



PROGRAMME IN BUILDING SURVEYING
DEPARTMENT OF BUILT ENVIRONMENT STUDIES AND TECHNOLOGY
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA
PERAK BRANCH
SERI ISKANDAR CAMPUS

QLASSIC AUDIT AND INSPECTION
(Single Storey House Project at Seri Iskandar, Perak)

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BACHELOR OF BUILDING SURVEYING (HONS.)

PRACTICAL TRAINING REPORT

FEBRUARY 2022

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This practical training report is fulfilment of the practical training course.

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ACKNOWLEDGEMENT

I would like to express the deepest appreciation to my lecturer, Sr. Dr Suriani binti Ngah Abdul Wahab, who has the attitude and the substance of a genius, continually and convincingly conveyed a spirit of adventure in regard to research and an excitement in regard to teaching. Without her guidance and persistent help, this report would not have been possible.

I would also like to thank all my other lecturers, who taught me in the past semester. They demonstrated to me the objectives of Quality Assessment System in Construction (QLASSIC), the concern for building maintenance and how to overcome the defect in the building, safety aspects in the building and even showing how to use tools and equipment for maintenance works.

Also special thanks to Mr. Ho Wen Yan, the Chief Executive Officer of Hua Yang Berhad, for giving me the opportunity to undergo a practical training at his company for 4 months. I also want to show my gratitude to Puan Eliana binti Mahmud, En. Mahdi bin Amil and Amirul Syahfarin bin Hussain, who gave me countless information and advice regarding the QLASSIC assessment on 82 units of house. A lot of appreciation to them for guiding and teaching me on the usage of tools and equipment, the code for defects and, the flow and procedure during the QLASSIC assessment. Not forgotten to all the staff of Agro-Mod Industries Sdn. Bhd. that has been friendly and helped me during my internship.

Last but not least, special thanks to my friends and family for supporting me and giving me a lot of advice and motivational tips to ensure me finishing my practical training report within the deadline. They have helped me in many ways including giving me the proper guideline and information on how to create an excellent report.

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CHAPTER 1

1.1 COMPANY INTRODUCTION

Hua Yang Berhad has come a long way from its first eight four-storey shops at Jalan Gopeng, Ipoh. Today, the Group consistently delivers quality, affordable, integrated townships, high-rise residential projects and commercial lots across the nation.

With over 21,229 properties worth RM5.145 billion completed across the nation, the company has honed and refined its skills in identifying areas within established and thriving districts to successfully introduce its concept of affordable lifestyle accommodation. Hua Yang currently has developments in Klang Valley, Johor, Perak, Negeri Sembilan, and Penang and is recognised as one of the nation's leading property developers in the affordable home segment. This is a testament to their dedicated workforce and the close rapport Hua Yang has built with its customers.

Through this journey, their vision has remained the same, which is to be steadfast in its commitment to make dreams of affordable home ownership a reality. Looking ahead, the company aims to stay ahead of the curve by embracing a digitalised transformation, migrating its operations online, and allowing Hua Yang to increase productivity and efficiency.

Regardless of the future ahead, the company will continue on a steady path, to create value and drive excellence in all it does.

1.2 COMPANY BACKGROUND



Figure 1.1: Hua Yang Berhad logo

Company name	Hua Yang Berhad
Date of establishment	December 28th, 1978
Company registration number	197801007059 (44094-M)
Company owner	Mr. Ho Wen Yan
Nature of business	Investment holding, property development and provision of management services
Type of company	Limited by shares, public limited
Office address	C-21, Jalan Medan Selayang 1, Medan Selayang, 68100 Batu Caves, Selangor Darul Ehsan, Malaysia.
Telephone	+603 6188 4488
Fax	+603 6188 4487
Email	kl@huayang.com.my
Website	http://www.huayang.com.my/

Table 1.1: Hua Yang Berhad background details

1.2.1 Perak Branch Background

Hua Yang Berhad has 15 subsidiary companies and Agro-Mod Industries Sdn. Bhd. is one of them. Hua Yang Berhad holds a controlling interest in its subsidiary company, meaning it has or controls more than half of its stock towards those companies.

As for Agro-Mod Industries Sdn. Bhd, it was established in 1985 with their first office being built in Gopeng and later changed to Ipoh as the main office of Perak branch. The main construction site is in Bandar Universiti located in Seri Iskandar with more than 5 plots of lands having been developed. The ongoing construction is a terrace residential house (Sakura) with 60% status of completion and will continue for developing another terrace residential house (Centaurea) which will be started around mid-year of 2022.

Company name	Agro-Mod Industries Sdn. Bhd.
Date of establishment	September 6th, 1985
Company registration number	198501011978 (144430-W)
Company owner	Mr. Ho Wen Yan
Nature of business	Property development and provision of secretarial services
Type of company	Limited by shares, private limited
Office address	123A, Jalan Raja Permaisuri Bainun, (Jalan Kampar), 30250 Ipoh, Perak Darul Ridzuan, Malaysia.
Telephone	+605 2543 812
Fax	+605 2542 625
Email	ipoh@huayang.com.my

