INTERNSHIP FINAL REPORT

PKT QUANTITY SURVEYING CONSULTANT SDN BHD

Suite E-11-06, Plaza Mont Kiara, 50480 Kuala Lumpur, Malaysia

Prepared as a fulfillment of the internship course requirements Quantity Surveying Study Program, Faculty of Civil Engineering and Planning, Universitas Bung Hatta.

Compiled by:

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FACULTY OF CIVIL ENGINEERING AND PLANNING

UNIVERSITAS BUNG HATTA

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VALIDATION PAGE

Final Report

at:

PKT Quantity Surveying Consultant Sdn. Bhd.

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ARCHITECTURAL AND FINISHING WORK MEASUREMENT FOR CARCOSA SERI NEGARA LINK BRIDGE

ABSTRACT

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This report serves to outline the key experiences and insights gained during the internship by, Hijria Azzahra, a Quantity Surveying student from Universitas Bung Hatta. The internship was conducted at PKT Quantity Surveying Consultant Sdn. Bhd. from April 28 to July 31, 2025. During this period, an assignment was received for the Carcosa Seri Negara project, where reporting was done to a mentor in the Contract Executive division and primary assistance was provided with contract-related measurements.

The primary responsibilities included analyzing DCR documents, performing measurements using TAS software, and updating Interim Valuation documents. In performing these duties, a participatory observation approach was adopted, and communication was actively and effectively maintained with senior colleagues within professional boundaries, while an eagerness to learn was demonstrated. In addition to gaining knowledge in software usage and core Quantity Surveying principles, social skills in interactions with peers, supervisors, and fellow interns were also developed.

This report presents a comprehensive overview of the activities and core experiences gained during the internship at PKT Quantity Surveying Consultant Sdn. Bhd. Extensive details on the practical knowledge and skills acquired by directly engaging with the professional world of QS consultancy are provided, as these skills may not have been learned during university coursework.

This experience offered a profound understanding of operational challenges within a professional environment and highlighted the critical importance of process optimization. In conclusion, the internship provided invaluable new knowledge and professional experience, The experience has been highly beneficial, as it has enriched skills in Quantity Surveying and enhanced problem-solving abilities.

Keywords: Quantity Surveying (QS), Internship, PKT Quantity Surveying Consultant, Carcosa Seri Negara project, Construction Measurement, TAS Software, Interim Valuation, Participatory Observation, Professional Development, Problem-Solving.

AKNOWLEDGEMENTS

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

Assalammu'alaikum Wr. Wb.

All praise be to God Almighty for His grace and guidance, which made the completion of this internship report possible. This internship report, which was conducted at a Quantity Surveying (QS) consulting firm in Kuala Lumpur, Malaysia, is submitted to fulfill a portion of the academic requirements for obtaining the degree of Ahli Madya (A.Md.) in Quantity Surveying from the Diploma III (D3) Program at Universitas Bung Hatta, Padang.

This internship report could not have been completed on time without the guidance, assistance, and prayers from various parties. Therefore, the sincerest gratitude is extended to all parties who have assisted in the process of completing this internship report, namely:

1. Myself, for the successful completion of this report, hardwork and dedication that has been committed throughout this internship.
2. My parents and family for their unwavering support.
3. Dato SR. Peter Tan, as the founder & Managing Director of PKT Quantity Surveying Consultant Sdn. Bhd.
4. Mr. SR. Low Keng Liang as the supervisor during the internship period.
5. Mr. Amirul Normazli as the best mentor during the internship period.
6. Dr. Dwifitra Y Jumas, S.T, MSCE as the academic supervisor during the the preparation of this internship report.
7. Dr. Wahyudi P. Utama, BQS., M.T as the Head Department of Quantity Surveying Department.
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9. Timmy, Chimo, dan Moon the fursiblings that gives unconditionally emotional support.

Finally, it is acknowledged that this report may still have its limitations. Constructive criticism and suggestions from readers are therefore welcomed. It is hoped that this report will be a valuable resource for all who read it.

Wassalammu'alaikum Wr. Wb

Padang, 7th July 2025

HIJRIA AZZAHRA
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1.1 Internship Background

Formal education, of course, involves more than just theory and analysis. It is also essential to develop practical experience and directly apply all the knowledge and theories acquired during university studies. The hands-on application of theory in a professional setting helps shape students to their full potential, ensuring they are prepared to enter the workforce upon graduation. Quantity Surveying, Faculty of Civil Engineering and Planning, Universitas Bung Hatta is one of the academic institutions that specializes in Quantity Surveying, with an emphasis on its practical application in the field. To support this objective, the Quantity Surveying Program at Universitas Bung Hatta mandates that the students complete an internship/practical work as a partial requirement for their D3 degree. The program provides students with a hands-on review of the academic knowledge they have studied. The internship for this report was conducted at PKT Quantity Surveying Consultant Sdn Bhd, a firm specializing in Quantity Surveying located at Suite E-11-06 Plaza Mont Kiara No.2, Jalan Kiara 50480 Kuala Lumpur, Malaysia. The internship period spanned from 28th April 2025, to 31st July 2025.

This internship is expected to serve as a platform for students to gain hands-on experience in the field and put into practice all the theories they have learned and acquired during their university studies. During the internship, students are directly exposed to the working environment of a consultancy firm, where they encounter the real-world tasks and challenges that professional Quantity Surveyors must face. This provides an opportunity to discover the many factors that can influence a project's progress and to analyze which elements facilitate its advancement and which ones impede its successful completion. Consequently, the internship is expected to broaden students' perspectives on both theoretical concepts and their practical application in the field.

1.2 Internship Objectives

The purpose of this internship is to fulfill the curriculum requirements for the Diploma III (D3) program in the Quantity Surveying study program at Universitas Bung Hatta. Furthermore, the internship is also intended to provide students with direct knowledge concerning the execution of consulting work within a professional firm. The purpose of this internship is to achieve the following goals:

1. To enable students to understand the role of Quantity Surveyors in construction projects.
2. To hone students' measurement and calculation skills as a Quantity Surveyor.
3. To allow students to directly observe and understand the working processes and systems that Senior Quantity Surveyors use to manage a project from its inception to completion.
4. To bridge the gap between students' academic knowledge and practical application in the Quantity Surveying field.
5. To develop students' problem-solving skills, teamwork abilities, and technical skills in the field of Quantity Surveying.

1.3 Internship Period and Location

The following is the Internship Schedule and Implementation:

- Company Name : PKT Quantity Surveying Consultant Sdn Bhd.
- Company Location : Suite E-11-06 Plaza Mont Kiara No.2, Jalan Kiara 50480 Kuala Lumpur, Malaysia.
- Internship Duration : 28th April 2025 – 31st July 2025
- Work Hours : 8.45 am – 5.45 pm (Monday – Friday)

1.4 Internship Scopes

This internship aims to provide a comprehensive understanding of the Quantity Surveying profession within a real-world consultancy environment. The scope of work encompasses a variety of tasks and responsibilities designed to bridge the gap between academic theory and practical application.

1. Measurement and Quantity Take-Off
    - Project-Specific Measurement: Performing detailed quantity take-offs, covering structural, architectural, and mechanical & electrical (M&E) elements.
    - Software Proficiency: Gaining hands-on experience and developing proficiency in industry-standard software, specifically TAS Glodon, and other software such as TRB, and TBQ for efficient and accurate quantity measurement from project drawings.
    - Documentation: Preparing and verifying Bills of Quantities (BQ) and other relevant measurement documents in compliance with standard methods of measurement.
2. Cost Estimation and Financial Management
    - Preliminary Cost Planning: Assisting in the preparation of preliminary cost estimates and budget forecasts for different stages of the project lifecycle.
    - Tender Analysis: Participating in the analysis of tender submissions, including the evaluation of costs, review of contractors' rates, and preparation of comparative reports.
    - Payment Claims: Assisting in the preparation and verification of progress payment claims from contractors.
3. Contract Administration and Documentation
    - Contract Review: Understanding the various types of construction contracts and assisting in the review of contract documents.
    - Tender Documentation: Preparing and compiling comprehensive tender documentation packages for subcontractors and suppliers.

- Design/Document Change Request: Is a crucial tool for maintaining control and transparency throughout a construction project, especially when unexpected changes arise.
- Variation Orders: Assisting in the valuation of changes and variations to the original contract, including the preparation of variation orders.

4. Site and Project Coordination
   - On-Site Exposure: Participating in site visits to gain a practical understanding of construction processes, verify on-site work progress, and correlate it with project documentation.
   - Team Collaboration: Working closely with senior Quantity Surveyors and other team members to ensure smooth project administration and timely completion of tasks.
5. Skills Development
   - Technical Skills: Enhancing technical proficiency in quantity measurement, cost control, and contract management.
   - Problem-Solving: Developing critical thinking and problem-solving skills to address real-world challenges in project execution.
   - Professionalism: Cultivating professional work ethics, communication skills, and the ability to work effectively in a dynamic and fast-paced consultancy environment.

CHAPTER II
COMPANY PROFILE

2.1 General Information

Figure 2. 1 PKT Quantity Surveying Consultant Sdn Bhd Logo
(Source: https://my.linkedin.com/company/pktqs)

PKT Quantity Surveying Consultant Sdn Bhd was established in 1991, and for over 34 years has grown to become one of the leading quantity surveying consulting firms in Malaysia. With a professional staff of more than 80, PKT possesses extensive expertise across 12 key sectors, ensuring every project is executed in accordance with international standards while maintaining a deep understanding of local conditions. (Surveyors, 2024)

The primary sectors in which PKT operates are:

- Residential
- Commercial
- Office Fit-Out
- Data Centres
- Retail
- Factories
- Infrastructure
- Logistics
- Entertainment
- Hotel & Resorts
- Education
- Healthcare

Beyond the core duties and responsibilities of Quantity Surveyors in determining a project's cost estimation plan, PKT Quantity Surveying also has a dedicated division to handle contractual matters, specifically the Contract Executive division. A Contract Executive in a QS firm is a professional who focuses specifically on the administrative and legal aspects of construction contracts. While a Quantity Surveyor's role is broader and involves managing a project's overall costs and finances, the Contract Executive's primary responsibility is to ensure all contractual agreements are properly prepared, executed, and enforced.

Headquartered in Plaza Mont' Kiara, Kuala Lumpur, PKT offers high-quality services in cost planning, project management, and construction consultation, utilizing the latest technology such as CAD measurement and BIM-based estimation.

2.2 Organizational Chart

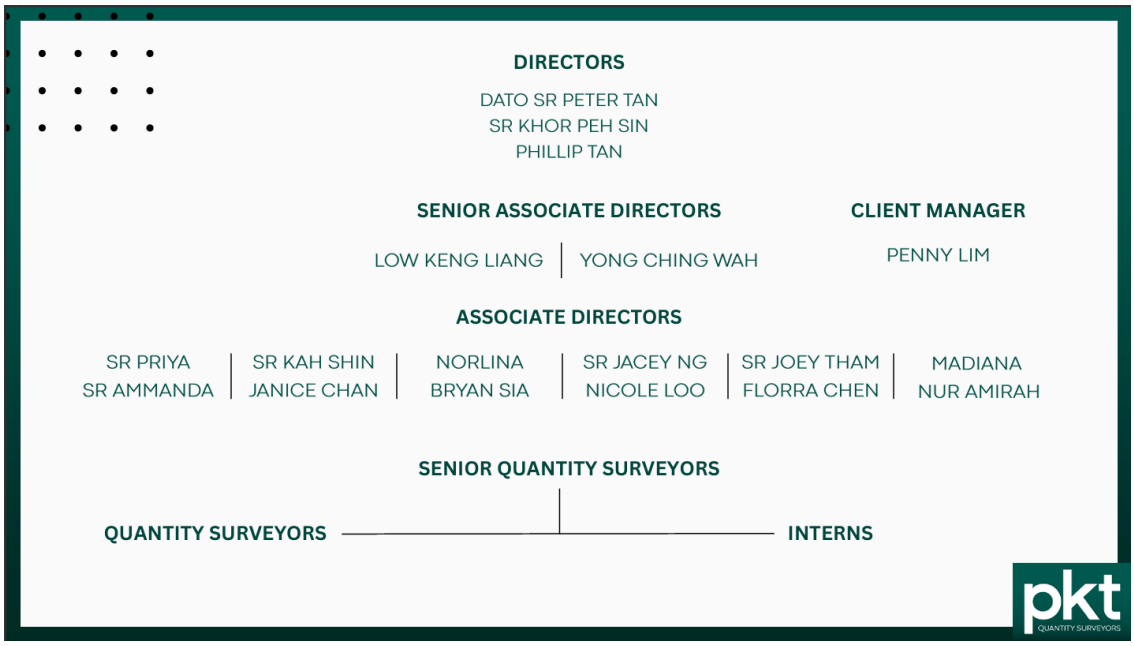


Figure 2. 2 Company Organizational Chart
(Source: file://172.16.0.240/PKT%20Library/2.%20Company%20Profile/PKT%20FULL_2024_.pdf)

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

- **Dato Sr Peter Tan – Founder & Managing Director**

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

- **Sr Khor Peh Sin – Director**

  With over 30 years of experience, holding a Bachelor of Building and a Master's in Project Management from UNSW, and registered with BQSM, RISM & AIQS. His expertise includes contract administration and project cost efficiency.

- **Phillip Tan – BIM Director**

  A graduate of the University of Melbourne with a Bachelor of Environments and a Master of Construction Management. He is a member of the Australian Institute of Quantity Surveyors (AIQS) and plays a crucial role in the integration of BIM systems at PKT.

Led by these experts, PKT is committed to delivering efficient and innovative solutions that align with global standards, while remaining tailored to the needs of the local industry. Complementing its core services, PKT also has a team of dedicated support personnel, among whom are:

- **Senior Associate Directors – (Low Keng Liang, Yong Ching Wah)**

  Senior Associate Director is a high-level management professional who acts as a critical link between middle management and executive leadership within an organization. While the exact duties can vary greatly depending on the company and industry, the role generally combines hands-on leadership with strategic responsibilities. As shown in the organizational chart, Mr. Low Keng Liang, a Senior Associate Director at PKT, served as the direct supervisor throughout the internship. Together with Mr. Yong Ching Wah, both were regarded as pivotal figures in the office environment. They acted as both professional role models and the authoritative reference for all Quantity Surveying work within the firm.

- **Associate Directors**

  Associate Director is a proven leader who has mastered the technical skills of quantity surveying and is now taking on the added responsibility of managing both people and key business relationships. They are responsible for managing, mentoring, and developing a team of junior and senior Quantity Surveyors. They act as a leader, delegating tasks, ensuring quality, and fostering the professional growth of their team. As shown in the chart, PKT has several associate directors who lead and give guidance to their teams, ensuring work is carried out in line with established procedures.

- **Senior Quantity Surveyors**

  A Senior Quantity Surveyor is a highly experienced professional in the construction industry who oversees all financial and contractual aspects of a project. They are responsible for managing budgets, preparing and negotiating contracts with subcontractors, and ensuring that projects are delivered on time and within budget. This role requires a strong understanding of cost control, risk management, and contract law, as well as the ability to provide leadership and mentorship to junior team members, acting as a key point of contact for clients, contractors, and project managers.

- **Quantity Surveyors**

  The Quantity Surveyor (QS) is the core, mid-level professional in the firm. This is the stage after the entry-level or “trainee” role, where the individual is expected to work with a high degree of autonomy and manage their own projects. Unlike a trainee who mainly assists, a Quantity Surveyor’s responsibilities are comprehensive. They are the main point of contact for the day-to-day financial management of a project, handling tasks from creating initial cost plans to managing tender documents, performing valuations of work completed, and preparing final accounts. They possess solid technical knowledge and are trusted to make independent decisions that keep the project on budget and on schedule.

The QS role is where a professional truly masters their craft before moving into a leadership or management position.

2.3 Company Scope of Services

Based on its role as a leading Quantity Surveying firm, PKT Quantity Surveying Consultant Sdn Bhd offers a comprehensive range of services focused on managing construction project costs and contracts. The company's expertise spans the entire project lifecycle, from initial planning to final completion:

- Feasibility Studies

Aiding clients set up their initial budget with minimal information and benchmarking their budgets against other similar project in the region. This allows clients to prepare their case studies to their respective boards or steering committees.

- Cost Planning

As believers in detailed elemental cost planning, the company undertake detailed measurements with assumptions to establish a cost plan that reduces possible variance. The company develop 5D BIM models at this stage to support the companys costing with full visibility to clients.

- Value Engineering

Due to our large exposure to various project types, the company can recommend VE methods, whether it may be structural efficiency, building efficiency, specification replacements, or construction methodology.

- Bill of Quantities

Measurement and Preparation of BQs are the companys bread and butter, using a combination of 2D & 3D measurement software, the company aims to be as accurate as possible at all times to improve tender competitiveness, and deliver within our client's timelines.

- Tender & Procurement

A fine balance between transparency and confidentiality is important when tendering. The company believe in maintaining full privacy of the clients's info, while ensuring the tenderers have the most suitable info to price our tenders fairly and competitively.

- Contract Advice

Having the right procurement strategy is key towards achieving the best value for money. The company provide advice on various contrsct forms to use to suit the project to have a balance of risk and cost efficiency for all stakeholders.

- Contract Documents

As part of the contract, the company prepare the necessary information for all parties to maintain proper records in case of any arguments or dispute that may occur.

- Progress Valuations

Monthly progress valuations on site are necessary to ensure that clients are not overpaying the contractor on monthly billing and vice versa. The company will plan these monthly visits accordingly with the stakeholders to preserve fairness in the contract.

- Contract Administration

At points during the contract where dispute may occur regarding the works on site, the company will advice the clients/PMs accordingly on the proper clauses and the execution of such clauses. The company have worked with various forms to date.

- Variation Assessment

While the company work on their pre-contract documents with the fellow consultants to minimize variations, the company understand that changes on projects are inevitable. The company will assess any design changes for cost impact and prepare the necessary compliant Variation paperwork to suit the processes.

- Cost Control

Managing the overall budget and compliance to the budget despite the changes is a key responsibility that the company undertake on all of the projects. The company will advise the clients on any potential budget blowouts due to these changes in the companys financial reporting.

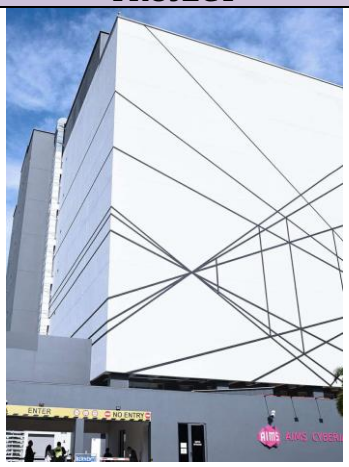
- Final Account

Understanding the final financial outlay for the project is an important step towards assessing the success of any project. The company will liaise with the contractor and

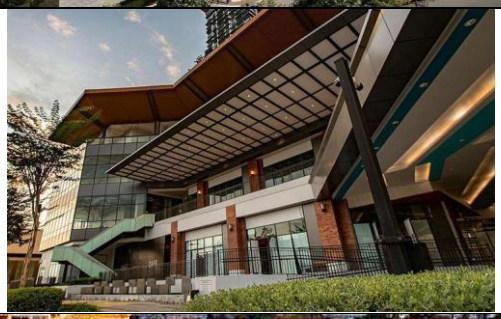
various subcontractors to settle all outstanding claims so that our clients are aware of the final figure for the project.

2.4 Company Experiences

Table 2. 1 Company Experience Projects

NO	PROJECT	PROJECT INFO
1		AIMS Data Centre (phase 1 & 2) Client: AIMS Data Centre Total Cost: Undisclosed Status: Phase 1 – 2021, Phase 2 – 2024 Capacity: Phase 1 – 6MW, Phase 2 – 8MW DC Tier: 3+
2		Alix Residence Client: TA Global Total Cost: 240 mil Status: Completed 2024
3		Alfa Residence Client: UEM Sunrise Total Cost: 480 mil Status: Completed 2024
4		Astrea Client: UEM Sunrise Total Cost: 165 mil Status: Completed 2023

5		The Gems Client: IOI Properties | Mitsubishi Total Cost: 315 mil Status: Completed 2023
6		Hill10 Residence Client: i-Berhad Total Cost: 460 mil Status: Completed 2022
7		Continew Residence Client: Ibraco Berhad Total Cost: 205 mil Status: Completed 2022
8		Megah Rise Residence Client: PPB Hartabina Total Cost: 260 mil Status: Completed 2022
9		Tamansari Selangor Client: BRDB Development Total Cost: 47 mil Status: Completed 2022

10		Double Tree by Hilton Hotel Client: i-Berhad Total Cost: 500 mil Status: Completed 2022 Sectors: 4-Star Hotel
11		Courtyard by Mariott Hotel Client: Tropicana Corporation Berhad Total Cost: 306 mil Status: Completed 2022 Sectors: 4-Star Hotel
12		TRX Exchange Mall Client: Lendlease Projects Total Cost: Undisclosed Status: Completed 2024
13		Megah Rise Mall Client: PPB Hartabina Total Cost: 260 mil Status: Completed 2022
14		Sunway Pyramid Client: Sunway REIT Management Total Cost: 8 mil | Extension to mall & convention center Status: Completed 2022

15		Suria KLCC Client: KLCC Property Berhad Total Cost: 65 mil | Refurbishment Status: Completed 2022
16		UOB KL Main Branch Client: UOB Properties Total Cost: 14 mil Status: Completed 2023
17		IPG Media Brand Client: Merx Malaysia Sdn Bhd Total Cost: 3 mil Status: Completed 2024

(Source: file://172.16.0.240/PKT%20Library/2.%20Company%20Profile/PKT%20FULL_2024_.pdf)

CHAPTER III
ACTIVITIES REPORT

3.1 Introduction

Formal education provides a crucial foundation of theoretical and analytical knowledge. However, to truly prepare for the demands of a professional career, it is essential to bridge academic learning with practical, real-world application. To meet this objective, hands-on experience through a structured internship is considered an invaluable component of a comprehensive education. (Santoso & Gunawan, 2024)

In this context, a formal internship was undertaken at PKT Quantity Surveying Consultant Sdn Bhd in Kuala Lumpur, Malaysia, by the author, a student from the Diploma III (D3) program. The internship was conducted from 28th April 2025, to 31st July 2025. The internship report details the work done in the Contract Executive Division, which primarily involved assisting with the renovation project for the Carcosa Seri Negara gallery building. During the internship period, guidance was provided by one supervisor and one mentor, and work was done within the mentor's team. The supervisor is a highly experienced professional with over two decades of expertise in Quantity Surveying, and holds a senior position in the field. During the internship period, the intern's role extended beyond a single project. The experience involved not only supporting the main renovation project but also assisting in the preparation and management of contract documents for various other sections of the company. This provided a comprehensive understanding of a Quantity Surveyor's diverse responsibilities within a professional consultancy firm.

This report documents the activities, tasks, and challenges encountered throughout the internship. It aims to detail how the practical application of theoretical knowledge enhanced the intern's technical and professional skills, the experience provided key insights into the day-to-day operations of the Quantity Surveying profession and preparations were made for a future career in the industry. The internship was undertaken under PKT Quantity Surveying Sdn Bhd, with the head office located on the 11th floor of Plaza Mont Kiara in Kuala Lumpur, and a branch

office in Johor Bahru. The company has a total of 93 staff members, which includes a mix of senior, junior, and assistant Quantity Surveyors, as well as interns and non-QS support staff. The staff is categorized as follows:

- **Senior Quantity Surveyors:** These are highly experienced professionals with over 10 years of experience in the field, often responsible for managing complex projects and providing strategic guidance.
- **Junior Quantity Surveyors:** This category includes staff with 3 to 10 years of experience. They handle day-to-day project tasks, cost control, and contract administration under the supervision of senior staff.
- **Assistant Quantity Surveyors:** This is an entry-level role for those new to the profession. They typically work alongside and assist junior Quantity Surveyors to gain practical experience.
- **Non-QS Staff:** These are professionals who provide essential support to the core business functions, including roles in IT, administration, and accounting.
- **Quantity Surveyor Interns:** These are students or recent graduates who join the firm for a defined period to receive on-the-job training and exposure to the industry.

The PKT office workspace is divided into 5 separate sections or rooms. In which each section consists of about 12 to 15 staffs including the interns who work on different projects and belong to different teams. During the internship period, the primary assignment was the Carcosa Seri Negara Main Building Renovation Project, under the supervision of Senior Associate Director Mr. Low Keng Liang and under the mentorship of Mr. Amirul Normazli. Several tasks were also assigned, such as making DCR documents, Taking Off and Measurement using TAS software, Querry Lists, making Tender Invitation Letter, also Tenderers calls followup.

3.2 Task List

The following is a list of job descriptions and task performed during the internship period.

Table 3. 1 Task List

No.	Project Name	
1	961 – Guocoland Emerald 9 Cheras	• Interim Valuation • Updating DCR
2	928 – Sime Darby SJCC	• Updating DCR • Printing and Stamping received drawings
3	952 – Carcosa Seri Negara	• Interim Valuation • DCR • Querries • TAS measurement • TAS drawing • Print, binding and stamping received drawings • Site Meeting and Site Visit • Tenderers Call • Contract Documents Appendix making
4	1000 – PPAM Cheras	• Demarcation • Manual qty measurement
5	Ad-Hoc – AWS KUL073	• Addendum listing
6	948 – Chin Hin Rawang	• TBQ key in
7	1027 – Johor Apartment Greenland Danga Bay	• TRB Reinforcement Bar Measurement
8	892 – Belfield	• Contract Document Making

3.3 Performed Activities

3.3.1 961 – Guocoland Emerald 9 Cheras

About the client

GuocoLand Berhad

Figure 3. 1 Client GuocoLand Logo
(Source: https://www.guocoland.com.sg/index.shtml)

GuocoLand (Malaysia) Berhad, listed on the Main Market of Bursa Malaysia, is the property arm of Hong Leong Group. The company is an established property developer in developing community-centric residential townships as well as innovative commercial and integrated development projects in Malaysia. GuocoLand Malaysia is a subsidiary of the Singapore-based GuocoLand Limited, the multi-award-winning premier regional property player with established operations in Singapore, China, and Malaysia. GuocoLand's recently unveiled prominent development projects are Emerald 9 and Emerald Hills.

About the project

Emerald 9 is a fully integrated development located at the prime location in Cheras 9th Mile; comprises residential towers, office spaces and urban street shoppes and courtyard clustered around green spaces. The project is within a short walking distance from the mass rapid transit (MRT) station at Taman Suntex and is only eight stops away from the Kuala Lumpur city centre.

Emerald Hills is a freehold low-density guarded and gated residential development on 47.4 acres of hilly greens at the peak of Alam Damai. This low-density residential development boasts a density of only 33 units per acre. It comprises 1,378 lakefront condominium units in four blocks and 181 terraced homes in total,

surrounded by 21 acres of open space, with a central park and lake that are encircled by a 1.7km jogging and cycling track.

Figure 3. 2 GuocoLand Emerald 9 Cheras Residence Illustration
(Source: https://guocoland.com.my/emerald9/)

Task Performed

On April 29, 2025, upon commencement of the internship at the company, the Guocoland Emerald 9 Cheras project was immediately introduced. The procedures for updating project documents, specifically the DCR and interim valuation documents, were also explained by the assistant.

One of the initial tasks for an intern, when assisting with project documentation, is to create a duplicate of the original file. This copy is then renamed with the intern's name, allowing the assistant and the people who to make updates and modifications within their own file. This practice is essential as it enables the supervising staff to easily review and correct the intern's work without altering the original project documents. In this project, assistance with the Interim Valuation and updating of the DCR for the Guocoland Emerald 9 Cheras project was provided.

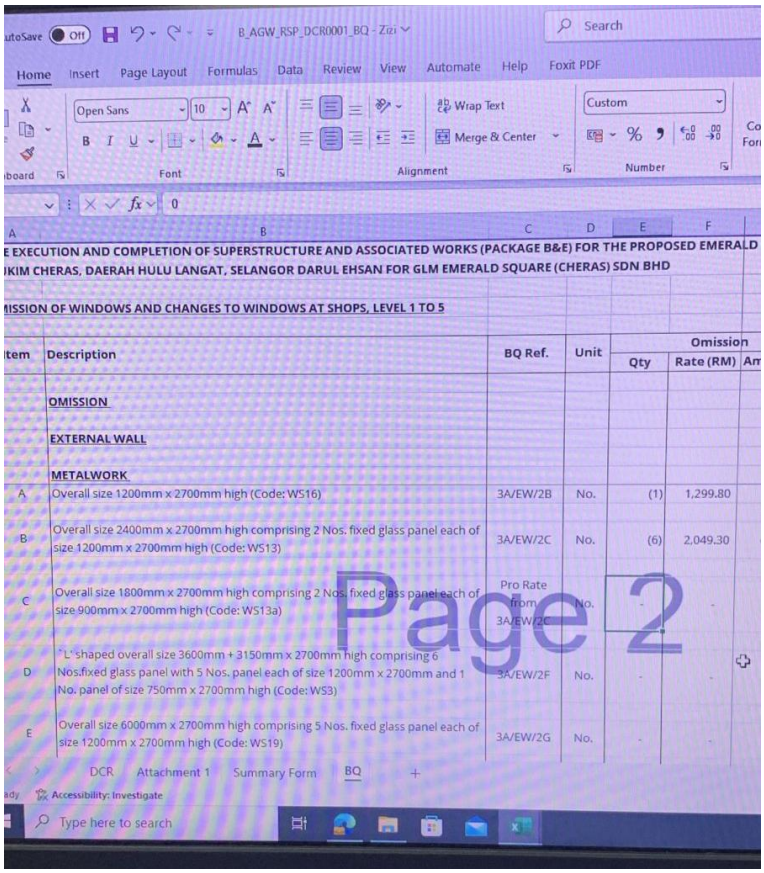


Figure 3. 3 DCR Update for Emerald 9 Cheras by GuocoLand
(Source: Intern's documentation)

Based on the picture above, the following elements and requirements can be observed that, at the top of the document, there is a clear section for project details and a list of tasks to be included in the DCR (Document Change Request). This is followed by a table with specific columns for "Item" and "Description". The "Description" column must be populated with either an "Omission" or an "Addition".

- Omission: This term is to be used for items that are to be demolished or removed.
- Addition: This term is used for items that are to be added, particularly those that are intended to replace the omitted items.

This structure indicates a systematic approach to documenting changes, ensuring a clear and auditable record of all items being removed and their corresponding replacements.

Continuing from the previous section, the document includes additional columns for detailing the Bill of Quantities (BQ) and financial information.

Next to the “Description” column is the “BQ Ref” column, which is to be filled with the reference code for each item. This code serves as an identifier to facilitate the efficient retrieval of the corresponding item in the description. Following this are columns for the Unit of Measurement and specific financial details for each omitted item:

- Qty (Quantity): The quantity is determined through measurement. This can be done either manually or by using specialized software.
- Rate: The rate is the predetermined standard cost assigned to each specific item.
- Amount: The amount is calculated by multiplying the quantity by the rate *(Amount = Qty x Rate)*.

The identical procedure is to be executed for all items categorized as additions, ensuring that each new item is documented with the same level of detail, including its BQ reference code, unit of measurement, quantity, rate, and total amount.

