Quality Assessment System in Construction

Ir. Tan Lin Choo, *graduated from Monash University, Australia with a Bachelor in Civil Engineering (Hons) in 1989. Ir. Tan is currently the Senior Manager of Total Quality Management – Knowledge Management in Sunway Construction Group of Companies.*

Mr. Akira Yabe, *graduated from Waseda University, Japan with a Bachelor in Science and Engineering in 1979. He is currently the Director of Total Quality Management (Centre of Excellence) and Southern Region Projects Management in Sunway Construction Group of Companies.*

Mr Mohd Faudzi bin Hanafiah, *obtained his Bachelor of Science degree in Civil Engineering from The Ohio State University, United States of America in 1987. He is currently the General Manager of Total Quality Management - Quality Assurance. His responsibilities include coordinating, establishing and maintaining good practices related to quality matters at Sunway Construction Group of Companies.*

Mr Azmi Mamat, *graduated from Case Western Reserve University, Ohio, USA with a Bachelor in Mechanical Engineering in 1991. He is currently the Senior Manager of Total Quality Management - Quality Assurance in Sunway Construction Group of Companies.*

To date, many Malaysian construction companies have been certified ISO 9001. Yet, many find themselves struggling to comply with ISO 9001 requirements due to lack of proper documentation and inconsistent quality of workmanship. This can be critical problem when clients require Quality Assessment System In Construction (QLASSIC) certification for their projects.

The common issues that construction companies face are:

- Work proceeds at site without Consultant's approval. For example, Request for Work Inspection is not issued and Inspection Checklist is not utilised for workmanship verification.
- Lack of in-process quality inspection during installation to detect sub-standard workmanship. Early detection is very important to enable the project to undertake corrective actions in a timely manner in order to minimise defects and reduce rectification work.
- Installation using unapproved materials is sometimes not detected until too late. The use of wrong materials in construction compromises quality standards. As it will be costly to dismantle work that has been completed, it is therefore important to carry out regular inspections on materials to ensure that only the correct and approved materials are used as per project specifications.
- Rectification of defects is not carried out in a timely manner. When defects are accumulate towards the end of project, extensive rectification works may lead to late handover.
- Lack of discipline to comply with ISO 9001 requirements on daily basis. As a result of this, many companies have had to spend additional time to prepare for ISO 9001 audits annually, especially on documentations such as Drawing Controls, Inspection and Test Records, etc.
- Lack of attention on quality-related infrastructure. Defects caused by damaged materials due to poor handling and storage, failed cube test due to poor preparation of sample cubes, or untraceable approved samples due to non-designated area for sample display.

The Sunway Construction Group of Companies (SunCon) recognises the above challenges and has introduced a system called Sunway Quality Merit System (SQMS) to address these issues. The SQMS systematically assesses projects on a regular basis to ensure that all our construction activities comply with ISO 9001 standards and inspections are carried out as per Approved Inspection and Test Plan. This ensures consistent good workmanship as per QLASSIC requirements.

INTRODUCTION TO SUNWAY QUALITY MERIT SYSTEM

Sunway Quality Merit System (SQMS) was first introduced in SunCon in the first quarter of 2014 to measure project quality performance in terms of system and product quality at every stage of construction. The assessment is based on the QLASSIC requirements for the measurement of Product Workmanship and ISO 9001 standards to measure the effectiveness of Inspection and Test, and Document/Record Management practices.

OBJECTIVES

The quality performance of all SunCon projects are benchmarked using SQMS scores. Due recognition is given to projects with high SQMS scores and their good practices are shared company-wide. Meanwhile, gaps in projects with low SQMS scores are identified for immediate improvement action. This is a continuous improvement process of measuring and adopting effective practices in alignment with organisation's objective to achieve the highest standard of quality and excellence.

The objectives of SQMS are:

- To benchmark all projects in SunCon
- To measure project quality performance systematically and objectively
- To standardise good practices across all projects in SunCon

- To create better awareness of product quality as per QLASSIC requirements among all staff and subcontractors
- To achieve a minimum 75% QLASSIC score for all SunCon projects

SQMS assessment is conducted on a monthly basis in all SunCon projects, ranging from high-rise to landed building projects, civil projects such as Bus Rapid Transit (BRT), Light Rail Transit (LRT) and Mass Rapid Transit (MRT) and geotechnical projects, covering all trades including piling, reinforced concrete, precast installation, steel structure, brickwork, plastering to painting, etc.

ASSESSMENT CATEGORIES

The SQMS score of a project is determined based on compliance with the following 5 main assessment categories:

A. Product Workmanship

The assessment methodology on product workmanship is conducted based on QLASSIC standards, using proper QLASSIC tools such as 1.2m spirit level, L-angle, tapping rod, steel gauge and measuring tape.

New assessment criteria have been established for trades not covered under QLASSIC standards such as brickwork, blockwork, premix, piling work, soil compaction, etc.