Table 1.2: Agro-Mod Industries Sdn. Bhd. background details

1.3 ORGANISATION CHART (HUA YANG BERHAD)

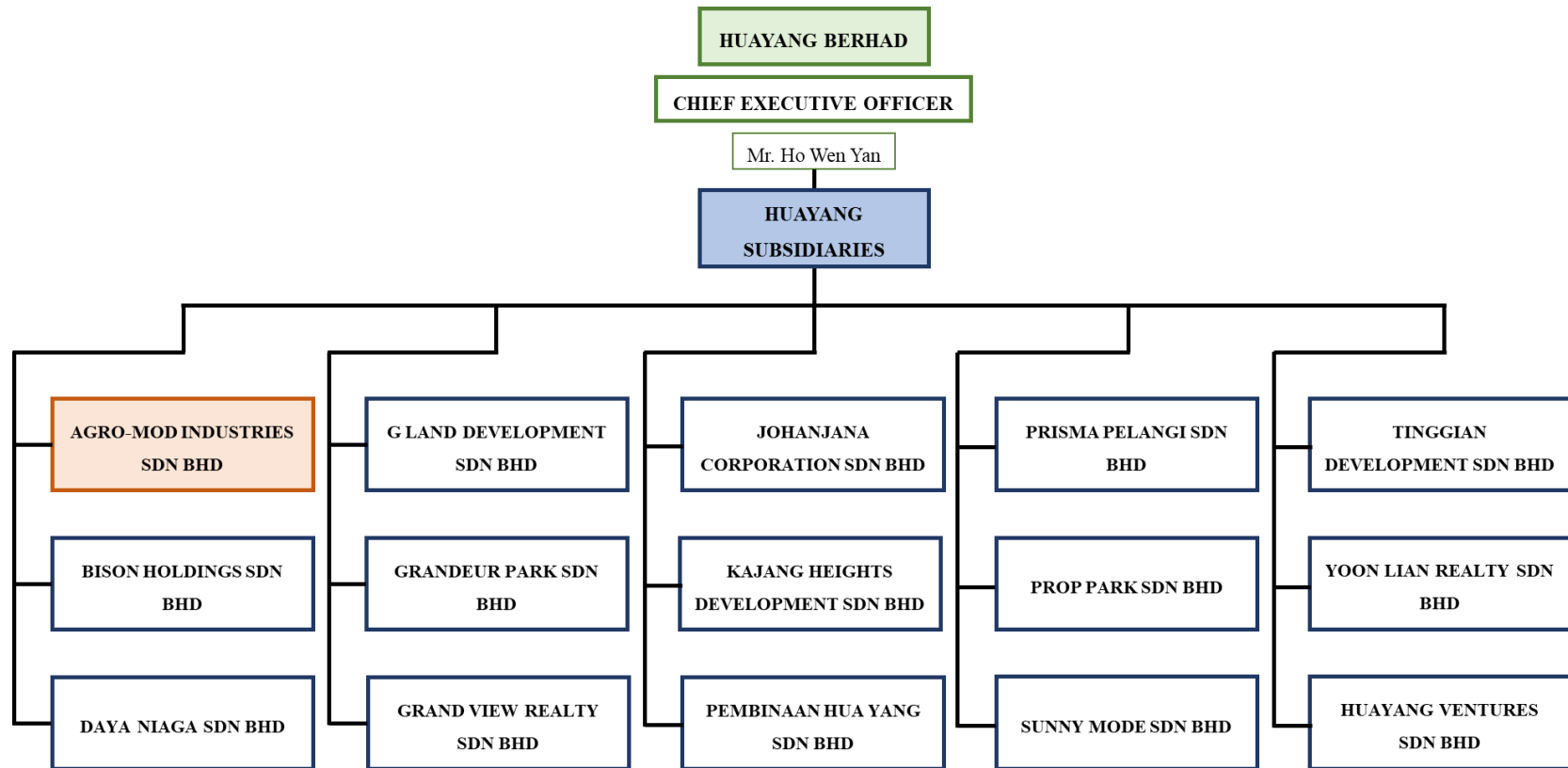


Chart 1.1: Hua Yang Berhad and its subsidiaries

1.3.1 ORGANISATION CHART (AGRO-MOD INDUSTRIES SDN. BHD.)

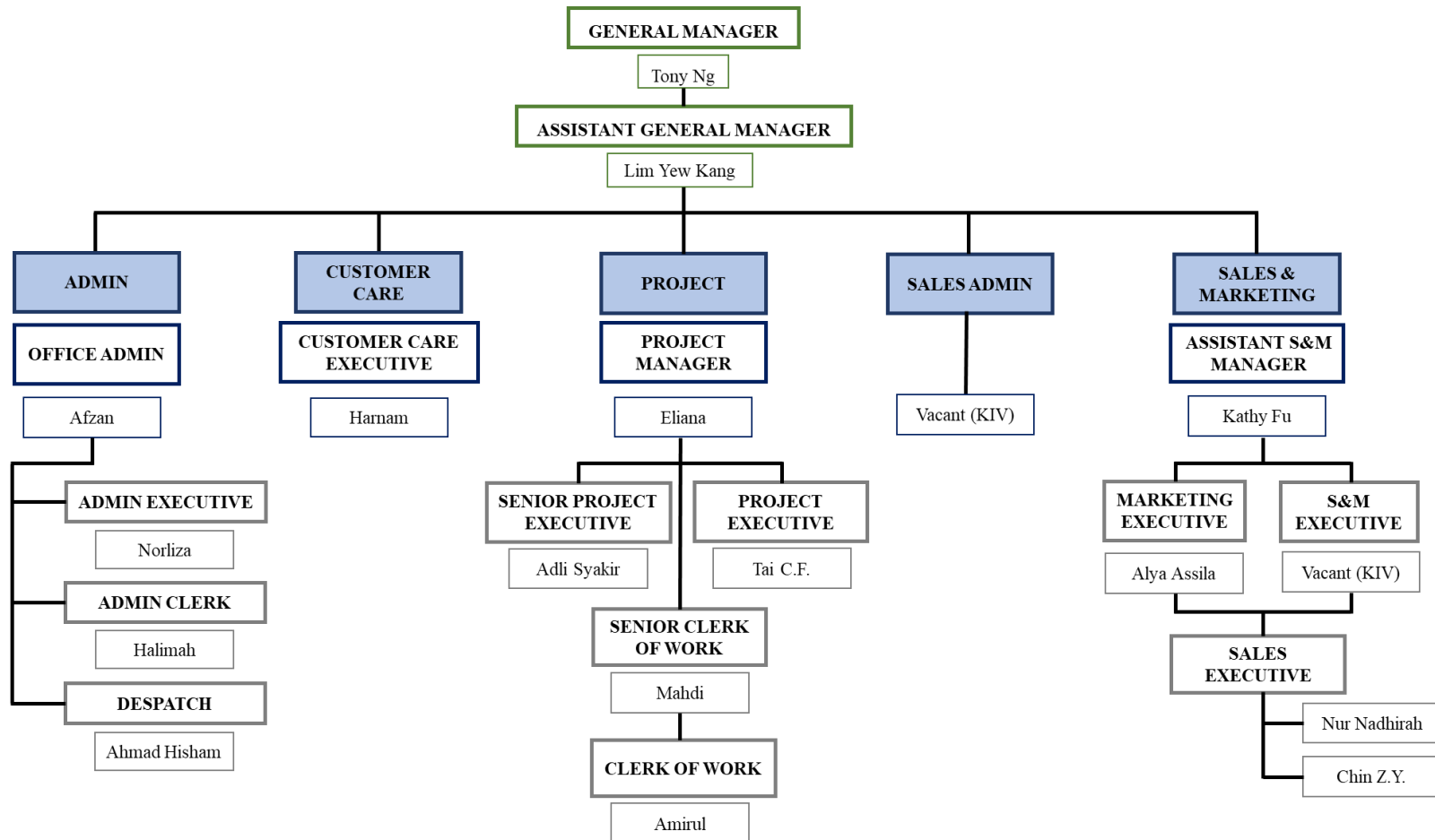


Chart 1.2: Agro-Mod Industries Sdn. Bhd. organisation chart

1.4 CEO BACKGROUD OF ACADEMIC AND ACHIEVEMENTS

Mr. Ho Wen Yan was appointed to the Board of Hua Yang on 1 June 2007. He received his architectural training in the United Kingdom at the University of Bath and the Architectural Association. He also holds a Master of Science (Construction Economics and Management) Degree from University College London.