3.3.2 928 – Sime Darby SJCC

About the client

Sime Darby

Sime Darby is a major Malaysian multinational conglomerate with a long history, dating back to its founding in 1910. The company has evolved significantly over the years, and in 2017, it underwent a major restructuring to create three distinct, publicly-listed companies:

- Sime Darby Berhad

Figure 3. 4 Sime Darby Berhad Logo
(Source: https://id.pinterest.com/pin/304344887331430711/)

This entity focuses on the core businesses of industrial equipment and automotive sectors. It operates as a trading conglomerate, acting as a partner for global brands like Caterpillar and BMW across the Asia Pacific region.

- Sime Darby Plantation Berhad

Figure 3. 5 Sime Darby Plantation Berhad Logo
(Source: https://d3.harvard.edu/platform-rctom/submission/sime-darby-plantations-a-new-model-for-environmentally-friendly-palm-oil/)

This is one of the world's largest producers of certified sustainable palm oil. It manages extensive plantation estates and mills across several countries.

- Sime Darby Property Berhad

Figure 3. 6 Sime Darby Property Berhad Logo
(Source: https://www.simedarbyproperty.com/home/)

This is the property development arm, responsible for townships and developments in Malaysia and other regions, including a consortium role in the iconic Battersea Power Station project in London.

About the project

Subang Jaya City Centre, an award-winning vibrant city that homes over 700,000 residents in Malaysia, filled with easy accessibility, commercial activities, public transportations, workplaces, and urban lifestyles. This dynamic township is often referred to as the pacesetter for other townships, and since launching in the year 1976, Subang Jaya has grown to become the flagship of self-contained integrated development. Subang Jaya City Centre (SJCC) is a major urban development project in Subang Jaya, Malaysia, primarily master-planned by Sime Darby Property. It's a 30-acre, transit-oriented development (TOD) designed to be a creative and connected hub.

SJCC is a true TOD, with excellent access to major highways like the Federal, NKVE, and LDP. A covered walkway directly connects it to the Subang Jaya LRT and KTM stations, making it very accessible for public transport users. The master plan includes residential towers and a "High Street" retail boulevard. This tree-lined street is a key feature, designed to be a lifestyle destination with cafés, dining spots, and local retail brands. Projects like "SJCC East One" are the first phase of this vision, offering serviced apartments with various facilities.

Within and around SJCC, a range of amenities will be found, including:

- Shopping: Empire Shopping Gallery, Subang Parade, and AEON BiG are all nearby.

- Recreation: The development is located just a short walk from the 72-acre Subang Ria Park, providing a large green space for residents.
- Healthcare: Subang Jaya Medical Centre is a key medical facility in the area.
- Subang Jaya is a well-known university town, and SJCC is close to institutions like INTI International College, Taylor's University, and Monash University.

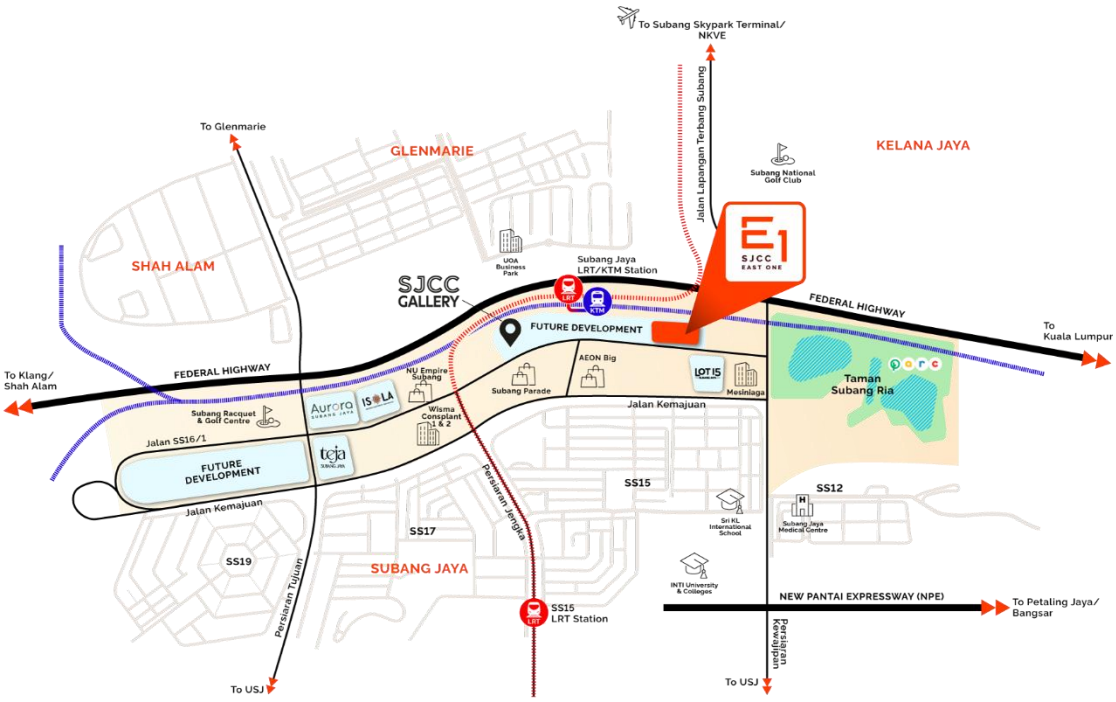


Figure 3. 7 SJCC Location Map
(Source: https://www.simedarbyproperty.com/sjcc/east1/)

Task Performed

On May 2, 2025, the Sime Darby SJCC project was assigned. For this project, updating and completing the IV and DCR documents was tasked. A demarcation for the basement to level 6 car park floor plan was also created, as requested.

For the demarcation task, the demarcation was requested by the assistant to be done manually using colored pencils. The assignment was understood as an initial introduction to the first stage of work after the architect's drawings are received by the QS team (known as received drawings), before proceeding to the next phase. This project allows to gain experience in updating DCR documents and contributed to the

verification of received drawings by performing the printing and stamping/chop of all sheets.

Stamping or “chopping/chop” received drawings is an essential formal procedure for document control, legal accountability, and project coordination.

The stamp serves as a formal, timestamped record of when a specific version of a drawing was received. This is crucial for:

- Version Control: Ensuring all project teams are working from the most current and accurate plans to avoid errors.
- Legal Proof: Providing a formal record of receipt that can be used to establish accountability in case of a dispute.
- Workflow Management: Acknowledging the document has been entered into the project system and is ready for review and action.

In short, the practice ensures that document flow is systematic, transparent, and legally sound, which is vital for the successful execution of a construction project.

3.3.3 952 – Carcosa Seri Negara

Figure 3. 8 Carcosa Seri Negara Project Signboard
(Source: Intern's documentation)

About the client

Aset Warisan Satu Sdn. Bhd. (Developer)

Aset Warisan Satu Sdn Bhd was incorporated on 2024-05-15 in Malaysia with registration number of 1565027U / 202401019178. Aset Warisan Satu Sdn. Bhd.'s business includes activities of holding companies, this means it is an investment company that holds shares or assets in other companies. Aset Warisan Satu Sdn Bhd, in collaboration with Think City, is involved in restoring Seri Negara, with the goal of creating a new gallery and upcoming link bridge that connects the gallery with the Botanical Garden there.

Figure 3. 9 Aset Warisan Satu Sdn Bhd Plaque on The Carcosa Seri Negara Building Entrance

(Source: Intern's documentation)

About the project

This project was the primary focus and the priority throughout the internship, during which a significant number of contract documents were handled. The work at Carcosa Seri Negara involved two main projects: an ongoing renovation and repurposing of the Seri Negara building, which was 70% complete, and the upcoming construction of a link bridge connecting the Seri Negara building to the national botanical gardens.

Carcosa Seri Negara is a mansion located next to Taman Tasik Perdana, Kuala Lumpur. Currently this mansion is owned by the Malaysian Government. The hotel includes two colonial mansions, one called Carcosa and the other called Seri Negara.

Built by Sir Frank Swettenham in 1896, it served as his official residence. He moved in in 1904 and called it “Carcosa”, possibly a loanword from Italian meaning “dear place”. At the same time, Sir Frank was also preparing to build “King’s House” on the adjacent hillside. The purpose of King’s House (now known as “Seri Negara”, meaning “beautiful countries”) was to provide shelter for the Governor of the Straits Settlements and important guests of the Malay Peninsula.

Figure 3. 10 Carcosa Seri Negara, Kuala Lumpur
(Source: https://id.wikipedia.org/wiki/Carcosa_Seri_Negara)

Figure 3. 11 Carcosa Seri Negara Site Visit
(Source: Intern’s documentation)

Carcosa Seri Negara is a historic complex of two colonial-era mansions located within the Perdana Botanical Gardens in Kuala Lumpur, Malaysia. Originally built for British colonial officials, the two buildings—Carcosa (1898) and Seri Negara (1913)—played a significant role in Malaysia's history. The Constitution of Malaya was drafted in Seri Negara, and the Federation of Malaya Agreement was signed there in 1957. After independence, the buildings served as a luxury hotel and a residence for visiting dignitaries, including Queen Elizabeth II. The buildings are noted for their eclectic architectural style, blending Neo-Gothic and Tudor Revival elements. They are considered national heritage sites. The buildings have been closed for several years, but a major restoration and adaptive reuse project is currently underway. The plan is to transform the complex into a museum and art gallery, with a new link bridge connecting the Seri Negara building to the national botanical gardens. This renovation is also part of the preparations for Asean-Malaysia Conference 2025.

Figure 3. 12 Carcosa Seri Negara, Kuala Lumpur Featured in Crazy Rich Asians
(Source: https://cj.my/121789/6-luxurious-houses-from-the-movie-crazy-rich-asians/)

The twin building is located at the hilltop overlooking the Perdana Botanical Gardens of Kuala Lumpur. It holds many historic significances as it was where the nation's independence agreement was signed. It was falling into disrepair due to poor maintenance before it was repaired by Crazy Rich Asians crew in 2017. It was depicted

as Nick Young's family ancestral home in the movie. The mansion is now being redeveloped into Asian Heritage Museum.

Task Performed

During this priority project, significant new knowledge in the field of QS consultancy were gained. Throughout the project, a variety of key tasks were undertaken, such as preparing query lists, drafting DCR documents, and updating Interim Valuation documents. Measurements, utilized TAS software to create 3D designs, processed received drawing documents, and prepared invitation letters for project-related meetings and tenders were also performed. Additionally, support was provided in the preparation of the contract document, which was made for the appendix.

Given that this was the main project during the internship, a more comprehensive breakdown for some of the specific contributions will be provided in the following section.

3.3.3.1.1.1 Making Tender Invitation Letter

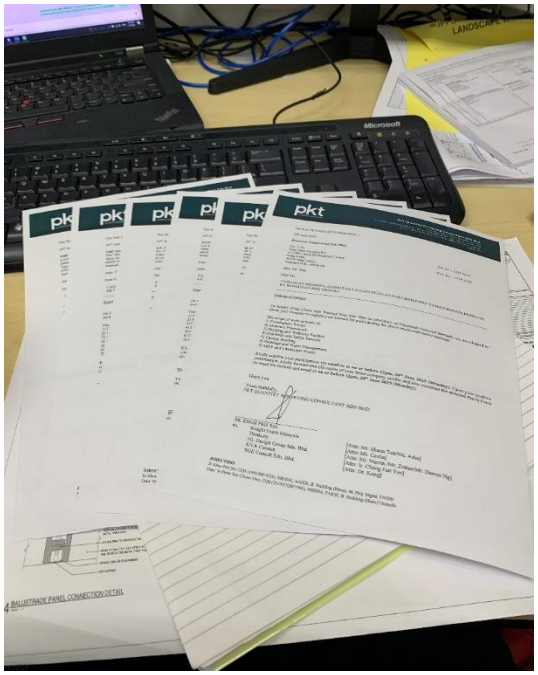


Figure 3. 13 Carcosa Seri Negara Link Bridge Tender Invitation Letter Example
(Source: Intern's documentation 24062025)

In preparing letters for six potential tenderers (Preserver Engineering Sdn Bhd, Sanki Kigyo Group, S.P. Mulia Sdn Bhd, TRC Synergy Berhad, YBE Engineering Sdn Bhd, and Q Ace (M) Sdn Bhd) using the company's standardized letterhead, and specific details were the main responsibility. These included the letter's reference number, date, the company's full name and address, the intended recipient, and a statement that began with the full project title and concluded with a comprehensive expression of interest for the tendered work. Following that, the scope of work for the project is also outlined, along with the required tender submission instructions which must be submitted via the designated email address before the specified deadline and must include supporting documents such as the latest company profile and the completed Pre-Q/pre-qualification form. After sending the letters to prospective tenderers via email, a follow-up process is initiated if no response is received by the specified deadline. This follow-up usually consists of a direct phone call to the tenderers company to confirm their interest in participating in the tender or to obtain their formal rejection of the invitation.

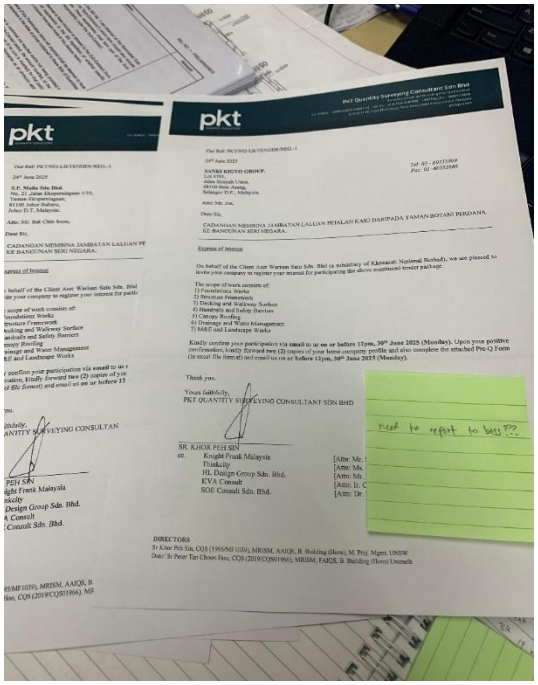


Figure 3. 14 Carcosa Seri Negara Link Bridge Tender Invitation Letter Example Post Followup

(Source: Intern's documentation 01072025)

Final responses were yielded from the potential tenderers following up. Ultimately, four candidates accepted the tender invitation, whereas two others, specifically TRC Synergy Berhad and Q Ace (M) Sdn Bhd, submitted a formal rejection reply via email, followed by a statement of their reasons.

pkt
QUANTITY SURVEYORS

Page 2

Acknowledgement

I / we are ~~*interested~~ / not interested to participate the above mentioned Tender Package.

If not interested, kindly state the reasons: The scope of the tender package is too broad, while our core business is more on steel structural works covering both fabrication and installation

Signature :

Company : Q ACE (M) SDN BHD
Name : AMRANUDIN BIN MOHD ARIFFIN
Position : DIRECTOR
Date : 01 / 07 / 2025
*Please delete as appropriate

Figure 3. 15 Formal Tender Rejection Letter Example
(Source: Intern's documentation)

3.3.3.1.1.2 Chop/Stamping Received Drawings

The next task, which appeared relatively simple, was to stamp the received drawings. This process, applied to new drawings from architects or design teams—including those resulting from design change requests—involves stamping each sheet using the "received stamp". The stamp's purpose is to clearly indicate the date of receipt by the Quantity Surveyors (QS), thereby preventing discrepancies in the subsequent cost estimation process.

Figure 3. 16 Received Stamp
(Source: https://www.tokopedia.com/kenzie88/stampel-trodat-received)

3.3.3.1.1.3 TAS Measurement

No prior experience with Glodon Cubicost software was gained during academic studies; therefore, this internship was a valuable opportunity to learn about a widely-used measurement tool in Malaysia. The Glodon suite consists of three modules: TAS, TRB, and TBQ. The TAS module is dedicated to the quantity take-off of structural and architectural elements. Throughout the internship, measurement tasks were often assigned, ranging from simple take-offs to the creation of complete 3D models with TAS. This section will detail one such measurement project completed using the TAS software.

DCR Toilet 3 > Semi Outdoor Lounge

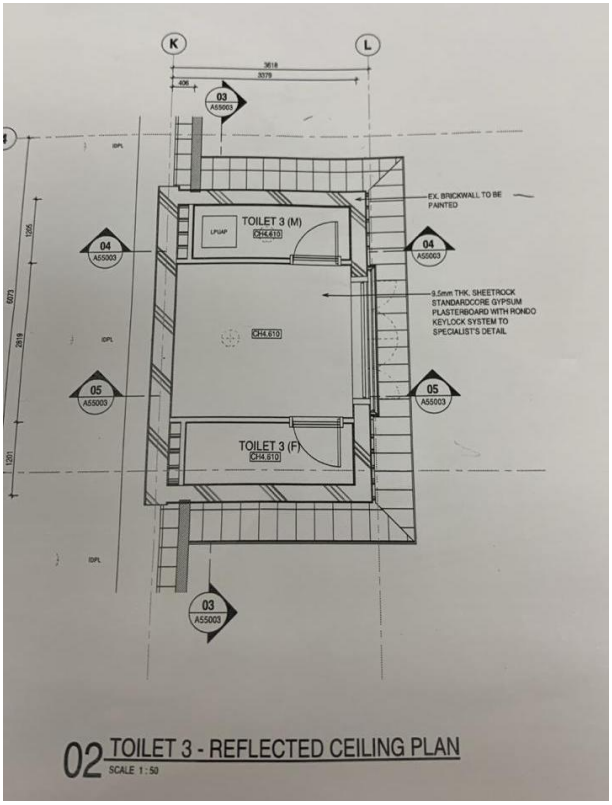


Figure 3. 17 Carcosa Seri Negara Toilet 3 Contract Plan Drawing
(Source: Intern's documentation)

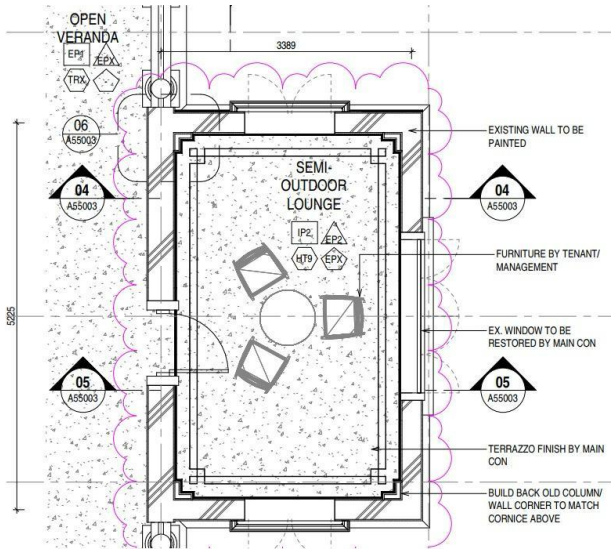


Figure 3. 18 Carcosa Seri Negara Toilet 3 DCR Plan Drawing

(Source: Intern's documentation)

In this task, the contract drawings were required to be studied and compared with the Design Change Request (DCR) drawings. The next step was to create a list of items that were either omitted or added. After documenting these changes, quantity take-offs for these specific items were performed using the TAS software.

The first steps for a take-off measurement using TAS software are to create a new project, enter the project name, and select the measurement rules. The specified rule is the Malaysian Measurement Rules No. 2. Next, the project information is entered. After all initial steps are completed and the TAS canvas appears, drawings can be imported from a PDF, which are then automatically converted into a CAD format within TAS. Once the drawings are successfully imported, it is necessary to scale the drawings to ensure the accuracy of the measurements between the imported file and the TAS environment. After the drawing is properly scaled, then item-by-item measurements can be started. This can be done by using a custom element and selecting a unit, such as area (m^2). After entering the information for the new area in the list, measurements in TAS can be performed by dragging points on the plan drawing. For example, to measure a plafond ceiling, drag a point from the top-left corner and then extend it to the bottom-right corner and as a result, the volume of the selected area is instantly calculated and can be directly exported to Excel. The software may

occasionally prompt user to save the current project, to which user should click “Yes” to save the data updates.

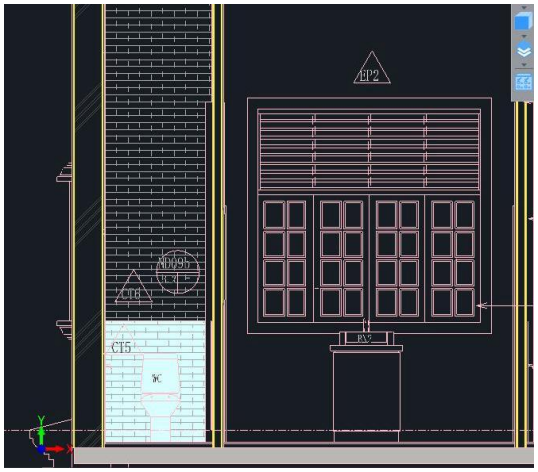


Figure 3. 19 The Visualization of Measurements in The TAS Software
(Source: Intern’s documentation)

The figure displays the front view floor plan of toilet 3. The colored area, designated as CT5 (ceramic tiles), indicates the wall finishing for a portion of the lower walls inside the toilet stalls. The measurement methodology employing the TAS software is notable for its simplicity and efficiency, which allows for rapid completion of tasks without consuming excessive time.

Another Carcosa Seri Negara related task was given, which also utilized the TAS software, was to create a 3D model of a guardhouse.

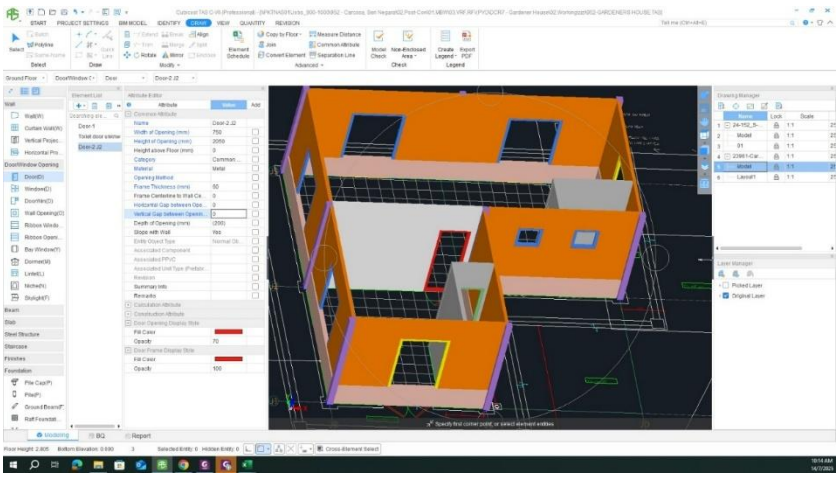


Figure 3. 20 Carcosa Seri Negara Guardhouse TAS Model
(Source: Intern’s documentation)

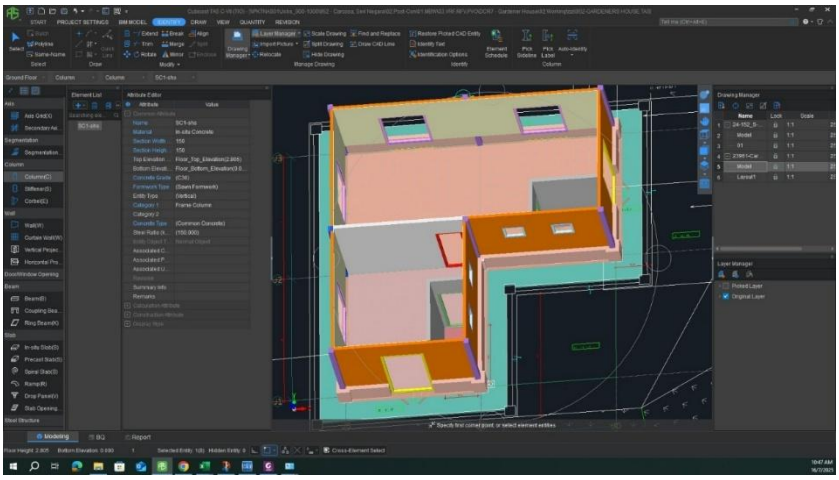


Figure 3. 21 Carcosa Seri Negara Guardhouse TAS Model Cont'd
(Source: Intern's documentation)

A 3D model was created using the features on the left-hand side of the interface, entered item information based on the details in the drawing, and input the dimensions or volume to produce a 3D model that accurately corresponds with the 2D drawing. Once the model is created and revised to ensure all information is accurate, the volume calculation can be performed. This is done by clicking the "Calculate" icon, selecting "All floors", and clicking "OK". The detailed breakdown and calculation for each item within the 3D model are successfully generated, and the results can be easily converted to an Excel spreadsheet.

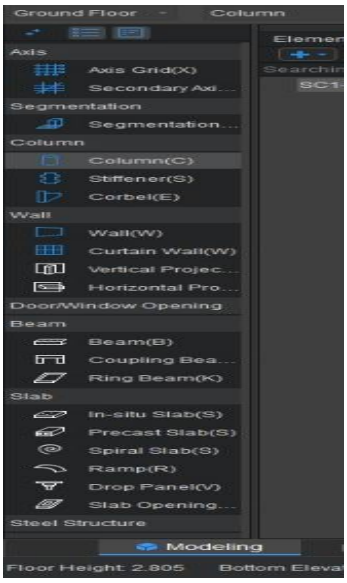


Figure 3. 22 Detail Feature Used in Creating TAS 3D Model
(Source: Intern's documentation)

3.3.3.1.1.4 Making DCR document

After the measurement process, a Design Change Request (DCR) document was also created. In the event of an addendum during the Carcosa Seri Negara project, this DCR document is crucial for keeping track of the project's timeline. A DCR is initiated after an addendum or a new request from the owner or design team. The Quantity Surveyor (QS) then conducts a re-measurement to determine the additional and omitted items. Subsequently, these work items are listed in an Excel sheet, along with their quantities and rates. The DCR document can only be issued after it has been finalized.

3.3.3.1.1.5 IV update and print binding

Upon receipt of the contractor's monthly claim documentation—which certifies the increase in the percentage of work completed on-site—the Quantity Surveyor (QS) consultant is responsible for updating the interim valuation. This process ensures the project's financial records accurately reflect the progress made. The updated Document IV was then printed in two copies: one for the client and another for the contractor. The client's copy typically contained original documents, such as those with wet signatures, original A3-sized received drawings, and original documents from annual meeting discussions (if applicable). In contrast, the contractor's copy was generally composed of duplicated documents and did not require printing on paper sizes other than A4.

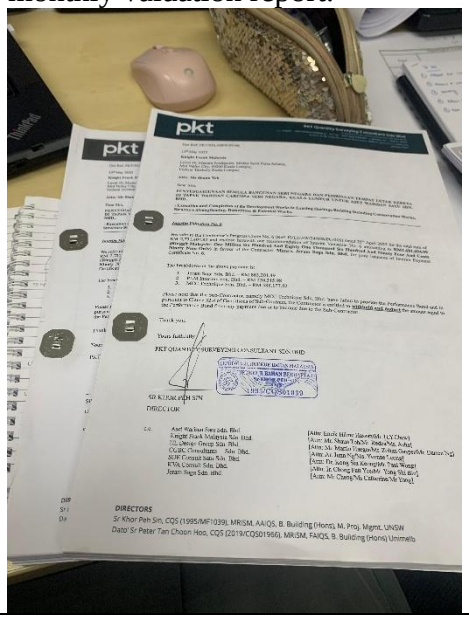
This document will be used as the reference point for the following month's interim valuation and for all valuations thereafter.

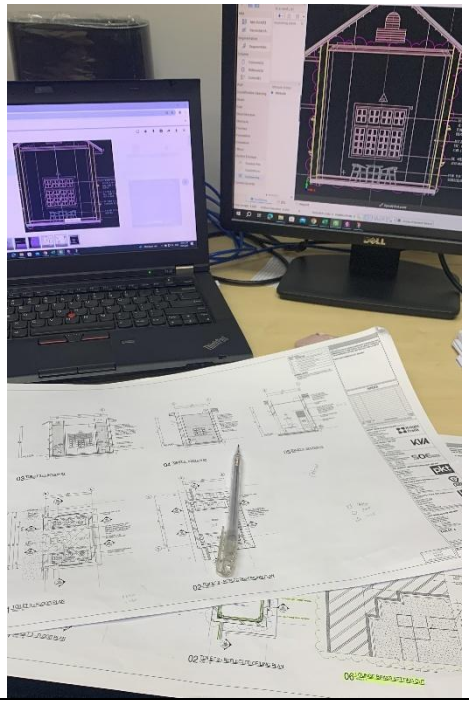
3.3.3.1.1.6 Site visit and site meeting

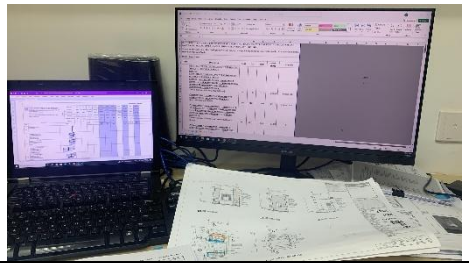
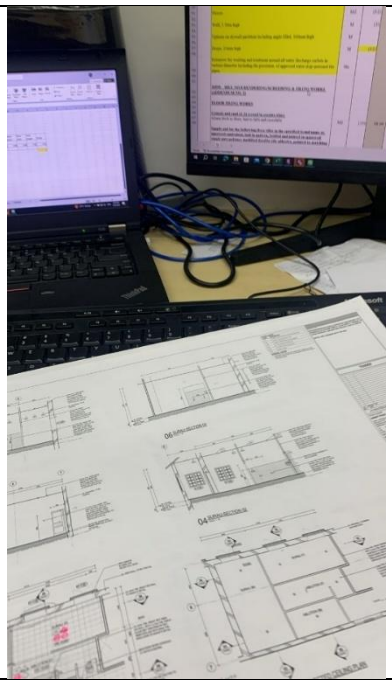
On July 9, 2025, a site meeting was attended, and the Carcosa Seri Negara project site was visited. For safety, essential project PPE (Personal Protective Equipment) or (KKP) Keselamatan dan Kesihatan Pekerjaan, including a hard hat, a hi-vis vest, and steel-toed boots, was provided. This experience was highly educational, as it allowed for firsthand observation of the ongoing work. The work detailed in the interim valuation was observed, and the actual progress was represented by the

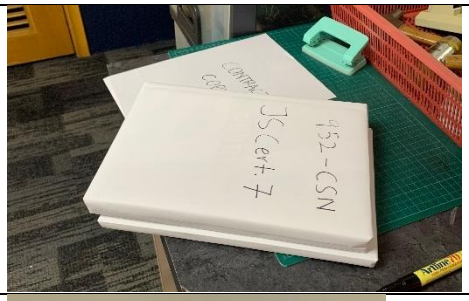
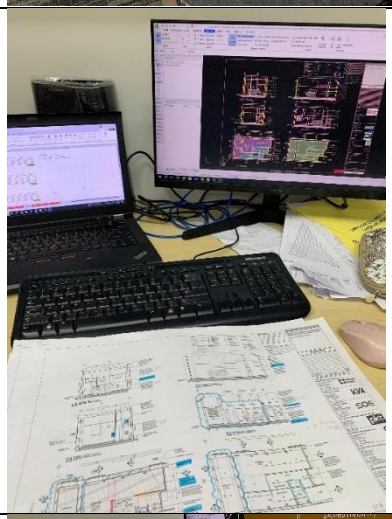
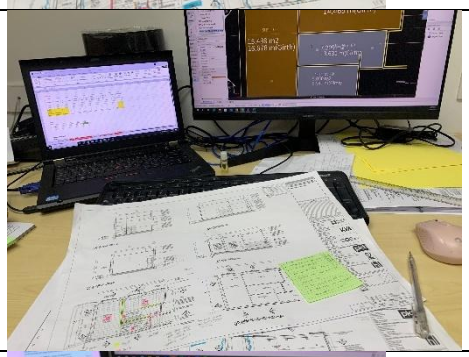
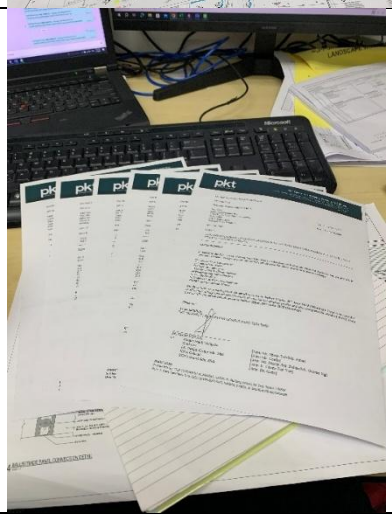
percentage of work completed in the document. Additionally, the additional work items from the DCR document that had been created and measured can be observed. A glimpse into the real-life experience of being a Quantity Surveyor consultant was gained by observing the work being done based on the measurements.

