

26 August 2024

Quality Assurance Program at MoW Projects

Agenda



وزارة الأشغال
Ministry of Works

Brief Background, Purpose & Benefits

Introduction to Quality

Quality Assurance Program at MoW Projects

Audit Program Outcome

The Way Forward

Arising Issues and Discussions

MED was entrusted by MoW's top management to manage the Quality Assurance audits inspections.

MED Quality Assurance Team in cooperation with project directorates embarked on the implementation of the QAP in MoW's projects.

Internal Quality Audits/Inspections shall be performed in compliance to MoW's QMS Quality Manual & ISO 9001: 2015.

The QA Program was devised with the following purpose & benefits

1

Ensure that government projects are meeting all requirements related to quality management and materials specifications throughout the project life cycle.

2

To have a standard quality assessment system for all projects , which:

- Measure construction processes against the Contract Specifications, Project Quality Plan (PQP), Method Statement, Inspection & Test Plan (ITP) and the relevant Standards.
- Utilize a sampling approach to suitably represent the assessed project element.

3

Ensure good Return on Investment (ROI), optimized maintenance activities / greater longevity

(Low Life Cycle Cost “long term benefits”),

and effective utilization of MoW expertise

4

Encourage & promote Quality culture.

Quality Management System - Management system to direct and control an organization with regards to quality

Quality Assurance (QA)

Part of quality management focused on providing confidence that quality requirements will be fulfilled. QA primarily focuses on the processes and procedures that improve quality, including training, documentation, monitoring and audits. QA refers to defect prevention, whereas QC refers to defect detection.

Quality Control (QC)

Part of quality management focused on fulfilling quality requirements on the product to find defects that remain after development, it focuses on reactive processes such as testing and inspection. QC helps ensure the finished product meets expectations.

MED's QA Program Activities

The process flow for the handling of Quality Assurance Program and auditing, inspection and testing activities for Ministry of Works (MoW) Project is according to

MED-CRS-PR-003
"Project Quality Assurance and Auditing/Inspecting"

The procedure that outlines the steps for carrying out an independent Project Quality Audit at MoW Projects by MED QA Team is described in

MED-CRS-SOP-004
"Project Quality Audit"

MED Quality Assurance Team

Quality Managers (5 nos. Lead Auditors) +
Auditors (13 nos. Supporting Team Members)
= 18 nos

The team is composed of Senior Engineers, Senior Architects & Senior Technicians from various MED Sections.

Quality Assurance Program at MoW Projects

Project Selection Criteria Under QAP

Due to limited resources and other scope related factors, MED have defined the following criteria for the selection of MoW projects to be included in the Quality Assurance Program:

Minimum Project cost of
BD500,000



Availability of Quality
Manager (Lead Auditor) &
supporting Audit team.



Invitation to the project
Kick-off meeting by
Projects Directorates.



Based on the above listed criteria, MED will review project lists submitted by MoW Directorates, accordingly the selected projects meeting all above-mentioned criteria will be included in the Quality Assurance Program.

The following related documents may be referred to for the audit activity, as applicable

- Project Quality Plan
- Inspection and Test Plan
- Contract Specifications, Bill of Quantities (BoQ)
- Approved construction drawings
- Approved shop drawings and/or calculations
- Construction program
- Method statement
- Project Safety Plan
- Site Waste Management Plan
- Project progress reports

- Quality Control records, including but not limited to the following:
 - Request for Inspection
 - QC checklist for various materials/work elements
 - Summary of Quality Control Records
 - Test Results Summary/Interpretative Results/Analysis
 - Calibration Records
- Pre-evaluation of materials manufacturer/supplier
- Manufacturers' recommendations
- Purchasing/procurement records
- Materials delivery schedule/records of materials receiving inspections conducted at site

Quality Assurance Program at MoW Projects

The following related documents may be referred to for the audit activity, as applicable

- MED Assessed Lists uploaded and published on the MoW website such as -
<https://www.works.gov.bh/arabic/publications/researchandreports/pages/researchesreports.aspx>

List of Approved Independent Calibration Laboratories

List of Approved Independent Materials Testing Laboratories

Pre-Qualification List for Civil, Architectural, Electrical and Mechanical Materials

Performance Rating of Produced Unbound Materials (Road Base and Sub-base)

Performance Rating of Produced Asphalt Mixes

Status Summary of Ready Mixed Concrete Suppliers

Status Summary of Precast Concrete Products

General Process of the Project Quality Audit



The QA Manager shall prepare a Project Quality Audit Plan stating the areas or work processes to be audited.

This Audit Plan shall be prepared ahead of each and every audit to be carried out.

The QA Manager shall submit this Audit Plan to the PM, within a reasonable period of time prior to the Project Quality Audit.

The QA Manager shall conduct an Opening Meeting which will provide the Auditees with an overview of the Project Quality Audit Plan and audit process. The objective evidence of a departure from any provision of the standard/specification and/or approved procedures shall be issued with a Corrective Preventive Action (CPA) Request. The CPA may be checked as a Non-Conformance or Observation.