He joined Hua Yang on 20 October 2003 as a Project Coordinator at its Johor Branch. He has been an Executive Director of the Group since 1 June 2007 and was appointed Chief Executive Officer on 20 August 2010.

He was appointed to the Board of Magna Prima Berhad on 13 February 2017 as Executive Director. On 13 February 2020, he was redesignated from Executive Director to Non-Independent Non-Executive Director of Magna Prima Berhad.

EDUCATION ACHIEVEMENT

Architectural training

- University of Bath (England, United Kingdom)
- Architectural Association School of Architecture (London, United Kingdom)

EMPLOYMENT ACHIEVEMENT

Project Coordinator (2003) – Hua Yang Berhad (Johor branch)

Executive Director (2007) – Hua Yang Berhad

Chief Executive Officer (2010) – Hua Yang Berhad

Executive Director (2017) – Board of Magna Prima Berhad

1.5 COMPANY JOURNEY



Hua Yang Berhad was incorporated on 28 December 1978 under a private limited company, Heng Po Sdn Bhd. First project in Ipoh comprising 8 units of 4-storey shops at Jalan Gopeng, Ipoh. The project was completed in September 1981.

Figure 1.2: Hua Yang Berhad (Ipoh, 1978)



Acquisition of 838 acres of land in Bandar Universiti, Hua Yang's first integrated township in Perak consisting of residential and commercial units that was launched in year 2001.

Figure 1.3: Bandar Universiti Seri Iskandar (Ipoh, 1991)



The Group expanded to the Southern region with an acquisition of 477 acres of freehold land in Johor Bahru for a township development, launched in March 2001.

Figure 1.4: Taman Pulai Indah (Johor, 1993)



Acquisition of 17.89 acres of land in Sungai Besi to develop One South, a mixed development flagship project. The 1st phase of One South was launched at the start of 2010.

Figure 1.5: One South Sungai Besi (Selangor, 2007)



In October, the Group launched its first high-rise development in Klang Valley, Symphony Heights Serviced Apartments, which was successfully completed in November 2012.

Figure 1.6: Symphony Heights Serviced Apartments (Selangor, 2008)



At the beginning of 2010, the Group launched Senawang Link, an integrated commercial and industrial development project in Seremban.

Figure 1.7: Senawang Link (Negeri Sembilan, 2010)



The Group launched its first project in Seberang Perai, Penang. Meritus Residensi, a 44-storey tower with 480 units of serviced apartments and 15 retail shops was completed in January, 2020.

Figure 1.8: Meritus Residensi (Penang, 2018)



The Group launched its new project in Bandar U, Perak. Sakura comprises of 410 single-storey terraced houses spread across 25-acres of land is targeted to complete in Q3, 2021.

Figure 1.9: Sakura, Bandar Universiti (Perak, 2019)



Completion and hand over of the Group's maiden project in Penang, Meritus Residensi. Launched Phase 1 Aston Acacia in Bukit Mertajam, comprise of 311 units of serviced apartments.

Figure 1.10: Aston Acacia (Penang, 2020)

1.6 SUMMARY

Hua Yang Berhad is an investment holding company engaged in property development and provision of management services. Its segments consist of the property development segment engaged in constructing and developing residential and commercial properties and the concession assets segment engaged in the collection of rentals over the concession periods from assets held under build, operate and transfer agreements. Majority of the revenue is derived from the property development segment with operations spread across Malaysia.

Through multiple mega-projects, Hua Yang Berhad can be seen as one of an excellent company with several branch offices namely in Selangor, Johor, Perak and Penang, all with an undergoing project. The company is also listed in the Main Board of Bursa Malaysia Securities Berhad as one of the developer stock exchange companies in Malaysia. Their subsidiaries are also contributing major roles towards their exponential growth and providing a stable financial flow to the company.

The focus and main goal of the company is to provide a higher quality of products while lowering the cost towards the buyers. In order to achieve that objective, they exert to have their own core values amongst the staff members. One of their values is the strength of teamwork amongst themselves as the more experienced staff members are obliged to help the less experienced ones. This effort will not only create a strong bond between the staff members but also create a sense of professionalism toward them as well.

CHAPTER 2

2.1 INTRODUCTION TO QLASSIC

Quality Assessment System in Construction (QLASSIC) is a system or method to measure and evaluate the workmanship quality of a building construction work based on Construction Industry Standard (CIS 7:2006). QLASSIC enables the quality of workmanship between construction projects to be objectively compared through a scoring system.

Quality remains one of the most important parameters in construction, alongside time and cost. However, quality is subjective and it is difficult to quantify. CIDB, with working groups consisting of public and private stakeholders, in 2005, have put together a construction industry standard or CIS on the base quality requirement for the industry.

QLASSIC gives an opportunity for developers and contractors to demonstrate their commitment to quality. The QLASSIC Score is the company's endorsement of a quality project. Be recognized as a Quality Developer and Quality Contractor in your industry. QLASSIC is the way forward to achieve high quality buildings for customers. Learn and apply QLASSIC quality standards in your building projects. QLASSIC is the way forward to achieve high quality buildings for customers.

2.2 BACKGROUND OF QLASSIC

Issues of construction quality and workmanship have always been a major challenge in developing countries and Malaysia is no exception. As revealed in A Study of Contribution Factors to Building Failures and Defects in Construction Industry (2011) conducted by Ahzahar N, Karim NA, Hassan SH, Eman J; poor workmanship is one of the popular factors that lead to building defects and failures in local developments.

In November 2008, Housing and Local Government Minister Datuk Seri Ong Ka Chuan said the ministry had received on average 250 complaints every year on building defects from buyers. The need for quality workmanship in construction should not be taken lightly as it ensures future marketability of developments and enhances the confidence of property purchasers.

Recognising its importance, the Construction Industry Development Board (CIDB), which is vested with the responsibility of developing and ensuring quality in the construction industry introduced the Quality Assessment System in Construction (QLASSIC) in 2007. It is an independent assessment tool to measure and evaluate the quality of workmanship of building projects based on the Construction Industry Standard (CIS) 7.

QLASSIC enables the workmanship quality between construction projects to be relatively and quantitatively compared. It also serves as a tool for industry players to benchmark their quality performance against industry standards besides serving as a quality yardstick for the construction industry.

Achieving QLASSIC high scores require planning right from the beginning. The commitment to produce quality workmanship will influence the design, materials used and the selection of consultants and contractors to carry out the project.

2.3 IMPORTANCE OF QLASSIC

QLASSIC is an important tool to measure the workmanship of a property and it is useful and important towards the home-buyers as well as the developer as it can reduce the number of future possible defects on the property.

