



DEPARTMENT OF BUILDING
UNIVERSITI TEKNOLOGI MARA
(PERAK)

THE IMPORTANCE OF
QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)
IN CONSTRUCTION

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DECEMBER 2019

It is recommended that the report of this practical training provided

by

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entitled

**THE IMPORTANCE OF
QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)
IN CONSTRUCTION**

be accepted in partial fulfillment of the requirement for obtaining the Diploma In Building.

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(PERAK)

DECEMBER 2019

STUDENT'S DECLARATION

I hereby declare that this report is my own work, except for extract and summaries for which the original references are stated herein, prepared during a practical training session that I underwent at Setiakon Builders Sdn Bhd for a duration of 20 weeks starting from 5 August 2019 and ended on 20 December 2019. It is submitted as one of the prerequisite requirements of BGN310 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

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Date : 13TH DECEMBER 2019

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ABSTRACT

The report entitled The importance of Quality Assurance and Quality Control (QA/QC) in construction. The main objective for this report is to investigate the importance of Quality Assurance and Quality Control in construction stage. In this report, contains information about the scope works of Quality Assurance and Quality Control in construction, the differences between Quality Assurance, QA and Quality Control, QC and the types and the works sequence of the inspection and testing conduct by QA/QC. This report was fully based from the practical experiences in Lumi Tropicana Site. All the information mostly gains from the interviews with QA/QC engineers in this site. At the end of the report, this report conclude that Quality Assurance and Quality Control, QA/QC are very important in the construction as QA/QC is the heart of the project.

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CHAPTER 1.0 INTRODUCTION

QA stands for Quality assurance & QC stands for Quality control. QA/QC is the combination of quality assurance, the process or set of processes used to measure and assure the quality of a product, and quality control, the process of ensuring products and services meet consumer expectations. (Diffen, 2017) Quality assurance and quality control are very important in every industry, such as in construction, medical, manufacturing, machineries, and others. Nowadays, it is must to have Quality assurance and Quality control, as it will help to provide and control the quality of the products, services, systems that been provided by the producer, to gain satisfaction from the consumer.

Quality assurance and Quality control are under the Quality Management System. Quality system management is a set of policies, processes and procedures required for planning and execution (production/development/service) in the core business area of an organization. ISO 9001 is an example of a Quality Management System. Malaysian Standards (MS) is also an example of Quality Management System.

A Quality Management System integrates the various internal processes within the organization and intends to provide a process approach for project execution. A process based Quality Management System enables the organizations to identify, measure, control and improve the various core business processes that will ultimately lead to improved business performance. (9000Store)



Figure 1.0: Quality management system summary chart

Quality Assurance and Quality Control, QA/QC have in many sectors, however, the aim of this study is to discover the Quality Assurance and Quality Control, QA/QC in the construction. In construction, Quality Assurance and Quality Control QA/QC have a main role. From the initial stage until the final stage of construction project, which means detecting defects, QA/QC will ensure all the construction matters such as materials, structure done, follows the guaranteed specifications provided. Thus, this will ensure the quality of the construction workdone, follow the standards.

1.1 Background and Scope of Study

This industrial training was done in one of Setiakon Builders Sdn Bhd ongoing project, at Lumi Tropicana, Damansara, Petaling Jaya, Selangor. This project consists 4 Tower for residential and facilities area, each tower have 36 levels and 186 units, 3 storey SOHO 62 units, 7 storey of carpark, the landscape area above of the carpark with rock climbing area and tennis and soccer court, infinity swimming pool connecting all towers, multipurpose hall, theatre hall, Children day care centre, Squash court, Ping-Pong court and Relaxation Spa.



Figure 1.1. : Lumi Tropicana project

Title project	Lumi Tropicana
Client	Mayfair Ventures Sdn. Bhd.
Main Contractor	Setiakon Builders Sdn. Bhd.
Project value	RM 223,538,379.36
Commencement date	1st July 2016
Contract period	36 Months
Consultant	Ateliar ADT Architect (Asia) Sdn. Bhd.
Structure Engineer	T. Y.Lin International Sdn. Bhd.

Mechanical Engineer	Perunding Mektrik Sdn. Bhd.
Quantity Surveyor	Baharuddin Ali & Low Sdn. Bhd.
Landscape Architecture	Shah PK + Associates Sdn. Bhd.
Location Coordinate	Tropicana Petaling Jaya, Selangor : 3.128988, 101.595034

Table 1.1. : Organization chart in Lumi Tropicana

Scope of Study

Scope of study in this report about scopeworks of Quality Assurance and Quality Control, QAQC in this construction site. To aknowledge how QAQC engineer scopeworks from initial stage of construction until the construction complete. Also, to differentiate between Quality Assurance and Quality Control in construction stage. It will summarize the differences of Quality Assurance and Quality control. Plus, to study the types and methods used by QAQC engineer in this Lumi Tropicana site project, follows the verified standards.

1.2 Objectives

1. To acknowledge the scope works in Quality Assurance and Quality Control in construction stage.
2. To differentiate the differences between Quality Assurance and Quality Control.
3. To study the types and the work sequence of the inspections and testing conduct under Quality Assurance and Quality Control in construction.

1.3 Methodology

Methods of study used during the completion of the report are :

1. INTERVIEW :

Interviews with the QA/QC engineers in Lumi Tropicana Site about the QA/QC scope works and the types and methods of inspection used. Every information of the interviews were written. Besides, interviews about the projects construction progress with all the site supervisors.

2. OBSERVATION :

Observations on inspection methods done by following the inspection do by the QA/QC engineers. Plus, observation on the testing of cube test, slump test and steel tensile strength test conduct on the laboratory. Moreover, observation of the project progress by doing site daily reports.

3. RESEARCH :

Research on the documents and standards that organized by QA/QC engineers in Lumi Tropicana site project. Research the informations on internet and online books, as a references to support the points.

CHAPTER 2.0 COMPANY BACKGROUND

2.1 Introduction of Company

Founded on 12 December 1994, Setiakon Builders Sdn. Bhd. (Setiakon) has been expanding expertise. Setiakon Builders, previously known as Khidmat Builders Sdn Bhd, is involved in building construction, civil engineering, labour supply for the construction industry and investment holding. Setiakon have participated in an impressive line-up prestigious projects, including, the construction of Putrajaya, Cyberjaya, the Kuala Lumpur Flood Mitigation, Prince Court Medical Centre and the CIQ Complex in Johor Baharu.



In recent years, the company has increased its involvement in the residential sector with the construction numbers of high-profile residential towers in Klang valley and Johor. Today, Setiakon is a leading contractor in Malaysia with completed and current portfolio residential, retail, health care, institutional, commercial, industrial and infrastructure projects. The company is also spreading its wings abroad, having secured contracts in Dubai, United Arab Emirates.

For more than two decades, has been building a track record of excellence founded on its strength and experience in the construction sector. By re-inventing its best practices in all areas of operations, the home grown contractor has opened up a world of opportunities in the form of high value projects, repeated and referred businesses. Recognized as a key player in the industry, Setiakon has secured satisfied clients from a board of spectrum of businesses, fueling the company growth not just in size, but also capabilities and credibility.

2.2 Company Profile



Figure 2.2.(a) : Setiakon Builders Sdn. Bhd. Logo

NAME OF COMPANY	SETIAKON BUILDERS SDN. BHD.
DIRECTORS	<p style="text-align: center;"><u>MANAGING DIRECTOR:</u></p> <div style="text-align: center;">  </div> <p style="text-align: center;"><i>Figure 2.2.(b) : DATO' KUAN AH HOCK</i></p> <p style="text-align: center;"><u>EXECUTIVE DIRECTOR:</u></p> <div style="text-align: center;">  </div> <p style="text-align: center;"><i>Figure 2.2.(c) : MR TAN TONG KWEE</i></p>
STAKEHOLDERS	<p>Dato' Kuan Ah Hock (31.7%)</p> <p>Mr Tan Tong Kwee (22.2%)</p> <p><u>Substantial Shareholders</u></p> <p>Mr Tee Gan Ting (16.7%)</p> <p>Mr Tee Kian Chon (16.7%)</p> <p>Mr Tan Juinn Siong (11.1%)</p>

VISION	To be one of most distinguished building solution provider in Malaysia and the region
MISSION	To build quality, efficient and conducive environment that fulfils people's dreams, aspirations and vision for a better world
OBJECTIVES	<ul style="list-style-type: none"> ➤ To ensure customer satisfactions by delivering construction work of the highest standard in a cost-effective and timely manner ➤ To deliver quality and productivity by consistently raising our capabilities and professionalism ➤ To provide forward-looking construction solutions to meet our client's requirement and needs
HEADQUARTER ADDRESS	13, Jalan Cempaka SD 12/1, Bandar Sri Damansara, 52200 Kuala Lumpur, Wilayah Persekutuan
NO TEL & FAKS	NO TEL: NO FAKS :
CONSTRUCTION GRADE	<p><u>CIDB MALAYSIA</u></p> <p>(G7) - (B) BUILDING Specialization :</p> <p>B04 (Kerja-kerja pembinaan bangunan)</p> <p>B02 (IBS: Sistem kerangka keluli)</p> <p>B14 (Kerja-kerja cat)</p> <p>B05 (Kerja cerucuk)</p> <p>B12 (Kerja pemasangan kaca)</p> <p>B13 (Pemasangan jubin)</p> <p>B24 (Kerja penyenggaraan bangunan)</p>

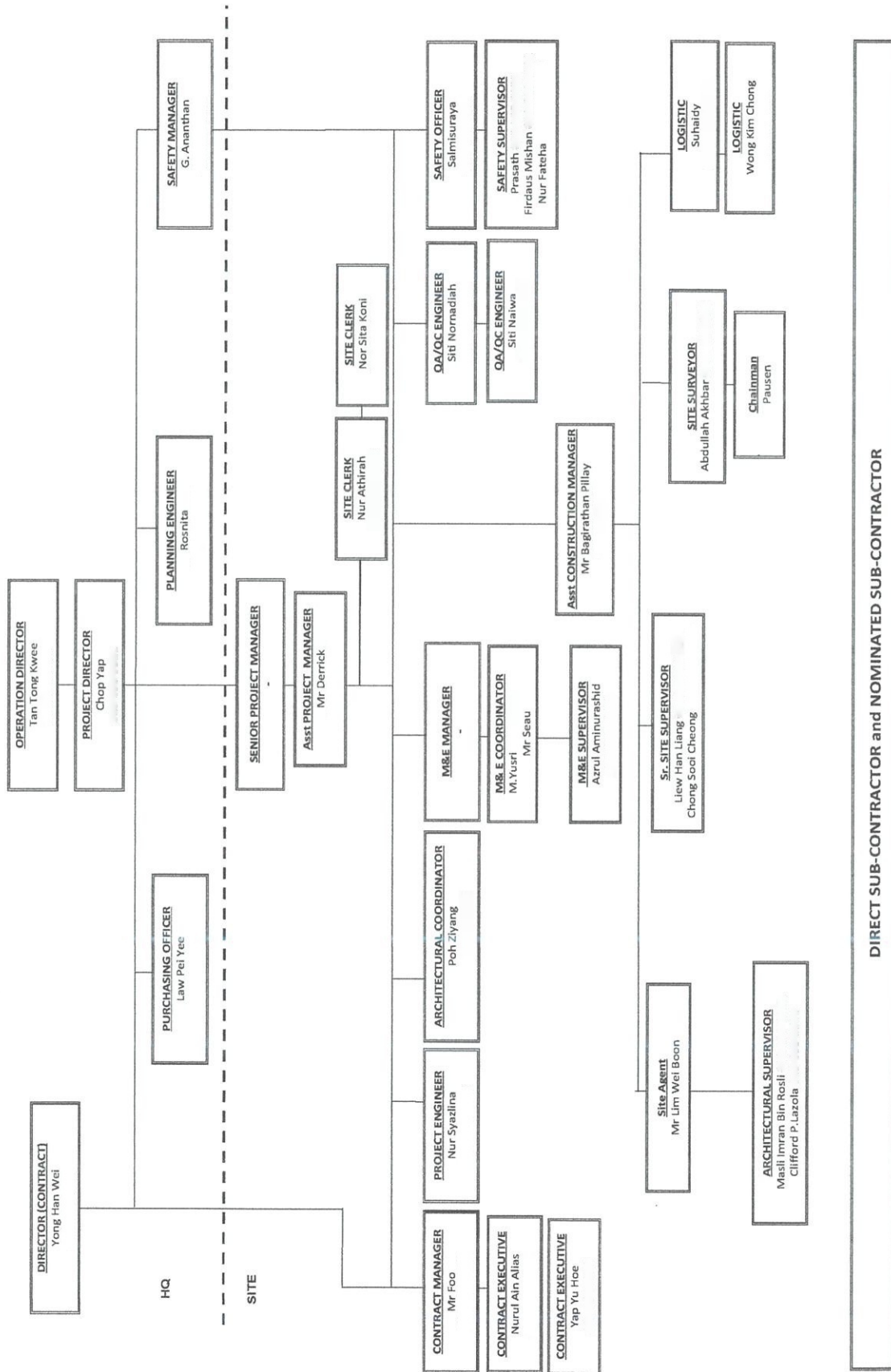
	<p>(G7) - (CE) CIVIL ENGINEERING</p> <p>Specialization:</p> <p>CE21 (Pembinaan kejuruteraan awam)</p> <p>CE13 (Pemasangan papan iklan)</p> <p>CE01 (Pembinaan jalan dan pavemen)</p> <p>CE02 (Pembinaan Jambatan dan jeti)</p> <p>CE10 (Kerja cerucuk)</p> <p>CE34 (Kerja pemasangan konkrit pratuang)</p> <p>CE03 (Struktur merin)</p> <p>CE36 (Kerja-kerja tanah)</p> <p>(G7) - (ME) MECHANICAL & ELECTRICAL ENGINEERING</p> <p>Specialization:</p> <p>E03 (Sistem automasi bangunan)</p> <p>E06 (Sistem pencahayaan khas)</p> <p>E10 (Sistem bekalan kuasa tanpa gangguan)</p> <p>E11 (Kerja am elektrik)</p> <p>E16 (Lampu Jalan & Lampu Isyarat)</p> <p>E17 (Kabel Bawah Tanah Voltan Rendah)</p> <p>M15 (Kelengkapan mekanikal pelbagai)</p>
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Table 2.2 : Setiakon Builders Sdn. Bhd. Company profile

2.3 Organization Chart

1.3 ORGANISATION CHART - SETIAKON BUILDERS SDN BHD

PROJECT: LUMI TROPICANA



2.4 List of Project

2.4.1) Completed Projects

Setiakon Builders SDN. BHD. have successfully constructed lot of projects. Focusing mainly on building and infrastructure works. There are several projects that have been constructed by Setiakon Builders SDN. BHD. :

NAME OF PROJECTS	TYPES OF PROJECTS	PROJECT VALUE
1.) Putrajaya's Dataran Putra, Putrajaya	ATTRACTIONS	Not stated
2.) Customs, Immigration & Quarantine Complex Tanjung Kupang, Johor	GOVERNMENT OFFICE	Not stated
3.) Kuala Lumpur Flood Mitigation, Kuala Lumpur	INFRASTRUCTURE	Not stated
4.) Jabatan Bomba Putrajaya, Precint 7, Putrajaya	GOVERNMENT OFFICE	RM 49,750,000.00
5.) Glomac Damansara Commercial, Damansara, Selangor	COMMERCIAL	RM 147,750,000.00
6.) Arina Bussiness Suites, Kampung Baru, Kuala Lumpur	RESIDENTIAL AND COMMERCIAL	RM 199,888,888.00
7.) Anggun Puri Condominium, Solaris Dutamas, Kuala Lumpur	RESIDENTIAL	RM 30,168,000.00
8.) Kelana Sentral, Kelana Jaya, Selangor	RESIDENTIAL AND COMMERCIAL	RM 31,000,000.00
9.) Neo Damansara, Damansara Perdana, Petaling Jaya, Selangor	RESIDENTIAL	RM 32,902,159.47
10.) Setiawalk, Puchong, Petaling Jaya, Selangor	RESIDENTIAL AND COMMERCIAL	RM 51,383,879.00
11.) Zetapark, Setapak, Kuala Lumpur	RESIDENTIAL AND COMMERCIAL	RM 158,000,000.00
12.) Glomac Damansara Residence, Damansara, Selangor	RESIDENTIAL AND COMMERCIAL	RM 149,788,888.88
13.) The Greens Condominium, TTDI, Petaling Jaya, Selangor	RESIDENTIAL	RM 168,300,000.00
14.) Tropez Residence Danga Bay, Johor	RESIDENTIAL AND COMMERCIAL	RM 315,433,333.00
15.) Mirage Residences, Kuala Lumpur	RESIDENTIAL	RM 62,000,000.00

