists of two main blocks, namely Block A with a height of 38 floors and Block B with a height of 25 floors, with a total of 364 residential units. Alix Residence is designed as a modern residence that integrates comfort, space efficiency, and state-of-the-art electrical systems, including the installation of power systems, lighting, communication, and security.

The work that is the focus of this project is Electrical & Electronic, which includes the installation of electrical systems, power distribution systems, general and emergency lighting systems, fire alarm systems, CCTV, access control, and internal communication systems.

The main objectives of the Alix Residence construction project are as follows:

- Providing high-quality vertical residences that meet the standards of comfort, safety, and energy efficiency for urban communities in Kuala Lumpur.
- Implement an integrated electrical and electronic system to support building operations optimally and sustainably.
- Ensuring construction is carried out in accordance with technical specifications and scheduled timelines, with strict supervision from a team of professional consultants and supported by measurable quantity based implementation.
- Supporting the development of integrated residential areas that are in line with urban spatial planning and the needs of the modern property market.

4.2 Project technical data

The technical data of the Alix Residence construction project is as follows:

Project name	: Alix Residence
Project owner	: Orchard Park Sdn. Bhd
Office address	: 34th floor, Menara TA One, 22, Jalan P. Ramlee, 50250 Kuala Lumpur, Malaysia

Project Location	: Jalan Dutamas Dahlia, Dutamas. 51200 Kuala Lumpur, Federal Territory of Kuala Lumpur, Malaysia
Job Type	: Electrical Work and Electronic Work
Implementation Time	: 32 Months (Overall based on contract)
Nature of the Contract	: PAM Contract 2006 (With Quantities)
Payment Methods	: Monthly Payment
Contract Value	:RM. 171.880.000
Land	: 18.509 m2
Building Area	: 2.135,97 m2 (TA 1st Floor)
Number of Floors	: 38-storey Block A (200 residential units), 25-storey Block B (164 residential units)
Building Type	: Residence (Apartment)
Civil & Structural Engineer	: Jurutera Perunding Primareka Sdn. Bhd
Architect	: GDP Architects Sdn. Bhd
Mechanical & Electrical Engineer	: Petareka Perunding (M) Sdn Bhd
Quantity Surveyor	: Perunding Kos T&K Sdn Bhd
Landscape Architect	: WDI Design Sdn. Bhd
Interior Design	: Motto Design Sdn. Bhd

4.3 Materials and Equipment

The materials and equipment used in the electrical and electronic work of the Alix Residence block A project were selected based on technical standards, cost efficiency, and long-term reliability. The details of the materials and equipment used are:

1. Cables and Conveyors

   Cables are a vital element in the electrical system. Some of the types of cables used include:

   - Mega brand Cable 4x16 mm + CPC as the main conductor of power distribution
   - NYM cables (2x1.5 mm, 3x1.5mm, 3x2.5mm, 3x4mm dam) for indoor electrical installations
   - NYY cable (2x1.5 m, 3x2.5mm) for outdoor electrical installation as it has an additional protective layer
   - RG6 coaxial cable is used for CCTV and video communication systems
   - Low-voltage 2-core 4mm cable for control system needs
   - TP-Link Cat6 UTP cable for data network system and smart building integration

2. Electrical Installation Equipment
   - Faceplate and Bell Push Switch
   - By Bell Switch
   - ERA FS220 20A 2P Fireman Switch as a component of fire protection and emergency disconnection
3. Electronic Devices and Supporting Systems
   - RFID Door Access Control System (D99/KM99) functions for security systems and occupant access management
   - CCTV as a security monitoring system
4. Supporting Equipment
   - Electric welding and cutting sets are used for supporting work for cable tray installation, panels, and light construction
   - The generator set is used as a temporary power supply during the installation and testing process of the system

4.4 Construction Methods

The construction method of electrical and electronic work is carried out through systematic stages, paying attention to occupational safety (K3) factors, coordination between parties, and work quality standards. The stages of implementation are as follows:

1. Preparation Stage
    a. Technical Coordination
        - Conducting kick-off meetings with MEP consultants, civil contractors, and architects.
        - Align cable lines, trays, conduit pipes, and panel locations so that they do not conflict with the structure, plumbing, and interior.
    b. Document Inspection
        - Review of electrical & electronic work pictures.
        - Compare with architectural & civil drawings to determine possible installation paths.
    c. Material Mobilization
        - Bringing materials (cables, conduits, panels, CCTV, access control) into the project warehouse.
        - Checking the completeness of the quality certificate.
        - Storing materials to standard.
    d. Field Preparation
        - Determine the area laydown point for the material.
        - Preparing work equipment: drills, crimping pliers, fish tape, meggers, backup generators.
        - Provide PPE (helmet, safety shoes, gloves, vest, safety glasses).

2. Cable Line Installation Work
    a. Cable Strip Installation
        - Mark the path on the wall/ceiling according to the picture.
        - Installing PVC/steel conduit for indoor lines.
        - Install trays/cable stairs for the main line on the ceiling/service floor.

- Provide a pull box/junction box every 15 meters or every >90° turn.

b. Cable Pulling
    - The cable is pulled using fish tape or drum rollers.
    - Performed by a minimum of 3 people (one person inserting the cable into the path, one pulling it, and one person directing it so that it does not get caught or damaged).
    - Cable pulling lubricant is applied to reduce friction.
    - The cable is labeled with identification on both ends.

c. Neat & Safe
    - The cable is tied with a cable tie/clamp on the tray.
    - The fastener distance ≤ 40 cm for small cables and 60 cm ≤ for large cables.
    - Cables are separated by function, power cable, control cable (low voltage), and data & communication cable (Cat6, coaxial)

3. Electrical Equipment Installation

a. Distribution Panel
    - The panels are placed in the panel room/service room.
    - The installation of MCB, MCCB, and ELCB is according to the single line diagram.
    - Torque checking bolts using a torque wrench.

b. Sockets, Switches, and Bell Switches
    - Installation of the back box according to standard height
    - Cable terminal adjustment

c. Indoor & Outdoor Lights
    - Installation of light brackets on ceilings/walls.
    - Cable connection using a connector (not manual isolation).
    - Testing the lighting position to suit the architectural design.

4. Electronic Systems Jobs
    a. CCTV
        - Installation of camera brackets at points according to the security layout.
        - Pull the coaxial/UTP + power supply cable to the control room.
        - Installation of DVR/NVR and monitor.
        - Setting IP addresses for system integration.
    b. Access Control (RFID)
        - Installation of RFID reader on the side of the door.
        - Installation of a magnetic door lock/electric strike on the door frame.
        - Cat6 cable connection to the controller.
        - Installation of access control software on the server.
    c. Fireman Switch
        - Installed in the main door area as standard.
        - Function tested with emergency shutdown simulation.

4.5 Quantity Calculation

The calculation of the quantity of electrical and electronic work on the Alix Residence Block A project is carried out manually based on the work drawings. Cable length measurement is carried out using AutoCAD software, by utilizing the dimension tools feature to measure the cable distance. Meanwhile, the calculation of the number of units (item numbers) is done manually by referring to the symbols

and legends contained in the plan drawing. The following figure 4.2 shows the card access system layout of the 1st floor

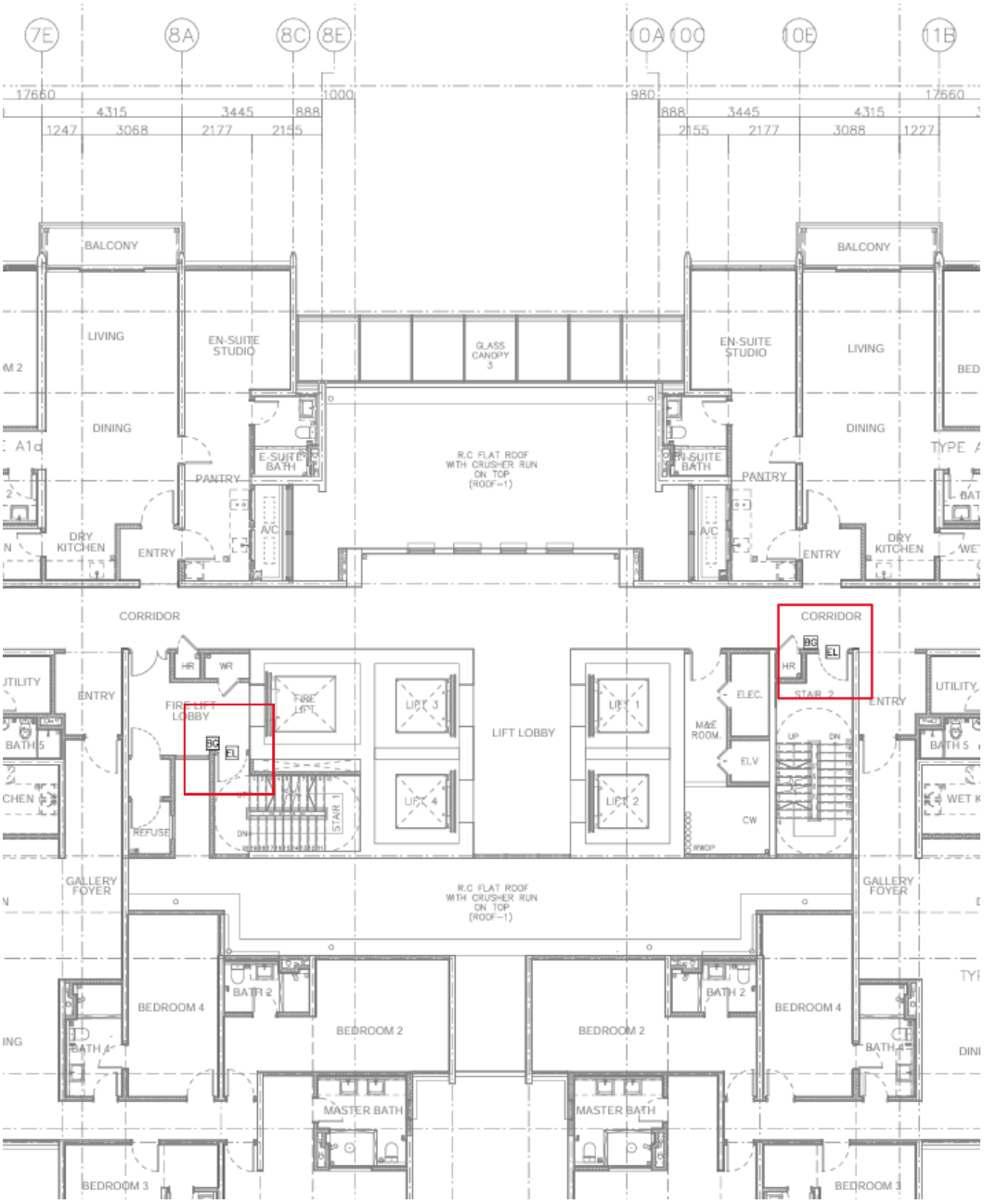


Figure 4. 2 Card Access system layout 1st Floor

In the drawing of the plan there is also a legend for the image caption, seen in figure 4.3.

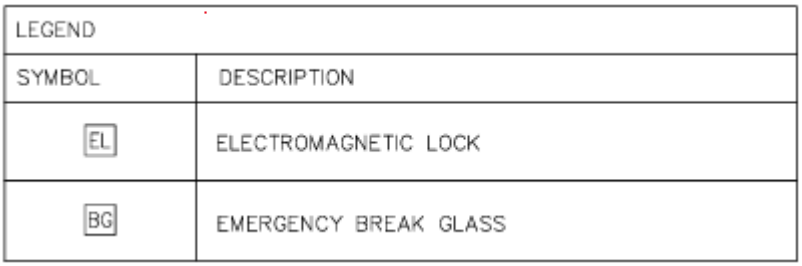


Figure 4. 3 Legend for drawing Card Access system layout

An example of an electronic calculation shown is the layout of the 1st floor card access system, with the results of the quantity recapitulation shown in the following Table 4.1

Table 4. 1 Calculation of the quantity of card accesses 1st floor

No	Description	member	Unit	Qty	Total QTY
	1st floor				
1	Electromagnetic Lock	1	Nos.	2	2
2	Emergency break glass	1	Nos.	2	2

- No: Work item sequence number.
- Description: The description or type of item that is calculated.
- Member: The number of repetitions of a typical item.
- Unit: A unit of measurement of quantity (unit/fruit/nos).
- Qty: indicates the quantity of the calculated item
- Total qty: total quantity multiplied by the number (member)

Based on the table above, it is known that the calculation of the electronic quantity for card access on the 1st floor of Alix residence block A, which consists of electromagnetic lock items and also emergency break glass items.

For electrical calculations as an example of cable routing calculations for the 1st floor, here is a Figure 4.4 of the cable routing plan for the 1st floor

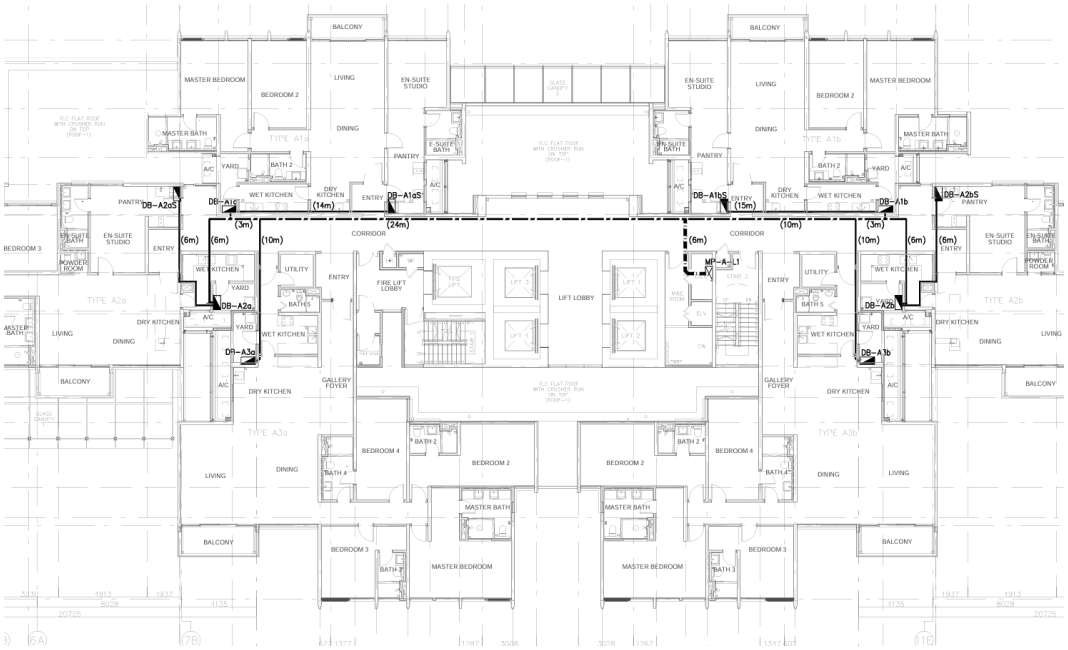


Figure 4. 4 1st floor plan picture

The following table 4.2 shows the calculation of the 1st floor cable routing

Table 4. 2 Calculation of cable routing on the 1st floor

No	Description	member	Unit	length	total length	Enclosure	Total enclosure	Remarks
	1st F (4x1c 16mm SQ PVC CU. CABLE + CPC)							
1	MP-A-L1 to DB-A1a	1	m	33	33	6	6	200x50 MS Trunking
		1	m		0	27	27	75x50 Ms trunking
2	MP-A-L1 to DB-A3a	1	m	40	40	6	6	200x50 MS Trunking
		1	m		0	24	24	75x50 Ms trunking
		1	m		0	10	10	25mm dia. Concealed Conduit
3	MP-A-L1 to DB-A2a	1	m	39	39	6	6	200x50 MS Trunking
		1	m		0	27	27	75x50 Ms trunking
		1	m		0	6	6	25mm dia. Concealed Conduit
4	MP-A-L1 to DB-A1b	1	m	19	19	6	6	200x50 MS Trunking
		1	m		0	13	13	75x50 Ms trunking
5	MP-A-L1 to DB-A2b	1	m	25	25	6	6	200x50 MS Trunking
		1	m		0	13	13	75x50 Ms trunking

No	Description	member	Unit	length	total length	Enclosure	Total enclosure	Remarks
6		1	m		0	6	6	25mm dia. Concealed Conduit
	MP-A-L1 to DB-A3b	1	m	26	26	6	6	200x50 MS Trunking
		1	m		0	10	10	75x50 Ms trunking
		1	m		0	10	10	25mm dia. Concealed Conduit
7	DB-A2b to DB-A2bS	1	m	6	6	6	6	25mm dia. Concealed Conduit
8	DB-A1b to DB-A1bS	1	m	15	15	15	15	25mm dia. Concealed Conduit
9	DB-A2a to DB-A2aS	1	m	6	6	6	6	25mm dia. Concealed Conduit
10	DB-A1a to DB-A1aS	1	m	14	14	14	14	25mm dia. Concealed Conduit
Total 1st floor			223				223	

Based on the table above, it can be explained as follows:

- No: Job Sequence Number
- Description: Description of cable lines, starting point to destination
- Member: the same number of jobs (because only the 1st floor is not typical so the member is 1)
- Unit: the unit of the calculation (the length of the cable is the unit of meters)
- Length: length of cable obtained
- Total length: the total length of the cable after multiplying the typical number (member)
- Enclosure: cable cover (with cable tray trunking / with conduit)
- Total Enclosure: the total enclosure after multiplying the typical number (member)
- Remarks: type of enclosure used

Based on the table above, it is known that the quantity of electrical work for the installation of cable routing on the 1st floor of the Alix Residence Block A project.

4.6 Cost Estimate

The first step in cost estimation is determining the unit price of work through Unit Price Analysis. This process is intended to generate cost values that are accurate and accountable from both technical and administrative perspectives. For example, unit price analysis is conducted for electronic work items such as:

- Electromagnetic Lock

Table 4. 3 Electromagnetic Lock Working Unit Price Analysis

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	TENAGA KERJA				
	Mandor	OH	0,04	RM 180,00	RM 7,20
	Tukang Listrik	OH	0,4	RM 180,00	RM 72,00
	Pekerja Terampil	OH	0,2	RM 120,00	RM 24,00
			JUMLAH HARGA SATUAN		RM 79,20
B	MATERIAL				
	Electromagnetic Lock Set	Set	1	RM 195,00	RM 195,00
	Kabel Low Voltage 2 Core	M	10	RM 2,40	RM 24,00
			JUMLAH HARGA SATUAN		RM 219,00
C	PERALATAN				
			JUMLAH HARGA PERALATAN		RM -
D	JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)				RM 298,20
E	BIAYA UMUM	10,00%	% x D		RM 29,82
F	HARGA SATUAN PEKERJAAN (D+E)				RM 328,02

The unit price analysis for the electromagnetic lock system is composed of labor, material, equipment, and general cost components. In the labor section (A), the work involves three types of personnel: a foreman with a coefficient of 0,04 OH, an electrician at 0,40 OH, and a skilled worker at 0,20 OH. With daily rates of RM 180,00 for both the foreman and electrician, and RM 120,00 for the skilled worker, the total labor cost amounts to RM 103,20 per unit of work.

In the material section (B), one set of electromagnetic lock is required at RM 195,00, along with 10 meters of low-voltage 2-core cable priced at RM 2,40 per meter, resulting in a total material cost of RM 219,00. No equipment is listed under section C, indicating that no specific tools are needed for this scope of work.

The direct cost (D), which combines labor, material, and equipment, totals RM 328,20. Although section E is labeled for general costs at 10% of the direct cost, the value is not calculated separately and is instead already included in the final unit price. Therefore, the total unit price for the installation of the

electromagnetic lock system is RM 328,20 per set, which serves as the basis for the Bill of Quantities (BQ).

- Emergency Break Glass

Table 4. 4 Analysis of Work Unit Price Emergency break glass unit

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	TENAGA KERJA				
	Mandor	OH	0,02	RM 180,00	RM 3,60
	Tukang Listrik	OH	0,2	RM 180,00	RM 36,00
	Pekerja Terampil	OH	0,1	RM 120,00	RM 12,00
			JUMLAH HARGA SATUAN		RM 39,60
B	MATERIAL				
	Emergency Break Glass Unit	Bh	1	RM 30,00	RM 30,00
	Kabel Low Voltage 2 Core	M	5	RM 2,40	RM 12,00
			JUMLAH HARGA SATUAN		RM 42,00
C	PERALATAN				
			JUMLAH HARGA PERALATAN		RM -
D	JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)				RM 81,60
E	BIAYA UMUM	10,00%	% x D		RM 8,16
F	HARGA SATUAN PEKERJAAN (D+E)				RM 89,76

The unit price analysis for the installation of the emergency break glass unit is composed of labor, material, equipment, and general cost components. In the labor section (A), the work involves three categories of personnel: a foreman with a coefficient of 0,02 OH, an electrician at 0,20 OH, and a skilled worker at 0,10 OH. With daily rates of RM 180,00 for both the foreman and electrician, and RM 120,00 for the skilled worker, the total labor cost amounts to RM 51,60 per unit of work.

In the material section (B), one emergency break glass unit is required at RM 30,00, along with 5 meters of low-voltage 2-core cable priced at RM 2,40 per meter, resulting in a total material cost of RM 42,00. No equipment is listed under section C, indicating that no specific tools are needed for this scope of work.

The direct cost (D), which includes labor, material, and equipment, totals RM 81,60. The general cost (E) is calculated at 10% of the direct cost, amounting to RM 8,16. Therefore, the final unit price (F) for the installation of the emergency break glass unit is RM 89,76 per unit, which serves as the basis for the Bill of Quantities (BOQ).

After conducting a unit price analysis (AHSP), the next step is to prepare a Bill of Quantity (BQ). The BQ is obtained by multiplying the unit price of the work by

the volume of the work that has been calculated in advance based on the work drawing.

This calculation aims to find out the total cost needed for each electronic work item, such as electromagnetic locks and emergency break glass, according to the number of units installed in the Alix Residence Block A project.

The results of the BQ calculation are presented in Table 4.5 with the following structure:

Table 4. 5 BQ

NO	DESCRIPTION	UNIT	VOLUME	UNIT PRICE	TOTAL PRICE
I	**ELEKTRIKAL**				
	1st-11th Floor				
	Cable Routing				
	4x1c 16mm SQ PVC CU. CABLE + CPC	m	2453	RM 105,60	RM 259.036,80
	200x50 MS Trunking	m	396	RM 54,34	RM 21.518,64
	75x50 Ms trunking	m	1254	RM 43,01	RM 53.934,54
	25mm dia. Concealed conduit	m	803	RM 28,60	RM 22.965,80
	SUB-TOTAL CABLE ROUTING				**RM 357.455,78**
	Lighting Layout				
	8W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING	no	11	RM 106,70	RM 1.173,70
	12W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING	no	22	RM 111,10	RM 2.444,20
	5W LED DOWN LIGHT 3000K CIRCLE	no	55	RM 101,20	RM 5.566,00
	17W LED DOWN LIGHT	no	220	RM 124,30	RM 27.346,00
	LED STRIP (WARM WHITE)	m	132	RM 105,60	RM 13.939,20
	1X18 W T8 CEILING MOUNTED LED LIGHT FITTING	no	11	RM 125,40	RM 1.379,40
	1X18W T8 WALL MOUNTED LED LIGHT FITTING	no	22	RM 126,50	RM 2.783,00
	2X9W T8 LED LIGHT FITTING C/W DIFFUSER	no	44	RM 136,40	RM 6.001,60
	SELF-CONTAINED EMERGENCY LIGHT (LED) CONCEALED IN CEILING	no	88	RM 207,90	RM 18.295,20
	SELF-CONTAINED KELUAR SIGN (LED)	no	33	RM 235,40	RM 7.768,20
	FIREMAN SWITCH	no	22	RM 856,90	RM 18.851,80
	1 GANG 1 WAY LIGHTING SWITCH	no	33	RM 100,10	RM 3.303,30
	SUB-TOTAL LIGHTING LAYOUT				**RM 108.851,60**
	Lighting small power				
	Lighting point c/w connector	no	1116	RM 180,84	RM 201.817,44
	ceiling fan point c/w connector & hook	no	159	RM 220,33	RM 35.032,47
	1x13A switch socket outlet (300mm from F.F.L)	no	560	RM 172,48	RM 96.588,80
	2x13A switch socket outlet (300mm from F.F.L)	no	90	RM 190,08	RM 17.107,20
	1X13A switch socket outlet (1200mm from F.F.L)	no	68	RM 172,48	RM 11.728,64
	2x13A switch socket outlet (1200mm from F.F.L)	no	101	RM 190,08	RM 19.198,08
	1x15A switch socket outlet for fridge (1200mm from F.F.L)	no	46	RM 222,31	RM 10.226,26
	1X13A switch socket outlet for hood (2100mm from F.F.L)	no	56	RM 172,48	RM 9.658,88
	1x15A switch socket outlet for hob (600mm from F.F.L)	no	56	RM 222,31	RM 12.449,36
	1x15A switch socket outlet for oven (600mm from F.F.L)	no	56	RM 222,31	RM 12.449,36
	1x13A switch socket outlet for microwave (600mm from F.F.L)	no	56	RM 172,48	RM 9.658,88
	Air Conditioner point (2800mm from F.F.L)	no	80	RM 263,56	RM 21.084,80
	20A SPN isolator	no	11	RM 108,68	RM 1.195,48
	water heater point c/w blind faceplate (2800mm from F.F.L)	no	125	RM 246,18	RM 30.772,50
	smatv outlet (300mm from F.F.L) unless stated otherwise	no	90	RM 153,89	RM 13.850,10
	telecom fiber wall socket (300mm from F.F.L) with labeling master unit and en-suite stu	no	56	RM 159,39	RM 8.925,84
	door bell point (2400mm from F.F.L)	no	56	RM 88,73	RM 4.969,07
	audio intercom point (1500mm from F.F.L)	no	56	RM 325,89	RM 18.250,03
	distribution board (1800mm from F.F.L)	no	56	RM 924,55	RM 51.774,80
	Air conditioner switch (1200mm from F.F.L)	no	182	RM 371,14	RM 67.547,48
	water heater switch (1200mm from F.F.L)	no	125	RM 270,38	RM 33.797,50

NO	DESCRIPTION	UNIT	VOLUME	UNIT PRICE	TOTAL PRICE
	2 gang 1 way for hood & hob switch (1200mm from F.F.L)	no	56	RM 243,98	RM 13.662,88
	1 gang 1 way switch (1200mm from F.F.L)	no	274	RM 218,24	RM 59.797,76
	2 gang 1 way switch (1200mm from F.F.L)	no	159	RM 243,98	RM 38.792,82
	3 gang 1 way switch (1200mm from F.F.L)	no	114	RM 254,54	RM 29.017,56
	2 gang 1 way for oven & microwave switch (1200mm from F.F.L)	no	22	RM 243,98	RM 5.367,56
	1 gang 1 way for oven switch (1200mm from F.F.L)	no	34	RM 218,24	RM 7.420,16
	1 gang 1 way for microwave switch (1200mm from F.F.L)	no	34	RM 218,24	RM 7.420,16
	exhaust fan c/w connector	no	35	RM 510,18	RM 17.856,30
	30A TPN isolator	no	11	RM 185,68	RM 2.042,48
	door bell switch (1200mm FROM F.F.L)	no	34	RM 40,04	RM 1.361,36
	30A SPN isolator	no	12	RM 111,98	RM 1.343,76
	2 gang 2 way switch (1200mm from F.F.L)	no	24	RM 226,82	RM 5.443,68
	swimming pool light2	no	3	RM 530,64	RM 1.591,92
	pole light	no	2	RM 717,64	RM 1.435,28
	uplight with earthspike	no	12	RM 354,64	RM 4.255,68
	bollard light	no	2	RM 420,64	RM 841,28
	pavilion column light	no	2	RM 294,14	RM 588,28
	wall light	no	6	RM 276,54	RM 1.659,24
	1x13A weather proof switch socket outlet (1200mmfrom F.F.L)	no	2	RM 349,25	RM 698,50
	SUB-TOTAL LIGHTING SMALL POWER				**RM 888.679,62**
	Small power				
	1x13A metalclad switch socket outlet (1500mm from F.F.L)	no	33	RM 174,68	RM 5.764,44
	distribution board	no	4	RM 924,55	RM 3.698,20
	Fireman switch	no	22	RM 364,32	RM 8.015,04
	SUB-TOTAL SMALL POWER				**RM 17.477,68**
	SUB-TOTAL ELECTRICAL				**RM 1.372.464,68**

II	**ELEKTRONIK**				
	CCTV 36th Floor				
	cctv (2mp ip poe fixed lens dome camera)	no	2	RM 419,57	RM 839,14
	4 port poe network switches	no	1	RM 184,58	RM 184,58
	SUB-TOTAL CCTV				**RM 1.023,72**
	Card Access				
	electromagnetic lock	no	22	RM 328,02	RM 7.216,44
	emergency break glass	no	22	RM 89,76	RM 1.974,72
	SUB-TOTAL CARD ACCESS				**RM 9.191,16**
	SUB-TOTAL ELECTRONICAL				**RM 10.214,88**
	TOTAL ELECTRICAL AND ELECTRONICAL				**RM 1.382.679,57**

Based on the table above, it can be explained as follows:

- No: Work item sequence number.
- Description: A description or name of a work item.
- Unit: A unit of measurement (e.g., meter, unit, fruit).
- Volume: The total number of items based on the working drawing.
- Unit Price: The price per unit of the item based on the results of the AHSP analysis.
- Total Price: The result of multiplying volume and unit price.

Based on the Bill of Quantity (BQ) Table of electrical and electronic work for the Alix Residence Block A project on floors 1–11, a total of RM 1.382.679,57 was obtained. Electrical work made the largest contribution, with a value of RM 1.372.464,68, divided into four main groups: Cable Routing (RM 357.455,78), Lighting Layout (RM 108.851,60), Lighting Small Power (RM 888,679.62), and Small Power (RM 17.477,68). Meanwhile, electronic work has a total of RM 10.214,88, consisting of CCTV at RM 1.023,72 and card access at RM 9.191,16.

The compilation of the value refers to the actual volume of work multiplied by the unit price, as determined by the analysis.

4.7 Scheduling

The first step in the scheduling process is to calculate the duration of each job.(Manto, 2012) The calculation begins by determining the working capacity of one worker, using the formula:

$$\frac{1}{total\ coefficient\ AHSP}$$

For example, in electromagnetic lock work, the total coefficients in AHSP are:

$$\frac{1}{(0{,}04 + 0{,}4 + 0{,}2)} = 1{,}5625$$

So the working capacity of one worker for 1 is 1.5625 days, that is, one worker is able to complete 1.5625 units of electromagnetic locks in one day. Furthermore, this capacity is multiplied by the number of workers allocated. For example, if the job requires 5 workers, then the total working capacity of the team is:

$$5\ x\ 1{,}5625 = 7{,}8125$$

With a work volume of 22 units, the duration of the work is calculated as:

$$\frac{22}{7{,}8125} = 2{,}816 \sim 3\ day$$

Thus, the estimated duration to complete electromagnetic lock work with 5 workers is 3 days.

After getting the total duration, to make an S curve graphic we determine the weight of each job as shown in Table 4.6.

Table 4. 6 Time Schedule

NO. DIVISI	URAIAN	JUMLAH HARGA PEKERJAAN		BOBOT	DURASI (MINGGU)
		RM		%	
1	Cable Routing	RM	357.455,78	25,85	9
2	Lighting Layout	RM	108.851,60	7,87	3
3	Lighting small power	RM	888.679,62	64,27	15
4	Small power	RM	17.477,68	1,26	2
6	CCTV 36th Floor	RM	1.023,72	0,07	1
7	Card Access	RM	9.191,16	0,66	1
	JUMLAH TOTAL HARGA PEKERJAAN	**RM**	**1.382.679,57**	100	

- No Divisi: Indicates the division/occupation sequence number on the list.
- Uraian: Indicates the name or description of the job type.
- Jumlah harga pekerjaan (RM): The value of the budgeted cost for the work in Malaysian Ringgit.
- Bobot (%): The percentage of the work's contribution to the total cost of the project.
- Durasi (minggu): The estimated length of time the work is carried out in units of weeks.

To find the weights using the formula:

$$\frac{\text{Unit rate of work item}}{\text{Total Cost of Work item}}\ x\ 100\%$$

Like an example of weights for cable routing jobs:

$$= \frac{357.455,78}{1.382.679,57}\ x\ 100\%$$

$$= 25,85\%$$

Based on the table, the work with the highest percentage weight is Lighting Small Power with a value of 64,27% of the total project cost, worth RM 888.679,64 and an implementation duration of 15 weeks. The second position with the largest weight was occupied by Cable Routing with a weight of 25,85% or RM 357,455.78

for 9 weeks. Meanwhile, other categories have a much smaller weight: Lighting Layout of 7,87%, Small Power of 1,26 %, Card Access of 0,66 %, and CCTV of 36th Floor only 0,07%.

CHAPTER V
CONCLUSIONS AND SUGGESTIONS

5.1 Conclusion

1. Full application of technical competencies: The internship strengthens multielement quantification capabilities (structure, architecture, MEP) with AutoCAD, CostX, and Glodon (TAS/TRB/TBQ), leading to precise, traceable, and audit-ready cost estimation.

2. Consistent technical administrative integration: The results of quantity calculations are effectively connected to TBQ/BOQ, IV, VO, and RFVA, so that contractual values, progress, and variations can be verified and accounted for.

3. Tender and documentation process experience: The preparation of Pre Qualification and Appendix D improves understanding of procurement flows, document completeness, and image revision control, which has a direct impact on cost accuracy.

4. Key findings of Chapter IV (small final project): The electrical and electronic BQ of Alix Residence Block A of RM 1.382.679,57 is dominated by two work groups Lighting Small Power (64,27%) and Cable Routing (25,85%) so that quality, cost, and schedule control on these two items determine the total efficiency. Conversion to duration weights is sufficient for the compilation of the S-curve.

5.2 Suggestions

1. Strengthening BIM Technology Integration

Optimizing the utilization of CostX and Glodon with the 5D BIM approach needs to be continuously developed, including advanced training to deepen cost analysis based on digital models.

2. Sustainable Academic Industry Collaboration

Similar internship programs are expected to be a sustainable bridge between campuses and industry, including applied research opportunities for cost estimation and project management method innovation.

3. Non-Technical Competency Enrichment

In addition to technical skills, soft skills such as negotiation, conflict resolution, and time management are essential to support the role of the Quantity Surveyor in a real work environment.

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ATTACHMENT

Measurement Staircase for BPNT4 Shop Office Project

PROJECT: 1007 - Bkt Puchong
BUILDING : End Unit
STR: Stair 1 (GF to Roof Floor)

T/O : Dava
DATE : 20-Jun-25
DWG.

PAGE :
PURPOSE : REMEASUREMENT

REF.	LENGTH	HEIGHT OF FLIGHT	LENGTH OF FLIGHT	WIDTH	BEAM THICK	SLAB THICK	NO	CONC (M3)	SLAB (M2)	MEMBER REF.	BAR MARK	REBAR C/C	NO. IN EACH	TOTAL NO	LENGTH BAR IN EACH	TOTAL LENGTH OF BAR	MILD STEEL BAR R6	MILD STEEL BAR R8	MILD STEEL BAR R10	HIGH TENSILE BAR T10	HIGH TENSILE BAR T12	HIGH TENSILE BAR T16	HIGH TENSILE BAR T20	HIGH TENSILE BAR T25	HIGH TENSILE BAR T32	HIGH TENSILE BAR T40
GF-M																										
Flight 1																										
TVOP 1				1,150	-		1	-		TVOP 1	T16	0,15	9	9	2,40	20,77	-	-	-	-	-	20,77	-	-	-	-
TVOP 2				1,150	-		1	-		TVOP 2	T16	0,15	9	9	1,63	14,16	-	-	-	-	-	14,16	-	-	-	-
BVOP				1,150			1			BVOP	T16	0,15	9	9	6,35	55,00	-	-	-	-	-	55,00	-	-	-	-
THOP 1				2,397			1			THOP 1	T10	0,20	13	13	1,15	14,93	-	-	-	14,93	-	-	-	-	-	-
THOP 2				1,634			1			THOP 2	T10	0,20	9	9	1,15	10,55	-	-	-	10,55	-	-	-	-	-	-
BHOP				6,346			1			BHOP	T10	0,20	33	33	1,15	37,64	-	-	-	37,64	-	-	-	-	-	-
Flight 2																										
TVOP 1				1,150	-		1	-		TVOP 1	T16	0,15	9	9	1,94	16,77	-	-	-	-	-	16,77	-	-	-	-
TVOP 2				1,150	-		1	-		TVOP 2	T16	0,15	9	9	1,15	9,98	-	-	-	-	-	9,98	-	-	-	-
BVOP				1,150			1			BVOP	T16	0,15	9	9	4,26	36,90	-	-	-	-	-	36,90	-	-	-	-
THOP 1				1,935			1			THOP 1	T10	0,20	11	11	1,15	12,28	-	-	-	12,28	-	-	-	-	-	-
THOP 2				1,151			2			THOP 2	T10	0,20	7	14	1,15	15,54	-	-	-	15,54	-	-	-	-	-	-
BHOP				4,258			1			BHOP	T10	0,20	22	22	1,15	25,63	-	-	-	25,63	-	-	-	-	-	-
M-L1																										
Flight 3																										
TVOP1				1,150	-		1	-		TVOP1	T16	0,15	9	9	1,90	16,45	-	-	-	-	-	16,45	-	-	-	-
TVOP2				1,150	-		1	-		TVOP2	T16	0,15	9	9	1,00	8,67	-	-	-	-	-	8,67	-	-	-	-
BVOP				1,150			1			BVOP	T16	0,15	9	9	3,84	33,29	-	-	-	-	-	33,29	-	-	-	-
THOP1				1,898			1			THOP1	T10	0,20	10	10	1,15	12,06	-	-	-	12,06	-	-	-	-	-	-
THOP2				1,000			1			THOP2	T10	0,20	6	6	1,15	6,90	-	-	-	6,90	-	-	-	-	-	-
BHOP				3,841			1			BHOP	T10	0,20	20	20	1,15	23,24	-	-	-	23,24	-	-	-	-	-	-
L1-Roof																										
Flight 4,6																										
TVOP1				1,150	-		2	-		TVOP1	T12	0,15	9	17	1,65	28,65	-	-	-	-	28,65	-	-	-	-	-
TVOP2				1,150	-		2	-		TVOP2	T12	0,15	9	17	1,12	19,38	-	-	-	-	19,38	-	-	-	-	-
BVOP				1,150			2			BVOP	T12	0,15	9	17	3,89	67,44	-	-	-	-	67,44	-	-	-	-	-
THOP1				1,653			2			THOP1	T10	0,25	8	15	1,15	17,51	-	-	-	17,51	-	-	-	-	-	-
THOP2				1,118			2			THOP2	T10	0,25	5	11	1,15	12,59	-	-	-	12,59	-	-	-	-	-	-
BHOP				3,891			2			BHOP	T10	0,25	17	33	1,15	38,10	-	-	-	38,10	-	-	-	-	-	-
Flight 5,7																										
TVOP1				1,150	-		2	-		TVOP1	T12	0,15	9	17	1,67	28,91	-	-	-	-	28,91	-	-	-	-	-
TVOP2				1,150	-		2	-		TVOP2	T12	0,15	9	17	1,84	31,82	-	-	-	-	31,82	-	-	-	-	-
TVOP3				1,150	-		2	-		TVOP3	T12	0,15	9	17	1,27	22,00	-	-	-	-	22,00	-	-	-	-	-
BVOP				1,150			2			BVOP	T12	0,15	9	17	3,90	67,53	-	-	-	-	67,53	-	-	-	-	-
THOP1				1,668			2			THOP1	T10	0,25	8	15	1,15	17,65	-	-	-	17,65	-	-	-	-	-	-
THOP2				1,836			2			THOP2	T10	0,25	8	17	1,15	19,19	-	-	-	19,19	-	-	-	-	-	-
THOP3				1,269			2			THOP3	T10	0,25	6	12	1,15	13,97	-	-	-	13,97	-	-	-	-	-	-
BHOP				3,896			2			BHOP	T10	0,25	17	33	1,15	38,14	-	-	-	38,14	-	-	-	-	-	-
TOTAL								-																		
								(M3)																		
TOTAL BAR LENGTH (m)																	-	-	-	315,92	265,73	211,99	-	-	-	-
WEIGHT/M (Kg)																	0,222	0,395	0,617	0,617	0,888	1,579	2,466	3,854	6,314	9,866
TOTAL WEIGHT/M (Kg)																	**-**	**-**	**-**	**194,92**	**235,97**	**334,73**	**-**	**-**	**-**	**-**

UNIVERSITAS BUNG HATTA

PROJECT: 1007 - Bkt Puchong
BUILDING : End Unit
STR: Stair 1 (GF to Roof Floor)

T/O : Dava
DATE : 20-Jun-25
DWG.