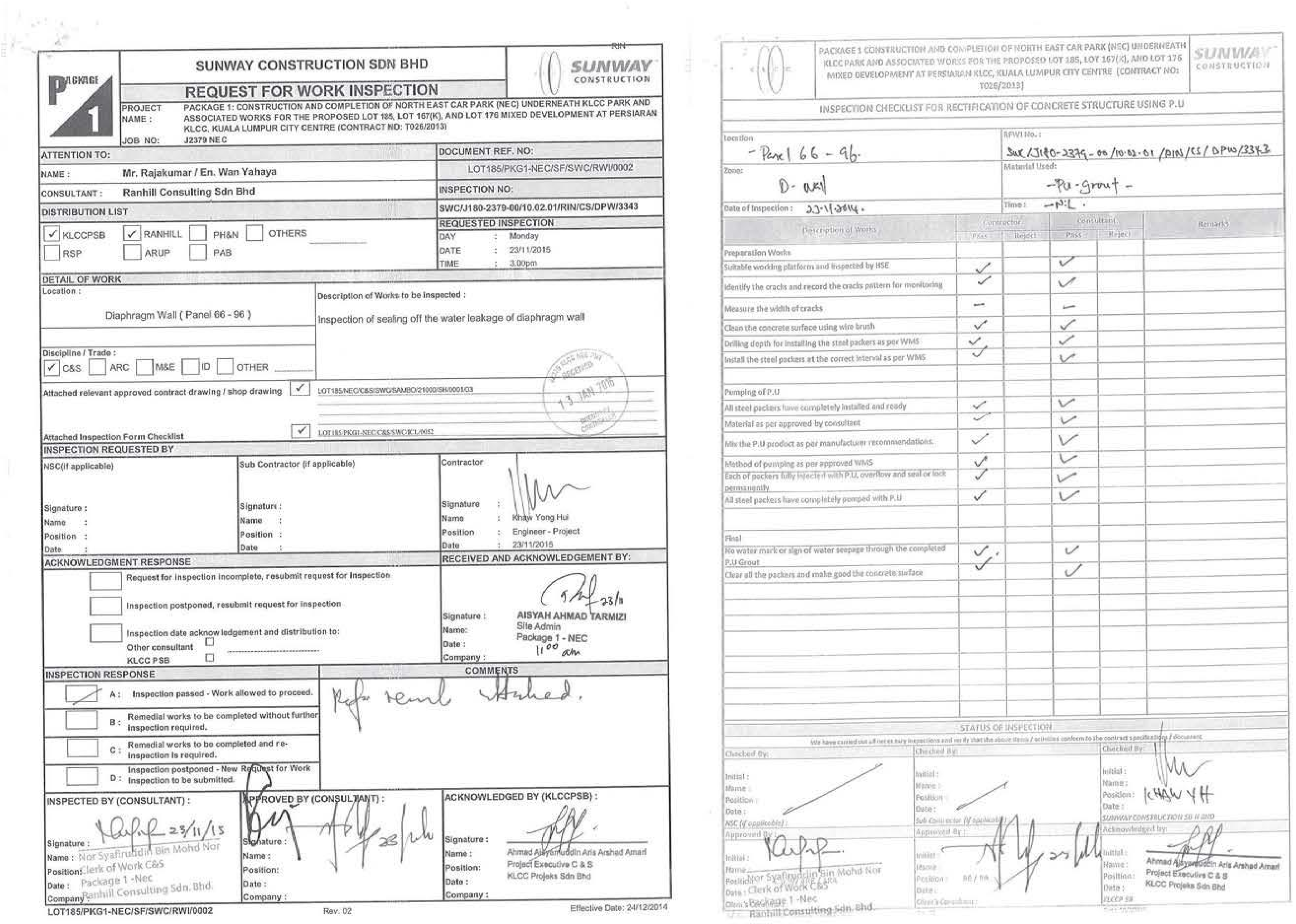
The assessors will also check whether the right materials are being used as per approval or specifications.

Product workmanship assessment using QLASSIC tools at Sunway Velocity Phase 2 Project

B. Inspection and Test

This criteria is used to measure whether a project's in-process inspection and test have been carried out accordingly at each stage of construction as per the approved Inspection and Test Plan.

Evidence of inspection and tests conducted is verified via the relevant Request For Work Inspection (RIN) and Inspection Checklists which must be duly signed by representatives of the Client and Consultants.