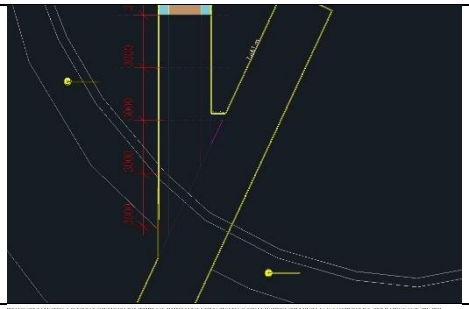
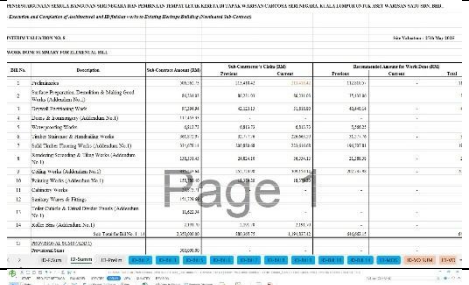
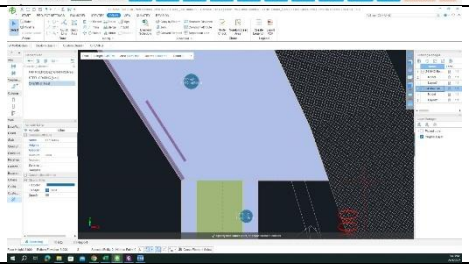
Table 3. 2 Task Timeline Breakdown

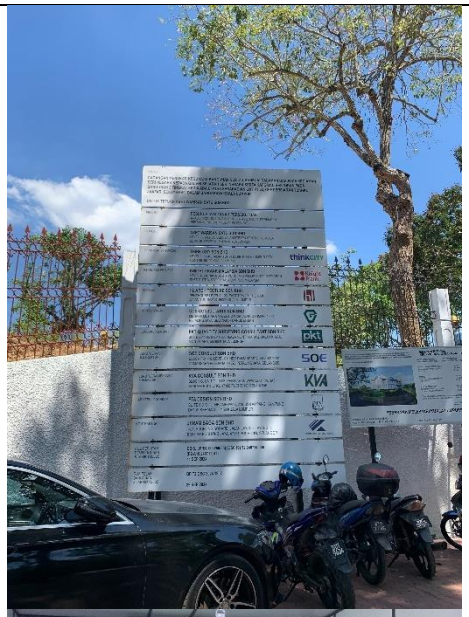
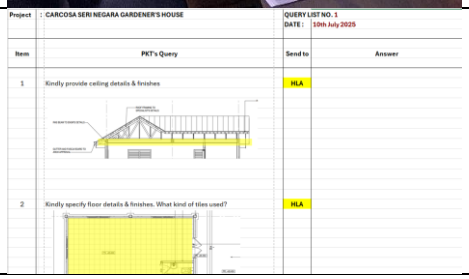
Date Timeline	Task Description	Key Accomplishments
5 May 2025	CSN task handover from former intern	On this day, the Carcosa Seri Negara project was introduced, and support was provided to the team. After a comprehensive briefing on the new role, all relevant project documents and drawings were promptly reviewed.
6 May 2025	IV_6 update for CSN and Certificate no.6 PLM ID claim 5	Developed the ability to meticulously reconcile contractor claims with on-site progress, project schedules, and contractual documentation. This skill was crucial for ensuring the accuracy and fairness of each monthly valuation report. 
7 May 2025	Updating and adding new Variation Order from contractors claim (VO5)	Learning to identify and assess the financial impact of design changes, site-specific issues, or client requests. This experience highlighted the importance of meticulous record-keeping and clear communication to ensure that all changes are properly justified

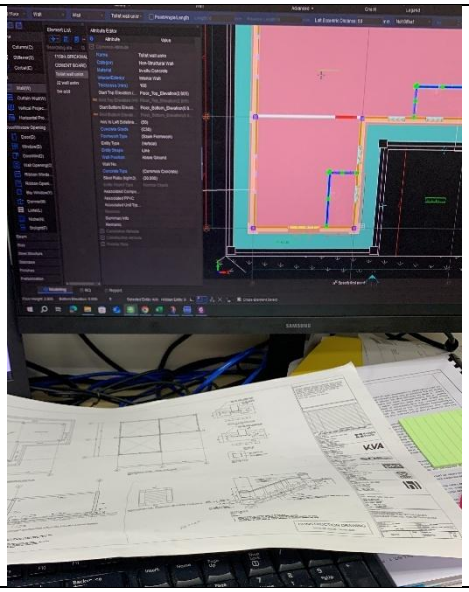
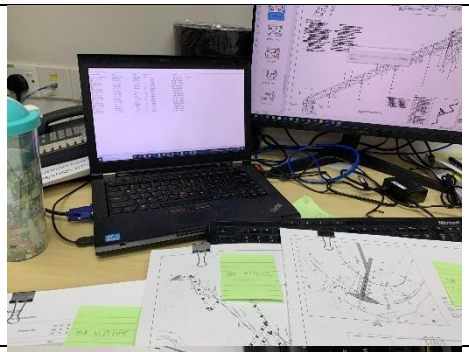
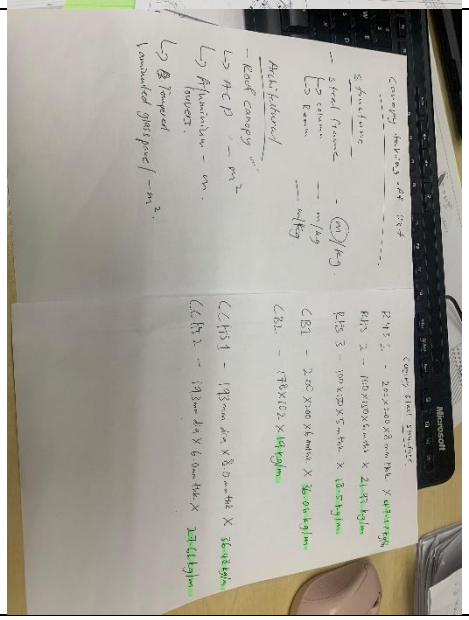
		and accounted for, thereby mitigating potential disputes and maintaining project profitability.
8 May 2025	VO updating and DCR listing start	The skills required to update contract documents IV were developed, and the creation of DCR documents was also the responsibility.
13 May 2025	CSN Toilet 3 DCR listing	A comprehensive understanding of contract documents and proficiency in updating them were gained. The skills to create DCR documents were also acquired.
20 May 2025	Client and Contractor's updated IV physical document making and sending, creating query list for Toilet 3 DCR	Following the document updates, the preparation process was learned and executed. This involved printing, binding, and then packaging the documents to meet company-specific standards before their dispatch to clients and contractors.
21 May 2025	CSN IV claim updating	Gained knowledge and skill on updating IV documents.
22 – 23 May 2025	CSN Toilet 3 omission TAS measurement start	Learned how to measure items omitted in the contract drawing before DCR using the TAS software. 

26 May 2025	CSN toilet 3 query list to be emailed	Submission of the query list and email was the responsibility of the designated team.
27 May 2025	CSN DCR input to excel to make DCR document	The additional items from the DCR are first documented and then compiled into an Excel document to be officially issued.
29 – 30 May 2025	CSN contract and DCR input to excel	Following the DCR items, the omitted items from contract then also compiled into the same excel. 
3 – 5 June 2025	CSN DCR qty excel key in	Comprehension of the established procedures for keying in DCR documents was achieved.
9 June 2025	CSN DCR toilet 3 to be semi outdoor lounge document prep	The necessary documentation for a project scheduled to begin is created and organized.
10 June 2025	CSN Surau DCR measurement start	The process of conducting DCR (Direct Current Resistance) measurements for the surau started.
11 – 12 June 2025	CSN Surau DCR qty measurement to be key in	

19 June 2025	Client and Contractor's updated IV physical document making and sending	
20 June 2025	CSN Surau DCR measurement discussion	
23 June 2025	CSN Surau addition DCR measurement	
24 June 2025	CSN tenderers registration letter making, link bridge measurement start	

25 – 26 June 2025	CSN link bridge measurement and chop for received drawings	On-plan measurements for the link bridge are being conducted in TAS software. This task involves not only the physical measurements but also a comprehensive study of measurement-related procedures and a formal process of stamping and approving the latest set of drawings received.
30 June – 3 July 2025	CSN link bridge architectural finishes TAS measurement	
4 July 2025	CSN IV cert no.8 update	
7 – 8 July 2025	CSN link bridge TAS mea cont'd	

9 July 2025	CSN site visit and site meeting	 
10 – 11 July 2025	CSN gardener's hourse query list and link bridge measurement cont'd	

14 – 15 July 2025	CSN guardhourse TAS 3D model making and measurement start	
16 July 2025	CSN cert no.8 print bind for client and contractor	Document print and binding before sending to the respective client and contractor.
23 – 24 July 2025	CSN link bridge print chop received new dwg, TAS measurement	
28 July 2025	CSN link bridge canopy structure measurement	

31 July 2025	CSN appendix-D doc making	PROPOSED CONSTRUCTION OF A PEDESTRIAN BRIDGE FROM TAMAN BOTANI PERDANA TO CARCOSA SERI NEGARA. - *Execution and Completion of Pedestrian Bridge Comprising of Structural Works, M&E Services & Landscape Works* **APPENDIX D - LIST OF TENDER DRAWINGS** **DESCRIPTION** — **DRAWING NO.** **ARCHITECTURAL DRAWINGS:** GENERAL COVER PAGE 241042/T/A30001/00 TECHNICAL SHEET 241042/T/A30002/00 DRAWING LIST 241042/T/A30003/T01 SITE PLAN 241042/T/A30011/00 EXISTING LANDSCAPE PLAN 241042/T/A30012/00 SIGNBOARD DETAILS 241042/T/A30051/00 NOTICEBOARD DETAILS 241042/T/A30052/00 HOARDING SITE PLAN 241042/T/A30053/00 HOARDING DETAILS 241042/T/A30054/00

An example of a meeting report is provided below. The report was obtained and recorded after an annual weekly/monthly meeting conducted by the mentor.

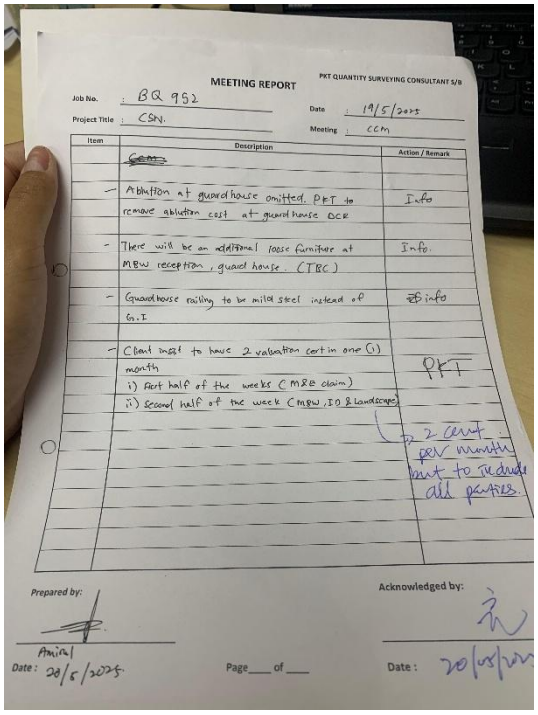
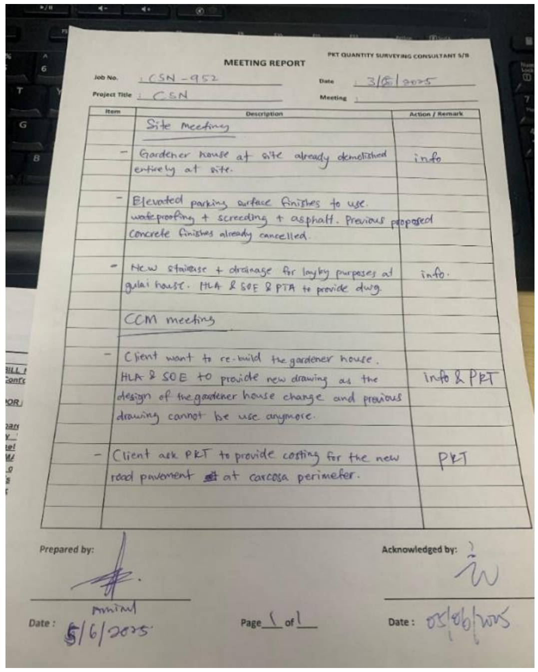


Figure 3. 23 CSN Meeting Report Example Dated 19/5/2025
(Source: Intern's documentation)



PKT QUANTITY SURVEYING CONSULTANT S/B

MEETING REPORT

Job No. : CSN – 952

Date : 3/6/2025

Project Title : CSN

Meeting :

Item	Description	Action / Remark
	Site meeting	
-	Gardener house at site already demolished entirely at site.	info
-	Elevated parking surface finishes to use. waterproofing + screeding + asphalt. Previous proposed concrete finishes already cancelled.	
-	New staircase + drainage for layby purposes at gulai house. HLA & SOE & PTA to provide dwg.	info.
	CCM meeting	
-	Client want to re-build the gardener house. HLA & SOE to provide new drawing as the design of the gardener house change and previous drawing cannot be use anymore.	Info & PKT
-	Client ask PKT to provide costing for the new road pavement at carcosa perimeter.	PKT

Prepared by: Amirul

Date : 5/6/2025

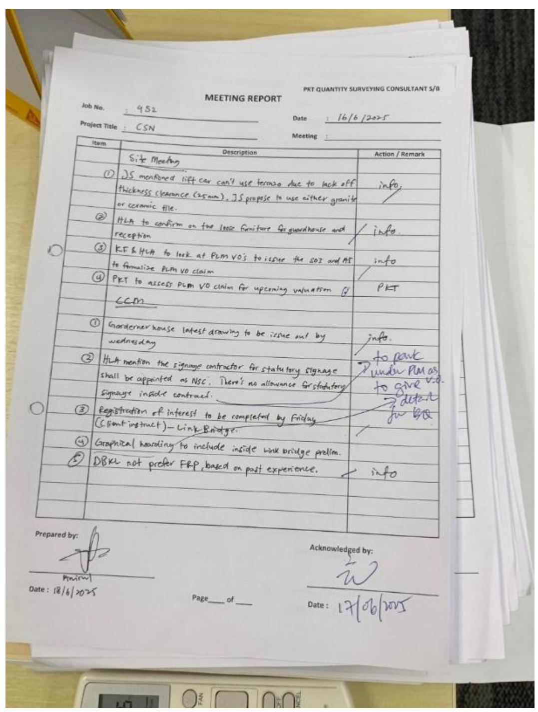
Page 1 of 1

Acknowledged by:

Date : 05/06/2025

Figure 3. 24 CSN Meeting Report Example Dated 3/6/2025

(Source: Intern’s documentation)



PKT QUANTITY SURVEYING CONSULTANT S/B

MEETING REPORT

Job No. : 952

Date : 16/6/2025

Project Title : CSN

Meeting :

Item	Description	Action / Remark
	Site Meeting	
①	JS mentioned lift car can't use terrazo due to lack off thickness clearance (25mm). JS propose to use either granite or ceramic tile.	info
②	HLA to confirm on the loose furniture for guardhouse and reception	info
③	KF & HLA to look at PLM VO's to issue the SOI and AI to formalize PLM VO claim	info
④	PKT to assess PLM VO claim for upcoming valuation	PKT
	CCM	
①	Gardener house latest drawing to be issue out by wednesday	info.
②	HLA mention the signage contractor for statutory signage shall be appointed as NSC. There's no allowance for statutory signage inside contract.	to park under PLM as V.O.
③	Registration of interest to be completed by Friday (Client instruct) – Link Bridge.	to give detail for BQ
④	Graphical hoarding to include inside link bridge prelim.	
⑤	DBKL not prefer FRP, based on past experience.	info

Prepared by: Amirul

Date : 18/6/2025

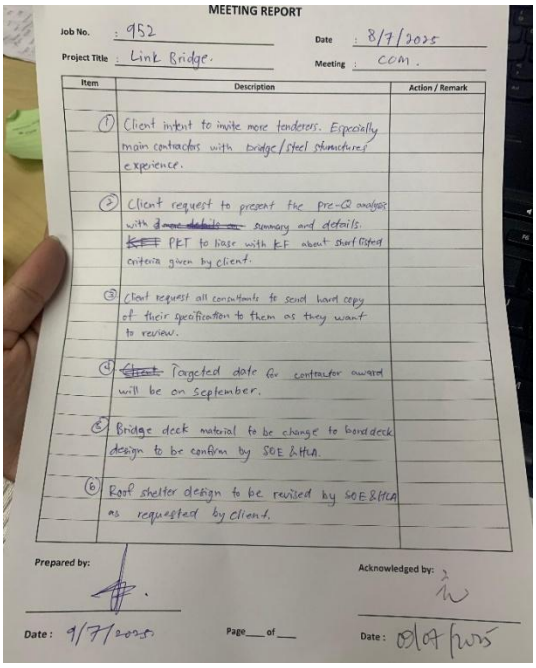
Page__ of __

Acknowledged by:

Date : 17/06/2025

Figure 3. 25 CSN Meeting Report Example Dated 16/6/2025

(Source: Intern’s documentation)



MEETING REPORT

Job No. : 952 Date : 8/7/2025

Project Title : Link Bridge. Meeting : com.

Item	Description	Action / Remark
1	Client intent to invite more tenderers. Especially main contractors with bridge/steel structures experience.	
2	Client request to present the pre-Q analysis with ~~2 more details on~~ summary and details: ~~KEF~~ PRT to liase with KF about shortlisted criteria given by client.	
3	Client request all consultants to send hard copy of their specification to them as they want to review.	
4	~~Client~~ Targeted date for contractor award will be on September.	
5	Bridge deck material to be change to board deck design to be confirm by SOE & HHA.	
6	Roof shelter design to be revised by SOE & HHA as requested by client.	

Prepared by: Acknowledged by:

Date : 9/7/2025 Page___of___ Date : 08/07/2025

Figure 3. 26 CSN Meeting Report Example Dated 8/7/2025
(Source: Intern's documentation)

3.3.4 1000 – PPAM Cheras

About the client

The client and ultimate owner of the PPAM program is the Malaysian Government, specifically acting through relevant ministries and agencies. This initiative is not a private-sector venture but a public-sector project designed as a social welfare and retention strategy. The primary purpose of this program is to ensure that civil servants, who are the backbone of public administration, have access to stable and affordable housing. By providing homes at subsidized or below-market prices, the government aims to alleviate financial burdens, enhance the quality of life for its employees, and ultimately, strengthen the public service sector by making it a more attractive and sustainable career path.

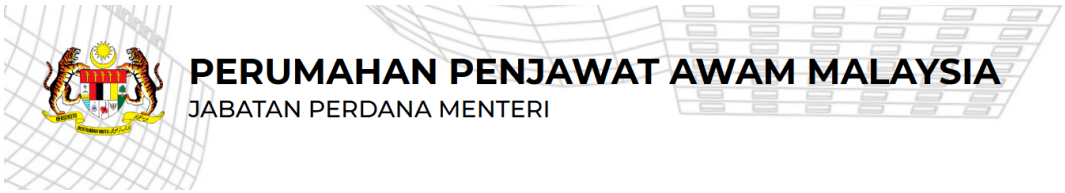


Figure 3. 27 Government Owned Project PPAM
(Source: https://www.ppam.gov.my/)

About the project

This project located in Cheras is a component of the "Perumahan Penjawat Awam Malaysia (PPAM)" initiative, which aims to provide affordable and quality housing for Malaysian civil servants. The primary purpose of PPAM is to support government employees in homeownership, especially within expensive and congested urban environments. The PPAM Cheras project, similar to its counterparts, offers subsidized apartments and condominiums specifically for civil servants, with a strategic location to facilitate access to public amenities and work. The PPAM Cheras project serves as a prime example of the initiative's implementation. Strategically located in a dense urban area, this specific development offers apartments and condominiums that are tailored to the needs of civil servants. The project is designed with a focus on affordability and quality, ensuring that even with the lower prices, the homes are built to a high standard. A key feature of the Cheras development, consistent with other PPAM projects, is its location. The sites are chosen to provide convenient access to essential public amenities, transportation networks, and workplaces, thereby reducing commuting times and improving overall convenience for residents.

Task Performed

This project belonged to another team that was in-rush and required additional support. The project team was assisted by performing demarcation using TAS software. Specific tasks included the measurement of road sign markings, column guards, scupper drain lines, and slab and roof slab measurements, also task involved documenting the specifications of the doors and ironmongeries used in the tower A, B, C, and Ground Floor referring to the project drawings.

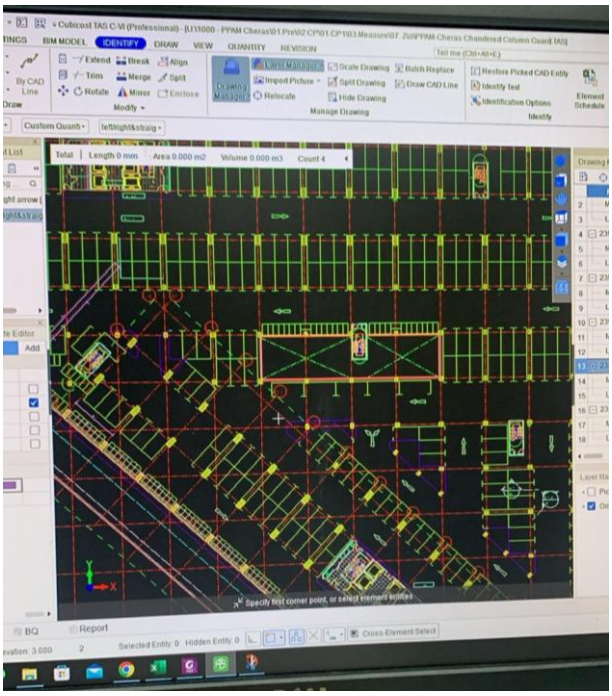


Figure 3. 28 PPAM Cheras TAS Demarcation
(Source: Intern's documentation)

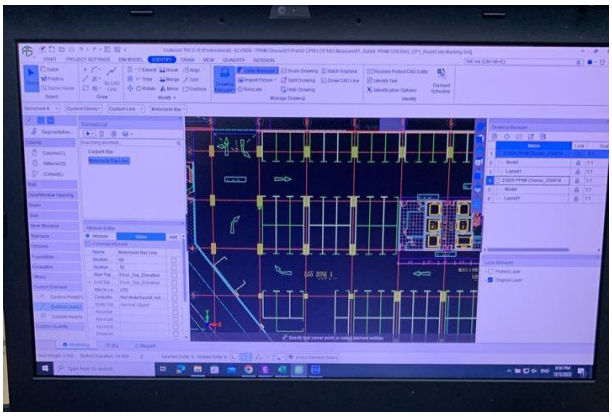


Figure 3. 29 PPAM Cheras TAS Demarcation Cont'd
(Source: Intern's documentation)

Based on the image provided, the demarcation process is conducted using TAS software. The procedure for undertaking demarcation in this software is as follows:

- Making new project: A new project must first be created, and all relevant project details must be accurately entered.
- Drawing Import: In the drawing manager, received drawings—which can be in either PDF or CAD format—are imported into the project.

- Floor Plan Selection: Following the successful import of the drawings, the specific floor plan on which the demarcation is to be performed is selected.
- Commence Demarcation: Once the correct floor plan is active, the user can begin the demarcation process using the custom quantity or custom element feature and choose Custom Count and Custom Qty Lines.

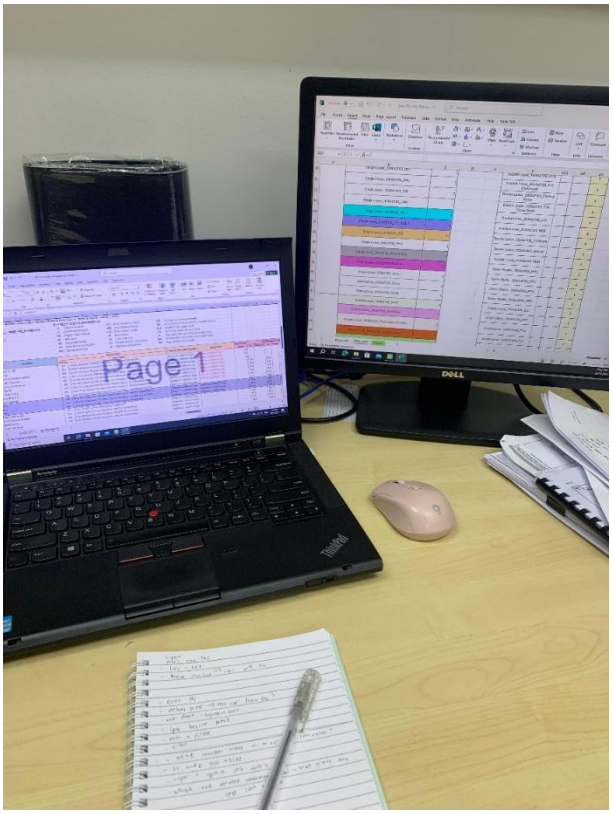


Figure 3. 30 PPAM Cheras Door Spec and Ironmongeries Excel
(Source: Intern's documentation)

The primary objective of this undertaking is to conduct a meticulous re-enumeration and comprehensive audit of the quantities and specific item descriptions for all door specifications and ironmongeries that have been incorporated into Tower A, Tower B, Tower C, and the Ground Floor (GF) of the building structure. The data resulting from this detailed assessment is to be systematically collated and subsequently compiled into a definitive, up-to-date Excel file for official record-keeping.

3.3.5 Ad-Hoc – AWS KUL073

About the client

Sunway Construction Sdn. Bhd.

SUNWAY®
CONSTRUCTION

Figure 3. 31 Sunway Construction Sdn Bhd Logo
(Source: https://www.sunwayconstruction.com.my/)

Sunway Construction Sdn Bhd is a leading Malaysian construction company that is a subsidiary of the larger Sunway Group. The company provides a wide range of integrated construction services and is recognized as a key player in the industry. Established in 1981 as Sungei Way Quarry & Construction Sdn Bhd, the company has evolved significantly over the decades. It was first publicly listed on the Kuala Lumpur Stock Exchange in 1997 before being privatized and then re-listed as a pure-play construction company in 2015 under the name Sunway Construction Group Berhad (SunCon).

The company operates with a "Build-Own-Operate" business model, which allows it to be involved in projects from design to completion. This integrated approach, along with strong financial backing and support from its parent company, Sunway Group, has solidified its position in the market. SunCon has a strong focus on sustainability and is committed to a net-zero carbon emissions target by 2050.

Sunway Construction has a robust track record of completing landmark projects in Malaysia and has an international presence in countries like Singapore, India, and the Middle East. In recent years, the company has expanded its focus to include high-tech projects, particularly in the rapidly growing data center sector. They have secured significant contracts for data center projects like AWS, which are expected to contribute positively to their future earnings. They are also a strong contender for upcoming mega-infrastructure projects, such as the MRT 3 and Penang LRT in Malaysia.

Sunway Construction has secured a major contract from a US-based multinational technology company—widely believed to be Amazon Web Services (AWS)—for the construction of data centers in Malaysia. The contract positions Sunway Construction as the main contractor, responsible for executing the data center projects in the region on behalf of the US-based client. The client is an undisclosed US-based multinational technology company. Public filings and industry reports strongly suggest this client is Amazon Web Services (AWS), which has announced a significant, multi-billion dollar investment in establishing an AWS Region in Malaysia.

About the project

AWS Asia Pacific (Kuala Lumpur) Region, which was announced in 2023. While Amazon Web Services (AWS) doesn't publicly list exact data center locations, information from sources like Datacentermap.com suggests a potential site in Setul, Kuala Lumpur. Another report indicates an initial facility in Cyberjaya, Selangor. AWS does not publicly disclose exact data center locations, and the information available is often compiled from third-party sources, says Datacentermap.com.

Task performed

The architectural and structural addendums present in the newly received drawings were audited as part of this project. This involves a detailed comparison with the previous set of drawings to identify all changes across a total of three addendum revisions. This addendum demarcation was executed through a manual method.

Changes in the printed received drawings were meticulously highlighted to identify any items that were modified or added as a result of the addendum revisions. This analog approach ensures a clear and visual record of all alterations made to the latest received drawings.

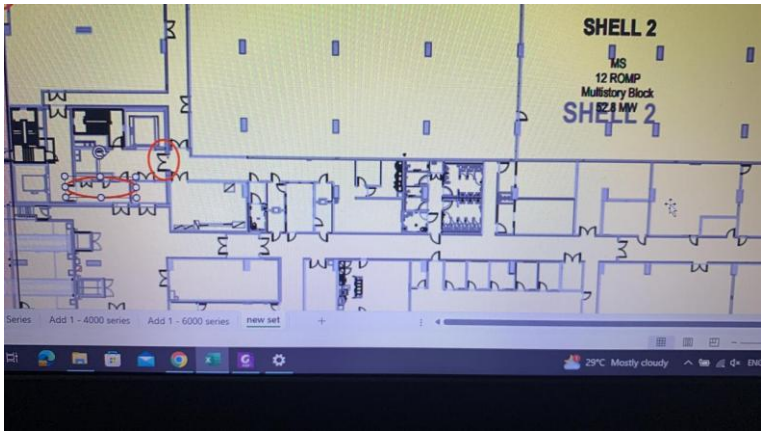


Figure 3. 32 AWS KUL073 Addendum Demarcation
(Source: Intern's documentation)

The process for marking addendum items was executed in a meticulous manner and capturen in excel. This involved a direct comparison between the original received drawings and each subsequent revision, namely Addendum 1, Addendum 2, and the New Set addendum. Every single change was systematically documented, including alterations from the original drawing to Addendum 1, from Addendum 1 to Addendum 2, and from Addendum 2 to the New Set. This rigorous, item-by-item comparison ensures a comprehensive and auditable trail of all design modifications.