PAGE :
PURPOSE : REMEASUREMENT

LANDING SLAB

REF.	LENGTH			WIDTH	SLAB THICK	BEAM THICK	NO	CONC (M2)		MEMBER REF.	BAR MARK		NO. IN EACH	TOTAL NO	LENGTH BAR IN EACH	TOTAL LENGTH OF BAR	MILD STEEL BAR R6	R8	R10	HIGH TENSILE BAR T10	T12	T16	T20	T25	T32	T40
GF-M																										
Landing 1	2,30			1,200	0,225		1	2,76	2,76	TVOP	T16		16	16	3,60	58,73	-	-	-	-	-	58,73	-	-	-	-
							1	-	-	THOP	T10		19	19	2,30	43,65	-	-	-	43,65	-	-	-	-	-	-
							1	-	-	BVOP	T16		16	16	2,53	41,31	-	-	-	-	-	41,31	-	-	-	-
							1	-	-	BHOP	T10		14	14	2,30	31,38	-	-	-	31,38	-	-	-	-	-	-
M-1F																										
Landing 2	2,30			1,200	0,225		1	2,76	2,76	TVOP	T16		16	16	2,74	44,74	-	-	-	-	-	44,74	-	-	-	-
							1	-	-	THOP	T10		15	15	2,30	33,80	-	-	-	33,80	-	-	-	-	-	-
							1	-	-	BVOP	T16		16	16	2,09	34,17	-	-	-	-	-	34,17	-	-	-	-
							1	-	-	BHOP	T10		11	11	2,30	26,36	-	-	-	26,36	-	-	-	-	-	-
1F-RF																										
Landing 3,5	2,30			1,200	0,165		2	5,52	5,52	TVOP	T16		16	33	3,60	117,47	-	-	-	-	-	117,47	-	-	-	-
							2	-	-	THOP	T10		19	38	2,30	87,31	-	-	-	87,31	-	-	-	-	-	-
							2	-	-	BVOP	T16		16	33	2,53	82,61	-	-	-	-	-	82,61	-	-	-	-
							2	-	-	BHOP	T10		14	27	2,30	62,77	-	-	-	62,77	-	-	-	-	-	-
Landing 4,6	2,30			1,200	0,165		2	5,52	5,52	TVOP	T12		16	33	2,02	65,99	-	-	-	-	65,99	-	-	-	-	-
							2	-	-	THOP	T10		9	18	2,30	41,77	-	-	-	41,77	-	-	-	-	-	-
							2	-	-	BVOP	T12		16	33	1,41	45,99	-	-	-	-	45,99	-	-	-	-	-
							2	-	-	BHOP	T10		7	13	2,30	30,51	-	-	-	30,51	-	-	-	-	-	-
TOTAL								**16,56** (M2)	**16,56** (M2)				TOTAL BAR LENGTH (m)				-	-	-	357,55	111,98	379,03	-	-	-	-
													WEIGHT/M (Kg)				0,222	0,395	0,617	0,617	0,888	1,579	2,466	3,854	6,314	9,866
													TOTAL WEIGHT/M (Kg)				**-**	**-**	**-**	**220,61**	**99,44**	**598,49**	**-**	**-**	**-**	**-**

UNIVERSITAS BUNG HATTA

PROJECT: 1007 - Bkt Puchong
BUILDING : End Unit
STR: Stair 1 (GF to Roof Floor)

T/O : Dava
DATE : 20-Jun-25
DWG.

PAGE :
PURPOSE : REMEASUREMENT

LANDING BEAM

REF.	LENGTH			WIDTH	BEAM THICK	SLAB THICK	NO	CONC (M3)		MEMBER REF.	BAR MARK		NO. IN EACH	TOTAL NO	LENGTH BAR IN EACH	TOTAL LENGTH OF BAR	MILD STEEL BAR R6	R8	R10	HIGH TENSILE BAR T10 LINKS	T12	T16	T20	T25	T32	T40
GF-M																										
ST-B1	2,45			0,125	0,600		2	0,37	6,49	TB 1	T20		2	2	6,31	12,61	-	-	-	-	-	-	12,61	-	-	-
							1	-		TB 2	T20		2	2	4,14	8,28	-	-	-	-	-	-	8,28	-	-	-
							1	-		BB 1	T20		2	2	6,67	13,35	-	-	-	-	-	-	13,35	-	-	-
							1	-		BB 2	T20		2	2	3,05	6,09	-	-	-	-	-	-	6,09	-	-	-
							1	-		LINKS	R6		8	8	1,45	11,32	11,32	-	-	-	-	-	-	-	-	-
							1			LINKS	R6		18	18	1,45	26,32										
	5,48			0,125	0,600		1	0,41	7,25	LINKS	R6		13	13	1,45	18,71	18,71	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
TOTAL								0,78	13,75				TOTAL BAR LENGTH (m)				30,03	-	-	-	-	-	40,33	-	-	-
								(M3)					WEIGHT/M (Kg)				0,222	0,395	0,617	0,617	0,888	1,579	2,466	3,854	6,314	9,866
													TOTAL WEIGHT (Kg)				**6,67**	-	-	-	-	-	**99,45**	-	-	-

UNIVERSITAS BUNG HATTA

PROJECT: 1007 - Bkt Puchong
BUILDING : Int Unit
STR: Stair 1 (GF to 2nd Floor)

T/O : Dava
DATE : 20-Jun-25
DWG.

PAGE :
PURPOSE : REMEASUREMENT

REF.	LENGTH	HEIGHT OF FLIGHT	LENGTH OF FLIGHT	WIDTH	BEAM THICK	SLAB THICK	NO	CONC (M3)	SLAB (M2)	MEMBER REF.	BAR MARK	REBAR C/C	NO. IN EACH	TOTAL NO	LENGTH BAR IN EACH	TOTAL LENGTH OF BAR	MILD STEEL BAR R6	MILD STEEL BAR R8	MILD STEEL BAR R10	HIGH TENSILE BAR T10	HIGH TENSILE BAR T12	HIGH TENSILE BAR T16	HIGH TENSILE BAR T20	HIGH TENSILE BAR T25	HIGH TENSILE BAR T32	HIGH TENSILE BAR T40
GF-M																										
Flight 1																										
TVOP 1				1,150	-		1	-		TVOP 1	T16	0,15	9	9	2,40	20,77	-	-	-	-	-	20,77	-	-	-	-
TVOP 2				1,150	-		1	-		TVOP 2	T16	0,15	9	9	1,63	14,16	-	-	-	-	-	14,16	-	-	-	-
BVOP				1,150			1			BVOP	T16	0,15	9	9	6,35	55,00	-	-	-	-	-	55,00	-	-	-	-
THOP 1				2,397			1			THOP 1	T10	0,20	13	13	1,15	14,93	-	-	-	14,93	-	-	-	-	-	-
THOP 2				1,634			1			THOP 2	T10	0,20	9	9	1,15	10,55	-	-	-	10,55	-	-	-	-	-	-
BHOP				6,346			1			BHOP	T10	0,20	33	33	1,15	37,64	-	-	-	37,64	-	-	-	-	-	-
Flight 2																										
TVOP 1				1,150	-		1	-		TVOP 1	T16	0,15	9	9	1,94	16,77	-	-	-	-	-	16,77	-	-	-	-
TVOP 2				1,150	-		1	-		TVOP 2	T16	0,15	9	9	1,15	9,98	-	-	-	-	-	9,98	-	-	-	-
BVOP				1,150			1			BVOP	T16	0,15	9	9	4,26	36,90	-	-	-	-	-	36,90	-	-	-	-
THOP 1				1,935			1			THOP 1	T10	0,20	11	11	1,15	12,28	-	-	-	12,28	-	-	-	-	-	-
THOP 2				1,151			2			THOP 2	T10	0,20	7	14	1,15	15,54	-	-	-	15,54	-	-	-	-	-	-
BHOP				4,258			1			BHOP	T10	0,20	22	22	1,15	25,63	-	-	-	25,63	-	-	-	-	-	-
M-L1																										
Flight 3																										
TVOP1				1,150	-		1	-		TVOP1	T16	0,15	9	9	1,90	16,45	-	-	-	-	-	16,45	-	-	-	-
TVOP2				1,150	-		1	-		TVOP2	T16	0,15	9	9	1,00	8,67	-	-	-	-	-	8,67	-	-	-	-
BVOP				1,150			1			BVOP	T16	0,15	9	9	3,84	33,29	-	-	-	-	-	33,29	-	-	-	-
THOP1				1,898			1			THOP1	T10	0,20	10	10	1,15	12,06	-	-	-	12,06	-	-	-	-	-	-
THOP2				1,000			1			THOP2	T10	0,20	6	6	1,15	6,90	-	-	-	6,90	-	-	-	-	-	-
BHOP				3,841			1			BHOP	T10	0,20	20	20	1,15	23,24	-	-	-	23,24	-	-	-	-	-	-
L1-Roof																										
Flight 4																										
TVOP1				1,150	-		1	-		TVOP1	T12	0,15	9	9	1,65	14,33	-	-	-	-	14,33	-	-	-	-	-
TVOP2				1,150	-		1	-		TVOP2	T12	0,15	9	9	1,12	9,69	-	-	-	-	9,69	-	-	-	-	-
BVOP				1,150			1			BVOP	T12	0,15	9	9	3,89	33,72	-	-	-	-	33,72	-	-	-	-	-
THOP1				1,653			1			THOP1	T10	0,25	8	8	1,15	8,75	-	-	-	8,75	-	-	-	-	-	-
THOP2				1,118			1			THOP2	T10	0,25	5	5	1,15	6,29	-	-	-	6,29	-	-	-	-	-	-
BHOP				3,891			1			BHOP	T10	0,25	17	17	1,15	19,05	-	-	-	19,05	-	-	-	-	-	-
Flight 5																										
TVOP1				1,150	-		1	-		TVOP1	T12	0,15	9	9	1,67	14,46	-	-	-	-	14,46	-	-	-	-	-
TVOP2				1,150	-		1	-		TVOP2	T12	0,15	9	9	1,84	15,91	-	-	-	-	15,91	-	-	-	-	-
TVOP3				1,150	-		1	-		TVOP3	T12	0,15	9	9	1,27	11,00	-	-	-	-	11,00	-	-	-	-	-
BVOP				1,150			1			BVOP	T12	0,15	9	9	3,90	33,77	-	-	-	-	33,77	-	-	-	-	-
THOP1				1,668			1			THOP1	T10	0,25	8	8	1,15	8,82	-	-	-	8,82	-	-	-	-	-	-
THOP2				1,836			1			THOP2	T10	0,25	8	8	1,15	9,60	-	-	-	9,60	-	-	-	-	-	-
THOP3				1,269			1			THOP3	T10	0,25	6	6	1,15	6,99	-	-	-	6,99	-	-	-	-	-	-
BHOP				3,896			1			BHOP	T10	0,25	17	17	1,15	19,07	-	-	-	19,07	-	-	-	-	-	-
TOTAL								-					TOTAL BAR LENGTH (m)				-	-	-	237,34	132,88	211,99	-	-	-	-
								(M3)					WEIGHT/M (Kg)				0,222	0,395	0,617	0,617	0,888	1,579	2,466	3,854	6,314	9,866
													TOTAL WEIGHT/M (Kg)				-	-	-	**146,44**	**118,00**	**334,73**	-	-	-	-

UNIVERSITAS BUNG HATTA

PROJECT: 1007 - Bkt Puchong
BUILDING : Int Unit
STR: Stair 1 (GF to 2nd Floor)

T/O : Dava
DATE : 20-Jun-25
DWG.

PAGE :
PURPOSE : REMEASUREMENT

LANDING SLAB

REF.	LENGTH			WIDTH	SLAB THICK	BEAM THICK	NO	CONC (M2)		MEMBER REF.	BAR MARK		NO. IN EACH	TOTAL NO	LENGTH BAR IN EACH	TOTAL LENGTH OF BAR	MILD STEEL BAR R6	MILD STEEL BAR R8	MILD STEEL BAR R10	HIGH TENSILE BAR T10	HIGH TENSILE BAR T12	HIGH TENSILE BAR T16	HIGH TENSILE BAR T20	HIGH TENSILE BAR T25	HIGH TENSILE BAR T32	HIGH TENSILE BAR T40
GF-M																										
Landing 1	2,30			1,200	0,225		1	2,76	2,76	TVOP	T16		16	16	3,60	58,73	-	-	-	-	-	58,73	-	-	-	-
							1	-	-	THOP	T10		19	19	2,30	43,65	-	-	-	43,65	-	-	-	-	-	-
							1	-	-	BVOP	T16		16	16	2,53	41,31	-	-	-	-	-	41,31	-	-	-	-
							1	-	-	BHOP	T10		14	14	2,30	31,38	-	-	-	31,38	-	-	-	-	-	-
M-1F																										
Landing 2	2,30			1,200	0,225		1	2,76	2,76	TVOP	T16		16	16	2,74	44,74	-	-	-	-	-	44,74	-	-	-	-
							1	-	-	THOP	T10		15	15	2,30	33,80	-	-	-	33,80	-	-	-	-	-	-
							1	-	-	BVOP	T16		16	16	2,09	34,17	-	-	-	-	-	34,17	-	-	-	-
							1	-	-	BHOP	T10		11	11	2,30	26,36	-	-	-	26,36	-	-	-	-	-	-
1F-RF																										
Landing 3	2,30			1,200	0,150		1	2,76	2,76	TVOP	T12		16	16	2,02	32,99	-	-	-	-	32,99	-	-	-	-	-
							1	-	-	THOP	T10		9	9	2,30	20,88	-	-	-	20,88	-	-	-	-	-	-
							1	-	-	BVOP	T12		16	16	1,41	23,00	-	-	-	-	23,00	-	-	-	-	-
TOTAL								**8,28** (M2)	**8,28** (M2)				TOTAL BAR LENGTH (m)				-	-	-	171,32	55,99	178,95	-	-	-	-
													WEIGHT/M (Kg)				0,222	0,395	0,617	0,617	0,888	1,579	2,466	3,854	6,314	9,866
													TOTAL WEIGHT/M (Kg)				**-**	**-**	**-**	**105,70**	**49,72**	**282,56**	**-**	**-**	**-**	**-**

UNIVERSITAS BUNG HATTA

PROJECT: 1007 - Bkt Puchong
BUILDING : Int Unit
STR: Stair 1 (GF to 2nd Floor)

T/O : Dava
DATE : 20-Jun-25
DWG.

PAGE :
PURPOSE : REMEASUREMENT

LANDING BEAM

REF.	LENGTH			WIDTH	BEAM THICK	SLAB THICK	NO	CONC (M3)		MEMBER REF.	BAR MARK		NO. IN EACH	TOTAL NO	LENGTH BAR IN EACH	TOTAL LENGTH OF BAR	MILD STEEL BAR R6	R8	R10	HIGH TENSILE BAR T10 LINKS	T12	T16	T20	T25	T32	T40
GF-M																										
ST-B1	2,45			0,125	0,600		2	0,37	6,49	TB 1	T20		2	2	6,31	12,61	-	-	-	-	-	-	12,61	-	-	-
							1	-		TB 2	T20		2	2	4,14	8,28	-	-	-	-	-	-	8,28	-	-	-
							1	-		BB 1	T20		2	2	6,67	13,35	-	-	-	-	-	-	13,35	-	-	-
							1	-		BB 2	T20		2	2	3,05	6,09	-	-	-	-	-	-	6,09	-	-	-
							1	-		LINKS	R6		8	8	1,45	11,32	11,32	-	-	-	-	-	-	-	-	-
							1			LINKS	R6		18	18	1,45	26,32										
	5,48			0,125	0,600		1	0,41	7,25	LINKS	R6		13	13	1,45	18,71	18,71	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
							1										-	-	-	-	-	-	-	-	-	-
							1	-									-	-	-	-	-	-	-	-	-	-
TOTAL								0,78	13,75				TOTAL BAR LENGTH (m)				30,03	-	-	-	-	-	40,33	-	-	-
								(M3)					WEIGHT/M (Kg)				0,222	0,395	0,617	0,617	0,888	1,579	2,466	3,854	6,314	9,866
													TOTAL WEIGHT (Kg)				6,67	-	-	-	-	-	99,45	-	-	-

UNIVERSITAS BUNG HATTA

PROJECT: 1007 - Bkt Puchong
BUILDING : End UNIT
STR: Stair 2 (GF to 2nd Floor)

T/O : Dava
DATE : 20-Jun-25
DWG.

PAGE :
PURPOSE : REMEASUREMENT

REF.	LENGTH	HEIGHT OF FLIGHT	LENGTH OF FLIGHT	WIDTH	BEAM THICK	SLAB THICK	NO	CONC (M3)	SLAB (M2)	MEMBER REF.	BAR MARK	REBAR C/C	NO. IN EACH	TOTAL NO	LENGTH BAR IN EACH	TOTAL LENGTH OF BAR	MILD STEEL BAR R6	R8	R10	HIGH TENSILE BAR T10	T12	T16	T20	T25	T32	T40
GF-M																										
Flight 1,3,5																										
TVOP 1				0,950	-		3	-		TVOP 1	T12	0,15	7	22	1,50	33,02	-	-	-	-	33,02	-	-	-	-	-
TVOP 2				0,950	-		3	-		TVOP 2	T12	0,15	7	22	0,92	20,24	-	-	-	-	20,24	-	-	-	-	-
THOP 1				1,501			3			THOP 1	T10	0,20	9	26	0,95	24,24	-	-	-	24,24	-	-	-	-	-	-
THOP 2				0,920			3			THOP 2	T10	0,20	6	17	1,95	32,76	-	-	-	32,76	-	-	-	-	-	-
BVOP				0,950			3			BVOP	T12	0,15	7	22	3,83	84,26	-	-	-	-	84,26	-	-	-	-	-
BHOP				3,830			3			BHOP	T10	0,20	20	60	0,95	57,43	-	-	-	57,43	-	-	-	-	-	-
M-L1																										
Flight 2,4,6																										
TVOP1				0,950	-		3	-		TVOP1	T12	0,15	7	22	1,47	32,36	-	-	-	-	32,36	-	-	-	-	-
TVOP2				0,950	-		3	-		TVOP2	T12	0,15	7	22	0,91	19,98	-	-	-	-	19,98	-	-	-	-	-
BVOP				0,950			3			BVOP	T12	0,15	7	22	3,25	71,57	-	-	-	-	71,57	-	-	-	-	-
THOP1				1,471			3			THOP1	T10	0,20	8	25	0,95	23,81	-	-	-	23,81	-	-	-	-	-	-
THOP2				0,908			3			THOP2	T10	0,20	6	17	0,95	15,79	-	-	-	15,79	-	-	-	-	-	-
BHOP				3,253			3			BHOP	T10	0,20	17	52	0,95	49,21	-	-	-	49,21	-	-	-	-	-	-
TOTAL								-																		
								(M3)																		
TOTAL BAR LENGTH (m)																	-	-	-	203,24	261,43	-	-	-	-	-
WEIGHT/M (Kg)																	0,222	0,395	0,617	0,617	0,888	1,579	2,466	3,854	6,314	9,866
TOTAL WEIGHT/M (Kg)																	**-**	**-**	**-**	**125,40**	**232,15**	**-**	**-**	**-**	**-**	**-**

-

UNIVERSITAS BUNG HATTA

PROJECT: 1007 - Bkt Puchong
BUILDING : End UNIT
STR: Stair 2 (GF to 2nd Floor)

T/O : Dava
DATE : 20-Jun-25
DWG.

PAGE :
PURPOSE : REMEASUREMENT

LANDING SLAB

REF.	LENGTH			WIDTH	SLAB THICK	BEAM THICK	NO	CONC (M2)		MEMBER REF.	BAR MARK		NO. IN EACH	TOTAL NO	LENGTH BAR IN EACH	TOTAL LENGTH OF BAR	MILD STEEL BAR R6	R8	R10	HIGH TENSILE BAR T10	T12	T16	T20	T25	T32	T40
Landing	2,00			1,150	0,165		3	6,90	6,90	TVOP	T12		14	43	1,87	80,32	-	-	-	-	80,32	-	-	-	-	-
							3	-	-	THOP	T10		10	31	2,00	62,04	-	-	-	62,04	-	-	-	-	-	-
							3	-	-	BVOP	T12		14	43	1,22	52,46	-	-	-	-	52,46	-	-	-	-	-
							3	-	-	THOP	T10		7	21	2,00	42,60	-	-	-	42,60	-	-	-	-	-	-
Landing 2	2,00			1,150	0,165		2	4,60	4,60	TVOP	T12		14	29	2,13	61,09	-	-	-	-	61,09	-	-	-	-	-
							2			BVOP	T12		14	29	2,04	58,45	-	-	-	-	58,45	-	-	-	-	-
							2			THOP	T10		12	23	2,00	46,62	-	-	-	46,62	-	-	-	-	-	-
							2			BHOP	T10		11	22	2,00	44,78	-	-	-	44,78	-	-	-	-	-	-
TOTAL								**11,50** (M2)	**11,50** (M2)				TOTAL BAR LENGTH (m)				-	-	-	196,04	252,32	-	-	-	-	-
													WEIGHT/M (Kg)				0,222	0,395	0,617	0,617	0,888	1,579	2,466	3,854	6,314	9,866
													TOTAL WEIGHT/M (Kg)				**-**	**-**	**-**	**120,96**	**224,06**	**-**	**-**	**-**	**-**	**-**

LANDING BEAM

REF.	LENGTH			WIDTH	BEAM THICK	SLAB THICK	NO	CONC (M3)		MEMBER REF.	BAR MARK		NO. IN EACH	TOTAL NO	LENGTH BAR IN EACH	TOTAL LENGTH OF BAR	MILD STEEL BAR R6	R8	R10	HIGH TENSILE BAR T10 LINKS	T12	T16	T20	T25	T32	T40
GF-L2																										
LB	2,00			0,150	0,450		3	0,41	6,30	TB1	T12		2	6	2,70	16,21	-	-	-	-	16,21	-	-	-	-	-
							3	-		BB	T16		2	6	2,51	15,03	-	-	-	-	-	15,03	-	-	-	-
							3	-		LINKS	T10		8	24	1,20	28,89	-	-	-	28,89	-	-	-	-	-	-
TOTAL								**0,41** (M3)	**6,30**				TOTAL BAR LENGTH (m)				-	-	-	28,89	16,21	15,03	-	-	-	-
													WEIGHT/M (Kg)				0,222	0,395	0,617	0,617	0,888	1,579	2,466	3,854	6,314	9,866
													TOTAL WEIGHT (Kg)				**-**	**-**	**-**	**17,83**	**14,39**	**23,73**	**-**	**-**	**-**	**-**

Measurement Rebar Coping for BPNT4 Shop Office Project

Project : BPNT4-Shoplot
Building : End Unit & int
Element : Coping
Item : Reinforcement Bar
Dwg No. : Layout

Description / Annotation	Bar Size	Member	No.	Length	T8	T10	T12	T16	T20	T25	T32	T40	R6	R8	R10	R12
END																
2T10	T10	1	2	55,97		111,93										
R6-300	R6	1	281	0,90									252,75			
INT																
Font Area & Back																
2T10	T10	1	2	13,64		27,28										
R6-300	R6	1	69	0,90									62,28			
Share grid 5/25																
2t10	t10	1	2	18,34		36,67										
r6-300	r6	1	93	0,50									46,34			
Share grid 7/27 (for adj)																
2t10	t10	1	2	24,11		48,22										
r6-300	r6	1	122	0,50									60,78			
			Total Length :		-	224,10	-	-	-	-	-	-	422,15	-	-	-
			Conversion (kg/m) :		0,395	0,616	0,888	1,579	2,466	3,854	6,313	9,864	0,222	0,395	0,616	0,888
			Total Weight (kg) :		-	**138,05**	-	-	-	-	-	-	**93,72**	-	-	-
			reference :		**T8**	**T10**	**T12**	**T16**	**T20**	**T25**	**T32**	**T40**	**R6**	**R8**	**R10**	**R12**

UNIVERSITAS BUNG HATTA

Measurement Excavation for BPNT4 Shop Office Project

Project : Shoplot
Building : BPNT4
Element : Ground Beam End
Item : Excavation
Dwg No. : BPNT4-GF Layout

Excavation from existing level with max. depth:

ne 0.25m depth = - m3 **ne 4.00m depth = - m3**
ne 1.00m depth = 14,26 m3 **ne 6.00m depth = - m3**
ne 2.00m depth = - m3

Item	Description / Annotation	Member	No. of Beam	Area (M2) Length	Width	Area	Height / Depth / Thk (m) Height / Depth / Thk (m)	Lean Conc	Nett	Excavation (m3); with max. depth <= 0.25	<= 1	<= 2	<= 4	<= 6
1	E1-GF-H1	1	1,0	6,592	0,225	1,48	0,60	0,05	0,65		0,96			
2	E1-GF-H2	1	1,0	6,365	0,225	1,43	0,60	0,05	0,65		0,93			
3	E1-GF-H3	1	1,0	6,365	0,225	1,43	0,60	0,05	0,65		0,93			
4	E1-GF-H5	1	1,0	6,365	0,225	1,43	0,60	0,05	0,65		0,93			
5	E1-GF-H6	1	1,0	6,365	0,225	1,43	0,60	0,05	0,65		0,93			
6	E1-GF-H7	1	1,0	6,365	0,225	1,43	0,60	0,05	0,65		0,93			
7	E1-GF-H7a	1	1,0	1,816	0,150	0,27	0,45	0,05	0,50		0,14			
8	E1-GF-H7b	1	1,0	4,401	0,150	0,66	0,45	0,05	0,50		0,33			
9	E1-GF-H8	1	1,0	6,368	0,225	1,43	0,60	0,05	0,65		0,93			
10	E1-GF-V1	1	1,0	21,024	0,225	4,73	0,60	0,05	0,65		3,07			
11	E1-GF-V2	1	1,0	5,659	0,150	0,85	0,60	0,05	0,65		0,55			
12	E1-GF-V3	1	1,0	1,824	0,150	0,27	0,45	0,05	0,50		0,14			
13	E1-GF-V4a	1	1,0	3,523	0,150	0,53	0,45	0,05	0,50		0,26			
14	E1-GF-V4b	1	1,0	0,875	0,150	0,13	0,45	0,05	0,50		0,07			
15	E1-GF-V6	1	1,0	21,574	0,225	4,85	0,60	0,05	0,65		3,16			
			14,0	105,5					**Total :**	-	**14,26**	-	-	-

UNIVERSITAS BUNG HATTA

Project : Shoplot
Building : BPNT4
Element : Ground Beam Int
Item : Excavation
Dwg No. : BPNT4-GF Layout

Excavation from existing level with max. depth:

ne 0.25m depth = - m3 **ne 4.00m depth = - m3**
ne 1.00m depth = 10,93 m3 **ne 6.00m depth = - m3**
ne 2.00m depth = - m3

Item	Description / Annotation	Member	No. of Beam	Area (M2) Length	Width	Area	Height / Depth / Thk (m) Height / Depth / Thk (m)	Lean Conc	Nett	Excavation (m3); with max. depth <= 0.25	<= 1	<= 2	<= 4	<= 6
1	I2-GF-H1	1	1,0	6,598	0,225	1,48	0,60	0,05	0,65		0,96			
2	I2-GF-H2	1	1,0	6,480	0,225	1,46	0,60	0,05	0,65		0,95			
3	I2-GF-H3	1	1,0	6,480	0,225	1,46	0,60	0,05	0,65		0,95			
4	I2-GF-H5	1	1,0	6,480	0,225	1,46	0,60	0,05	0,65		0,95			
5	I2-GF-H6	1	1,0	6,480	0,225	1,46	0,60	0,05	0,65		0,95			
6	I2-GF-H7	1	1,0	6,480	0,225	1,46	0,60	0,05	0,65		0,95			
7	I2-GF-H7a	1	1,0	2,301	0,150	0,35	0,45	0,05	0,50		0,17			
8	I2-GF-H8	1	1,0	6,480	0,225	1,46	0,60	0,05	0,65		0,95			
9	I2-GF-V1	1	1,0	21,360	0,113	2,40	0,60	0,05	0,65		1,56			
10	I2-GF-V2	1	1,0	5,664	0,150	0,85	0,60	0,05	0,65		0,55			
11	I2-GF-V3	1	1,0	1,825	0,150	0,27	0,45	0,05	0,50		0,14			
12	I2-GF-V4	1	1,0	3,528	0,150	0,53	0,45	0,05	0,50		0,26			
13	I2-GF-V5	1	1,0	21,685	0,113	2,44	0,60	0,05	0,65		1,59			
			13,0	101,8		17,1			**Total :**	-	**10,93**	-	-	-

UNIVERSITAS BUNG HATTA

Project : Shoplot
Building : BPNT4
Element : Ground Slab End
Item : Excavation
Dwg No. : BPNT4-GF Layout

Excavation from existing level with max. depth:

ne 0.25m depth = 25,00 m3 **ne 4.00m depth = - m3**
ne 1.00m depth = - m3 **ne 6.00m depth = - m3**
ne 2.00m depth = - m3

Item	Description / Annotation	Member	No. of Slab	Area (M2) Length	Width	Area	Height / Depth / Thk (m) Height / Depth / Thk (m)	Lean Conc	Nett	Excavation (m3); with max. depth <= 0.25	<= 1	<= 2	<= 4	<= 6
1	125 Thk	1	1,0			118,40	0,125	0,05	0,175	20,72				
									-	-				
2	125 Thk- Toilet	1	1,0			2,79	0,125	0,05	0,175	0,49				
3	125 Thk- Toilet	1	1,0			1,81	0,125	0,05	0,175	0,32				
									-	-				
4	125 Thk - external walkway	1	1,0			18,00	0,125	0,05	0,175	3,15				
									-	-				
5	125 Thk- Refuse	1	1,0			1,52	0,125	0,05	0,175	0,27				
									-	-				
									-	-				
									-	-				
									-	-				
									-	-				
			5,0			142,53			**Total :**	**25,00**	-	-	-	-

Project : Shoplot
Building : BPNT4
Element : Ground Slab Int
Item : Excavation
Dwg No. : BPNT4-GF Layout

Excavation from existing level with max. depth:

ne 0.25m depth = 26,00 m3 **ne 4.00m depth = - m3**
ne 1.00m depth = - m3 **ne 6.00m depth = - m3**
ne 2.00m depth = - m3

Item	Description / Annotation	Member	No. of Slab	Area (M2) Length	Width	Area	Height / Depth / Thk (m) Height / Depth / Thk (m)	Lean Conc	Nett	Excavation (m3); with max. depth <= 0.25	<= 1	<= 2	<= 4	<= 6
1	125 thk	1	1,0			124,05	0,125	0,05	0,175	21,71				
									-	-				
2	125 thk - toilet	1	1,0			3,52	0,125	0,05	0,175	0,62				
									-	-				
3	125 thk- external walkway	1	1,0			18,31	0,125	0,05	0,175	3,20				
									-	-				
									-	-				
									-	-				
									-	-				
									-	-				
									-	-				
									-	-				
			3,0			145,88			**Total :**	**26,00**	-	-	-	-

UNIVERSITAS BUNG HATTA

Measurement Concrete, Formwork, BRC A8 for BPNT4 Shop Office Project

Project : BPNT4- Shoplot
Building : End Unit
Element : RC PLINTH TANK
Item : Concrete, Fwk,BRC A8
Dwg No. :

Item	Description / Annotation	Member	No.	Length	Width	Height	Concrete m3	Fwk m2	BRC A8 m2
1	**Roof Floor** 150mm Thick Slab	2	1	1,50	1,500	0,150	0,68	1,800	4,500
							0,68	1,80	4,50

Project : BPNT4- Shoplot
Building : Int Unit
Element : RC PLINTH TANK
Item : Concrete, Fwk, BRC A8
Dwg No. :

Item	Description / Annotation	Member	No.	Length	Width	Height	Concrete m3	Fwk m2	BRC A8 m2
1	**Roof Floor** 150mm Thick Slab	1	1	1,50	1,500	0,150	0,34	0,900	2,250
							0,34	0,90	2,25

Project : BPNT4- Shoplot
Building : Corner Unit
Element : RC PLINTH TANK
Item : Concrete, Fwk, BRC A8
Dwg No. :

Item	Description / Annotation	Member	No.	Length	Width	Height	Concrete m3	Fwk m2	BRC A8 m2
1	**Roof Floor** 150mm Thick Slab	2	1	1,50	1,500	0,150	0,68	1,800	4,500
							0,68	1,80	4,50

Measurement Upstand Beam TNB Compact Substation for BPNT4 Shop Office Project

Project : BPNT4-Shoplot
Building :
Element : tnb compact sub (upstand beam)
Item :
Dwg No. : TNB Compact plinth PE

Description / Annotation	Bar Size	Member	No.	Length	T8	T10	T12	T16	T20	T25	T32	T40	R6	R8	R10	R12
L SHAPE																
3T12	T12	2	3	1,60			9,60									
2T16	T16	2	2	1,60				6,40								
LINK																
T10-200	T10	2	9	0,90		16,18										
125 X 300																
2T12	T12	2	2	1,60			6,40									
2T16	T16	2	2	1,60				6,40								
LINK																
T10-200	T10	2	9	0,61		10,98										
			Total Length :		-	27,16	6,40	6,40	-	-	-	-	-	-	-	-
			Conversion (kg/m) :		0,395	0,616	0,888	1,579	2,466	3,854	6,313	9,864	0,222	0,395	0,616	0,888
			Total Weight (kg) :		**-**	**16,73**	**5,68**	**10,11**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
			reference :		**T8**	**T10**	**T12**	**T16**	**T20**	**T25**	**T32**	**T40**	**R6**	**R8**	**R10**	**R12**

UNIVERSITAS BUNG HATTA

Measurement Beam Rebar (Intermediate Unit) using TRB for BPNT4 Shop Office Project

Classification Condition			Rebar Weight (kg)						Summary (kg)
Floor	Name	Rebar Type	Rebar Diameter (mm)						
			6	10	12	16	20	25	
Ground Floor	I2-GF-H1	T	0	23,963	27,289	0	0	0	51,253
	I2-GF-H2	T	0	23,963	24,161	5,683	0	0	53,807
	I2-GF-H3	T	0	22,921	13,168	0	40,237	0	76,326
	I2-GF-H5	T	0	23,963	24,255	5,683	0	0	53,901
	I2-GF-H6	T	0	23,963	27,296	0	0	0	51,26
	I2-GF-H7	T	0	23,963	0	24,451	40,849	0	89,263
	I2-GF-H7a	T	0	6,88	9,743	0	0	0	16,623
	I2-GF-H8	T	0	71,89	10,726	24,34	8,879	0	115,836
	I2-GF-V1	T	0	70,496	75,445	12,454	43,522	0	201,917
	I2-GF-V2	T	0	18,039	11,438	20,18	0	0	49,657
	I2-GF-V3	T	0	6,116	10,433	0	0	0	16,549
	I2-GF-V4	T	0	9,938	21,982	0	0	0	31,92
	I2-GF-V5	T	0	70,496	82,498	0	44,04	0	197,034
	I2-MF-H1	T	0	0	9,452	0	0	0	9,452
		R	3,404	0	0	0	0	0	3,404
	I2-MF-H1a	T	0	21,836	10,613	29,638	0	0	62,087
	I2-MF-H2	T	0	21,836	10,357	23,921	8,879	0	64,993
	I2-MF-H2a	T	0	0	9,452	0	0	0	9,452
		R	3,404	0	0	0	0	0	3,404
	I2-MF-V1	T	0	63,265	16,27	43,251	99,312	51,641	273,739
	I2-MF-V3	T	0	0	9,865	0	0	0	9,865
		R	3,095	0	0	0	0	0	3,095
	I2-MF-V4	T	0	0	14,551	0	0	0	14,551
		R	6,016	0	0	0	0	0	6,016
	I2-MF-V5	T	0	62,361	16,359	52,716	81,564	50,87	263,87
1st Floor	I2-1F-H1	T	0	38,852	48,442	47,756	0	0	135,05
	I2-1F-H2	T	0	32,471	36,442	19,741	48,603	0	137,257
	I2-1F-H3 (225 X 1813)	T	0	22,838	27,213	0	0	50,67	100,72
	I2-1F-H3 (225 X 600)	T	0	15,628	0	0	26,662	70,413	112,703
	I2-1F-H4	T	0	6,88	5,391	9,793	0	0	22,064
	I2-1F-H5 (225 X 3401)	T	0	49,451	57,727	0	0	55,603	162,78
	I2-1F-H5 (225 X 600)	T	0	31,257	0	0	0	118,562	149,819
	I2-1F-H6	T	0	23,963	3,906	14,854	0	103,031	145,755
	I2-1F-H7	T	0	26,047	13,859	0	0	103,031	142,937
	I2-1F-H8	T	0	71,89	10,357	0	0	83,173	165,42
	I2-1F-V1 (112.5 X 1150)	T	0	17,401	25,016	12,328	36,33	85,439	176,515
	I2-1F-V1 (112.5 X 600)	T	0	56,035	12,566	32,631	72,216	80,275	253,722
	I2-1F-V1 (112.5 X 900)	T	0	10,19	14,391	9,092	0	0	33,673
	I2-1F-V2	T	0	37,027	11,399	14,412	0	49,598	112,436
	I2-1F-V3	T	0	0	13,381	13,973	0	0	27,354
		R	6,189	0	0	0	0	0	6,189
	I2-1F-V4 (112.5 X 1150)	T	0	17,401	25,016	12,328	0	142,205	196,951
	I2-1F-V4 (112.5 X 600)	T	0	54,227	12,278	35,605	101,517	25,435	229,062
	I2-1F-V4 (112.5 X 900)	T	0	8,916	14,391	10,039	0	0	33,346