SUNWAY CONSTRUCTION SDN BHD
REQUEST FOR WORK INSPECTION
PROJECT NAME: PACKAGE 1: CONSTRUCTION AND COMPLETION OF NORTH EAST CAR PARK (NEC) UNDERNEATH KLCC PARK AND ASSOCIATED WORKS FOR THE PROPOSED LOT 185, LOT 167(K), AND LOT 176 MIXED DEVELOPMENT AT PERSIARAN KLCC, KUALA LUMPUR CITY CENTRE (CONTRACT NO: T026/2013)
JOB NO: J2379 NEC
ATTENTION TO:
NAME: Mr. Rajakumar / En. Wan Yahaya
CONSULTANT: Ranhill Consulting Sdn Bhd
DOCUMENT REF. NO: LOT185/PKG1-NEC/SF/SWC/RWI/0002
INSPECTION NO: SWC/J180-2379-00/10.02.01/RIN/CS/DPW/3343
DISTRIBUTION LIST: ✓ KLCCPSB ✓ RANHILL PH&N OTHERS RSP ARUP PAB
REQUESTED INSPECTION: DAY: Monday; DATE: 23/11/2015; TIME: 3.00pm
DETAIL OF WORK
Location: Diaphragm Wall (Panel 66 - 96)
Description of Works to be Inspected: Inspection of sealing off the water leakage of diaphragm wall
Discipline / Trade: ✓ C&S ARC M&E ID OTHER
Attached relevant approved contract drawing / shop drawing ✓ LOT185/NEC/C&S/SWC/SAMBO/21000/SH/0001/03
Attached Inspection Form Checklist ✓
INSPECTION REQUESTED BY
Contractor: Name: Khaw Yong Hui; Position: Engineer - Project; Date: 23/11/2015
ACKNOWLEDGMENT RESPONSE
Request for inspection incomplete, resubmit request for inspection
Inspection postponed, resubmit request for inspection
Inspection date acknowledgement and distribution to: Other consultant; KLCC PSB
RECEIVED AND ACKNOWLEDGEMENT BY: AISYAH AHMAD TARMIZI, Site Admin, Package 1 - NEC
INSPECTION RESPONSE
A: Inspection passed - Work allowed to proceed.
B: Remedial works to be completed without further inspection required.
C: Remedial works to be completed and re-inspection is required.
D: Inspection postponed - New Request for Work Inspection to be submitted.
COMMENTS
INSPECTED BY (CONSULTANT): Nor Syafiruddin Bin Mohd Nor, Clerk of Work C&S, Package 1 -Nec, Ranhill Consulting Sdn. Bhd.
APPROVED BY (CONSULTANT):
ACKNOWLEDGED BY (KLCCPSB): Ahmad Aliyanuddin Aris Arshad Amari, Project Executive C & S, KLCC Projeks Sdn Bhd
LOT185/PKG1-NEC/SF/SWC/RWI/0002 Rev. 02 Effective Date: 24/12/2014

INSPECTION CHECKLIST FOR RECTIFICATION OF CONCRETE STRUCTURE USING P.U
Location: Panel 66 - 96. Zone: D-wall. RFWI No.: SWC/J180-2379-00/10.02.01/RIN/CS/DPW/3343. Material Used: PU-grout. Date of Inspection: 23-11-2014. Time: NIL

Description of Works	Contractor Pass	Contractor Reject	Consultant Pass	Consultant Reject	Remarks
Preparation Works					
Suitable working platform and inspected by HSE	✓		✓		
Identify the cracks and record the cracks pattern for monitoring	✓		✓		
Measure the width of cracks	–		–		
Clean the concrete surface using wire brush	✓		✓		
Drilling depth for installing the steel packers as per WMS	✓		✓		
Install the steel packers at the correct interval as per WMS	✓		✓		
Pumping of P.U					
All steel packers have completely installed and ready	✓		✓		
Material as per approved by consultant	✓		✓		
Mix the P.U product as per manufacturer recommendations	✓		✓		
Method of pumping as per approved WMS	✓		✓		
Each of packers fully injected with P.U, overflow and seal or lock permanently	✓		✓		
All steel packers have completely pumped with P.U	✓		✓		
Final					
No water mark or sign of water seepage through the completed P.U Grout	✓		✓		
Clear all the packers and make good the concrete surface	✓		✓		

STATUS OF INSPECTION
Checked By: KHAW YH, Sunway Construction Sdn Bhd
Approved By: Nor Syafiruddin Bin Mohd Nor, Clerk of Work C&S, Package 1 -Nec, Ranhill Consulting Sdn. Bhd.
Acknowledged by: Ahmad Aliyanuddin Aris Arshad Amari, Project Executive C & S, KLCC Projeks Sdn Bhd

Evidence of Inspection and Test are conducted accordingly

C. Response to Client's Complaints

At SunCon, all complaints must be responded to in a timely manner. This measures the Project Team's response time to complaints received. The score is based on the percentage of Non-Conformance Report (NCR) closed at the time of assessment.

D. Quality Infrastructure

The setting-up and maintenance of quality-related infrastructures such as sample display area, cube collection area and material storage area to support in achieving good product quality are assessed in this criteria.

D.1 Designated Sample Display Area

Projects must provide a designated area for Sample Display where samples are segregated by trades, neatly arranged and labelled with approval status for easy reference and retrieval.

Samples are neatly displayed according to trades at Citrine Project, Sunway Iskandar

D.2 Cube Collection Area

A designated area for cube/mould storage and curing tank with clear signages and good housekeeping must be provided to facilitate the preparation and curing of concrete cube samples to minimise cube strength failure.

SunCon's standardised cube collection area at Sunway BRT Depot Project

D.3 Material Storage

Designated storage areas must be sufficiently protected to prevent damage to the materials, as the quality of final product will be affected if damaged materials are used for installation.