2.3.1 Importance Towards Home-Buyers

High QLASSIC scoring indicates developers' emphasis on workmanship and their commitment in delivering the best product to the market. It includes developers' attention to details in their planning and construction processes and the outcome of the finished goods. Therefore, it is crucial for home-buyers to be aware of the developers' QLASSIC scorings, or at the very least, to have some ideas on how it works and its implications.

With this valuable knowledge, home-buyers are able to determine whether the project has met the rolled-out standards and criteria specified by CIDB, which ultimately enables home-buyers to make better decisions and minimize the risks of buying a property where construction defects can be found at every corner. After all, quality should always be paramount in the consumers' minds regardless of product.

2.3.2 Importance Towards Developers

Not only does it serve as a benchmark for developers' quality performance against industry standards, it allows relative and quantitative comparison of workmanship that could be the guideline of construction standards so that developers can know exactly where they fell short and improve accordingly. In the long-terms, it saves developers tons of money because it alleviates them from huge expenditures of rectification works.

Besides, offering quality products to home-buyers does the developers' reputation good because nothing beats the gratification of knowing they have made the best choice when it comes to choosing the right property from the right developer.

2.4 QCLASSIC ASSESSMENT CRITERIA

The QCLASSIC assessment is done during the process of both construction and completion stages of development. The assessment scopes are targeted at multiple aspects which include structural works, architectural works, mechanical and electrical (M&E) works as well as external works.

The areas of inspection cover;

- floor finishes
- wall
- ceiling
- door
- window
- internal fixtures (e.g., wardrobe, bathtub, sink, railing etc.)
- basic M & E fitting
- roof
- apron and perimeter drain
- external drain
- roadwork and carpark on the ground
- footpaths and turfing
- playground

The assessment will determine the extent of defects found in a building which include hollowness, cracks and damages, unevenness as well as functionality, with the examiners' own judgement-by-visuals and assessment tools. The score for each component is as below:

Component	Residential Buildings	
	Category A (Landed Housing)	Category B (Stratified Housing)
Structural works	15%	20%
Architectural works	70%	60%
M&E works	5%	10%
External works	10%	10%
Total score	100%	100%

(Source: CIS 7:2014, Table 1, Page 4)

Table 2.1: Weighting distribution according to building category

QLASSICS adopts the principle of ‘first time inspection’, meaning that corrected construction works after the assessment will not be re-evaluated in order to ensure contractors and developers do things right the first time and every time.

A meticulous and detailed assessment will be carried out on randomly and statistically selected samples with a sample size sufficient to represent the whole project based on plans, drawings and sampling guidelines specified in the CIS7:2014 standard.

2.5 PROCESS OF QLASSIC ASSESSMENT

The QLASSIC assessment is carried out during the construction and completion stages of a development. The scope of assessment includes structural works, architectural works, mechanical and electrical (M&E) works as well as external works.

QLASSIC assessments are carried out through site inspections, visual assessments and the use of assessment tools and equipment. QLASSIC utilises the principle of ‘first time inspection’ where construction works that are rectified after an assessment will not be re-assessed.

An assessment will be carried out based on the random selection of samples that adequately represent the entire building project. Samples are selected statistically from drawings and plans and the selection is pre-determined based on the sampling guideline detailed in the CIS 7:2014 standard.

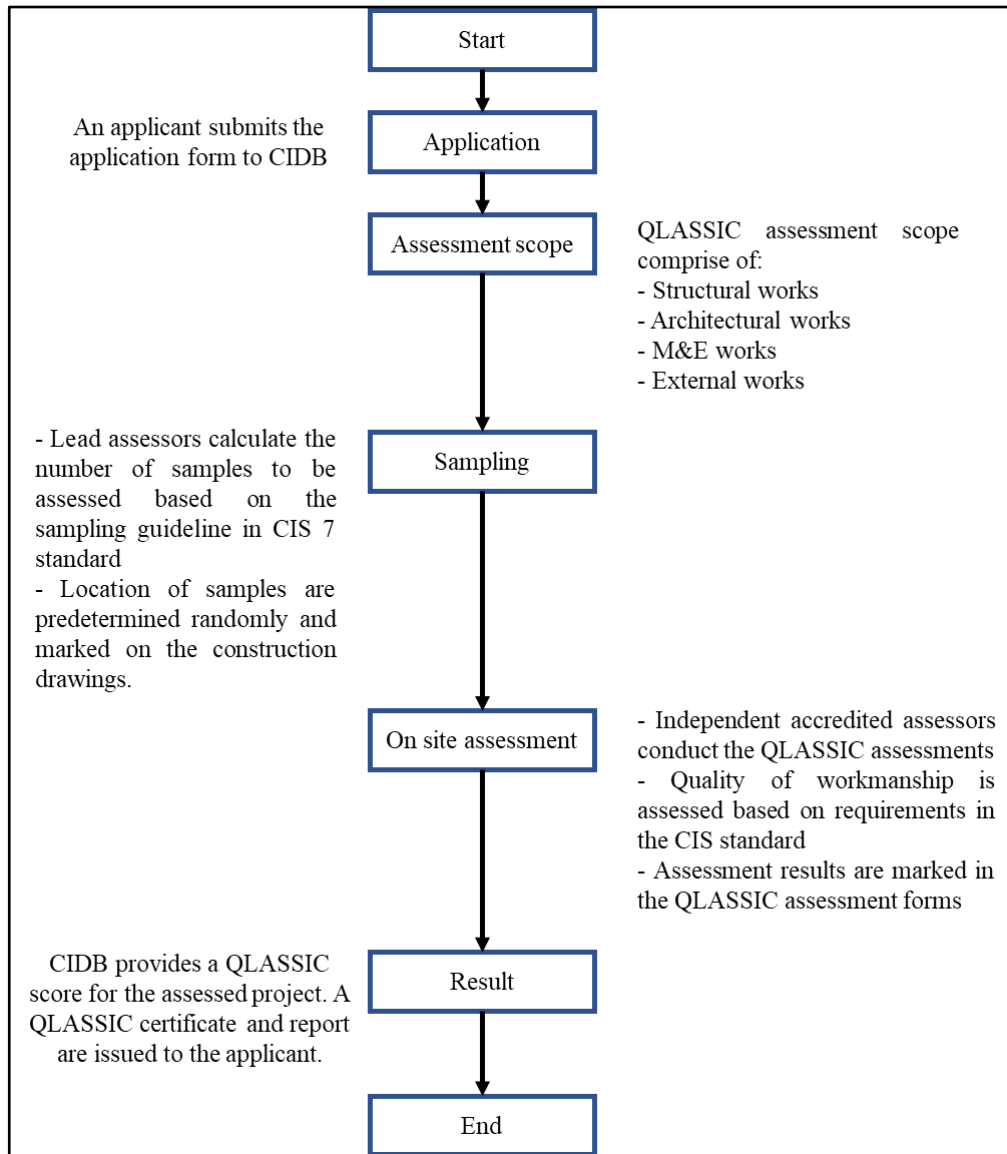
2.5.1 Assessment Methodology

The QLASSIC assessment is carried out based on site inspection, visual assessment, and use of assessment tools and equipment. The selection of samples is pre-determined through sampling guidelines and statistical approaches. Samples are selected from drawings and plans. The assessment is carried out based on random selection of samples that adequately represent the entire building project. The sampling guideline is detailed in the CIS 7:2014 standard.