Classification Condition			Rebar Weight (kg)						Summary (kg)
Floor	Name	Rebar Type	Rebar Diameter (mm)						
			6	10	12	16	20	25	
2nd Floor	I2-2F-H1	T	0	21,836	7,999	36,624	0	0	66,46
	I2-2F-H2	T	0	23,963	10,357	0	0	76,228	110,549
	I2-2F-H3	T	0	25,005	25,554	0	0	191,908	242,467
	I2-2F-H4	T	0	6,88	10,265	0	0	0	17,145
	I2-2F-H5	T	0	29,173	12,044	0	0	254,806	296,022
	I2-2F-H6	T	0	23,963	3,601	14,854	0	114,354	156,772
	I2-2F-H7	T	0	23,963	3,601	14,854	0	103,039	145,457
	I2-2F-H8	T	0	23,963	10,357	0	0	76,236	110,556
	I2-2F-H9	T	0	21,836	20,279	12,707	0	0	54,822
	I2-2F-V1 112.5 X 600	T	0	57,842	19,244	40,836	94,873	0	212,795
	I2-2F-V1 112.5 X 900	T	0	21,653	29,628	41,994	0	84,283	177,557
	I2-2F-V2	T	0	18,988	21,201	0	0	49,598	89,787
	I2-2F-V3	T	0	0	7,395	13,108	0	0	20,503
		R	5,261	0	0	0	0	0	5,261
	I2-2F-V4 112.5 x 600	T	0	57,842	21,197	66,439	46,881	0	192,36
	I2-2F-V4 112.5 X 900	T	0	21,653	29,539	20,492	0	86,953	158,637
Roof	I2-RF-H1	T	0	0	9,42	16,858	0	0	26,278
		R	6,808	0	0	0	0	0	6,808
	I2-RF-V1	T	0	0	21,174	0	0	0	21,174
		R	7,737	0	0	0	0	0	7,737
	I2-RF-V2	T	0	17,172	10,654	0	30,144	0	57,97
Total			41,914	1482,101	1040,637	753,633	824,508	2107,35	6250,142

Taking Off / Measurement Cable Routing for Alix Residence Project

Cable Routing

no	Description	member	unit	length	total length	Enclosure	total enclosure	remarks
	1st F (4x1c 16mm SQ PVC CU. CABLE + CPC)							
1	MP-A-L1 to DB-A1a	1	m	33	33	6	6	200x50 MS Trunking
		1	m		0	27	27	75x50 Ms trunking
2	MP-A-L1 to DB-A3a	1	m	40	40	6	6	200x50 MS Trunking
		1	m		0	24	24	75x50 Ms trunking
		1	m		0	10	10	25mm dia. Concealed conduit
3	MP-A-L1 to DB-A2a	1	m	39	39	6	6	200x50 MS Trunking
		1	m		0	27	27	75x50 Ms trunking
		1	m		0	6	6	25mm dia. Concealed conduit
4	MP-A-L1 to DB-A1b	1	m	19	19	6	6	200x50 MS Trunking
		1	m		0	13	13	75x50 Ms trunking
5	MP-A-L1 to DB-A2b	1	m	25	25	6	6	200x50 MS Trunking
		1	m		0	13	13	75x50 Ms trunking
		1	m		0	6	6	25mm dia. Concealed conduit
6	MP-A-L1 to DB-A3b	1	m	26	26	6	6	200x50 MS Trunking
		1	m		0	10	10	75x50 Ms trunking
		1	m		0	10	10	25mm dia. Concealed conduit
7	DB-A2b to DB-A2bS	1	m	6	6	6	6	25mm dia. Concealed conduit
8	DB-A1b to DB-A1bS	1	m	15	15	15	15	25mm dia. Concealed conduit
9	DB-A2a to DB-A2aS	1	m	6	6	6	6	25mm dia. Concealed conduit
10	DB-A1a to DB-A1aS	1	m	14	14	14	14	25mm dia. Concealed conduit
	2F-11F (4x1C 16mm SQ PVC CU. Cable + CPC							
11	MP-A-L1 to DB-A1a	10	m	33	330	6	60	200x50 MS Trunking
		10	m		0	27	270	75x50 Ms trunking
12	MP-A-L1 to DB-A3c	10	m	40	400	6	60	200x50 MS Trunking
		10	m		0	24	240	75x50 Ms trunking
		10	m		0	10	100	25mm dia. Concealed conduit
13	MP-A-L1 to DB-A2a	10	m	39	390	6	60	200x50 MS Trunking
		10	m		0	27	270	75x50 Ms trunking
		10	m		0	6	60	25mm dia. Concealed conduit
14	MP-A-L1 to DB-A1d	10	m	19	190	6	60	200x50 MS Trunking
		10	m		0	13	130	75x50 Ms trunking
15	MP-A-L1 to DB-A2b	10	m	25	250	6	60	200x50 MS Trunking
		10	m		0	13	130	75x50 Ms trunking
		10	m		0	6	60	25mm dia. Concealed conduit
16	MP-A-L1 to DB-A3b	10	m	26	260	6	60	200x50 MS Trunking
		10	m		0	10	100	75x50 Ms trunking
		10	m		0	10	100	25mm dia. Concealed conduit
17	DB-A2b to DB-A2bS	10	m	6	60	6	60	25mm dia. Concealed conduit
18	DB-A1d to DB-A1bS	10	m	15	150	15	150	25mm dia. Concealed conduit
19	DB-A2a to DB-A2aS	10	m	6	60	6	60	25mm dia. Concealed conduit
20	DB-A1a to DB-A1aS	10	m	14	140	14	140	25mm dia. Concealed conduit

Taking Off/Measurement Lighting Layout for Alix Residence Project

lighting layout

no	Description	member	unit	qty	total qty
	1st Floor				
1	8W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING	1	nos.	1	1
2	12W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING	1	nos.	2	2
3	5W LED DOWN LIGHT 3000K CIRCLE	1	nos.	5	5
4	17W LED DOWN LIGHT	1	nos.	20	20
5	LED STRIP (WARM WHITE)	2	m	6	12
6	1X18 W T8 CEILING MOUNTED LED LIGHT FITTING	1	nos.	1	1
7	1X18W T8 WALL MOUNTED LED LIGHT FITTING	1	nos.	2	2
8	2X9W T8 LED LIGHT FITTING C/W DIFFUSER	1	nos.	4	4
9	SELF-CONTAINED EMERGENCY LIGHT (LED) CONCEALED IN CEILING	1	nos.	8	8
10	SELF-CONTAINED KELUAR SIGN (LED)	1	nos.	3	3
11	FIREMAN SWITCH	1	nos.	2	2
12	1 GANG 1 WAY LIGHTING SWITCH	1	nos.	3	3
	2nd - 11th Floor	13	nos.	33	429
13	8W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING	10	nos.	1	10
14	12W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING	10	nos.	2	20
15	5W LED DOWN LIGHT 3000K CIRCLE	10	nos.	5	50
16	17W LED DOWN LIGHT	10	nos.	20	200
17	LED STRIP (WARM WHITE)	20	m	6	120
18	1X18 W T8 CEILING MOUNTED LED LIGHT FITTING	10	nos.	1	10
19	1X18W T8 WALL MOUNTED LED LIGHT FITTING	10	nos.	2	20
20	2X9W T8 LED LIGHT FITTING C/W DIFFUSER	10	nos.	4	40
21	SELF-CONTAINED EMERGENCY LIGHT (LED) CONCEALED IN CEILING	10	nos.	8	80
22	SELF-CONTAINED KELUAR SIGN (LED)	10	nos.	3	30
23	FIREMAN SWITCH	10	nos.	2	20
24	1 GANG 1 WAY LIGHTING SWITCH	10	nos.	3	30

Taking Off/Measurement Lighting Small Power for Alix Residence Project

Lighting Small Power

no	Description	member	unit	qty	total qty
	Type A1				
1	Lighting point c/w connector	11	nos.	27	297
2	ceiling fan point c/w connector & hook	11	nos.	4	44
3	1x13A switch socket outlet (300mm from F.F.L)	11	nos.	12	132
4	2x13A switch socket outlet (300mm from F.F.L)	11	nos.	3	33
5	1X13A switch socket outlet (1200mm from F.F.L)	11	nos.	3	33
6	2x13A switch socket outlet (1200mm from F.F.L)	11	nos.	3	33
7	1x15A switch socket outlet for fridge (1200mm from F.F.L)	11	nos.	1	11
8	1X13A switch socket outlet for hood (2100mm from F.F.L)	11	nos.	2	22
9	1x15A switch socket outlet for hob (600mm from F.F.L)	11	nos.	2	22
10	1x15A switch socket outlet for oven (600mm from F.F.L)	11	nos.	2	22
11	1x13A switch socket outlet for microwave (600mm from F.F.L)	11	nos.	2	22
12	Air Conditioner point (2800mm from F.F.L)	11	nos.	2	22
13	20A SPN isolator	11	nos.	1	11
14	water heater point c/w blind faceplate (2800mm from F.F.L)	11	nos.	3	33
15	smatv outlet (300mm from F.F.L) unless stated otherwise	11	nos.	3	33
16	telecom fiber wall socket (300mm from F.F.L) with labeling master unit and en-suite studio	11	nos.	2	22
17	door bell point (2400mm from F.F.L)	11	nos.	2	22
18	audio intercom point (1500mm from F.F.L)	11	nos.	2	22
19	distribution board (1800mm from F.F.L)	11	nos.	2	22
20	Air conditioner switch (1200mm from F.F.L)	11	nos.	4	44
21	water heater switch (1200mm from F.F.L)	11	nos.	3	33
22	2 gang 1 way for hood & hob switch (1200mm from F.F.L)	11	nos.	2	22
23	1 gang 1 way switch (1200mm from F.F.L)	11	nos.	8	88
24	2 gang 1 way switch (1200mm from F.F.L)	11	nos.	4	44
25	3 gang 1 way switch (1200mm from F.F.L)	11	nos.	2	22
26	2 gang 1 way for oven & microwave switch (1200mm from F.F.L)	11	nos.	1	11
27	1 gang 1 way for oven switch (1200mm from F.F.L)	11	nos.	1	11
28	1 gang 1 way for microwave switch (1200mm from F.F.L)	11	nos.	1	11
	TOTAL 1ST-11TH F				1144

Lighting Small Power

no	Description	member	unit	qty	total qty
	Type A2				
1	Lighting point c/w connector	11	nos.	34	374
2	ceiling fan point c/w connector & hook	11	nos.	5	55
3	exhaust fan c/w connector	11	nos.	1	11
4	1x13A switch socket outlet (300mm from F.F.L)	11	nos.	16	176
5	2x13A switch socket outlet (300mm from F.F.L)	11	nos.	3	33
6	1X13A switch socket outlet (1200mm from F.F.L)	11	nos.	1	11
7	2x13A switch socket outlet (1200mm from F.F.L)	11	nos.	4	44
8	1x15A switch socket outlet for fridge (1200mm from F.F.L)	11	nos.	1	11
9	1X13A switch socket outlet for hood (2100mm from F.F.L)	11	nos.	2	22
10	1X15A switch socket outlet for hob (600mm from F.F.L)	11	nos.	2	22
11	1x15A switch socket outlet for oven (600mm from F.F.L)	11	nos.	2	22
12	1x13A switch socket outlet for microwave (600mm from F.F.L)	11	nos.	2	22
13	Air Conditioner point (2800mm from F.F.L)	11	nos.	2	22
14	30A TPN isolator	11	nos.	1	11
15	water heater point c/w blind faceplate (2800mm from F.F.L)	11	nos.	4	44
16	smatv outlet (300mm from F.F.L) unless stated otherwise	11	nos.	3	33
17	telecom fiber wall socket (300mm from F.F.L) with labeling master unit and en-suite studio	11	nos.	2	22
18	door bell switch (1200mm FROM F.F.L)	11	nos.	2	22
19	door bell point (2400mm from F.F.L)	11	nos.	2	22
20	audio intercom point (1500mm from F.F.L)	11	nos.	2	22
21	distribution board (1800mm from F.F.L)	11	nos.	2	22
22	Air conditioner switch (1200mm from F.F.L)	11	nos.	6	66
23	water heater switch (1200mm from F.F.L)	11	nos.	4	44
24	2 gang 1 way for hood & hob switch (1200mm from F.F.L)	11	nos.	2	22
25	1 gang 1 way switch (1200mm from F.F.L)	11	nos.	7	77
26	2 gang 1 way switch (1200mm from F.F.L)	11	nos.	5	55
27	3 gang 1 way switch (1200mm from F.F.L)	11	nos.	4	44
28	2 gang 1 way for oven & microwave switch (1200mm from F.F.L)	11	nos.	1	11
29	1 gang 1 way for oven switch (1200mm from F.F.L)	11	nos.	1	11
30	1 gang 1 way for microwave switch (1200mm from F.F.L)	11	nos.	1	11
	TOTAL 1ST-11TH F				1364

Lighting Small Power

no	Description	member	unit	qty	total qty
	Type A3				
1	Lighting point c/w connector	11	nos.	37	407
2	ceiling fan point c/w connector & hook	11	nos.	5	55
3	exhaust fan c/w connector	11	nos.	2	22
4	1x13A switch socket outlet (300mm from F.F.L)	11	nos.	21	231
5	2x13A switch socket outlet (300mm from F.F.L)	11	nos.	2	22
6	1X13A switch socket outlet (1200mm from F.F.L)	11	nos.	2	22
7	2x13A switch socket outlet (1200mm from F.F.L)	11	nos.	2	22
8	1x15A switch socket outlet for fridge (1200mm from F.F.L)	11	nos.	2	22
9	1X13A switch socket outlet for hood (2100mm from F.F.L)	11	nos.	1	11
10	1X15A switch socket outlet for hob (600mm from F.F.L)	11	nos.	1	11
11	1x15A switch socket outlet for oven (600mm from F.F.L)	11	nos.	1	11
12	1x13A switch socket outlet for microwave (600mm from F.F.L)	11	nos.	1	11
13	Air Conditioner point (2800mm from F.F.L)	11	nos.	3	33
14	30A SPN isolator	11	nos.	1	11
15	water heater point c/w blind faceplate (2800mm from F.F.L)	11	nos.	4	44
16	smatv outlet (300mm from F.F.L) unless stated otherwise	11	nos.	2	22
17	telecom fiber wall socket (300mm from F.F.L) with labeling master unit and en-suite studio	11	nos.	1	11
18	door bell switch (1200mm FROM F.F.L)	11	nos.	1	11
19	door bell point (2400mm from F.F.L)	11	nos.	1	11
20	audio intercom point (1500mm from F.F.L)	11	nos.	1	11
21	distribution board (1800mm from F.F.L)	11	nos.	1	11
22	Air conditioner switch (1200mm from F.F.L)	11	nos.	6	66
23	water heater switch (1200mm from F.F.L)	11	nos.	4	44
24	2 gang 1 way for hood & hob switch (1200mm from F.F.L)	11	nos.	1	11
25	1 gang 1 way switch (1200mm from F.F.L)	11	nos.	9	99
26	2 gang 2 way switch (1200mm from F.F.L)	11	nos.	2	22
27	2 gang 1 way switch (1200mm from F.F.L)	11	nos.	5	55
28	3 gang 1 way switch (1200mm from F.F.L)	11	nos.	4	44
30	1 gang 1 way for oven switch (1200mm from F.F.L)	11	nos.	1	11
31	1 gang 1 way for microwave switch (1200mm from F.F.L)	11	nos.	1	11
	TOTAL 1ST-11TH F				1375

Lighting Small Power

no	Description	member	unit	qty	total qty
	Type A3E				
1	Lighting point c/w connector	1	nos.	38	38
2	ceiling fan point c/w connector & hook	1	nos.	5	5
3	swimming pool light2	1	nos.	3	3
4	pole light	1	nos.	2	2
5	uplight with earthspike	1	nos.	12	12
6	bollard light	1	nos.	2	2
7	pavilion column light	1	nos.	2	2
8	wall light	1	nos.	6	6
9	exhaust fan c/w connector	1	nos.	2	2
10	1x13A switch socket outlet (300mm from F.F.L)	1	nos.	21	21
11	2x13A switch socket outlet (300mm from F.F.L)	1	nos.	2	2
12	1X13A switch socket outlet (1200mm from F.F.L)	1	nos.	2	2
13	2x13A switch socket outlet (1200mm from F.F.L)	1	nos.	2	2
14	1x15A switch socket outlet for fridge (1200mm from F.F.L)	1	nos.	2	2
15	1X13A switch socket outlet for hood (2100mm from F.F.L)	1	nos.	1	1
16	1X15A switch socket outlet for hob (600mm from F.F.L)	1	nos.	1	1
17	1x15A switch socket outlet for oven (600mm from F.F.L)	1	nos.	1	1
18	1x13A switch socket outlet for microwave (600mm from F.F.L)	1	nos.	1	1
19	1x13A weather proof switch socket outlet (1200mmfrom F.F.L)	1	nos.	2	2
20	Air Conditioner point (2800mm from F.F.L)	1	nos.	3	3
21	30A SPN isolator	1	nos.	1	1
22	water heater point c/w blind faceplate (2800mm from F.F.L)	1	nos.	4	4
23	smatv outlet (300mm from F.F.L) unless stated otherwise	1	nos.	2	2
24	telecom fiber wall socket (300mm from F.F.L) with labeling master unit and en-suite studio	1	nos.	1	1
25	door bell switch (1200mm FROM F.F.L)	1	nos.	1	1
26	door bell point (2400mm from F.F.L)	1	nos.	1	1
27	audio intercom point (1500mm from F.F.L)	1	nos.	1	1
28	distribution board (1800mm from F.F.L)	1	nos.	1	1
29	Air conditioner switch (1200mm from F.F.L)	1	nos.	6	6
30	water heater switch (1200mm from F.F.L)	1	nos.	4	4
31	2 gang 1 way for hood & hob switch (1200mm from F.F.L)	1	nos.	1	1
32	1 gang 1 way switch (1200mm from F.F.L)	1	nos.	10	10
33	2 gang 2 way switch (1200mm from F.F.L)	1	nos.	2	2
34	2 gang 1 way switch (1200mm from F.F.L)	1	nos.	5	5
35	3 gang 1 way switch (1200mm from F.F.L)	1	nos.	4	4
36	1 gang 1 way for oven switch (1200mm from F.F.L)	1	nos.	1	1
37	1 gang 1 way for microwave switch (1200mm from F.F.L)	1	nos.	1	1
	TOTAL 30th F				156

Small power

no	Description	member	unit	qty	total qty
	floor 1,3,4,6,7,9,10				
1	1x13A metalclad switch socket outlet (1500mm from F.F.L)	7	nos.	3	21
2	Fireman switch	7	nos.	2	14
	floor 2,5,8,11				
3	1x13A metalclad switch socket outlet (1500mm from F.F.L)	4	nos.	3	12
4	distribution board	4	nos.	1	4
5	Fireman switch	4	nos.	2	8

Taking Off/Measurement Card Access for Alix Residence Project

card access

no	Description	member	unit	qty	total qty
	1st floor				
1	electromagnetic lock	1	nos.	2	2
2	emergency break glass	1	nos.	2	2
	2nd-11th floor				
3	electromagnetic lock	10	nos.	2	20
4	emergency break glass	10	nos.	2	20

CCTV

no	Description	member	unit	qty	total qty
	36th floor				
	cctv (2mp ip poe fixed lens dome camera)	1	nos.	2	2
	4 port poe network switches	1	nos.	1	1

REKAPITULASI VOLUME

Pekerjaan : Elektrikal dan Elektronik

Lokasi : Jalan Dutamas Dahlia, Dutamas. 51200 Kuala Lumpur, Federal Territory of Kuala Lumpur, Malaysia

Proyek : Alix Residence Blok A

NO	DESCRIPTION	UNIT	VOLUME
I	**ELEKTRIKAL**		
	1st-11th Floor		
	Cable Routing		
	4x1c 16mm SQ PVC CU. CABLE + CPC	m	2453
	200x50 MS Trunking	m	396
	75x50 Ms trunking	m	1254
	25mm dia. Concealed conduit	m	803
	Lighting Layout		
	8W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING	no	11
	12W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING	no	22
	5W LED DOWN LIGHT 3000K CIRCLE	no	55
	17W LED DOWN LIGHT	no	220
	LED STRIP (WARM WHITE)	m	132
	1X18 W T8 CEILING MOUNTED LED LIGHT FITTING	no	11
	1X18W T8 WALL MOUNTED LED LIGHT FITTING	no	22
	2X9W T8 LED LIGHT FITTING C/W DIFFUSER	no	44
	SELF-CONTAINED EMERGENCY LIGHT (LED) CONCEALED IN CEILING	no	88
	SELF-CONTAINED KELUAR SIGN (LED)	no	33
	FIREMAN SWITCH	no	22
	1 GANG 1 WAY LIGHTING SWITCH	no	33
	Lighting small power		
	Lighting point c/w connector	no	1116
	ceiling fan point c/w connector & hook	no	159
	1x13A switch socket outlet (300mm from F.F.L)	no	560
	2x13A switch socket outlet (300mm from F.F.L)	no	90
	1X13A switch socket outlet (1200mm from F.F.L)	no	68
	2x13A switch socket outlet (1200mm from F.F.L)	no	101
	1x15A switch socket outlet for fridge (1200mm from F.F.L)	no	46
	1X13A switch socket outlet for hood (2100mm from F.F.L)	no	56
	1x15A switch socket outlet for hob (600mm from F.F.L)	no	56
	1x15A switch socket outlet for oven (600mm from F.F.L)	no	56
	1x13A switch socket outlet for microwave (600mm from F.F.L)	no	56
	Air Conditioner point (2800mm from F.F.L)	no	80
	20A SPN isolator	no	11
	water heater point c/w blind faceplate (2800mm from F.F.L)	no	125
	smatv outlet (300mm from F.F.L) unless stated otherwise	no	90
	telecom fiber wall socket (300mm from F.F.L) with labeling master unit and en-suite studio	no	56
	door bell point (2400mm from F.F.L)	no	56
	audio intercom point (1500mm from F.F.L)	no	56
	distribution board (1800mm from F.F.L)	no	56
	Air conditioner switch (1200mm from F.F.L)	no	182
	water heater switch (1200mm from F.F.L)	no	125
	2 gang 1 way for hood & hob switch (1200mm from F.F.L)	no	56
	1 gang 1 way switch (1200mm from F.F.L)	no	274
	2 gang 1 way switch (1200mm from F.F.L)	no	159

REKAPITULASI VOLUME

Pekerjaan : Elektrikal dan Elektronik

Lokasi : Jalan Dutamas Dahlia, Dutamas. 51200 Kuala Lumpur, Federal Territory of Kuala Lumpur, Malaysia

Proyek : Alix Residence Blok A

NO	DESCRIPTION	UNIT	VOLUME
	3 gang 1 way switch (1200mm from F.F.L)	no	114
	2 gang 1 way for oven & microwave switch (1200mm from F.F.L)	no	22
	1 gang 1 way for oven switch (1200mm from F.F.L)	no	34
	1 gang 1 way for microwave switch (1200mm from F.F.L)	no	34
	exhaust fan c/w connector	no	35
	30A TPN isolator	no	11
	door bell switch (1200mm FROM F.F.L)	no	34
	30A SPN isolator	no	12
	2 gang 2 way switch (1200mm from F.F.L)	no	24
	swimming pool light2	no	3
	pole light	no	2
	uplight with earthspike	no	12
	bollard light	no	2
	pavilion column light	no	2
	wall light	no	6
	1x13A weather proof switch socket outlet (1200mmfrom F.F.L)	no	2
	Small power		
	1x13A metalclad switch socket outlet (1500mm from F.F.L)	no	33
	distribution board	no	4
	Fireman switch	no	22
II	**ELEKTRONIK**		
	CCTV 36th Floor		
	cctv (2mp ip poe fixed lens dome camera)	no	2
	4 port poe network switches	no	1
	Card Access		
	electromagnetic lock	no	22
	emergency break glass	no	22

Unit rate for Labour Alix Residence Project

Labour

Description	unit	RM
Male Labourer - unskilled	Day	80
Male Labourer -skilled	Day	120
Concretor	Day	90
Steel Bar Bender & Fixer	Day	100
Carpenter	Day	130
Bricklayer/ Blocklayer	Day	135
Pavior	Day	135
Joiner	Day	135
Plasterer	Day	140
Tiler	Day	140
Marble/ Granite Slab Installer	Day	150
Plumber	Day	180
Glazier	Day	180
Painter	Day	150
Welder	Day	180
Drain Layer	Day	180
Pipe Layer	Day	150
Electrician	Day	180
Structural Steel Worker	Day	150
Bitumen Worker	Day	120
Scaffolding Erector	Day	120
Surveyor	Day	250
Surveyor's Assistant	Day	180
Foreman	Day	180

Plant and Equipment

Description	unit	RM
Backhoe Case 580F/G	Day	500
Bob Cat	Day	300
Vibrator, concrete immersion type- 40mm dia	Day	300
Vibrator, concrete immersion type- 58mm dia	Day	400
Water pump, 100mm dia (Diesel)	Day	400
Water pump, 150mm dia (Elec. EL-1510)	Day	500
Water pump, 200mm dia (Elec. EL-2025)	Day	600
Mobile crane 16 tonnes	Day	900
Mobile crane 20 tonnes	Day	1000
Mobile crane 25 tonnes	Day	1300
Mobile crane 35 tonnes	Day	2500
Mobile crane 45 tonnes	Day	3500
Excavator Komatsu PC 300-5	Day	500
Tipper (5-ton)	Day	500
Tipper (10-ton)	Day	800
10 Wheel (Licensed) Lorry/Dumper (10T)	Day	700
10 Wheel (Unlicensed) Lorry/Dumper (10T)	Day	700
Concrete Mixer- (10 cu.ft)	Day	500
Pneumatic Jack Hammer	Day	200
Pneumatic Drill	Day	200
Portable Arc Welder	Day	200
Electric Welding and Cutting set	Day	200
Air Compressor 135CFM	Day	400
Air Compressor 160CFM	Day	500
Oxyacetylene Cutting Set	Day	200
Generator 25 KVA Capacity	Day	500
Generator 60 KVA Capacity	Day	800
Generator 100 KVA Caoacity	Day	1500
Bar Bender and Cutter	Day	300
Concrete Breaker 40 lbs.	Day	500
Concrete Breaker 60 lbs.	Day	500
Skylift capacity 20m	Day	600
Skylift capacity 26m	Day	700
Skylift capacity 30m	Day	1000
Skylift capacity 40m	Day	1200
Skylift capacity 53m	Day	1500
Diamond Cutter	Day	400
Concrete Coring Machine for 50mm diameter opening	Day	150
Concrete Coring Machine for 75mm diameter opening	Day	250
Concrete Coring Machine for 100mm diameter opening	Day	350
Concrete Coring Machine for 150mm diameter opening	Day	500
Concrete Coring Machine for 200mm diameter opening	Day	600
Concrete Coring Machine for 250mm diameter opening	Day	800
Concrete Coring Machine for 300mm diameter opening	Day	1000
Forklift- 2,5 tonne	Day	250
Forklift- 10 tonne	Day	650

Unit rate for Material Alix Residence Project

Material

Description	unit	RM
Kabel Mega Cable 4x16 mm² + CPC	m	45
Trunking U-Li 200x50 mm	m	16
Trunking U-Li 75x50 mm	m	9
Conduit PVC 25 mm (concealed)	m	2
8W LED Downlight Fitting (Philips)	no	18
12W LED Downlight Fitting (Philips)	no	22
Philips Meson 5W 3000K	no	13
17W LED Down Light	no	34
Philips Hue / EcoFit LED Strip 3000K	roll	85
Philips 1×18W T8 LED Tube + Batten Housing (Ceiling/Surface)	no	35
Philips 1×18W T8 LED Tube + Wall Bracket Fitting	no	36
Philips 2×9W T8 LED Tube + Diffuser Batten	no	45
Philips / Osram (LED Emergency Downlight 3W–5W, 1–3 Hours Backup)	no	110
Philips / Osram / Eaton / Schneider (LED Exit Sign, 3h backup, bilingual “Keluar/E	no	135
Schneider / MEM / MK (Heavy Duty, Metal Enclosure, 63A–100A, IP65)	no	700
Schneider Vivace / Clipsal / AvatarOn	no	12
Kabel NYM 2×1.5 mm² – Mega Cable	roll	170
U-Li / DNC / Sigma (High Quality, Heavy Duty, Fire Retardant) pipa conduit 20mm	batang	3,8
OEM / Local Brand (basic fitting, round type, E27 holder, PVC/ceramic base)	no	4,5
Material Bantu (T-doos, klem, isolasi)	ls	7
Kabel NYM 3×1.5 mm² – Mega Cable	roll	230
Branded (Panasonic / KDK ceiling fan hook, with safety pin) pengait kipas	no	7
Branded (Hilti, Fischer, U-Li, heavy duty) baut dynabolt	no	2,5
Kabel NYM 3×4.0 mm² – Mega Cable	roll	500
Panasonic stop kontak 15A + faceplate	set	25
Material Bantu (Inbow doos, dll)	ls	5
Harga Kabel NYM 3×2.5 mm² – Mega Cable	roll	320
Panasonic stop kontak 13A + faceplate	set	19
Material Bantu (Pipa drain, klem, dll)	ls	15
Material Bantu (sekrup, dll)	ls	5
20A SPN Isolator - Panasonic brand	no	35
Blind Faceplate -Panasonic brand	no	8
Kabel Coaxial RG6- Mega cable	roll	180
Outlet TV + Faceplate	set	18
Kabel Fiber Optic Patch Cord	set	28

Material

Description	unit	RM
Outlet Fiber Optic + Faceplate	set	22
Door bell	unit	25
Back Box PVC	unit	2,5
Faceplate + Bell Push switch	unit	8
Accessories (screw,clip,etc)	ls	2
Consumable (isolasi,sekrup,dll)	ls	3
Back box + Faceplate	set	12
Audio Intercom-panasonic	unit	180
30A TPN isolator - Schneider	unit	105
Saklar 2 Gang 2 Way- Schneider	Unit	25
Door bell switch	unit	15
30A SPN isolator - Schneider	unit	38
Pipa Konduit Fleksibel/Keras	ls	25
Kabel NYY 2x1.5mm (Outdoor) - Mega cable	roll	280
6W – 12W LED Pool Light	unit	280
Pole light 3m – 4m, single arm, LED 30–50W	unit	450
LED Uplight 3W–7W (Warm White/3000K, IP65, dengan earth spike)	unit	120
LED Bollard Light 0.6m – 0.9m (10W – 15W, IP65 aluminium housing)	unit	180
Lim Seong Hai Lighting- pavilion column light	unit	65
yako lighting - outdoor wall lamp TL-T608/8W-3000K	unit	49
Kabel NYY 3x2.5mm (Outdoor)- Mega cable	roll	780
Stop Kontak Weatherproof 13A - Schneider S56C313_GY	unit	115
Material Bantu (sealant, klem)	ls	8
Stop Kontak 13A Metalclad - Schneider ESM15_G11	unit	21
EPS 12 Way DB Board / DB Box (Full Set)	set	99
Schneider Acti 9 iID 2P 63A 300mA Type AC	unit	174,5
Hager 1P MCB	unit	15
ERA FS220 20A 2P Fireman Switch	unit	132
HIKVISION DS-2CD2121G0-I 2MP WDR Fixed Dome Network Camera	unit	156
TP-Link Cat6 UTP Cable	roll	320
TP-Link TL-SG1005P	unit	139
RFID Door Access Control System D99 / KM99 dengan Magnetic Lock 600lbs (280	set	195
Kabel Low Voltage 2 Core 4mm mega cable	roll	240
EL-EB4 Emergency Break Glass Door Release	unit	30
Stop Kontak 2x13A + Faceplate	set	35
Air Conditioner Switch schneider	unit	60
Water heater switch schneider	unit	50
Box inbow/outbow	unit	12
2 gang 1 way switch schneider	unit	35
1 gang 1 way switch schneider	unit	20
3 gang 1 way switch schneider	unit	40
exhaust fan + connector	unit	210

ANALISA HARGA SATUAN PEKERJAAN (AHSP)

1 4x1c 16mm SQ PVC CU. CABLE + CPC

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,15	RM 120,00	RM 18,00
	Teknisi Pembantu	OH	0,3	RM 80,00	RM 24,00
			JUMLAH HARGA SATUAN		RM 51,00
B	**MATERIAL**				
	Kabel Mega Cable 4x16 mm² + CPC	M	1	RM 45,00	RM 45,00
			JUMLAH HARGA SATUAN		RM 45,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 96,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 9,60
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 105,60

2 200x50 MS Trunking

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Teknisi Panel (Ahli)	OH	0,1	RM 120,00	RM 12,00
	Teknisi Pembantu	OH	0,2	RM 80,00	RM 16,00
			JUMLAH HARGA SATUAN		RM 33,40
B	**MATERIAL**				
	Trunking U-Li 200x50 mm	M	1	RM 16,00	RM 16,00
			JUMLAH HARGA SATUAN		RM 16,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 49,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 4,94
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 54,34

3 75x50 Ms trunking

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,025	RM 180,00	RM 4,50
	Teknisi Panel (Ahli)	OH	0,08	RM 120,00	RM 9,60
	Teknisi Pembantu	OH	0,2	RM 80,00	RM 16,00
			JUMLAH HARGA SATUAN		RM 30,10
B	**MATERIAL**				
	Trunking U-Li 75x50 mm	M	1	RM 9,00	RM 9,00
			JUMLAH HARGA SATUAN		RM 9,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 39,10
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 3,91
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 43,01

4 25mm dia. Concealed conduit

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,02	RM 180,00	RM 3,60
	Teknisi Panel (Ahli)	OH	0,07	RM 120,00	RM 8,40
	Teknisi Pembantu	OH	0,15	RM 80,00	RM 12,00
			JUMLAH HARGA SATUAN		RM 24,00
B	**MATERIAL**				
	Conduit PVC 25 mm (concealed)	M	1	RM 2,00	RM 2,00
			JUMLAH HARGA SATUAN		RM 2,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 26,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 2,60
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 28,60

5 8W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	8W LED Downlight Fitting	Unit	1	RM 18,00	RM 18,00
			JUMLAH HARGA SATUAN		RM 18,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 97,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 9,70
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 106,70

6 12W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	12W LED Downlight Fitting	Unit	1	RM 22,00	RM 22,00
			JUMLAH HARGA SATUAN		RM 22,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 101,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 10,10
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 111,10

7 5W LED DOWN LIGHT 3000K CIRCLE

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	5W LED Downlight 3000K	Unit	1	RM 13,00	RM 13,00
			JUMLAH HARGA SATUAN		RM 13,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 92,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 9,20
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 101,20

8 17W LED DOWN LIGHT

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	17W LED Down Light	Unit	1	RM 34,00	RM 34,00
			JUMLAH HARGA SATUAN		RM 34,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 113,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 11,30
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 124,30

9 LED STRIP (WARM WHITE)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	LED Strip (Warm White)	M	1	RM 17,00	RM 17,00
			JUMLAH HARGA SATUAN		RM 17,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 96,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 9,60
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 105,60

10 1X18 W T8 CEILING MOUNTED LED LIGHT FITTING

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	1x18W T8 Ceiling Mounted LED Light Fitting	Unit	1	RM 35,00	RM 35,00
			JUMLAH HARGA SATUAN		RM 35,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 114,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 11,40
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 125,40

11 1X18W T8 WALL MOUNTED LED LIGHT FITTING

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	1x18W T8 Wall Mounted LED Light Fitting	Unit	1	RM 36,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 36,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 115,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 11,50
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 126,50

12 2X9W T8 LED LIGHT FITTING C/W DIFFUSER

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	2x9W T8 LED Light Fitting C/W Diffuser	Unit	1	RM 45,00	RM 45,00
			JUMLAH HARGA SATUAN		RM 45,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 124,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 12,40
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 136,40

13 SELF-CONTAINED EMERGENCY LIGHT (LED) CONCEALED IN CEILING

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	Self-Contained Emergency Light (LED) Concealed in Ceiling	Unit	1	RM 110,00	RM 110,00
			JUMLAH HARGA SATUAN		RM 110,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 189,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 18,90
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 207,90

14 SELF-CONTAINED KELUAR SIGN (LED)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	Keluar Sign (LED)	Unit	1	RM 135,00	RM 135,00
			JUMLAH HARGA SATUAN		RM 135,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 214,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 21,40
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 235,40

15 FIREMAN SWITCH

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	Fireman Switch	Unit	1	RM 700,00	RM 700,00
			JUMLAH HARGA SATUAN		RM 700,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 779,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 77,90
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 856,90

16 1 GANG 1 WAY LIGHTING SWITCH

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Teknisi Panel (Ahli)	OH	0,25	RM 120,00	RM 30,00
	Teknisi Pembantu	OH	0,5	RM 80,00	RM 40,00
			JUMLAH HARGA SATUAN		RM 79,00
B	**MATERIAL**				
	1 Gang 1 Way Lighting Switch	Unit	1	RM 12,00	RM 12,00
			JUMLAH HARGA SATUAN		RM 12,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 91,00
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 9,10
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 100,10

17 Lighting point c/w connector

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,025	RM 180,00	RM 4,50
	Tukang Listrik	OH	0,5	RM 180,00	RM 90,00
	Pekerja Terampil	OH	0,25	RM 120,00	RM 30,00
			JUMLAH HARGA SATUAN		RM 124,50
B	**MATERIAL**				
	Kabel NYM 2x1.5mm	M	10	RM 1,70	RM 17,00
	Pipa Konduit PVC 20mm	Btg	3	RM 3,80	RM 11,40
	Fitting Lampu Plafon	Bh	1	RM 4,50	RM 4,50
	Material Bantu (T-doos, klem, isolasi)	Ls	1	RM 7,00	RM 7,00
			JUMLAH HARGA SATUAN		RM 39,90
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 164,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 16,44
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 180,84

18 ceiling fan point c/w connector & hook

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYM 3x1.5mm	M	10	RM 2,30	RM 23,00
	Pipa Konduit PVC 20mm	Btg	3	RM 3,80	RM 11,40
	Pengait Kipas (Hook) & Baut Dynabolt	Set	1	RM 9,50	RM 9,50
	Material Bantu (T-doos, isolasi)	Ls	1	RM 7,00	RM 7,00
			JUMLAH HARGA SATUAN		RM 50,90
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 200,30
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 20,03
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 220,33

19 2x13A switch socket outlet (300mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,02	RM 180,00	RM 3,60
	Tukang Listrik	OH	0,4	RM 180,00	RM 72,00
	Pekerja Terampil	OH	0,2	RM 120,00	RM 24,00
			JUMLAH HARGA SATUAN		RM 99,60
B	**MATERIAL**				
	Kabel NYM 3x2.5mm	M	8	RM 3,20	RM 25,60
	Pipa Konduit PVC 20mm	Btg	2	RM 3,80	RM 7,60
	Stop Kontak 2x13A + Faceplate	Set	1	RM 35,00	RM 35,00
	Material Bantu (Inbow doos, dll)	Ls	1	RM 5,00	RM 5,00
			JUMLAH HARGA SATUAN		RM 73,20
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 172,80
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 17,28
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 190,08