Table 2.4.1 : List completed projects

2.4.2) Project in progress

There are several projects that are still in construction and handing over process:

NAME OF PROJECTS	TYPES OF PROJECTS	PROJECT VALUE
1.) Tropicana Gardens, Kota Damansara, Petaling Jaya, Selangor	RESIDENTIAL AND COMMERCIAL	RM 391,213,888.00
2.) Atria Damansara, Petaling Jaya, Selangor	RESIDENTIAL AND COMMERCIAL	RM 72,343,325.89
3.) The Link2, Bukit Jalil, Selangor	RESIDENTIAL AND COMMERCIAL	RM 260,898,000.00
4.) 28 Dutamas, Segambut, Selangor	RESIDENTIAL AND COMMERCIAL	RM 100,000,000.00
5.) Arte +, Ampang, Kuala Lumpur	RESIDENTIAL AND COMMERCIAL	RM 277,500,000.00
6.) D'Sara Sentral, Sungai Buloh, Selangor	RESIDENTIAL AND COMMERCIAL	RM 376,747,560.00
7.) Tropicana Metropark, Subang Jaya, Selangor	RESIDENTIAL AND COMMERCIAL	RM 212,688,000.00
8.) I-Marcom Kia Peng, Kuala Lumpur	RESIDENTIAL AND COMMERCIAL	RM 240,038,000.00
9.) Lumi Tropicana, Petaling Jaya, Selangor	RESIDENTIAL AND COMMERCIAL	RM 223,538,379.36

Table 2.4.2 : List project in progress

CHAPTER 3.0 CASE STUDY

3.0 Introduction to Case Study

Lumi Tropicana is an on-going construction project at Tropicana, Damansara, Petaling Jaya, Selangor. The construction site located at Persiaran Tropicana, in front of the entrance gate of the Tropicana Golf and Country Resort. Lumi Tropicana is located on strategic location, as it near to the access road, beside of New Klang Valley Expressway, near to the public transportation hub as it near to Sultan Abdul Aziz Shah Subang Airport as it just 9.1 km, near to LRT Lembah Subang Station as it just 2.8 km, near to MRT Surian Station as it just 3.1 km, plus, Lumi Tropicana on MRT Feeder Bus route (T807) connecting both LRT and MRT stations. Moreover, Lumi Tropicana is near to commercial area centre such as Mutiara Damansara Commercial area that consists The Curve mall, IPC Shopping Centre, IKEA Damansara, One Utama Shopping Mall, and Kota Damansara Commercial area that consist Dataran Sunway and The Strand.

The type of project of Lumi Tropicana is residential and commercial. The project value estimated RM 223,538,379.36. The completion of this project have two phases, for the 1st phase, estimately fully construct on end year of 2019 and for the 2nd phase, estimately fully construct on June 2020. The Defects period of time is 2 years after the completion of the project. This project own by Mayfair Ventures Sdn. Bhd. .



Figure 3.0.(a) : Red mark is the location of Lumi Tropicana site project, it is located on the strategic location as it near to all commercial areas, access road, education and public transportation hub.

Lumi Tropicana construction project have two phases, each phase has it duedate of handing over the project to the client. Currently, two phases are in construction, 1st Phase consist 2 towers (Tower A1 and B1) each towers consist 35 levels, each level have 6 units of houses except M&E and facilities area at level 20 & 19 for tower A1 and level 18 & 17 level for Tower B1, total unit of houses for each tower is 186 units, 3 level SOHO units (62 Units), infinity swimming pool connecting all towers, relaxation spa and jacuzi area, 7 storey carpark and landscape area above the carpark with rock climbing area, playground, soceer court and tennis court, and facilities area consists multipurpose hall, theatre hall, children day care centre, Ping-Pong court, badminton and squah court. For 1st phase estimate fully constructed end year of 2019.

For the 2nd phase, it consists 2 towers (Tower A2 and B2) each towers consist 35 levels, each level have 6 units of houses except M&E and facilities area at level 20 & 19 for tower A2 and level 18 & 17 level for Tower B2, total unit of houses for each tower is 186 units, and the facilities area estimate complete construct on June 2021.



Figure 3.0.(b) : Panorama view of the progress from the landscape area above the carpark, from the left is Tower A1, then Tower B1, Tower A2 and Tower B2



Figure 3.0.(c) : Landscape area above the carpark



Figure 3.0.(d) : 7 levels of carpark



Figure 3.0.(e) : Panorama view of the progress from the infinity swimming pool area and the jacuzzi area

For this case study, it will focus on the importance of Quality Assurance, QA and Quality Control, QC, QA/QC on the construction stage. This report explains the scope works of Quality Assurance and Quality Control in construction stage, the differences of Quality Assurance, QA and Quality Control, QC, and the types and methods of inspection conduct under QA/QC engineers in Lumi Tropicana. All the data, informations are based on the experiences and documentations from QA/QC engineers in this site.

3.1 Scope works of Quality Assurance and Quality Control in construction stage.

There are several scope works of Quality Assurance and Quality Control, QA/QC in construction stage. There are documenting project quality plan, monitoring the workdone and workmanship, monitoring the materials, inspecting the works, documenting the data, dealing with parties involve and testing the materials.

1.) Documenting Project Quality Plan

Documenting Project Quality Plan, PQP, is at the initial stage of the construction, before start the construction. Project Quality Plan is very important in the construction project as it provide the guidances in all aspects of the quality. In PQP, contains the details about the construction project, the organisation in the project, project drawings details, the forms of inspections checklists, method statement of works, testing plans and the safety and health policy.

Project Quality Plan, PQP is created and documented by Quality Assurance engineer or Project Planner. In Lumi Tropicana, PQP is created and documented by Westly Lok, the Project coordinator of Lumi Tropicana site. After PQP is created, from the discussion all the parties, PQP is verified by agreement from the parties involves such as, main contractor, consultant, sub-contractors and the client. Then, PQP is properly documented and being keep by the QA/QC engineers in this site.

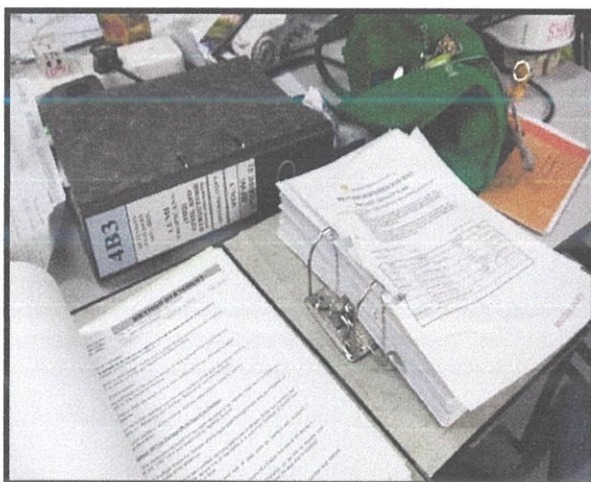


Figure 3.1.1(a) : Project Quality Plan
Lumi Tropicana

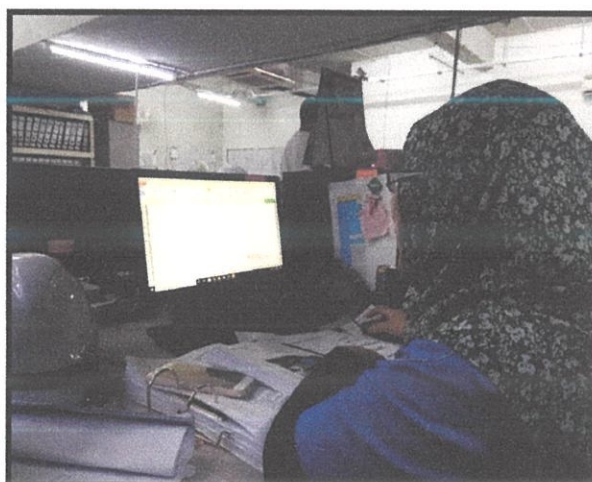
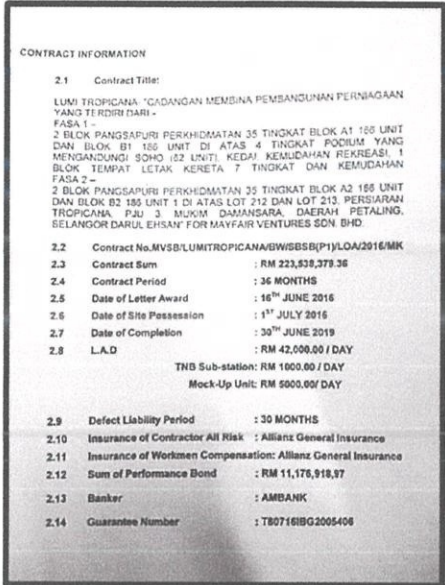
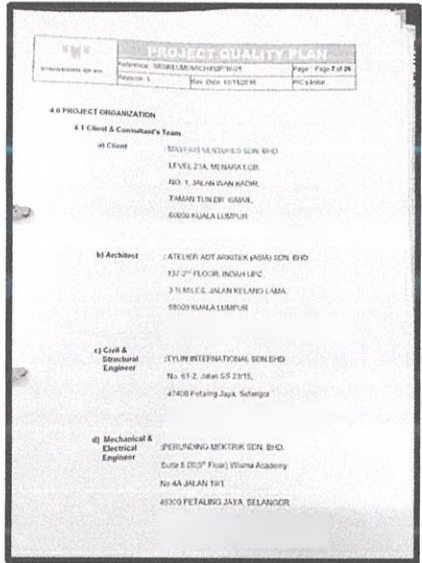


Figure 3.1.1(b) : QA/QC engineer
keeping the soft and hardcopy of the PQP

Examples of the form and information in the PQP :

EXAMPLE OF THE FORM	EXPLANATION
<ul style="list-style-type: none"> The details of the construction project information :  <p>CONTRACT INFORMATION</p> <p>2.1 Contract Title: LUMI TROPICANA 'CADANGAN MEMBINA PEMBANGUNAN PERNIAGAAN YANG TERDIRI DARI - FASA 1 - 2 BLOK PANGSAPURI PERKHIDMATAN 35 TINGKAT BLOK A1 188 UNIT DAN BLOK B1 188 UNIT DI ATAS 4 TINGKAT PODIUM YANG MENGANDUNGI SOHO (82 UNIT) KEDAI KEMUDAHAN REHREAS 1 BLOK TEMPAT LETAK KERETA 7 TINGKAT DAN KEMUDAHAN FASA 2 - 2 BLOK PANGSAPURI PERKHIDMATAN 35 TINGKAT BLOK A2 188 UNIT DAN BLOK B2 188 UNIT 9 DI ATAS LOT 212 DAN LOT 213 PERSIARAN TROPICANA PAU 3 MUKIM DAMANSARA, DAERAH PETALING, SELANGOR DARUL EHSAN' FOR MAYFAIR VENTURES SDN BHD</p> <p>2.2 Contract No.MVSB/LUMITROPICANA/BWSBSB(P1)LOA/2016/MK</p> <p>2.3 Contract Sum : RM 223,838,378.36</p> <p>2.4 Contract Period : 36 MONTHS</p> <p>2.5 Date of Letter Award : 16TH JUNE 2016</p> <p>2.6 Date of Site Possession : 1ST JULY 2016</p> <p>2.7 Date of Completion : 30TH JUNE 2019</p> <p>2.8 L.A.D : RM 42,000.00 / DAY TNB Sub-station: RM 1000.00 / DAY Mock-Up Unit: RM 5000.00/ DAY</p> <p>2.9 Defect Liability Period : 30 MONTHS</p> <p>2.10 Insurance of Contractor All Risk : Allianz General Insurance</p> <p>2.11 Insurance of Workmen Compensation: Allianz General Insurance</p> <p>2.12 Sum of Performance Bond : RM 11,176,918.87</p> <p>2.13 Banker : AMBANK</p> <p>2.14 Guarantee Number : T80716IBG2005406</p>	<p>There are the details of the construction project informations in the PQP. The details are, the contract title, contract sum, contract period, date of letter award, date of site possession, date of completion, defect liability period, insurance agents and banker.</p>
<ul style="list-style-type: none"> The organisation in the project  <p>PROJECT QUALITY PLAN</p> <p>4.0 PROJECT ORGANIZATION</p> <p>4.1 Client & Consultant's Team</p> <p>a) Client : MAYFAIR VENTURES SDN BHD LEVEL 21A, MENARA LGB NO. 1, JALAN DAMANSARA TAMAYUN BER HAJAL 60000 KUALA LUMPUR</p> <p>b) Architect : ATELIER ADI ARKITEK ANDIA SDN BHD 132/2ND FLOOR, INDAH LINC 3 7/5 MILE, JALAN KELANG LAMA 58000 KUALA LUMPUR</p> <p>c) Civil & Structural Engineer : JYLN INTERMEDIATE SDN BHD No. 61-2, Jalan SS 2/31E, 47400 Putrajaya, Selangor</p> <p>d) Mechanical & Electrical Engineer : PERLINDUNG MEKTRIK SDN BHD Suite 8, 050TH Floor, Wilma Academy 70-4A, JALAN 10/1 48000 PETALING JAYA, SELANGOR</p>	<p>There are the informations about the whole organisation in the construction site. For examples, details about the client and the consultants team, the details such as the headquarters address and telephone and fax number. The explanation about the role and the responsibilities of each position in the organisation also written in the PQP.</p>

- **Project drawing details**

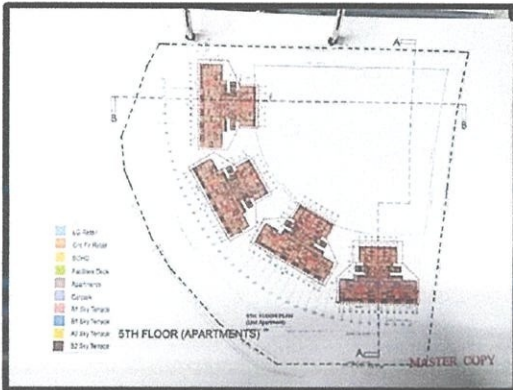


Figure 3.1.1(e) : The towers plan

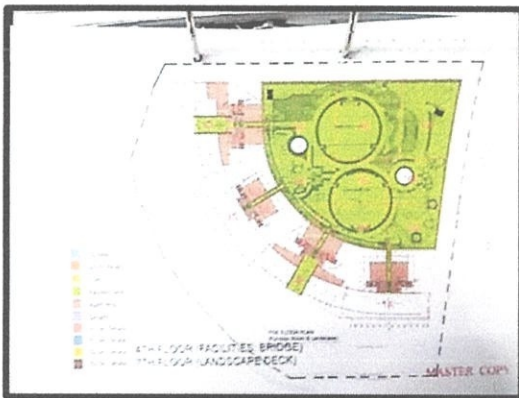


Figure 3.1.1(f) : The landscape area layout plan

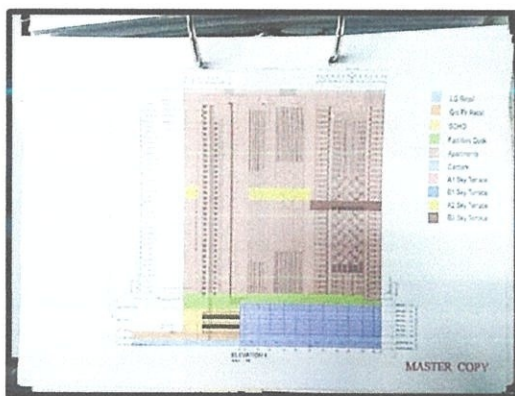


Figure 3.1.1(g) : The front view of the towers

There are the project drawing details inside the PQP. All the drawings are documented in the PQP for general informations. All the name of the towers, zones and levels are explains in the project drawing details. This will help provide information to the workers know the right location they need to work.