3.3.6 948 – Chin Hin Rawang

About the client

Chin Hin Group Berhad

Figure 3. 33 Client Chin Hin Group Logo
(Source: https://www.chinhingroup.com/)

Chin Hin Group is a dynamic and diversified conglomerate that plays a significant role in Malaysia's construction and property sectors, providing a wide array of products and services across the entire value chain. Founded in 1974 by Datuk Seri Chiau Beng Teik, Chin Hin Group Berhad is a public-listed company headquartered in Kuala Lumpur, Malaysia. The company's journey began with the trading of building materials and has since grown to become a key player in the Malaysian industrial landscape. Chin Hin operates with an integrated business model known as Synergy+, which encompasses four core divisions:

- Building Materials: This is the company's foundational business, focusing on the manufacturing and distribution of a wide range of building materials, including concrete, steel, glass, and roofing systems. This division is the backbone of its operations.
- Property Development: Through its subsidiary Chin Hin Group Property Berhad, the company develops residential and commercial properties. They are known for their focus on creating smart living spaces and unique, themed developments.
- Construction Engineering: This division provides engineering and construction solutions for various projects, ensuring efficiency and quality from start to finish.

- Home & Living: Chin Hin has expanded into the home and living sector, offering products and solutions that cater to modern lifestyles. The acquisition of companies like Signature International has strengthened this segment.

About the project

Chin Hin Rawang project is a landed house project whereas a landed house project is a real estate development that consists of homes built directly on the land. This is the primary distinction that separates them from other residential properties like apartments or condominiums, which are considered "vertical housing" because multiple units are stacked on top of each other. The term "landed house" is especially common in countries with a strong preference for traditional, ground-level living, and it is a key term used by developers and real estate agents. The project info for this task as follows:

CADANGAN MEMBINA

SECTION 1:
A. 42 UNIT RUMAH TERES 2 TINGKAT JENIS A FASA 1A
B. 12 UNIT RUMAH TERES 3 TINGKAT JENIS A1 FASA 1A
C. 1 UNIT PENCAWANG ELEKTRIK TNB FASA 1A
D. 1 UNIT PENCAWANG ELEKTRIK TNB FASA 1B
SECTION 1A:
E. 37 UNIT RUMAH TERES 2 TINGKAT JENIS A FASA 1A
SECTION 1B:
F. 43 UNIT RUMAH SELANGORKU 1 TINGKAT FASA 1B
SECTION 2:
G. 48 UNIT RUMAH TERES 2 TINGKAT JENIS A FASA 2
H. 92 UNIT RUMAH TERES 2 TINGKAT JENIS B FASA 2
SECTION 2A:
I. 145 UNIT RUMAH SELANGORKU 1 TINGKAT FASA 1B
DI ATAS LOT 1301, LOT 648, LOT 650, LOT 651, LOT 652 DAN LOT 32661, MUKIM SERENDAH, DAERAH HULU SELANGOR
UNTUK TETUAN STELLAR TRINITY SDN. BHD.

Task Performed

In this particular instance, all bid data submitted by tenderers were keyed into the e-Tender and then compiled and inputted into the TBQ software. This task was performed specifically during the Tender Opening stage for the project, ahead of the contract award. Access credentials for one of the five licensed company accounts within the TBQ software were provided in order to perform the required tasks for this project.

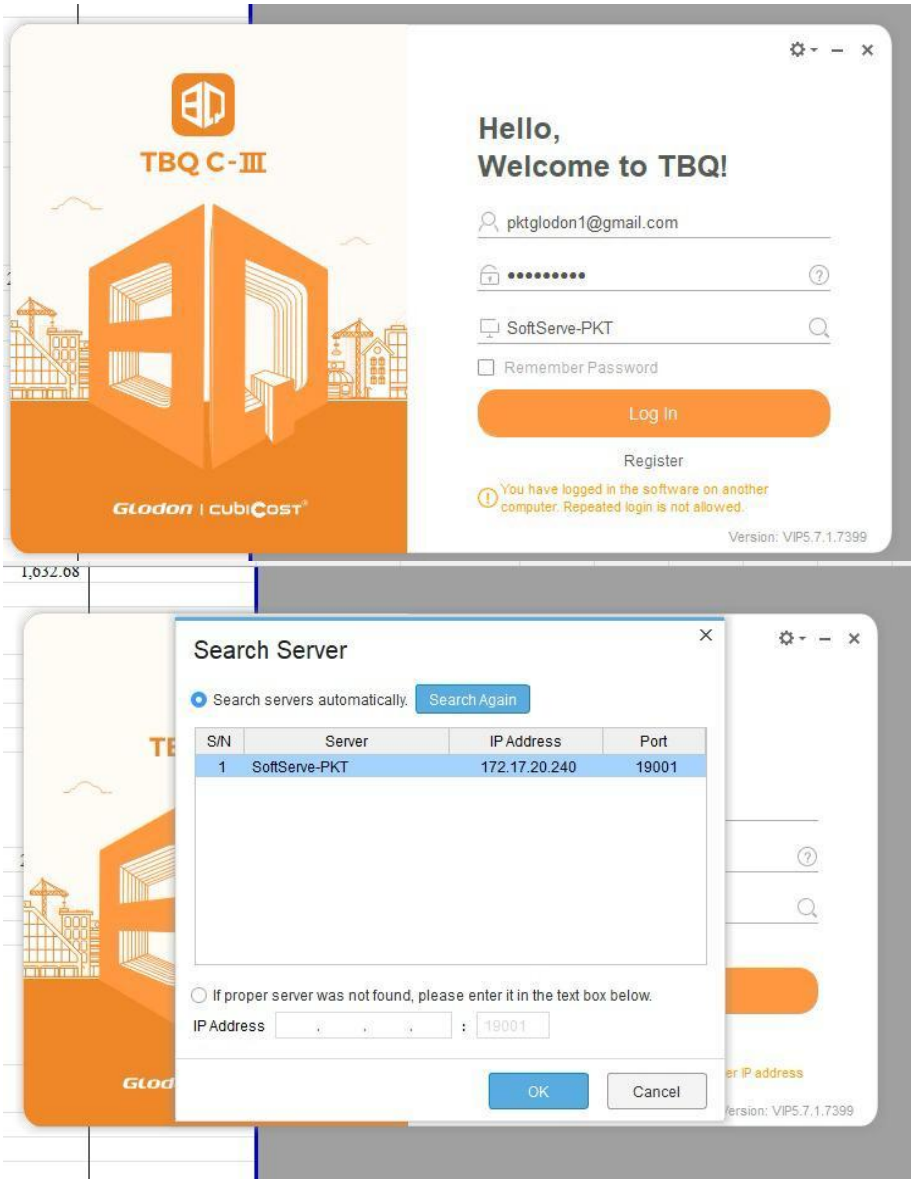


Figure 3. 34 TBQ Software Login Display
(Source: Intern's documentation)

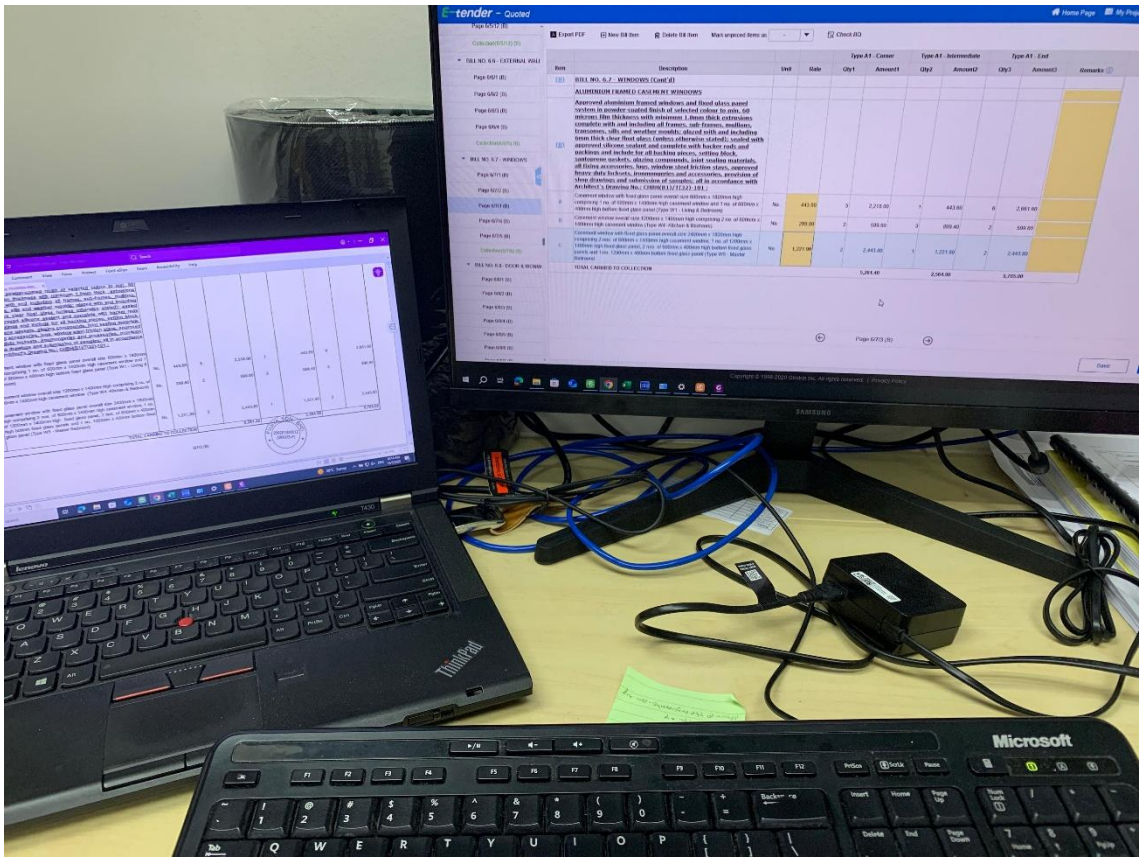


Figure 3. 35 e-Tender Key in Before TBQ Working
(Source: Intern's documentation)

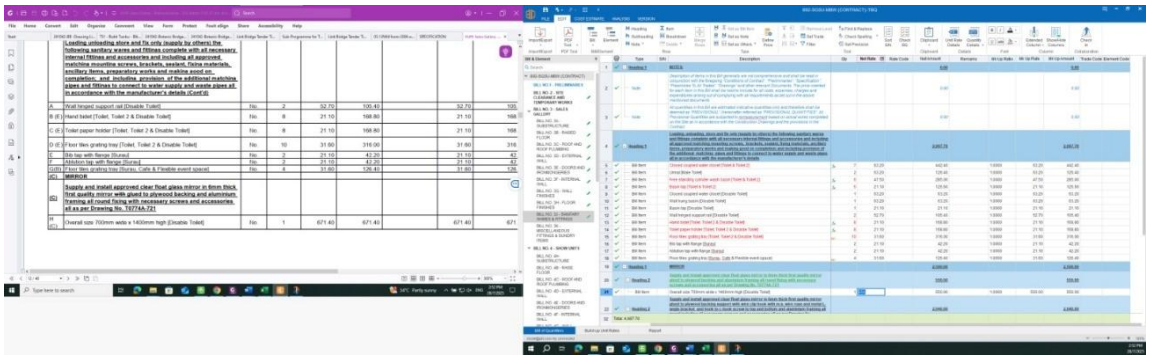


Figure 3. 36 Chin Hin Rawang TBQ Key in
(Source: Intern's documentation)

3.3.7 1027 – Johor Apartment Greenland Danga Bay

About the client

https://www.akdi.net/portfolio-page/commercial,residential/greenland-danga-bay-sdn-bhd/

Greenland Danga Bay Sdn Bhd was established on March 28, 2014. It is a joint venture between the Greenland Group from Shanghai, China, and Iskandar Waterfront Holdings (IWH), based in Johor Bahru, Malaysia. Greenland Group is known as a major developer specializing in large-scale projects, including skyscrapers, urban complexes, and industrial parks. They have worked on projects in over 100 cities in nine countries. The main project of Greenland Danga Bay Sdn Bhd is a major development in the Danga Bay area of Johor Bahru, a strategic location in Iskandar Malaysia. One of their most well-known projects is:

- Greenland Jade Palace: This is an integrated development comprising 13 luxury high-rise residential towers with complete facilities. The project is located on the Danga Bay waterfront.

The company also invests in other projects in the area, often collaborating with local companies like MB World Group Bhd. These projects generally have a very high Gross Development Value (GDV) and aim to transform the Danga Bay area into an international lifestyle and tourism destination.

About the project

The mixed development of approximately 367,000 m2 gross floor area (GFA) is located on the Iskandar Waterfront Development in Johor Bahru, Malaysia. The development is parcellised into five (5) plots – Plots 1, 2, 3, 4 and 6. The project is composed predominantly of 13 towers high-rise residential towers (2743 units) with full condominium facilities atop carpark and retail podiums. Residents communal facilities are located on the extensively landscaped podium roof top which is commonly reffered to as the “E-Deck”. Retail facilities, including F&B of approximately 8,000 m2 (GFA) are provided at the ground floor and first floor level of the podium. Car and motorcycle parking, major MEP plant rooms and other support facilities are located at the podium floor.

Task performed

Assistance with calculating reinforcement bars was requested for another project from the company's Johor Bahru branch, and it was done using TRB software. Since the project was located in Johor, communication with Kuala Lumpur team had to be conducted online via a WhatsApp group. Despite the indirect communication, it did not hinder the team members from effectively collaborating on the rebar calculation tasks.

Initially unfamiliar with the TRB software, an opportunity was given to learn from the assistant Quantity Surveyors who were also assisting the Johor team. The TRB software was used to measure reinforcement bars for both drop panels and slab panels for the Johor Apartment project.

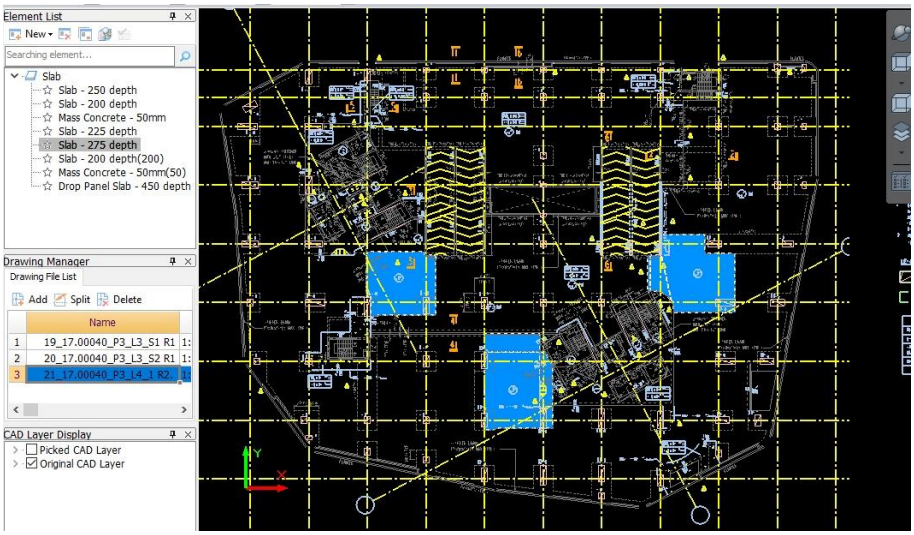


Figure 3. 37 Johor Apartment TRB Slab Rebar Measurement
(Source: Intern's documentation)

The screen capture provides a clear view of the reinforcement bar measurement for the P3-ST6 staircase. In this specific project code, "P3" denotes Podium 3, while "ST6" stands for Staircase 6. This naming convention is crucial for accurately identifying the precise location and component of the construction element within the project's overall structural plan.

3.3.8 892 – Belfield

About the client

Eupe Corporation Berhad

Figure 3. 38 Client Eupe Corporation Berhad Logo
(Source: https://eupe.com.my/)

Eupe Corporation Berhad is a Malaysian investment holding company with its main business in property development. Founded in 1986 and listed on the Main Board of KLSE since 1997, the company has primarily focused on developing residential and commercial properties, particularly in northern Malaysia where it has built over 25,000 homes. The company's operations are divided into several key segments:

- Property Development: This is Eupe's main business and revenue driver. It involves the development of a range of residential and commercial properties.
- Property Construction: This segment is responsible for the construction of its own development projects.
- Chalet and Golf Operation and Management: Through its subsidiary, CintaSayang Resort & Hotel, Eupe manages chalets, restaurants, golf clubs, and other recreational facilities.
- Other Activities: This includes property rentals, the sale of building materials, and complex management services.

About the project

Circadia

Circadia @ Belfield is a major upcoming residential and commercial development located in Kuala Lumpur located just steps from Merdeka 118, Malaysia.

Developed by Eupe Corporation Berhad, the project has a gross development value (GDV) of over RM1 billion, making it the developer's largest project in Kuala Lumpur to date. The development is planned to be a distinctive urban precinct that emphasizes communal living and a connection to nature. The project will incorporate elements of urban sustainability and eco-design, with dedicated spaces for family bonding and outdoor activities. It is part of Eupe's "Shared Value" philosophy. As of recent reports, the project is still in the planning stages, with a launch expected in late 2024 or 2025.

Figure 3. 39 Circadia @ Belfield
(Source: https://circadia.com.my/#location)

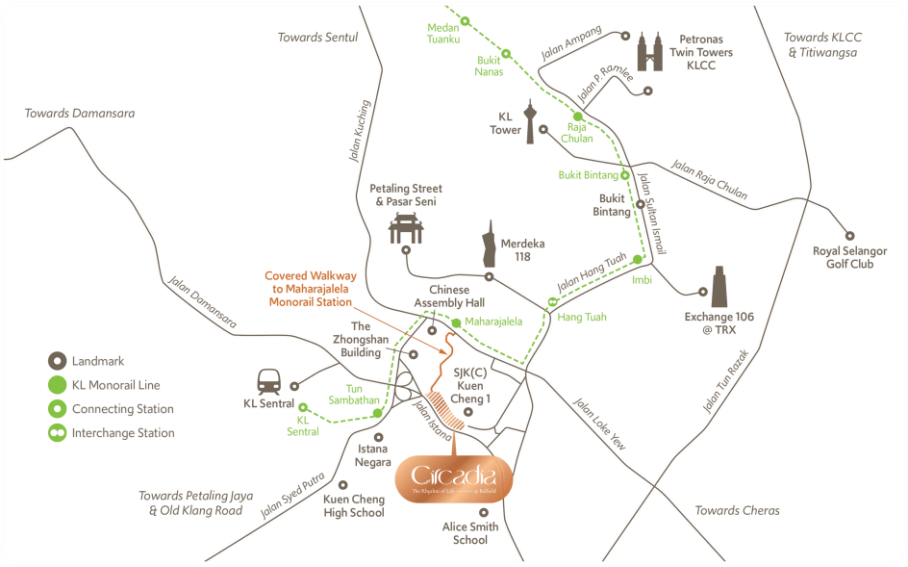


Figure 3. 40 Circadia Location Map
(Source: https://circadia.com.my/#location)

Task performed

For this project, the contract document drafting was the only task requested, so there is not much to elaborate on regarding the project work itself. Several examples of the contents of the contract document, which had to be compiled according to the company's standard template, include:

1. Agreement and PAM contract 2006 with Quantity
2. List of correspondences
3. Form of Tender
4. Conditions of tendering
5. Specifications
6. Preambles to all trades
7. BOQ
8. Final Sum
9. Appendices
10. Contract Drawings

3.4 Demarcation

3.4.1 Elaboration

Demarcation is a critical process performed by a Quantity Surveyor (QS) to analyze, verify, and establish clear boundaries for the work shown. The purpose is to eliminate ambiguity in the scope, responsibilities, and costs that need to be calculated for the project. This process goes beyond simply reading the drawings; it is about "mapping" what needs to be measured and managed based on the visual information provided.

3.4.2 Demarcation Objectives

Several key reasons as for why QS performs a demarcation for the received drawings before starting the measurement:

- Ensuring a Clear Scope of Work

  Construction drawings often have overlaps or inconsistencies between different disciplines (architectural, structural, and MEP). Demarcation ensures the QS can clearly separate these work scopes, preventing double-counting or accidentally missing items.

- Identifying Design Gaps

  When a QS analyzes the drawings, they may find areas that are not detailed or are inconsistent across different drawings. For example, an architectural drawing might show a window, but the structural drawing lacks the necessary opening details. Demarcation helps to identify these "gaps" before work begins, preventing costly claims for additional work later on.

- The Foundation for Cost Calculation

  The demarcation process is the bedrock for creating the Bill of Quantities (BoQ). By setting clear boundaries, the QS can accurately measure the quantities of each work item. For instance, a QS will mark which areas fall under floor finishing, wall works, or ceiling installations to ensure every item is calculated correctly.

- Assisting the Tendering Process

  When compiling tender documents, drawing demarcation allows the QS to create a well-defined work package. This makes it easier for bidding contractors to understand the project scope and provide accurate bids, minimizing the risk of unexpected costs.

3.4.3 Demarcation Step-By-Step

When a QS receives drawings, they will perform actions such as:

- Using Colour Coding (Manual Demarcation): Different colours may be used on a drawing to highlight specific work items that need to be measured. For example,

all partition walls to be measured might be highlighted in yellow, while finishing areas are highlighted in blue.

- Making Annotations: The QS may write notes directly on the drawings to flag areas that require clarification from the design team or contain ambiguous details.
- Comparing Drawings: The QS will cross-reference the floor plans with section drawings and detail drawings to ensure all information is consistent and there are no conflicting details.
- Using the Custom Quantity feature in TAS: Demarcation using the TAS software has so far been the quickest and easiest way. As for the step by step doing demarcation using TAS, first the QS will import the received drawing that needs demarcation (CAD, PDF) to the TAS software and then proceed to do demarcation using the Custom Quantity feature, this then allows for demarcation to be carried out both quickly and simply.

During the internship, demarcation for the PPAM Cheras Carpark project was assigned, with the requirement to calculate the total number of parking spaces across six basement floors using the Glodon TAS software. This calculation includes spaces for cars, electric cars, motorcycles, designated parking for disabled individuals or OKU (Orang Kekurangan Upaya), and other necessary things for basement carpark such as column guard, rubber speed hump, convex mirror, straight directional sign, straight/turn right directional sign, turn left/right directional sign, turn right directional sign, turn left directional sign, height restriction barrier, zebra crossing, wheel stopper, and pedestrian walkway.

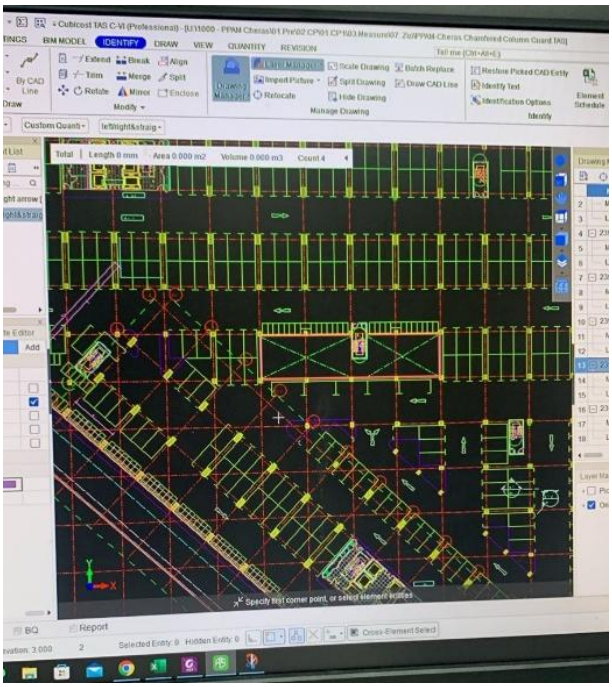


Figure 3. 41 PPAM Cheras Carpark Demarcation TAS

(Source: Intern's documentation)

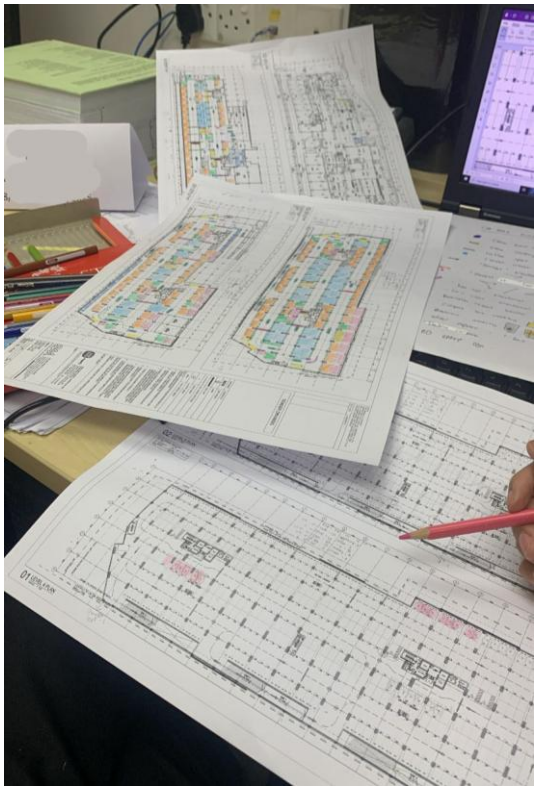


Figure 3. 42 Sime Darby Carpark Manual Demarcation

(Source: Intern's documentation)

3.5 Querries

3.5.1 Elaboration

A query is a formal question or request for clarification that a QS raises to the design team (like the architect or engineer) when they identify an issue in the project documents. This process is crucial, as it ensures that the information is clear, consistent, and complete before a contract is finalized and construction begins. Queries are a fundamental part of the demarcation process. As a QS reviews drawings and specifications, they look for any of the following issues:

- Ambiguities
- Inconsistencies
- Missing Information
- Unclear Scope

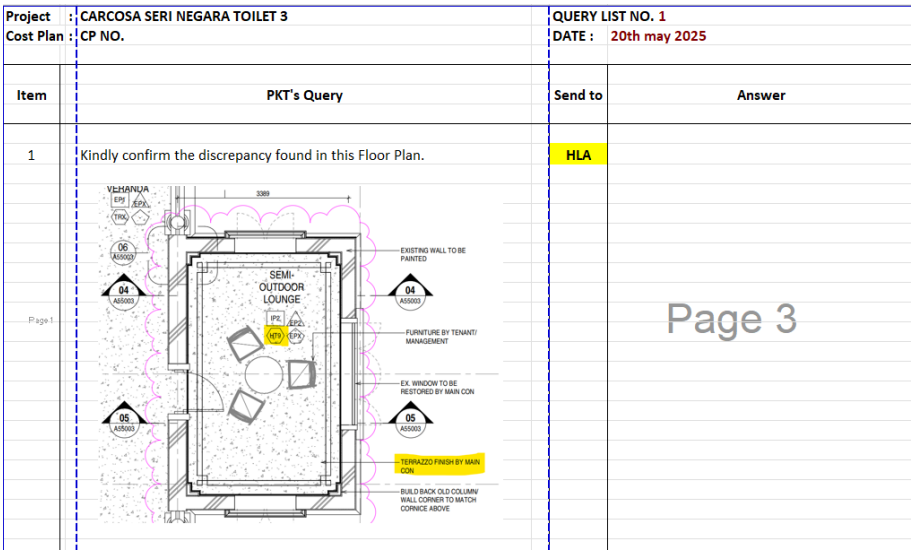
3.5.2 The Query Process and Its Importance

The process of raising and resolving queries is a critical risk mitigation strategy. It typically follows these steps:

1. The QS documents the query in a formal format, often called a Request for Information (RFI) or a Query Sheet.
2. The RFI is submitted to the relevant design professional (e.g., the architect or a structural engineer).
3. The design team provides a formal response, which may include a written clarification, a revised drawing, or a new specification.

During the internship, a query list was assigned for the Carcosa Seri Negara Main Building Renovation Project, specifically for the renovation of Toilet 3, which was repurposed as a semi-outdoor lounge. Below is an example of a query list that was created, as shown in the table below, the Excel format is a standardized template containing an item number column, the “PKT’s query” where to insert the querries to be submitted to the architect or other design team, a “send to” column for the designated

recipient in this case HLA is the architect team for the project, and a “answer” column for the clarification to be provided by the architect and design team.



Project :	CARCOSA SERI NEGARA TOILET 3	QUERY LIST NO. 1	
Cost Plan :	CP NO.	DATE :	20th may 2025
Item	PKT's Query	Send to	Answer
1	Kindly confirm the discrepancy found in this Floor Plan.	HLA	

Figure 3. 43 Query List Example
(Source: Intern’s documentation)

In this query, discrepancy founded in the floor plan where in the code, the floor finish was written as “HT9” which is homogenous tiles 9, but in the explanation arrow it was written as “Terazzo Finish”, this is then considered as discrepancy as it needed a further confirmation on which material is actually used.

3.6 DCR

3.6.1 Elaboration

DCR (Design/Document Change Request) is a formal document used in a construction project to propose and manage changes to the original design, drawings, or specifications. It serves as a structured method for documenting any modification from the initial scope of work. QS is responsible for analyzing the financial implications of every DCR. Their key tasks include:

1. Cost Assessment: The QS evaluates the costs associated with the proposed change, including materials, labor, and equipment. They will determine if the change results in a price increase (variation), a decrease, or no change at all.

2. Documentation and Valuation: Once a DCR is approved, the QS formally documents the change and prepares a valuation or variation order. This document legally amends the contract, ensuring that the contractor is compensated for any additional work or that a credit is issued for work no longer required.
3. Contract Management: By managing DCRs, the QS maintains an accurate record of the project's financial evolution, ensuring that the final account reflects all approved changes. This process is crucial for preventing disputes and ensuring project profitability.

3.6.2 The DCR Process and Its Importance

DCR becomes mandatory for a Quantity Surveyor (QS) when a proposed change to the project's design or scope of work is officially approved and needs to be formally documented for contractual and financial purposes. It's the key tool for a QS to manage the financial impact of a change, which is often called a variation. The creation of a DCR isn't the first step in the process; it's the result of a sequence of events triggered by a discrepancy or new requirement, such as:

1. The discrepancy is found

   This is the starting point. A problem is identified on the project, which could be due to several reasons:

   a. Design inconsistency: The QS, while reviewing the drawings, finds a conflict. For example, the architectural plan shows a door, but the structural plan has a load-bearing column in the same location.
   b. Client request: The client asks for a change, such as upgrading a material or adding a new feature.
   c. Site condition: A contractor on site discovers an unforeseen issue, like an existing utility line that wasn't on the drawings, which requires a change to the foundation design.

2. The formal query is issued

   Instead of immediately creating a DCR, the QS first sends a formal request for clarification, often known as an RFI (Request for Information) or Query List, to the design team. The RFI or Query List explains the problem and asks for an official solution.