20 1x15A switch socket outlet for oven (600mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,025	RM 180,00	RM 4,50
	Tukang Listrik	OH	0,5	RM 180,00	RM 90,00
	Pekerja Terampil	OH	0,25	RM 120,00	RM 30,00
			JUMLAH HARGA SATUAN		RM 124,50
B	**MATERIAL**				
	Kabel NYM 3x4.0mm	M	8	RM 5,00	RM 40,00
	Pipa Konduit PVC 20mm	Btg	2	RM 3,80	RM 7,60
	Stop Kontak 15A + Faceplate	Set	1	RM 25,00	RM 25,00
	Material Bantu (Inbow doos, dll)	Ls	1	RM 5,00	RM 5,00
			JUMLAH HARGA SATUAN		RM 77,60
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 202,10
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 20,21
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 222,31

21 1x13A switch socket outlet for microwave (600mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,02	RM 180,00	RM 3,60
	Tukang Listrik	OH	0,4	RM 180,00	RM 72,00
	Pekerja Terampil	OH	0,2	RM 120,00	RM 24,00
			JUMLAH HARGA SATUAN		RM 99,60
B	**MATERIAL**				
	Kabel NYM 3x2.5mm	M	8	RM 3,20	RM 25,60
	Pipa Konduit PVC 20mm	Btg	2	RM 3,80	RM 7,60
	Stop Kontak 13A + Faceplate	Set	1	RM 19,00	RM 19,00
	Material Bantu (Inbow doos, dll)	Ls	1	RM 5,00	RM 5,00
			JUMLAH HARGA SATUAN		RM 57,20
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 156,80
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 15,68
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 172,48

22 Air Conditioner point (2800mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYM 3x4.0mm	M	12	RM 5,00	RM 60,00
	Pipa Konduit PVC 20mm	Btg	4	RM 3,80	RM 15,20
	Material Bantu (Pipa drain, klem, dll)	Ls	1	RM 15,00	RM 15,00
			JUMLAH HARGA SATUAN		RM 90,20
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 239,60
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 23,96
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 263,56

23 20A SPN isolator

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,01	RM 180,00	RM 1,80
	Tukang Listrik	OH	0,25	RM 180,00	RM 45,00
	Pekerja Terampil	OH	0,1	RM 120,00	RM 12,00
			JUMLAH HARGA SATUAN		RM 58,80
B	**MATERIAL**				
	20A SPN Isolator	bh	1	RM 35,00	RM 35,00
	Material Bantu (sekrup, dll)	Ls	1	RM 5,00	RM 5,00
			JUMLAH HARGA SATUAN		RM 40,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 98,80
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 9,88
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 108,68

24 water heater point c/w blind faceplate (2800mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYM 3x4.0mm	M	10	RM 5,00	RM 50,00
	Pipa Konduit PVC 20mm	Btg	3	RM 3,80	RM 11,40
	Blind Faceplate	Bh	1	RM 8,00	RM 8,00
	Material Bantu	Ls	1	RM 5,00	RM 5,00
			JUMLAH HARGA SATUAN		RM 74,40
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 223,80
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 22,38
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 246,18

25 smatv outlet (300mm from F.F.L) unless stated otherwise

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,015	RM 180,00	RM 2,70
	Tukang Listrik	OH	0,3	RM 180,00	RM 54,00
	Pekerja Terampil	OH	0,15	RM 120,00	RM 18,00
			JUMLAH HARGA SATUAN		RM 74,70
B	**MATERIAL**				
	Kabel Coaxial RG6	M	15	RM 1,80	RM 27,00
	Pipa Konduit PVC 20mm	Btg	4	RM 3,80	RM 15,20
	Outlet TV + Faceplate	Set	1	RM 18,00	RM 18,00
	Material Bantu	Ls	1	RM 5,00	RM 5,00
			JUMLAH HARGA SATUAN		RM 65,20
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 139,90
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 13,99
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 153,89

26 telecom fiber wall socket (300mm from F.F.L) with labeling master unit and en-suite studio

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,015	RM 180,00	RM 2,70
	Tukang Listrik	OH	0,3	RM 180,00	RM 54,00
	Pekerja Terampil	OH	0,15	RM 120,00	RM 18,00
			JUMLAH HARGA SATUAN		RM 74,70
B	**MATERIAL**				
	Kabel Fiber Optic (Patch Cord)	Set	1	RM 28,00	RM 28,00
	Pipa Konduit PVC 20mm	Btg	4	RM 3,80	RM 15,20
	Outlet Fiber Optic + Faceplate	Set	1	RM 22,00	RM 22,00
	Material Bantu	Ls	1	RM 5,00	RM 5,00
			JUMLAH HARGA SATUAN		RM 70,20
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 144,90
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 14,49
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 159,39

27 door bell point (2400mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,005	RM 180,00	RM 0,90
	Tukang Listrik	OH	0,05	RM 180,00	RM 9,00
	Pekerja Terampil	OH	0,03	RM 120,00	RM 3,60
			JUMLAH HARGA SATUAN		RM 13,50
B	**MATERIAL**				
	Door bell	unit	1	RM 25,00	RM 25,00
	back box PVC/GI (86X86mm)	unit	1	RM 2,50	RM 2,50
	Faceplate + Bell Push Switch	Btg	1	RM 8,00	RM 8,00
	Kabel NYM 2x1,5mm	M	10	RM 1,70	RM 17,00
	Conduit PVC 20mm	M	10	RM 1,27	RM 12,67
	Accessories (screw,clip,etc)	ls	1	RM 2,00	RM 2,00
			JUMLAH HARGA SATUAN		RM 67,17
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 80,67
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 8,07
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 88,73

28 audio intercom point (1500mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Tukang Listrik	OH	0,25	RM 180,00	RM 45,00
	Pekerja Terampil	OH	0,25	RM 120,00	RM 30,00
			JUMLAH HARGA SATUAN		RM 84,00
B	**MATERIAL**				
	Kabel NYM 3x2,5mm	m	5	RM 3,20	RM 16,00
	Back box + Faceplate	set	1	RM 12,00	RM 12,00
	Audio Intercom	unit	1	RM 180,00	RM 180,00
	Conduit PVC 20mm	m	1	RM 1,27	RM 1,27
	Consumable (isolasi,sekrup,dll)	ls	1	RM 3,00	RM 3,00
			JUMLAH HARGA SATUAN		RM 212,27
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 296,27
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 29,63
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 325,89

29 Air conditioner switch (1200mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Tukang Listrik	OH	0,8	RM 180,00	RM 144,00
	Pekerja Terampil	OH	0,4	RM 120,00	RM 48,00
			JUMLAH HARGA SATUAN		RM 201,00
B	**MATERIAL**				
	Kabel NYM 3x4 mm	m	10	RM 5,00	RM 50,00
	Pipa PVC 20mm	btg	3	RM 3,80	RM 11,40
	Air Conditioner Switch	unit	1	RM 60,00	RM 60,00
	Box inbow/outbow	unit	1	RM 12,00	RM 12,00
	Consumable (isolasi,sekrup,dll)	ls	1	RM 3,00	RM 3,00
			JUMLAH HARGA SATUAN		RM 136,40
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 337,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 33,74
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 371,14

30 water heater switch (1200mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYM 3x2,5 mm	m	10	RM 3,20	RM 32,00
	Pipa PVC 20mm	btg	3	RM 3,80	RM 11,40
	Water Heater Switch	unit	1	RM 50,00	RM 50,00
	Box inbow/outbow	unit	1	RM 12,00	
	Consumable (isolasi,sekrup,dll)	ls	1	RM 3,00	RM 3,00
			JUMLAH HARGA SATUAN		RM 96,40
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 245,80
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 24,58
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 270,38

31 2 gang 1 way for hood & hob switch (1200mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYM 3x1,5 mm	m	10	RM 2,30	RM 23,00
	Pipa PVC 20mm	btg	3	RM 3,80	RM 11,40
	2 Gang 1 way switch	unit	1	RM 35,00	RM 35,00
	Box inbow/outbow	unit	1	RM 12,00	
	Consumable (isolasi,sekrup,dll)	ls	1	RM 3,00	RM 3,00
			JUMLAH HARGA SATUAN		RM 72,40
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 221,80
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 22,18
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 243,98

32 1 gang 1 way switch (1200mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYM 3x1,5 mm	m	8	RM 2,30	RM 18,40
	Pipa PVC 20mm	btg	2	RM 3,80	RM 7,60
	1 Gang 1 way switch	unit	1	RM 20,00	RM 20,00
	Box inbow/outbow	unit	1	RM 12,00	
	Consumable (isolasi,sekrup,dll)	ls	1	RM 3,00	RM 3,00
			JUMLAH HARGA SATUAN		RM 49,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 198,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 19,84
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 218,24

33 3 gang 1 way switch (1200mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYM 3x1,5 mm	m	12	RM 2,30	RM 27,60
	Pipa PVC 20mm	btg	3	RM 3,80	RM 11,40
	3 Gang 1 way switch	unit	1	RM 40,00	RM 40,00
	Box inbow/outbow	unit	1	RM 12,00	
	Consumable (isolasi,sekrup,dll)	ls	1	RM 3,00	RM 3,00
			JUMLAH HARGA SATUAN		RM 82,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 231,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 23,14
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 254,54

34 exhaust fan c/w connector

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,05	RM 180,00	RM 9,00
	Tukang Listrik	OH	0,8	RM 180,00	RM 144,00
	Pekerja Terampil	OH	0,4	RM 120,00	RM 48,00
			JUMLAH HARGA SATUAN		RM 201,00
B	**MATERIAL**				
	Kabel NYM 3x2,5 mm	m	12	RM 3,20	RM 38,40
	Pipa PVC 20mm	btg	3	RM 3,80	RM 11,40
	exhaust fan c/w connector	unit	1	RM 210,00	RM 210,00
	Box inbow/outbow	unit	1	RM 12,00	
	Consumable (isolasi,sekrup,dll)	ls	1	RM 3,00	RM 3,00
			JUMLAH HARGA SATUAN		RM 262,80
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 463,80
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 46,38
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 510,18

35 30A TPN isolator

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,01	RM 180,00	RM 1,80
	Tukang Listrik	OH	0,25	RM 180,00	RM 45,00
	Pekerja Terampil	OH	0,1	RM 120,00	RM 12,00
			JUMLAH HARGA SATUAN		RM 58,80
B	**MATERIAL**				
	30A TPN isolator	bh	1	RM 105,00	RM 105,00
	Material Bantu (sekrup, dll)	Ls	1	RM 5,00	RM 5,00
			JUMLAH HARGA SATUAN		RM 110,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 168,80
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 16,88
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 185,68

36 2 gang 2 way switch (1200mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,025	RM 180,00	RM 4,50
	Tukang Listrik	OH	0,5	RM 180,00	RM 90,00
	Pekerja Terampil	OH	0,25	RM 120,00	RM 30,00
			JUMLAH HARGA SATUAN		RM 124,50
B	**MATERIAL**				
	Kabel NYM 3x1.5mm (untuk	M	15	RM 2,30	RM 34,50
	Pipa Konduit PVC 20mm	Btg	4	RM 3,80	RM 15,20
	Saklar 2 Gang 2 Way	Set	1	RM 25,00	RM 25,00
	Material Bantu	Ls	1	RM 7,00	RM 7,00
			JUMLAH HARGA SATUAN		RM 81,70
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 206,20
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 20,62
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 226,82

37 door bell switch (1200mm FROM F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,005	RM 180,00	RM 0,90
	Tukang Listrik	OH	0,05	RM 180,00	RM 9,00
	Pekerja Terampil	OH	0,03	RM 120,00	RM 3,60
			JUMLAH HARGA SATUAN		RM 13,50
B	**MATERIAL**				
	Door Bell Switch	unit	1	RM 15,00	RM 15,00
	Back Box PVC/Metal	unit	1	RM 2,50	RM 2,50
	Kabel NYA/NYM 2x1,5mm	M	2	RM 1,70	RM 3,40
	Accessories	Ls	1	RM 2,00	RM 2,00
			JUMLAH HARGA SATUAN		RM 22,90
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 36,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 3,64
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 40,04

38 30A SPN isolator

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,01	RM 180,00	RM 1,80
	Tukang Listrik	OH	0,25	RM 180,00	RM 45,00
	Pekerja Terampil	OH	0,1	RM 120,00	RM 12,00
			JUMLAH HARGA SATUAN		RM 58,80
B	**MATERIAL**				
	30A SPN isolator	bh	1	RM 38,00	RM 38,00
	Material Bantu (sekrup, dll)	Ls	1	RM 5,00	RM 5,00
			JUMLAH HARGA SATUAN		RM 43,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 101,80
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 10,18
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 111,98

39 swimming pool light2

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYY 2x1.5mm (Outdoor)	M	10	RM 2,80	RM 28,00
	Swimming Pool Light	unit	1	RM 280,00	RM 280,00
	Pipa Konduit Fleksibel/Keras	ls	1	RM 25,00	RM 25,00
			JUMLAH HARGA SATUAN		RM 333,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 482,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 48,24
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 530,64

40 pole light

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYY 2x1.5mm (Outdoor)	M	10	RM 2,80	RM 28,00
	pole light	unit	1	RM 450,00	RM 450,00
	Pipa Konduit Fleksibel/Keras	ls	1	RM 25,00	RM 25,00
			JUMLAH HARGA SATUAN		RM 503,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 652,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 65,24
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 717,64

41 uplight with earthspike

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYY 2x1.5mm (Outdoor)	M	10	RM 2,80	RM 28,00
	uplight with earthspike	unit	1	RM 120,00	RM 120,00
	Pipa Konduit Fleksibel/Keras	ls	1	RM 25,00	RM 25,00
			JUMLAH HARGA SATUAN		RM 173,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 322,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 32,24
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 354,64

42 bollard light

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYY 2x1.5mm (Outdoor)	M	10	RM 2,80	RM 28,00
	bollard light	unit	1	RM 180,00	RM 180,00
	Pipa Konduit Fleksibel/Keras	ls	1	RM 25,00	RM 25,00
			JUMLAH HARGA SATUAN		RM 233,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 382,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 38,24
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 420,64

43 pavilion column light

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYY 2x1.5mm (Outdoor)	M	10	RM 2,80	RM 28,00
	pavilion column light	unit	1	RM 65,00	RM 65,00
	Pipa Konduit Fleksibel/Keras	ls	1	RM 25,00	RM 25,00
			JUMLAH HARGA SATUAN		RM 118,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 267,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 26,74
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 294,14

44 wall light

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,03	RM 180,00	RM 5,40
	Tukang Listrik	OH	0,6	RM 180,00	RM 108,00
	Pekerja Terampil	OH	0,3	RM 120,00	RM 36,00
			JUMLAH HARGA SATUAN		RM 149,40
B	**MATERIAL**				
	Kabel NYY 2x1.5mm (Outdoor)	M	10	RM 2,80	RM 28,00
	wall light	unit	1	RM 49,00	RM 49,00
	Pipa Konduit Fleksibel/Keras	ls	1	RM 25,00	RM 25,00
			JUMLAH HARGA SATUAN		RM 102,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 251,40
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 25,14
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 276,54

45 1x13A weather proof switch socket outlet (1200mmfrom F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,025	RM 180,00	RM 4,50
	Tukang Listrik	OH	0,5	RM 180,00	RM 90,00
	Pekerja Terampil	OH	0,25	RM 120,00	RM 30,00
			JUMLAH HARGA SATUAN		RM 124,50
B	**MATERIAL**				
	Kabel NYY 3x2.5mm (Outdoor)	M	8	RM 7,80	RM 62,40
	Pipa Konduit PVC 20mm	Btg	2	RM 3,80	RM 7,60
	Stop Kontak Weatherproof 13A	Set	1	RM 115,00	RM 115,00
	Material Bantu (sealant, klem)	Ls	1	RM 8,00	RM 8,00
			JUMLAH HARGA SATUAN		RM 193,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 317,50
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 31,75
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 349,25

46 1x13A metalclad switch socket outlet (1500mm from F.F.L)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,02	RM 180,00	RM 3,60
	Tukang Listrik	OH	0,4	RM 180,00	RM 72,00
	Pekerja Terampil	OH	0,2	RM 120,00	RM 24,00
			JUMLAH HARGA SATUAN		RM 99,60
B	**MATERIAL**				
	Kabel NYM 3x2.5mm	M	8	RM 3,20	RM 25,60
	Pipa Konduit PVC 20mm	Btg	2	RM 3,80	RM 7,60
	Stop Kontak 13A Metalclad	Set	1	RM 21,00	RM 21,00
	Material Bantu (Inbow doos, dll)	Ls	1	RM 5,00	RM 5,00
			JUMLAH HARGA SATUAN		RM 59,20
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 158,80
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 15,88
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 174,68

47 distribution board

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,15	RM 180,00	RM 27,00
	Tukang Listrik	OH	1,5	RM 180,00	RM 270,00
	Pekerja Terampil	OH	0,75	RM 120,00	RM 90,00
			JUMLAH HARGA SATUAN		RM 387,00
B	**MATERIAL**				
	Box DB 12 Ways + Busbar	Bh	1	RM 99,00	RM 99,00
	RCCB 2-Pole 63A	Bh	1	RM 174,50	RM 174,50
	MCB	Bh	12	RM 15,00	RM 180,00
			JUMLAH HARGA SATUAN		RM 453,50
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 840,50
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 84,05
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 924,55

48 Fireman switch

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,04	RM 180,00	RM 7,20
	Tukang Listrik	OH	0,8	RM 180,00	RM 144,00
	Pekerja Terampil	OH	0,4	RM 120,00	RM 48,00
			JUMLAH HARGA SATUAN		RM 199,20
B	**MATERIAL**				
	Fireman Switch Unit	Bh	1	RM 132,00	RM 132,00
			JUMLAH HARGA SATUAN		RM 132,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 331,20
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 33,12
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 364,32

49 cctv (2mp ip poe fixed lens dome camera)

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,04	RM 180,00	RM 7,20
	Tukang Listrik	OH	0,8	RM 180,00	RM 144,00
	Pekerja Terampil	OH	0,4	RM 120,00	RM 48,00
			JUMLAH HARGA SATUAN		RM 199,20
B	**MATERIAL**				
	Kamera Dome IP POE 2MP	Bh	1	RM 156,00	RM 156,00
	Kabel UTP Cat6	M	25	RM 1,05	RM 26,23
			JUMLAH HARGA SATUAN		RM 182,23
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 381,43
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 38,14
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 419,57

50 4 port poe network switches

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,01	RM 180,00	RM 1,80
	Tukang Listrik	OH	0,15	RM 180,00	RM 27,00
			JUMLAH HARGA SATUAN		RM 28,80
B	**MATERIAL**				
	4-Port POE Network Switch	Bh	1	RM 139,00	RM 139,00
			JUMLAH HARGA SATUAN		RM 139,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 167,80
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 16,78
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 184,58

51 electromagnetic lock

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,04	RM 180,00	RM 7,20
	Tukang Listrik	OH	0,4	RM 180,00	RM 72,00
	Pekerja Terampil	OH	0,2	RM 120,00	RM 24,00
			JUMLAH HARGA SATUAN		RM 79,20
B	**MATERIAL**				
	Electromagnetic Lock Set	Set	1	RM 195,00	RM 195,00
	Kabel Low Voltage 2 Core	M	10	RM 2,40	RM 24,00
			JUMLAH HARGA SATUAN		RM 219,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 298,20
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 29,82
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 328,02

52 emergency break glass

NO.	URAIAN	SATUAN	KOEFISIEN	HARGA SATUAN (RM)	JUMLAH HARGA (RM)
A	**TENAGA KERJA**				
	Mandor	OH	0,02	RM 180,00	RM 3,60
	Tukang Listrik	OH	0,2	RM 180,00	RM 36,00
	Pekerja Terampil	OH	0,1	RM 120,00	RM 12,00
			JUMLAH HARGA SATUAN		RM 39,60
B	**MATERIAL**				
	Emergency Break Glass Unit	Bh	1	RM 30,00	RM 30,00
	Kabel Low Voltage 2 Core	M	5	RM 2,40	RM 12,00
			JUMLAH HARGA SATUAN		RM 42,00
C	**PERALATAN**				
			JUMLAH HARGA PERALATAN		RM -
D	**JUMLAH HARGA TENEGA, BAHAN DAN PERALATAN (A+B+C)**				RM 81,60
E	**BIAYA UMUM**	**10,00%**	**% x D**		RM 8,16
F	**HARGA SATUAN PEKERJAAN (D+E)**				RM 89,76

BILL OF QUANTITY

Pekerjaan : Elektrikal dan Elektronik
Lokasi : Jalan Dutamas Dahlia, Dutamas. 51200 Kuala Lumpur, Federal Territory of Kuala Lumpur, Malaysia
Proyek : Alix Residence Blok A (1ST-11TH FLOOR)

NO	DESCRIPTION	UNIT	VOLUME	UNIT PRICE	TOTAL PRICE
I	**ELEKTRIKAL**				
	1st-11th Floor				
	Cable Routing				
	4x1c 16mm SQ PVC CU. CABLE + CPC	m	2453	RM 105,60	RM 259.036,80
	200x50 MS Trunking	m	396	RM 54,34	RM 21.518,64
	75x50 Ms trunking	m	1254	RM 43,01	RM 53.934,54
	25mm dia. Concealed conduit	m	803	RM 28,60	RM 22.965,80
	SUB-TOTAL CABLE ROUTING				**RM 357.455,78**
	Lighting Layout				
	8W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING	no	11	RM 106,70	RM 1.173,70
	12W LED DOWN LIGHT FITTING SURFACE/ CONCEALED IN CEILING	no	22	RM 111,10	RM 2.444,20
	5W LED DOWN LIGHT 3000K CIRCLE	no	55	RM 101,20	RM 5.566,00
	17W LED DOWN LIGHT	no	220	RM 124,30	RM 27.346,00
	LED STRIP (WARM WHITE)	m	132	RM 105,60	RM 13.939,20
	1X18 W T8 CEILING MOUNTED LED LIGHT FITTING	no	11	RM 125,40	RM 1.379,40
	1X18W T8 WALL MOUNTED LED LIGHT FITTING	no	22	RM 126,50	RM 2.783,00
	2X9W T8 LED LIGHT FITTING C/W DIFFUSER	no	44	RM 136,40	RM 6.001,60
	SELF-CONTAINED EMERGENCY LIGHT (LED) CONCEALED IN CEILING	no	88	RM 207,90	RM 18.295,20
	SELF-CONTAINED KELUAR SIGN (LED)	no	33	RM 235,40	RM 7.768,20
	FIREMAN SWITCH	no	22	RM 856,90	RM 18.851,80
	1 GANG 1 WAY LIGHTING SWITCH	no	33	RM 100,10	RM 3.303,30
	SUB-TOTAL LIGHTING LAYOUT				**RM 108.851,60**
	Lighting small power				
	Lighting point c/w connector	no	1116	RM 180,84	RM 201.817,44
	ceiling fan point c/w connector & hook	no	159	RM 220,33	RM 35.032,47
	1x13A switch socket outlet (300mm from F.F.L)	no	560	RM 172,48	RM 96.588,80
	2x13A switch socket outlet (300mm from F.F.L)	no	90	RM 190,08	RM 17.107,20
	1X13A switch socket outlet (1200mm from F.F.L)	no	68	RM 172,48	RM 11.728,64
	2x13A switch socket outlet (1200mm from F.F.L)	no	101	RM 190,08	RM 19.198,08
	1x15A switch socket outlet for fridge (1200mm from F.F.L)	no	46	RM 222,31	RM 10.226,26
	1X13A switch socket outlet for hood (2100mm from F.F.L)	no	56	RM 172,48	RM 9.658,88
	1x15A switch socket outlet for hob (600mm from F.F.L)	no	56	RM 222,31	RM 12.449,36
	1x15A switch socket outlet for oven (600mm from F.F.L)	no	56	RM 222,31	RM 12.449,36
	1x13A switch socket outlet for microwave (600mm from F.F.L)	no	56	RM 172,48	RM 9.658,88
	Air Conditioner point (2800mm from F.F.L)	no	80	RM 263,56	RM 21.084,80
	20A SPN isolator	no	11	RM 108,68	RM 1.195,48
	water heater point c/w blind faceplate (2800mm from F.F.L)	no	125	RM 246,18	RM 30.772,50
	smatv outlet (300mm from F.F.L) unless stated otherwise	no	90	RM 153,89	RM 13.850,10
	telecom fiber wall socket (300mm from F.F.L) with labeling master unit and en-suite studio	no	56	RM 159,39	RM 8.925,84
	door bell point (2400mm from F.F.L)	no	56	RM 88,73	RM 4.969,07
	audio intercom point (1500mm from F.F.L)	no	56	RM 325,89	RM 18.250,03
	distribution board (1800mm from F.F.L)	no	56	RM 924,55	RM 51.774,80
	Air conditioner switch (1200mm from F.F.L)	no	182	RM 371,14	RM 67.547,48
	water heater switch (1200mm from F.F.L)	no	125	RM 270,38	RM 33.797,50
	2 gang 1 way for hood & hob switch (1200mm from F.F.L)	no	56	RM 243,98	RM 13.662,88
	1 gang 1 way switch (1200mm from F.F.L)	no	274	RM 218,24	RM 59.797,76
	2 gang 1 way switch (1200mm from F.F.L)	no	159	RM 243,98	RM 38.792,82
	3 gang 1 way switch (1200mm from F.F.L)	no	114	RM 254,54	RM 29.017,56
	2 gang 1 way for oven & microwave switch (1200mm from F.F.L)	no	22	RM 243,98	RM 5.367,56
	1 gang 1 way for oven switch (1200mm from F.F.L)	no	34	RM 218,24	RM 7.420,16
	1 gang 1 way for microwave switch (1200mm from F.F.L)	no	34	RM 218,24	RM 7.420,16
	exhaust fan c/w connector	no	35	RM 510,18	RM 17.856,30
	30A TPN isolator	no	11	RM 185,68	RM 2.042,48
	door bell switch (1200mm FROM F.F.L)	no	34	RM 40,04	RM 1.361,36
	30A SPN isolator	no	12	RM 111,98	RM 1.343,76
	2 gang 2 way switch (1200mm from F.F.L)	no	24	RM 226,82	RM 5.443,68
	swimming pool light2	no	3	RM 530,64	RM 1.591,92
	pole light	no	2	RM 717,64	RM 1.435,28
	uplight with earthspike	no	12	RM 354,64	RM 4.255,68
	bollard light	no	2	RM 420,64	RM 841,28
	pavilion column light	no	2	RM 294,14	RM 588,28
	wall light	no	6	RM 276,54	RM 1.659,24
	1x13A weather proof switch socket outlet (1200mmfrom F.F.L)	no	2	RM 349,25	RM 698,50
	SUB-TOTAL LIGHTING SMALL POWER				**RM 888.679,62**
	Small power				
	1x13A metalclad switch socket outlet (1500mm from F.F.L)	no	33	RM 174,68	RM 5.764,44
	distribution board	no	4	RM 924,55	RM 3.698,20
	Fireman switch	no	22	RM 364,32	RM 8.015,04
	SUB-TOTAL SMALL POWER				**RM 17.477,68**
	SUB-TOTAL ELECTRICAL				**RM 1.372.464,68**
II	**ELEKTRONIK**				
	CCTV 36th Floor				
	cctv (2mp ip poe fixed lens dome camera)	no	2	RM 419,57	RM 839,14
	4 port poe network switches	no	1	RM 184,58	RM 184,58
	SUB-TOTAL CCTV				**RM 1.023,72**
	Card Access				
	electromagnetic lock	no	22	RM 328,02	RM 7.216,44
	emergency break glass	no	22	RM 89,76	RM 1.974,72
	SUB-TOTAL CARD ACCESS				**RM 9.191,16**
	SUB-TOTAL ELECTRONICAL				**RM 10.214,88**
	TOTAL ELECTRICAL AND ELECTRONICAL				**RM 1.382.679,57**

Time Schedule

NO. DIVISI	URAIAN	JUMLAH HARGA PEKERJAAN RM	BOBOT %	DURASI (MINGGU)	Waktu Pelaksanaan															
					Bulan 1				Bulan 2				Bulan 3				Bulan 4			
					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Cable Routing	RM 357.455,78	25,85	9	2,87	2,87	2,87	2,87	2,87	2,87	2,87	2,87	2,87							
2	Lighting Layout	RM 108.851,60	7,87	3							2,62	2,62	2,62							
3	Lighting small power	RM 888.679,62	64,27	15		0,43	0,43	0,43	1,29	3,00	3,00	3,86	4,28	9,00	8,78	8,57	7,36	5,71	4,07	4,07
4	Small power	RM 17.477,68	1,26	2					0,63					0,63						
6	CCTV 36th Floor	RM 1.023,72	0,07	1											0,07					
7	Card Access	RM 9.191,16	0,66	1								0,66								
	JUMLAH TOTAL HARGA PEKERJAAN	**RM 1.382.679,57**	100		2,87	3,30	3,30	3,30	4,79	5,87	8,50	10,02	9,78	9,63	8,86	8,57	7,36	5,71	4,07	4,07
Bobot Kumulatif					2,87	6,17	9,47	12,78	17,57	23,44	31,93	41,95	51,73	61,36	70,22	78,79	86,15	91,86	95,93	100

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
- BLOK A - 38 TINGKAT (200 UNIT KEDIAMAN)
- BLOK B - 25 TINGKAT (164 UNIT KEDIAMAN)

DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL,
DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA,
SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN,
KUALA LUMPUR, MALAYSIA

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Revision	Date	Note

Drawing Title

PERSPECTIVE VIEW
VIEW 1

Note :

The Perspective View above is only for illustration, informations & reference.

Current Plot Date - Tuesday, 13 October 2020 | *CAD File Name - 02-101 - 104 - PERSPECTIVE VIEWS.pwr*

Status: **CONSTRUCTION DRAWING**

Scale	Date	Drawn By	Checked By
NOT TO SCALE	OCTOBER 2020	JIHA	ISA

Project Number	Issuance Status	Revision
2441/09	CD	0

Drawing Number: 02-101

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
- BLOK A - 38 TINGKAT (200 UNIT KEDIAMAN)
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Revision	Date	Note

Drawing Title

PERSPECTIVE VIEW
VIEW 2

Note :

The Perspective View above is only for illustration, informations & reference.

Current Plot Date - Tuesday, 13 October 2020	CAD File Name : 02-101 - 104 - PERSPECTIVE VIEWS.pwr
Status: **CONSTRUCTION DRAWING**	
Scale: NOT TO SCALE	Date: OCTOBER 2020
Drawn By: JIHA	Checked By: ISA
Project Number: 2441/09	Issuance Status: CD
Revision: 0	
Drawing Number: 02-102	

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
- BLOK A - 38 TINGKAT (200 UNIT KEDIAMAN)
- BLOK B - 25 TINGKAT (164 UNIT KEDIAMAN)

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KUALA LUMPUR, MALAYSIA

UNTUK
TETUAN ORCHARD PARK SDN BHD

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Revision	Date	Note

Drawing Title

PERSPECTIVE VIEW
VIEW 3

Note :

The Perspective View above is only for illustration, informations & reference.

Current Plot Date - Tuesday, 13 October 2020 | *CAD File Name : 02-101 - 104 - PERSPECTIVE VIEWS.pwr*

Status: **CONSTRUCTION DRAWING**

Scale	Date	Drawn By	Checked By
NOT TO SCALE	OCTOBER 2020	JIHA	ISA

Project Number	Issuance Status	Revision
2441/09	CD	0

Drawing Number: 02-103

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
- BLOK A - 38 TINGKAT (200 UNIT KEDIAMAN)
- BLOK B - 25 TINGKAT (164 UNIT KEDIAMAN)

DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL,
DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA,
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KUALA LUMPUR, MALAYSIA

UNTUK
TETUAN ORCHARD PARK SDN BHD

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Revision	Date	Note

Drawing Title

PERSPECTIVE VIEW
VIEW 4

Note :
The Perspective View above is only for illustration, informations & reference.

Current Plot Date - Tuesday, 13 October 2020 | CAD File Name - 02-101 - 104 - PERSPECTIVE VIEWS.pwf

Status: **CONSTRUCTION DRAWING**

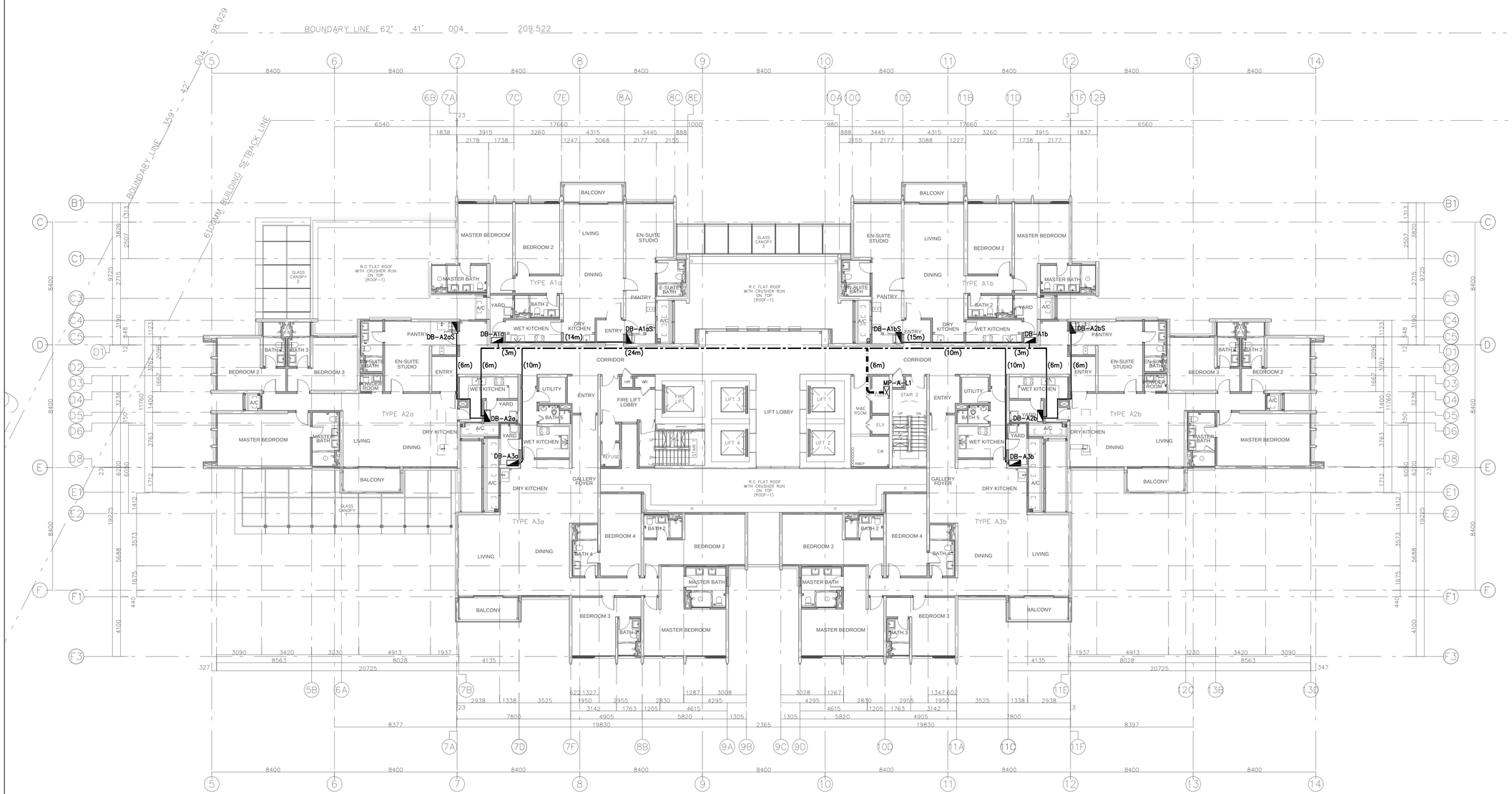
Scale	Date	Drawn By	Checked By
NOT TO SCALE	OCTOBER 2020	JIHA	ISA

Project Number	Issuance Status	Revision
2441/09	CD	0

Drawing Number: 02-104

LEGEND:	
SYMBOL	DESCRIPTION
▬ ▬ ▬	200mmX50mm MS TRUNKING
▬ · ▬	75mmX50mm MS TRUNKING
———	25mm DIA. CONCEALED CONDUIT
⊠	METERING PANEL
◪	DISTRIBUTION BOARD

FROM	TO	CABLE SIZE	ENCLOSURE
MP-A-L1	DB-A1a	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L1	DB-A2a	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L1	DB-A3a	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L1	DB-A1b	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L1	DB-A2b	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L1	DB-A3b	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING



1st FLOOR PLAN
SCALE 1:150

CONSRUCTION DRAWING

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
– BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
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DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL,
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Revision	Date	Note

Drawing Title

ELECTRICAL SERVICES

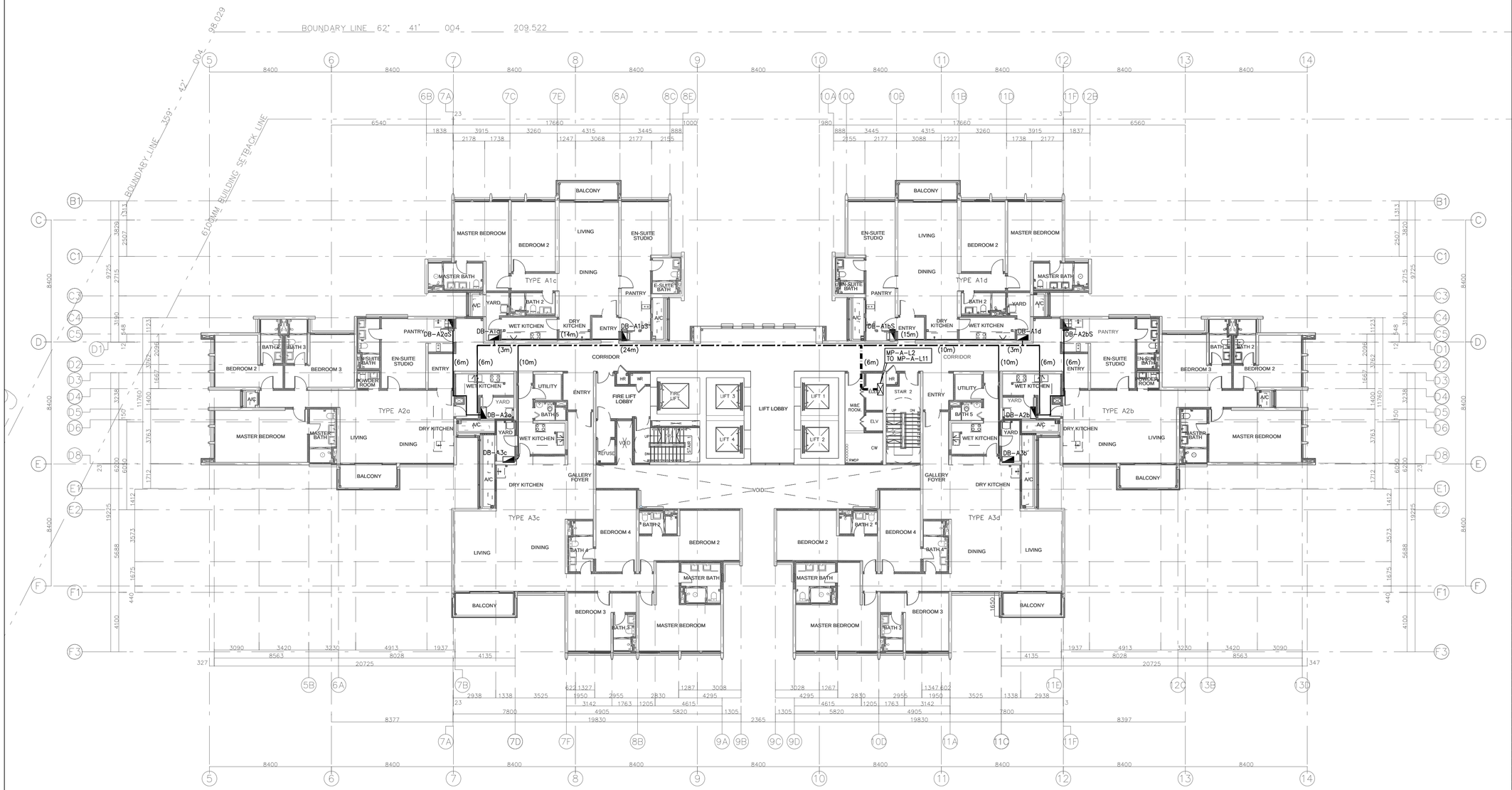
CABLE ROUTING LAYOUT
- 1st FLOOR PLAN
(BLOCK A)