The examples of the drawing details such as level layout plan, rear view, sides views, infront view and zoning area plan. The details drawing includes the measurement of the size each of the area.

- **The forms of inspection checklists**

Figure 3.1.1(h) : One of the architecture inspection form

INSPECTION FORM FOR DRAIN EXCAVATION	
CONTRACTOR :	
Project :	
Location : Road CH to LHS / RHS	
Item	
A CONSTRUCTION DRAWING/PART PRINT USED	
1	Drawing/part print no.
2	Date of issue :
B SETTING OUT	
1	Excavation pegs at drain centreline and offset pegs from drains set out at metre intervals
2	Offset pegs provided at m distance from drain centreline.
3	Temporary bench mark (TBM) set up nearby. Show location in enclosed Layout.
4	Levels and chainages are marked on offset pegs. Offset peg levels checked with nearby temporary benchmark (TBM).
C EXCAVATION WIDTH	
1	Drain brickwalls are = mm thick Therefore, drain base width = mm wide
2	Excavation width = drain base width + compactor width on both sides = + + = mm
D EXCAVATION DEPTH	
1	Designed invert levels = m RL to m RL
2	Excavation levels = m RL to m RL
3	Dipping depths checked = excavation levels - offset peg levels (Details of dipping depths are shown in the attached dipping form)
Inspected By : C.O.W Verified By : Contractor	
Signature & Date: Signature & Date:	

Figure 3.1.1(i) : The requirements of drain excavation inspection form

There are the inspection form checklists in the PQP. The inspection form checklists are separate according to the scope works. The scope works are divided into the architecture works, civil and structure works, and mechanical and electronics works.

The examples of architecture works inspection checklists are, brickworks, installation of door frame, plastering works, screeding and rendering works, skim coats, aluminium works, painting works, floor tiling works, waterproofing, plaster ceiling and more.

The examples of civil and structure works inspection checklists are, piling driving record, earthwork/basement work, roofing, formwork, concreting/closing of formwork, rebar and post-tensioning tendon, drain excavation, road shoulder, sewerage works and more.

The examples of mechanical and electrical works inspection checklist are, cable work inspection, wiring megger, G.I conduit installation, mechanical ventilation, floor trunking, lift installation and more.

Some of the inspection checklists are provided from the sub-contractors as they have their own verified standards. For example, floor trunking inspection checklist from Gn Engineering Sdn. Bhd.

- **Method statement of works**

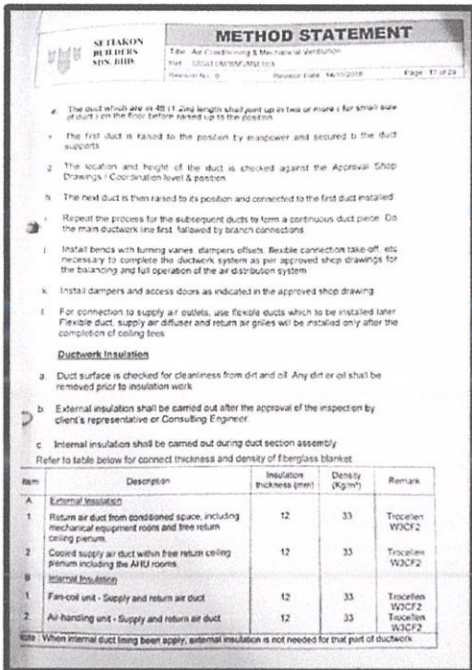


Figure 3.1.1(j) : Method statement air conditioning and mechanical ventilation

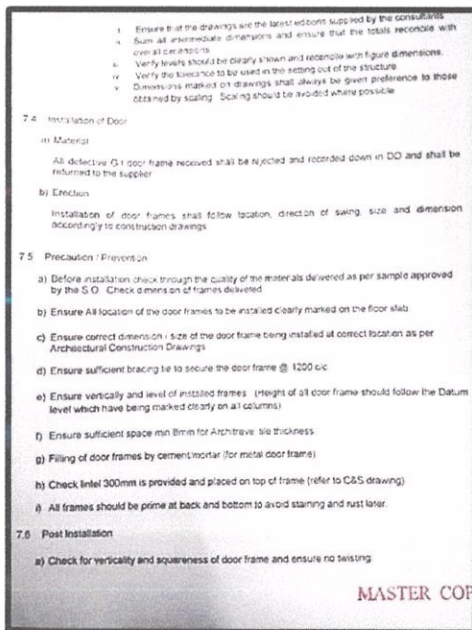


Figure 3.1.1(k) : Method installation and precaution of installation of the door

There are the method statement of works in the PQP. All the works have it method statement details. The method statement consists objectives, scope of works, machinery/tools/equipment list, manpower quantity list and work descriptions, handling and storage, work methodology, precautions, protection and preservation of work-in-progress (WIP), and the material details.

The method statement of works divides into the architecture works, civil and structure works and mechanical and electrical works. For example, method statement of architecture works, there are, brick layering, screeding, plastering the wall, door installation, tiling installation and more.

The examples method statement of civil and structure works, reinforced concrete structure work, Rectification work using non-shrink grout (concrete bulging), Anchoring rebar, concrete curing and more.

The examples method statement of mechanical and electrical works, concealed conduit in concrete floor slab, cable tray and trunking installation, lightning protection installation, fibre optic cable installation, earthing system installation,

- **Master works programmes**

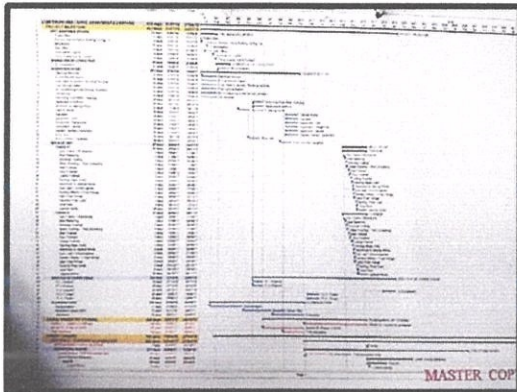


Figure 3.1.1(l) : The initial master works programmes

1337	Formwork	8 days	05/01/18	12/09/18
1338	Formwork	8 days	05/01/18	12/09/18
1339	Formwork	8 days	05/01/18	12/09/18
1342	Column	8 days	17/01/18	23/01/18
1341	Formwork	8 days	17/01/18	23/01/18
1342	Formwork	8 days	17/01/18	23/01/18
1343	Formwork	8 days	17/01/18	23/01/18
1344	Base Slab	8 days	24/01/18	30/01/18
1345	Formwork	8 days	24/01/18	30/01/18
1346	Formwork	8 days	24/01/18	30/01/18
1347	Formwork	8 days	24/01/18	30/01/18
1348	Formwork	8 days	24/01/18	30/01/18
1349	Formwork	8 days	24/01/18	30/01/18
1350	Formwork	8 days	24/01/18	30/01/18
1351	Formwork	8 days	24/01/18	30/01/18
1352	Formwork	8 days	24/01/18	30/01/18
1353	Formwork	8 days	24/01/18	30/01/18
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1355	Formwork	8 days	24/01/18	30/01/18
1356	Formwork	8 days	24/01/18	30/01/18
1357	Formwork	8 days	24/01/18	30/01/18
1358	Formwork	8 days	24/01/18	30/01/18
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1367	Formwork	8 days	24/01/18	30/01/18
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1370	Formwork	8 days	24/01/18	30/01/18
1371	Formwork	8 days	24/01/18	30/01/18
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1396	Formwork	8 days	24/01/18	30/01/18
1397	Formwork	8 days	24/01/18	30/01/18
1398	Formwork	8 days	24/01/18	30/01/18
1399	Formwork	8 days	24/01/18	30/01/18

Figure 3.1.1(m) : One of the architecture master works programmes

There are initial master works programmes in the project quality plan, PQP. The master works programmes are plan by the project planner and QA/QC engineers from the main contractor. From initial stage until final stage of the construction, the project planner with QA/QC engineers planning the work programs compactly based on work progress expectation.

The master work programmes made and design using software. The software is the Microsoft Project created by Microsoft Corporation. Microsoft project can design and arrange the work progress of the construction works. The works will arrange step by step until the finish stage of the construction.

In the schedule, the target date of the workdone are state in the master work programmes. It is as references and as estimator to estimate the end of the construction works.

- **The safety and health policies**

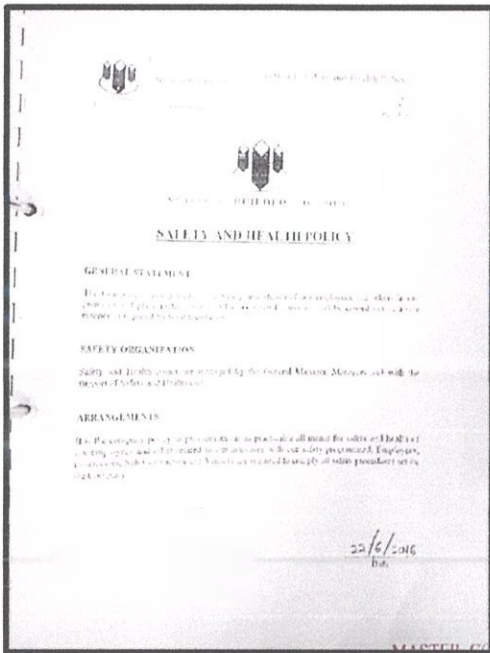


Figure 3.1.1(n) : Safety and health policy

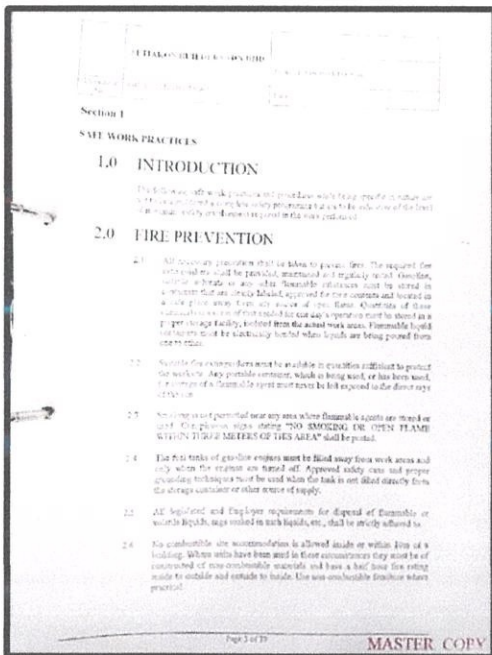


Figure 3.1.1(o) : Safe works practices

There are the safety and health policies in the Project quality plan, PQP. The safety and health policies are managed by the general manager, managers and with the support of safety and health unit. The policies consists, the occupational safety and health policy general statement, the applicable laws and regulations, safety organisation, safety training procedures, accident or incident procedures, worksite inspection, fire prevention, security procedures and noise monitoring.

First, there is Safety and health policy general statement. The general statement are verified and signed by the managing director of Setiakon, Dato’ Kuan Ah Hock as he will responsible upon the safety issues in the construction site.

Second, the applicable laws and regulations are based on the regulations from the Occupational Safety Health Administration, OSHA. All the regulations are stated in the PQP to inform to the parties involves to take alert on the regulations.

Table 3.1.1 : Contents in Project Quality Plan, PQP

2.) Monitoring and testing the materials

QA/QC engineers are monitoring and do testing on the materials used in the site. Monitoring the materials is very important as it helps to track the materials been used, the quality of the materials, the quantity of the material and to prevent gain wastage. To track the materials, QA/QC engineers monitoring the materials from the the arrivals of the material to the site until the construction complete. For example situation, the ironmongeries supplies arrive at the construction site, QA/QC engineers are monitoring the quantity and the quality of the ironmongeries with the supplier before receive it.



Figure 3.1.2(a) : The ironmongeries supplies, arrive on the construction site



Figure 3.1.2(b) : QA/QC engineer monitoring the ironmongeries by counting and checking it before receive it

Other example of monitoring the material, monitoring the key functionality. For high residential project, managing and monitoring keys, is one part of QA/QC works. It is difficult, as it is in enormous amount of the keys to manage and monitor. To ensure keys functionality, each of the keys have to inspect and test, then record the data. From the data, it helps to monitor and track the keys functionality. for further action, it helps identify which have the problems. To avoid many wastage on managing the keys, it is must to have systematic key system. The key system track person who use the keys, if any key missing, there will be compounds on the person.

Before ordering the materials, the supplier give samples of the materials to QA/QC engineer. Then, QA/QC engineer present towards the consultant teams about the material's sample. After the consultant team verified and satisfied with the material, the QA/QC engineer will proceed ordering the material. Each of the materials used are need to present to consultant teams and must be verified. Before that, the supplier have send the sample of the materials as the references for the main contractor, the consultant and sub-contractors. All the materials and equipments are use in the that particular project must have the sample. Then, all the samples keep by QA/QC engineers in the sample room provided by main contractor



Figure 3.1.2(c) : Tracking the key functionality with try the keys at its door

Figure 3.1.2(d) : Summary Keys functionality and losses of Tower A1



Figure 3.1.2(e) : Sample of rubber tactile tiles receives by QA/QC engineer



Figure 3.1.2(f) : QA/QC engineer keeping all the sample in the sample room

3.) Monitoring the workmanship

Monitoring the workmanship is one of the scope works of the QA/QC engineers. It is very important as it crucial step for control the quality of the workmanship. Every works in the construction, are monitored by the QA/QC engineers to check that the method use by the workers are right and follow the method statements. If the method use by the workers wrong, it will affect the quality of the works and sometimes make it more costing.



Figure 3.1.3 : Monitoring the work done with the client's representative

4.) Inspecting the works

QA/QC engineers inspect the work done. After the workers done their works, QA/QC will inspect the product's quality. Inspection do with the representative from the consultant team to verified by both parties. Each inspection have it forms and requirements. It is must to do inspection as it helps to determine poor products or poor workmanships.



Figure 3.1.4 : Inspection of the outstanding work done in the unit area

3.2 The differences of Quality Assurance, QA and Quality Control, QC.

Quality assurance and quality control are two aspects of quality management system. While some quality assurance and quality control activities are interrelated, the two are defined differently. Typically, QA activities and responsibilities cover virtually all of the quality system in one fashion or another, while QC is a subset of the QA activities. Also, elements in the quality system might not be specifically covered by QA/QC activities and responsibilities but may involve QA and QC. There are the differences: (Diffen, 2017)

DIFFERENCES	QUALITY ASSURANCE	QUALITY CONTROL
DEFINITION	All the planned and systematic activities implemented within the quality system that can be demonstrated to provide confidence that a product or service will fulfill requirements for quality.	The operational techniques and activities used to fulfill requirements for quality.
PROCESS	It is a process which deliberates on providing assurance that quality request will be achieved. The confidence provided by quality assurance is twofold internally to management and externally to customers, the government authorities, regulators, certifiers, and third parties.	It is a process which deliberates on fulfilling the quality request, quality control is more the inspection aspect of quality management.
AIM	Quality Assurance aim is to achieve quality request.	Quality Control aim is to identify and improve the quality.
TECHNIQUE	Quality Assurance is the technique of managing quality.	Quality Control is a method to verify quality.