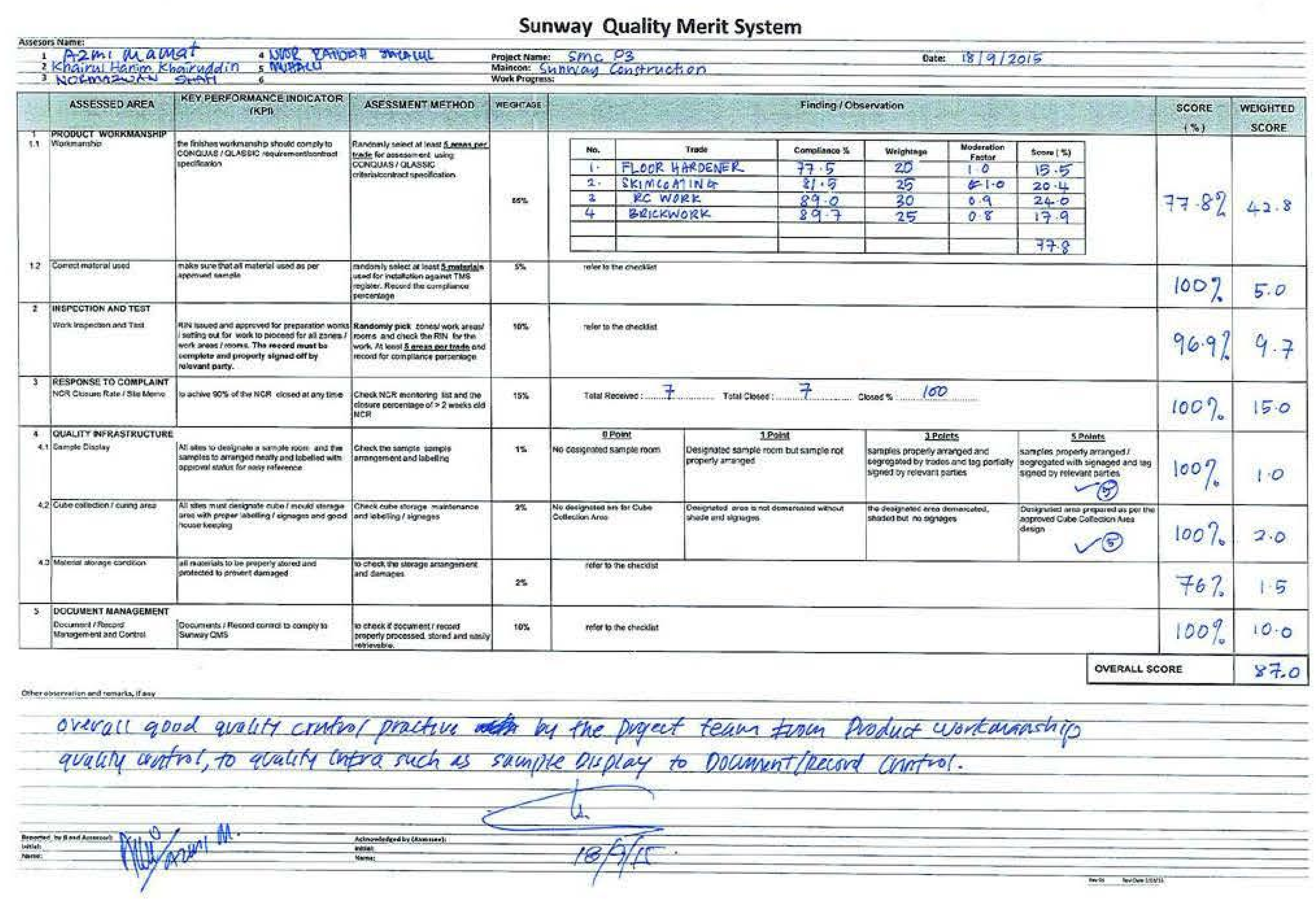
Door frames are stacked to prevent distortion and damage at Sunway Velocity Phase 2 Project

E. Document and Record Management

Documents and records must be systematically processed and stored as per ISO 9001 standards. This criteria evaluates adherence to document management procedures. Incoming documents are required to be dated and stamped with relevant controlled copy, registered and uploaded for dissemination to all staff electronically via SunCon Electronic Document Management System (eDMS).

Outgoing documents with acknowledgement copies will follow a similar procedure. All hardcopies and attachments are to be filed according to SunCon Project Filing Index (PFI) with standardised labels in a hanger or rack with signage to ensure traceability.

This also involves the checking of documents and records in both softcopy and hardcopy formats. The records in eDMS are checked against the hardcopy of Incoming and Outgoing Correspondences, Approved Construction and Shop Drawings, Site Memo, Request for Information (RFI), Request for Inspection (RIN) and Inspection Checklist, Safe Work Method Statement (SWMS), Technical Material Submission (TMS) and Minutes of Meetings to ensure there are no missing documents.



Sunway Quality Merit System

Assesors Name: 1 Azmi Mamat 2 Khairul Hanim Khairuddin 3 Normazwan Shah 4 Noor Zahidah Shaiful 5 Nubalu 6

Project Name: SMC P3 Date: 18/9/2015
Maincon: Sunway Construction
Work Progress:

	ASSESSED AREA	KEY PERFORMANCE INDICATOR (KPI)	ASESSMENT METHOD	WEIGHTAGE	Finding / Observation	SCORE (%)	WEIGHTED SCORE
1 / 1.1	PRODUCT WORKMANSHIP / Workmanship	the finishes workmanship should comply to CONQUAS / QLASSIC requirement/contract specification	Randomly select at least 5 areas per trade for assessment using CONQUAS / QLASSIC criteria/contract specification	65%	see trade table below	77.8%	42.8
1.2	Correct material used	make sure that all material used as per approved sample	randomly select at least 5 materials used for installation against TMS register. Record the compliance percentage	5%	refer to the checklist	100%	5.0
2	INSPECTION AND TEST / Work Inspection and Test	RIN issued and approved for preparation works / setting out for work to proceed for all zones / work areas / rooms. The record must be complete and properly signed off by relevant party.	Randomly pick zones/ work areas/ rooms and check the RIN for the work. At least 5 areas per trade and record for compliance percentage	10%	refer to the checklist	96.9%	9.7
3	RESPONSE TO COMPLAINT / NCR Closure Rate / Site Memo	to achive 90% of the NCR closed at any time	Check NCR monitoring list and the closure percentage of > 2 weeks old NCR	15%	Total Received : 7 Total Closed : 7 Closed % 100	100%	15.0
4 / 4.1	QUALITY INFRASTRUCTURE / Sample Display	All sites to designate a sample room and the samples to arranged neatly and labelled with approval status for easy reference	Check the sample sample arrangement and labelling	1%	0 Point: No designated sample room; 1 Point: Designated sample room but sample not properly arranged; 3 Points: samples properly arranged and segregated by trades and tag partially signed by relevant parties; 5 Points: samples properly arranged / segregated with signaged and tag signed by relevant parties ✓(5)	100%	1.0
4.2	Cube collection / curing area	All sites must designate cube / mould storage area with proper labelling / signages and good house keeping	Check cube storage maintenance and labelling / signages	2%	0 Point: No designated are for Cube Collection Area; 1 Point: Designated area is not demarcated without shade and signages; 3 Points: the designated area demarcated, shaded but no signages; 5 Points: Designated area prepared as per the approved Cube Collection Area design ✓(5)	100%	2.0
4.3	Material storage condition	all materials to be properly stored and protected to prevent damaged	to check the storage arrangement and damages	2%	refer to the checklist	76%	1.5
5	DOCUMENT MANAGEMENT / Document / Record Management and Control	Documents / Record control to comply to Sunway QMS	to check if document / record properly processed, stored and easily retrievable.	10%	refer to the checklist	100%	10.0
					OVERALL SCORE		87.0

No.	Trade	Compliance %	Weightage	Moderation Factor	Score (%)
1.	FLOOR HARDENER	77.5	20	1.0	15.5
2.	SKIMCOATING	81.5	25	1.0	20.4
3	RC WORK	89.0	30	0.9	24.0
4	BRICKWORK	89.7	25	0.8	17.9
					77.8

Other observation and remarks, if any

overall good quality control practice by the project team from Product workmanship quality control, to quality infra such as sample Display to Document/Record control.

Reported by (Lead Assessor): Initial: Name:
Acknowledged by (Assessee): Initial: Name: 18/9/15

Weightages for each SQMS assessment categories

Each of the 5 categories listed above is weighted according to its impact on overall workmanship quality, with Product Workmanship carrying the highest weightage (60%) of the overall SQMS score.

Implementation of Sunway Quality Merit System

SQMS assessment is carried out on every SunCon project on a monthly basis by a team of SQMS assessors. Project score and findings are reported at the closing meeting for immediate action by the Project Team. A formal report is submitted to SunCon Management at the end of the assessment day.

SQMS TEAM

We have formed a dedicated team of full-time assessors as we recognise the importance for the SQMS assessment to be conducted independently and in a consistent manner. The team's findings must be objective, fair and acceptable by all Project Teams. The assessors must have a vast knowledge of QLASSIC requirements and ISO 9001 standards with related

hands-on experience. They are are also certified CIDB (Construction Industry Development Board) QLASSIC assessors. Our SQMS team consists of 4 members and are responsible for the following:

- Schedule monthly assessments
- Conduct assessments as per schedule
- Report findings
- Analyse scores and findings on a monthly and quarterly basis
- Review SQMS criteria for continuous improvement on a quarterly basis.

SCHEDULING

All projects are assessed on a monthly basis to ensure that project quality is maintained at all times. The monthly SQMS assessment dates are scheduled every quarter and sent out to the Project Teams accordingly. Confirmation is sent a week prior to the scheduled assessment date.

SITE ASSESSMENT

SQMS assessment is conducted at the project site to measure the product workmanship and at the site office to check the documentation and records management.

At the opening meeting, the Project Team briefs the SQMS Team on their work progress since the last assessment. Trades and locations are predetermined before the site walk to ensure impartiality of the sample selection.

Project Team representatives, relevant trade masters and subcontractors are required to join the assessment site walk. QLASSIC tools such as 1.2m spirit level, L-angle, tapping rod, steel gauge and measuring tape are used and the findings are recorded in the Trade Assessment Checklist. The type or brand of materials used for installation, conditions of materials storage area and other quality-related infrastructures are captured and recorded throughout the assessment.

Upon completion of product workmanship assessment at site, the documentation of Inspection and Test records of the trades at the location being assessed and approval record of the materials captured at site, are checked accordingly at the site office.

The overall project documents including incoming and outgoing correspondences, approved construction drawings and shop drawings, site memos, etc are checked for adherence to the documents and records management system.

REPORTING

A. Closing Meeting with Project Team

The project score and findings are reported at the closing meeting, which is attended by the Project Team comprising the Project Manager, Project Engineers, respective trade masters and subcontractors.

The SQMS Team's role is to highlight its findings with photographs of the observations made during the assessment. Areas for improvement are discussed for corrective action to be taken accordingly. The Project Manager is required to acknowledge the score and findings by signing the SQMS Report.

B. Project SQMS Report

At the end of the assessment day, the SQMS Team prepares an official report to formalise the project score and findings. This will be submitted to SunCon Management and circulated company wide via email for sharing purposes.