A summary of assessment methods and tools are show below:

- | | |
|------------------------|-----------------------------|
| 1. Visual | 7. L-square (200mm x 300mm) |
| 2. Physical | 8. Steel gauge |
| 3. Auditory | 9. Angle mirror |
| 4. Spirit Level (1.2m) | 10. Steel measuring tape |
| 5. Tapping rod | 11. Spirit level |
| 6. Steel wedge | |

2.5.2 QCLASSIC Assessment Process



(Source: CIDB)

Figure 2.1: QCLASSIC assessment process

2.6 QLASSIC ASSESSMENT SCOPE

QLASSIC sets out the standard on quality of workmanship for various elements of building construction work. The quality of workmanship of a construction work is assessed according to the requirement of the standard. Marks are awarded if the workmanship complies with the standard. These marks are then summed up to calculate the QLASSIC Score (%) for the building construction project.

The scope of assessment includes structural works, architectural works, M&E works and external works. QLASSIC assessment is carried out during construction and completion stages. However, the current assessment by CIDB is upon completion of the project. In the future, CIDB may offer full scope of assessment. The QLASSIC assessment is carried out on all types of building projects. The buildings are categorised in the following manner:

Category	Type	Buildings
A	Landed housing	Detached, semi-detached, terrace and cluster house
B	Stratified housing	Flat, apartment, condominium, service apartment, small office home office (soho) and town house
C	Public/commercial/industrial building (without centralised cooling system)	Office building, school, factory, warehouse, workshop, small office flexible office (SOFO), small office virtual office (SOVO), religious building, stadium, community hall, hospital, airport, university, college, police station, etc.
D	Public/commercial/industrial building (with centralised cooling system)	

Table 2.2: Building classification under QLASSIC

2.7 SUMMARY

As a conclusion, motivations and barrier factors drive the construction companies and the contractors, to QLASSIC adoption are particularly significant for its real contribution. Quality in the construction industry can be defined as the attainment of acceptable levels of performance from construction activities. This performance would be attained when the activity meets or exceeds the requirement of the client or the owner.

The quality of any product or service is achieved when it conforms to the desired specifications. Achieving quality in the construction industry in the long run is a tough issue and has been a problem. Inefficient or no practice of quality management procedures will result in great loss of time, money, material, resources. For example, on a construction site, the designer would specify a particular grade of concrete. The contractor will use the ingredients of the concrete such that the desired grade of concrete is obtained.

CHAPTER 3

3.1 INTRODUCTION OF HUA YANG QCLASSIC

Hua Yang Berhad introduced QCLASSIC in April of 2015. Before the implementation of QCLASSIC in this company, the majority of the houses developed always had numerous issues regarding building defects due to poor workmanship. Just to name a few, the defects including wall and floor cracks, leaking of the roof, hollowness of the floor and wall tiles and inconsistent colour tone of the wall paint and much more.

Later in April of 2015, The CEO of Hua Yang Berhad, Mr. Ho Wen Yan, after reviewing all of the issues of the company's past projects, he decided to implement the QCLASSIC system onto all of his projects. The company created the QCLASSIC Program Liaison Team in May 2015 specializing in the management of QCLASSIC and slowly, they adapted the system and eventually they succeeded by achieving one of the best scores of QCLASSIC scoring percentage. Based on their past projects, as seen on their website, most of their projects scored more than 70% which is considered to be excellent by CIDB.

The company now is comfortable and familiar with the QCLASSIC systems. With the implementation of the system, the issues regarding building defects are now way less compared to the previous time. The building defects and imperfections are now being checked by their staff before proceeding to handing over the keys to the homeowner. All the complained defects were also fixed and repaired within the 14 days period according to the company Sales and Purchase Agreement (SPA) all within the 2 years Defect Liability Period (DLP).

3.2 BACKGROUND OF CASE STUDY

The case study is located at Bandar Universiti, Seri Iskandar, Perak which is the construction of a single storey terrace house project across 25-acre of land. The construction project consists of 5 phases comprising 6 blocks (82 units of houses) in each phase with 13 and 14 house units in each block. Each unit of Sakura measures 22' x 65' with a built-up size of 814 sqft. Offering 3 bedrooms and 2 bathrooms, a living space, complete with high ceilings for added comfort.

The township of Seri Iskandar has a good selection of national primary and secondary schools, Islamic schools and kindergartens. Also located in the vicinity is Kolej Vokasional Seri Iskandar, Sekolah Menengah Teknik Seri Iskandar, and Institut Latihan Kemas Seri Iskandar as well as healthcare facilities including clinics and a well-equipped medical centre.

As for this case study, the main focus is only on the Phase 1 of the construction. The task given was to do a Pre-Delivery Inspection (PDI) which required identifying and inspecting the house unit based on the QLASSIC inspection form. The work scope is managed under the QLASSIC department of the company. The duration of the work is starting from mid of October 2021 until the end of January 2022. At first, the inspection was assisted by a site supervisor and later fully handed as a one-person job.

The inspection work is done by checking the interior and exterior of the house unit by using tools and equipment. If defects and imperfections have been found during the inspection, a marking which is based on the QLASSIC inspection form, will be written on that defected area. The area later will be repaired during the '*Rectification Work*' program by the contractor.



Figure 3.1: Floor plan of Sakura unit (Corner and Intermediate lot)

Specification	
Property type	Single storey terrace
Standard lot	22' x 65'
No. of unit	410
Bedrooms	3
bathrooms	2

Table 3.1: The specification of Sakura house

3.3 DETAILS OF CASE STUDY







Figure 3.2: Terrace residential houses (Sakura Phase 1 – 82 units)

Developer	Hua Yang Berhad
Name of the project	Terrace Residential Building – Sakura Phase 1 (82 Units)
Location	Plot 7, Bandar Universiti Seri Iskandar, 32610 Seri Iskandar, Perak, Malaysia
Developer licence no.	7937-18/09-2021/0823(L)
Approved by	Perak Tengah District Council (MDPT)
Plan approval no.	MDPT.OSC / PS248 / MAC / 2019
Land lease	99 years (25/05/2107)
No. of housing units	82 units
Selling price	RM260,000 (min) – RM400,000 (max)
Lot size	22' x 65'