Preferably, a Closing Meeting is to be held to present the key findings, including non-conformities, if any.

Quality Assurance Program at MoW Projects

PROJECT QUALITY ASSURANCE CHECKLIST



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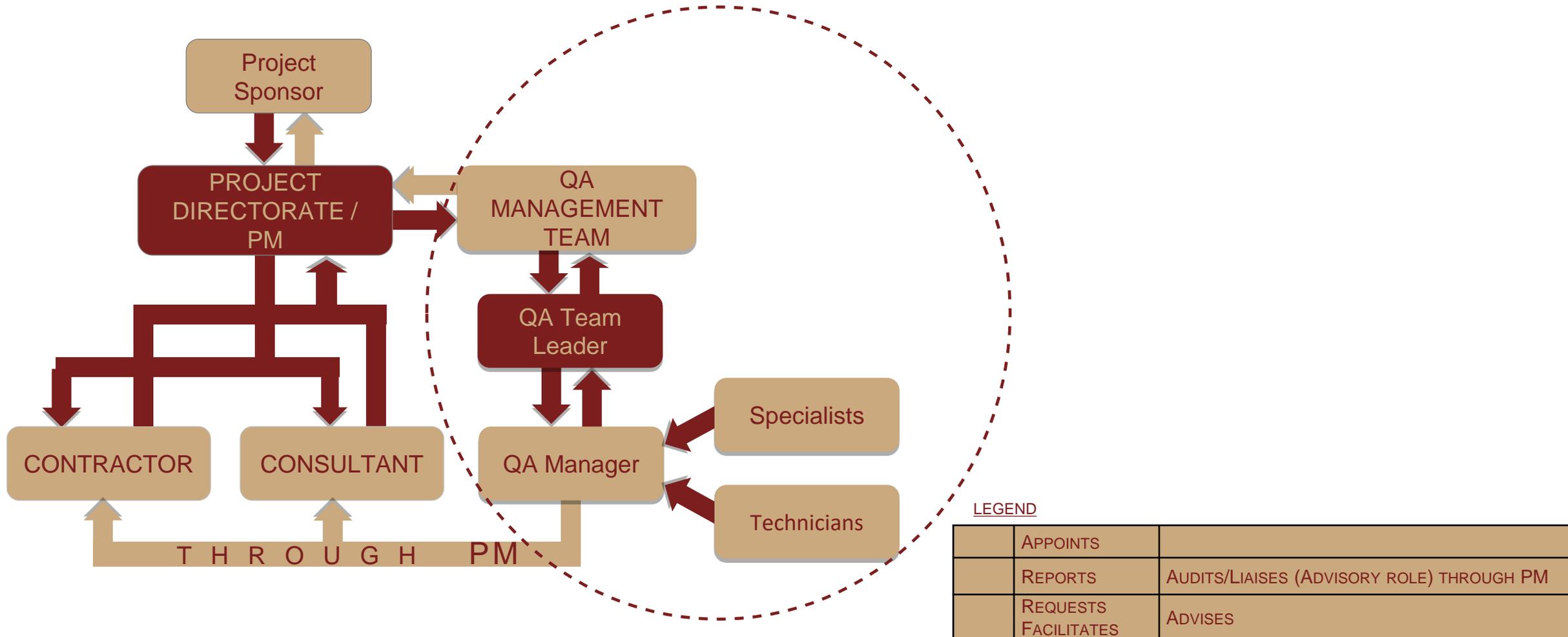
Distributed at Initial PQA Meetings to Project Team for each new project:

[LINK](#)

Quality Assurance Program at MoW Projects

General scope & Functional Interrelationships

The scope of Project Quality Audit includes observation of established procedures and examination of documents/records produced to assess their conformity with requirements



Reporting Processes

The QA Manager shall produce individual Project Quality Audits Reports tracked by unique numbers.

CPA will be numbered sequentially according to the numbers of audits conducted in the project.

Project Quality Audit Report shall be issued to PM for his issuance to Auditees on a timely basis.

The Auditees shall respond to the original Project Quality Audit Report and provide the objective evidence of completion of corrective action taken within one month or reasonable period accepted by the PM/QA Manager upon receiving the Project Quality Audit Report.

The PM shall return the original Project Quality Audit Report to the QA Manager for monitoring purpose. The Auditees will be given a copy for their reference.

Corrective/Preventive Action (CPA)

CPA can be defined as a failure to comply with requirements, a requirement is a need, expectation, or obligation, whether it is stated or implied by an organization, its customers, or other interested parties.

1

Works

violations against specified Project Specifications and requirements during the execution of work.

3

Material

violations for usage of materials against specified Project Standards and Contracts during the execution of works.

2

Procedural

violations against specified Procedural Standards for sequence of work or activity as indicated in Method Statements Inspection Test Plans and Project Specification.

4

Safety

safety violation as per Health & Safety Plan and/or international standards.