3. The official instruction is given

   This is the moment a DCR becomes mandatory. The design team responds to the RFI with a formal instruction to change the design, this instruction now supersedes the original contract drawings because the original agreement has been changed, the QS is now obligated to document this alteration including any omission and addition stated in the RFI.

Below are the DCR document examples made for the Carcosa Seri Negara Main Building Renovation Project during the internship.

Table 3. 3 Carcosa Seri Negara DCR Document Example

PENYESUAIGUNAAN SEMULA BANGUNAN SERI NEGARA DAN PEMBINAAN TEMPAT LETAK KERETA DI TAPAK WARISAN CARCOSA SERI NEGARA, KUALA LUMPUR UNTUK ASET WARISAN SATU SDN. BHD.. - Execution and Completion of Re-Development Works to Existing Heritage Building Including Conservation Works, Structure Strengthening, Demolition & External Works.						
DCR - SURAU						
Item	**Desription**	**Unit**	**Qty**	**Rate**	**Amount (RM)**	**Remarks**
	SURAU **Omission** **MBW - BILL NO.3 DRYWALL PARTITIONING WORK** **DRYWALL PARTITION WALLING (Cont'd)**					

	Supply and installation of the following drywall partition "KNAUF" or approved equivalent gypsum board as lining; fixed to approved framing system comprising of main supportframes/post at required locations, other horizontal and vertikal studs; infilled with 50mm thick insulation partition as described; all fixed to existing concrete floor and/wall items,other necessary works; all in accordance with manufacturer's printed specification and instruction **Non-Fire Rated Drywall Partition: (Cont'd)** Total 101.4mm thick drywall constructed out ofsingle layer of "KNAUF SECUROCK GLASS-MAT" water resistant gypsum board as lining on both sides of drywall (type DW5)	M2	(9)	305,00	(2.860,90)	

Table 3. 4 Carcosa Seri Negara DCR Document Example Cont'd

	SURAU **Addition** **BRICKWALL**					
	Build brickwall corner and plaster over to match cornice above	M2	51			
	MBW - BILL NO.3 DRYWALL PARTITIONING WORK **DRYWALL PARTITION WALLING** **Supply and installation of the following drywall partition "KNAUF" or approved equivalent gypsum board as lining; fixed to approved framing system comprising of main supportframes/post at required locations, other horizontal and vertikal studs; infilled with 50mm thick insulation partition as described; all fixed to existing concrete floor and/wall items,other necessary works; all in accordance with manufacturer's printed specification and instruction**					

	Non-Fire Rated Drywall Partition: Total 101.4mm thick drywall constructed out ofsingle layer of "KNAUF SECUROCK GLASS-MAT" water resistant gypsum board as lining on both sides of drywall (type DW5)	M2	12	305,00	3.788,10	

Inside the DCR document, the description of the work and items that is changing is usually written along with it's details, followed by the work's unit of measurement, the work's quantity, the rate for each work, and the total amount (quantity multiplied by the rate) in RM, finally, a dedicated "remarks" section is included for any essential notes, clarifications, or special conditions.

3.6.3 DCR and Addendum

DCR and an Addendum are two distinct but related documents that manage changes to the original contract and design. The DCR typically includes a detailed description of the proposed change, the reason for the change, and an initial assessment of its impact on the project's schedule, cost, and quality. It is a communication tool used for evaluation and approval before any work is carried out. An Addendum is a formal document that is attached to a contract or a set of design documents to modify, clarify, or supplement the original terms. It is issued after the initial documents have been released but before the contract is signed or the project begins.

While a DCR is a request for a change, an Addendum is a formal, binding legal document that implements a change that has been approved. It serves as an official modification to the original contract.

Lifecycle of a project change:

1. Initiation (DCR): A need for a change is identified, and a DCR is submitted to formally propose it. The DCR is a request for approval.
2. Approval Process: The DCR is reviewed by relevant parties, including engineers, project managers, and the client. They assess the feasibility and impact of the change.

3. Formalization (Addendum): Once the DCR is approved, its details—including the updated design, revised scope of work, and any agreed-upon changes to cost or schedule—are formally documented in an Addendum. The Addendum is then issued to all parties to ensure everyone is working from the same, updated set of documents.

In summary, a DCR is the proposal for a change, while an Addendum is the official implementation of an approved change. The DCR triggers the process, and the Addendum finalizes it, ensuring all parties are contractually bound to the new terms.

3.7 Measurement Methods

3.7.1 Elaboration

There are several ways to do Measurement for Taking Offs (TO) that has been learned throughout the internship, such as manual measurement and measurement using the Glodon TAS software. Throughout the internship, the key strengths and weaknesses of each quantity takeoff method were able to be identified and evaluated.

3.7.2 Manual Take Off Measurement

Table 3. 5 Key Strength and Weakness of Manual Takeoff Method

Advantages	Disadvantages
Low Initial Cost This method requires minimal investment, as the primary tools are paper drawings, a scale rule, pen or pencil, and a calculator. There is no need for expensive software licenses or hardware.	**Time-Consuming** The process is highly labor-intensive and slow, especially for large or complex projects. Manually measuring every element can take a significant amount of time.
Fundamental Understanding Performing a manual takeoff provides a deep, hands-on understanding of the design and the project's physical dimensions. This process helps quantity surveyors develop a strong foundational knowledge of construction measurement principles.	**High Risk of Human Error** Calculations and measurements are subject to human error, which can lead to inaccuracies in the Bill of Quantities (BoQ) and subsequent cost estimation.
Simplicity for Small Projects For very small-scale projects with simple designs, the manual method can be faster	**Difficult to Update** Any design revision or change to the drawings requires a complete re-takeoff

and more straightforward than setting up a complex software model.	of the affected sections, which is highly inefficient and prone to new errors.
	Lack of Visualization This method does not provide a visual representation of the measured quantities, making it difficult to verify the takeoff and understand the spatial relationships between different components.

3.7.3 TAS Taking Off Method

Table 3. 6 Key Strength and Weakness of TAS Software Takeoff Method

Advantages	Disadvantages
Speed and Efficiency Software automates the measuring and calculation process, drastically reducing the time required for takeoff. Complex quantities can be generated in a fraction of the time compared to manual methods.	**High Initial Cost** There is a substantial upfront investment for software licenses, training, and powerful hardware to run the application smoothly.
Enhanced Accuracy By calculating quantities directly from the digital model, software eliminates human calculation errors. It ensures consistency and precision across all measured items.	**Steep Learning Curve** Using advanced software requires a certain level of technical skill and training. New users need time to become proficient with the software's features and functionalities.
Easy to Update and Revise When design changes occur, the software can quickly update the quantities in the model. This is a significant advantage as it saves time and maintains accuracy throughout the project lifecycle.	**Potential for Misinterpretation** If the digital drawings or models are of poor quality or contain errors, the software may generate incorrect quantities. The user must still have the skill to identify and correct these issues.
Improved Visualization Software provides a 3D model of the project, allowing users to visualize the quantities being measured. This makes it easier to identify errors, understand the design, and communicate with other project stakeholders.	
Integration with Other Tools Modern takeoff software often integrates with other project management and cost	

estimation tools, creating a seamless workflow from takeoff to final cost analysis.	

GARDENER'S HOUSE TAKING OFF

No.	ITEMS	UNIT
	ARCHI	
	FLOOR	
1	floor finish & details query	m2
2	floor drop to RC apron	m
	WALL	
1	brickwall with raked mortar joints	m2
2	cement board internal wall with paint finish	m2
3	toilet wall details & finishes query	m2
4	metal stud wall	m2
	CEILING	
1	ceiling details & finishes query	m2
	DOOR IRONMONGERY	
1	door & ironmongery details finishes query	no
	WINDOWS	
1	louvered windows query	no
	SW	
1	sink & mirror	no
2	hand dryer	no
3	bidet hose & toilet roll holder	no
4	floor trap query	no
	ROOF	
1	fascia, gutter, insulated roof sheet to arch approval	m2

Figure 3. 44 Taking Off Example for Carcosa Seri Negara Gardener's House
(Source: Intern's documentation)

3.8 TAS

3.8.1 Elaboration

Glodon TAS is a component of the Glodon Cubicost software suite, which focuses on the calculation of quantities and costs in construction projects, particularly within the fields of architecture and structure. TAS, an acronym for Take-off Architecture & Structure, allows users to create a 3D model of a construction project and automatically calculate material quantities based on that model. Glodon TAS assists in the quantity calculation of architectural and structural work, such as determining the volume of concrete, surface areas, and the length of various materials. Glodon TAS utilizes a BIM (Building Information Modeling) approach to create

accurate 3D models of construction projects. The software can be integrated with other Glodon applications and is also capable of importing data from DWG (CAD) formats.

3.8.2 Starting Step-By-Step on Creating A 3D Model In TAS

This section will elaborate on the initial stages involved in using the TAS software for both quantity measurement and 3D model creation. The explanation covers the fundamental setup process that precedes all core modeling activities.

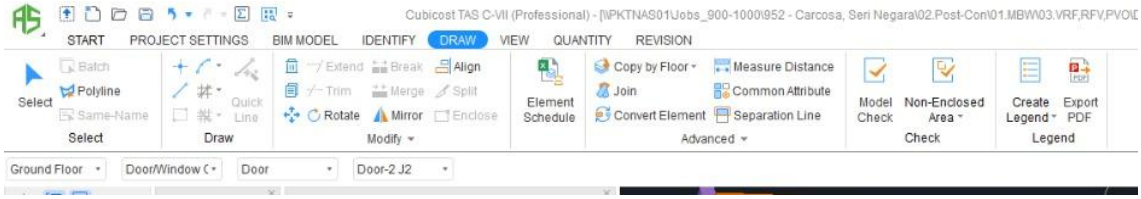


Figure 3. 45 TAS Interfaces Display
(Source: Intern's documentation)

START: This is the module used for creating a new project. It is the initial step when a user wants to begin a new measurement or start the creation of a 3D model within the TAS software.

PROJECT SETTING: This feature used to meticulously document all project information. The data must be accurately entered as per the received drawings or project specifications, as this is a critical prerequisite for commencing subsequent tasks like 3D modeling or measurements.

BIM MODEL: This interface allows users to directly import 3D models from other BIM platforms (such as Revit or ArchiCAD) into the software. This interface is crucial because it eliminates the need to manually build a model from scratch, saving a significant amount of time and reducing human error.

IDENTIFY: This interface includes the Drawing Manager feature, contains tools that facilitate the identification process for imported drawings from files such as CAD or PDF. The first step after importing a drawing is to scale the drawing in Scale Drawing feature to ensure accurate measurements within the TAS software. The interface also provides other useful features, including splitting drawings and the ability to hide drawings for better visibility.

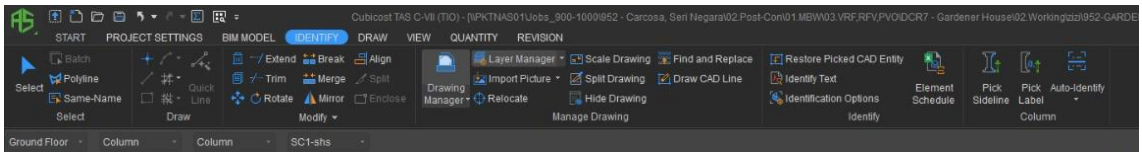


Figure 3. 46 TAS IDENTIFY Interface Display
(Source: Intern's documentation)

DRAW: This interface is the primary tool for creating or recreating building elements. This module is used to digitally draw architectural and structural components like walls, beams, columns, and slabs within the software's environment. After importing and scaling a drawing from a CAD or PDF file, the "Draw" interface provides a variety of functions and commands that allow the user to trace over the plan and build a precise 3D model. This manual drawing process is essential for generating a digital replica of the building, which is then used by the software to perform detailed quantity take-offs and estimations, The Select option below is used to choose the item to be measured or drawn, while the Draw option is used to select the method for performing the measurement or drawing.

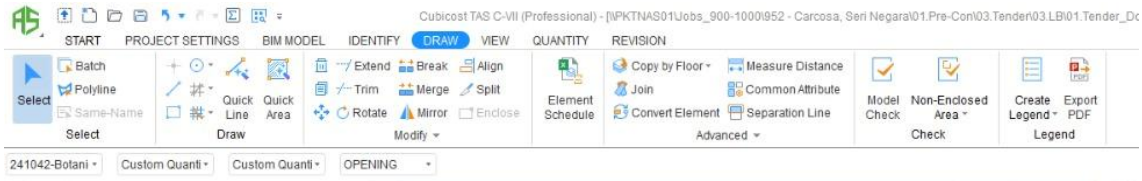


Figure 3. 47 TAS Draw Interface Display
(Source: Intern's documentation)

VIEW: This feature is the control panel for how the users see and interact with the building model. Its primary purpose is to help user visualize the project from various angles and perspectives. This includes tools for switching between a 2D plan view and a full 3D model view, as well as functions for zooming in and out, rotating the model, and panning to different sections. By manipulating these view options, users can inspect the accuracy of the drawn elements and identify any potential modeling errors, making it a crucial component for quality assurance and project navigation.

QUANTITY: This interface is the final module for reviewing and exporting the results of the modeling and drawing work. After a user has completed the 3D model, the software automatically calculates all the quantities based on predefined measurement rules. This interface provides a comprehensive view of the results, allowing users to

check, classify, and organize quantities of all building elements. From here, users can generate detailed reports that are typically exported to formats like Excel, which is crucial for preparing bills of quantities (BoQ) and for cost estimation. This interface essentially transforms the digital model into a tangible, numerical report.

REVISION: The last feature is a powerful feature designed to manage and track changes to a project's model and drawings. Its primary function is to compare two versions of a drawing (for instance, an old version and a new version) and automatically highlight the differences in quantities, dimensions, and elements. This intelligent drawing comparison helps users quickly identify what has been added, deleted, or modified in the project. By doing so, it drastically reduces the risk of human error and saves a significant amount of time in the quantity surveying process, ensuring that cost estimates and take-offs are always based on the most current project data.

Below are the fundamental steps necessary to initiate a new project, enabling both quantity measurement and the development of a 3D model, such as:

1. Creating a New Project

The first step in using Glodon TAS is to create a new project. This is the foundational action that will house all the model data and quantity information. Begin by clicking the [New] Project button, which initiates the setup wizard. It's a critical step as it establishes the digital environment for the entire project, from initial modeling to final reporting.

2. Inputting Project Details

After creating the new project, next step is to input key information. This data is essential for organizing the project and ensuring accuracy in the calculations.

1) Input Project Name

This is a mandatory field. The project name should be concise and clearly identifiable, such as "Carcosa Seri Negara Link Bridge" or "Carcosa Seri Negara Guardhouse". A well-named project is easy to locate and manage, especially when working on multiple projects.

2) Select [Measurement Rules]

This is a crucial step that directly impacts the accuracy of user's quantity takeoff. Based on the regional standards, the appropriate measurement rules are to be selected. For instance, selecting Malaysian measurement rules no.2 ensures that all the subsequent calculations for volume, area, and other quantities adhere to the specific local industry standards and regulations.

3) Input Existing Ground Level

This parameter defines the starting point for user's vertical measurements and elevations. Entering the Existing Ground Level is important for proper visualization of the 3D model in relation to the site and is used in calculations for excavation and foundation work.

4) Input Project Information (optional)

This section allows users to add additional details about the project. While not mandatory, providing information such as the project number, client, or designer can be very helpful for organization and future reference. This information is editable later, unlike the project name and measurement rules, which are set at the start.

3. Importing Drawing

In using the TAS software, which can be utilized for measurement and 3D modeling, the necessary step after creating a new project is to import the drawing that will be used for either measurement or 3D modeling. Importing drawing feature can be found in the "Drawing Manager" inside the "IDENTIFY" interface.

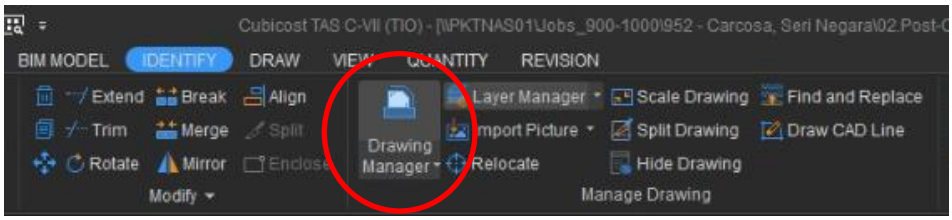


Figure 3. 48 TAS IDENTIFY Drawing Manager to Import Drawing
(Source: Intern's documentation)

4. Scale Drawing

After creating a new project and importing the drawings, next step is to perform scaling. This process synchronizes the scale of the imported drawing with the measurement tool within the TAS software.

Access to the “Scale Drawing” feature can be found in the IDENTIFY interface. The process of scaling a drawing begins by clicking the “Scale Drawing” feature and then selecting all the drawing elements. Once the entire drawing turns blue, click on a point that will serve as the reference line for measurement. This reference can be any line with a clear, known dimension. Finally, input the specified distance from the drawing and click enter.

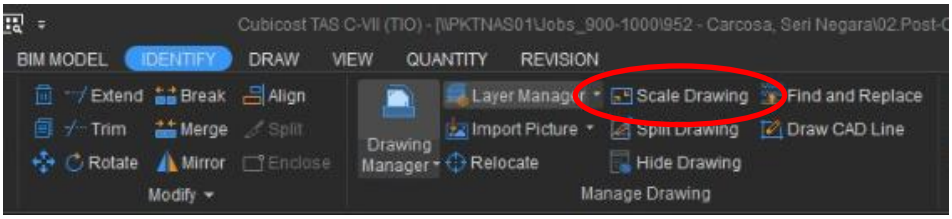


Figure 3. 49 TAS IDENTIFY Interface Features Display
(Source: Intern’s documentation)

5. Relocate

When a drawing is imported with a predetermined axis, a common issue arises where the scaled image fails to merge with the existing axis. Consequently, the drawing must be repositioned. This is achieved by utilizing the “Relocate” feature in the same interface to move the imported image to the predefined axis points.

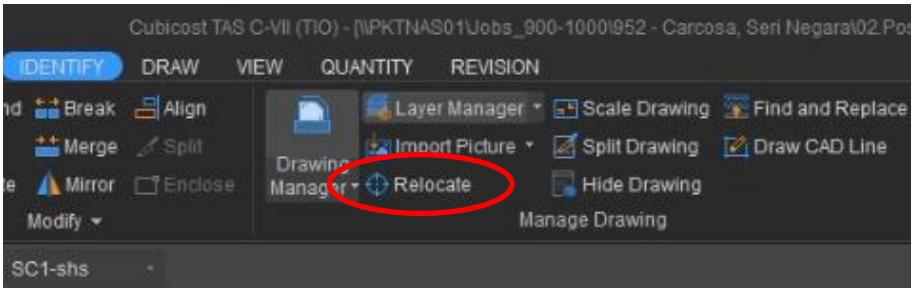


Figure 3. 50 TAS IDENTIFY Interface Features Display Cont’d
(Source: Intern’s documentation)

6. Drawing Start

Following the scaling and relocation of the drawing, the user can begin the measurement process using the features available in the “Draw” interface. User can choose to measure using lines, areas, or points. Additionally, there are features for automatically creating lines or areas, accessible through “Quick Line” and “Quick Area”. This feature facilitates simultaneous 3D measurement and rendering. Users simply input the required data, choose a line or area type, and then draw dimensions or points directly on a pre-scaled imported image.

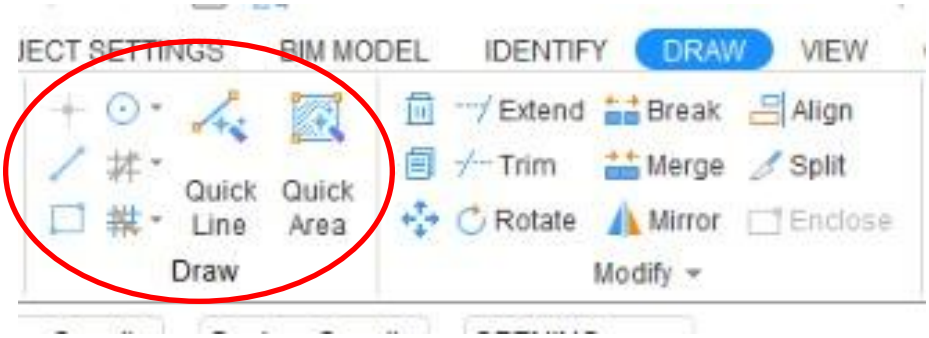


Figure 3. 51 TAS DRAW Interface Features Display
(Source: Intern’s documentation)

Image below provides a detailed view of several elements, showcasing the area measurement (m2) for various finishing works in the “Element List”. These include the finishes for FRP pultruded grating, steel grating, and opening details. The same procedural approach is to be universally applied to all work items to be measured.

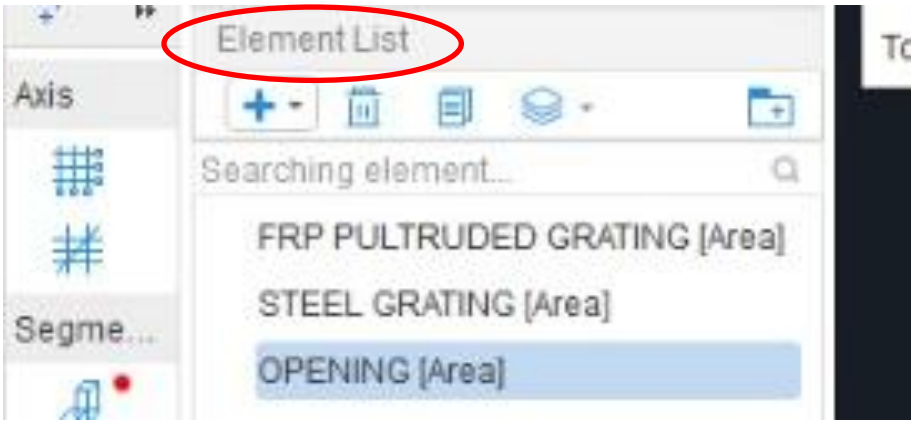


Figure 3. 52 TAS Draw Element List Bar
(Source: Intern’s documentation)

The figure below shows the "Attribute Editor" interface for the "Opening" element. This editor serves as the primary location for users to define and specify the details and material attributes of a given work item, with the functionality to be modified in response to subsequent revisions.

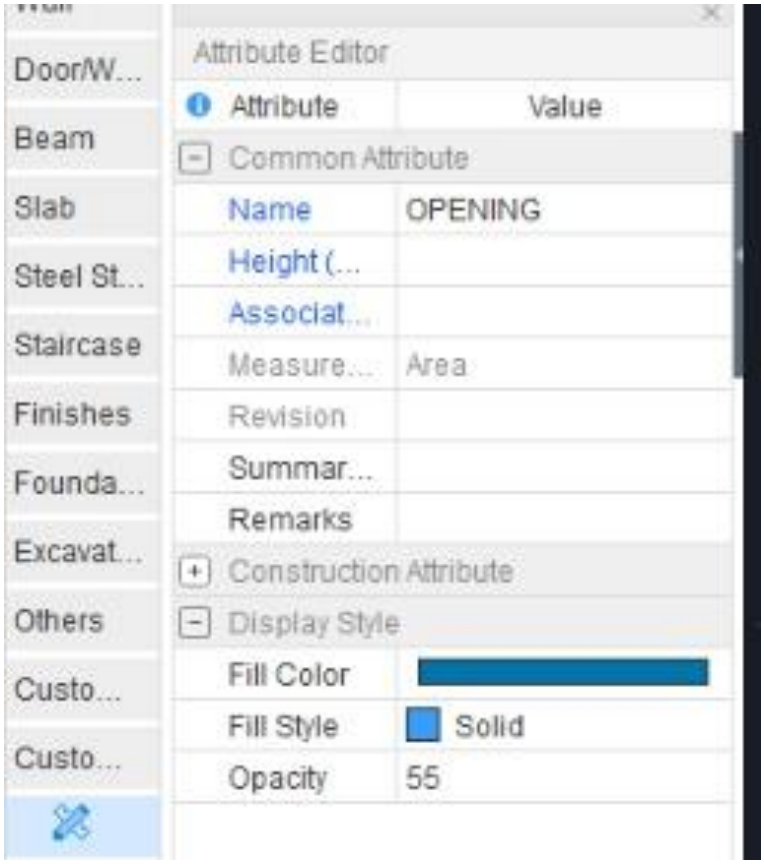


Figure 3. 53 TAS Attribute Editor
(Source: Intern's documentation)

Next up is the example of the measurement of the canopy roof that is performed using the "Area" function. After inputting the roof canopy's specifications into the "Element List," then measuring the area of the canopy can be proceeded.

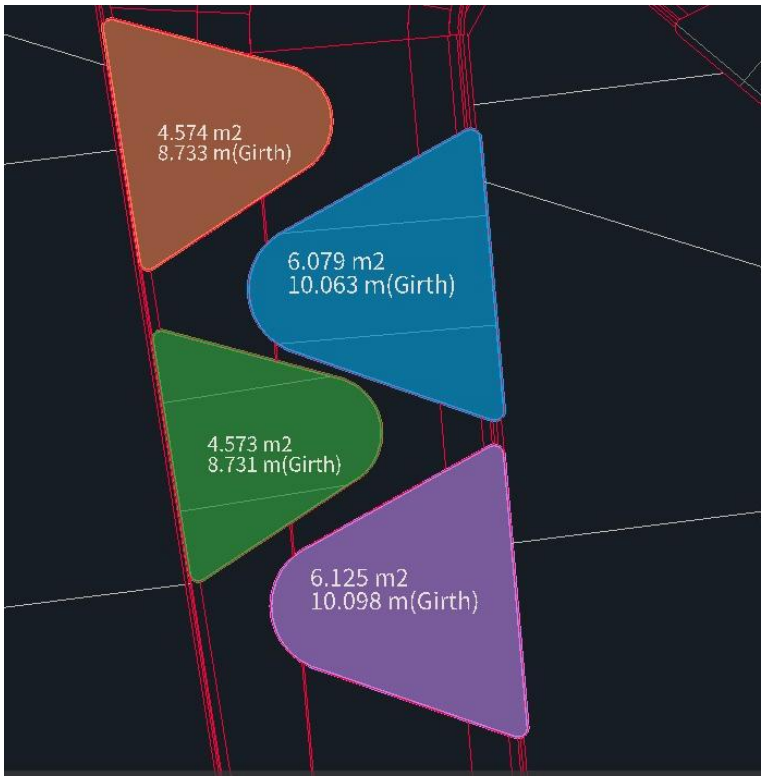


Figure 3. 54 Canopy Roof Area Measurement
(Source: Intern's documentation)

3.8.3 3D Model Examples

Carcosa Seri Negara Gardener's House

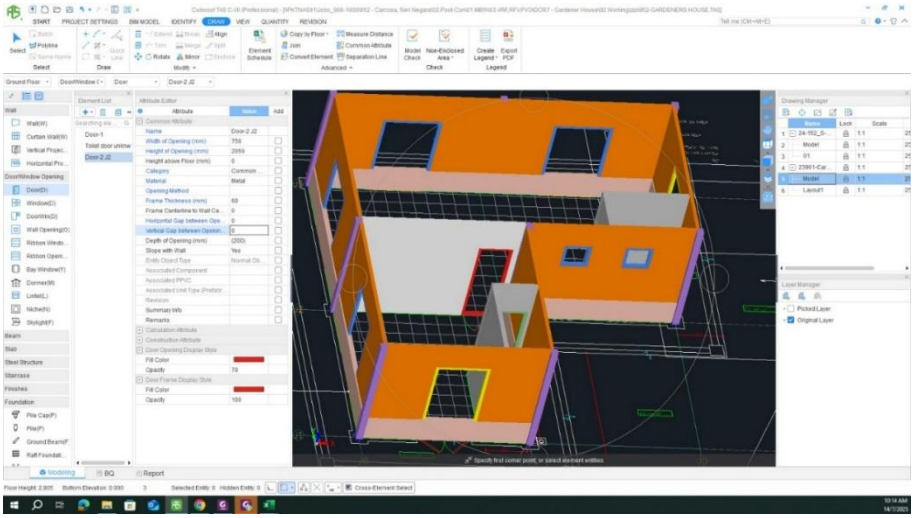


Figure 3. 55 Carcosa Seri Negara Gardener's House TAS 3D Model
(Source: Intern's documentation)

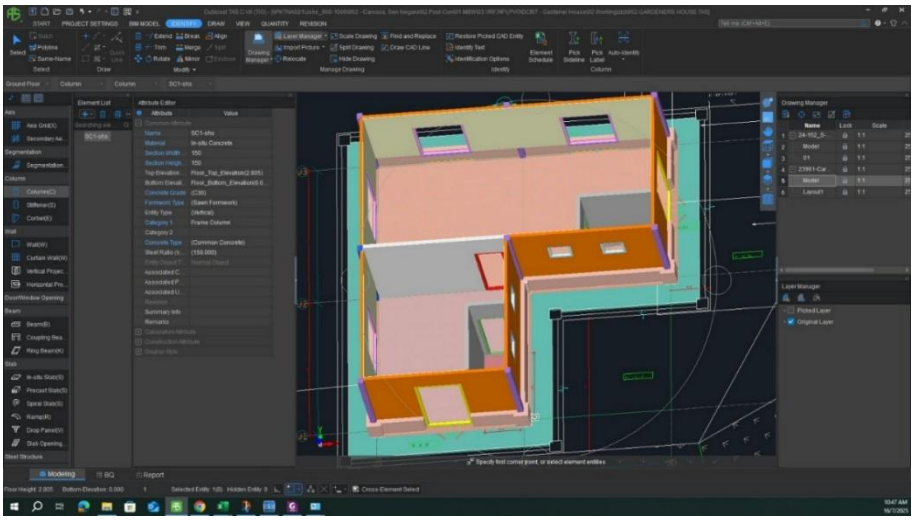


Figure 3. 56 Carcosa Seri Negara Gardener's House TAS 3D Model Cont'd
(Source: Intern's documentation)

3D model based on architects received drawing

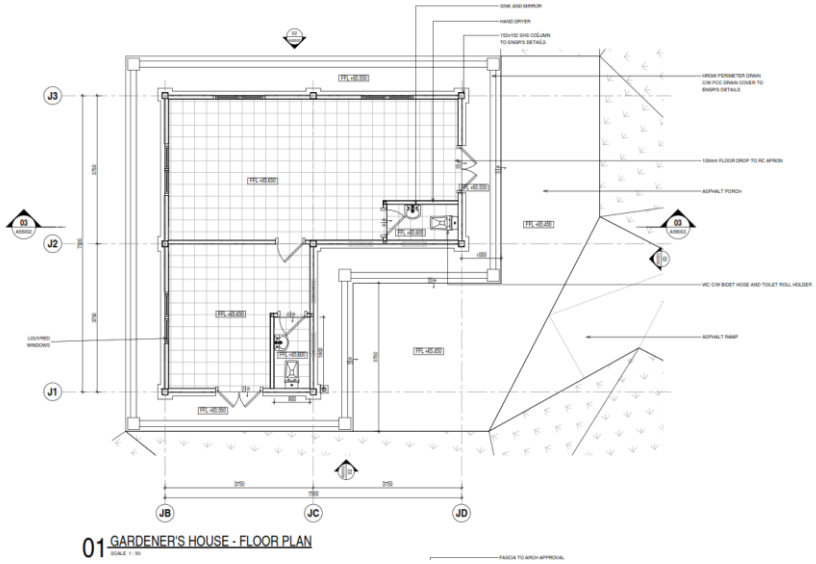


Figure 3. 57 Carcosa Seri Negara Gardener's House Floor Plan Reference for 3D Model
(Source: Intern's documentation)

Carcosa Seri Negara Link Bridge Measurement

Figure 3. 58 Carcosa Seri Negara Link Bridge Hoarding Board TAS Measurement
(Source: Intern's documentation)

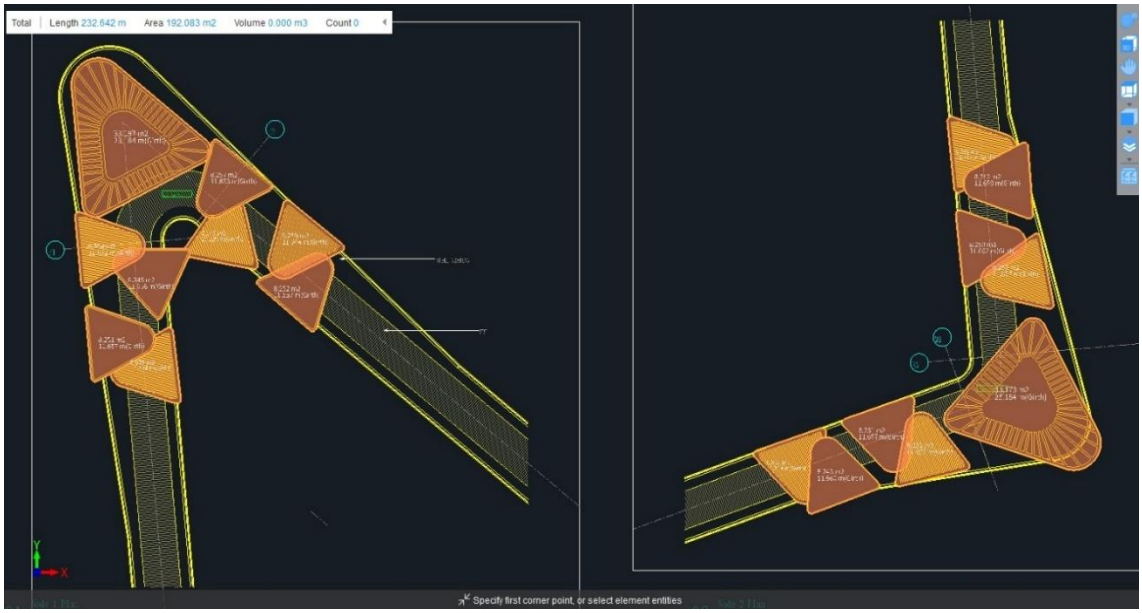


Figure 3. 59 Carcosa Seri Negara Link Bridge Canopy Plan TAS Mea (Before DCR)
(Source: Intern's documentation)

Figure 3. 60 Carcosa Seri Negara Link Bridge Canopy Plan TAS Mea (After DCR)
(Source: Intern's documentation)

3.9 TRB

3.9.1 Elaboration

Glodon TRB is a specialized companion software to Glodon TAS. While TAS handles the quantity takeoff for architectural and structural elements like concrete and walls, TRB (Take-off for Rebar) focuses specifically on the measurement and quantification of steel reinforcement bars (rebar). The two applications are designed to work together as part of the Glodon Cubicost suite. TAS typically used to create the main architectural and structural model, TRB then used to model and calculate all the rebar quantities within that structure. This ensures a comprehensive and accurate takeoff for both the concrete and the steel that reinforces it. During the internship, assistance was provided to the Johor team on the Johor Apartment Greenland Danga Bay rebar measurement. This is one of Dato' Sr. Peter Tan's projects, and the project team was directly appointed to assist him.