DESIGNED BY:	KESHAN	
DRAWN BY:	HARMAN	
CHECKED BY:	K.T WONG	
APPROVED BY:	K.T WONG	
SCALE:	AS SHOWN	
DATE:	JAN. 2021	
NOMBOR LUKISAN : 1412/ME/CR/LP-06		PINDAAN -

LEGEND:	
SYMBOL	DESCRIPTION
▬ ▬ ▬	200mmX50mm MS TRUNKING
▬ · ▬	75mmX50mm MS TRUNKING
———	25mm DIA. CONCEALED CONDUIT
⊠	METERING PANEL
◪	DISTRIBUTION BOARD

FROM	TO	CABLE SIZE	ENCLOSURE
MP-A-L2	DB-A1a	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L2	DB-A2a	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L2	DB-A3a	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L2	DB-A1b	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L2	DB-A2b	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L2	DB-A3b	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING

TYPICAL FOR MP-A-L3 TO MP-A-L11



TYPICAL FLOOR PLAN (2nd TO 11th FLOOR PLAN)

SCALE 1:150

CONSTRUCTION DRAWING

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
– BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
– BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)
DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL,
DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA,
SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN,
KUALA LUMPUR, MALAYSIA

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Revision	Date	Note

Drawing Title

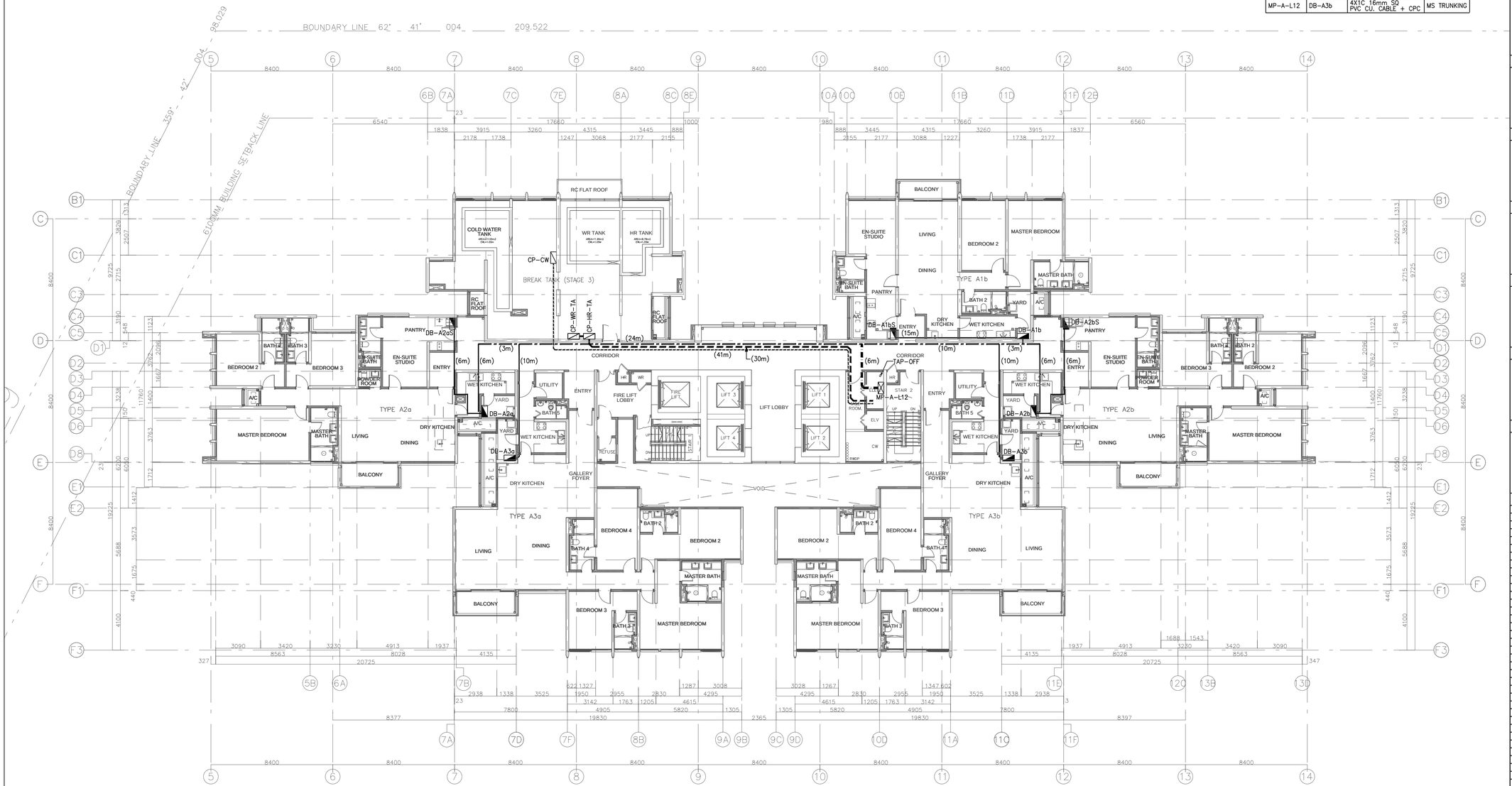
ELECTRICAL SERVICES

CABLE ROUTING LAYOUT
- 2nd TO 11th FLOOR PLAN
(BLOCK A)

DESIGNED BY:	KESHAN	
DRAWN BY:	HARMAN	
CHECKED BY:	K.T WONG	
APPROVED BY:	K.T WONG	
SCALE:	AS SHOWN	
DATE:	JAN. 2021	
NOMBOR LUKISAN : 1412/ME/CR/LP-07		PINDAAN 00

LEGEND:	
SYMBOL	DESCRIPTION
▬ ▬ ▬	200mmX50mm MS TRUNKING
▬ ▬ ▬	100mmX50mm MS TRUNKING
▬ · ▬	75mmX50mm MS TRUNKING
———	25mm DIA. CONCEALED CONDUIT
⊠	METERING PANEL
◪	DISTRIBUTION BOARD
▨	CONTROL PANEL
◘	SUB SWITCH BOARD

FROM	TO	CABLE SIZE	ENCLOSURE
MP-A-L12	DB-A2a	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L12	DB-A3a	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L12	DB-A1b	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L12	DB-A2b	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING
MP-A-L12	DB-A3b	4X1C 16mm SQ PVC CU. CABLE + CPC	MS TRUNKING



12th FLOOR PLAN (BREAK TANK)

SCALE 1:150

CONSTRUCTION DRAWING

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
– BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
– BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)
DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL,
DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA,
SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN,
KUALA LUMPUR, MALAYSIA

UNTUK
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Client

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Revision	Date	Note

Drawing Title

ELECTRICAL SERVICES

CABLE ROUTING LAYOUT
- 12th FLOOR PLAN (BREAK TANK)
(BLOCK A)

DESIGNED BY:	KESHAN	
DRAWN BY:	HARMAN	
CHECKED BY:	K.T WONG	
APPROVED BY:	K.T WONG	
SCALE:	AS SHOWN	
DATE:	JAN. 2021	
NOMBOR LUKISAN : 1412/ME/CR/LP-08		PINDAAN 00

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
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Revision	Date	Note

Drawing Title

ELECTRICAL SERVICES

LIGHTING LAYOUT
- 1st, 2nd & 3th FLOOR PLAN (BLOCK A)

DESIGNED BY:	KESHAN	
DRAWN BY:	HARMAN	
CHECKED BY:	K.T WONG	
APPROVED BY:	K.T WONG	
SCALE:	AS SHOWN	
DATE:	JAN. 2021	
NOMBOR LUKISAN :	1412/ME/LL/LP-07	PINDAAN 00

CONSTRUCTION DRAWING

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
- BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
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Revision	Date	Note

Drawing Title

ELECTRICAL SERVICES

LIGHTING LAYOUT
- 4th, 5th & 6th FLOOR PLAN (BLOCK A)

DESIGNED BY:	KESHAN
DRAWN BY:	HARMAN
CHECKED BY:	K.T WONG
APPROVED BY:	K.T WONG
SCALE:	AS SHOWN
DATE:	JAN. 2021

NOMBOR LUKISAN : 1412/ME/LL/LP-08

PINDAAN 00

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
- BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
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Revision	Date	Note

Drawing Title

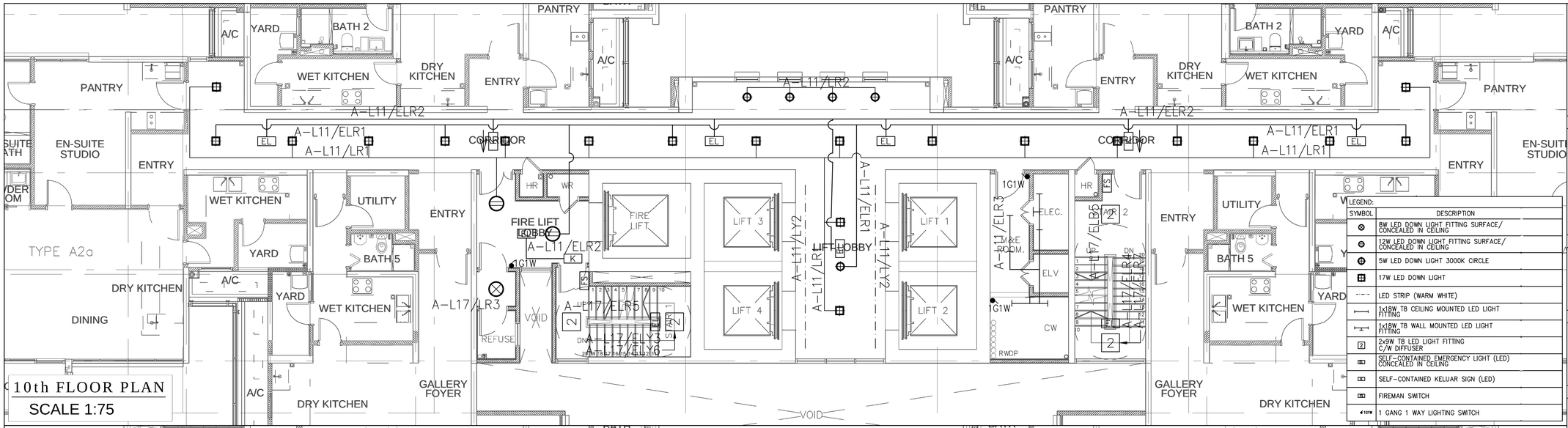
ELECTRICAL SERVICES

LIGHTING LAYOUT
- 7th, 8th & 9th FLOOR PLAN (BLOCK A)

DESIGNED BY:	KESHAN
DRAWN BY:	HARMAN
CHECKED BY:	K.T WONG
APPROVED BY:	K.T WONG
SCALE:	AS SHOWN
DATE:	JAN. 2021

NOMBOR LUKISAN : 1412/ME/LL/LP-09

PINDAAN 00



Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
- BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
- BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)
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Revision	Date	Note

Drawing Title

ELECTRICAL SERVICES

LIGHTING LAYOUT
- 10th, 11th & 12th FLOOR PLAN (BLOCK A)

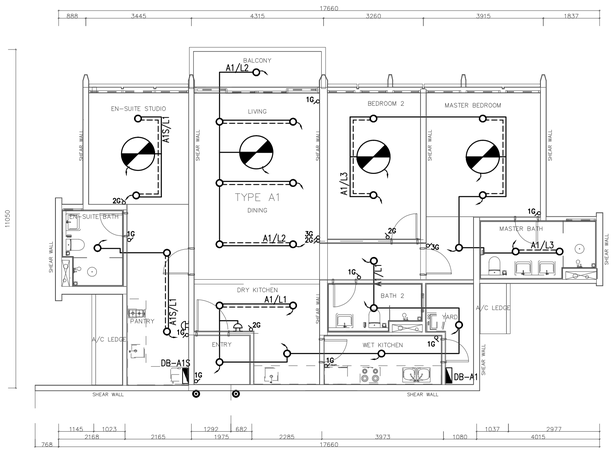
DESIGNED BY:	KESHAN
DRAWN BY:	HARMAN
CHECKED BY:	K.T WONG
APPROVED BY:	K.T WONG
SCALE:	AS SHOWN
DATE:	JAN. 2021

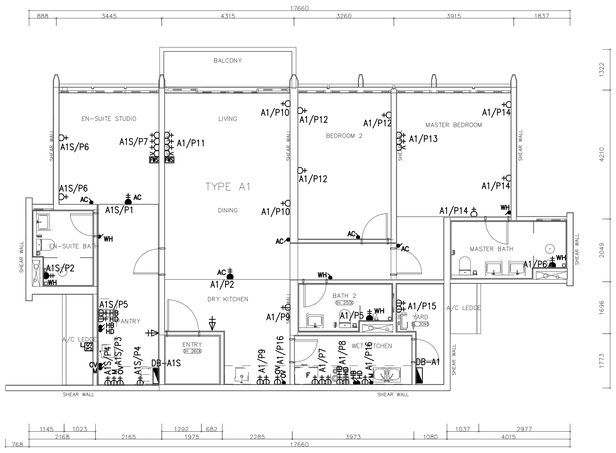
NOMBOR LUKISAN : 1412/ME/LL/LP-10

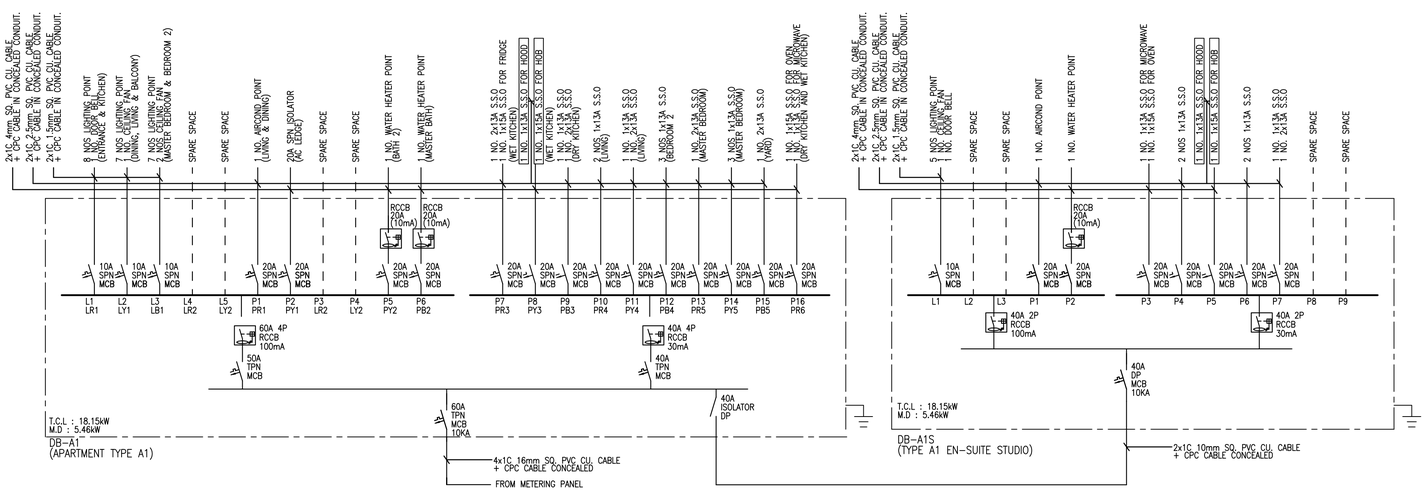
PINDAAN 00

LEGEND : TYPE A1 (TYPICAL UNIT)	
SYMBOL	DESCRIPTION
	LIGHTING POINT C/W CONNECTOR
	CEILING FAN POINT C/W CONNETOR & HOOK
	1x13A SWITCH SOCKET OUTLET (300mm FROM F.F.L)
	2x13A SWITCH SOCKET OUTLET (300mm FROM F.F.L)
	1x13A SWITCH SOCKET OUTLET (1200mm FROM F.F.L)
	2x13A SWITCH SOCKET OUTLET (1200mm FROM F.F.L)
F	1x15A SWITCH SOCKET OUTLET FOR FRIDGE (1200mm FROM F.F.L)
HD	1x13A SWITCH SOCKET OUTLET FOR HOOD (2100mm FROM F.F.L)
HB	1x15A SWITCH SOCKET OUTLET FOR HOB (600mm FROM F.F.L)
OV	1x15A SWITCH SOCKET OUTLET FOR OVEN (600mm FROM F.F.L)
M	1x13A SWITCH SOCKET OUTLET FOR MICROWAVE (600mm FROM F.F.L)
AC	AIR CONDITIONER POINT (2800mm FROM F.F.L)
	20A SPN ISOLATOR
WH	WATER HEATER POINT C/W BLIND FACEPLATE (2800mm FROM F.F.L)

LEGEND : TYPE A1 (TYPICAL UNIT)	
SYMBOL	DESCRIPTION
	SMATV OUTLET (300mm FROM F.F.L) UNLEA1S STATED OTHERWISE
	TELECOM FIBER WALL SOCKET (300mm FROM F.F.L) UNLEA1S STATED OTHERWISE
	DOOR BELL SWITCH (1200mm FROM F.F.L) (WITH LABELING MASTER UNIT AND EN-SUITE STUDIO)
	DOOR BELL POINT (2400mm FROM F.F.L)
	AUDIO NTERCOM POINT (1500mm FROM F.F.L)
	DISTRIBUTION BOARD (1800mm FROM F.F.L)
AC	AIR CONDITIONER SWITCH (1200mm FROM F.F.L)
WH	WATER HEATER SWITCH (1200mm FROM F.F.L)
HD HB	2 GANG 1 WAY FOR HOOD & HOB SWITCH (1200mm FROM F.F.L)
1G	1 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
2G	2 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
3G	3 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
OV M	2 GANG 1 WAY FOR OVEN & MICROWAVE SWITCH (1200mm FROM F.F.L)
OV	1 GANG 1 WAY FOR OVEN SWITCH (1200mm FROM F.F.L)
M	1 GANG 1 WAY FOR MICROWAVE SWITCH (1200mm FROM F.F.L)







CONSTRUCTION DRAWING

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
– BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
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DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA,
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Revision	Date	Note

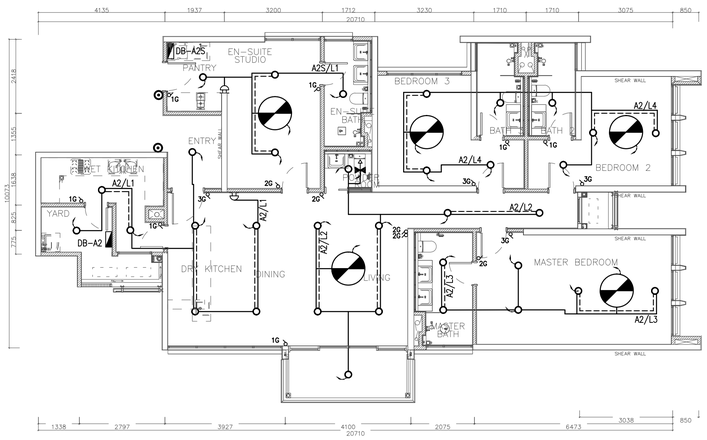
Drawing Title

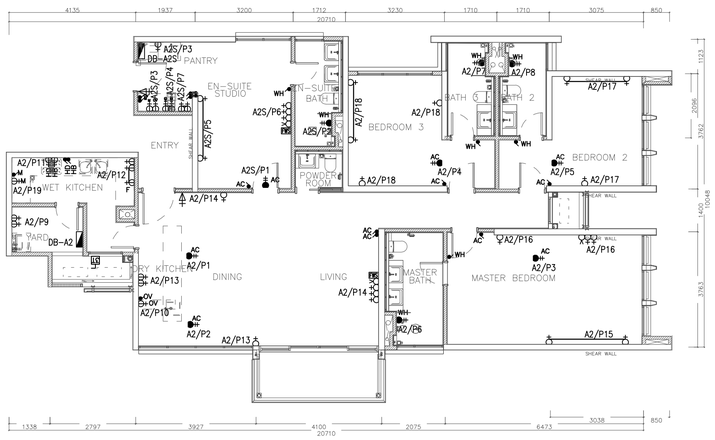
ELECTRICAL SERVICES

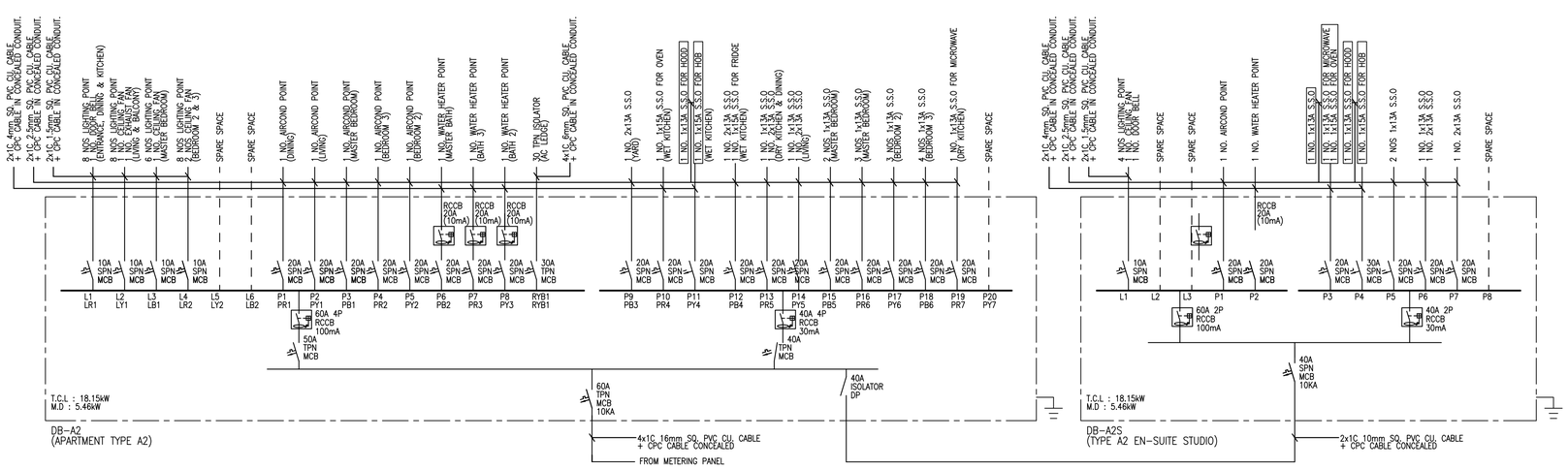
LIGHTING, SMALL POWER
& SINGLE LINE DIAGRAM
-CONDOMINIUM BLOCK A - TYPE A1

DESIGNED BY:	KESHAN	
DRAWN BY:	HARMAN	
CHECKED BY:	K.T WONG	
APPROVED BY:	K.T WONG	
SCALE:	1:100	
DATE:	JAN. 2021	
NOMBOR LUKISAN : 1412/ME/LSP/UNIT-01		PINDAAN 00

LEGEND : TYPE A2 (TYPICAL UNIT)	
SYMBOL	DESCRIPTION
	LIGHTING POINT C/W CONNECTOR
	CEILING FAN POINT C/W CONNETOR & HOOK
	EXHAUST FAN C/W CONNECTOR
	1x13A SWITCH SOCKET OUTLET (300mm FROM F.F.L)
	2x13A SWITCH SOCKET OUTLET (300mm FROM F.F.L)
	1x13A SWITCH SOCKET OUTLET (1200mm FROM F.F.L)
	2x13A SWITCH SOCKET OUTLET (1200mm FROM F.F.L)
F	1x15A SWITCH SOCKET OUTLET FOR FRIDGE (1200mm FROM F.F.L)
HD	1x13A SWITCH SOCKET OUTLET FOR HOOD (2100mm FROM F.F.L)
HB	1x15A SWITCH SOCKET OUTLET FOR HOB (600mm FROM F.F.L)
OV	1x15A SWITCH SOCKET OUTLET FOR OVEN (600mm FROM F.F.L)
M	1x13A SWITCH SOCKET OUTLET FOR MICROWAVE (600mm FROM F.F.L)
AC	AIR CONDITIONER POINT (2800mm FROM F.F.L)
	30A TPN ISOLATOR
WH	WATER HEATER POINT C/W BLIND FACEPLATE (2800mm FROM F.F.L)
	SMATV OUTLET (300mm FROM F.F.L) UNLESS STATED OTHERWISE
TV	TELECOM FIBER WALL SOCKET (300mm FROM F.F.L) UNLESS STATED OTHERWISE
	DOOR BELL SWITCH (1200mm FROM F.F.L)
	DOOR BELL POINT (2400mm FROM F.F.L)
	AUDIO INTERCOM POINT (1500mm FROM F.F.L)
	DISTRIBUTION BOARD (1800mm FROM F.F.L)
AC	AIR CONDITIONER SWITCH (1200mm FROM F.F.L)
WH	WATER HEATER SWITCH (1200mm FROM F.F.L)
HD HB	2 GANG 1 WAY FOR HOOD & HOB SWITCH (1200mm FROM F.F.L)
1G	1 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
2G	2 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
3G	3 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
OV M	2 GANG 1 WAY FOR OVEN & MICROWAVE SWITCH (1200mm FROM F.F.L)
OV	1 GANG 1 WAY FOR OVEN SWITCH (1200mm FROM F.F.L)
M	1 GANG 1 WAY FOR MICROWAVE SWITCH (1200mm FROM F.F.L)







CONSTRUCTION DRAWING

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
– BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
– BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)
DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL,
DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA,
SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN,
KUALA LUMPUR, MALAYSIA

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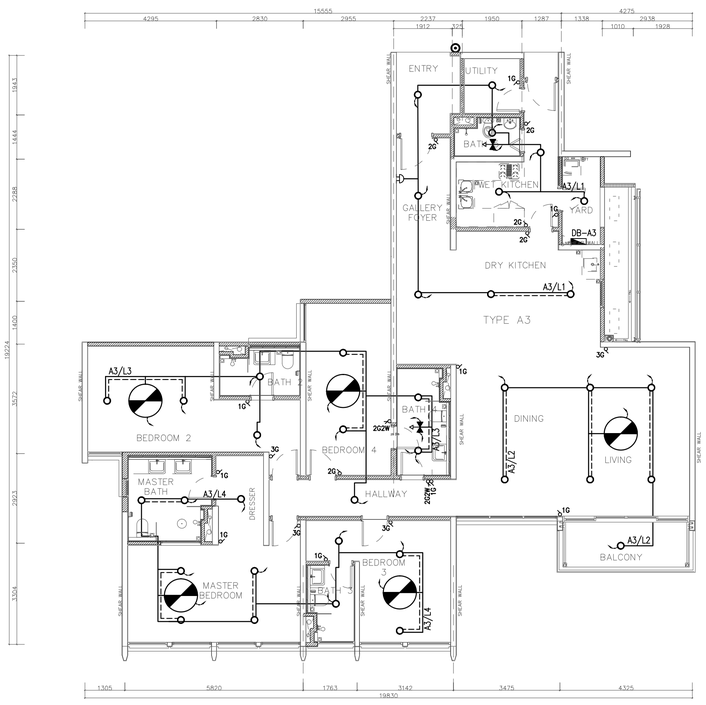
Revision	Date	Note

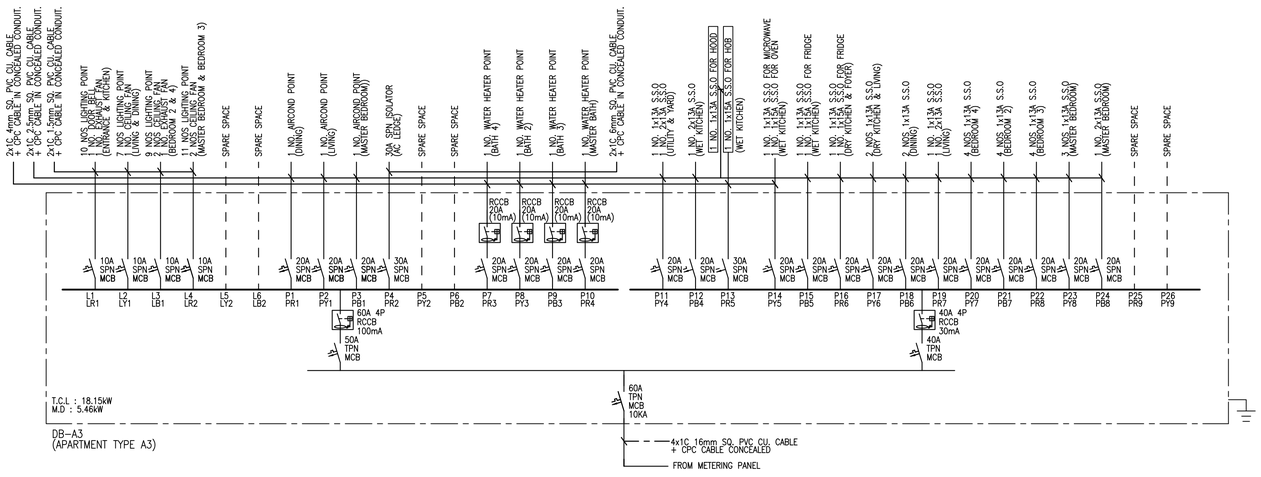
Drawing Title

ELECTRICAL SERVICES

LIGHTING, SMALL POWER
& SINGLE LINE DIAGRAM
-CONDOMINIUM BLOCK A - TYPE A2

DESIGNED BY:	KESHAN	
DRAWN BY:	HARMAN	
CHECKED BY:	K.T WONG	
APPROVED BY:	K.T WONG	
SCALE:	1:100	
DATE:	JAN. 2021	
NOMBOR LUKISAN : 1412/ME/LSP/UNIT-02		PINDAAN 00





LEGEND : TYPE A3 (TYPICAL UNIT)	
SYMBOL	DESCRIPTION
O	LIGHTING POINT C/W CONNECTOR
	CEILING FAN POINT C/W CONNETOR & HOOK
	EXHAUST FAN POINT C/W CONNECTOR
	1x13A SWITCH SOCKET OUTLET (300mm FROM F.F.L)
	2x13A SWITCH SOCKET OUTLET (300mm FROM F.F.L)
	1x13A SWITCH SOCKET OUTLET (1200mm FROM F.F.L)
	2x13A SWITCH SOCKET OUTLET (1200mm FROM F.F.L)
F	1x15A SWITCH SOCKET OUTLET FOR FRIDGE (1200mm FROM F.F.L)
HD	1x13A SWITCH SOCKET OUTLET FOR HOOD (2100mm FROM F.F.L)
HB	1x15A SWITCH SOCKET OUTLET FOR HOB (600mm FROM F.F.L)
OV	1x15A SWITCH SOCKET OUTLET FOR OVEN (600mm FROM F.F.L)
M	1x13A SWITCH SOCKET OUTLET FOR MICROWAVE (600mm FROM F.F.L)
AC	AIR CONDITIONER POINT (2800mm FROM F.F.L)
	30A SPN ISOLATOR
WH	WATER HEATER POINT C/W BLIND FACEPLATE (2800mm FROM F.F.L)
	SMATV OUTLET (300mm FROM F.F.L) UNLESS STATED OTHERWISE
TC	TELECOM FIBER WALL SOCKET (300mm FROM F.F.L) UNLESS STATED OTHERWISE
	DOOR BELL SWITCH (1200mm FROM F.F.L)
	DOOR BELL POINT (2400mm FROM F.F.L)
	AUDIO INTERCOM POINT (1500mm FROM F.F.L)
	DISTRIBUTION BOARD (1800mm FROM F.F.L)
AC	AIR CONDITIONER SWITCH (1200mm FROM F.F.L)
WH	WATER HEATER SWITCH (1200mm FROM F.F.L)
HD HB	2 GANG 1 WAY FOR HOOD & HOB SWITCH (1200mm FROM F.F.L)
1G	1 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
2GW	2 GANG 2 WAY SWITCH (1200mm FROM F.F.L)
2G	2 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
3G	3 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
OV	1 GANG 1 WAY FOR OVEN SWITCH (1200mm FROM F.F.L)
M	1 GANG 1 WAY FOR MICROWAVE SWITCH (1200mm FROM F.F.L)

CONSTRUCTION DRAWING

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
– BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
– BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)
DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL,
DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA,
SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN,
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Revision	Date	Note

Drawing Title

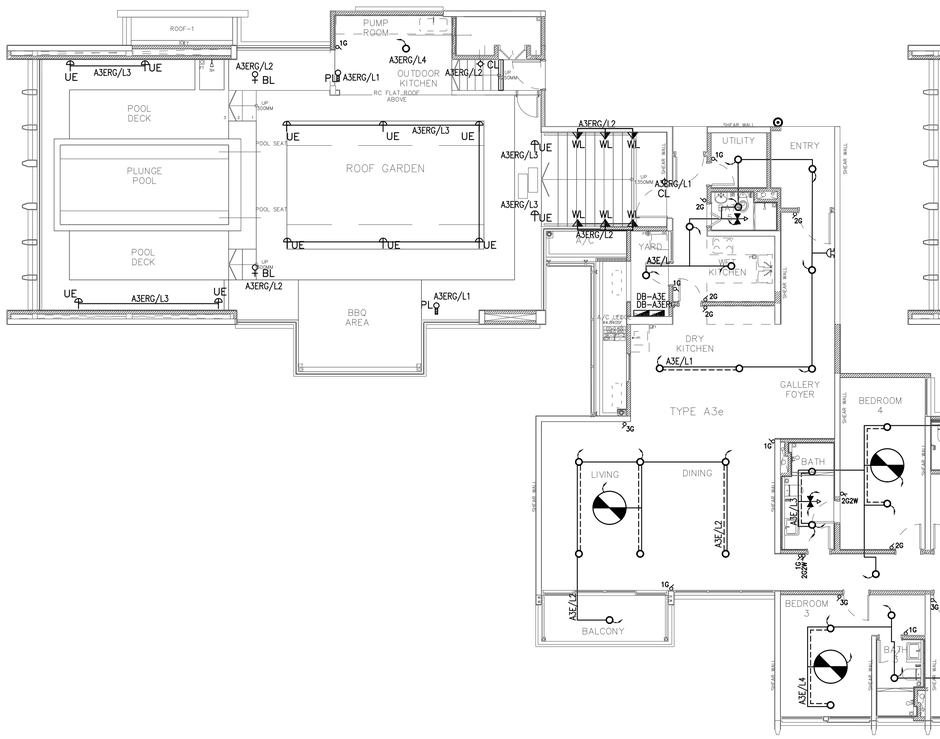
ELECTRICAL SERVICES

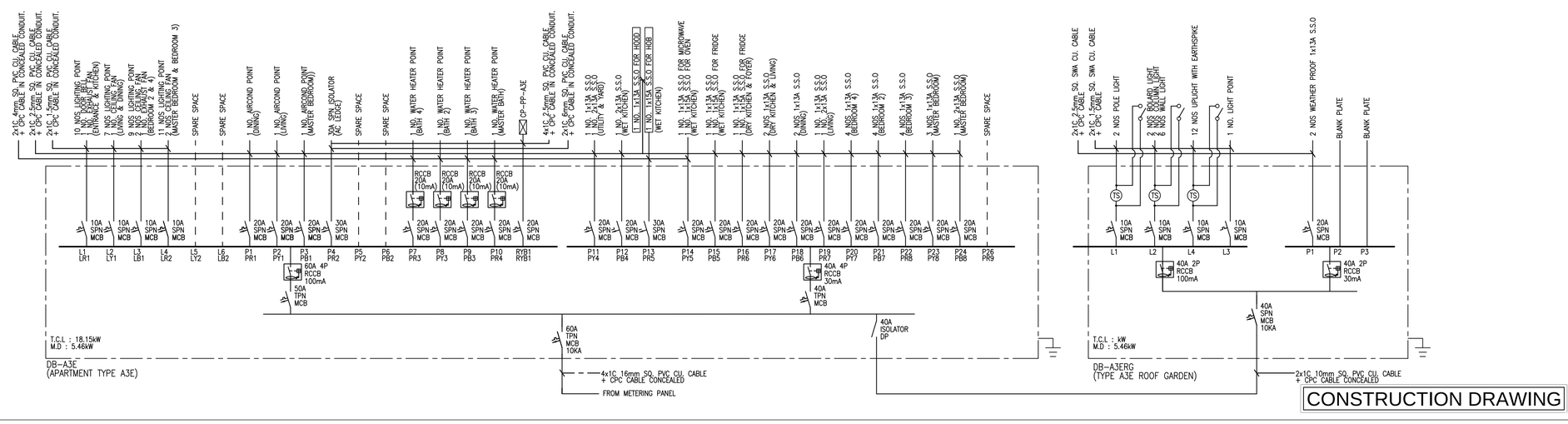
LIGHTING, SMALL POWER
& SINGLE LINE DIAGRAM
-CONDOMINIUM BLOCK A - TYPE A3

DESIGNED BY:	KESHAN	
DRAWN BY:	HARMAN	
CHECKED BY:	K.T WONG	
APPROVED BY:	K.T WONG	
SCALE:	1:100	
DATE:	JAN. 2021	
NOMBOR LUKISAN : 1412/ME/LSP/UNIT-03		PINDAAN 00