RESPONSIBILITIES	All team members are responsible for QA.	Testing team is responsible for QC.
STANDARD	Quality Assurance Defines standards and methodologies to followed in order to meet the customer requirements.	Quality Control ensures that the standards are followed while working on the product.
SCOPE WORKS	<ul style="list-style-type: none"> • Implement the QA/QC management system at site • Coordinate with quality inspections with all the site sub contractors and vendors coordinate all non destructive testing on site • Coordinate with the customers representative on all quality matters • Coordinate all receipt inspections • Distribute relevant QA/QC documentation to site subcontractors • Verify that the quality related site activities are in accordance with the applicable codes and standards • Participate in the site internal and external site audits • Coordinate all the quality site inspections 	<ul style="list-style-type: none"> • Ensures the quality records, acceptance certificates, mechanical completion certificates and the documentation for specific systems and buildings/areas are prepared and collated in accordance with project requirements • Coordinate with the planning and scheduling department to ensure milestone dates are understood for each turn over area • Coordinate with the site QC manager for the completion of as-built turnover documentation • Resolve any discrepancies between the completed milestone and quality documentation • Review suppliers inspection and test

<p>References : (QA/QC Construction)</p>	<p>through the site QC inspectors</p> <ul style="list-style-type: none"> • Ensure all quality control documentation is complied and completed for as-built hand over through the QC turnover engineer • Control all non-conformance reports and undertake remedial action • Compete site quality control instructions and action remedial responses • Monitor the implementation of the approved site QC Plan • Complete and coordinate the approval of the sites QC technical submittals to the customer • Coordinate with the site construction manager on all quality issues <p>Coordinate and chair the QA/QC site weekly meetings with the projects subcontractors QC personnel</p>	<p>plans against the milestone scope of work</p> <ul style="list-style-type: none"> • Coordinate with the commissioning department to define the scope of work • Assist the site subcontractors to compile turnover dossiers • Provide progress information for incorporation into project reports • Consider the implications of delays in QC as-built turnover documentation and bring to the attention of the site QC manager • Monitor and control the status of punch list and exception lists relevant to quality dossiers • Coordinate any inconsistencies with test packages with the field QC site inspectors • Provide progress data to the planning and scheduling department
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Table 3.2 : Differences between QA and QC

3.3 The types and the work sequence of the inspections and testing conduct under Quality Assurance and Quality Control in construction.

There are the types of inspections and testing conduct under Quality Assurance and Quality Control, QA/QC engineers in Lumi Tropicana site. For the types of inspection, there are inspection under architecture and inspection under civil and structure that handle by the QA/QC department here.

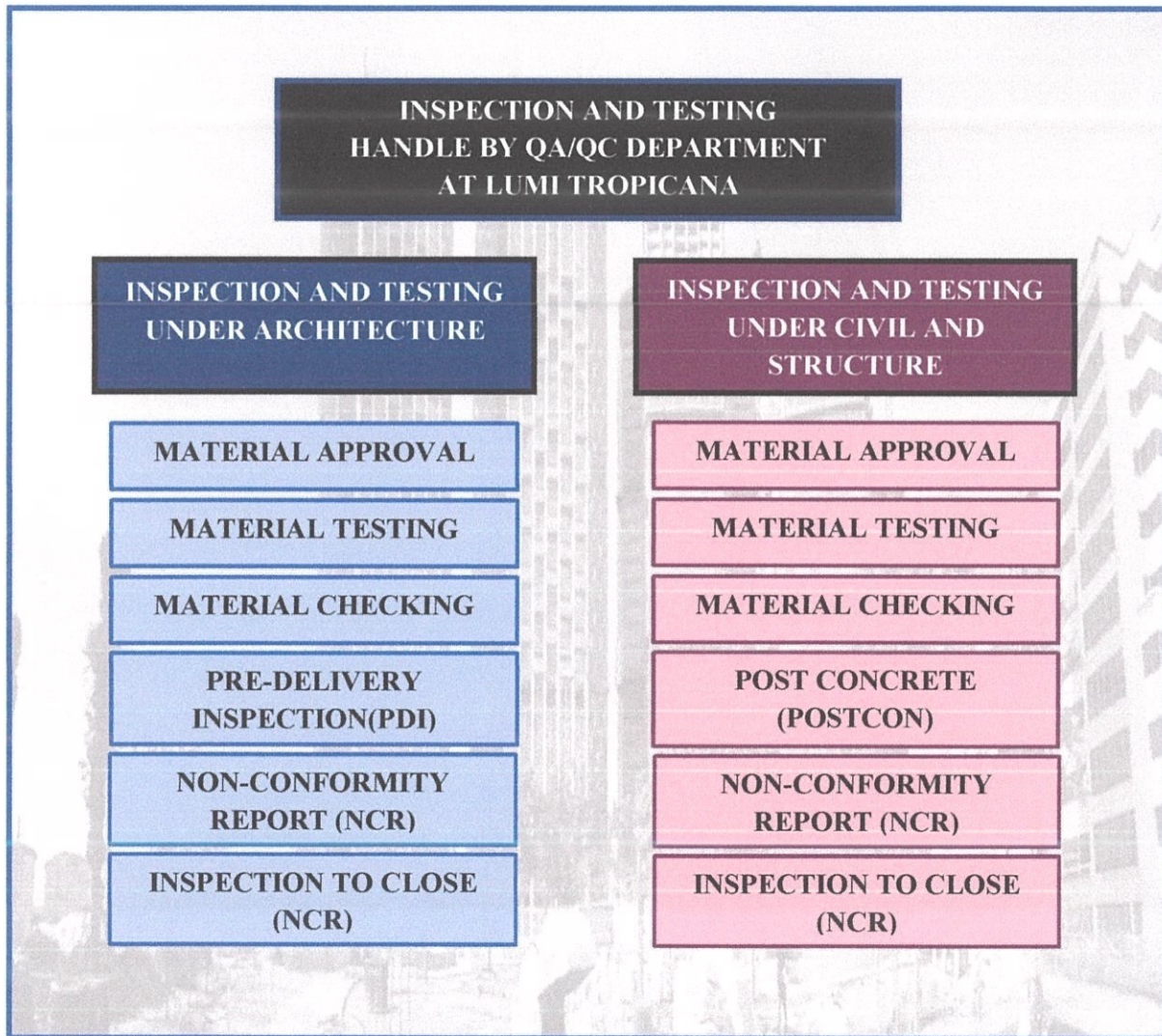


Figure 3.3 : The chart of the inspections sequences and the types of the inspections

3.3.1) Inspection and testing under Architecture

1. Material approval

All the materials used are need to approves by the parties, the clients and the consultants. Before purchasing the material, the approvals of the materials between the parties must approves. This will ensure that the materials are confirm to used. Then, QA/QC engineer are documenting and keeping the approvals.

2. Material testing

Material testing is the inspection to check the material condition and the characteristics for the preferences. All the materials used are been tested before purchasing. For examples, the material testing under architecture, the adhesion testing on the tiling, the surface testing on tiling, wind test on the window glass and others.

3. Material checking

When receiving the materials from the supplier, QA/QC engineer inspect the materials first before receiving it. QA/QC engineer inspect the condition, the types and the quantity of the delivered material. For example checking material under architecture, checking the ironmongeries and the keys, QA/QC engineer inspect the condition, the types of the ironmongeries and the keys. The quantity of the ironmongeries and the keys must tally with the delivery order before receiving it from the supplier.

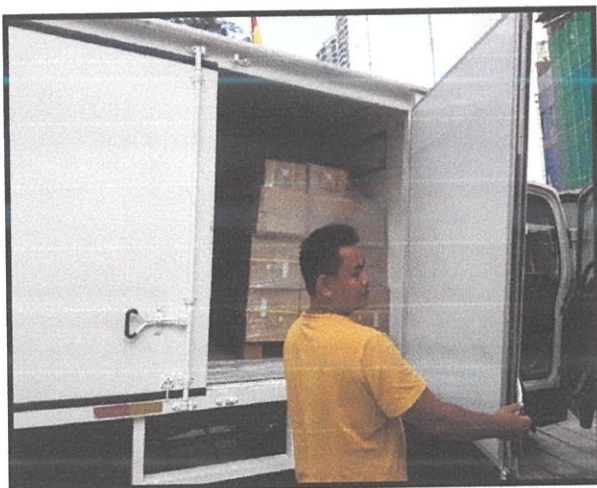


Figure 3.3.1(a) : Ironmongeries supplies deliver at the site



Figure 3.3.1(b) : Checking the types and the quantity of the ironmongeries received

4. Pre-delivery inspection (PDI)

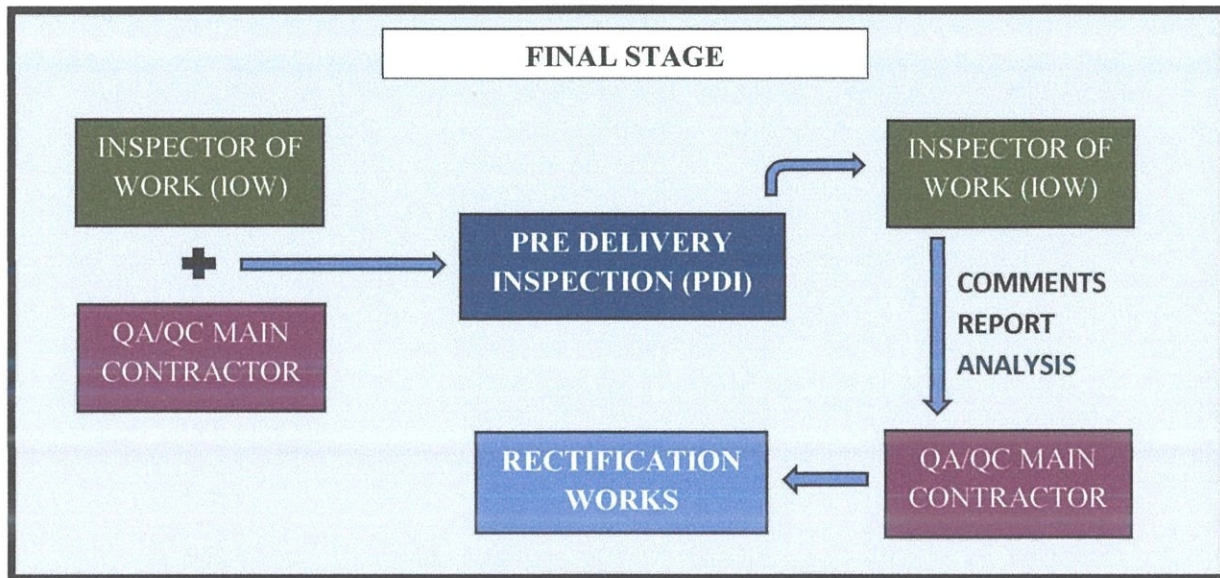


Figure 3.3.1(c) : The charts of the PDI sequence work steps

Pre-delivery inspection or known as PDI, is the inspection after the work done and in the process to delivery to the client. The inspection handle by QA/QC engineer with the Inspector of work (IOW). The main purpose of this inspection is to detect outstanding works problems and defects. Outstanding works are necessary elements in any building that need to build up or install based on the requirements provided. Defects are the imperfection or abnormality of work done that affect the quality and functionality of the material in the building.

For the process of the inspection, first, the QA/QC engineer follow up from the Inspector of work (IOW) about the place, date or type of elements to inspect. The elements that selected are, floor, wall, ceiling, door, window and electrical fittings. Second, inspect the selected elements and identify any outstanding works and defects. Then, any defects or unfinished works, are recorded by the Inspector of works (IOW) at the with the comments at the report analysis (RA). After the Inspector of Works (IOW) comments on the report analysis, the reports are send to main contractor's QA/QC engineer for rectification works. Then, QA/QC engineer give a memo about rectification works to the sub-contractors involves. QA/QC engineer are monitoring the rectification works progress done by the sub contractor involves.

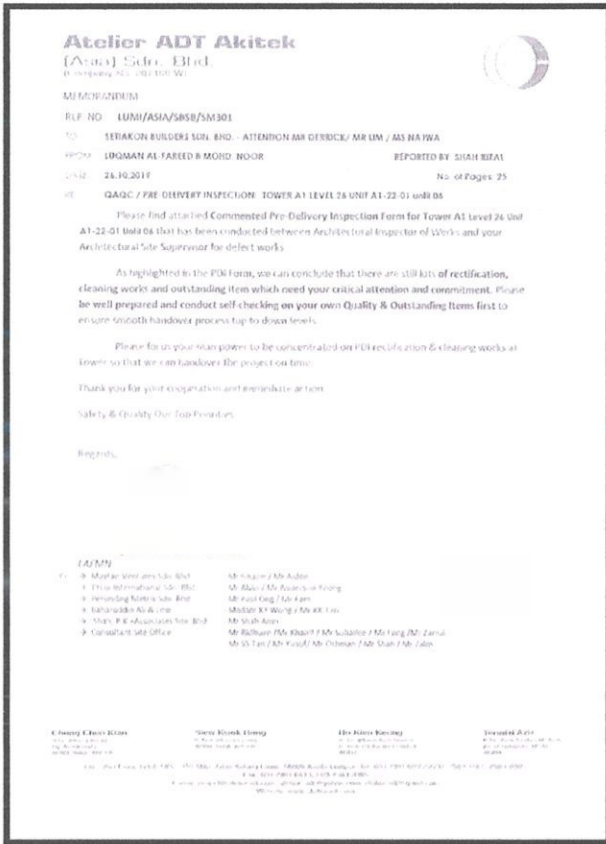


Figure 3.3.1(d) : QA/QC Report from the IOW

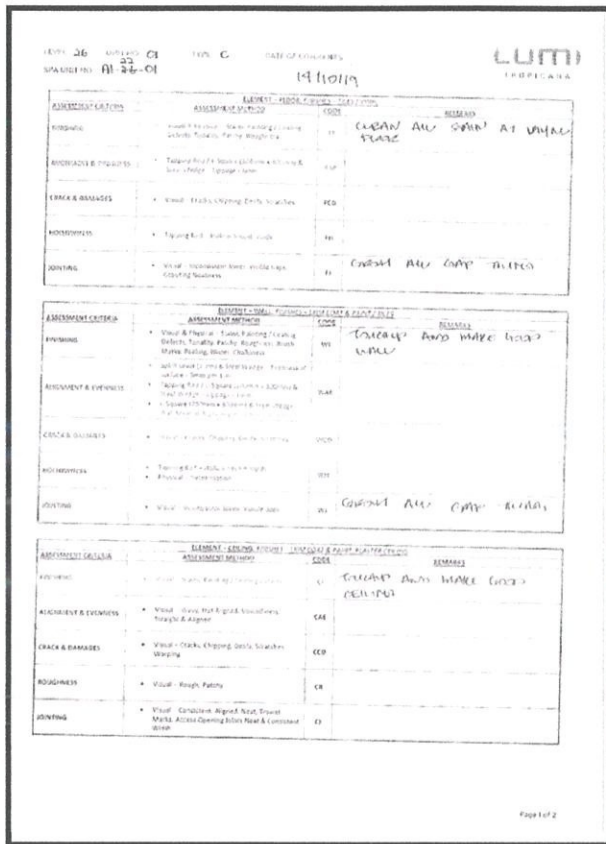


Figure 3.3.1(e) : Forms of PDI inspection from IOW

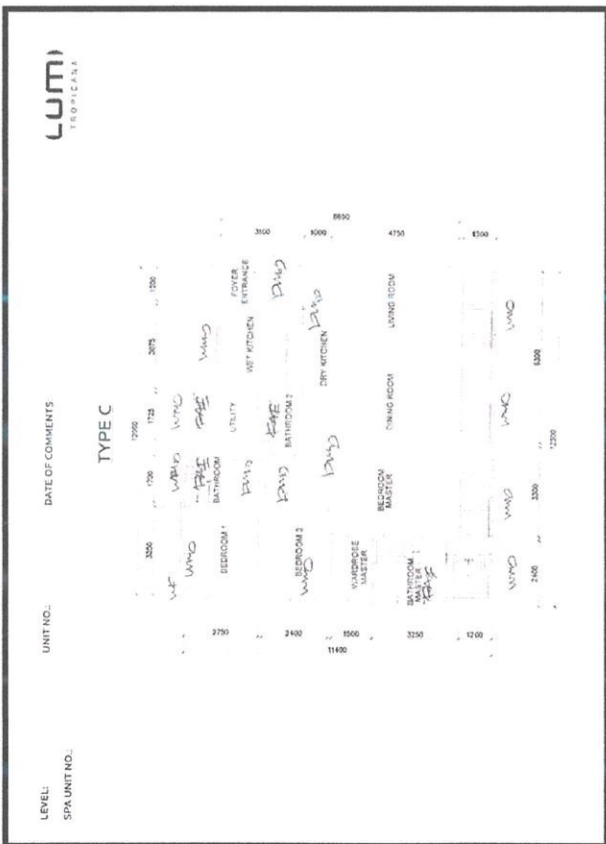


Figure 3.3.1(f) : Marking on layout plan



Figure 3.3.1(g) : Inspector of works (IOW) inspect PDI : hollowness of tiles at the corridor