C. SQMS Monthly Report

At the end of each month, the SQMS Team analyses the project scores and findings to identify the following:

- Project Ranking from the Highest to the Lowest scorer
- Most Improved Project for the month
- Most Declined Project for the month

{In Archive} Sunway Quality Merit System(SQMS) Report for Parcel F

Rozilawati Kamarudin to Yap Wei Len, Jimmy Lim Fang Liang, Liew Wei Leong, Shafiza BT Razali, Shahazrin Mohd Salleh, Mohd Hafizuddin Mohd Sani, Mohd Zayyani Mhd Fauzy, Mohd Fahmi Dasahi

Cc Kwan Foh Kwai, Chung Soo Kiong, Thomas Samuel, Richard Wong, Yabe, Mohd Faudzi Hanafiah, Azmi Mamat, Khairul Hanim Khairuddin, Mohd Afiq Mohd Yassin, ALL USERS SunCon

Archive: This message is being viewed in an archive.

Dear Mr Yap W.L/ Ms Shafiza / Mr Shahazrin and All Parcel F project team members,

Thanks for your kind support and cooperation during today SQMS at your project.

1. For the record your SQMS overall score is 91.2% and the detail score breakdown as per table below

	ASSESSMENT CATEGORY	Weigt age (Points)	Current Score	Previous Score Jan 2016	Previous Score Dec 2015	Remark
1	PRODUCT WORKMANSHIP					
1.1	Workmanship	55	91.3%	88.7%	100.0%	*Product workmanship score marginally improve compare to Jan 2015. Pls refer to Workmanship Table below for details*
1.2	Correct material used	5	100.0%	100.0%	100.0%	*All material used traceable to the relevant approval record*
2	INSPECTION AND TEST					
	Work Inspection and Test	10	96.4%	85.7%	100.0%	*Piling H59-1 not traceble to the respective Inspection and Test record*
3	RESPONSE TO COMPLAINT					
	NCR Closure Rate	15	84.6%	88.9%	100.0%	*11 outstanding out of 13 NCR received*
4	QUALITY INFRASTRUCTURE					
4.1	Sample Display	1	NA	N/A	N/A	
4.2	Cube collection / curing area	2	100.0%	100.0%	100.0%	*Ok*
4.3	Material storage condition	2	76.0%	72.0%	100.0%	*Storage of Rebars to improve*
5	DOCUMENT MANAGEMENT					
	Document / Record Management and Control	10	91.9%	79.6%	95.8%	*1. Few PFI files not properly labelled with handwritten. 2. Incoming Correspondence - no summary on completed file 3. Pending Scan - RFWI, RFI, Outging Letter & Outging Transmittal*
	OVERALL SCORE	100	91.2%	88.0%	99.6%	

2. Project Performance on Product Workmanship

No.	DEFECTS BY CONQUAS / QLASSIC CATEGORY	Dimension / Opening	Setting out / Alignment / Li	RC Surface Defects	Cracks	Jointing	Timber / Nails	Starter Bar Condition	Diameter/ Necking	Eccentricity	Pile integrity/ Capacity	Verticality	Free of Voids	Concrete Cut Level / Cast level / Wastage	Concrete Cube Sampling	Productivity	Total Compliance (%)	Weightage (%)	Score (%)
		COMPLIANCE % BY DEFECT CATEGORY															SCORING		
1	RC - Pilecap	100.0	80.0	90.0	100.0	90.0	100.0	60.0									89.5	50	44.8
2	Borepiles								95.0	95.0	100.0	95.0	95.0	70.0	100.0	90.0	93.1	50	46.6
																	Total Score		91.3

Observation:
For Borepiles, few of the piles assessed exceed 25% of concrete wastage. Pilecap works quality improved compared to last month. Good RC Surface finish however to further improved on the starter bars condition as found some of them corroded and contaminated with concrete as shown in the photos below,

SUNWAY QUALITY MERIT SYSTEM (SQMS) REPORT FOR PARCEL F

1.0 RC WORK - PILECAP

Good RC surface finished on Pilecap free from defects, bad formwork joints and free from timber / nails with overall Product Workmanship score of 89.5 %

Starter Bar Setting Out - 100% compliance

Starter Bar Condition - corruded / concrete contaminated rebars / starter bars with compliance of 60%

ALIGNMENT - Bulging surface

RC Surface Defects - honeycomb at the lower part with compliance of 90%

Sample SQMS Report

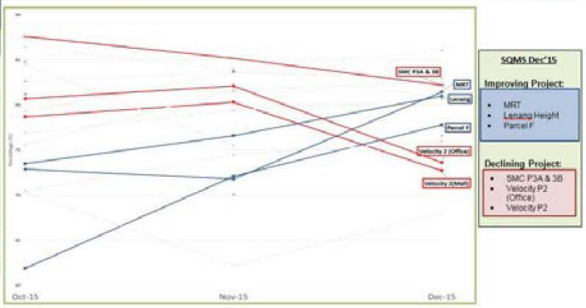
SQMS MONTHLY SUMMARY

December 2015 — 4th Quarter 2015

1. PROJECT PERFORMANCE OVERVIEW

SQMS SCORE in DEC'15

Project	Score (%)
Citrine (M1)	86.0
Velocity P3	85.1
CP3	82.9
CHSL	83.5
SMC Ph3	82.2
MRT	81.5
CP4 (Super)	81.4
Lenang	81.0
Velocity P2 (Hotel)	80.9
KLCC P1	80.7
L2	80.7
Parcel F	77.8
SH5	77.3
Velocity Tunnel	76.6
SP3	76.0
Velocity P2 (Office)	73.6
Velocity P2 (Mall)	72.7
Afiniti	68.0