3.9.2 TRB Step-By-Step

Below are the step-by-step on measuring slab reinforcement bar using TRB:

1. Import Drawings and Create a Model

   Begin by importing the digital structural drawings (DWG or CAD files) into Glodon TRB. The software will assist in generating a 3D model of the slab, which is the foundation for all subsequent measurements.

2. Define Rebar Attributes

   Next, define the properties of the reinforcement bars, such as the steel grade, diameter, and the specific layout patterns (e.g., spacing, hooks, and bending details) as specified in the project's structural drawings.

3. Model the Slab Rebar

   Using the 3D slab model as a guide, the rebar can then be modeled. TRB has features that allow for the quick placement of rebar based on the defined attributes. For instance, a specific area can be specified, and the reinforcement bars will be automatically arranged by the software according to the parameters that is already set.

4. Automatic Quantity Takeoff

   Once the rebar has been successfully modeled, Glodon TRB will automatically calculate the total quantity of steel reinforcement needed. This includes the total length, weight, and number of bars for the entire slab.

5. Verify and Generate Reports

   Finally, professional judgment is required to verify the output. The software's 3D visualization feature allows the QS to see the rebar arrangement, making it easier to check for any errors. After verification, comprehensive reports in various formats, such as Excel, which will contain a detailed breakdown of the rebar quantities, can be generated.

Example:

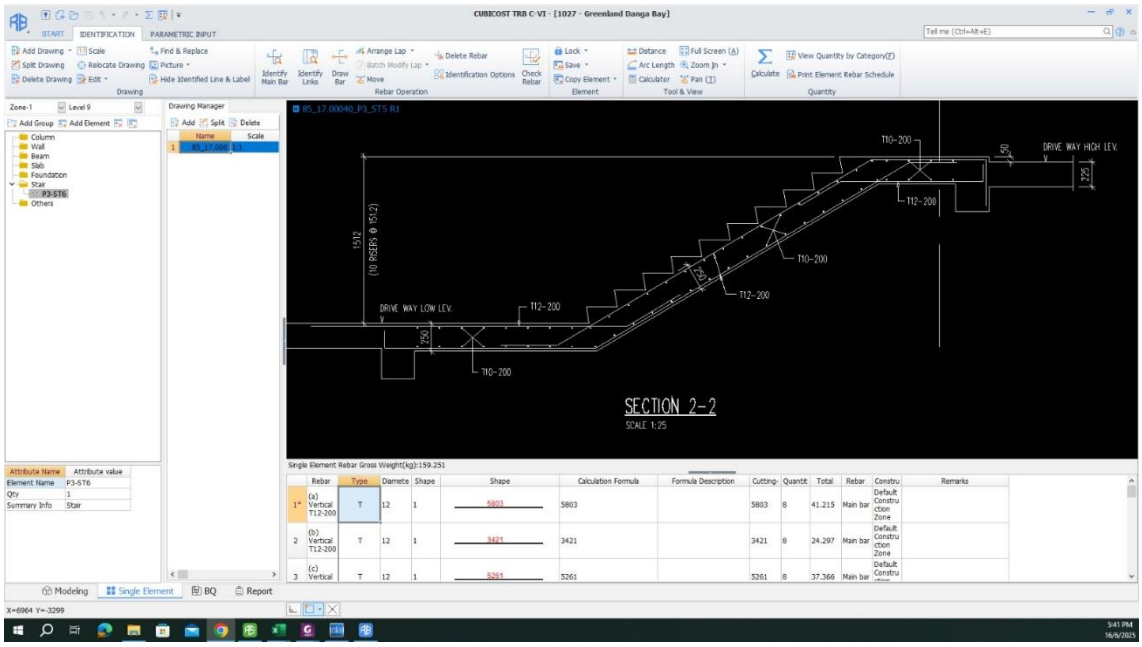


Figure 3. 61 Johor Apartment Greenland Danga Bay Stair Rebar Measurement
(Source: Intern's documentation)

This image is "SECTION 2-2" with a scale of 1:25.

The following is a list of the details and elements that have been observed and identified from the drawing:

- Reinforcement Bars:
  - T12-200: This shows the main reinforcement bars with a diameter of 12 mm and a spacing of 200 mm between them. This reinforcement is visible on the top and bottom of the stairs, as well as on the bottom and top landing slabs.
  - T10-200: This shows the stirrup or distribution reinforcement with a diameter of 10 mm and a spacing of 200 mm between them. This reinforcement typically functions to hold the main reinforcement in place and prevent cracking.
- Dimension:
  - 1512: This is the total height of the stairs, which consists of 10 Risers @ 151.2, meaning there are 10 steps with a height of 151.2 mm each.

- 250: This is the horizontal dimension showing the length of the step (tread width).
- 150 dan 225: This is the vertical dimension showing the height of the landing platform or the surrounding structure.

o Level:

- DRIVE WAY LOW LEV: Shows the low entry way level.
- DRIVE WAY HIGH LEV: Shows the high entry level, at the top of the stairs.

3.9.3 TRB Operation Example

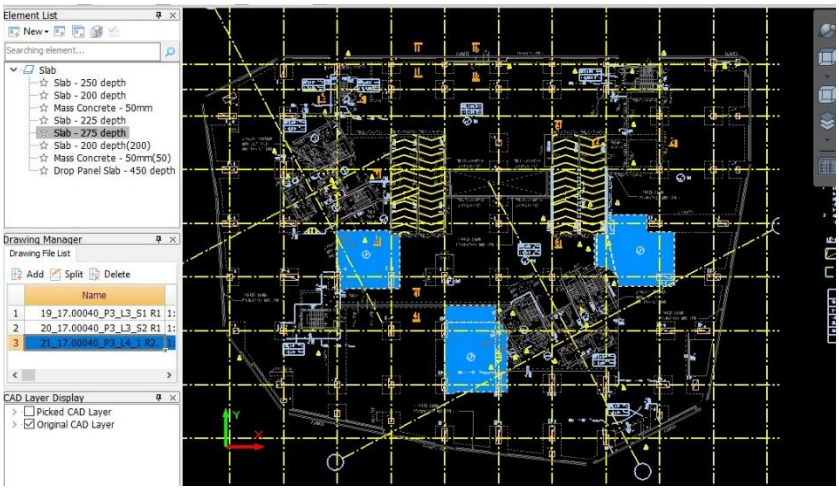


Figure 3. 62 Johor Apartment Greenland Danga Bay Slab Rebar Measurement
(Source: Intern's documentation)

Figure 3. 63 Johor Apartment Greenland Danga Bay Slab Rebar Mea Cont'd
(Source: Intern's documentation)

Figure 3. 64 Johor Apartment Greenland Danga Bay Slab Rebar Mea Cont'd

(Source: Intern's documentation)

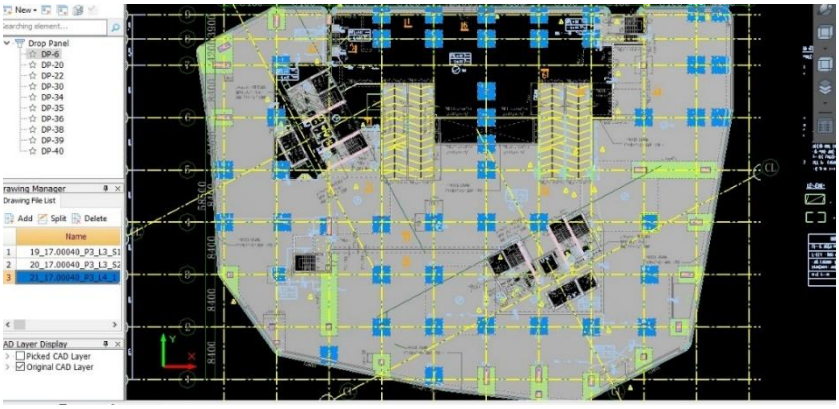


Figure 3. 65 Johor Apartment Greenland Danga Bay Drop Panel Rebar TAS Mea

(Source: Intern's documentation)

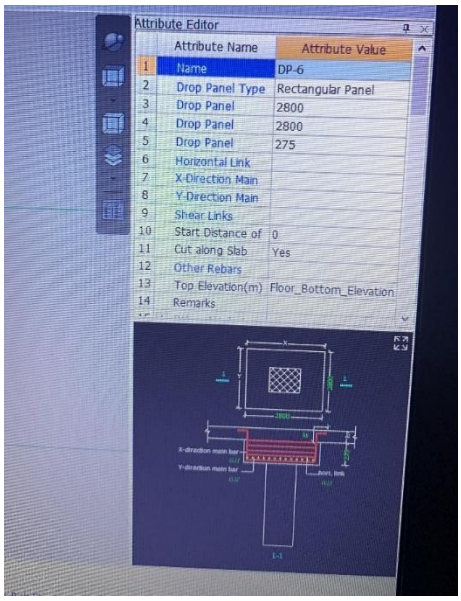


Figure 3. 66 Attribute Editor in TRB For Drop Panel
(Source: Intern's documentation)

The process of taking measurements in TRB software is fundamentally the same as in TAS. First, click the item that need to be measured from the element list (as shown in the example image, a drop panel rebar). After that, the specific details for the drop panel rebar are input according to the received drawings. Only then can the measurement process begin from the CAD drawing that has been imported into TRB.

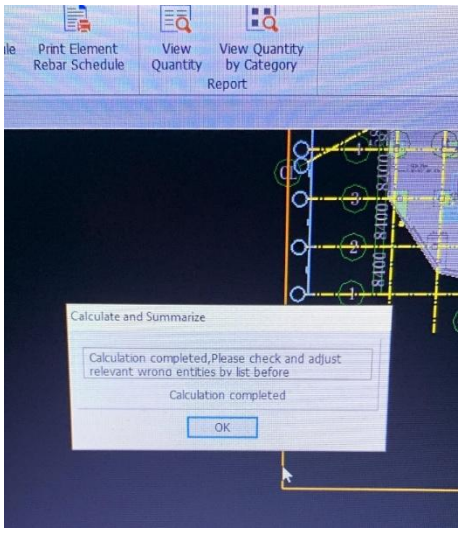


Figure 3. 67 Completed Calculation Pop Up After Calculating All Measured Rebar
(Source: Intern's documentation)

3.10 TBQ

3.10.1 Elaboration

Glodon TBQ is a BIM-based cost-estimating software used primarily in the Quantity Surveying (QS) field for preparing Bills of Quantities (BoQs) and managing cost data. It is part of the larger Glodon Cubicost suite, which integrates with other software like TAS (for architecture/structure takeoff) and TRB (for rebar takeoff). TBQ is centered on data management and analysis. Instead of manually creating a BoQ from scratch, the software allows user to:

- Import Data: Quantities can be imported directly from the BIM models created in Glodon TAS and TRB, or from Excel and PDF files.
- Build-up Rates: A library of unit rates and resource costs can be created and managed, which allows for the quick pricing of BoQ items.
- Pricing and Analysis: The software automatically links quantities to rates, calculates costs, and allows for various cost adjustments. It can also perform multi-dimensional data analysis.
- Generate Reports: Professional and standardized tender documents and reports can be generated with just a few clicks, and they can be easily exported to Excel.

3.10.2 TBQ Key in Step-By-Step

Alongside with TBQ, other software web such as E-tender is used to make a digital BQ before it was keyed in to the TBQ to create the BQ for a project. Cubicost by Glodon offers an e-Tender system as a key part of its comprehensive digital cost management platform, specifically within the Cubicost TBQ (Take-off Bill of Quantities) software. The e-Tender system is an online platform that digitizes and streamlines the process of tendering for subcontracts on construction projects. It aims to reduce the traditional reliance on paper documents and manual processes, making the entire workflow more efficient, transparent, and accurate. The system facilitates a full digital tendering process from start to finish, which typically includes the following steps:

1. Preparation and Publishing: After tender documents are prepared within Cubicost TBQ, a user can “publish” them with a single click. The system generates a secure, electronic tender submission file.
2. Invitation to Tender: The digital tender documents are then sent to all qualified contractors via email, inviting them to participate in the bid.
3. Online Quoting: Contractors can access a dedicated web-based system to submit their pricing information and complete the bid.
4. Intelligent Evaluation: Once bids are received, the system automatically imports them into the TBQ software. It provides an intelligent analysis and comparison tool, allowing users to quickly:
    a) Compare rates and total amounts from different contractors.
    b) Mark the highest and lowest quotations.
    c) Analyze prices in graphical format.
    d) Sort and filter data to facilitate a fair and efficient evaluation.
5. Awarding the Tender: Based on the evaluation, the user can award the tender to the appropriate contractor directly within the system.

3.10.3 TBQ Operating Experience

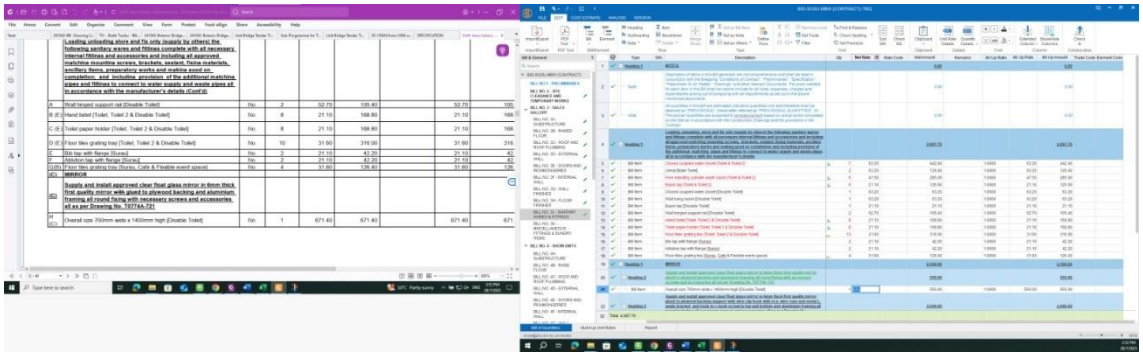


Figure 3. 68 TBQ Key in For Chin Hin Rawang
(Source: Intern’s documentation)

The experience of supporting this project was highly beneficial, providing a clear understanding of the streamlined online process consultants use to handle tender data. This procedure involves meticulously studying each tenderer’s document before inputting the information into the e-Tender web, ultimately allowing for a smooth data

transfer to the TBQ software for the critical step of determining the award for the tenderers.

3.11 Site Visit, Site Meeting

3.11.1 Elaboration

During the ongoing renovation of the historic Carcosa Seri Negara, the firsthand experience of a site visit proved to be an invaluable learning opportunity. At 9 July 2025, with the mentor's accompaniment, the project's progress was able to be witnessed in its physical form, moving beyond the theoretical plans. This visit was crucial for observing the intricate details of the ongoing work, from the structural reinforcements to the careful preservation of heritage elements. Walking through the future spaces allowed for an understanding of the scale and complexity of the renovation that no blueprint or report could accurately convey. It highlighted the tangible challenges faced by the team, providing a real-world context for all subsequent discussions.

Following our inspection of the site, next thing to do was the site meeting, a formal assembly of all key stakeholders. This gathering included representatives from the contractor, Jeram Saga Sdn Bhd, the architect, HLA, and other participating parties. The meeting served as a vital forum for addressing the observations made on site. It was here that practical issues and progress were discussed, with each party providing updates from their respective disciplines. The collaborative environment was key to problem-solving, as challenges—such as unforeseen site conditions or design adjustments—were tackled through direct communication, ensuring that solutions were agreed upon and documented with full consensus.

The seamless flow from the site visit to the site meeting demonstrated the core of effective project management. The visit provided the essential visual evidence and on-the-ground reality check, while the meeting provided the structured platform for communication, decision-making, and accountability. This synergistic process ensures that the project remains on track, mitigating potential risks and maintaining the highest standards of quality. The experience at Carcosa Seri Negara underscored that

successful projects are not merely built by hands, but are carefully navigated through consistent communication and coordinated oversight among all involved parties.

3.12 Interim Valuation (IV)

3.12.1 Elaboration

In the realm of construction project management, interim valuation is a critical process that ensures the financial health and continuity of a project. As construction projects are often large-scale undertakings that span months or even years, it is impractical for a contractor to wait until completion to receive full payment. The purpose of an interim valuation, therefore, is to provide a mechanism for regular, staged payments to the contractor for work that has been completed and materials that have been delivered to the site. This process is central to the role of a Quantity Surveyor (QS), who acts as a crucial link between the client and the contractor to ensure fair and accurate financial administration.

The primary objective of an interim valuation is to maintain a healthy cash flow for the contractor, which in turn prevents financial strain and potential project delays. By receiving periodic payments, the contractor can cover ongoing expenses such as labor wages, material procurement, and overhead costs, thereby sustaining the project's momentum. For the client, this process provides an organized and transparent method of tracking project expenditure, ensuring that payments are directly tied to the physical progress of the work.

The interim valuation process typically begins with the contractor submitting a payment claim (or application for payment) to the Quantity Surveyor on a predetermined date, often monthly. This claim details the value of all work completed and any materials delivered to the site since the last valuation. The Quantity Surveyor's role is then to meticulously review this claim. This involves a comprehensive site inspection to physically verify the work and materials claimed, followed by a detailed measurement and quantification of the progress against the project's Bill of Quantities (BoQ) or other contract documents. The QS must also assess any variations or changes to the original scope of work and account for them accordingly.

Once the QS has assessed the contractor's claim, they prepare an Interim Certificate for the client (often through the contract administrator or architect). This certificate states the amount of money due to the contractor, taking into account any deductions. A common deduction is retention, where a small percentage of the payment is withheld by the client. This serves as a security deposit to guarantee the contractor will remedy any defects that may arise after the project's completion, ensuring quality and accountability. The final payment is then made by the client to the contractor based on the value stated in this certificate.

In summary, the interim valuation is far more than just a financial transaction; it is a systematic and collaborative process that underpins the entire financial framework of a construction project, (Husein & Juma'at, 2023). It provides a transparent, fair, and objective way to manage payments, ensuring that the project proceeds smoothly for both the client and the contractor while mitigating financial risks. Through their expertise in measurement, contract administration, and cost control, the Quantity Surveyor is the key professional who makes this vital process possible.

3.12.2 Creating Interim Valuation

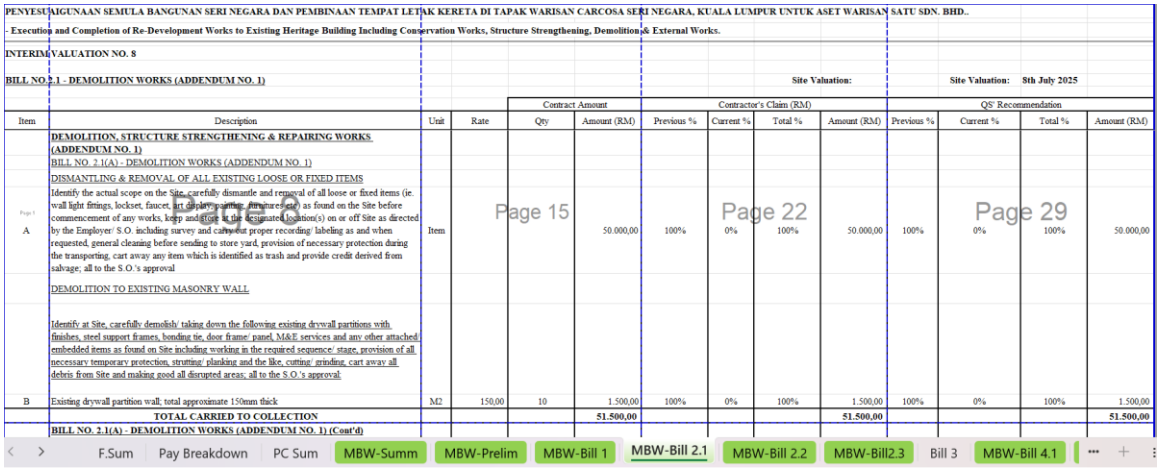
The following is process for creating an Interim Valuation:

Table 3. 7 Step-By-Step on Creating IV

1.	Contractor Submits a Claim	The process begins with the contractor submitting a formal payment claim to the Quantity Surveyor (QS) on a date specified in the contract, typically on a monthly basis. This claim details the value of all work completed and materials delivered since the previous valuation.
2.	Quantity Surveyor Reviews the Claim	The QS meticulously reviews the contractor's claim to verify its accuracy and adherence to the contract terms.
3.	Site Inspection and Verification	The QS conducts a site inspection to physically verify the work that has been completed and the materials that are currently on site.
4.	Measurement and Quantification	The QS performs a detailed measurement and quantification of the work's progress,

	checking it against the Bill of Quantities (BoQ) or other contract documents.
5. Assessment of Variations	Any variations or changes to the original scope of work are assessed and valued, with the costs accounted for in the valuation.
6. Preparation of Interim Certificate	After verifying and adjusting the claim, the QS prepares an Interim Certificate for the client. This document formally states the amount of money due to the contractor for the work completed.
7. Deductions	Any necessary deductions, such as a percentage for retention, are applied to the total amount before the final value is certified.
8. Client Payment	The client makes the payment to the contractor based on the final value specified in the Interim Certificate.

During the internship period, A monthly Interim Valuation for the Carcosa Seri Negara Main Building Renovation was assigned to be updated. The assigned task of maintaining and updating the monthly Interim Valuations, identified by codes such as IV_6, IV_7, and IV_8.



PENYESUAIGUNAAN SEMULA BANGUNAN SERI NEGARA DAN PEMBINAAN TEMPAT LETAK KERETA DI TAPAK WARISAN CARCOSA SERI NEGARA, KUALA LUMPUR UNTUK ASET WARISAN SATU SDN. BHD..
- Execution and Completion of Re-Development Works to Existing Heritage Building Including Conservation Works, Structure Strengthening, Demolition & External Works.

INTERIM VALUATION NO. 8

BILL NO 2.1 - DEMOLITION WORKS (ADDENDUM NO. 1) — Site Valuation: — Site Valuation: 8th July 2025

Item	Description	Unit	Rate	Contract Amount Qty	Contract Amount (RM)	Contractor's Claim (RM) Previous %	Current %	Total %	Amount (RM)	QS' Recommendation Previous %	Current %	Total %	Amount (RM)
	DEMOLITION, STRUCTURE STRENGTHENING & REPAIRING WORKS (ADDENDUM NO. 1)												
	BILL NO. 2.1(A) - DEMOLITION WORKS (ADDENDUM NO. 1)												
	DISMANTLING & REMOVAL OF ALL EXISTING LOOSE OR FIXED ITEMS												
A	Identify the actual scope on the Site, carefully dismantle and removal of all loose or fixed items (ie. wall light fittings, lockset, faucet, art display, paintings, furniture, etc) as found on the Site before commencement of any works, keep and store at the designated location(s) on or off Site as directed by the Employer/ S.O. including survey and carry out proper recording/ labeling as and when requested, general cleaning before sending to store yard, provision of necessary protection during the transporting, cart away any item which is identified as trash and provide credit derived from salvage, all to the S.O.'s approval	Item			50.000,00	100%	0%	100%	50.000,00	100%	0%	100%	50.000,00
	DEMOLITION TO EXISTING MASONRY WALL												
B	Identify at Site, carefully demolish/ taking down the following existing drywall partitions with finishes, steel support frames, bonding tie, door frame/ panel, M&E services and any other attached/ embedded items as found on Site including working in the required sequence/ stage, provision of all necessary temporary protection, strutting/ planking and the like, cutting/ grinding, cart away all debris from Site and making good all disrupted areas; all to the S.O.'s approval: Existing drywall partition wall; total approximate 150mm thick	M2	150,00	10	1.500,00	100%	0%	100%	1.500,00	100%	0%	100%	1.500,00
	TOTAL CARRIED TO COLLECTION				**51.500,00**				**51.500,00**				**51.500,00**
	BILL NO. 2.1(A) - DEMOLITION WORKS (ADDENDUM NO. 1) (Cont'd)												

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F.Sum | Pay Breakdown | PC Sum | MBW-Summ | MBW-Prelim | MBW-Bill 1 | MBW-Bill 2.1 | MBW-Bill 2.2 | MBW-Bill2.3 | Bill 3 | MBW-Bill 4.1

Figure 3. 69 Interim Valuation Document Example
(Source: Intern's documentation)

The file naming convention, such as IV_6, indicates an "Interim Valuation" document, with the numeral signifying the project's corresponding month. Within the document's header, the full project name is stated, along with a detailed description of

the work completed during the relevant month. This is followed by a clear indication of the Interim Valuation's sequential number. Below the header, a table is structured with several key columns. The initial columns, "Item" and "Description", provide a complete account of the work performed, including the associated bill number. This is followed by columns specifying the "Unit" for the unit of measurement and "Rate" for each work item. Subsequently, a column for the "Qty" (Quantity) of each task is included. The next column, labeled "Amount" (in RM), represents the total cost of each item *(Amount = Qty x Rate)*. This total is ultimately aggregated under the heading of Contractor's Amount, which serves as the total claimed price for the work and forms the basis for the contractor's claim.

Following the main work items table, the document features a section dedicated to the contractor's claim, which is presented in a percentage-based format. This section includes three distinct columns:

- Previous (%): This column records the percentage of the contractor's claim that was submitted and approved in the preceding month's valuation.
- Current (%): This column quantifies the percentage of work completed and being claimed by the contractor for the current month in which the Interim Valuation is being prepared.
- Total (%): This final column provides the cumulative percentage by summing the values from the "Previous (%)" and "Current (%)" columns. The purpose of this column is to track the total progress of the project, with the cumulative percentage serving as a correlation benchmark between the contractor's claims from the previous period and the current month.

This structured format allows for a transparent and progressive record of project completion as reflected in the contractor's monetary claims.

This same procedural and percentage-based methodology is also applied to the "QS Recommendation" column. The term "QS recommendation" refers to the amount suggested by the Quantity Surveyor (QS) to be paid to the contractor for work that has

been completed. In short, this is the value approved by the QS after reviewing the contractor's claim.

3.13 Team Coordination and Socialization

3.13.1 Elaboration

Teamwork and effective communication are crucial for the success of any project. The Carcosa Seri Negara team was assisted by the experienced mentor, Amirul Normazli. The main responsibility was to be proactive and responsive, not just in the individual tasks but also in the interactions with the entire team. This proactive approach was key to a smooth workflow, as it's quickly learned that being aggressive in pursuing tasks and staying ready to act on new information made the project more efficient for everyone. It was through this constant readiness that a true contribution was able to be made to the team's momentum, and potential delays were avoided.

Navigating the communication channels was a significant part of the team's coordination. When a project is moving quickly, direct communication is often the most effective method. Regular check-ins were made with the mentor, both in person and via WhatsApp messages, especially when the project was in a rush. This dual-channel approach—formal and informal—allowed the team to rapidly address issues and share critical updates without any lag. Open lines of communication were maintained so that nothing was left to chance, ensuring that the team could quickly pivot or provide new information as needed.

The other role also involved reporting to the senior associate director to seek guidance on any obstacles that has been encountered. This was a valuable learning experience. By actively communicating with a senior member of the team, a deeper understanding of the project's overall strategy and professional challenges was gained. In some cases, questions will be asked, and the expertise of others will be relied upon, This not only helped in professional growth but also ensured that the team's work was aligned with the project's broader goals. This constant cycle of learning, communicating, and taking action was a cornerstone of the team's success.

CHAPTER IV
FOCUSED REVIEW

This chapter presents a specialized review and analysis of the architectural finishes on the Carcosa Seri Negara Link Bridge construction project, which is located at Taman, Persiaran Tuanku Ja'afar, Tasik Perdana, 50480 Kuala Lumpur, Federal Territory of Kuala Lumpur, Malaysia.