LEGEND : TYPE A3E	
SYMBOL	DESCRIPTION
	LIGHTING POINT C/W CONNECTOR
	CEILING FAN POINT C/W CONNETOR & HOOK
SPL2	SWIMMING POOL LIGHT 2
PL	POLE LIGHT
UE	UPLIGHT WITH EARTHSPIKE
BL	BOLLARD LIGHT
CL	PAVILION COLUMN LIGHT
WL	WALL LIGHT
	EXHAUST FAN POINT C/W CONNECTOR
	1x13A SWITCH SOCKET OUTLET (300mm FROM F.F.L)
	2x13A SWITCH SOCKET OUTLET (300mm FROM F.F.L)
	1x13A SWITCH SOCKET OUTLET (1200mm FROM F.F.L)
	2x13A SWITCH SOCKET OUTLET (1200mm FROM F.F.L)
F	1x15A SWITCH SOCKET OUTLET FOR FRIDGE (1200mm FROM F.F.L)
HD	1x13A SWITCH SOCKET OUTLET FOR HOOD (2100mm FROM F.F.L)
HB	1x15A SWITCH SOCKET OUTLET FOR HOB (600mm FROM F.F.L)

LEGEND : TYPE A3E	
SYMBOL	DESCRIPTION
OV	1x15A SWITCH SOCKET OUTLET FOR OVEN (600mm FROM F.F.L)
M	1x13A SWITCH SOCKET OUTLET FOR MICROWAVE (600mm FROM F.F.L)
WP	1x13A WEATHER PROOF SWITCH SOCKET OUTLET (1200mm FROM F.F.L)
AC	AIR CONDITIONER POINT (2800mm FROM F.F.L)
	30A SPN ISOLATOR
WH	WATER HEATER POINT C/W BLIND FACEPLATE (2800mm FROM F.F.L)
	SMATV OUTLET (300mm FROM F.F.L) UNLESS STATED OTHERWISE
	TELECOM FIBER WALL SOCKET (300mm FROM F.F.L) UNLESS STATED OTHERWISE
	DOOR BELL SWITCH (1200mm FROM F.F.L)
	DOOR BELL POINT (2400mm FROM F.F.L)
	AUDIO INTERCOM POINT (1500mm FROM F.F.L)
	DISTRIBUTION BOARD (1800mm FROM F.F.L)
AC	AIR CONDITIONER SWITCH (1200mm FROM F.F.L)
WH	WATER HEATER SWITCH (1200mm FROM F.F.L)
HD HB	2 GANG 1 WAY FOR HOOD & HOB SWITCH (1200mm FROM F.F.L)
1G	1 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
2G2W	2 GANG 2 WAY SWITCH (1200mm FROM F.F.L)
2G	2 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
3G	3 GANG 1 WAY SWITCH (1200mm FROM F.F.L)
OV	1 GANG 1 WAY FOR OVEN SWITCH (1200mm FROM F.F.L)
M	1 GANG 1 WAY FOR MICROWAVE SWITCH (1200mm FROM F.F.L)





CONSTRUCTION DRAWING

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
– BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
– BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)
DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL,
DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA,
SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN,
KUALA LUMPUR, MALAYSIA

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Revision	Date	Note

Drawing Title

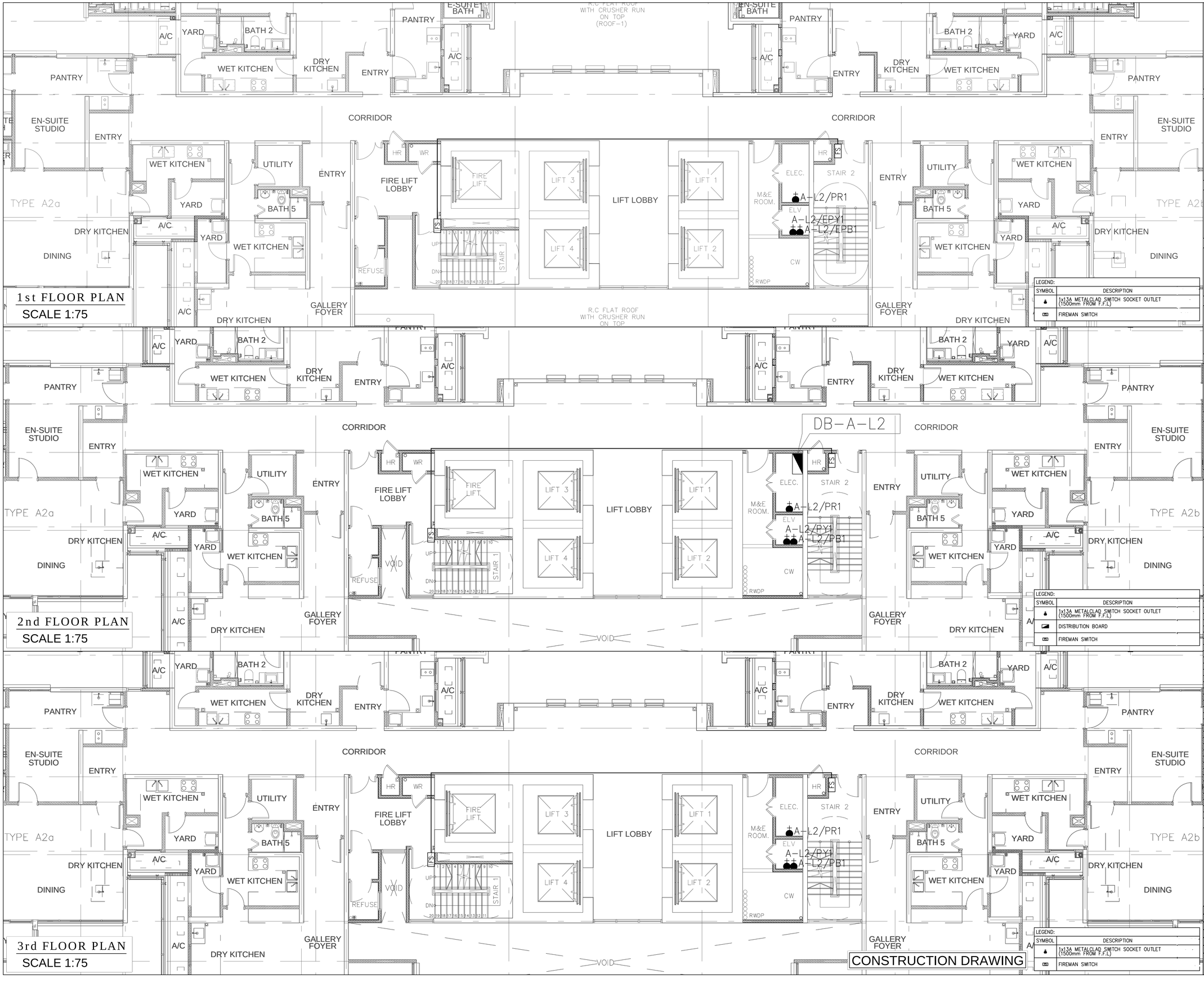
ELECTRICAL SERVICES

LIGHTING, SMALL POWER
& SINGLE LINE DIAGRAM
CONDOMINIUM BLOCK A - TYPE A3E

DESIGNED BY:	KESHAN
DRAWN BY:	HARMAN
CHECKED BY:	K.T WONG
APPROVED BY:	K.T WONG
SCALE:	1:100
DATE:	JAN. 2021

NOMBOR LUKISAN : 1412/ME/LSP/UNIT-04

PINDAAN 00



CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
- BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
- BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)

DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL, DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA, SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN, KUALA LUMPUR, MALAYSIA

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Revision	Date	Note

Drawing Title

ELECTRICAL SERVICES

SMALL POWER LAYOUT
- 1st, 2nd & 3rd FLOOR PLAN (BLOCK A)

DESIGNED BY:	KESHAN
DRAWN BY:	HARMAN
CHECKED BY:	K.T WONG
APPROVED BY:	K.T WONG
SCALE:	AS SHOWN
DATE:	JAN. 2021

NOMBOR LUKISAN : 1412/ME/SP/LP-07

PINDAAN 00

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
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F+603.6201.0413

Revision	Date	Note

Drawing Title

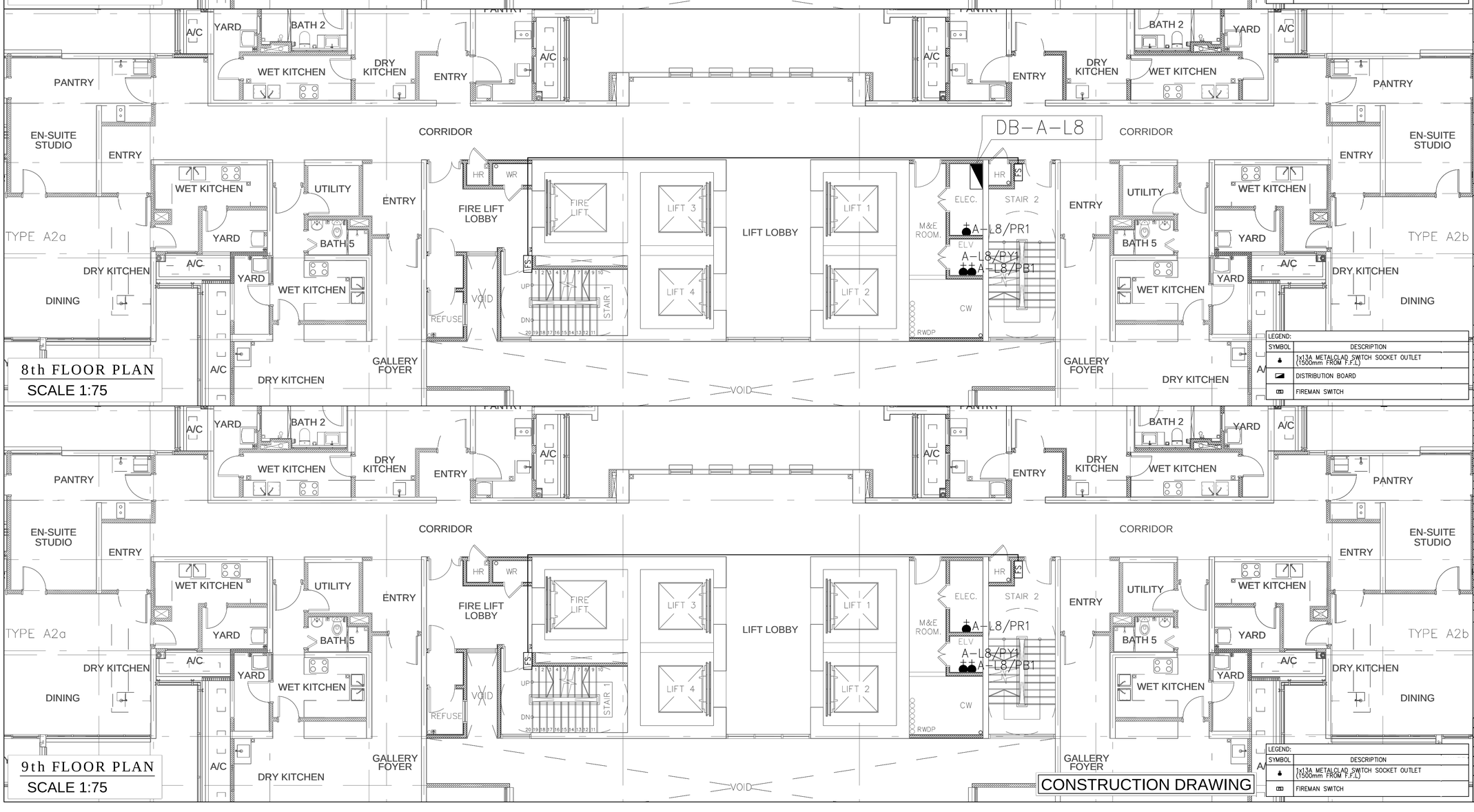
ELECTRICAL SERVICES

SMALL POWER LAYOUT
- 4th, 5th & 6th FLOOR PLAN (BLOCK A)

DESIGNED BY:	KESHAN
DRAWN BY:	HARMAN
CHECKED BY:	K.T WONG
APPROVED BY:	K.T WONG
SCALE:	AS SHOWN
DATE:	JAN. 2021

NOMBOR LUKISAN : 1412/ME/SP/LP-08

PINDAAN 00



Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
- BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
- BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)

DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL, DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA, SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN, KUALA LUMPUR, MALAYSIA

UNTUK
TETUAN ORCHARD PARK SDN BHD

Client

ORCHARD PARK SDN BHD
(Company No: 235189-H)
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22, Jalan P. Ramlee,
50250 Kuala Lumpur, Malaysia
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Revision	Date	Note

Drawing Title

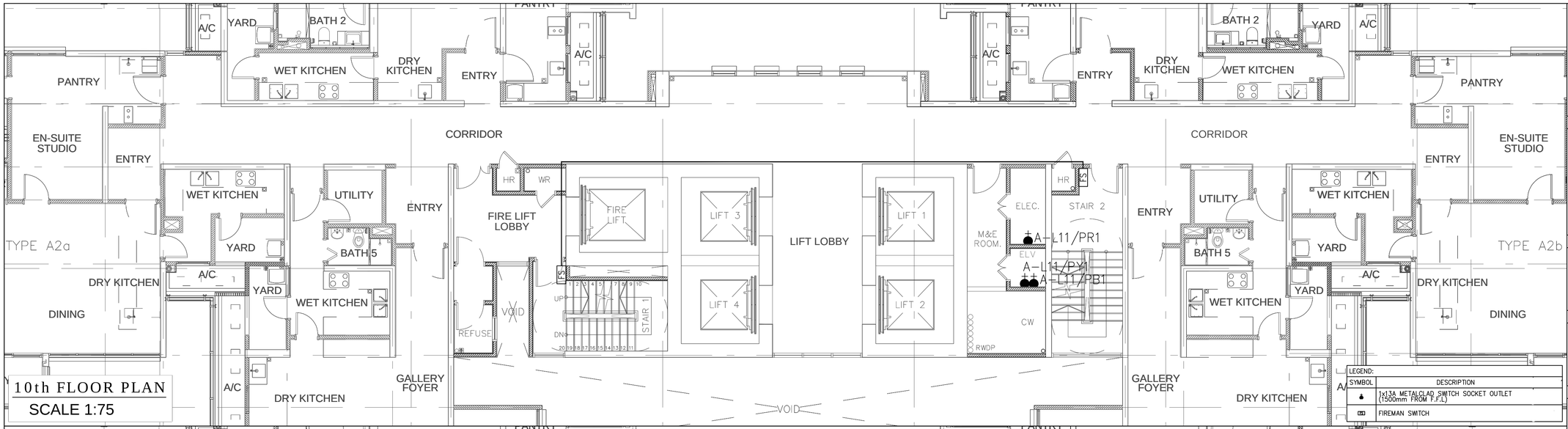
ELECTRICAL SERVICES

SMALL POWER LAYOUT
- 7th, 8th & 9th FLOOR PLAN (BLOCK A)

DESIGNED BY:	KESHAN
DRAWN BY:	HARMAN
CHECKED BY:	K.T WONG
APPROVED BY:	K.T WONG
SCALE:	AS SHOWN
DATE:	JAN. 2021

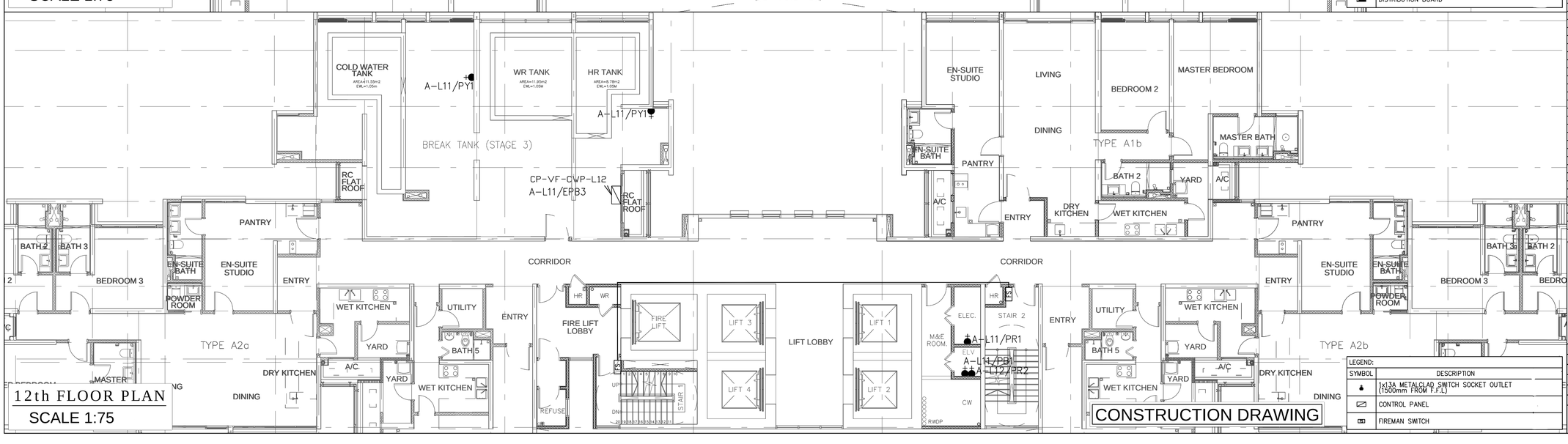
NOMBOR LUKISAN : 1412/ME/SP/LP-09

PINDAAN 00



10th FLOOR PLAN
SCALE 1:75

11h FLOOR PLAN
SCALE 1:75



12th FLOOR PLAN
SCALE 1:75

CONSTRUCTION DRAWING

LEGEND:	
SYMBOL	DESCRIPTION
	1x13A METALCLAD SWITCH SOCKET OUTLET (1500mm FROM F.F.L)
	FIREMAN SWITCH

LEGEND:	
SYMBOL	DESCRIPTION
	1x13A METALCLAD SWITCH SOCKET OUTLET (1500mm FROM F.F.L)
	FIREMAN SWITCH
	DISTRIBUTION BOARD

LEGEND:	
SYMBOL	DESCRIPTION
	1x13A METALCLAD SWITCH SOCKET OUTLET (1500mm FROM F.F.L)
	CONTROL PANEL
	FIREMAN SWITCH

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI MENGANDUNGI:
- BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
- BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)

DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL, DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA, SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN, KUALA LUMPUR, MALAYSIA

UNTUK
TETUAN ORCHARD PARK SDN BHD

Client

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Revision	Date	Note

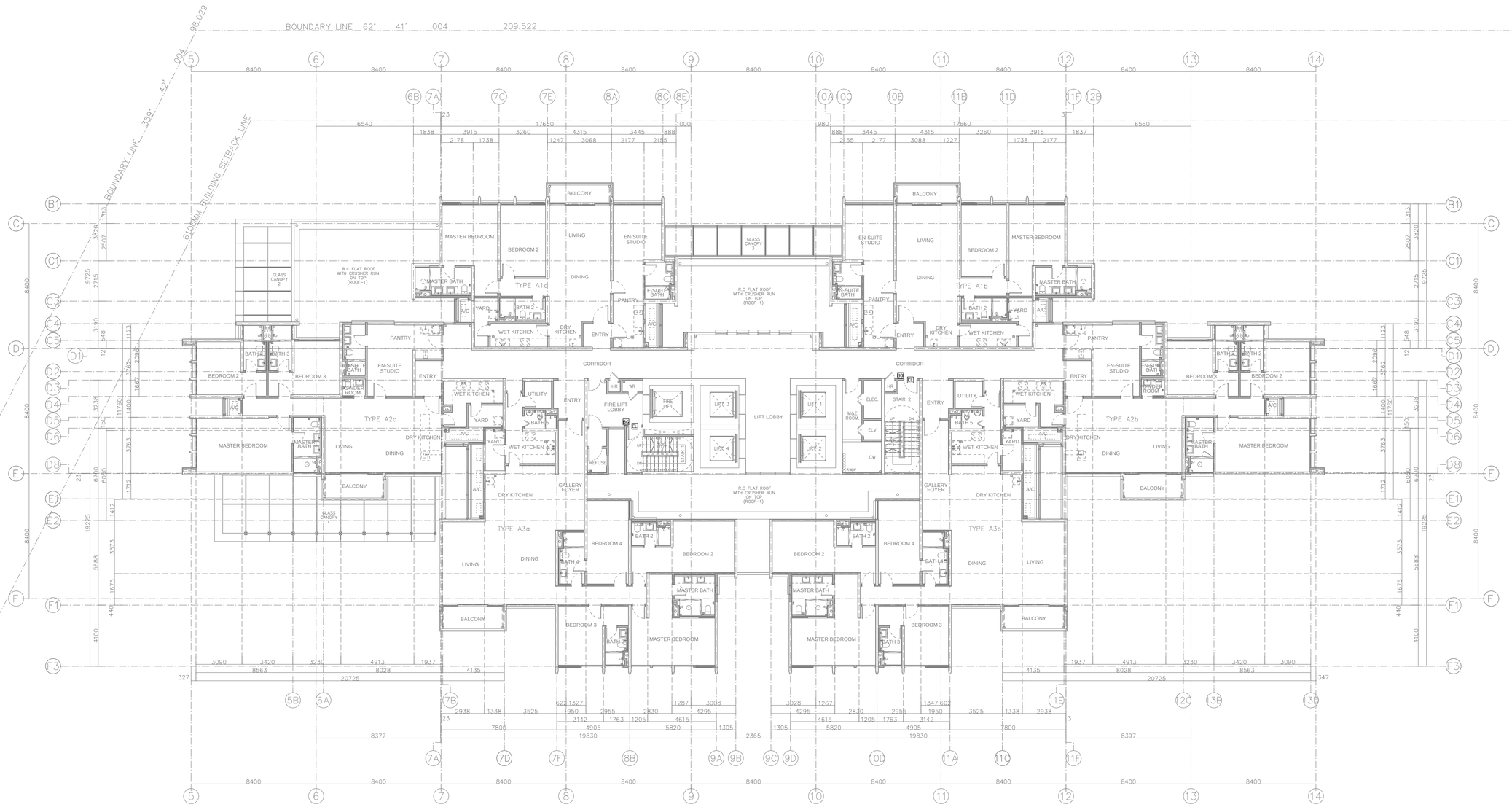
Drawing Title

ELECTRICAL SERVICES

SMALL POWER LAYOUT
- 10th, 11th & 12th FLOOR PLAN (BLOCK A)

DESIGNED BY:	KESHAN
DRAWN BY:	HARMAN
CHECKED BY:	K.T WONG
APPROVED BY:	K.T WONG
SCALE:	AS SHOWN
DATE:	JAN. 2021
NOMMOR LUKISAN : 1412/ME/SP/LP-10	PINDAAN 00

LEGEND	
SYMBOL	DESCRIPTION
EL	ELECTROMAGNETIC LOCK
BG	EMERGENCY BREAK GLASS



1st FLOOR PLAN

SCALE 1:150 (A1)

CONSTRUCTION DRAWING

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI
MENGANDUNGI:
– BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
– BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)
DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN
KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL,
DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA,
SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN,
KUALA LUMPUR, MALAYSIA

UNTUK
TETUAN ORCHARD PARK SDN BHD

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Revision	Date	Note

Drawing Title

EXTRA LOW VOLTAGE SERVICES

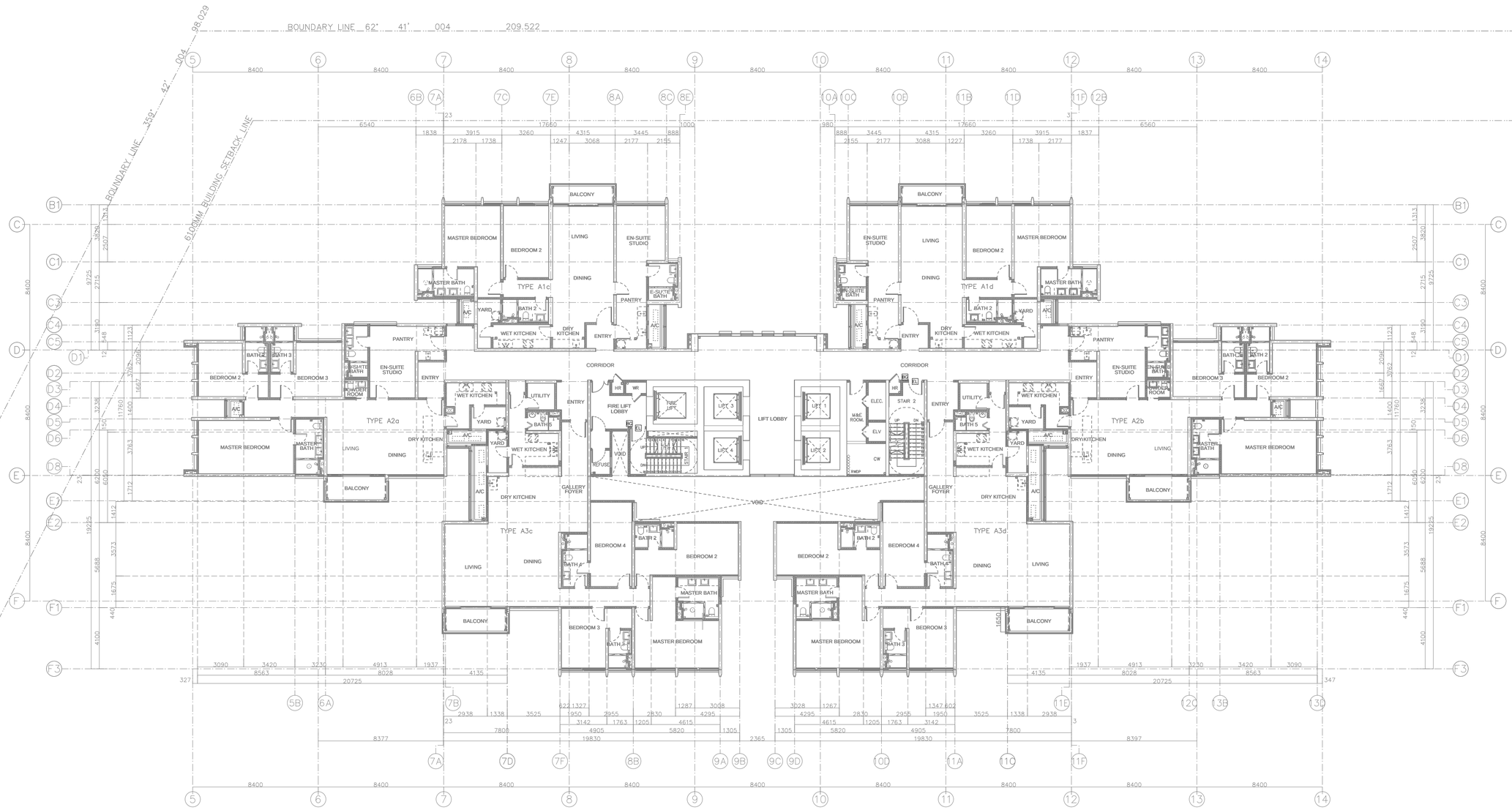
CARD ACCESS SYSTEM LAYOUT
- 1st FLOOR PLAN (BLOCK A)

DESIGNED BY:	KESHAN	
DRAWN BY:	IZZAT	
CHECKED BY:	K.T WONG	
APPROVED BY:	K.T WONG	
SCALE:	AS SHOWN	
DATE:	JAN. 2021	

NOMBOR LUKISAN : 1412/ME/CAS/LP-07

PINDAAN 00

LEGEND	
SYMBOL	DESCRIPTION
EL	ELECTROMAGNETIC LOCK
BG	EMERGENCY BREAK GLASS



TYPICAL FLOOR PLAN (2nd TO 11th FLOOR PLAN)

SCALE 1:150 (A1)

CONSTRUCTION DRAWING

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI
MENGANDUNGI:
– BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
– BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)
DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN
KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL,
DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA,
SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN,
KUALA LUMPUR, MALAYSIA

UNTUK
TETUAN ORCHARD PARK SDN BHD

Client

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Architect

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www.GDParchitects.com

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Quantity Surveyor

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50480 Kuala Lumpur
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Revision	Date	Note

Drawing Title

EXTRA LOW VOLTAGE SERVICES

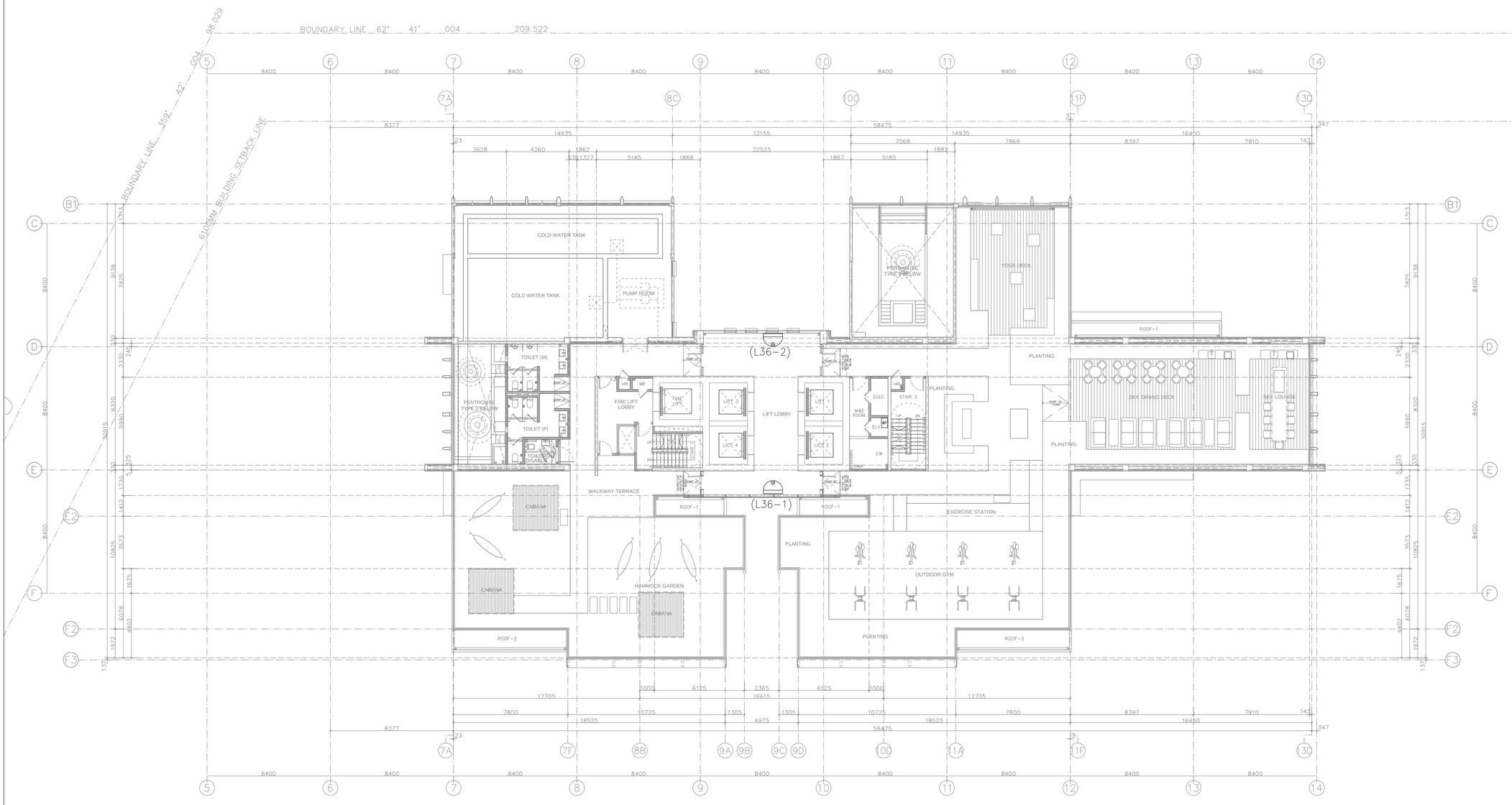
CARD ACCESS SYSTEM LAYOUT
- TYPICAL 2nd TO 11th FLOOR PLAN
(BLOCK A)

DESIGNED BY:	KESHAN	
DRAWN BY:	IZZAT	
CHECKED BY:	K.T WONG	
APPROVED BY:	K.T WONG	
SCALE:	AS SHOWN	
DATE:	JAN. 2021	

NOMBOR LUKISAN : 1412/ME/CAS/LP-08

PINDAAN 00

LEGEND	
SYMBOL	DESCRIPTION
	2MP IP POE FIXED LENS DOME CAMERA
4P	4 PORTS POE NETWORK SWITCHES



36th FLOOR PLAN (SKY GARDEN)

SCALE 1:150 (A1)

CONSTRUCTION DRAWING

Project Title

CADANGAN PEMBANGUNAN 2 BLOK PANGSAPURI
MENGANDUNGI:
– BLOK A – 38 TINGKAT (200 UNIT KEDIAMAN)
– BLOK B – 25 TINGKAT (164 UNIT KEDIAMAN)
DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN
KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL,
DI ATAS LOT 1580, OFF JALAN DUTAMAS RAYA,
SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN,
KUALA LUMPUR, MALAYSIA

UNTUK
TETUAN ORCHARD PARK SDN BHD

Client

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Revision	Date	Note

Drawing Title

EXTRA LOW VOLTAGE SERVICES

CCTV SYSTEM LAYOUT
- 36th FLOOR PLAN (BLOCK A)

DESIGNED BY:	KESHAN	
DRAWN BY:	IZZAT	
CHECKED BY:	K.T WONG	
APPROVED BY:	K.T WONG	
SCALE:	AS SHOWN	
DATE:	JAN. 2021	

NOMBOR LUKISAN : 1412/ME/CTV/LP-07

PINDAAN 00

LOG BOOK MAGANG

PRODI TEKNIK EKONOMI KONSTRUKSI

DAVA MAULANA
2210015410046

UNIVERSITAS BUNG HATTA

LOGBOOK KEGIATAN HARIAN MAGANG MAHASISWA
KURIKULUM MERDEKA BELAJAR KAMPUS MERDEKA (MBKM)

DATA MAHASISWA

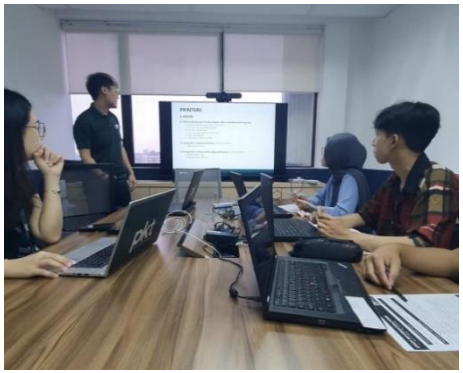
Nama	:	Dava Maulana
NPM	:	2210015410046
Tempat/Tanggal Lahir	:	Padang/ 08 Juni 2001
Alamat	:	Komplek Permata Biru Blok D no 3
No. Hp	:	089621568008
E-mail	:	daffa7808@gmail.com

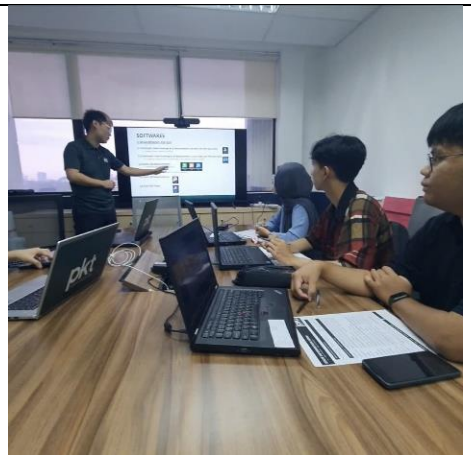
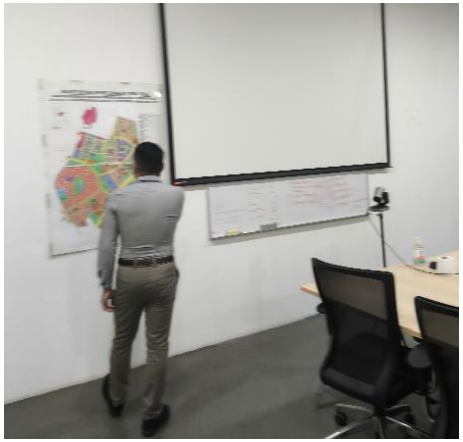
DATA PEMBIMBING INDUSTRI

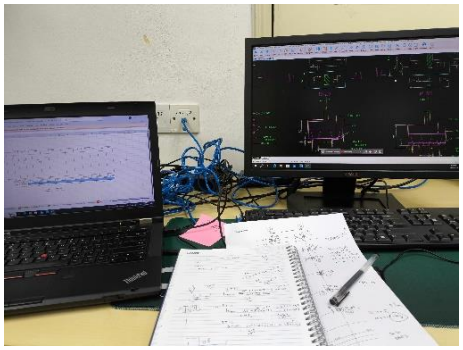
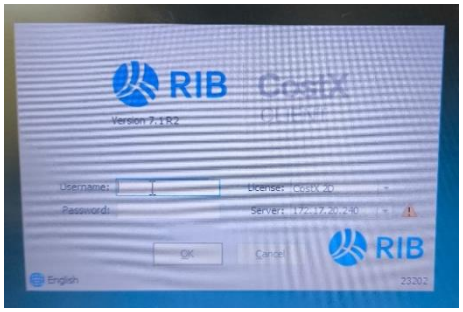
Nama (beserta gelar)	:	Alwi Abdul Razak B.Sc
Nama Perusahaan	:	PKT Quantity Surveying Consultant Sdn Bhd
Alamat Perusahaan		Suite E-11-06, Plaza Mont Kiara, 50480 Kuala Lumpur, Malaysia
Jabatan	:	Senior Contract Executive
No. Hp	:	+60173738270
E-mail	:	alwi@pktqs.com

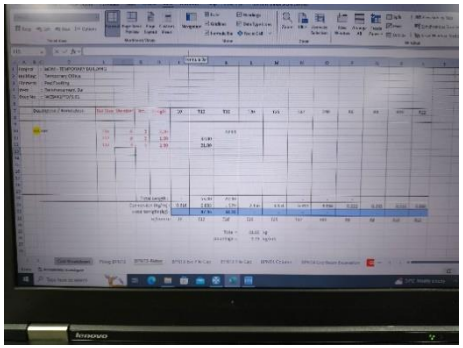
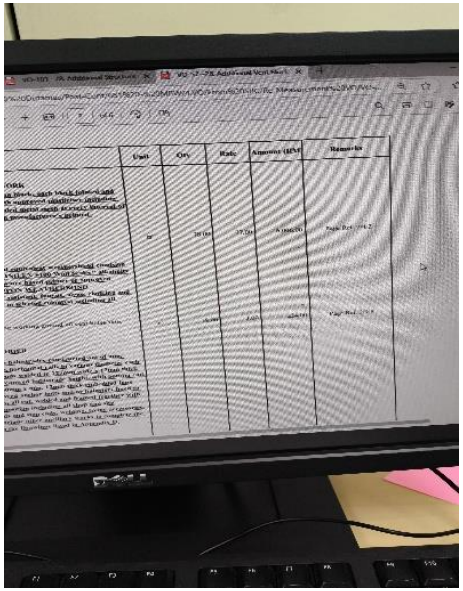
KEGIATAN MAGANG

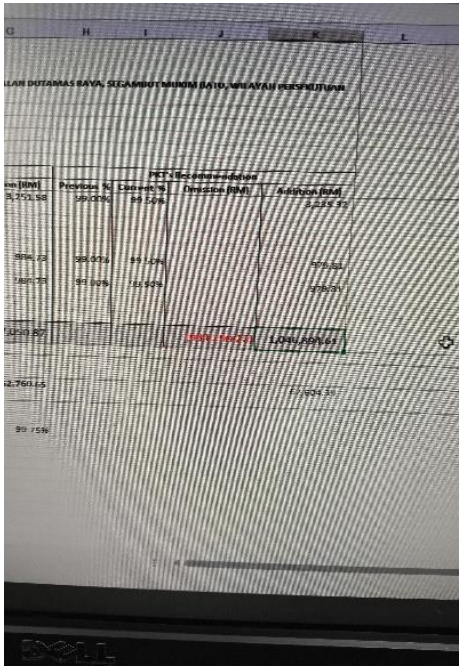
BULAN KE	:	I
MINGGU KE	:	I
TANGGAL	:	28 April 2025 – 2 Mei 2025

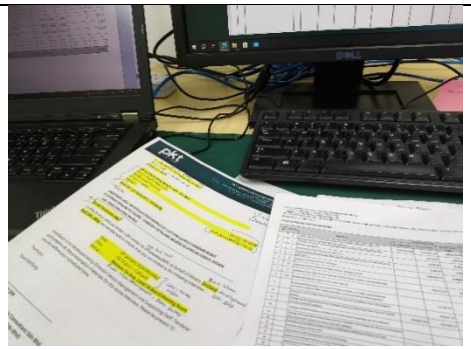
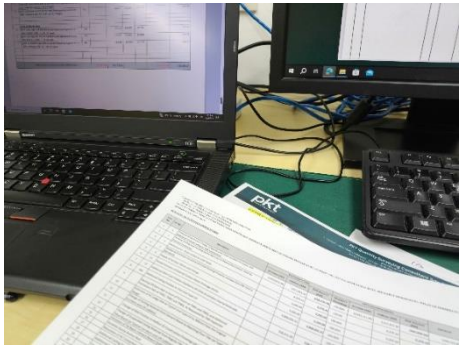
No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P. L.
1	28 April 2025	• Pengenalan awal perusahaan yang di pimpin oleh Penny Lim & Leon Tan 	• Mengetahui lingkungan kerja	• Beradaptasi dengan lingkungan kerja	• Mengamati bagaimana lingkungan kerja berinteraksi dan berkomunikasi untuk menyesuaikan gaya komunikasi.	