5. Non-conformity report (NCR)

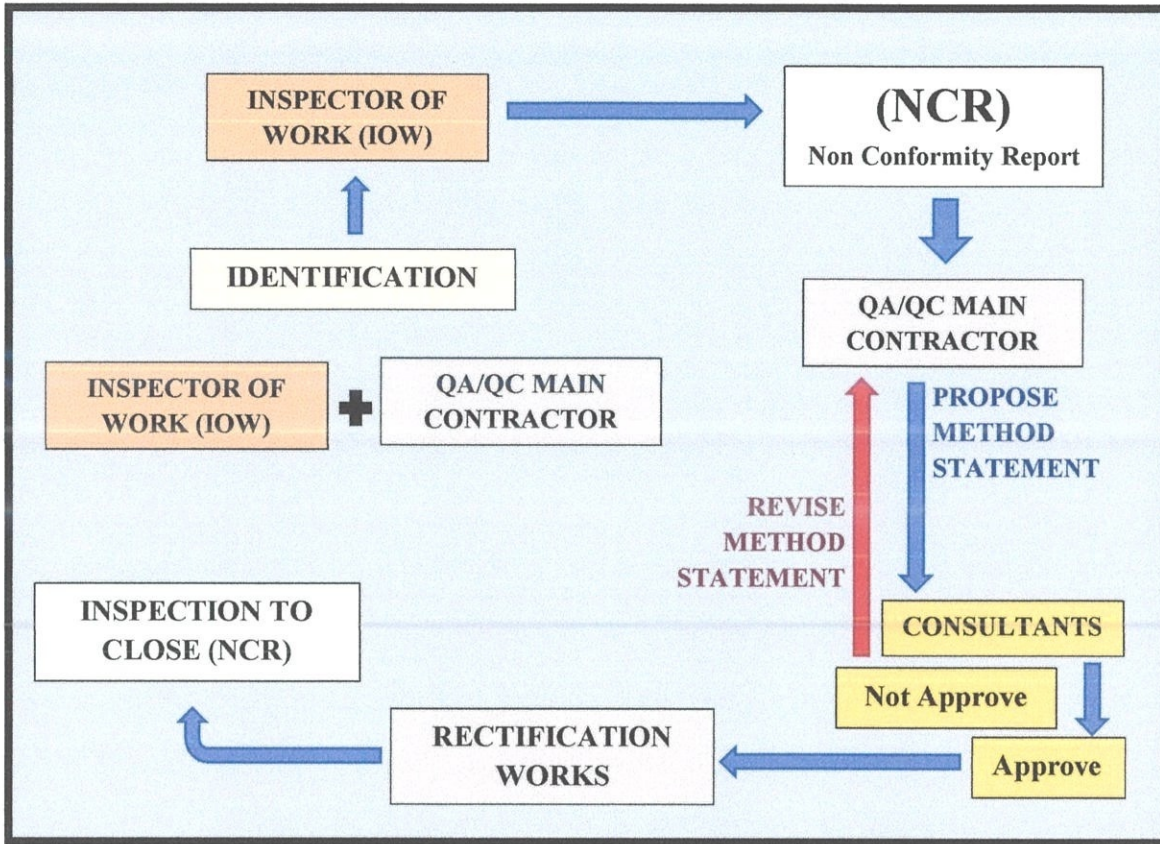


Figure 3.3.1(h) : The charts of the NCR sequence steps

Non-conformity report (NCR) is the complaining report for the major workmanship mistakes or major defects occur on the building elements. The building elements built are different from the actual design. The procedure for (NCR), first the Inspector of work (IOW) and the QA/QC engineer from main contractor are identify the major mistakes or major defects when Pre-Delivery inspection (PDI). Then, Inspector of work (IOW) send Non-conformity report (NCR) to QA/QC engineer for further action. QA/QC engineer propose method statement from Project Quality Plan, PQP for the rectification works, towards the consultants.

The method statements proposed are monitoring and investigating by the consultants. If the method statements are reject, QA/QC engineer will revise and update the new method statements by consulting from the consultation until the method statement approve. After the consultants approve the method statement, QA/QC engineer send a memo to the sub contractor involve for rectification works.

ADT-NCR-012
RUSTED PLASTER CEILING SCREW

Project: HUBI PROPOSAL
Site: 110
Contractor: M2V-ANALIM
Inspector: M2V-ANALIM
Date: 18/03/2019

REMARKS OR ISSUE DESCRIPTION (To be completed by the Inspr):
 Use of non stainless steel on Ceiling Works
 Use of this unapprove of screw has cause rusted effect that can be seen clearly even after skin and paint of the plaster ceiling is not touch. A/L to Tower B. (Most of Unit is concerns 18/3/19)

VERIFICATION FOR CORRECTIVE ACTION
 Is corrective action implemented and effective?
 Yes No

Signature: C. D. W. / P.M.
 Date: 18/03/2019
 Signature: M2V-ANALIM
 Date: 18/03/2019

MASTER COPY

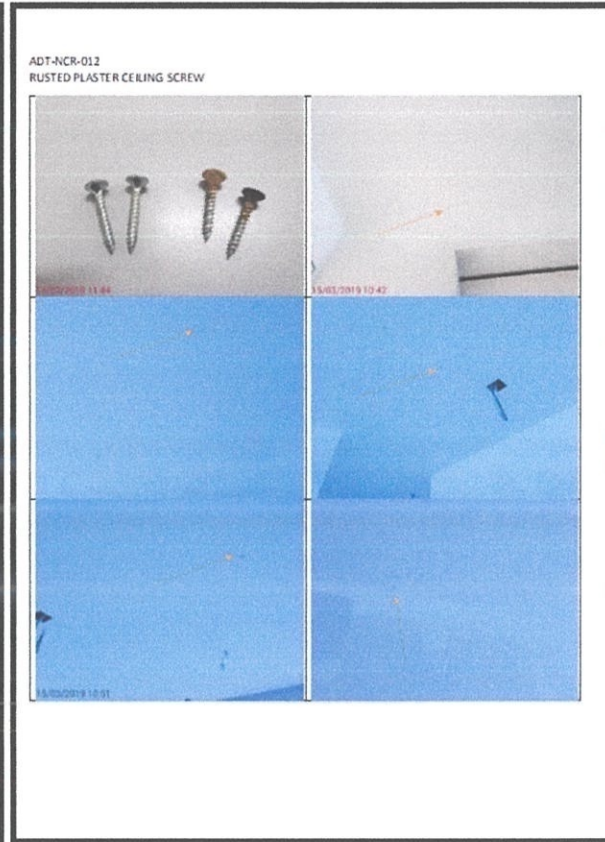


Figure 3.3.1(i) : IOW NCR form report

Figure 3.3.1(j) : The photos attached with the report

SETIAKON BUILDERS SDN BHD

NO. 11, JALAN SETIAKON 1, TAMAN SETIAKON, 40100 KUALA KEMPAS, JOHORE NEHARU

TEL: 07-65211111 FAX: 07-65211111

SYB/11/MS/004 Rev No : 00

MATERIAL SUBMISSION APPROVAL FORM

Contract No: Ref No: SYB/11/MS/AR/12

TO: ATY FERRARI WATER (AMUSIN) BHD
 No. 1, Jalan Negeri, Batu Pahat
 JAWAHAR 80100

Submittal: New Submittal Resubmission Rev. Submittal

Material: Plaster Board Ceiling (Type: Gypsum Board)
 Submittal No: 10
 Manufacturer: Gypsum Board Manufacturing Sdn. Bhd.
 Warranty: 12

Material: Sample Engineer Shop Drawing Specification Temporary Fixation Design Calculation
 EP or other Manufacturer's Warranty Certificate (Required) Other Self Production (Not for Service Contract)

Prepared and submitted by:
 Signature: [Signature]
 Name: [Name]
 Designation: [Designation]
 Date: [Date]

COMMENT BY SUBJECT CONSULTANT:
 1. BUKAN STAINLESS (KOROSI)
 2. PASTIKAN KAWAT BESI SUDAH DILAPOR (KOROSI) BERTAMBAH
 3. AS

Submitted by:
 Signature: [Signature]
 Name: [Name]
 Designation: [Designation]
 Date: [Date]

Notes:
 No submit comment subject to full compliance with contract drawing and specification
 Resubmit with a comment / add-on detail submission
 Re-submission required / Required

COPIES TO: MSB-002 ARKITEKTURAL QS
 KURNI LANDSCAPES SETI



Figure 3.3.1(k) : Material submission approval (Propose)

Figure 3.3.1(l) : The pamphlet of the product attached with the report

6. Inspection to close (NCR)

After the rectification works done, there are inspection to close (NCR). Non-conformity report is mandatory to close as it have to build like in actual design and for safety reasons and functionality. If (NCR) not close, the penalty charges are on the main contractor. Inspection to close (NCR) are inspect by the consultants, inspector of work (IOW) and the QA/QC engineer from the main contractor. If the rectification works are successfully rectify, then the (NCR) can close, if not, there are further investigation and rectification works by the consultants.

3.3.2) Inspection and testing under Civil and Structure

1. Material approval

All the materials used are need to approves by the parties, the clients and the consultants. Before purchasing the material, the approvals of the materials between the parties must approves. This will ensure that the materials are confirm to used. Then, QA/QC engineer are documenting and keeping the approvals. For example, the types of the cement, the product of cement that selected to used have the approval first before purchasing.

2. Material testing

Testing of the materials are necessary to control the quality of the material. For testing under QA/QC, there are various type of testing such as, cube test, tensile test, slump test, field density test, wind load test, and others. But, QA/QC engineers responsible to monitoring the testing materials. Every testing are monitor by the QA/QC engineers to follow up about the materials. Then, the results have to verify by the consultants, and works can proceed. There are example of material testing conduct by QA/QC engineer. There are cube test and reinforcement bar test. For reinforcement bar test, there are tensile strength test, bend test and re-bend test.

a.) Cube Test

Cube test is the one of the testing the material. The material that being testing is the concrete mix. The purpose of the test are to ensure the concrete mixing are has been done properly with the required cement grade, and the required ratio of the material. This cube test are done for ages 7 days and 28 days. Each 20 m³ of concrete mix came to the site are taken sample for the cube test. The testing witnesses are the represent of the main contractor, QAQC engineer, sub contractor involve and the Inspector of work (IOW).

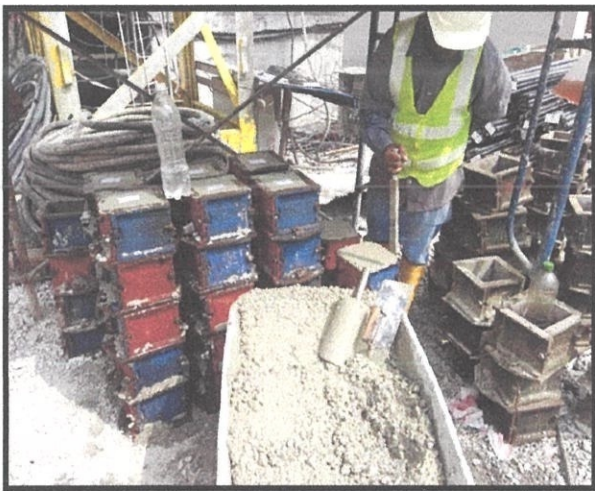


Figure 3.3.2(a) : Making the concrete cubes for test sample

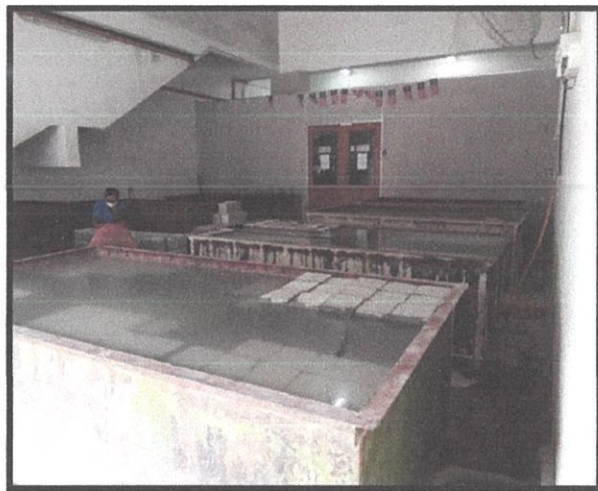


Figure 3.3.2(b) : Curing process

S.B SUMMARY OF CONCRETE CURE TEST-TRIAL MIX												
SUPPLIER : SIA NIK SIDA BHD												
NO	LOCATION/DESCRIPTION	SUPPLIER	GRADE	DATE ORDER	CURE TEST DATE			CURE STRENGTH			REMARK	
					7 DAYS	28 DAYS	56 DAYS	7 DAYS	28 DAYS	56 DAYS		
1	TRIP MIX	SIA NIK	S10	20/07/24	20/07/24	20/07/24	20/07/24	38.4	37.8	38.2	38.8	OK
2	TRIP MIX	SIA NIK	S10	20/07/24	20/07/24	20/07/24	20/07/24	38.4	37.8	38.2	38.8	OK
3	TRIP MIX	SIA NIK	S10	20/07/24	20/07/24	20/07/24	20/07/24	38.4	37.8	38.2	38.8	OK
4	TRIP MIX	SIA NIK	S10	20/07/24	20/07/24	20/07/24	20/07/24	38.4	37.8	38.2	38.8	OK
5	TRIP MIX	SIA NIK	S10	20/07/24	20/07/24	20/07/24	20/07/24	38.4	37.8	38.2	38.8	OK
6	TRIP MIX	SIA NIK	S10	20/07/24	20/07/24	20/07/24	20/07/24	38.4	37.8	38.2	38.8	OK
7	TRIP MIX	SIA NIK	S10	20/07/24	20/07/24	20/07/24	20/07/24	38.4	37.8	38.2	38.8	OK
8	TRIP MIX	SIA NIK	S10	20/07/24	20/07/24	20/07/24	20/07/24	38.4	37.8	38.2	38.8	OK
9	TRIP MIX	SIA NIK	S10	20/07/24	20/07/24	20/07/24	20/07/24	38.4	37.8	38.2	38.8	OK
10	TRIP MIX	SIA NIK	S10	20/07/24	20/07/24	20/07/24	20/07/24	38.4	37.8	38.2	38.8	OK

Figure 3.3.2(c) : All the cube test result are document



Figure 3.3.2(d) : Pressure machine for cube test

b.) Reinforcement bar Test (tensile strength test)

Each 1 tonne of reinforcement bar come to the site have to testing. There are various size diameter of reinforcement bar. There are 32 mm, 25 mm, 20 mm, 12 mm and 10 mm of reinforcement bar diameter. For tensile strength test, the purpose of the tensile strength test are to determine the effectiveness and behavior of a material when a stretching force acts on it. These tests are done under optimum temperature and pressure conditions and determine the maximum strength or load that the material can withstand. First, the reinforcement bar (rebar) are cutting to same length (100 mm). Then the reinforcement bars are weigh and ready to test. The reinforcement bars are insert in the tensile machine. Then, the machine pull out the reinforcement bars from upside and downside (opposite direction) until the reinforcement bar break a part. The tensile machine automatically measure the tensile strength of the reinforcement bar.