This chapter also contains a detailed examination of the process from general and technical data to the materials used, construction methodology, quantity surveying, cost estimation, and scheduling of the architectural finishes of the Carcosa Seri Negara link bridge. Along with more information about the project as well as a systematic workflow, arrangement and analysis and the inclusion of addendum or new items in the most recent BQ. Below is a picture of the site plan and also a picture of the overall floor finishes for the link bridge.

4.1 Data Overview

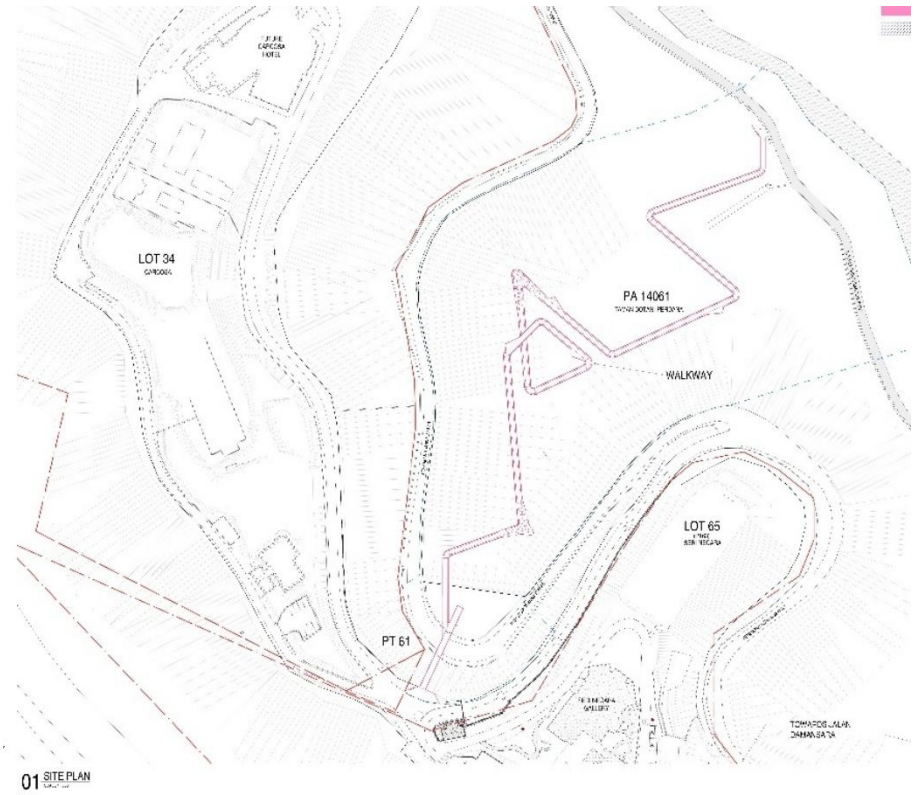


Figure 4. 1 Carcosa Seri Negara Link Bridge Site Plan
(Source: HLA drawing)

Figure 4. 2 Carcosa Seri Negara Link Bridge Project Image Illustration
(Source: HLA drawing)

The Carcosa Seri Negara Link Bridge is an upcoming project designed to connect the main building of Carcosa Seri Negara, which is situated on a hill within the Taman Tasik Perdana area, to the Perdana Botanical Garden. The bridge is approximately 1.2 kilometers long with a width of 1.8 meters per section. Its design is described as both intricate and visually captivating. The Carcosa Seri Negara main building located in Taman, Persiaran Tuanku Ja'afar, Tasik Perdana, 50480 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur, Malaysia. (Malaysia, 2024)

The bridge's construction is intended not only to add to the aesthetic value of the Carcosa Seri Negara site but also according to Sr Samuel Tan, Chief Executive Officer of Olive Tree Property Consultants, to underscore the critical importance of preserving heritage buildings such as Carcosa Seri Negara and the Sultan Abdul Samad Building. (Tan, 2024)

The measurements were chosen to be performed on this project for several compelling reasons. Primarily, this specific project was its main and central focus throughout the internship period, which provided a unique opportunity to gain an in-depth familiarity with its complete workflow, allowing for a comprehensive

understanding of its intricate details and management procedures. Furthermore, this was an exceptionally unusual undertaking for PKT, as it diverged from their typical portfolio of building construction and instead involved the development of a pedestrian bridge in a historic – heritage area. This distinctive nature presented not only a significant professional challenge but also a valuable new learning opportunity, offering a chance to contribute to an unconventional construction project that required a different set of skills and considerations.

4.2 Technical Data

Project Name	: Cadangan Membina Jambatan Laluan Pejalan Kaki Serta Kemudahan Daripada Taman Botani Perdana Ke Bangunan Seri Negara di Atas Sebahagian Lot Pt 63, Off Persiaran Tuanku Jafa'ar Seksyen 60, Dalam Bandaraya Kuala Lumpur
Owner	: Pesuruhjaya Tanah Persekutuan
Developer (Client)	: Aset Warisan Satu Sdn. Bhd.
Project Address	: Taman, Persiaran Tuanku Ja'afar, Tasik Perdana, 50480 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur, Malaysia.
Work Scope	: Architectural Finishes
Working Period	: 10 Months (Estimated)
Contract Type	: PAM Contract 2006
Payment Method	: Monthly Payment
Over All Price	: RM 11.916.844,56 (Est. cost)
Total Bridge Length	: 1,2KM (Finishes only, Estimated)
Building Type	: Link Bridge
Project Manager	: Knight Frank Malaysia Sdn. Bhd.
Civil and Structural Engineer	: SOE Consult Sdn. Bhd.
Architect	: HL Architecture Sdn. Bhd.
Mechanical Electrical	: KVA Consult Sdn. Bhd.

Quantity Surveyor : PKT Quantity Surveying Consultant Sdn. Bhd.

Heritage Architect : CGB Consultant Sdn. Bhd.

4.3 Materials

In the Bill of Quantities (BQ) document, material specifications are typically detailed, which ensured a clear and unambiguous material selection. It was understood that the material standards in Malaysia are specified in great detail, encompassing everything from the material's source and manufacturing method to the precise dimensions required on all sides.

In the architectural finishes work for this link bridge, The identification and measurement of several of the items and materials used was a key responsibility. Below are some examples of the materials used for the link bridge architecture finishes work:

Table 4. 1 Material for Bridge Deck Floor Finishes Detail

BRIDGE DECK
FLOOR FINISHES
Steel Grating
Supply, fabricate, delivery and installation of the overall size 1000mm long (max.) x 1000mm wide x 25mm thick hot dip galvanized serrated welded steel bar grating, consisting of bearing bars 25mm deep × 3mm thick at 30mm center-to-center spacing and cross rods at 100mm center-to-center spacing. Each grating module shall be securely fixed using threaded boss welded to the structural member, with bolts tack welded to M-shape clips after installation and all well leveled and set of 30mm x 30mm G.I steel "L" angle framing fixed into the sides of the concrete slab; 385mm wide x 548 long access panel complete with hinge,latch and locks ;all cut, welded and frames together with all welds filled smooth and fixed in position including all shop and site connections, drilling, grouting, short piece at corners and/or end, fixing accessories,ironmongery, other ancillary and sundry works; all to Architect's approval:
Floor grating, 600mm wide [Bothsides of walkway]
Floor grating [Nodes & Balcony]

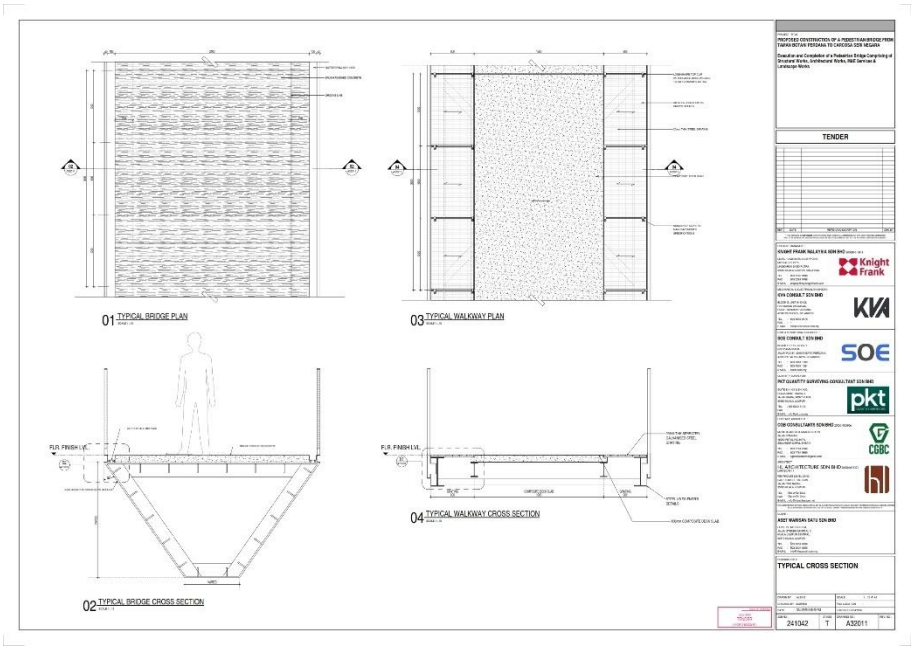


Figure 4. 3 Typical Cross Section Plan Detail Drawing
(Source: HLA drawing)

Table 4. 2 Material ACP for Canopy Roof Detail

CANOPY ROOF
ACP
Approved 4mm (min.) thick aluminium composite panel compliance with MS 2517:2017 coated with PVDF paint or equivalent; pre-fabricated panels to be fastened to extruded aluminium mullion with 12mm (min.) groove between panels, stainless steel or approved other non-rust materials in fittings, fixing accessories, weather strips, brackets, fasteners, silicone sealant, mastics, gaskets, and all other necessary accessories and ancillary works, submission of shop drawings and calculations and other ancillary works to complete the whole installation all in accordance with the specialist's design and specifications and as detailed in Drawing's:
Composite panel as roof covering [Small canopy]
Composite panel as roof covering [Big canopy]

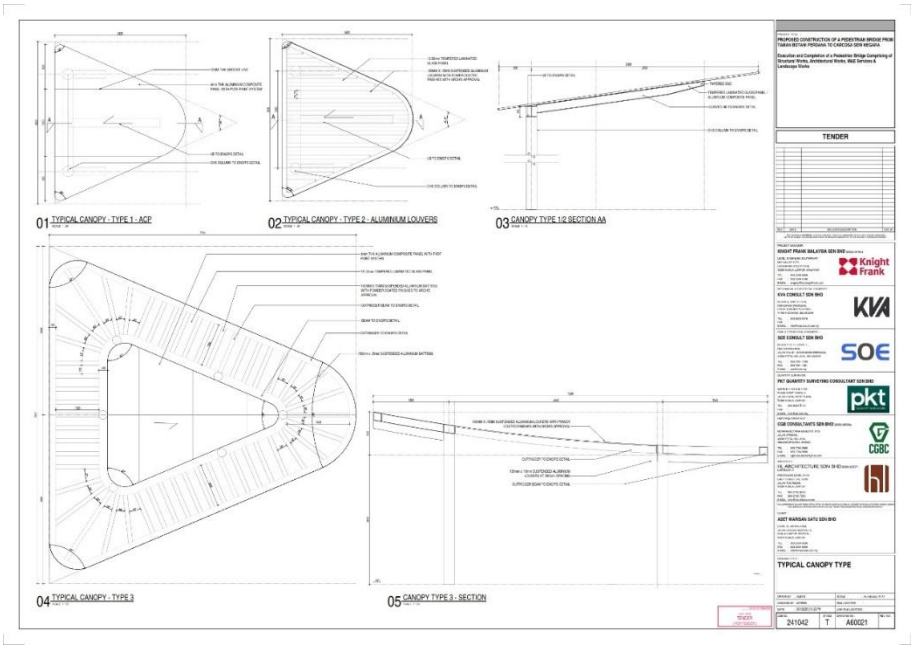


Figure 4. 4 Canopy Detail Drawing
(Source: HLA drawing)

One of the materials used for the canopy roof finishes was Aluminum Composite Panel (ACP). This material was used for the small Type 1 canopies.

Table 4. 3 Material for handrailing detail

HANDRAILING
Handrail comprising 100mm x 8mm thick galvanized flatbar for top & bottom rail; 2 nos of 58mm x 80mm x 8mm thick plate girder galvanized steel at 1500mm spacing as vertical structural member as detailed on Engineer's Drawings; 40mm x 6mm thick flat bar as intermediate baluster in selected metal finish; Railing to include 60mm diameter galvanized steel railing profile and 40mm diameter hot dip galvanized steel railing profile with recessed channel for LED lighting (measured separately) ; All components to be securely fixed to structure using galvanized steel bolt; all cut, welded and frames together with all welds filled smooth and fixed in position including all shop and site connections, drilling, grouting, bends, quadrants, ramps, knees and stop ends, welding, fixing accessories, submission of shop drawings, other ancillary works and fixing accessories to complete whole installation all as detailed on Architect's Drawings
1200mm high (exposed) handrailing

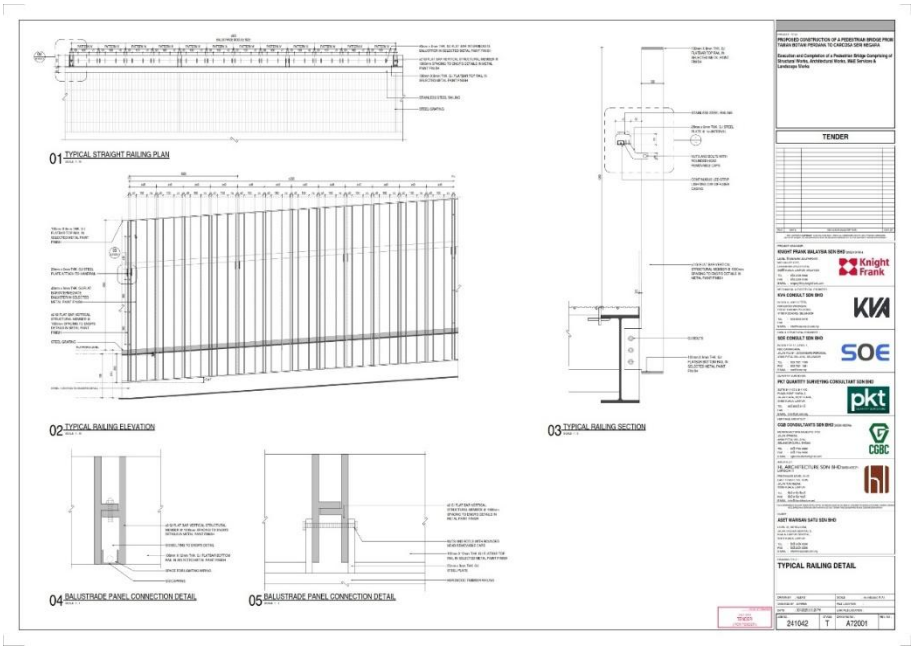


Figure 4. 5 Handrailing Detail Drawing
(Source: Intern's documentation)

4.4 Construction Method

Given that the link bridge project is in its tendering stage and all information remains in a provisional, estimated form, this chapter utilizes the construction methodology that was observed during a site visit for the renovation of the Seri Negara building and it is highly likely that the construction of the link bridge will proceed a construction method that is closely similar to that of the Seri Negara building.

The construction methodology expected for the pedestrian walking link bridge, which connects the Seri Negara building with the Perdana Botanical Gardens, presents a unique challenge, unlike typical building projects. This is primarily attributed to the Seri Negara building's position atop a hill and the bridge's projected route through the dense forests below. From the site visit, it is specifically noted that the ongoing construction of the Seri Negara building utilizes a construction method that highly specialized construction approach.

This project's methodology deviates significantly from conventional building practices, by utilizing materials that are almost entirely pre-fabricated, the project

minimizes the need for extensive on-site labor and material processing. This strategic choice not only ensures adherence to high quality standards but also dramatically reduces the construction duration. Furthermore, the limited site accessibility prevents the use of large-scale heavy equipment, compelling the project to rely on smaller, more agile machinery.

This combination of pre-fabricated components and a minimized workforce results in a remarkably efficient construction timeline. The entire process is streamlined, with on-site work focusing primarily on assembly rather than extensive foundational construction or material preparation. Ultimately, this tailored methodology overcomes the logistical challenges posed by the building's remote location, ensuring the project is completed with a high degree of precision and efficiency.

4.5 Quantity Measurement

4.5.1 Elaboration

In Malaysia, the Standard Method of Measurement, Second Edition (SMM2) serves as the primary standard for Quantity Surveyors (QS) when measuring construction work (THE INSTITUTION OF SURVEYORS, 2000). The use of SMM2 is critical for ensuring transparency, accuracy, and consistency within the country's construction industry. While material specifications are typically outlined in a separate project document, they are intrinsically linked to the Bill of Quantities (BoQ). SMM2 provides guidelines for the meticulous description of materials in the BoQ. For example, instead of a general term like "concrete", it mandates a detailed entry such as "Grade 30 concrete" with specific strength and aggregate specifications. This practice guarantees that contractors use the precise materials that comply with the standards established by the project designers. The document is published by the Royal Institution of Surveyors Malaysia (RISM) and functions as the standard guideline for such procedures:

- The preparation of the Bill of Quantities (BoQ)

  SMM2 establishes a standardized methodology for the measurement, description, and classification of all construction work items.

- Contract and Tendering

  A BoQ prepared using SMM2 ensures a fair and consistent tendering process for contractors, given that all tenderers utilize a standardized basis for their measurements.

Meanwhile, the quantity take-off process for commencing measurement work is conducted meticulously in accordance with the SMM2 rules:

- Review and Analysis of Drawings and Specifications

  The Quantity Surveyor is required to meticulously examine all project drawings including architectural, structural, mechanical, and electrical plans as well as the corresponding specification documents in order to fully understand the project’s overall scope.

- Systematical Measurement

  A systematic approach to measurement is executed by the QS, who meticulously measures each work element using either specialized software (e.g., TAS) or manual methods. For example:

  - The volume of concrete is calculated in cubic meters (m3).
  - The area of plastering work is calculated in square meters (m2).
  - The length of reinforcement bars (rebar) is calculated in linear meters, while their weight is measured in kilograms (kg) or tonnes, depending on the SMM2 guidelines.

- Classification and Description

  Every measured item will be classified and given a clear description in accordance with SMM2, including the material type, dimensions, work method, and location.

- The preparation of the Bill of Quantities (BoQ)

  The calculated quantities are subsequently compiled into a Bill of Quantities (BoQ). This document serves as the foundation for tender bidding and is crucial for effective project cost management.

The primary contract used for building construction in Malaysia is the PAM Contract 2006, a standard form of agreement published by the Malaysian Institute of Architects (Pertubuhan Akitek Malaysia). (PAM, 2006)

This contract is of great significance to a Quantity Surveyor because it provides the legal and procedural foundation for all key tasks, including measurement, valuation, and financial administration, which are crucial for the proper execution of construction projects, such as:

- Determining the Role of the QS

  This contract defines the role and responsibilities of the Quantity Surveyor on a project, such as preparing the Bill of Quantities, evaluating tenders, and certifying payments to the contractor.

- Payment Terms

  Pursuant to the PAM 2006 contract, the Bill of Quantities serves as the foundational document for determining payments owed to the contractor. These payments encompass both interim (progress) payments and the valuation of additional work resulting from variation orders.

- Dispute Mechanism

  This contract also provides a mechanism for resolving disputes related to measurement and payment, which ensures a fair process.

The actual preparation of the schedule and S-curve is primarily carried out by construction management personnel; however, a Quantity Surveyor plays a significant role in determining and creating the schedule and S-curve (Smith & Doe, 2023). Creating S-curve is basically based on the following provisions:

- Scheduling

  The project schedule (for example, using Microsoft Project or Microsoft Excel) is created based on the quantity of work provided by the Quantity Surveyor. For instance, a large volume of concrete will require a longer duration to complete, and this quantity data is used to estimate the time required.

- S-Curve

This is a chart showing the cumulative value of work completed versus time.

  - To create an S-Curve, the quantity data from the BoQ is used to plot the planned S-curve at the beginning of the project.
  - Throughout the project's duration, the Quantity Surveyor will monitor and verify the completed work to plot the actual S-curve).
  - The primary purpose of the S-Curve is to monitor project progress, predict potential issues, and manage cash flow. If the actual S-curve falls below the planned curve, it indicates that the project may be behind schedule or experiencing cost issues.

4.5.2 Practical Aplication

In this section, The quantity measurement for the link bridge's architectural finishes was performed using TAS software, an application that was mastered during the internship. The measurement work conducted with the TAS software was based on the overall floor finishes plan, a document imported in PDF format from the set of received drawings that were originally drafted by the architect.

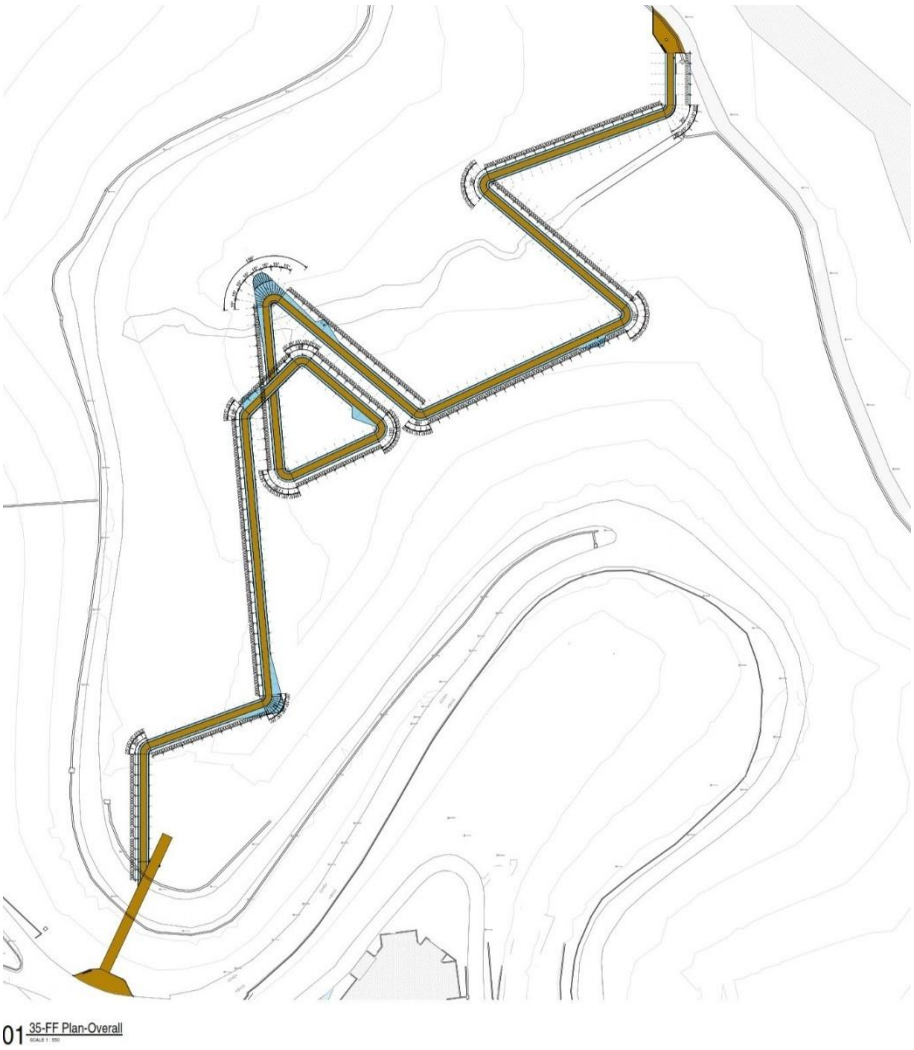


Figure 4. 6 Carcosa Seri Negara Link Bridge Overall Finishes Plan
(Source: HLA drawing)

In the scope of architectural finishes, the initial item quantified was the floor grating work. The measurement for this specific element was performed with direct reference to the construction drawings received from the architect. The measurement of the steel grating on the walkway path was executed in accordance with the established methodological steps, which commence with importing the drawing into the TAS software. This measurement was performed by taking the detailed drawing as the primary benchmark.

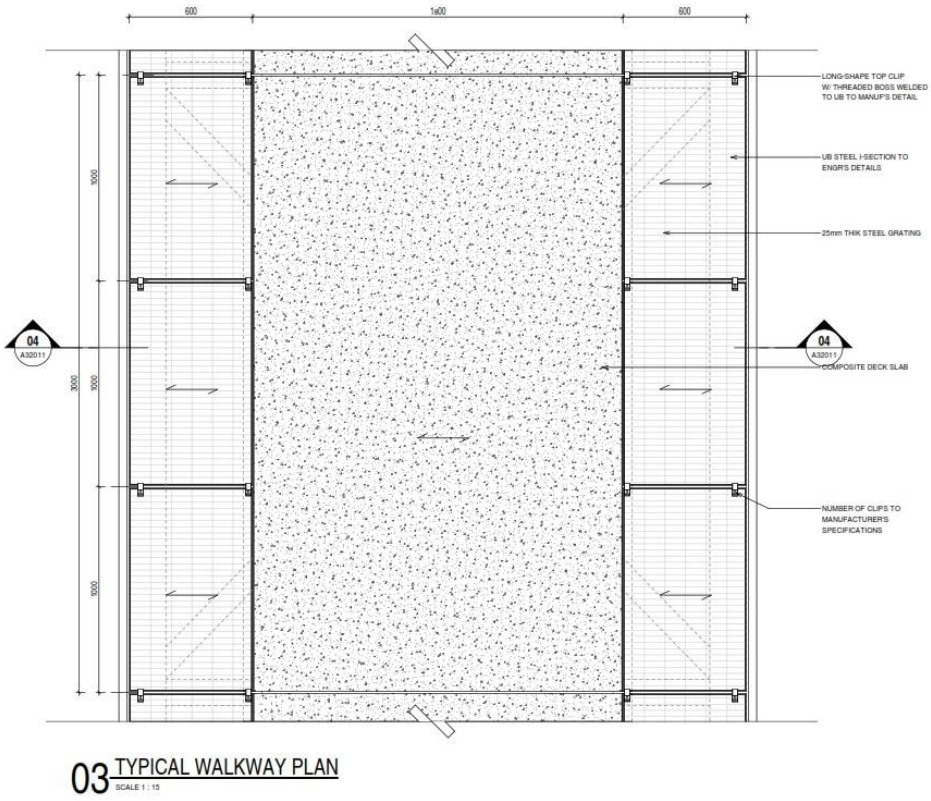


Figure 4. 7 Typical Walkway Plan Detail
(Source: Intern's documentation)

As can be seen from the detailed walkway plan, the steel grating used has a width of 600 cm, with a length equal to the length of the walkway bridge. However, since the material measurement system in SMM2 already specifies material details, including special items with their length and diameter, the measurement of this steel grating is conducted using a single unit of measurement: meters (m). As a result, the measurements extracted from the TAS software are in the following format:

Table 4. 4 Walkway Steel Grating Measurement

	Steel Grating	-			
	Supply, fabricate, delivery and installation of the overall size 1000mm long (max.) x 1000mm wide x 25mm thick hot dip galvanized serrated welded steel bar grating, consisting of bearing bars 25mm deep × 3mm thick at 30mm center-to-center spacing and cross rods at 100mm center-to-center spacing. Each grating module shall be securely fixed using threaded boss welded to the structural member, with bolts tack welded to M-shape clips after installation and all well leveled and set of 30mm x 30mm G.I steel "L" angle framing fixed into the sides of the concrete slab; 385mm wide x 548 long access panel complete with hinge,latch and locks ;all cut, welded and frames together with all welds filled smooth and fixed in position including all shop and site connections, drilling, grouting, short piece at corners and/or end, fixing accessories,ironmongery, other ancillary and sundry works; all to Architect's approval:	-			
A	Floor grating, 600mm wide [Bothsides of walkway]	M	999	300,00	299.700,00

Remarks:

- The first column contains the name of the material being measured: Steel Grating.
- Detailed specifications of the materials used: "Supply, fabricate, delivery and installation of the overall size 1000mm long (max) x 1000mm wide x 25mm thick hot dip galvanized serrated welded steel bar grating, consisting of bearing bars 25mm deep × 3mm thick at 30mm center-to-center spacing and cross rods at 100mm center-to-center spacing. Each grating module shall be securely fixed using threaded boss welded to the structural member, with bolts tack welded to M-shape clips after installation and all well leveled and set of 30mm x 30mm G.I steel "L" angle framing fixed into the sides of the concrete slab; 385mm wide x 548 long access panel complete with hinge, latch and locks; all cut, welded and frames together with all welds filled smooth and fixed in position including all shop and site connections, drilling, grouting, short piece at corners and/or end, fixing

accessories, ironmongery, other ancillary and sundry works; all to Architect's approval:"

- Breakdown of materials used and supporting notes on quantity: "Floor grating, 600mm wide [Bothsides of walkway]" meaning the Steel Grating is to be installed in the Floor Grating and the 600mm width is applicable for each of the walkway sides".
- Unit of measurement column: in this case, meter (M).
- Quantity column for measured materials/work: This quantity to be 999meter for the steel grating.
- Unit price per unit of measurement for calculated materials/work: This is the price of the unit of measurement, which in this case is a price of RM 300.00 per meter of steel grating.
- Total price column, calculated by multiplying the quantity and the unit rate for the measured materials/work: 999meter × RM 300.00 = RM 299.700,00

Based on the example above, it can be clearly and detailedly known that the form of systematic and detailed measurement and BQ (Bill of Quantity) preparation. This process is supported by the convenience gained from using TAS software in measuring construction quantities.

4.6 Cost Estimation

In the process of cost estimation, the action taken after measuring and calculating all materials for each architectural finishes task is to compile the entirety of these calculations into a Bill of Quantity (BQ). A typical BQ generally includes:

- Preliminaries

This is the first major section and contains all the costs that are not directly related to the physical measured works. It covers the general administrative and operational costs of the entire project. This section is usually divided into two parts:

  - General Information and Requirements: This part is for the client's information and is not priced. It includes details about the project, the site location, contractual conditions, and client expectations

- Pricing Schedule: This is where the contractor will insert lump sums for items such as,
    - Site Management: Costs for the project manager, site engineers, and administrative staff.
    - Temporary Works: Costs for temporary roads, fences, scaffolding, and site offices.
    - Health and Safety: Costs for safety measures, first aid, and compliance with regulations.
    - Security and Site Hoardings: Costs for securing the site and any necessary hoardings

- Measured Works

This is the most important part of the BQ and is the main "shopping list" of the project. It breaks down the entire construction work into a series of bill sections, typically organized by trade or building element. Each line item in this section includes:

- Item Number: A unique reference for each item.
- Item Description: A detailed, precise description of the work and materials involved. For example, instead of just "concrete", the description would be "Reinforced concrete grade 30 (20mm aggregate) to ground beam, cast in-situ, including formwork and steel reinforcement".
- Unit of Measurement: The standard unit for measuring the work (e.g., m^2, m^3, kg, number).
- Quantity: The measured quantity of the work item.
- Rate (RM): The price per unit, which the contractor fills in during the tender process.
- Amount (RM): The total cost for the item (Quantity x Rate).