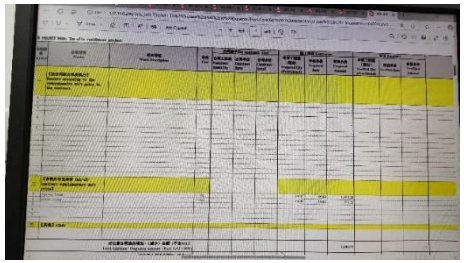
		 • Briefing by Head of Division / Superior • Meeting project (Ayer Holdings Puchong Shoplot) di Puchong 	• Mengetahui proyek yang akan dikerjakan • Mengetahui bagaimana rapat antar pihak yang terlibat dalam proyek (pre-construction)	• - • Memahami bahasa klien (karena campur mandarin)		

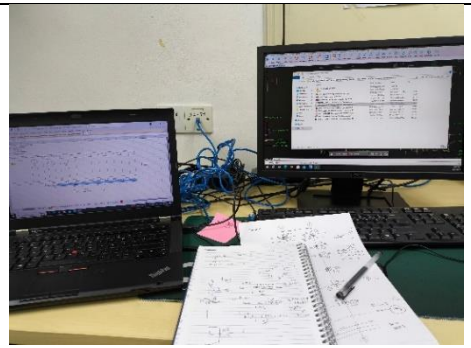
		• Mempelajari Cost X   • Menghitung Panjang pembesian pile cap (Ayer Holdings Puchong Shoplot)	• Mengenal dan mempelajari penggunaan CostX sebagai alat bantu perhitungan kuantitas proyek. • Berhasil menghitung panjang besi pile cap	• takut salah input data • -	• secara aktif bertanya kepada pembimbing lapangan.	

2	29 April 2025	• Menghitung kuantitas pile cap (pembesian,Panjang)  • Remeasurement VO (Project TA Orchard Park @ Dutamas / Alix Residence) 	• Berhasil menghitung banyak pile cap • Data remeasurement berhasil diperoleh dan dikonfirmasi sehingga menghasilkan nilai VO yang lebih akurat sesuai dengan dokumen teknis yang berlaku.	• - • Kekhawatiran akan kesalahan input data, yang dapat berdampak pada akurasi keseluruhan perhitungan VO.	• secara aktif bertanya kepada pembimbing lapangan.	

3	30 April 2025	• Membuat excel mengenai VO (Project TA Orchard Park @ Dutamas / Alix Residence)  • Menghitung bobot pekerjaan • Membuat/mengedit surat (Tender Interview)	• Berhasil menyelesaikan dokumen-dokumen yang berkaitan dengan proyek • Bobot pekerjaan • Surat Undangan Tender			

		 • Mengecek kesesuaian harga pada VO (Project TA Orchard Park @ Dutamas / Alix Residence) 	• Excel Variation Order Proyek Alix Residence			

4	1 Mei 2025	Libur Hari Buruh				
5	2 Mei 2025	• Check amount of BQ IV51 (Project TA Orchard Park @ Dutamas / Alix Residence)  • Check amount of end lot,corner lot, intermediate lot (Ayer Holdings Puchong Shoplot) • scan document • Manage file IV52 Project TA Orchard Park @ Dutamas / Alix Residence)	• BQ Interim Valuation 51 Alix Residece			

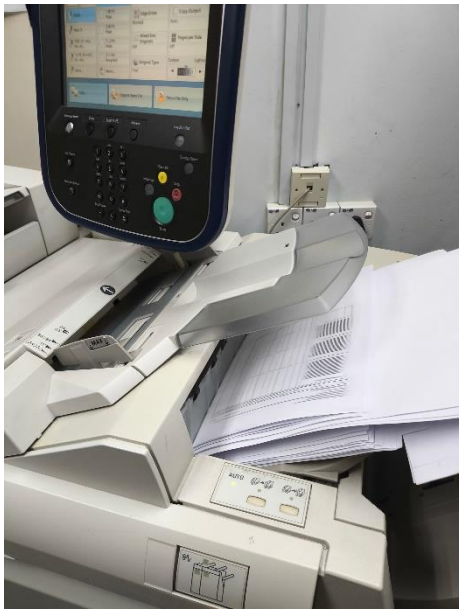
						

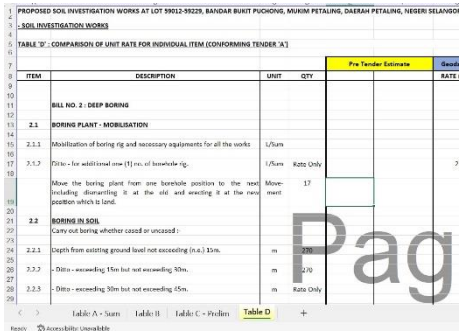
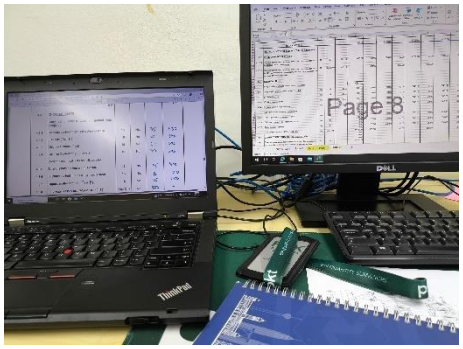
(Mont Kiara, 2 Mei 2025)
Pembimbing Lapangan,

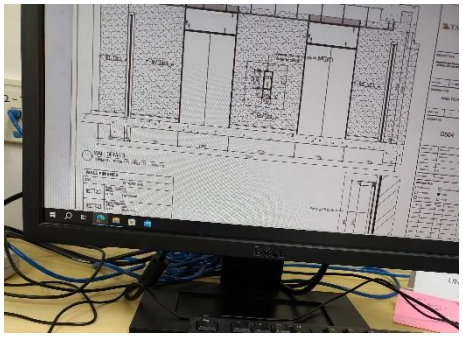
(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)

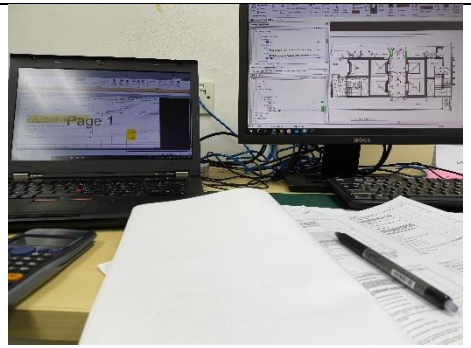
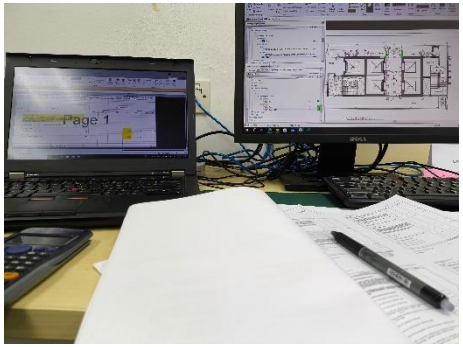
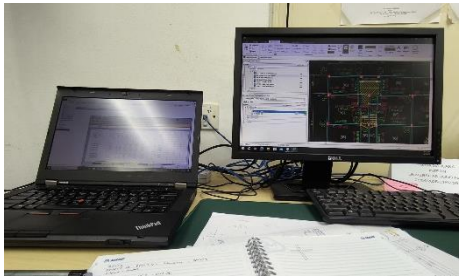
KEGIATAN MAGANG

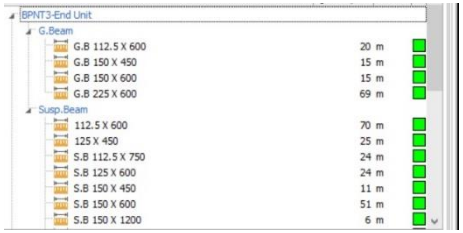
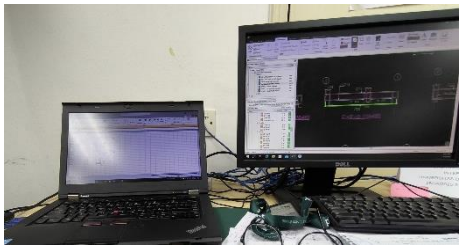
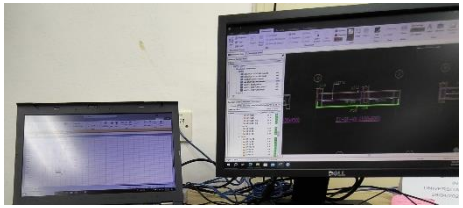
BULAN KE	:	I
MINGGU KE	:	II
TANGGAL	:	5 Mei 2025 – 9 Mei 2025 (10 Mei – 11 Mei Lembur)

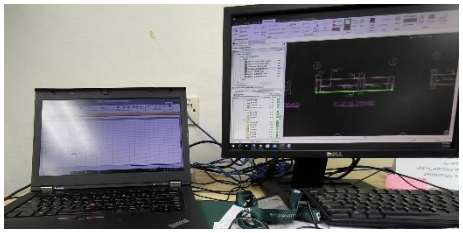
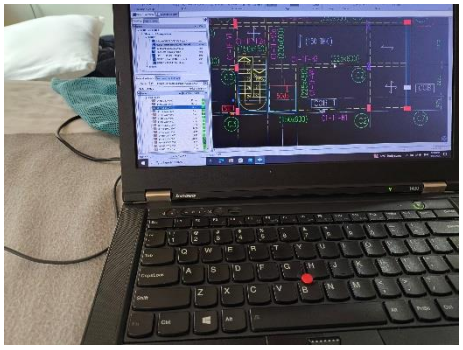
No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L.
1	5 Mei 2025	• Print dokumen IV 51 draft (Project TA Orchard Park @ Dutamas / Alix Residence) 				

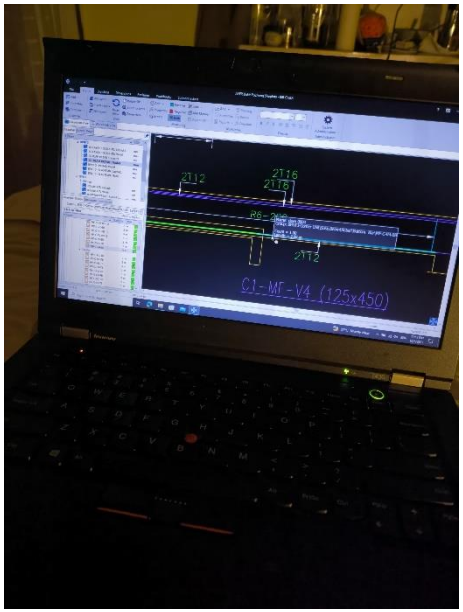
		• Menginput data (total bill Pre Tender Estimate BPNT4 (Ayer Holdings Puchong Shoplot))  PROPOSED SOIL INVESTIGATION WORKS AT LOT 59012-59229, BANDAR BUKIT PUCHONG, MUKIM PETALING, DAERAH PETALING, NEGERI SELANGOR - SOIL INVESTIGATION WORKS TABLE 'D' : COMPARISON OF UNIT RATE FOR INDIVIDUAL ITEM (CONFORMING TENDER 'A') Pre Tender Estimate ITEM / DESCRIPTION / UNIT / QTY / RATE BILL NO. 2 : DEEP BORING 2.1 BORING PLANT - MOBILISATION 2.1.1 Mobilization of boring rig and necessary equipments for all the works — L/Sum 2.1.2 Ditto - for additional one (1) no. of borehole rig. — L/Sum — Rate Only Move the boring plant from one borehole position to the next including dismantling it at the old and erecting it at the new position which is land. — Move-ment — 17 2.2 BORING IN SOIL Carry out boring whether cased or uncased : 2.2.1 Depth from existing ground level not exceeding (n.a.) 15m. — m — 270 2.2.2 - Ditto - exceeding 15m but not exceeding 30m. — m — 270 2.2.3 - Ditto - exceeding 30m but not exceeding 45m. — m — Rate Only Table A - Sum | Table B | Table C - Prelim | Table D Ready | Accessibility: Unavailable • Mengecek Amount dan Rate BPNT4 (Ayer Holdings Puchong Shoplot)  Page 3	• Excel PTE BPNT4 Puchong Shoplot			
2	6 Mei 2025	• Print dan Mengedit Surat • Meeting (Project TA Orchard Park @ Dutamas / Alix Residence)	• Adanya pergantian warna cat dinding disekitar lobi lift			

		 • Scan dokumen • Mempelajari gambar, menghitung kuantitas finishing dinding pada lobby lift (Project TA Orchard Park @ Dutamas / Alix Residence) 	• Memahami gambar dan hal yang akan di hitung			
3	7 Mei 2025	• Melanjutkan menghitung kuantitas finishing dinding pada lobby lift (Project TA Orchard Park @ Dutamas / Alix Residence) menggunakan cost X dan menginput nilai di excel	• Kuantitas area finishing dinding pada lobi lift			

		  • Mempelajari gambar BPNT3 (Ayer Holdings Puchong Shoplot)  • Menghitung rebar,formwork, banyak pilecap pada gambar BPNT3 (Ayer Holdings Puchong Shoplot)	• Memahami gambar • Kuantitas besi,bekisting pilecap BPNT3			

4	8 Mei 2025	• Measure length beam for end unit, corner unit (BPNT3 , Ayer Holdings Puchong Shoplot)   • Measure beam rebar for end unit (BPNT3, Ayer Holdings Puchong Shoplot)	• Kuantitas Panjang sloof/balok BPNT3 • Kuantitas besi balok/sloof BPNT3 pada end unit shoplot			
5	9 Mei 2025	• Melanjutkan perhitungan beam rebar end unit (BPNT3 , Ayer Holdings Puchong Shoplot) 				

		• Binding dokumen (menggunakan binder mechine) (Ayer Holdings Puchong Shoplot) • Menghitung beam rebar corner unit (Ayer Holdings Puchong Shoplot) 	• Kuantitas besi balok/sloof BPNT3 pada corner unit shoplot			
6	10 Mei 2025	• Lembur melanjutkan perhitungan balok/sloof (Ayer Holdings Puchong Shoplot) 		• Sinyal internet di rumah lambat sehingga proses kinerja tidak efisien		
7	11 Mei 2025	• Lembur melanjutkan perhitungan balok/sloof (Ayer Holdings Puchong				

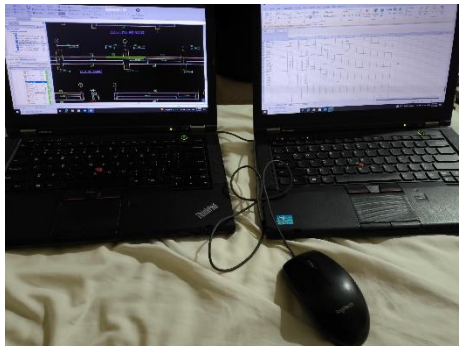
		Shoplot)  				

(Mont Kiara, 11 Mei 2025)
Pembimbing Lapangan,

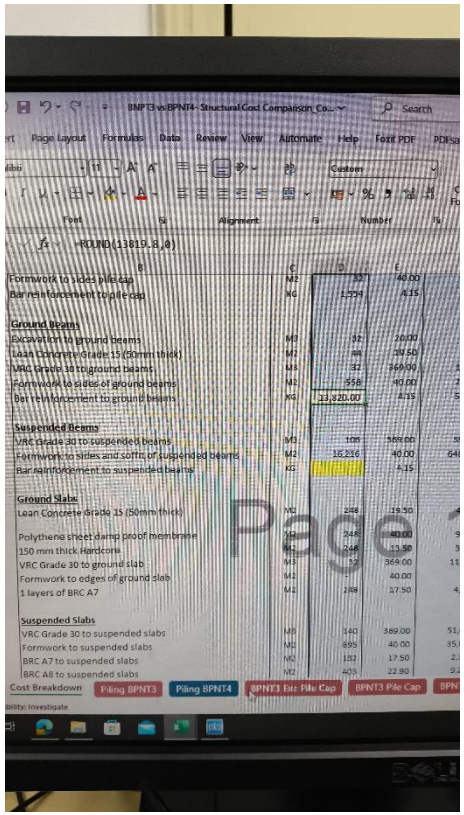
(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)

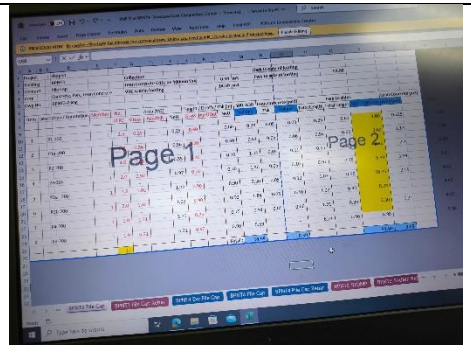
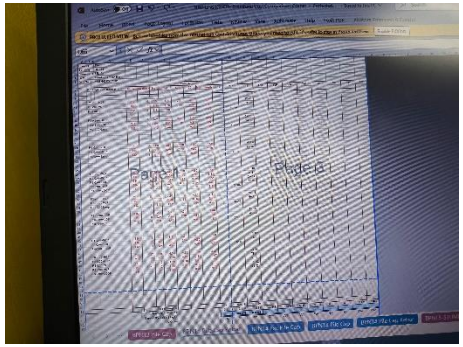
KEGIATAN MAGANG

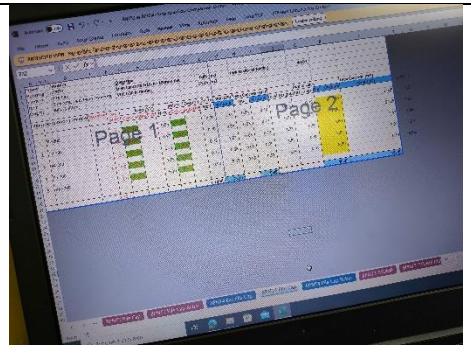
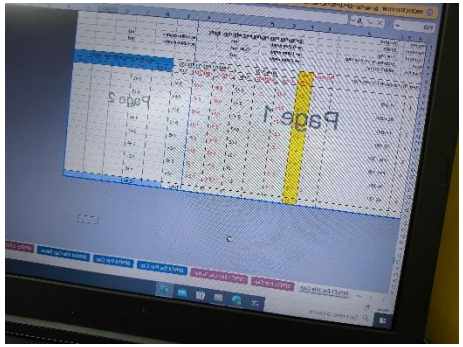
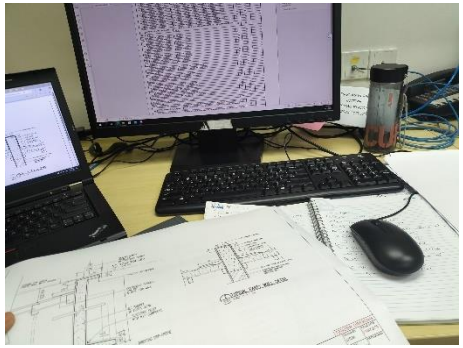
BULAN KE	:	I
MINGGU KE	:	III
TANGGAL	:	12 Mei 2025 – 16 Mei 2025 (17 Mei Lembur)

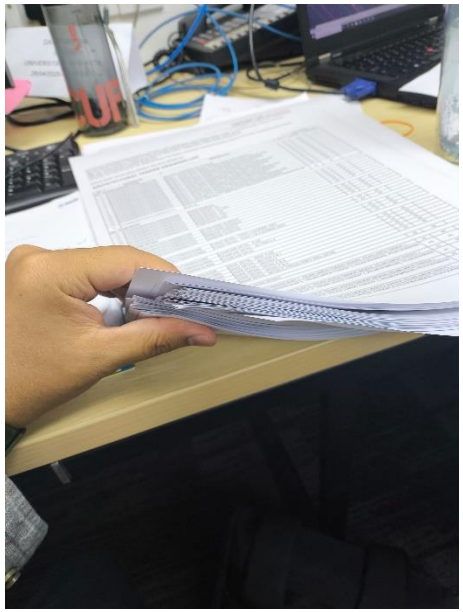
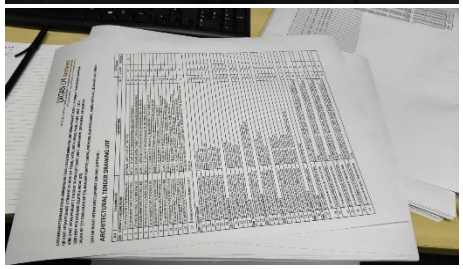
No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	12 Mei 2025 (Cuti, Tanggal merah)	• Lembur melanjutkan perhitungan balok/sloof BPNT3 (bekisting,beton,pembesian) dan BPNT4 (bekisting, beton) 				
2	13 Mei 2025	• Melanjutkan perhitungan BPNT3 corner dan end unit (menginput hasil perhitungan ke excel)		• Kendala karena tenggat waktu yang singkat sehingga membuatnya		

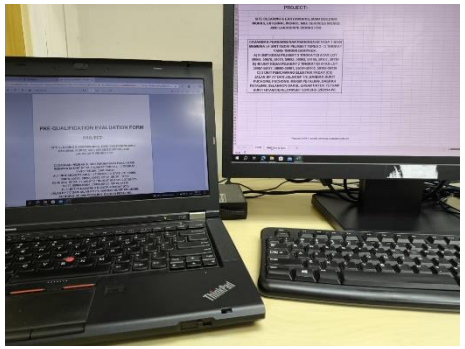
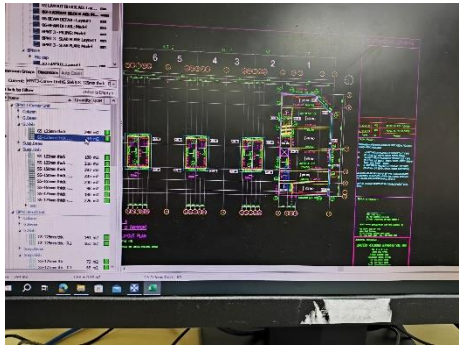
		   • Memperbaiki perhitungan bekisting, balok, pile cap pada BPNT4		terburu-buru (tidak fokus) • Kelelahan dan kantuk saat lembur (kurang istirahat) menyebabkan kesalahan penginputan kuantitas.		
3	14 Mei 2025	• Memeriksa keselarasan nilai BPNT3, BPNT4 end and corner	• Kuantitas perbandingan struktur BPNT3 &			

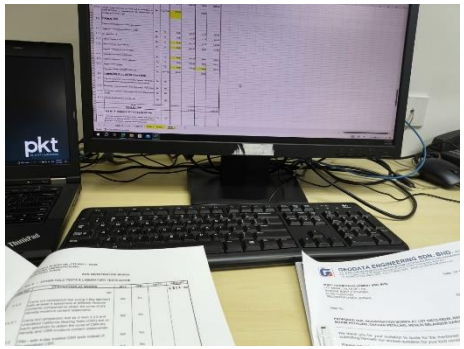
		unit  • Memperbaiki hasil bekisiting, dari pile cap, balok/sloof BPNT4 dan 3 pada corner unit	BPNT4 cost breakdown • Kuantitas pile cap,balok/sloof			

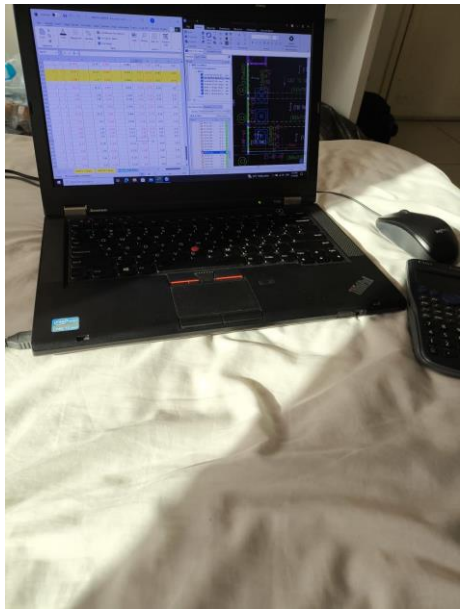
			 				

			  • Mempelajari gambar untuk tender (arsitektur) (Ayer Holdings Puchong Shoplot) 				

		• Print gambar tender (Ayer Holdings Puchong Shoplot)  				
4	15 Mei 2025	• Print BQ • Mengedit file excel Pre-Q Form Evaluasi (Ayer Holdings Puchong	• Excel Pre-Qualification for Kontrakto			

		Shoplot)  • Merevisi Luas Slab/Plat BPNT 3 & BPNT 4 end dan corner unit 				
5	16 Mei 2025	• Mengedit dan input nilai file excel Tabulation S1 (Final Tender)				

		(Ayer Holdings Puchong Shoplot)  • Memperbaiki tinggi/kedalaman balok/sloof pada end dan corner unit BPNT3 dan BPNT4 (Ayer Holdings Puchong Shoplot)				
6	17 Mei	• Lembur melanjutkan memperbaiki kedalaman/tinggi sloof/balok pada end dan corner unit BPNT3&4				

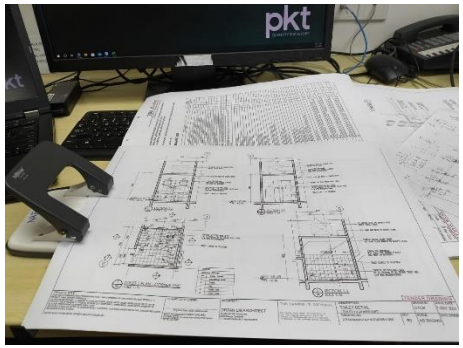
		(Ayer Holdings Puchong Shoplot) 				

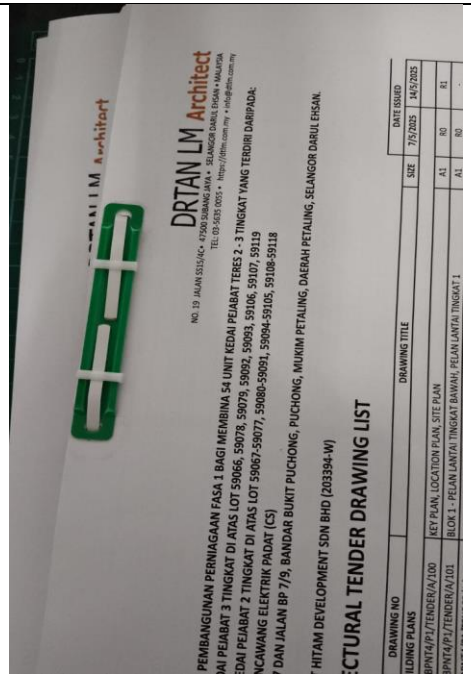
(Mont Kiara, 17 Mei 2025)
Pembimbing Lapangan,

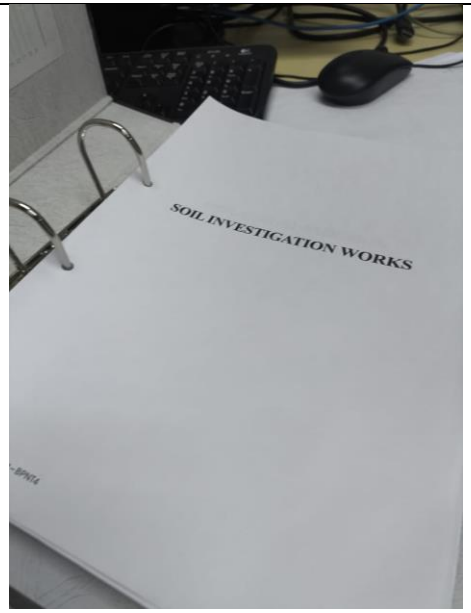
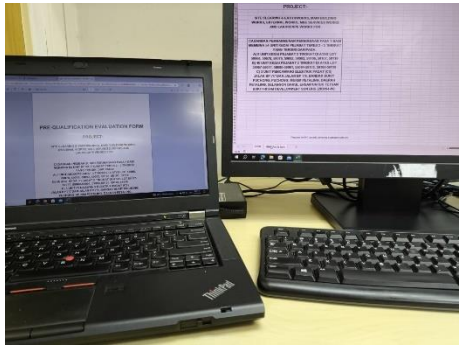
(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)

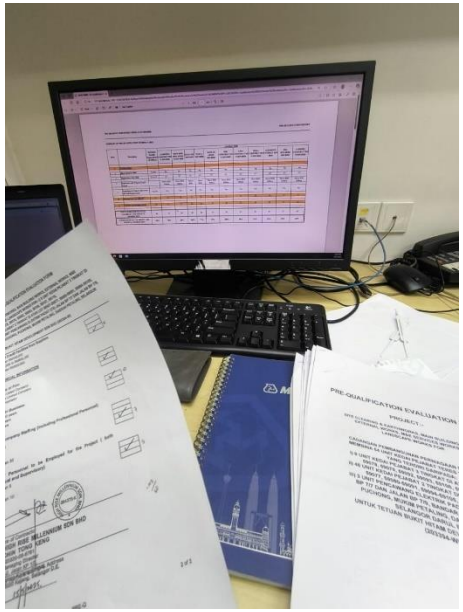
KEGIATAN MAGANG

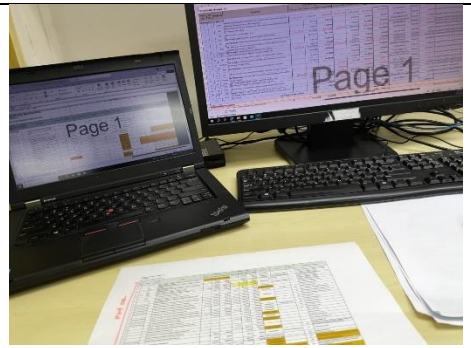
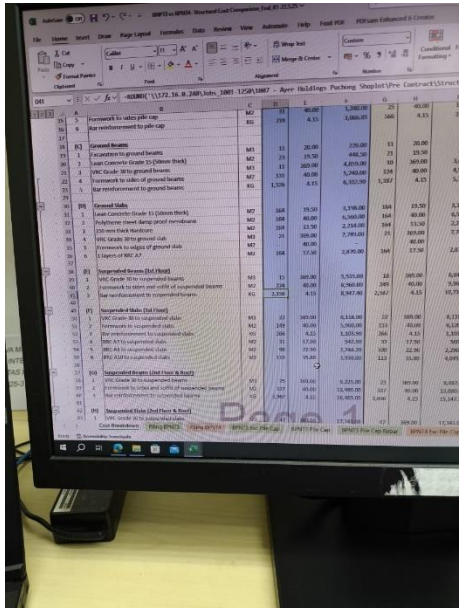
BULAN KE	:	I
MINGGU KE	:	IV
TANGGAL	:	19 Mei 2025 – 23 Mei 2025

No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	19 Mei 2025	• Binder architect drawing for tender (Ayer Holdings Puchong Shoplot) 				

		 • Print BPNT3 vs BPNT4 structural cost comparasion corner & end lot (Ayer Holdings Puchong Shoplot)				
2	20 Mei 2025	• Binder soil investigation				

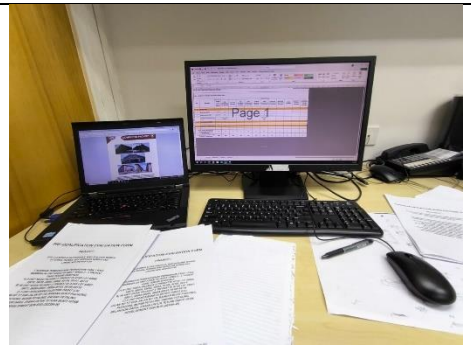
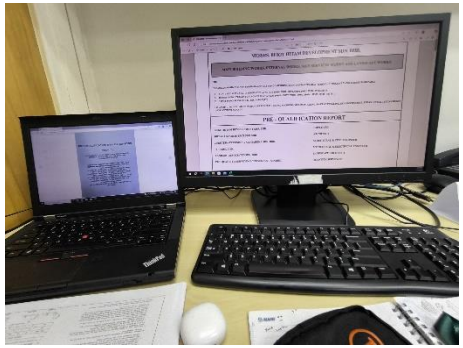
		 • Mengedit pre-Q report (word) (Ayer Holdings Puchong Shoplot)  • Binder pre Q contractor (Ayer Holdings Puchong Shoplot)				

		• Mengecek BPNT4 Pre-Q report (Ayer Holdings Puchong Shoplot) 				
3	21 Mei 2025	izin sakit				
4	22 Mei 2025	• Memperbaiki pre-Q dokumen (Ayer Holdings Puchong Shoplot) karna adanya perubahan form dari pihak owner • Mengecek dan input excel VO summary Alix SBC (09.04.25 & 7.5.25)				

		 • Memindahkan file excel rebar beam (measurement) ke file utama (Ayer Holdings Puchong Shoplot)  • Rapat dengan tim projek / pembimbing lapangan mengenai		• Kesalahan gambar oleh pihak		

		projek (Ayer Holdings Puchong Shoplot) • Menghitung ulang banyak kolom dan pembesian kolom BPNT4 (Ayer Holdings Puchong Shoplot)		sipil/kontraktor yang membuat rancu dalam memahami gambarnya		

5	23 Mei 2025	• Melihat profil Perusahaan yang mengikuti tender dan menandai projek sejenis yang telah dilakukan Perusahaan tersebut (Ayer Holdings Puchong Shoplot)				

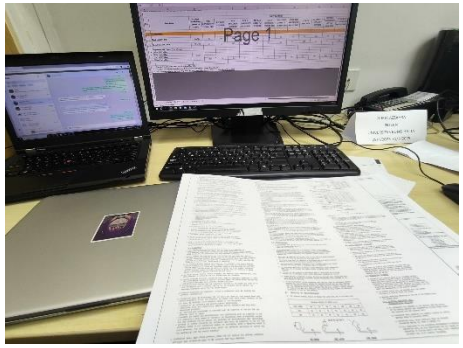
		  • Merevisi excel pre-Q report (Ayer Holdings Puchong Shoplot) • Menscan perbandingan hitungan struktur BPNT4 vs BPNT4 end & corner (Ayer Holdings Puchong Shoplot) • Mengecek pre-qualification report (Ayer Holdings Puchong Shoplot)				

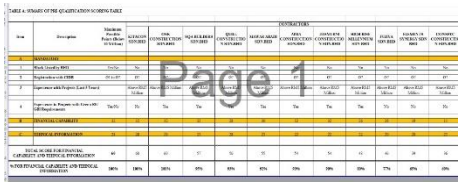
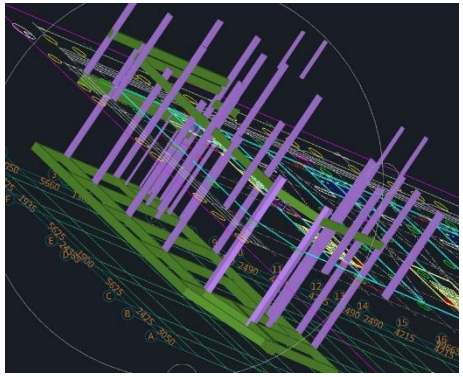
(Mont Kiara, 23 Mei 2025)
Pembimbing Lapangan,

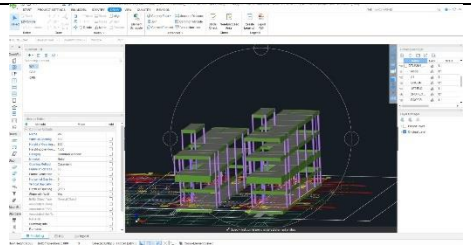
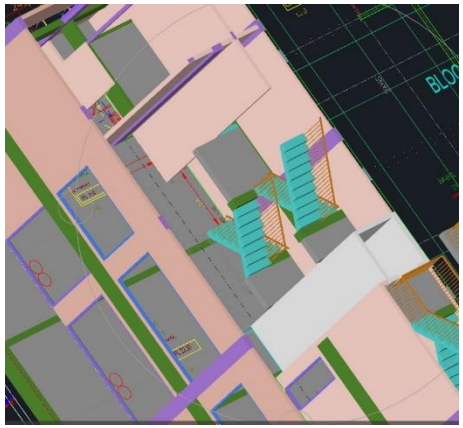
(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)

KEGIATAN MAGANG

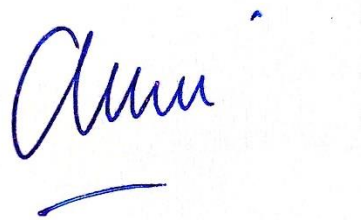
BULAN KE	:	II
MINGGU KE	:	I
TANGGAL	:	26 Mei 2025 – 30 Mei 2025

No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	26 Mei 2025	• Cuti Berduka				
2	27 Mei 2025	• Mengeprint gambar struktur untuk tender (Ayer Holdings Puchong Shoplot)  • Memasukkan item tambahan pada Pre-Q excel (Ayer Holdings				

		Puchong Shoplot)  • Membuat taking off list pekerjaan struktur (Ayer Holdings Puchong Shoplot)				
3	28 Mei 2025	• Menghitung kuantitas kolom menggunakan TAS • Menambah item pada taking off list 				
4	29 Mei 2025	• Menghitung kuantitas balok,plat menggunakan TAS				

						
5	30 Mei 2025	• Menghitung kuantitas Tangga,dinding menggunakan TAS 		• Sulit membuat model tangga karena masih baru menggunakan softwarenya dan juga sulit memahami gambarnya		