Table 3.2: Details of case study

3.4 TOOLS AND EQUIPMENT

No.	Tools and Equipment	Function
1.	 <p data-bbox="507 786 911 824">Figure 3.3: Spirit Level (1.2m)</p>	<ul style="list-style-type: none"> • Assessment on evenness of surface (wall, floor, tabletop) • Assessment on falls in wet areas (toilet, bath) • Check alignment and evenness of surface with this tool.
2.	 <p data-bbox="555 1191 863 1229">Figure 3.4: Tapping rod</p>	<ul style="list-style-type: none"> • Assessment on hollowness for internal wall • Assessment on hollowness for floor and wall tiling as well as tabletop tiles
3.	 <p data-bbox="560 1597 858 1635">Figure 3.5: Spirit level</p>	<ul style="list-style-type: none"> • Assessment on mechanical and electrical (M&E) power sockets and outlets for levelness
4.	 <p data-bbox="499 2002 922 2040">Figure 3.6: Steel measuring tape</p>	<ul style="list-style-type: none"> • This tool is used to look into the height of every M&E points and the consistent cut tiles on the floor





5..	 <p>Figure 3.7: Angle mirror</p>	<ul style="list-style-type: none"> • This tool is used to check if the top of door leaves is painted.
6.	 <p>Figure 3.8: Steel wedge</p>	<ul style="list-style-type: none"> • Usually used with the spirit level 1.2m, this tool is used to check that edges are straight and aligned. Also used with L-square to check on lippage between tiles.
7.	 <p>Figure 3.9: Steel gauge</p>	<ul style="list-style-type: none"> • Used to check the gap between door frame and walls.
8.	 <p>Figure 3.10: L-square (200mm x 300mm)</p>	<ul style="list-style-type: none"> • Assessment on the squareness of every corner of the interior walls.

Table 3.1: List of tools and equipment

3.5 PROCESS OF INSPECTION

The term for QCLASSIC inspection work is known as Pre-Delivery Inspection (PDI) which will be checked by the developer for any item that is damaged, incomplete, missing or not operating properly and the results will be noted on the PDI Form that will then be accessed and verified by CIDB in a later stage. The average size of each of the house lots is 22' x 65' with the difference being the corner and the end lots. The inspection started from the living area and ended up at the car porch area as shown below.

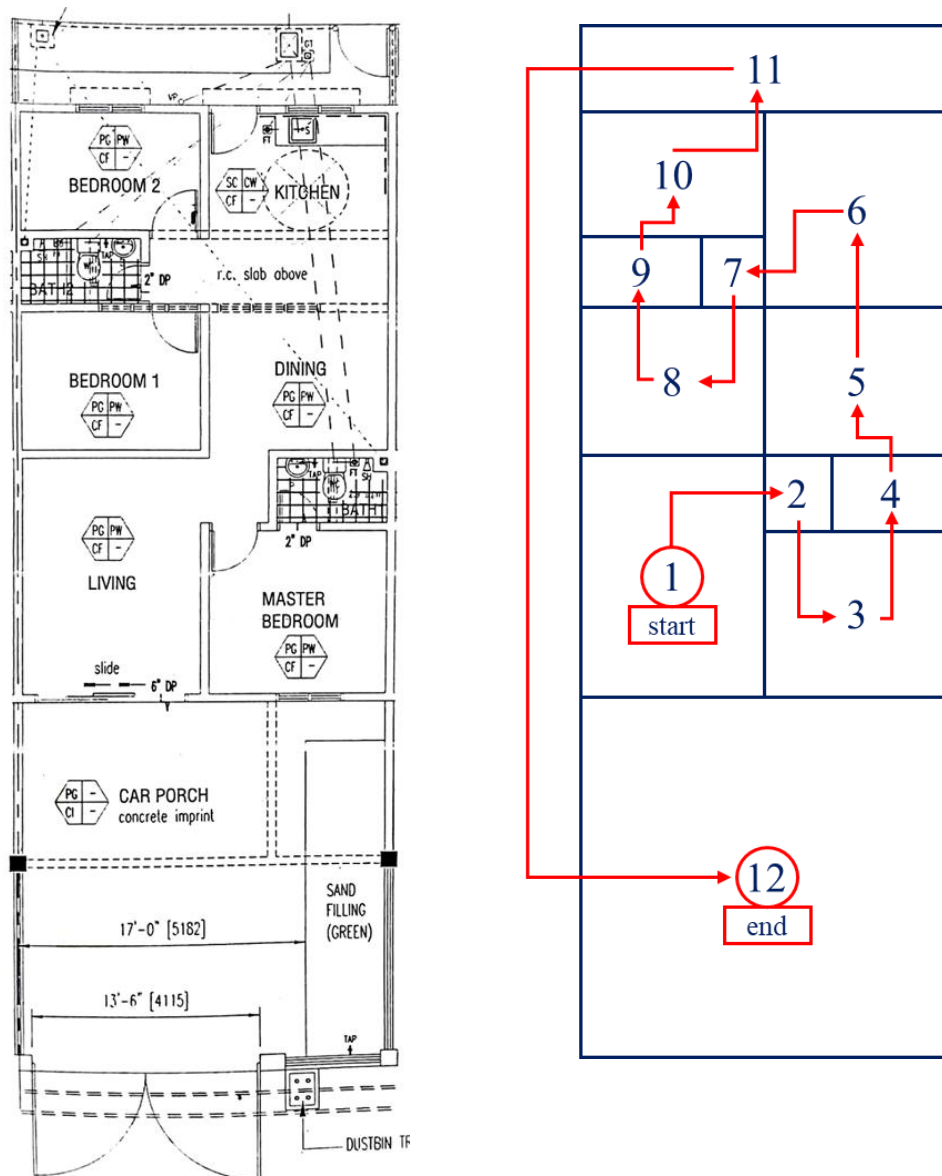


Figure 3.11: The floor plan and the PDI inspection workflow

3.5.1 Pre-Delivery Inspection Work

This section will explain in detail the inspection works and the usage of the aforementioned tools and equipment. There are in total 12 areas in each house unit and 8 different tools have been used with the addition of visual inspections and marking by using chalks.