Figure 3.3.2(e) : Reinforcements bar with difference sizes



Figure 3.3.2(f) : Cutting the rebars



Figure 3.3.2(g) : Weighing the rebars



Figure 3.3.2(h) : Tensile machine test

c.) Reinforcement bar (Bend and re-bend test)

For bend and re-bend testing of reinforcement bar, the purpose of this testing is to measure the effect of strain ageing on steel. Strain ageing has embrittlement effect which takes place after cold deformation by diffusion of nitrogen in steel. (CEP). For the process, first, the bend test, all the reinforcement bars are bend 45° by the rebar bending machine. After bend (cool bending), the reinforcement bars are monitoring to check any cracks. Then, the reinforcement bars are insert in the oven for an hour for re-bend test. For re-bend of bars, it is preferably be implemented for small diameter bars with mild steel. Heating could be adopted to assist for re-bend process. However, heating should be applied to a good length of a bar instead of a concentrated location because of the possible occurrence of overheating. Moreover, after heating the cooler adjacent part of the steel bar may experience fracture when the bars are stressed in case concentrated heating is applied to steel bars.

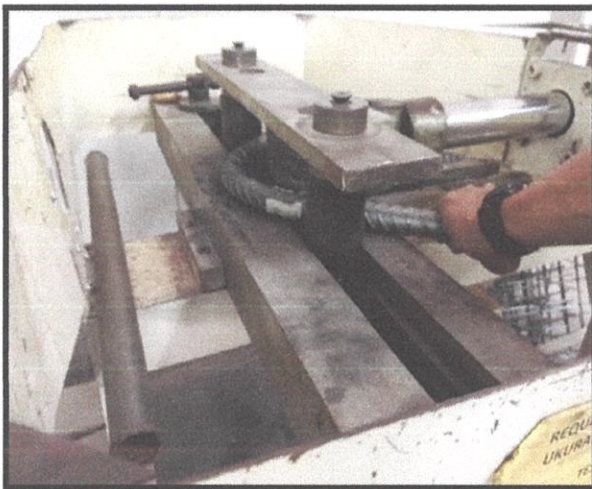


Figure 3.3.2(i) : Bending the rebars



Figure 3.3.2(j) : Heating process after the rebar bend



Figure 3.3.2(k) : Checking any cracks



Figure 3.3.2(l) : Re-bending the rebar after heating process

3. Material checking

When receiving the materials from the supplier, QA/QC engineer inspect the materials first before receiving it. QA/QC engineer inspect the condition, the types and the quantity of the delivered material. For example checking material under civil and structure, checking the types of cement, the size and condition of the reinforcement bar, the concrete mix, the size and types of bricks and others. All the delivery order receipt are recorded for documentation and proof for tracking.



Figure 3.3.2(m) : The cement supplies deliver on site



Figure 3.3.2(n) : QA/QC engineer checking the material with the logistic

4. Post concrete (POSTCON)

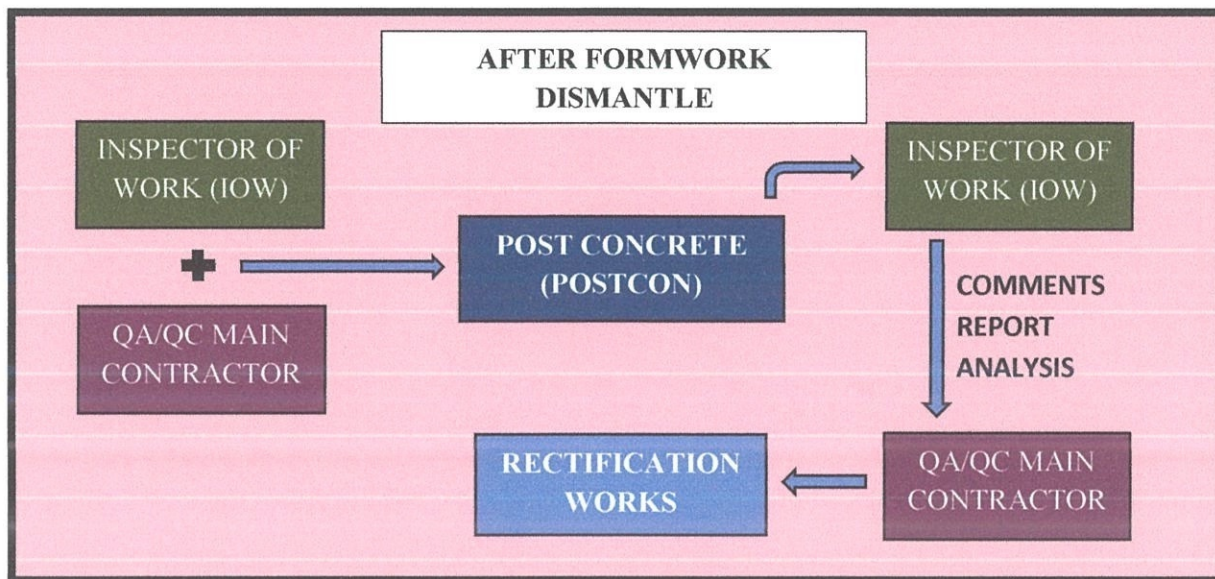


Figure 3.3.2(o) : The charts of Post concrete inspection sequence works steps

Post concrete (POSTCON) is the inspection after the formworks are dismantled from the hardened concrete. The purpose of post concrete is to detect defects and mistakes done by the workmanship. A good quality of the final condition of the concrete can ensure the high sustainability of the concrete. Plus Post concrete is done to make sure that the condition of the concrete is satisfied and safe for the next works, architecture works to enter. For example, there are major honeycombs on the surface of the wall, if the plastering (architecture works), the plaster is easily broken when hardened as there are hollows.

For post concrete inspection, first, the civil and structure supervisor follow up to the QA/QC engineer about the dismantled works or formworks. After formworks are done and dismantled, QA/QC and the Inspector of Work (IOW) set a date, time and location for the inspection. While inspecting, QA/QC and Inspector of Works are identifying the defects and mistakes on the concrete by spraying the paint spray to mark the location. At the same time, QA/QC engineers take the photo for the evidence and mark on the layout plan. After that, the Inspector of Works (IOW) comments on the report and sends it to the QA/QC engineers for further actions. Then, QA/QC sends a memo for the subcontractor involved for rectification works. For rectification, there is a period of time to finish the rectification to ensure that the architecture works schedule is not delayed because of a longer period of rectification works.



Figure 3.3.2(p) : QA/QC engineer with IOW for Post concrete

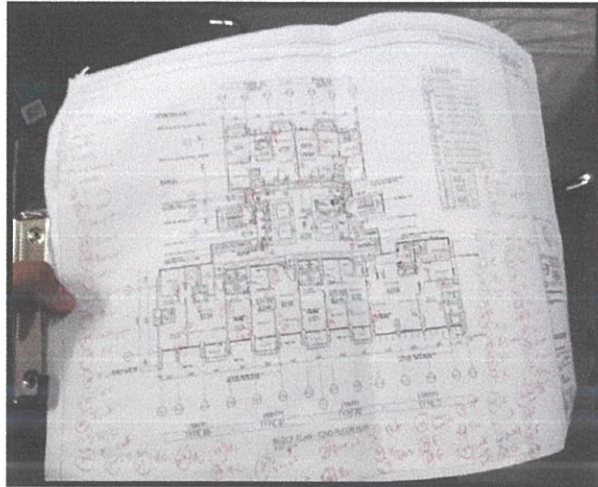


Figure 3.3.2(q) : A sample of marking on layout plan



Figure 3.3.2(r) : Defects: bulging

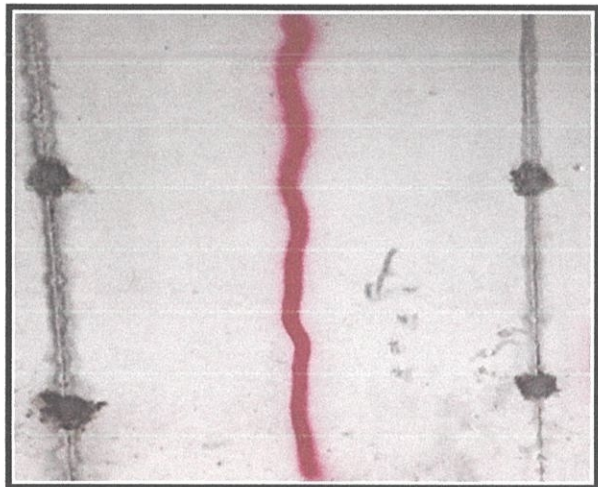


Figure 3.3.2(s) : Defects: crack lines



Figure 3.3.2(t) : Defects: honeycombs



Figure 3.3.2(u) : Defects: steel exposed

5. Non-conformity report (NCR)

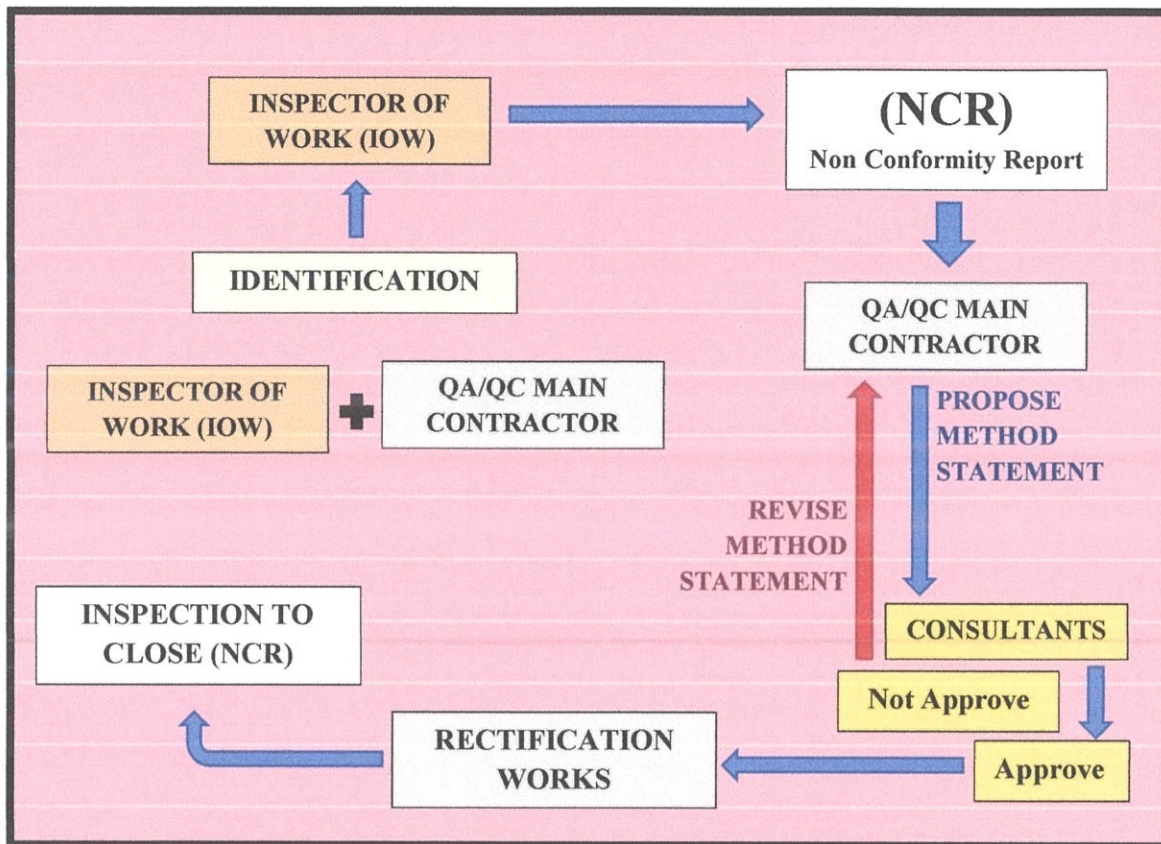


Figure 3.3.2(v) : The chart of the NCR (C&S) sequence works steps

Non-conformity report (NCR) for civil and structure is the complaining report for the major workmanship mistakes or major defects occur on the building structure or elements. The building elements or structure built are different from the actual design. The procedure for (NCR), first the Inspector of work (IOW) and the QA/QC engineer from main contractor are identify the major mistakes or major defects when Post concrete or from the eye sight. Then, Inspector of work (IOW) send Non-conformity report (NCR) to QA/QC engineer for further action. QA/QC engineer propose method statement from Project Quality Plan, PQP for the rectification works, towards the consultants.

The method statements proposed are monitoring and investigating by the consultants. If the method statements are reject, QA/QC engineer will revise and update the new method statements by consulting from the consultation until the method statement approve. After the consultants approve the method statement, QA/QC engineer send a memo to the sub contractor involve for the rectification works. To close (NCR) under civil and structure are pivotal as the structure is the main part of the building.