SQMS Dec'15

Improving Project:
- MRT
- Lenang Height
- Parcel F

Declining Project:
- SMC P3A & 3B
- Velocity P2 (Office)
- Velocity P2

Analysis of most improved and declined projects in the month

2. TRADE SCORE (%) BY PROJECT

Trade	SP3	Velocity P2 (Mall)	Velocity P2 (Office)	Velocity P2 (Hotel)	Citrine (M1)	Affiniti	L2	SH5	CP4 (Super)	KLCC1	SMC P3A & 3B	Lenang Height	Velocity Tunnel	Velocity P3	CP3	MRT	CHSL	Parcel F
Piling													100.0				100.0	100.0
RC Work (in-situ)				77.5	96.5			66.6	85.5	58.3	84.9			93.4	88.8	70.0	91.7	
Floor hardener					76.0			57.5						57.5	87.5			
Plastering/ skimcoating					81.4						75.0	76.3						
Tiling		78.8				51.9	84.9		71.9			81.5						
Ceiling Work		74.0							70.0			88.0						
Strip ceiling																72.0		
Blockwork		80.0								98.2	85.8							
Brickwork			72.2		90.0				93.2	52.9	77.4	91.7						
Painting (Wall)						62.7	81.7											
Painting (Ceiling)	66.0					64.0	78.0											
Precast Installation								98.8										
Protective Coating (SB/S)																96.0		
Protective Coating (Pier)																100.0		
Carpet	80.0																	
Window	84.0																	
Door	72.0	50.0				46.8												

REMARK: Blue Font – Good | Red Font – Need Improvement

Analysis of Trade Score by Projects

3. BAD & GOOD PRACTICES

3.1 RC Work

CHSL-RC Abutment free from surface defects and smooth jointing

Citrine-Slab soffit surface defects and good jointing with minimal grinding work required

3.2 Brickwork

Lenang Height-Overall good bricklaying workmanshipwith less deep void and fully filled with mortar especially at soldier course area

SMC P3-Brickwallnot alligned and straight especially at top part of the wall

SMC P3-Inconsistent installation of teeting and jointing not fully filled with mortar

SMC P3-No interlocking between 2 brickwalls

Good and bad practices observed during particular month

- Analysis of Trade Scores by Projects
- Analysis of Best and Worst Performing Subcontractors
- Good and Bad Practices Observed during the month

The Project Manager of the project with the lowest SQMS score is required to present his immediate action plan for improvement at the Monthly Management Meeting.

D. SQMS Quarterly Report

Every quarterly, the SQMS Team prepares a 3-month statistical data analysis report so that the SunCon TQM-COE Head of Department and Special Project Director can review the overall performance of project. This report presents the performance in the current quarter and will be compared against those of previous quarters. Critical areas that require improvement and root causes are identified to close the gap between the top and bottom performers.

Statistical analysis of Overall SQMS Score for project performance monitoring

The effectiveness of SQMS is reviewed on a quarterly basis and where necessary, to fine-tune the criteria and/or methodology for continued improvement. To-date, the SQMS has been improved and revised for the 7th time.

So far, SQMS has proved to be effective in improving the overall project quality and product workmanship in SunCon projects as shown in the diagram below.

SQMS score by categories in Year 2015

SQMS QUARTERLY WINNER AWARD

The project with the highest SQMS score for the quarter will be declared the "SQMS Quarterly Winner". The award is given to the winning project in recognition of its good and consistent project quality performance as well as to motivate other projects to improve their performances. This creates a healthy, competitive environment among the Project Teams and inevitably, dynamic cross-project learning takes place continuously to adopt good quality practices and avoid poor/bad practices.

The award consisting of a trophy and prize money is presented to the winning Project Team during an official award ceremony held at the winning project site.

This ceremony is attended by the SunCon Management and Project Managers to celebrate the achievement of the winning project, together with their subcontractors and workers.

This is followed by a Cross Learning Program (CLP) site walk which provides a good opportunity for project managers (or their representatives) from other projects to learn from the winning project. This is part of the continuous learning process and knowledge sharing of good practices within the SunCon Group of Companies.

CHALLENGES

Sunway Construction Group of companies (SunCon) has diversified projects such as building, civil and geotechnical. The initial challenge was for the SQMS Team to standardise quality measurement criteria to be applicable to this wide range of project types.

The product workmanship category in SQMS is based on QLASSIC standards which covers finishing trades such as plastering, painting and tiling. However, due to the vast nature of our construction works, we also faced the uphill task of formulating a set of product workmanship criteria to assess trades not covered by QLASSIC standards, such as brickwork, blockwork, premix, piling work, soil compaction, etc.

Many brainstorming sessions were held with the Heads of Operations to derive a mutually agreed quality measurement criteria and weightage to cover the various trades in this wide range of project types.

The full acceptance of these criteria is critical to get the necessary buy-in by all relevant parties.