1. Spirit level (1.2m)

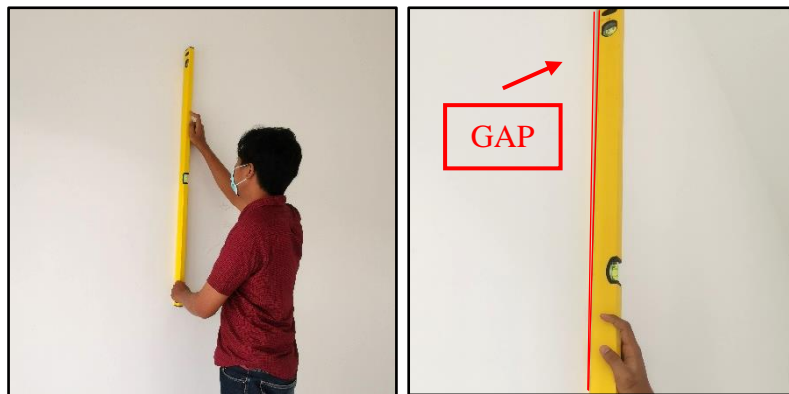


Figure 3.12: Spirit level (1.2m) is used on the internal walls

The spirit level (1.2m) is used to measure all the internal walls for evenness of the house. The inspection is tested on 3 different spots on each wall side whether tested diagonally, vertically as well as horizontally. Based on CIDB CIS 7: 2021, the tolerance of the gap is not more than 3mm. If a gap has been found that is more than 3mm, '2C' will be marked on the wall indicating that the wall is uneven.

This tool is also used to measure the evenness of the floor. The procedure for the flooring inspection is also the same as the inspection on the wall, which needs to be checked on three different spots. Toilet on the other hand is checked to see whether the falls of the floor is going towards the floor trap or just simply lays flat.

2. Spirit level (1.2m)



Figure 3.13: Tapping rod is used on the tiles

The tapping rod is used to identify hollow and the lippage of the tiles. As for the case study, the inspection includes checking on the floor and wall tiles including tabletop tiles located at the kitchen. This inspection is more towards hearing the hollowness and finding lippage of the tiles and will be marked '1D'. Based on CIDB CIS 7: 2021, the lippage between two tiles cannot be more than 1mm.

3. Spirit level



Figure 3.14: Spirit level is used on M&E outlets

The spirit level is used to check the levelness of the mechanical and electrical (M&E) outlets. If the outlet has been found unlevel, which is indicated by the position of the bubble, passed the lines of the spirit level, '6C' will be marked above that outlet.

4. Steel measuring tape



Figure 3.15: Steel measuring tape used to measure the height of M&E outlets



Figure 3.16: Steel measuring tape used to measure the uniformity of cut tiles

The steel measuring tape is used to inspect two elements during the PDI. The first inspection is used to ensure the height of the M&E outlets which need to be on 5ft. from the floor level. Any sockets that have been found to be more or less than 5ft. will be marked and rectification work needs to be done immediately.

The second element is used on the inspection of the uniformity of the cut tiles alongside the wall and the floor area. The cut tiles need to be the same size and if the tiles are not consistent, it will be marked as '*inconsistent floor tiles*'.

5. Angle mirror



Figure 3.17: Angle mirror is used on the door

The angle mirror is used to check whether the top of the door leaf has been painted or not. Every door in the house needs to be checked and if it has been found unpainted, '3I' will be marked on the door.

6. Steel wedge



Figure 3.18: Steel wedge is used on the door

The steel wedge is used to check the gap between the door and the door frame. Based on CIDB CIS 7: 2021, the gap for doors needs to be less than 5mm and the gap also needs to be consistent all around its surroundings. Any gap that has been found more than 5mm will be marked as '3A'.

7. L-square (200mm x 300mm) and steel gauge

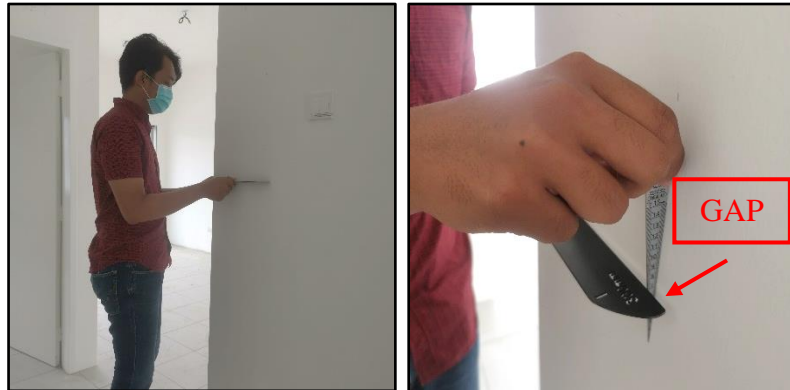


Figure 3.19: L-square and steel wedge is used on wall corners

The L-square is used to inspect the squareness of a wall and needs to be used with the steel wedge. Each corner of the interior wall needs to be checked for its squareness. Based on CIDB CIS 7: 2021, any gap from the squareness inspection is acceptable if it is not more than 3mm. In order to measure the gap of the wall, a steel wedge is used together with the L-square and the spirit level (1.2m) to check whether the gap is more than 3mm or not.

3.6 SUMMARY

With the implementation of QLASSIC in the Sakura project, the risk of having multiple building defects and imperfections towards the future will be decreased. Before the process of Vacant Possession (VP) of the home-owner, the house lot will be checked thoroughly through the process of Pre-Delivery Inspection (PDI). The inspection is done to check for any building elements that do not comply according to QLASSIC standard due to poor workmanship.

After the first inspection, a rectification work will be started to fix and repair according to the marking made from the first PDI. All the workers such as plasterer, tiler and others need to ensure to remedy the marked area which needs to be complied according to QLASSIC standard. Later in the process, the second PDI will begin as soon as all rectification works are done. The main purpose of this second inspection is to check whether the workers fixed the issues or just simply doing it wrongly.

The Pre-Delivery Inspection is beneficial towards the new home-owner as their property can be guaranteed to have a decreased amount of possible future defects. The home owners should have a home inspection performed on their new home at some point within the first year to ensure any problems that may be present can be repaired before serious problems occur.

CHAPTER 4

4.1 INTRODUCTION

This chapter will be elaborating the problems that have been identified throughout the period of the internship. It will concentrate on how to deal with the problems using a reliable research method for suitable recommendation based on the case study site project. Based on the observation made throughout the duration of 4 months, there are some major problems towards the contractor as well as the developer in regarding the implementation of QLASSIC.

QLASSIC is a method to measure and evaluate the workmanship quality of a building construction. On one hand, this method or system is obviously important towards the new homeowner as they are expecting to have a good quality of house. The developer will also be benefited by using this method as their reputation of making high quality property will increase.

While on the other hand, there are some major drawbacks of using this method. One of the major issues is it will lengthen the estimated finished project as the rectification works need a significant amount of time for the works to be done. The issues of this project are they have few manpower allocated towards the rectification work process.

4.2 PROBLEMS AND RECOMMENDATIONS

The introduction of the QLASSIC system to the company has an outstanding advantage not only towards the company itself, but also towards the home-owner as well. However, this system can backfire the company as the system can easily increase the overall expenditure and cost towards the construction projects. This is one of the major problems when applying the QLASSIC system into a construction project.