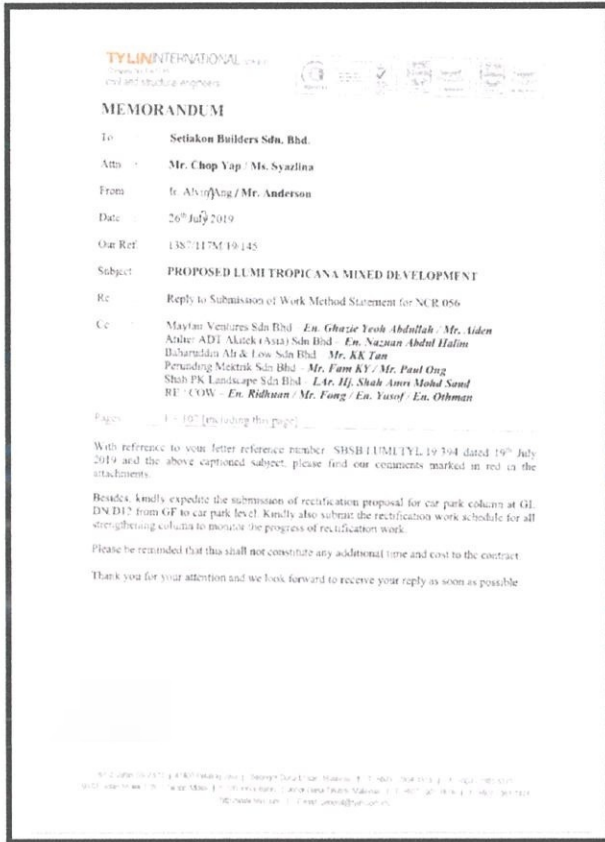


Figure 3.3.2(w) : NCR report from IOW

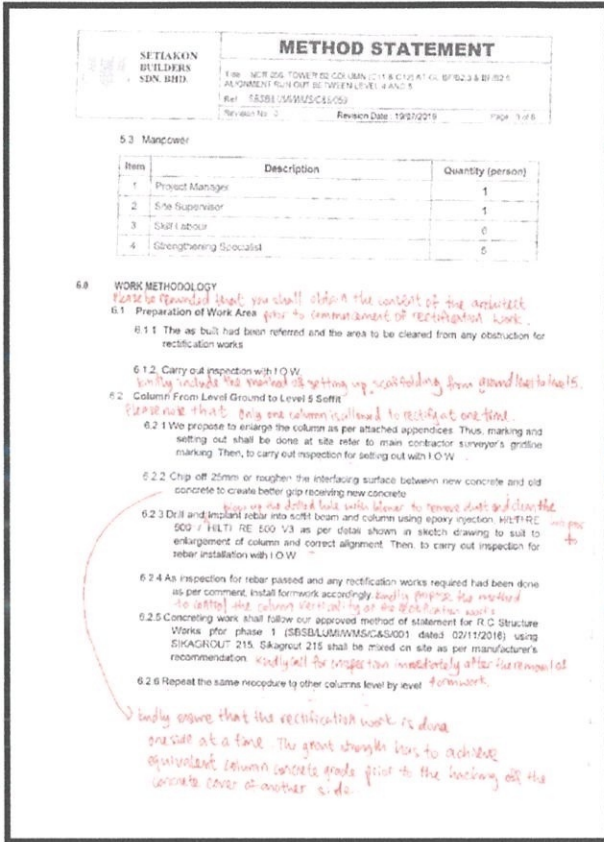


Figure 3.3.2(x) : Reject method statement

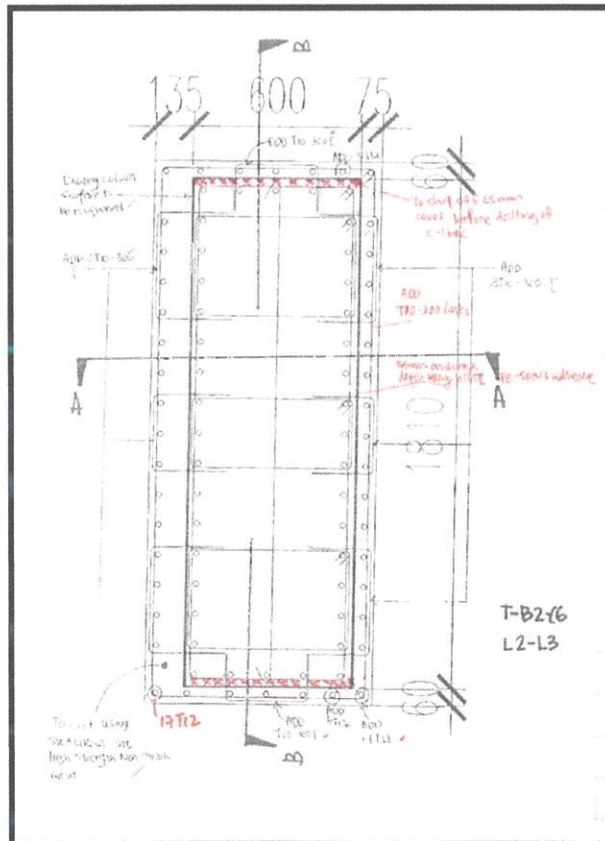


Figure 3.3.2(y) : Revised drawing of the column

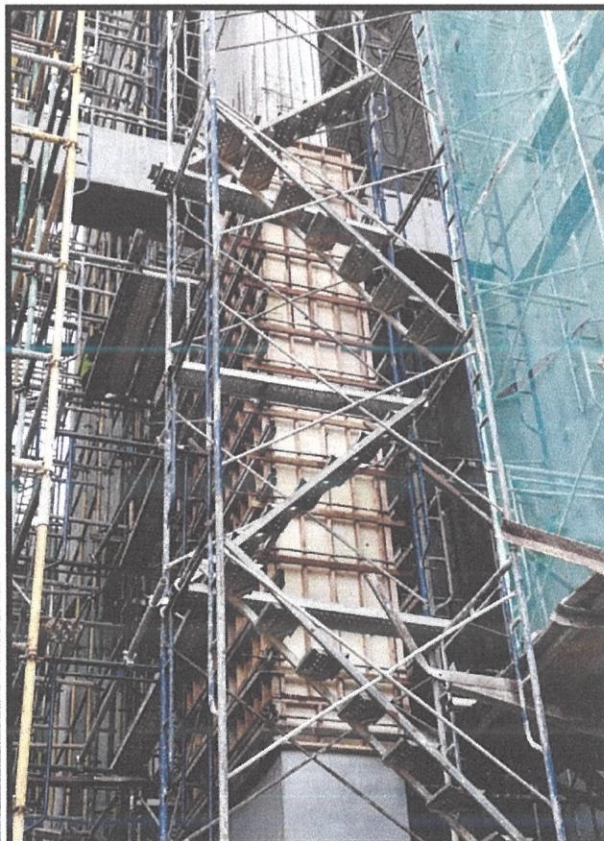


Figure 3.3.2(z) : Rectification works

6. Inspection to close (NCR)

After the rectification works done, there are inspection to close (NCR). Non-conformity report is mandatory to close as it have to build like in actual design and for safety reasons and functionality. For structure, to close (NCR) at the structure are crucial as the structures are the main part of the building, failure structure leads to collapsing of the building. If (NCR) not close, the penalty charges are on the main contractor. Inspection to close (NCR) are inspect by the consultants, inspector of work (IOW) and the QA/QC engineer from the main contractor. If the rectification works are successfully rectify, then the (NCR) can close, if not, there are further investigation and rectification works by the consultants.

CHAPTER 4.0 CONCLUSION

4.0 Conclusion

In conclusion, Quality Assurance and Quality Control are very importance for any construction project. Quality Assurance and Quality Control are the heart of the project. The scope works of QA/QC are covering all parts of the projects from the materials, documentation control, providing method statement for architecture works, civil and structure, mechanical and electrical, some even landscape and interior design, QA/QC are controlling, guiding, monitoring all the works in project, as it was the responsibilities of QA/QC to sustain the quality of the products from initial stage until the final stage.

There are the differences between Quality Assurance, QA and Quality Control, QC from the scope works, aim and responsibilities, but Quality Assurance and Quality Control never can break a part as both needs each other to make it complete. Different companies have differences standards, and somehow the standards of quality can be differences. So, there will be many differences on standards, forms and inspections of the quality.

Quality Assurance and Quality Control, QA/QC are very importance for maintain the quality of the projects. Systematic quality system management can save the project cost, can low the wastage cost and can produce a high quality of the products. Thus, it is believe that Quality Assurance and Quality Control are very important in the construction.

REFERENCES

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<https://the9000store.com/iso-9001-2015-requirements/what-is-iso-9001-quality-management-system/>
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https://www.diffen.com/difference/Quality_Assurance_vs_Quality_Control
- CIDB Malaysia. Carian Kontraktor Berdaftar. Available from :
<https://cims.cidb.gov.my/smis/regcontractor/reglocalsearchcontractor.vbhtml>
- CEP, Civil Engineering Portal. Available from :
<https://www.engineeringcivil.com/what-is-the-purpose-of-conducting-re-bend-test-of-steel-reinforcement.html>
- QA/QC Construction, QA job description / QC job description. Available from :
<https://qaqc-construction.com/qaqc-job-descriptions-overview/>

APPENDICES

Appendix A : The details of the construction project information	(Page – 17)
Appendix B : The organisation in the project	(Page – 17)
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(Architecture work : Door frame installation)	(Page – 20)
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Appendix A : The details of the construction project information

1.1 CONTRACT SUMMARY

- 1 Project : CADANGAN MEMBINA PEMBANGUNAN PERNIAGAAN YANG TERDIRI DARI:
1. FASA 1, 2 BLOK PANGSAPURI PERKHIDMATAN 35 TINGKAT BLOK A1 186 UNIT DAN BLOK B1 186 UNIT DI ATAS 4 TINGKAT PODIUM MEGANDUNGI SOHO (62 UNIT), KEDAI, KEMUDAHAN REKERASI DAN TEMPAT LETAK KERETA DAN 1 BLOK TEMPAT LETAK KERETA 7 TINGKAT DAN KEMUDAHAN.
2. FASA 2, 2 BLOK PANGSAPURI PERKHIDMATAN 35 TINGKAT (DI ATAS 4 TINGKAT PODIUM) BLOK A2 186 UNIT DAN BLOK B2 186 UNIT,
- DI ATAS LOT 212 DAN 213, PERSIARAN TROPICANA, PJU 3, MUKIM DAMANSARA, DEARAH PETALING, SELANGOR. UNTUK TETUAN MAYFAIR VENTURES SDN BHD
- 2 Client : MAYFAIR VENTURES SDN. BHD.
Dated : 16 June 2016
- 3 Letter of Award Reference : MVSB/LumiTropicana/BW/SBSB(P1)/LOA/2016/MK
- 4 Contract Value : RM223,538,379.36
- 5 Site Possession Date : 1 July 2016
- 6 Date of Completion : 30 June 2019
- 7 Revised Date of Completion : 30 November 2019
- 8 Contract Period : Thirty six (36) Months
- 9 L.A.D : RM42,000.00 / day (Excluding TNB Sub-station)
TNB Sub-station : RM1,000.00 / day
Mock-Up (Unit) : RM5,000.00 / day
- 10 Defect Liability Period : Thirty (30) Months
- 11 Insurances : **(a) Contractor All Risk**
Company Name: Allianz General Insurance Company Bhd
Policy No: 16EMT000051
Date: 1-01-2016 to 31-03-2021
- (b) Workman Compensation**
Company Name: Allianz General Insurance Company Bhd
Policy No: 16WMT000124
Date: 1-7-2016 - 30-6-2019

Appendix B : The project organisation

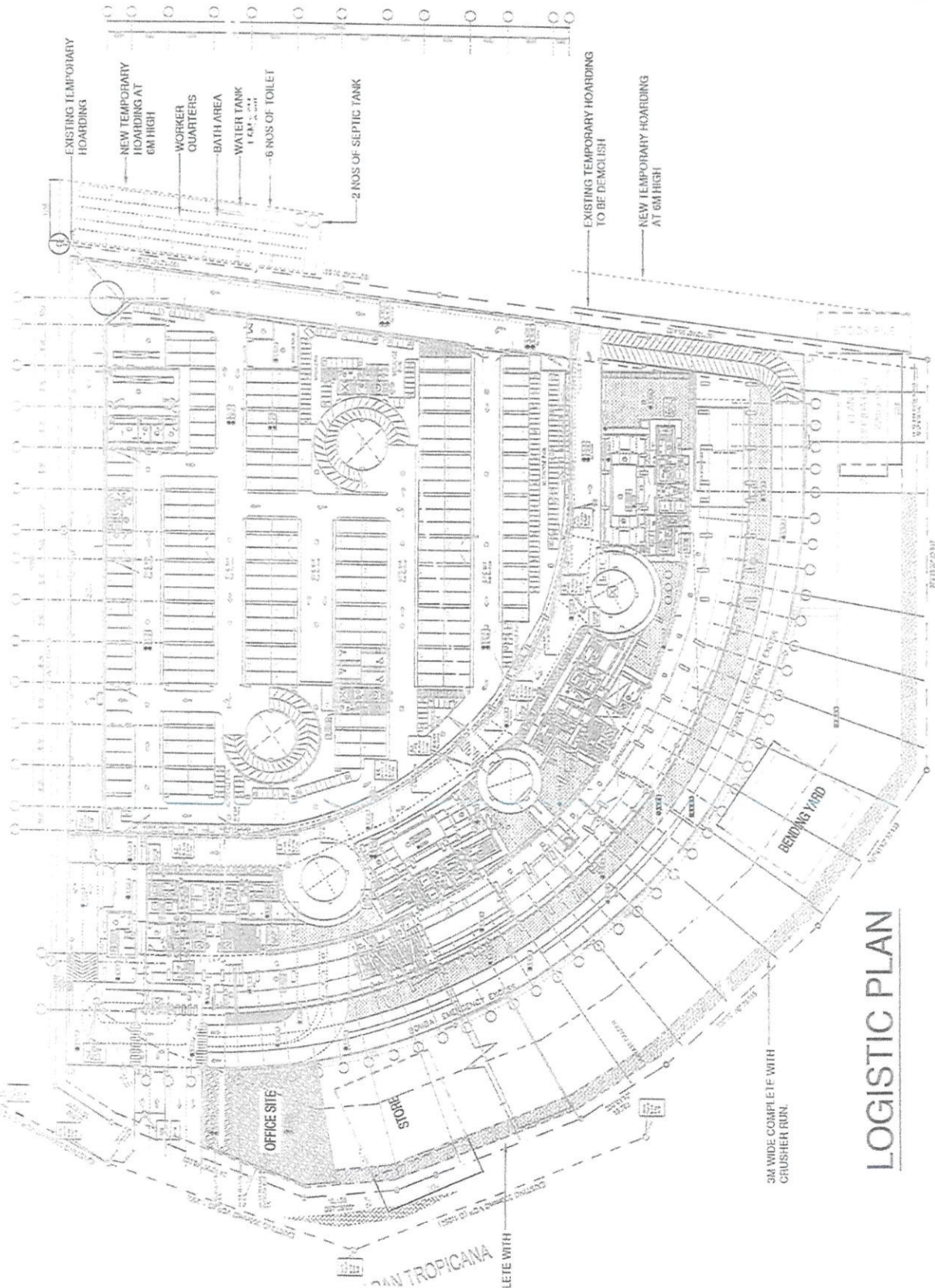
1.2 _ PROJECT DIRECTORY FOR LUMI TROPICANA

Client / Developer	Company Name	MV	Person Incharged	Email Address	Contact No.
	Mayfair Ventures Sdn Bhd Level 23A, Menara LGB, No.1, Jalan Wan Kadir, Taman Tun Dr. Ismail, 60000 Kuala Lumpur	MV	Mr. Aiden Chong Zhoxien Mr. MK Foo Ms. XW Yap MS. YM Khoo	aiden.chong@thrive.com.my mukain.foo@thrive.com.my projlumitrop@thrive.com.my	
Architect	Atelier ADT Akitek (Asia) Sdn. Bhd. 137-2nd Floor, Indah UPC, 31/2 Miles, Jalan Kelang Lama 58000 Kuala Lumpur	ADT	Mr. KH Siew Mr. Ahmad Nazuan Ms. Elphine Chew Mr. Ahmad Razlan Mr. Luqman Al-Fareed Mohd Noor Mr. Khairil Amin Jajiman Mr. Adam Laurecta	khiew1@gmail.com naz3161@yahoo.co.uk atelleraadt1@gmail.com ahmad.razlan@thrive.com.my luqman.alfareed@thrive.com.my khairil.amin@thrive.com.my	
C&S Engineer	T. Y Lin International Sd. Bhd. 1-2, Jalan SS 23/15, 47400 Petaling Jaya, Selangor Darul Ehsan	TYL	Mr. Ken Lim Mr. Alvin Ang Mr. Anderson Yeong Mr. YQ Lok Mr. Yusof Mustapa Mr. Fong Yong Keong Mr. Mohamad Othman Omar Bakri Mr. Ridhuan	alvinang@tylin.com.my 1387lumi@tylin.com.my mohd.yusof@thrive.com.my mohamad.othman@thrive.com.my ridhuan.wong@thrive.com.my	
M&E Engineer	Perunding Mektrik Sdn. Bhd. Suite 5.06 (5th Floor) Wisma Acedemy, No.4A.Jalan 19/1 46300, Petaling Jaya Selangor Darul Ehsan	PM	Mr. KY Fam Mr. Paul Ong Mr. SW Lai Mr. Suhaillee bin Sumadi	fam@mektrik.com.my paulong@mektrik.com.my soongweng.lai@thrive.com.my	
Quantity Surveyor	Baharudin Ali & Low Sdn. Bhd. 217 & 219, Jalan Perkasa Satu, Taman Maluri, Cheras, 55100 Kuala Lumpur	BAL	Mdm. KY Wong Mr. KK Tan Ms. ML Chew	balow@balow.com.my Mayfair-Tropicana@balow.com.my	
Landscape Architect	Shah, P.K. + Associates Sdn Bhd 52-2-2, Jalan Medan Putra 4, Medan Putra Business Centre, Bandar Manjalara 52200 Kuala Lumpur	SPK	Shah Amri Mohd Saud	shahpkassoc@gmail.com shahamri@shahpk.my	
ID Consultant					
GBI Facilitators	Green Tech Solutions No.1, Jalan USJ 20/2, 47360 Subang jaya, Selangor Darul Ehsan	GTS	Ir. Leong Siew Meng	gtsolutions20@gmail.com	
Main Contractor	Setiakon Builders Sdn Bhd No.13, Jalan Cempaka SD 12/1, Bandar Seri Damansara, 52200 Kuala Lumpur.	SBSB	Mr. Chop Yap (Project Division) Mr. Yong Han Wei (Contract Division) Mr. Yeo Joon Hai	chopyap.lumi@gmail.com hwyong2001@yahoo.com yeojh.lumi@yahoo.com	

Appendix C : Project drawing details in Project Quality Plan (PQP)

FOR INFORMATION ONLY: 20-10-2016

1. All dimensions shown are in meters.
 2. All dimensions are to be confirmed on site.
 3. All dimensions are to be confirmed on site.