- Provisional Sums and Prime Cost (PC) Sums

This section is for work items where the full scope or cost is not known at the time of tendering.

    - Provisional Sums: These are allowances for work that is not yet fully designed or is entirely unforeseen. For example, a provisional sum might be allocated for a complex drainage solution that will be finalized later.
    - Prime Cost (PC) Sums: These are allowances for materials or work that will be supplied or performed by a nominated sub-contractor. The QS provides a provisional amount for the item, and the contractor only includes their overhead and profit on that amount.
- Daywork Schedule

This is a pricing schedule for work that is impossible to measure accurately or predict in advance, and is paid for based on the time and materials actually used. It specifies the hourly or daily rates for different types of labour (e.g., skilled labour, general labour) and the cost of plant, equipment, and materials.

- Summary

The final section is a summary page that tabulates the totals from all the preceding sections: Preliminaries, Measured Works, and Provisional Sums. This page presents the final tender sum, which is the total price the contractor is bidding for the project.

The following is one of the examples of a Bill of Quantity (BQ) prepared for the architectural finishes work on the Carcosa Seri Negara Link Bridge project:

Table 4. 5 Link Bridge Architectural Finishes Cost Project Estimation

Poject No: 952
Project Name: Carcosa Seri Negara- Botanical Gardens
Canopy Walk Link Bridge

Link Bridge Architectural Finishes Cost Projection Estimation

No.	Description	Cost Estimate (RM)	Month	Cost/Month (RM)
1	FLOOR FINISHES	410.200,00	3	136.733,33
2	HANDRAILING	720.000,00	3,5	205.714,29
3	CANOPY ROOF	112.100,00	4	28.025,00
4	SCUPPER DRAIN	130.350,00	2,5	52.140,00
5	SIGNAGES	82.500,00	2	41.250,00
6	SEATINGS	396.000,00	2,5	158.400,00
7	PORTABLE FOLDABLE SECURITY GATE	10.000,00	2,5	4.000,00
8	PLASTERING & PAINTING	8.710,00	1,5	5.806,67
Total				1.869.860,00

Based on the provided cost project estimation table, the total cost for each architectural finishes item for the link bridge has been determined. These costs include: RM136,733.33 for floor finishes, RM205,714.29 for handrailing, RM28,025.00 for the canopy roof, RM52,140.00 for the scupper drain, RM41,250.00 for signages, RM158,400.00 for seatings, RM4,000.00 for a portable foldable security gate, and RM5,806.67 for plastering and painting. The total cost for all architectural finishes work is calculated to be RM1,869,860.00.

4.7 Scheduling

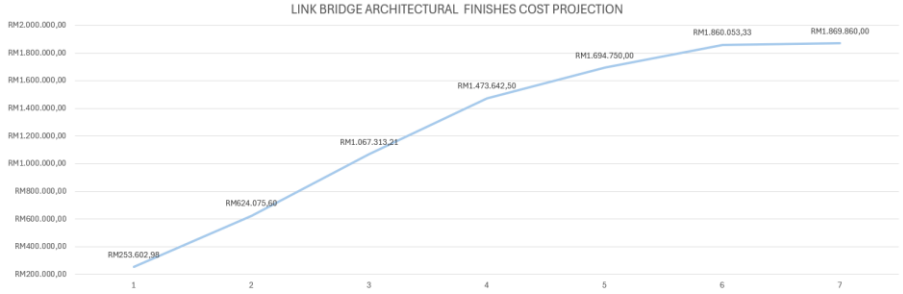
Next step is scheduling phase, after extracting all prices from the Bill of Quantities (BQ), a cumulative cost table is created on a monthly basis. This cumulative cost serves as the primary reference for generating the S-curve. The table includes three key columns for project tracking. The "Month" column details the project's monthly duration, which is approximately seven months in total. The "Monthly Cost" column represents the total expenditure incurred for the work completed during each specific month. Lastly, the "Cumulative Cost" column shows the running total of the project's costs, aggregating the current month's expenditure with the sum of the previous months for example: cumulative cost Month 2 is Month 1 RM253.602,98 + Month 2 RM370.472,62 = RM624.075,60.

Table 4. 6 Link Bridge Cumulative Cost for Scheduling

Month	Monthly Cost (RM)	Cumulative Cost (RM)
Month 1	RM253.602,98	RM253.602,98
Month 2	RM370.472,62	RM624.075,60
Month 3	RM443.237,62	RM1.067.313,21
Month 4	RM406.329,29	RM1.473.642,50
Month 5	RM221.107,50	RM1.694.750,00
Month 6	RM165.303,33	RM1.860.053,33
Month 7	RM9.806,67	RM1.869.860,00

Once the cumulative cost table is finalized, the S-curve is then created. The data for constructing the S-curve is sourced exclusively from the cumulative cost figures. Next, detailed monthly notations are added to the curve, followed by plotting the curve line that characteristically forms an S-shape to visually represent the project's progress.

Table 4. 7 Link Bridge 7 Months Duration S Curve



CHAPTER V
CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Based on the experience gained during the approximately three-month internship conducted at PKT Quantity Surveying Consultant Sdn. Bhd, From this international placement, several conclusions are able to be drawn:

- Valuable international work experience

  By working abroad, unique perspective on the international QS field is gained, with different professional practices and problem-solving methods being observed. The exposure demonstrates initiative and a global mindset, giving it a competitive edge. More than just a line on a resume, international experience fosters personal growth by building independence and self-confidence. It's a transformative journey that shapes into a more capable, culturally aware, and well-rounded professional.

- In-depth understanding and practical experience of the role of a Quantity Surveyor consultant in the construction industry

  Upon learning from college with a theoretical understanding of the Quantity Surveyor's role, the international internship provided the invaluable opportunity to apply this knowledge. This experience not only allowed for the implementation of what had been learned in a practical setting but also introduced new concepts and skills not covered in the academic curriculum. The implementation of digital tools to perform the quantity take-off process, in addition to other software suites like Cubicost Glodon TAS, TRB, and TBQ, which are integral to modern construction and cost management workflows.

- The establishment of a collaborative network and positive relationships with co-workers

  Beyond simply facilitating efficient task completion, a strong collaborative network is just as important to support the teamwork. Consequently, it is recognized that communication is the most critical element for effective teamwork.

Regardless of the difficulty or the challenges encountered within a project, a viable solution must be found through collaborative effort and consistent communication.

5.2 Suggestions

This document outlines a series of recommendations intended for various parties. Suggestions are addressed to the academic institution/department and the company that facilitated the internship, and personal guidance is also provided.

1. To further enhance the quality of the program and better prepare students for professional careers, it is recommended that the faculty and department establish a clear and definitive timeline for all internship-related activities. Providing students with a firm schedule will allow them to plan effectively, particularly for international placements which require significant logistical and preparatory work. Furthermore, the university and department should strengthen their pre-internship support, providing more robust training and guidance to students, especially those undertaking international internships. This preparation should include professional development, cultural sensitivity training, and an introduction to global industry standards. Finally, to ensure students are equipped with up-to-date skills, it is imperative that the curriculum integrates advanced software widely used in developed nations for Quantity Surveying. Enhancing the use of these industry-standard tools will not only complement theoretical learning but also significantly improve the students' practical skills and marketability upon graduation.
2. To ensure a smoother and more productive experience for future international interns, it is highly recommended that the company enhance its preparatory procedures. A more structured approach would involve providing comprehensive information on administrative processes, living arrangements, and cultural expectations well in advance of the intern's arrival. Furthermore, assigning a dedicated mentor and outlining a clear project scope from the outset would greatly assist in the intern's professional integration and productivity. By proactively addressing these logistical and professional needs, the company can facilitate a more seamless transition for international interns, allowing them to focus on their

work and contribute more effectively, ultimately leaving a lasting positive impression and strengthening the company's global reputation.

3. Last but not least, the intent is to focus on several key areas to enhance professional development. A commitment to fostering a more proactive approach to teamwork was demonstrated by actively seeking opportunities to contribute ideas and take initiative on collaborative projects. Concurrently, the meticulousness of the work will be improved, ensuring a higher level of accuracy and thoroughness in all tasks undertaken. Finally, time will be dedicated outside of core duties to continuously expand the knowledge base within the Quantity Surveying field, complementing practical experience with theoretical learning to achieve a more comprehensive understanding of the industry.

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APPENDICES

TAKE OFF

No.	Decription	Unit	Qty
	Floor Finishes		
	Steel Grating		
1	Floor grating, 600mm wide [Bothsides of walkway]	m	999
2	Floor grating [Nodes & Balcony]	m2	204
	Handrailing		
1	1200mm high (exposed) handrailing	m	1200
	Canopy Roof		
	ACP		
1	Composite panel as roof covering [Small canopy]	m2	37
2	Composite panel as roof covering [Big canopy]	m2	16
	Louvers Screen		
1	Suspended louvers screen [Small canopy]	m	210
2	Suspended louvers screen [Big canopy]	m	97
	Laminated Glass Panel		
1	Roof covering in 8° pitch [Small Canopy]	m2	35
2	Roof covering [Big Canopy]	m2	29
	Scupperdrain		
	Gutter drain		
1	100mm wide x 95mm deep metal sheet gutter drain	m	79
	Drip Edge Flashing		
1	G.I drip edge flashing fixed to gutter drain	m	79
	Signages		
1	900mm x 300mm x 4mm thick aluminium plate with laser etching and CNC cut out fixed to existing railing [Information Signage Small]	No	3
2	1500mm x 1700mm x 12mm thick folded aluminium panel with laser etching and CNC cut out with concrete base [Information Signage Big]	No	2
3	500mm x 70mm x 4mm thick aluminium plated with laser etching and CNC cut out fixed to existing railing [Distance Signage]	No	11
4	500mm x 70mm x 4mm thick aluminium plated with laser etching and CNC cut out fixed to exisiting railing [Directional Signage]	No	4
5	2700mm x 1200mm aluminium signage mounted to existing steel grating [Entrance Sign]	No	2
	Seatings		
1	Floor mounted seating	No	132
	Portable Foldable Security Gate		
1	Portable folding security gate [Entrance & Landing Area]	No	2
	Plastering & Painting		
1	20mm thick plainface to parapet wall	m2	41
2	Plastered surfaces of parapet wall	m2	41

CANOPY ARCHITECTURAL
NODE 1&2
CANOPY (BIG)

Classification Condition		Quantity	
Floor	Name	Girth(m)	Area(m2)
TYPICAL CANOPY TYPE	canopy ACP (BIG)	11,780	7,961
Total		11,780	7,961

Classification Condition		Quantity	
Floor	Name	Length(m)	Volume(m3)
TYPICAL CANOPY TYPE	SUSP ALUM LOUVER (BIG)	48,709	0,487
Total		48,709	0,487

Classification Condition		Quantity	
Floor	Name	Girth(m)	Area(m2)
TYPICAL CANOPY TYPE	GLASS PANEL (BIG)	39,356	14,687
Total		39,356	14,687

CANOPY TYPE (big)			
ACP			
area (m2)	no	total	
7,961	2	15,922	
Aluminium louvers			
total length (m)	no	total	
48,709	2	97,418	
13.52mm TEMPERED LAMINATED GLASS PANEL			
area (m2)	no	total	
14,687	2	29,374	corrected

SMALL CANOPY
CANOPY (small, ACP)

Classification Condition		Quantity	
Floor	Name	Girth(m)	Area(m2)
TYPICAL CANOPY TYPE	CANOPY (SMALL) ACP	8,735	4,577
Total		8,735	4,577

CANOPY (small ACP)			
ACP finishes (area)	no	total	
4,577	8	36,616	corrected

CANOPY (small, alum louvers)

Classification Condition		Quantity	
Floor	Name	Length(m)	Volume(m3)
TYPICAL CANOPY TYPE	susp alum louver (small)	26,277	0,003
Total		26,277	0,003

Classification Condition		Quantity	
Floor	Name	Girth(m)	Area(m2)
TYPICAL CANOPY TYPE	CANOPY SMALL AL GP	8,733	4,315
Total		8,733	4,315

CANOPY (small alum louv)				
Aluminium louvers	length	no	total	
	26,277	8	210,216	m
13.52mm tempered laminated glass panel	area	no	total	
	4,315	8	34,52	m2

100mm THK CONCRETE GRADE 35

C35: This indicates that the concrete can withstand a compressive strength of 35 MPa (megapascals) after 28 days of curing

PAV2 concrete (also known as C35) **is used for sustained heavy loads**, which makes it an ideal concrete mix for slabbing and heavy-duty paving.

Classification Condition				Quantity						
Floor	Concrete Grade	Entity Type	Thickness	Volume(m3)	Area(m2)	Area of formwork to soffit(<=3.5m)(m2)	Length of formwork to edge and break of slab in stages(0~0.25m)(m)	Weight of rebar(kg)	Number(pc)	
BRIDGE DECK FINISH	C35	Curved	100	96,692	966,925	966,925	1083,326	4834,623	6	
		Horizontal	100	15,229	152,293	148,063	113,535	761,464	3	
Total				111,921	1119,218	1114,988	1196,861	5596,087	9	updated
							1,197km = 1,2km			

100mm thk concrete G35 (bridge)

Classification Condition				Quantity						
Floor	Concrete Grade	Entity Type	Thickness	Volume(m3)	Area(m2) *BRC wiremesh	Area of formwork to soffit(<=3.5m)(m2)	Length of formwork to edge and break of slab in stages(0~0.25m)(m)	Weight of rebar(kg)	Number(pc)	
BRIDGE DECK FINISH bridge	C35	Horizontal	100	12,919	129,193	129,193	87,869	645,967	1	
Total				12,919	129,193	129,193	87,869	645,967	1	updated
							0,0879 kilometer			

100mm thk concrete G35 (walkway)

Classification Condition				Quantity						
Floor	Concrete Grade	Entity Type	Thickness	Volume(m3)	Area(m2) *BRC wiremesh *floordeck formwork	Area of formwork to soffit(<=3.5m)(m2)	Length of formwork to edge and break of slab in stages(0~0.25m)(m)	Weight of rebar(kg)	Number(pc)	
BRIDGE DECK FINISH walkway	C35	Curved	100	96,692	966,925	966,925	1083,326	4834,623	6	
		Horizontal	100	2,310	23,099	18,870	25,666	115,497	2	
Total				99,002	990,024	985,795	1108,992	4950,120	8	updated

BRC A9 WIREMESH bridge

Classification Condition		Quantity
Floor	Name	Area(m2) concrete G35 REF
	BRC A9 WIRE MESH (T)	129,193
Total		129,193

BRC A9 WIREMESH walkway

Classification Condition		Quantity
Floor	Name	Area(m2) concrete G35 REF
*also applies to formwork	BRC A9 WIRE MESH (T)	990,024
Total		990,024

RC KERB 250(h)

Classification Condition		Quantity				
Floor	Name	Volume(m3)	Area of formwork(m2)	Length of centerline(m)	Area(m2)	Weight of rebar(kg)
BRIDGE DECK FINISH	RC KERB	0,658	11,548	17,535	4,384	13,151
Total		0,658	11,548	17,535	4,384	13,151

SCUPPERDRAIN

Classification Condition		Quantity	
Floor	Name	Length(m)	Volume(m3)
241042-Botanic Bridge-pdf-Sheet - A35001 - OVERALL FLOOR FINISHES PLAN	SCUPPERDRAIN	79,030	0,790
Total		79,030	0,790

STEEL GRATING (M)

Classification Condition		Quantity	
Floor	Name	Length(m)	Volume(m3)
BRIDGE DECK FINISH	STEEL GRATING (M)	999,622	14,994
Total		999,622	14,994

ddt opening(area)	0,131	
TOTAL	999,491	

STEEL GRATING (M2)

Classification Condition		Quantity	
Floor	Name	Girth(m)	Area(m2)
BRIDGE DECK FINISH	STEEL GRATING (m2)	225,640	203,856
Total		225,640	203,856

ddt opening(area)	0,269	
TOTAL	203,587	

OPENING

to be ddt from steel grating

Classification Condition		Quantity	
Floor	Name	Girth(m)	Area(m2)
241042-Botanic Bridge-pdf-Sheet - A35001 - OVERALL FLOOR FINISHES PLAN	OPENING	3,811	0,400
Total		3,811	0,400

from steel grating (m)
0,131
from steel grating (area m2)

HANDRAILING		
Classification Condition		Quantity
Floor	Name	Length(m)
241042-Botanic Bridge-pdf-Sheet - A35001 - OVERALL FLOOR FINISHES PLAN	HANDRAIL	1200,013
Total		1200,013

PARAPET WALL CONCRETE

Classification Condition						Quantity						
Floor	Material	Concrete Grade	Entity Type	Thickness	Name	Volume(m3)	Area of formwork(m2)	Length of formwork to edge and break in stages(0~0.25m)(m)	Area(m2)	Weight of rebar(kg)	Number(pc)	Net length of wall(m)
241042-Botanic Bridge-pdf-Sheet - A35001 - OVERALL FLOOR FINISHES PLAN	In-situ Concrete	C30	Curved	200	1000mm H PARAPET WALL	0,543	5,435	2,000	2,717	16,304	3	2,717
			Vertical	200	1000mm H PARAPET WALL	3,125	31,251	2,000	15,625	93,753	6	15,625
Total						3,669	36,685	4,000	18,343	110,056	9	18,343

PARAPET WALL FINISH

Classification Condition				Quantity	
Floor	Name	Associated Room	Parent Entity Attribute Value	Area of finish to wall finish(m2)	Area of finish to concrete surface(m2)
241042-Botanic Bridge-pdf-Sheet - A35001 - OVERALL FLOOR FINISHES PLAN	WALL PLASTER & PAINT	[Null]	[Null]	41,159	41,159
Total				41,159	41,159

SEATING	
no	132

SIGNAGE & DIRECTORY		
CODE	DESC	QTY
E.INS - INFORMATION SIGNAGE SMALL	900mm (W) x 300mm (D) x 4mm thk aluminium plate with laser etching and CNC cut out fixed to existing railing	3
E.INB - INFORMATION SIGNAGE BIG	1500mm (W) x 1700mm (D) 12mm thk folded aluminium panel with laser etching and CNC cut out with concrete base	2
E.DIS - DISTANCE SIGNAGE	500mm (W) x 70mm (D) x 4mm thk aluminium plated with laser etching and CNC cut out fixed to existing railing	11
E. DIR - DIRECTIONAL SIGNAGE	500mm (W) x 70mm (D) x 4mm thk aluminium plated with laser etching and CNC cut out fixed to existing railing	4
E.ENT - ENTRANCE SIGN	2700mm (W) x 1200 (H) aluminium signange mounted to existing steel grating	2

BQ952-LB	BILL NO. 6(A) - ARCHITECTURAL WORKS (ADDENDUM NO. 1)					
Item	**Description**	**Unit**	**Qty**	**Rate**	**Amount**	
(A)	**BILL NO. 6(A) - ARCHITECTURAL WORKS**					
	(ADDENDUM NO. 1)					
	BRIDGE DECK					
	FLOOR FINISHES					
	Steel Grating					
	Supply, fabricate, delivery and installation of the overall size 1000mm long (max.) x 1000mm wide x 25mm thick hot dip galvanized serrated welded steel bar grating, consisting of bearing bars 25mm deep × 3mm thick at 30mm center-to-center spacing and cross rods at 100mm center-to-center spacing. Each grating module shall be securely fixed using threaded boss welded to the structural member, with bolts tack welded to M-shape clips after installation and all well leveled and set of 30mm x 30mm G.I steel "L" angle framing fixed into the sides of the concrete slab; 385mm wide x 548 long access panel complete with hinge,latch and locks ;all cut, welded and frames together with all welds filled smooth and fixed in position including all shop and site connections, drilling, grouting, short piece at corners and/or end, fixing accessories,ironmongery, other ancillary and sundry works; all to Architect's approval:					
A	Floor grating, 600mm wide [Bothsides of walkway]	M	999	300,00	RM	299.700,00
B	Floor grating [Nodes & Balcony]	M2	204	500,00	RM	102.000,00
C	385mm x 548mm access panel	No.	11	500,00	RM	5.500,00
D(A)	200mm (approximate) diameter cut out for CCTV post	No.	6	500,00	RM	3.000,00
	TOTAL CARRIED TO COLLECTION				RM	410.200,00
	HANDRAILING					
(A)	**Handrail comprising 100mm x 8mm thick galvanized flatbar for top & bottom rail; 2 nos of 58mm x 80mm x 8mm thick plate girder galvanized steel at 1500mm spacing as vertical structural member as detailed on Engineer's Drawings; 40mm x 6mm thick flat bar as intermediate baluster in selected metal finish; Railing to include 60mm diameter galvanized steel railing profile and 40mm diameter hot dip galvanized steel railing profile with recessed channel for LED lighting (measured separately) ; All components to be securely fixed to structure using galvanized steel bolt; all cut, welded and frames together with all welds filled smooth and fixed in position including all shop and site connections, drilling, grouting, bends, quadrants, ramps, knees and stop ends, welding, fixing accessories, submission of shop drawings, other ancillary works and fixing accessories to complete whole installation all as detailed on Architect's Drawings**					
A	1200mm high (exposed) handrailing	M	1200	600,00	RM	720.000,00
	TOTAL CARRIED TO COLLECTION				RM	720.000,00

	CANOPY ROOF					
	ACP					
	Approved 4mm (min.) thick aluminium composite panel compliance with MS 2517:2017 coated with PVDF paint or equivalent; pre-fabricated panels to be fastened to extruded aluminium mullion with 12mm (min.) groove between panels, stainless steel or approved other non-rust materials in fittings, fixing accessories, weather strips, brackets, fasteners, silicone sealant, mastics, gaskets, and all other necessary accessories and ancillary works, submission of shop drawings and calculations and other ancillary works to complete the whole installation all in accordance with the specialist's design and specifications and as detailed in Drawing's:					
B	Composite panel as roof covering [Small canopy]	M2	37	425,00	RM	15.725,00
C	Composite panel as roof covering [Big canopy]	M2	16	425,00	RM	6.800,00
	Approved 4mm (min.) thick aluminium composite panel compliance with MS 2517:2017 coated with PVDF paint or equivalent; pre-fabricated panels to be fastened to extruded aluminium mullion with 12mm (min.) groove between panels, stainless steel or approved other non-rust materials in fittings, fixing accessories, weather strips, brackets, fasteners, silicone sealant, mastics, gaskets, and all other necessary accessories and ancillary works, submission of shop drawings and calculations and other ancillary works to complete the whole installation all in accordance with the specialist's design and specifications and as detailed in Drawings: (Cont'd)					
A	Allow for providing and submitting ten (10) years written warranty commencing from the issuance date of Certificate of Practical Completion in the joint names of the Manufacturer and Main Contractor for the whole of Aluminium Composite Panel against all defects in materials and workmanship. The warranty/guarantee shall cover the cost of making good any defect/faults at the Contractor's own cost including cost to rectify any damaged/affected ancillary and surrounding works. The written format and contents of Warranty/Guarantee Letter shall be in the accordance with the format as shown on Appendix M	Item	-			
	Louvers Screens					
(A)	**The following are the powder coated (min. 65 micron) 150mm x 75mm suspended aluminium louvers each spaced at the required spacing and all welded to the RHS horizontal braces; including all cut, bracket/clip, anchorage bolts, drilling, grouting, stop end, making good to all disrupted areas; all other required fixing accessories, ancillary and sundry works; all to the Architect's approvals:**					
B	Suspended louvers screen [Small canopy]	M	210	125,00	RM	26.250,00
C	Suspended louvers screen [Big canopy]	M	97	125,00	RM	12.125,00
	Laminated Glass Panel					
	Total 13.52 thick laminated tempered glass; cut to recommend panes/sizes and fixed to canopy framing system (measured separately) including aluminium weather bar with TPE bubble gasket seal running between glazing bars clipped over fixing plate:					
A	Roof covering in 8° pitch [Small Canopy]	M2	35	800,00	RM	28.000,00
B	Roof covering [Big Canopy]	M2	29	800,00	RM	23.200,00
	TOTAL CARRIED TO COLLECTION				RM	112.100,00

	SCUPPER DRAIN					
	Gutter Drain					
	Supply, fabricate, deliver and installation of the 100mm wide x 95mm deep 0.55 BMT folded galvanised metal sheet with fall @ 1:400 gradient to form a gutter, other ancillary and sundry works; all to the Architect's approval:					
C	100mm wide x 95mm deep metal sheet gutter drain	M	79	1000,00	RM	79.000,00
	Drip Edge Flashing					
	Supply and install approved galvanised steel drip edge flashing as perimeter frame and well levelled into concrete; all cut, welded and frame together with all welds filled smooth:					
D	G.I drip edge flashing fixed to gutter drain	M	79	650,00	RM	51.350,00
	TOTAL CARRIED TO COLLECTION				RM	130.350,00
	SIGNAGES					
E	900mm x 300mm x 4mm thick aluminium plate with laser etching and CNC cut out fixed to existing railing [Information Signage Small]	No.	3	3500,00	RM	10.500,00
F	1500mm x 1700mm x 12mm thick folded aluminium panel with laser etching and CNC cut out with concrete base [Information Signage Big]	No.	2	9000,00	RM	18.000,00
G	500mm x 70mm x 4mm thick aluminium plated with laser etching and CNC cut out fixed to existing railing [Distance Signage]	No.	11	2000,00	RM	22.000,00
H	500mm x 70mm x 4mm thick aluminium plated with laser etching and CNC cut out fixed to exisiting railing [Directional Signage]	No.	4	2000,00	RM	8.000,00
I	2700mm x 1200mm aluminium signage mounted to existing steel grating [Entrance Sign]	No.	2	12000,00	RM	24.000,00
J(A)	Overall height 2500 mm post with directional signage to Seri Negara walkway, complete with fixings, finishes, and all necessary accessories.	No.	30			
	TOTAL CARRID TO COLLECTION				RM	82.500,00
(A)	**SEATINGS**					
(A)	**460mm height seating in triangular shape with 24mm thick "LAMBARDO STONE" finish or equivalent to architect approval, adhered to 3mm thick steel plate welded to grating panels complete with bearing bar and cross bar ; all cut, welded and frames together with all welds filled smooth and fixed in position including all shop and site connections, drilling, grouting, bends, quadrants, ramps, knees and stop ends, welding, fixing accessories, submission of shop drawings, other ancillary works and fixing accessories to complete whole installation all as detailed on Architect's Drawings:**					
E(A)	Floor mounted seating	No.	132	3000,00	RM	396.000,00
	TOTAL CARRIED TO COLLECTION				RM	396.000,00

(A)	**PORTABLE FOLDABLE SECURITY GATE**					
(A)	**Supply and deliver portable foldable security gate, heavy-duty steel construction with powder-coated finish, approximately 3000 mm span, complete with handle, lockable mechanism, and smooth-rolling wheels with brakes. Suitable for temporary access control and easy relocation; all to the Architect's approval:**					
F(A)	Portable folding security gate [Entrance & Landing Area]	No.	2	5000,00	RM	10.000,00
	TOTAL CARRIED TO COLLECTION				RM	10.000,00
	PLASTERING & PAINTING					
(A)	**Cement and sand (1:3) plastering with an approved plasticiser in two coats with a wood float finish:**					
A(A)	20m thick plainface to column; circular on plan	M2	26	80,00	RM	2.080,00
B(A)	20mm thick plainface to parapet wall	M2	41	80,00	RM	3.280,00
	Prepare and apply "NIPPON" or approved equivalent weathershield emulsion paint with spray textured coating comprises of one coat of "NIPPON VINILEX 5100 Wall Sealer" alkalinity and efflorescence resistant styrene arylic water based primer and two finishing coats of "NIPPON Weatherbond Advance" low VOC fungus, algae, chalking and flaking resistant pure acrylic based paint in selected colour(s) including all preparatory works on:					
C(A)	Plastered surfaces of column; circular on plan	M2	26	50,00	RM	1.300,00
D	Plastered surfaces of parapet wall	M2	41	50,00	RM	2.050,00
E(A)	Allow for providing and submitting Ten (10) years written warranty commencing from the issuance date of Certificate of Practical Completion in the joint names of the Manufacturer and Main Contractor for the whole of the external painting system measured in this Bill section against all defects in materials and workmanship. The warranty/guarantee shall cover the cost of making good any defect/faults at the Contractor's own cost including cost to rectify any damaged/affected ancillary and surrounding works. The written format and contents of Warranty/Guarantee Letter shall be in accordance with the format as shown on Appendix 'M'.	Item	-			
	TOTAL CARRIED TO COLLECTION				RM	8.710,00
	ANY OTHER WORKS					
	Provision for any other item/ work which is not described/ identified in this Schedule of Works however is shown on any other part(s) of Contract Document and/ or found on the Site as well as any item/ work is necessity for the proper execution and completion of the works under the Contract: (Please state on below with unit rate and prices of the item/work otherwise it shall be deemed that the Contractor has included in his prices for all necessary works required under this Contract and any claim for variation and/ or extension of time shall not be considered whatsoever)					
A(A)	(i)		Item	-		
B(A)	(ii)		Item	-		
C	(iii)		Item	-		
D	(iv)		Item	-		
E	(v)		Item	-		
TOTAL CARRIED TO FINAL SUMMARY					RM	1.869.860,00

Poject No:	952				
Project Name:	Carcosa Seri Negara- Botanical Gardens Canopy Walk Link Bridge				

Link Bridge Architectural Finishes Cost Projection Estimation

No.	Description	Cost Estimate (RM)	Month	Cost/Month (RM)
1	FLOOR FINISHES	410.200,00	3	136.733,33
2	HANDRAILING	720.000,00	3,5	205.714,29
3	CANOPY ROOF	112.100,00	4	28.025,00
4	SCUPPER DRAIN	130.350,00	2,5	52.140,00
5	SIGNAGES	82.500,00	2	41.250,00
6	SEATINGS	396.000,00	2,5	158.400,00
7	PORTABLE FOLDABLE SECURITY GATE	10.000,00	2,5	4.000,00
8	PLASTERING & PAINTING	8.710,00	1,5	5.806,67
	Total	1.869.860,00		

	0,15		0,15		0,2		0,2		0,2		0,05		0,05
Month 1		Month 2		Month 3		Month 4		Month 5		Month 6		Month 7	
	136.733,33		136.733,33		136.733,33								
	102.857,14		205.714,29		205.714,29		205.714,29						
	14.012,5		28.025,00		28.025,00		28.025,00		14.012,50				
					52.140,00		52.140,00		26.070,00				
						20.625,00	41.250,00		20.625,00				
							79.200,00			158.400,00		158.400,00	
										2.000,00		4.000,00	4.000,00
												2.903,33	5.806,67
	253.602,98		370.472,62		443.237,62		406.329,29		221.107,50		165.303,33		9.806,67

Month	Monthly Cost (RM)	Cumulative Cost (RM)
Month 1	RM253.602,98	RM253.602,98
Month 2	RM370.472,62	RM624.075,60
Month 3	RM443.237,62	RM1.067.313,21
Month 4	RM406.329,29	RM1.473.642,50
Month 5	RM221.107,50	RM1.694.750,00
Month 6	RM165.303,33	RM1.860.053,33
Month 7	RM9.806,67	RM1.869.860,00