No.	Problems & Recommendations	
1.	Increase the total expenditure of the project	
	The rectification works will definitely add up to the total expenditure. The contractor will increase the price as they need to hire skilled workers to do the rectification works. This problem at the end will affect the financial status of the developer.	The solution of this is to find and negotiate the best option of labours specifically for the rectification works in the current market. The contractor needs to balance out the level of skills and their price range.
2.	The construction progress is delayed due to few manpower	
	Labours at the case study site are currently decreasing due to two main reasons. The first one being the workers are mostly foreigners and they are affected during the Movement Control Orders (MCO). So, most of them are back to their own country. Second, after the MCO, the workers are being offered with a higher payment and changed to the high-paid company.	This is obviously a major issue as the rate of progress of the site will be dependent on the number of workers in it. The solution to these issues is to hire workers regarding price or skill level in order to catch up the initial schedule of work progress.

CHAPTER 5

In conclusion, based on the observation that has been made in the duration of this internship which is 4 months at the Hua Yang Berhad, there are a lot of new things that can be learnt about the process QLASSIC inspection and the rectification works done after the Pre-Delivery Inspection (PDI).

During the internship period, skills such as management of workers has been acquired as well as the increasing of communication skill towards work colleagues as well as the home-owner. Also, knowledge regarding the overall construction site has been gathered the supervisor of the company in terms of how the procedure of QLASSIC inspection, Pre-Delivery inspection as well as the rectification works.

Besides, the knowledge of QLASSIC that has been learned during the study are somewhat helps during this internship program. With the help of the company supervisor, the inspections are done much more easily.

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APPENDICES

PRE DELIVERY INSPECTION CHECKLIST


 PROJECT : _____
 BLOCK/ LEVEL/UNIT NO : _____
 LOCATION/AREA : _____
 INSPECTION REF. : _____

 Ref No.: PDI/001 REV: 1
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NO	ELEMENT & FINISHES	DEFECT GROUP	QUALITY STANDARDS	Legend	1st	2nd	3rd	REMARKS
					INSPECTION	INSPECTION	INSPECTION	
					OK = /	OK = /	OK = /	
					NOT OK = X	NOT OK = X	NOT OK = X	
					NOT RELATED = NA	NOT RELATED = NA	NOT RELATED = NA	
Floor, Wall, Ceiling, Door, Window, Fixtures, M&E								
1	FLOOR	Finishing	No stain marks, consistent colour tone	1a				
		Alignment & evenness	Evenness of surface(≤3mm over 1.2m)	1b				
		Crack & damages	No crack / defect	1c				
		Hollowness/ delamination	No hollow sound/Sign of delamination	1d				
		Jointing	Skirting thickness, consistent & neat, edge of floor to be straight	1e				
2	WALL	Finishing	No stain marks, consistent colour tone	2a				
			No patchy and rough surface	2b				
		Alignment & evenness	Evenness of surface (≤3mm over 1.2m)	2c				
			Walls meet at right angles(≤4mm over 300mm)	2d				
			Edges of walls to be straight and aligned	2e				
		Crack & damages	No crack / defect	2f				
		Hollowness/ delamination	No hollow sound/Sign of delamination	2g				
	Jointing	Consistent & neat, edge of wall to be straight	2h					
3	DOOR & FRAME & Accessories	Joint & gap	Consistent gaps between door and frame, bottom door leaf and finished floor, frame & wall(≤5mm)	3a				
			Neat joints between frame and wall internally and externally	3b				
		Alignment & Evenness	Door frame to be square & right angles	3c				
			Door leaf & frame / Double leaf to flush	3d				
		Materials & Damages	No stain marks/ corrosion	3e				
			Sags/wraps on door leaf	3f				
			Glazing clean, evenly sealed with putty or gasket	3g				
			Nail holes and joints proper sealed	3h				
Functionality	Consistent colour tone including top & bottom door	3i						
	Ease in opening & closing, no squeaky sound, lockset is functional(tested minimum one time)	3j						
4	WINDOW & FRAME & Accessories	Joint & gap	Consistent gaps between window and frame, frame and wall	4a				
			Neat joints between frame and wall internally and externally	4b				
		Alignment & Evenness	Parallel with wall opening	4c				
			Window & frame to be square & right angles	4d				
			Door leaf & frame to flush	4e				
		Materials & Damages	No stain marks, corrosion	4f				
			Nail/screw holes and joints proper sealed	4g				
			Louver window with glass panels of correct length	4h				
			Glazing clean, evenly sealed with putty or gasket	4i				
		Functionality	Ease in opening & closing, no squeaky sound, lockset is functional(tested minimum one time)	4j				
5	CEILING	Finishing	No stain marks, consistent colour tone, no patchy surfaces	5a				
		Alignment & evenness	Surface smooth, even and not wavy	5b				
			Straightness of corners	5c				
		Crack & damages	Spalling and leaks, no visible cracks	5d				
		Roughness	No rough surface	5e				
		Jointing	Consistent and neat	5f				

PRE DELIVERY INSPECTION CHECKLIST

 PROJECT : _____
 BLOCK/ LEVEL/UNIT NO : _____
 LOCATION/AREA : _____
 INSPECTION REF. : _____

 Ref No.: PDI/001 REV: 1
 Page 2/2

NO	ELEMENT & FINISHES	DEFECT GROUP	QUALITY STANDARDS	Legend	1st INSPECTION	2nd INSPECTION	3rd INSPECTION	REMARKS
					OK + / NOT OK + X NOT RELATED + NA	OK + / NOT OK + X NOT RELATED + NA	OK + / NOT OK + X NOT RELATED + NA	
6	M&E FITTINGS & Accessories	Joints & Gap	No gap between power point or switches & wall	6a				
			Consistent & neat joints	6b				
		Alignment & Evenness	Level, align & straight	6c				
			No stain marks, damage or defect	6d				
7	FITTURE & Accessories <small>(WC, Basin, Railing, Gate, Grill Door, number plate etc)</small>	Joint & Gap	Consistent & neat joints	7a				
			No gaps	7b				
		Alignment & Evenness	Welding at joint properly done	7c				
			Level and in alignment	7d				
Material & Damages	No damage or defect	7e						
	No stain mark	7f						
Functionality	Switches tested (tested minimum one time)	6f						
	Securely fixed	6g						
1st Inspection: Submitted by			1st Inspection Comments:					
Contractor: Name: Date & Time:			Inspected by Consultant/C.O.W/ R.E: Name: Date & Time:					
2nd Inspection: Submitted by			2nd Inspection Comments:					
Contractor: Name: Date & Time:			Inspected by Consultant/C.O.W/ R.E: Name: Date & Time:					
3rd Inspection: Submitted by			3rd Inspection Comments:					
Contractor: Name: Date & Time:			Inspected by Consultant/C.O.W/ R.E: Name: Date & Time:					