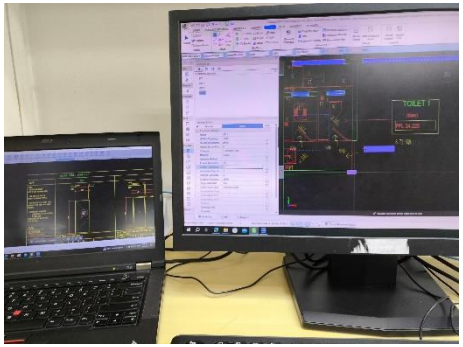
(Mont Kiara, 30 Mei 2025)
Pembimbing Lapangan,

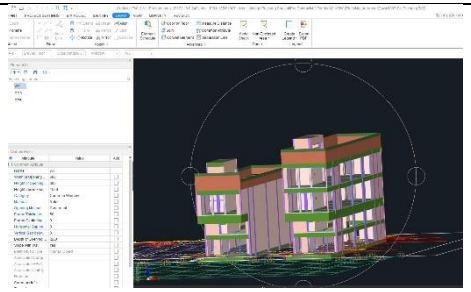
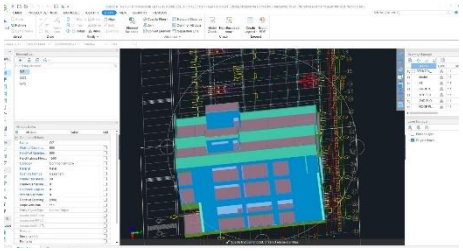


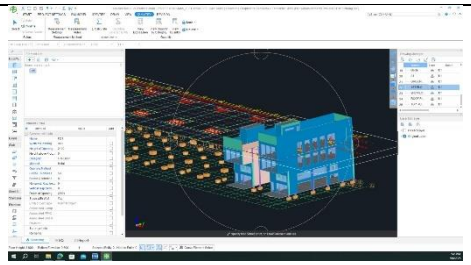
(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)

KEGIATAN MAGANG

BULAN KE	:	II
MINGGU KE	:	II
TANGGAL	:	2 Juni 2025 – 6 Juni 2025

No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	2 Juni 2025	• Libur (Seri Paduka Baginda Yang Di-Pertuan Agong's Birthday)				
2	3 Juni 2025	• Membuat model & Menghitung Jendela,pintu menggunakan TAS (Ayer Holdings Puchong Shoplot) 				
3	4 Juni 2025	• Membuat model & Menghitung Finishing menggunakan TAS (Ayer Holdings Puchong Shoplot)		• Kesulitan / ragu dalam membaca gambarnya	• Sering bertanya kepada pembimbing lapangan	

						
4	5 Juni 2025	• Melanjutkan Membuat model & Menghitung Finishing menggunakan TAS (Ayer Holdings Puchong Shoplot)  • Menghitung item plumbing/sanitasi menggunakan Cost X (Ayer Holdings Puchong Shoplot)				
5	6 Juni 2025	• Melanjutkan Membuat model & Menghitung Finishing menggunakan TAS (Ayer Holdings Puchong Shoplot)				

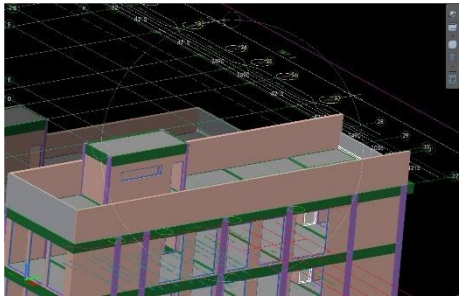
						

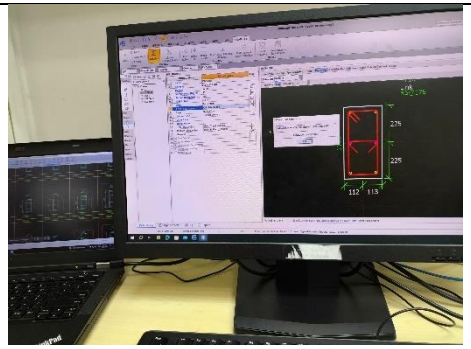
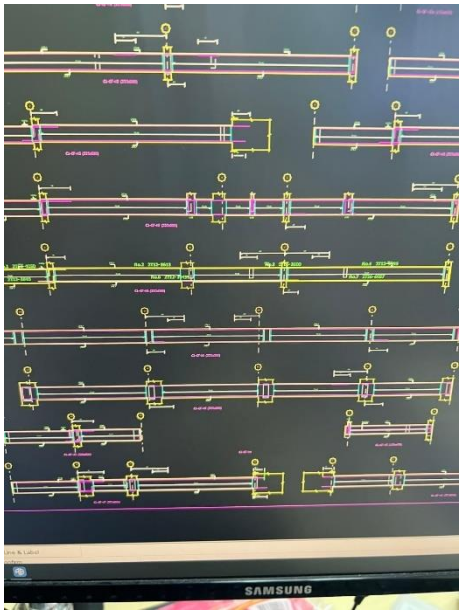
(Mont Kiara, 6 Juni 2025)
Pembimbing Lapangan,

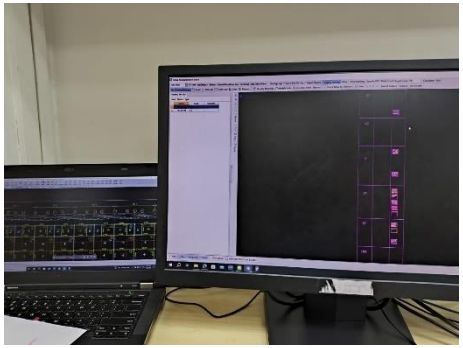
(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)

KEGIATAN MAGANG

BULAN KE	:	II
MINGGU KE	:	III
TANGGAL	:	9 Juni 2025 – 13 Juni 2025

No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	9 Juni 2025	• Menghitung ulang kembali arsitektur, karena ada perubahan pada gambar arsitektur (Ayer Holdings Puchong Shoplot) 				
2	10 Juni 2025	• Melanjutkan perhitungan arsitektur menggunakan TAS (Ayer Holdings Puchong Shoplot) • Menghitung pembesian kolom menggunakan TRB (Ayer Holdings Puchong Shoplot)	• Model TAS pada proyek Puchong shoplot			

						
3	11 Juni 2025	• Melanjutkan perhitungan pembesian kolom, balok menggunakan TRB (Ayer Holdings Puchong Shoplot) 		• Kesulitan dalam memahami gambarnya (terdapat perbedaan area pada detail dan layout)	• Sering bertanya ke pembimbing lapangan	

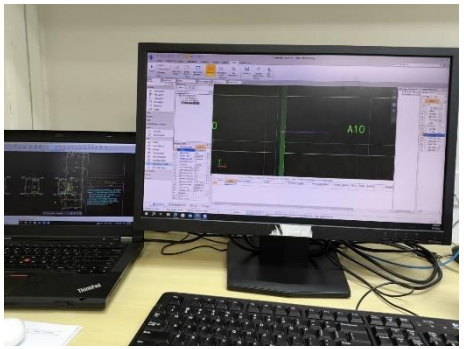
4	12 Juni 2025	• Menghitung pembesian balok menggunakan TRB (Ayer Holdings Puchong Shoplot) 				
5	13 Juni 2025	• Melanjutkan Menghitung pembesian balok (end & Int unit) menggunakan TRB (Ayer Holdings Puchong Shoplot)				

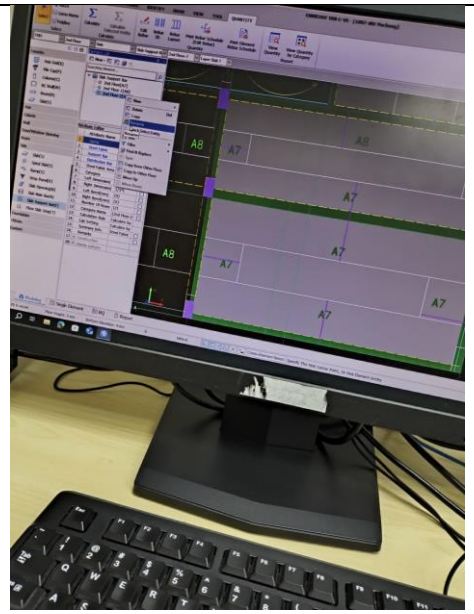
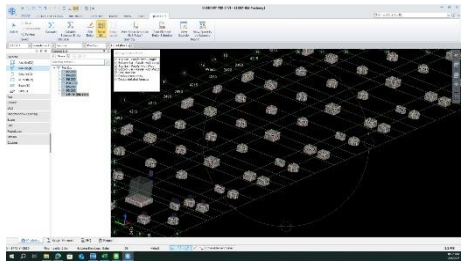
(Mont Kiara, 13 Juni 2025)
Pembimbing Lapangan,

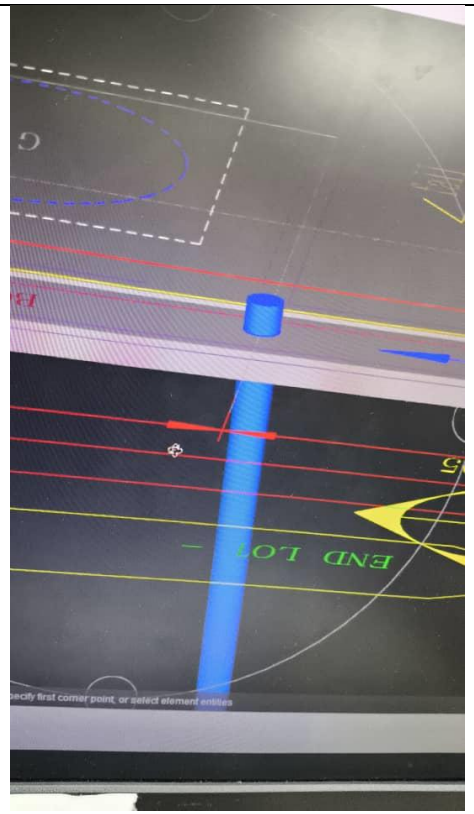
(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)
UNIVERSITAS BUNG HATTA

KEGIATAN MAGANG

BULAN KE	:	II
MINGGU KE	:	IV
TANGGAL	:	16 Juni 2025 – 20 Juni 2025

No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	16 Juni 2025	• Menghitung pembesian balok Int unit dan slab/plat menggunakan TRB (Ayer Holdings Puchong Shoplot) 				
2	17 Juni 2025	• Melanjutkan perhitungan pembesian slab/plat menggunakan TRB (Ayer Holdings Puchong Shoplot)				

						
3	18 Juni 2025	• Melanjutkan perhitungan pembesian slab/plat dan pilecap menggunakan TRB (Ayer Holdings Puchong Shoplot) 				
4	19 Juni 2025	• Menambah item pada TAS (RC Gutter,Rain Water Drop Panel,Spout Pipe)				

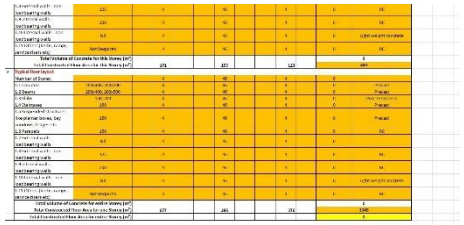
		 • Membuat Taking off List pekerjaan Arsitektur				
5	20 Juni 2025	• Membuat ulang / mengganti finishing lantai • Membuat excel CUI (Concrete Usage Index) Calculation		• Karena adanya perubahan gambar oleh arsitek pada finishing lantai		

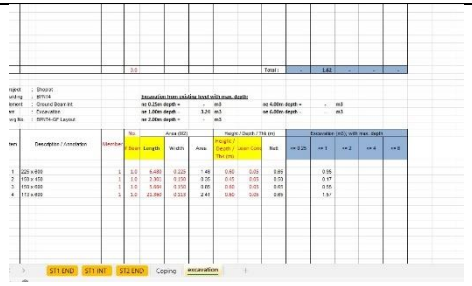
(Mont Kiara, 20 Juni 2025)
Pembimbing Lapangan,

(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)

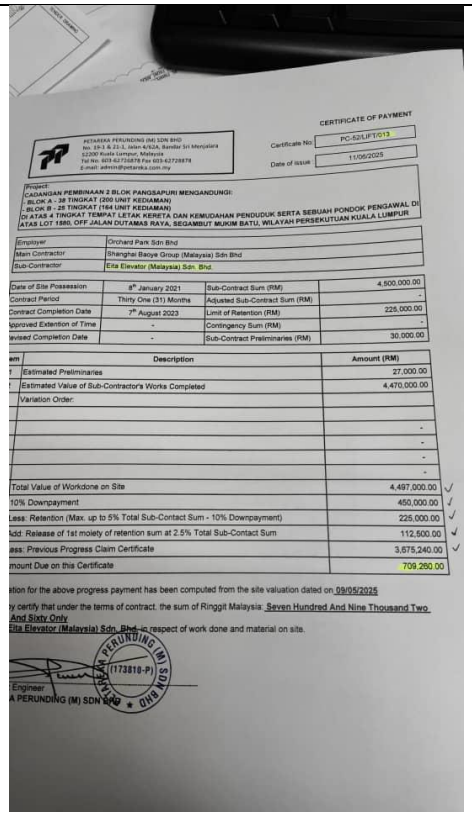
KEGIATAN MAGANG

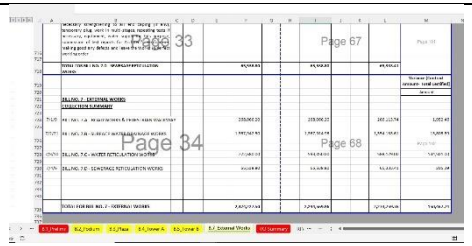
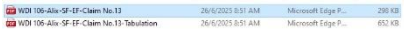
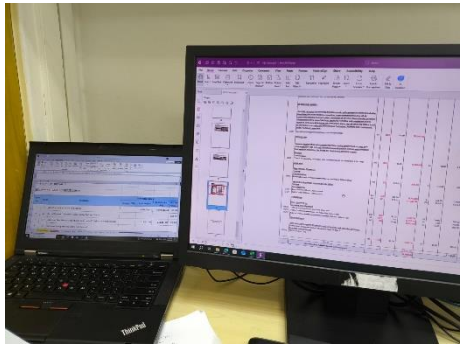
BULAN KE	:	III
MINGGU KE	:	I
TANGGAL	:	23 Juni 2025 – 27 Juni 2025

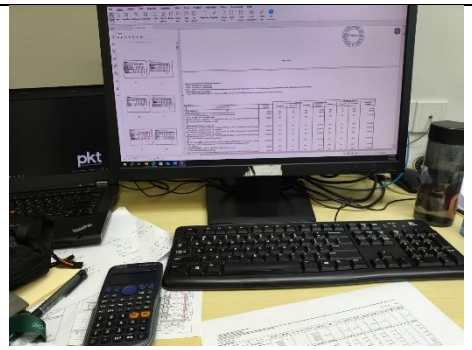
No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	23 Juni 2025	• Melanjutkan menginput volume beton pada excel CUI (Concrete Usage Index) Calculation  • Menghitung pembesian tangga				
2	24 Juni 2025	• Menghitung pembesian coping, parapet wall • Menghitung excavation piling, sloof, dan ground slab				

						
3	25 Juni 2025	• Mengedit & cek certificate of payment IV 52 by Petareka (Project TA Orchard Park @ Dutamas / Alix Residence) 				

Page 1

		 CERTIFICATE OF PAYMENT PETARAKA PERUNDING (M) SDN BHD No. 19-1 & 23-3, Jalan 4/62A, Bandar Sri Menjalara 52200 Kuala Lumpur, Malaysia Tel No. 603-62730878 Fax 603-62728878 E-mail: admin@petaraka.com.my Certificate No: PC-52/LIFT/013 Date of Issue: 11/05/2025 Project: CADANGAN PEMBINAAN 2 BLOK PANGSAPURI MENGANDUNGI: - BLOK A - 28 TINGKAT (200 UNIT KEDIAMAN) - BLOK B - 25 TINGKAT (164 UNIT KEDIAMAN) DI ATAS 4 TINGKAT TEMPAT LETAK KERETA DAN KEMUDAHAN PENDUDUK SERTA SEBUAH PONDOK PENGAWAL DI ATAS LOT 1880, OFF JALAN DUTAMAS RAYA, SEGAMBUT MUKIM BATU, WILAYAH PERSEKUTUAN KUALA LUMPUR Employer: Orchard Park Sdn Bhd Main Contractor: Shinghai Baoye Group (Malaysia) Sdn Bhd Sub-Contractor: Eita Elevator (Malaysia) Sdn. Bhd. Date of Site Possession: 8th January 2021 — Sub-Contract Sum (RM): 4,500,000.00 Contract Period: Thirty One (31) Months — Adjusted Sub-Contract Sum (RM): Contract Completion Date: 7th August 2023 — Limit of Retention (RM): 225,000.00 Approved Extention of Time: - — Contingency Sum (RM): - Revised Completion Date: - — Sub-Contract Preliminaries (RM): 30,000.00 Description — Amount (RM) Estimated Preliminaries: 27,000.00 Estimated Value of Sub-Contractor's Works Completed: 4,470,000.00 Variation Order: - - - - Total Value of Workdone on Site: 4,497,000.00 10% Downpayment: 450,000.00 Less: Retention (Max. up to 5% Total Sub-Contact Sum - 10% Downpayment): 225,000.00 Add: Release of 1st moiety of retention sum at 2.5% Total Sub-Contact Sum: 112,500.00 Less: Previous Progress Claim Certificate: 3,575,240.00 Amount Due on this Certificate: 709,260.00 ...tion for the above progress payment has been computed from the site valuation dated on 09/05/2025 ...y certify that under the terms of contract, the sum of Ringgit Malaysia: Seven Hundred And Nine Thousand Two ...And Sixty Only ...Eita Elevator (Malaysia) Sdn. Bhd. in respect of work done and material on site. ...Engineer ...A PERUNDING (M) SDN BHD PERUNDING (M) SDN BHD (173810-P) • Mengedit/ cek amount contractor's claim bagian podium,plaza,tower A & B, External Works (Project TA Orchard Park @ Dutamas / Alix Residence)				

						
4	26 Juni 2025	• Mengedit & cek certificate of payment IV 52 by WDI (Project TA Orchard Park @ Dutamas / Alix Residence)  • Mengedit file IV 52- draft 				

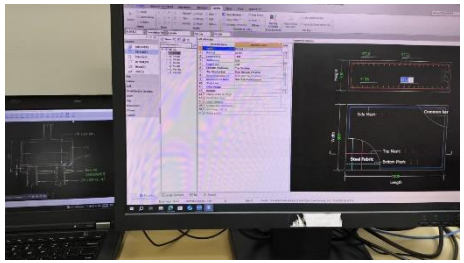
						
5	27 Juni 2025	• Libur tahun baru hijriah				

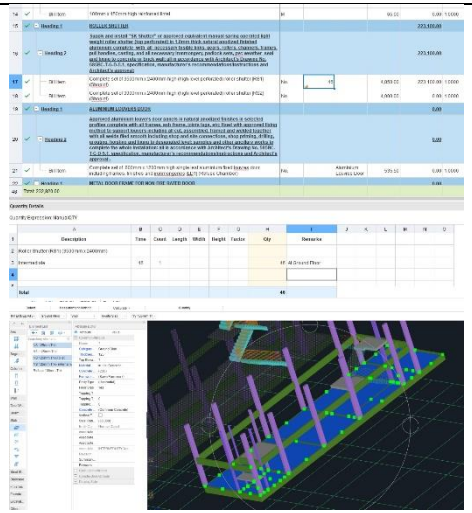
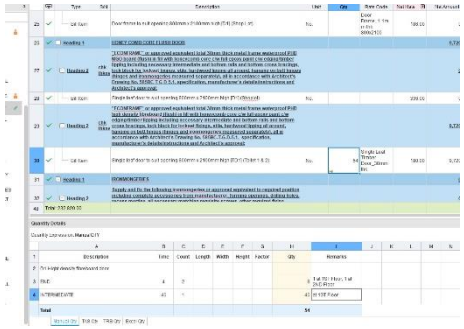
(Mont Kiara, 27 Juni 2025)
Pembimbing Lapangan,

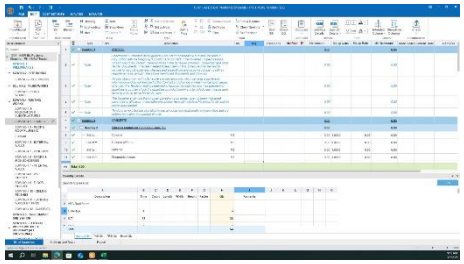
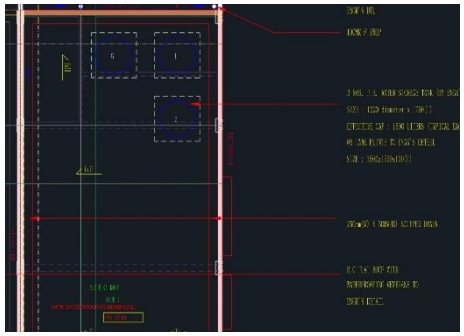
(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)

KEGIATAN MAGANG

BULAN KE	:	III
MINGGU KE	:	II
TANGGAL	:	30 Juni 2025 – 4 Juli 2025

No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	30 Juni 2025	• Membuat piling block 2 pada TAS dan TRB  • Memperbaiki beam dan kolom (arena intermediate-end dan intermediate-corner)				
2	1 Juli 2025	• Membuat TBQ, mengedit/memperbaiki perhitungan kuantitas TRB dan TAS				

						
3	2 Juli 2025	• Membuat TBQ, • mengedit/memperbaiki perhitungan kuantitas TRB dan TAS 				
4	3 Juli 2025	• Membuat TBQ, • mengedit/memperbaiki perhitungan kuantitas TRB dan				

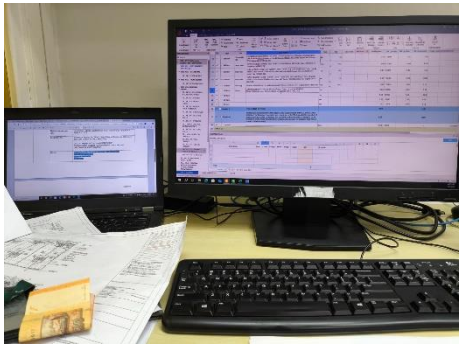
		TAS 				
5	4 Juli 2025	• Membuat TBQ, • mengedit/memperbaiki perhitungan kuantitas TRB dan TAS 				

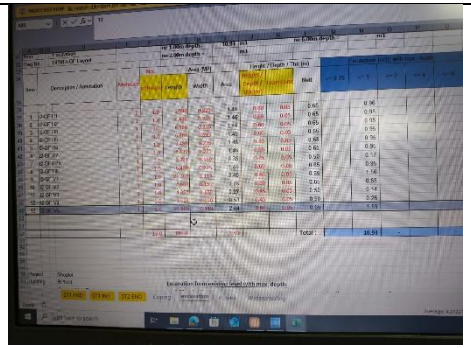
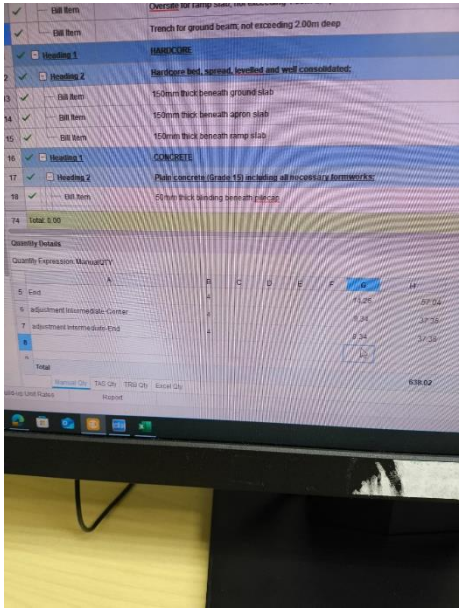
(Mont Kiara, 27 Juni 2025)
Pembimbing Lapangan,

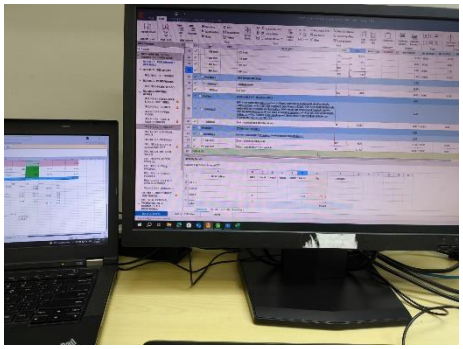
(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)

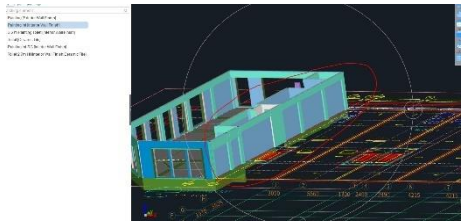
KEGIATAN MAGANG

BULAN KE	:	III
MINGGU KE	:	III
TANGGAL	:	7 Juli 2025 – 11 Juli 2025

No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	7 Juli 2025	• Membuat TBQ, mengedit/memperbaiki perhitungan kuantitas TRB dan TAS 				
2	8 Juli 2025	• Membuat TBQ, mengedit/memperbaiki perhitungan kuantitas TRB dan TAS				

		 				
3	9 Juli 2025	• Membuat TBQ, • mengedit/memperbaiki perhitungan kuantitas TRB dan				

		TAS 				
4	10 Juli 2025	• Membuat TBQ, • mengedit/memperbaiki perhitungan kuantitas TRB dan TAS • menyusun / mempersiapkan dokumen tender APPENDIX "D" **APPENDIX D – LIST OF TENDER DRAWINGS** **DESCRIPTION** / **DRAWING NO.** **LANDSCAPE:** LANDSCAPE PLAN – PHASE 1 — LAA/BPNT4/0363525/TD/001/25/R0 SOFT LANDSCAPE PLAN – PHASE 1 — LAA/BPNT4/0363525/TD/002/25/R0 HARD LANDSCAPE PLAN – PHASE 1 — LAA/BPNT4/0363525/TD/003/25/R0 SECTION ELEVATION A – A, SECTION ELEVATION B – B — LAA/BPNT4/0363525/TD/004/25/R0 PLANTING METHOD — LAA/BPNT4/0363525/TD/006/25/R0				
5	11 Juli 2025	• Membuat TBQ, • mengedit/memperbaiki perhitungan kuantitas TRB dan TAS • membuat item tambahan/kurang pada TAS bagian jendela dan dinding (revisi gambar oleh arsitek				

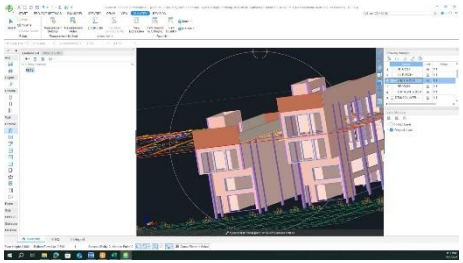
		omit area AC Ledge and Change Refuse area to Utility) 				

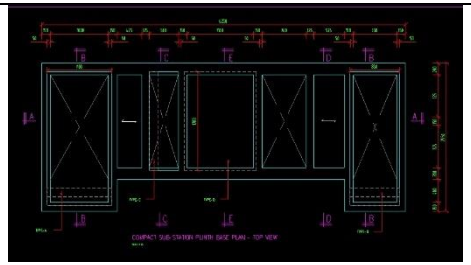
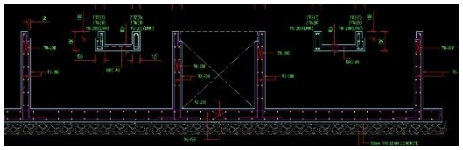
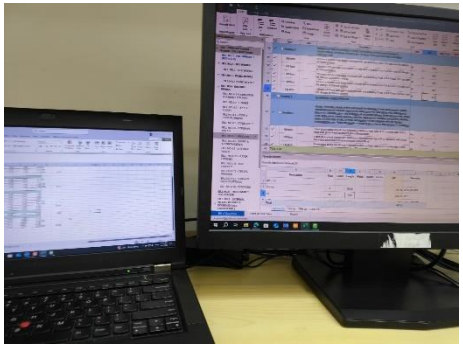
(Mont Kiara, 27 Juni 2025)
Pembimbing Lapangan,

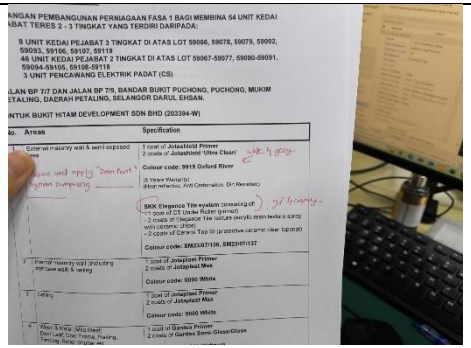
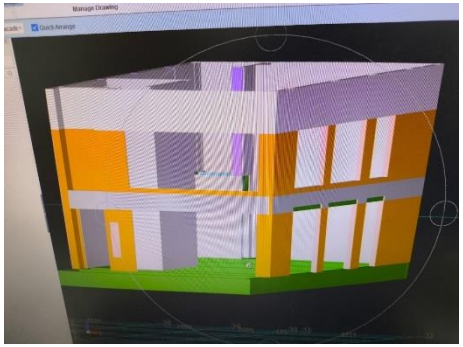
(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)

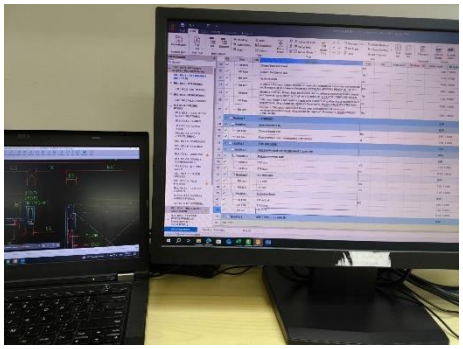
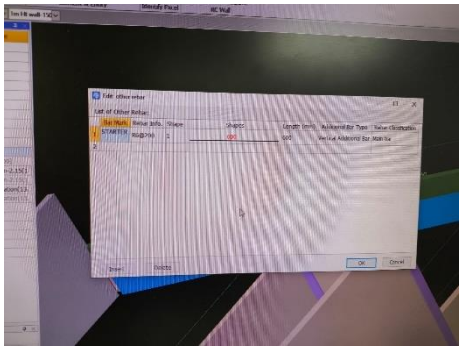
KEGIATAN MAGANG

BULAN KE	:	III
MINGGU KE	:	IV
TANGGAL	:	14 Juli 2025 – 18 Juli 2025

No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	14 Juli 2025	• Menambah item *vent pipe* pada TAS • Membuat TBQ, mengedit/memperbaiki perhitungan kuantitas TRB dan TAS 				
2	15 Juli 2025	• Menghitung kuantitas TNB Plinth PE				

		  • Menyusun dokumen untuk tender				
3	16 Juli 2025	• Membuat TBQ, • mengedit/memperbaiki perhitungan kuantitas TRB dan TAS 				

		 ANGAN PEMBANGUNAN PERNIAGAAN FASA 1 BAGI MEMBINA 54 UNIT KEDAI BAT TERES 2 - 3 TINGKAT YANG TERDIRI DARIPADA: 8 UNIT KEDAI PEJABAT 3 TINGKAT DI ATAS LOT 59066, 59078, 59079, 59092, 59093, 59106, 59107, 59119 46 UNIT KEDAI PEJABAT 2 TINGKAT DI ATAS LOT 59067-59077, 59080-59091, 59094-59105, 59108-59118 3 UNIT PENCAWANG ELEKTRIK PADAT (CS) LAN BP 7/7 DAN JALAN BP 7/9, BANDAR BUKIT PUCHONG, PUCHONG, MUKIM TALING, DAERAH PETALING, SELANGOR DARUL EHSAN. NTUK BUKIT HITAM DEVELOPMENT SDN BHD (203394-W) Areas / Specification 1 coat of Jotashield Primer 2 coats of Jotashield Ultra Clean Colour code: 9915 Oxford River 5 Years Warranty SKK Elegance Tile system (covering of) 1 coat of GT Under Roller (primer) 2 coats of Elegance tile texture overalls resin texture spray with ceramic (Fine) 2 coats of Cervera Top St (protective ceramic clear topcoat) Colour code: SM23-071136, SM23-071137 1 coat of Jotaplast Primer 2 coats of Jotaplast Max Colour code: 9000 White 1 coat of Jotaplast Primer 2 coats of Jotaplast Max Colour code: 9000 White 1 coat of Gardex Primer 2 coats of Gardex Semi-Gloss/Gloss 				
4	17 Juli 2025	• Membuat TBQ, • mengedit/memperbaiki perhitungan kuantitas TRB dan				

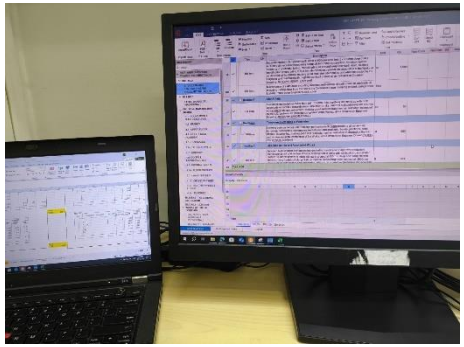
		TAS  • menyusun / mempersiapkan dokumen tender				
5	18 Juli 2025	• Membuat dokumen tender (*Appendices/Apendix)* • mengedit/memperbaiki perhitungan kuantitas TRB dan TAS 				

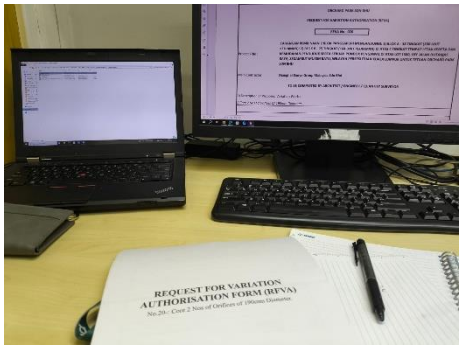
(Mont Kiara, 27 Juni 2025)
Pembimbing Lapangan,

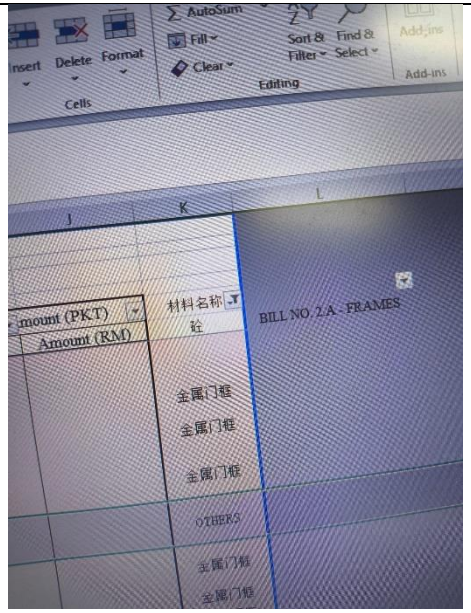
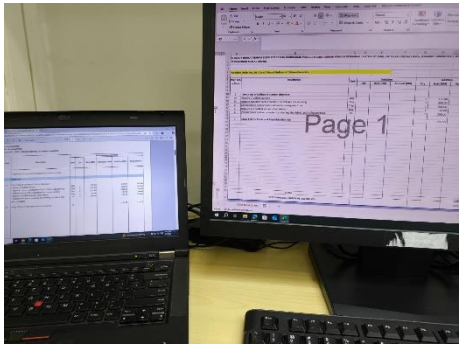
(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)

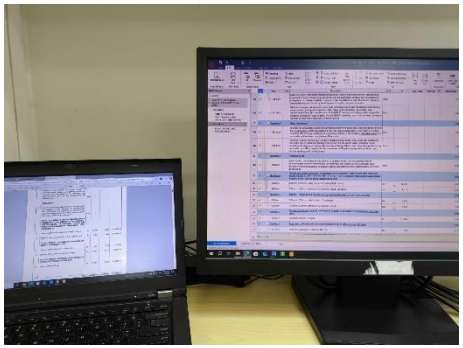
KEGIATAN MAGANG

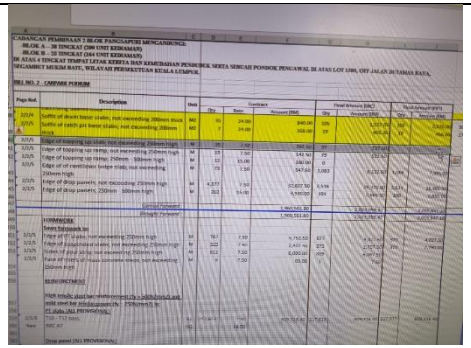
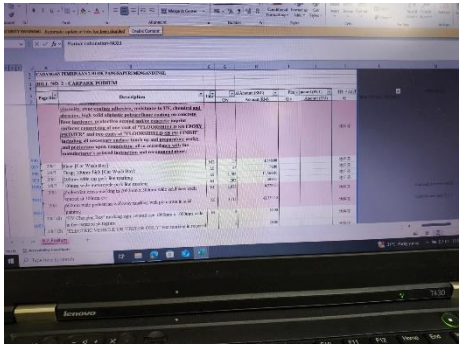
BULAN KE	:	IV
MINGGU KE	:	I
TANGGAL	:	21 Juli 2025 – 25 Juli 2025

No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	21 Juli 2025	• Mengerjakan TBQ input kuantitas 				

2	22 Juli 2025	• Mengerjakan RFV (Request For Variation , Alix Residence)  • Final Account , Alix remeasurement				

		 				
3	23 Juli 2025	• Alix remeasurement (Final Account) • Cek BQ pintu, jendela (bukit Puchong)				

4	24 Juli 2025	• Menghitung finishing/fasad louvred bkt puchong • Membuat TBQ bkt Puchong (input rate) 				
5	25 Juli 2025	• Input rate BQ • Mengerjakan IV 52 • Final Account (remeasurement Alix)				

(Mont Kiara, 27 Juni 2025)
Pembimbing Lapangan,

(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)
UNIVERSITAS BUNG HATTA

KEGIATAN MAGANG

BULAN KE	:	IV
MINGGU KE	:	II
TANGGAL	:	28 Juli 2025 – 31 Juli 2025

No	Tanggal	Uraian Kegiatan dan Dokumentasi	Hasil Yang dicapai	Kendala/Hambatan	Rencana Tindak Lanjut	Paraf P.L
1	28 Juli 2025	• Final Account (remeasurement Alix) • Mempelajari sanitary & ware (Alix residence)				
2	29 Juli 2025	• Scan file dokumen tender (Bkt Puchong)				
3	30 Juli 2025	• Mengedit file word GRE total qty (letter) , appendix • Edit description TBQ NS (floor finishes, wall finishes)				
4	31 Juli 2025	• Check rate bq urinoir dan toilet cubicle (Alix residence) • Check quantity urinoir and toilet cubicle (Alix residence)				

(Mont Kiara, 27 Juni 2025)
Pembimbing Lapangan,

(Alwi Abdul Razak B.Sc)
(Senior Contract Executive)