LOGISTIC PLAN

3M WIDE COMPLETE WITH CRUISER RUN



ASAVA (PVT) LTD
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LUMI TROPICANA

**GROUND FLOOR PLAN
LOGISTIC PLAN**

2020/ASAVA / P/100-102

Appendix D : The forms of inspections list

(Architecture work : Door installation)



SETIAKON BUILDERS SDN BHD (1326917-7)

Door Installation

RIN No. :

Reference Drawing Attached : YES / NO

Location / Gridline / Area

	1 st	2 nd	3 rd
	<input type="text"/>	<input type="text"/>	<input type="text"/>
a) Provision of primer to timber surface before installation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Door frame and door leaf proper sanded with paint finish(6 slides)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Numbers of hinge as specified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Swing direction as per design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Door panel aligned and levelled with door frame & wall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Ease in opening & closing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Gap between door frame and door leaf < 5mm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) No sags, warps, scratchers on door leaf	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Provision of intumescent strips at fire doors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Lockets with good fit & function smoothly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k) No missing ironmongeries or parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l) No sign of corrosion in ironmongery & frame	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- a) Provision of primer to timber surface before installation
- b) Door frame and door leaf proper sanded with paint finish(6 slides)
- c) Numbers of hinge as specified
- d) Swing direction as per design
- e) Door panel aligned and levelled with door frame & wall
- f) Ease in opening & closing
- g) Gap between door frame and door leaf < 5mm
- h) No sags, warps, scratchers on door leaf
- i) Provision of intumescent strips at fire doors
- j) Lockets with good fit & function smoothly
- k) No missing ironmongeries or parts
- l) No sign of corrosion in ironmongery & frame

Remark for Failure / Re-inspection :

Non-Conformance Report (NCR) Raised During Inspection / Re-inspection

ICR No.: _____

Closed

Outstanding

Inspected & Confirmed by :	Main Contractor	Consultant Representatives
Signature		
Name		
Designation		
Date		

Inspection Status : ✓ = Acceptable, X = Not Acceptable, - = Not Applicable

Appendix E : Method statements of works

(Architecture work : Door frame installation)



SETIAKON BUILDERS SDN BHD (326917-T)

LUMI TROPICANA, KOTA DAMANSARA

WORK METHOD STATEMENT FOR DOOR FRAME INSTALLATION

Project : LUMI TROPICANA - "CADANGAN MEMBINA PEMBANGUNAN PERNIAGAAN YANG

TERDIRI DARI:-

FASA 1 –

2 BLOK PANGSAPURI PERKHIDMATAN 35 TINGKAT BLOK A1 186 UNIT DAN BLOK B1 186 UNIT DI ATAS 4 TINGKAT PODIUM YANG MENGANDUNGI SOHO (62 UNIT), KEDAI, KEMUDAHAN REKREASI, 1 BLOK TEMPAT LETAK KERETA 7 TINGKAT DAN KEMUDAHAN

FASA 2 –

2 BLOK PANGSAPURI PERKHIDMATAN 35 TINGKAT BLOK A2 186 UNIT DAN BLOK B2 186 UNIT 1 DI ATAS LOT 212 DAN LOT 213, PERSIARAN TROPICANA, PJU 3, MUKIM DAMANSARA, DAERAH PETALING, SELANGOR DARUL EHSAN” FOR MAYFAIR VENTURE SDN BHD.

Reference No: SBSB/LUMI/WMS/ARCH/003

Revision: 0

Revised Date: 02/7/2016

COMPANY	ACTIVITY	DESIGNATION	NAME	SIGNATURE	DATE
SETIAKON BUILDERS SDN BHD	Prepared By	QA/QC Engineer	Noor Adlina		
	Reviewed By	Senior Project Manager	Richard Tan		
ATELIER ADT ARKITEK (ASIA) SDN BHD	Approved By				



**SETIAKON
BUILDERS
SDN. BHD.**

METHOD STATEMENT

Title : Door Frame Installation

Ref : SBSB/LUMI/WMS/ARCH/003

Revision No : 0

Revision Date : 02/07/2016

Page : 2 of 9

WORK METHOD STATEMENT PROPOSAL REVIEW SUMMARY

(To be reviewed and approved by the person(s) responsible for the work)

Type of work: Refer to title above

Contract / Project Name: LUMI TROPICANA

Doc Ref.: SBSB/LUMI/WMS/ARCH/003

NSC Contractor (if any):

Date : 02/07/2016

List Of Compliance Requirements	Comply	Does Not Comply	Remarks <i>(reference docs – e.g. specs, drgs, etc)</i>

Proposed inspection / hold & witness pts : Acceptable / Not Acceptable *(please circle and / or delete one)*

Proposed inspection checklist(s) : Acceptable / Not Acceptable *(please circle and / or delete one)*

For non-complying items, state justifications for acceptance, if applicable (including cost implication):

	Submitted By Main Contractor	Reviewed and Approved By Consultant
Signature (Name & Date)		
Company		
Status		

Denote:
 A = Proceed in accordance with the submission
 B = Subject to consultant's comments
 C = Re-submission



**SETIAKON
BUILDERS
SDN. BHD.**

METHOD STATEMENT

Title : Door Frame Installation

Ref : SBSB/LUMI/WMS/ARCH/003

Revision No : 0

Revision Date : 02/07/2016

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TABLE OF CONTENTS

ITEM	DESCRIPTION	QTY
1	ENDORSEMENT (with signatures)	1 page (cover page)
2	PROPOSAL REVIEW SUMMARY	1 page (previous page)
3	TABLE OF CONTENTS	1 page (this page)
4	AMENDMENT RECORD & DISTRIBUTION LIST	1 page (next page)
5	METHOD STATEMENT	4 pages



**SETIAKON
BUILDERS
SDN. BHD.**

METHOD STATEMENT

Title : Door Frame Installation

Ref : SBSB/LUMI/WMS/ARCH/003

Revision No : 0

Revision Date : 02/07/2016

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AMENDMENT RECORD

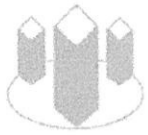
Revision	Section	Revision Details	Rev. Date
0	All	First Issue	02/07/2016

DISTRIBUTION LIST – Controlled Copies

No	Company	Department	Designation	Name
Master	Main Contractor			
1	Client			
2	Architect			
3	Consultant			
4	Nominated Subcontractor			

Note:

- a) Any copy of this Method Statement is valid for reference for construction works only after it has been:
 - i. completely signed off by both parties,
 - ii. stamped "CONTROLLED COPY" in **RED**
 - iii. assigned a controlled copy number (in **RED**)
- b) Upon receipt of the latest controlled-copy, please ensure that the previous controlled copy is stamped / marked "SUPERSEDED" or "OBSOLETE" immediately on all pages (including its attachments).
- c) Photocopies of a Controlled Copy (apart from forms and checklists) should not be made. Only recipients of Controlled Copies listed above will be notified of any revisions. If additional controlled-copies are required, please request to Main Contractor's QA Dept.
- d) In order to facilitate the task of Quality Control at the project site, the forms and checklists attached with the latest revision of this Method Statement can be freely copied and used. Outdated / superseded forms and checklists must not be used.
- e) If there are any errors, outdated or incorrect information, missing or illegible pages, and/or any other concerns about this Method Statement and/or its attachments; or if a complete replacement set is required, please inform to Main Contractor's QA Dept.



METHOD STATEMENT

Title : Door Frame Installation

Ref : SBSB/LUMI/WMS/ARCH/003

Revision No : 0

Revision Date : 02/07/2016

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1.0 OBJECTIVE

The objective of the work method statement is to provide a quality installation method for door so as to prevent difficulties in plastering, brick laying and tiling on the subsequent stage of works at proposed development of superstructure works at Lot 212 dan Lot 213, Persiaran Tropicana, PJU 3, Mukim Damansara, Daerah Petaling Selangor Darul Ehsan. Consist of 4 blocks 35-storey service apartment with recreation park and other facilities.

2.0 SCOPE OF WORKS

This Section Quality Plan covers setting out and installation of door frame so that the alignment and criticality of the frame are in control. This is essential to ensure good quality brickwork, plastering and painting.

3.0 REFERENCES

- a) Construction Drawings / Approved Shop Drawings.
- b) Contract Document

4.0 RESOURCES PLANNING

4.1 Machinery / Tools / Equipment

Item	Description
1	
2	
3	

4.2 Manpower

Item	Description	Quantity (person)
1	Site Supervisor	1 person
2	Clerk-of-work	1 person
3	Workers (Skilled workers)	5 person
4	Workers (General workers)	8 person



5.0 HANDLING AND STORAGE

Door frame shall be transported and unloaded to the designated location, whereas the frame shall be placed away from moisture and heat. Frame shall be prime of back and bottom upon arrival. This is to avoid oxidation.

All material should be handle with care and the workers are equipped with personal protective equipment (PPE). The prepacked material shall be stored on a dry area, off the ground to prevent contact with ground and dampness, Any torn of prepacked bag and/or hardened/expired of material upon arrival at the site shall be rejected and immediately remove from site.

Consignments of material should be arranged in a way that it is used in the order of delivery (First In First Out – FIFO).

6.0 SUBMISSION AND APPROVAL

The relevant samples, certificates and records pertaining to the material used shall be submitted to Architect/Engineer for approval.

7.0 WORK METHODOLOGY

7.1 Pre-installation Requirements :

a) Site clearance and setting out

The completed structure shall be cleared of all loose debris on the base of slab and setting out by string marker and plumb for verticality of door frame using a plumb bob. Door position must be correct in relation with the direction of door swing as per the architectural construction drawing. Ensure that the position of hinges on the door frame is in the correct manner.

b) The coordination of works with other trades :

- i. R.C frame.
- ii. Brick wall.
- iii. Plastering work

7.2 Metal Door Frames Installation

- a) This work method of statement is for the installation of G.I door frame to the lines, level and grades as indicated in the relevant drawings and specification, or as directed by the S.O.

7.3 Setting Out

- a) The site surveyor shall check through the construction drawing prior to commencement of works. The positions and levels of the doors which are already marked on the plan will be transferred to the ground and 1st. floor level. Before any erection of door frame, be sure that all reference lines / grid lines are available. Initial checks before setting out.

7.3.1 Work Procedure for Setting Out of Door Frame Position



METHOD STATEMENT

Title : Door Frame Installation

Ref : SBSB/LUMI/WMS/ARCH/003

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- i. Ensure that the drawings are the latest editions supplied by the consultants.
- ii. Sum all intermediate dimensions and ensure that the totals reconcile with overall dimensions.
- iii. Verify levels should be clearly shown and reconcile with figure dimensions.
- iv. Verify the tolerance to be used in the setting out of the structure.
- v. Dimensions marked on drawings shall always be given preference to those obtained by scaling. Scaling should be avoided where possible.

7.4 Installation of Door

a) Material

All defective G.I door frame received shall be rejected and recorded down in DO and shall be returned to the supplier.

b) Erection

Installation of door frames shall follow location, direction of swing, size and dimension accordingly to construction drawings.

7.5 Precaution / Prevention

- a) Before installation check through the quality of the materials delivered as per sample approved by the S.O. Check dimension of frames delivered.
- b) Ensure All location of the door frames to be installed clearly marked on the floor slab.
- c) Ensure correct dimension / size of the door frame being installed at correct location as per Architectural Construction Drawings.
- d) Ensure sufficient bracing tie to secure the door frame @ 1200 c/c.
- e) Ensure vertically and level of installed frames. (Height of all door frame should follow the Datum level which have being marked clearly on all columns).
- f) Ensure sufficient space min 8mm for Architrave; tile thickness.
- g) Filling of door frames by cement/mortar (for metal door frame).
- h) Check lintel 300mm is provided and placed on top of frame (refer to C&S drawing).
- i) All frames should be prime at back and bottom to avoid staining and rust later.

7.6 Post Installation

- a) Check for verticality and squareness of door frame and ensure no twisting.



- b) All frames must be fully protected by using plastic cover to protect against scratches, cement stains, dents and dust before painting on the wall.

7.7 Point of inspection and testing and their frequency

- a) Check size and thickness of door frame before installation.
- b) Door frame cavity (12.5mm on both sides) vertical & 75 mm for horizontal infill to be completely filled with cement mortar.
- c) Wall ties should be provided at correct course interval.
- d) Check for verticality and squareness of the door frame.
- e) Bottom of galvanized door frame to be painted before installation against rust.

8.0 HANDOVER, PROTECTION & PRESERVATION OF WORK-IN-PROGRESS (WIP)

The Contractor shall be responsible to manage and take measures to protect and preserve their work in progress as well as work handed over as per requirements.

9.0 INSPECTION AND TEST PLAN

The Client Representative shall be informed via RIN before proceeding with the work. The work shall not proceed without approval from Client Representative. Contractor shall first inspect the work completed by worker to its satisfactory prior request joint inspection from Client Representative.

Details of inspection activities shall be carried out as per ATTACHMENT A - Inspection Test Plan (ITP).

Checklists shall be implemented during inspection activities as per ATTACHMENT B – Inspection Checklist – (Door Frame Installation).

10.0 HEALTH, SAFETY, SECURITY AND ENVIRONMENT

SBSB will enhance safe working practice on all jobs and create a healthy and safe working environment for all concerned by:-

- Compliance, implementation and enforcement of the regulations in line with Occupational Safety and Health Act 1994 and Environmental Quality Act 1974.
- Safety first for all manpower. Workers to wear basic PPE during carried out the works.



**SETIAKON
BUILDERS
SDN. BHD.**

METHOD STATEMENT

Title : Door Frame Installation

Ref : SBSB/LUMI/WMS/ARCH/003

Revision No : 0

Revision Date : 02/07/2016

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11.0 RECORDS

11.1 Request For Inspection (RIN)

12.0 LIST OF ATTACHMENT

ATTACHMENT A – Inspection & Test Plan (ITP)

ATTACHMENT B – Inspection Checklist (Door Frame Installation)

Appendix F : Non-conformity report (NCR) form



SETIAKON
BUILDERS SDN. BHD.

NON-CONFORMANCE REPORT

LUMI TROPICANA
SETIAKON BUILDERS SDN BHD.

Contractor :

Date :

NCR No. : SBSB/

Location (Zone) :

SEC. 1 DETAIL OF NON-CONFORMANCE

NATURE OF WORK :

EXACT LOCATION :

Details of this non-conformance are given below;

REFERRED/ATTACHED DOCUMENT _____

INITIATED BY _____

SIGNED & DATE _____

SEC. 2 (To be filled by the Contractor)

Receipt Acknowledge By :

DATE :

PROPOSED RECTIFICATION :

Attachment :

Prepared by :

SEC. 3
Received & Approved The Proposed Rectification.

Comments

DATE :

SEC. 4
Proposed Follow-Up Date By Contractor
(Inspection Request shall be issued)

SEC. 5	Work inspected by Main Contractor	Main Contractor	
	<input type="checkbox"/> Works are now compliant <input type="checkbox"/> Works remain non-compliant		
Date of Rectification Done :			
Comments:			

SEC. 6	Re-inspected by Main Contractor	Main Contractor	
	<input type="checkbox"/> Works are now compliant		
Date of Rectification Done :			
Comments:			

SEC. 7	PREVENTIVE ACTION (CONTRACTOR)
COMMITMENT TO AVOID RECURRENCE (CONTRACTOR)	
Name: _____ Date: _____	

QA/QC DEPARTMENT		DISTRIBUTION		
<input type="checkbox"/> Form Completed <input type="checkbox"/> Attachments _____ _____	QA/QC VERIFICATION		INFO	ACTION
	Date :		FILE	