BENEFITS

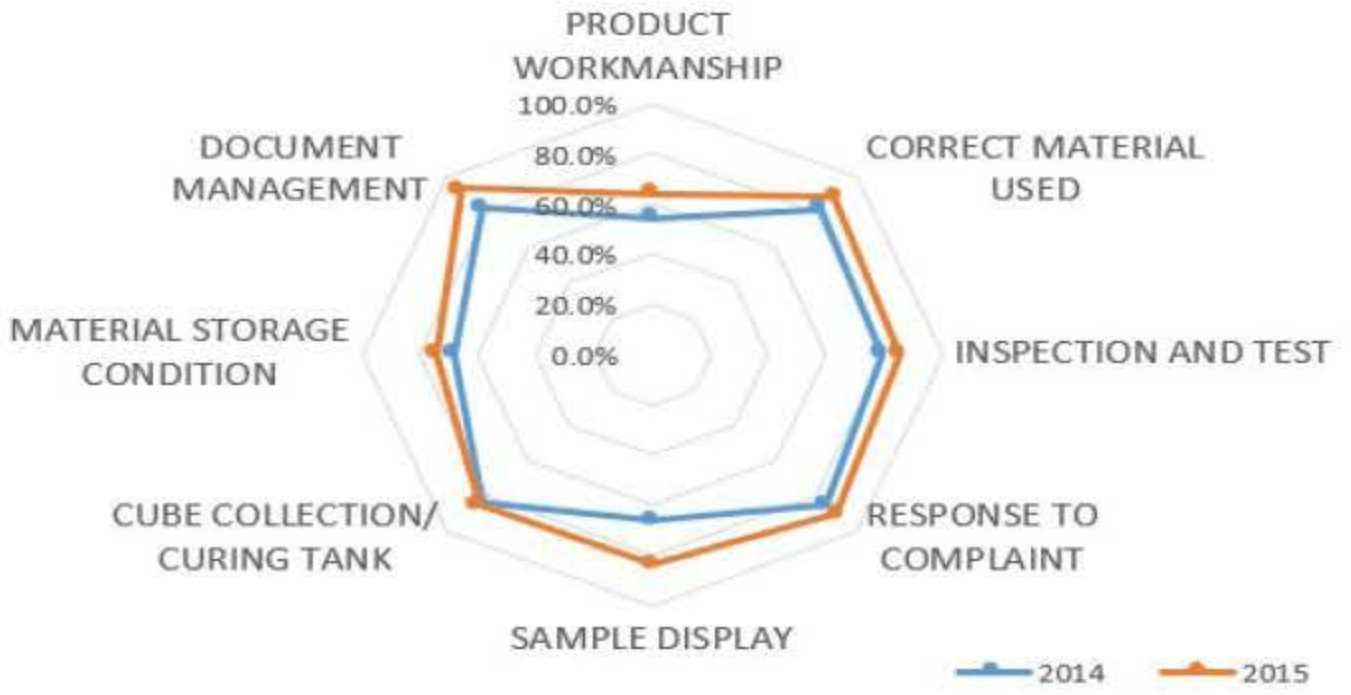
To date, Sunway Construction has implemented SQMS for more than two years. The full support by the SunCon Management enables us to inculcate the importance of product quality to Project Team members and subcontractors by increasing their awareness in the overall quality requirements and QLASSIC standards.

The benefits of SQMS are as listed below:

- Improves quality of product workmanship, from structural to architectural finishing works
- Creates an in-process inspection culture by Project Team members to identify and rectify defects immediately as work progresses

- Improves daily documentation which leads to good document and record management in compliance to ISO 9001 and our Quality, Environmental, Safety and Health (QESH) Management System
- Reduces the number of Non-Conformance Report (NCR) from Client and/or Consultants as workmanship quality and document management improve
- To date, the SunCon average QLASSIC score is 76%, which is above the national average of 70%

The marked improvement in the overall quality is shown in the figure below.



Improvement in project quality performance from Year 2014 to 2015

THE WAY FORWARD

Following the success of SQMS implementation, we extended the assessment initiatives to our subsidiary specialising in Mechanical, Electrical and Plumbing (MEP) works, from the second quarter of 2015.

With the incorporation of MEP works in SQMS, SunCon now has a complete set of project quality measurement for all trades, applicable to building, civil and geotechnical projects.

To further engage subcontractors in this initiative, SunCon implemented the "Best Subcontractor SQMS Quality Award", starting in the first quarter of 2016. This is to give due recognition to our subcontractors for their continuing efforts to play a pivotal role in improving project quality and to create a healthy competition environment among subcontractors to improve the quality of their respective trades. ■

IEM DIARY OF EVENTS

Title: IEM Mechanical & Electrical Forum (Full Flex) (Kuala Lumpur Convention Centre)

23 - 25 May 2016

Organised by : The Institution of Engineers, Malaysia
Time : 10.00 a.m. – 5.30 p.m.
CPD/PDP : Applying

Title: IEM Mechanical & Electrical Forum (Per Stream - Stream 1) (Kuala Lumpur Convention Centre)

23 - 25 May 2016

Organised by : The Institution of Engineers, Malaysia
Time : 10.00 a.m. – 5.30 p.m.
CPD/PDP : Applying

Title: IEM Mechanical & Electrical Forum (Per Stream - Stream 2) (Kuala Lumpur Convention Centre)

23 - 25 May 2016

Organised by : The Institution of Engineers, Malaysia
Time : 10.00 a.m. – 5.30 p.m.
CPD/PDP : Applying

Kindly note that the scheduled events below are subject to change. Please visit the IEM website at www.myiem.org.my for more information on the upcoming events.