Corrective/Preventive Action (CPA)

The Corrective/Preventive Action Request is categorized into six categories as listed below:

Quality Documents and Record Control		Performance Deficiencies	
1	PRC Project Record^[1] Control Incomplete / Conflict Records Request for Inspection / Daily Site Activities / Document Transmittal / Acknowledgement of Receipt / Schedule of Materials & Products / Schedule of Labor and Equipment's / Material Delivery Reports / Construction Activity Inspection Checklists / Material Approval Certificate / Summary of Approved Materials/ Cabinet Shelves / Folder Labels / Summary of Test Report and Test Certificates. Other Records relative to Quality and As-built Records / Safety Records.	4	PNC Project Non-Conformance The Project System & Procedure such as Quality Documents ^[1] and Records ^[2] are not being executed in ensuring the quality of end-product. Absence of Materials Approval Certificate. Absence / Failed Laboratory Test Results / Certificates. Material Sampling / Handling / Transportation / Storage / Testing / Installation / Application.
2	PDC Project Document^[2] Control Incomplete / Conflict Document Project Quality Plan / Project Inspection and Testing Plan / Method Statement / Construction Drawings / Technical Specifications/ Construction/Procurement/Equipment/Manpower Schedules	5	PSC Project Safety Concerns Safety concerns that require immediate action and could cause potential harm (no PPE, no tool box talk meeting)
System Deficiencies		Training and Awareness	
3	PSD Project System Deficiencies Non-availability/Non-submission of Project System, Procedures and Resources. Absence of Project Quality Plan/Inspection and Test Plan/Method Statement/ Construction / Procurement / Equipment / Manpower Schedules /Absence of Personnel appointed (QA/QC Manager / Engineer / Safety Officer).	6	PTA Project Lack of Training & Awareness Absence of Adequate Training related to Construction Work. Lack of Awareness of Health, Safety, Environment & Quality / Standards / Specifications / Law / Regulations used locally or internationally. Non-availability of QA/QC Manager / Engineer / Safety Officer.
		Terminology: Record: Request for Inspection / Daily Site Activities / Document Transmittal / Acknowledgement of Receipt / Summary of Approved Schedule of Materials & Products / Schedule of Labor and Equipment's / Material Delivery Reports / Construction Activity Inspection Checklists / Material Approval Certificate / Cabinet Shelves / Folder Labels / Summary of Test Report and Test Certificates. Other Records relative to Quality and As-Built Records / Safety Records. ^[1] Document: Project Quality Plan (PQP) / Project Inspection and Testing Plan (ITP) / Method Statement (MS) / Construction Drawings / Technical Specifications/ Construction / Procurement / Equipment / Manpower Schedules. ^[2]	

Corrective/Preventive Action (CPA) - Samples of PDC - Project Document Control

Concrete curing in site, must be always a Hold Point inspection in the applicable Inspection and Test Plan for the Contractor. A verifying document in the form of a Curing Record should be provided. Refer to MOW SSCW 2019 Module 2 clause 2.8 / Method Statement.

Documented Inspection and Test Plans for foundation and Concrete structures, the details are inadequate. No space for specific structure/ location identification, results data and authority signature.

The Contractor established and documented risk assessment that is embedded in the method statement of foundation works is inadequate. It did not define the risk of dump trucks, compactor and of persons at site which are relatively involved in backfilling works

Corrective/Preventive Action (CPA) - Sample of PNC - Project Non-Conformance



Concrete cube test specimens to be placed and cured in the required curing tank or a facility under temperature controlled conditions to comply with BS EN 12390-2. Refer to MOW SSCW 2019 Module 2 clause 2.2.2.4

Corrective/Preventive Action (CPA) - Sample of PNC - Project Non-Conformance



Flexible pipes, valves, fittings and GRP liners for drainage & sewerage lines should be stored in the shade or in a properly prepared & maintained storage area demarcated in respect of pipe sizes and manufacturers. And all flexible pipes that are permanently exposed to sunlight should be UV resistant.

Refer to MOW SSCW 2009 Module 17 clause 1.7, 1.10, 1.11 & 3.4 / Manufacturer's Data Sheet

Corrective/Preventive Action (CPA) - Samples of PRC - Project Record Control

Materials Schedule was not provided during the time of audit. Refer to MOW SSCW 2019 Module 1 clause 2.3.1

Site Survey Records or any Survey Inspection Reports must be maintained in the project.

Masonry works final checking/inspections (in terms of length, height, straightness & verticality) should be done to validate that all workmanship are in compliance with BS 8000: Part 3 or within the permissible tolerances given in Module 13 Table 1.

The Contractor was unable to provide the Equipment/ Tool Calibration Plan and Record or the Summary List of All Equipment's/ Tools, Plant & Machineries showing the calibration requirements details.



Quality Assurance Program at MoW Projects

Corrective/Preventive Action (CPA) - Samples of PSD - Project System Deficiencies

The Contractor was unable to provide its QMS (Quality Management System) / PQP (Project Quality Plan) during the time of audit.

Generator Installation are not supported by an " Inspection & Test Plan "and "Risk Assessment Analysis" refer to MOW SSCW 2019 Module 1 clause 2.4.3.

Electrical Items -There are no proper documents for the electrical materials that have existing MAC approval such as type test certificate and type test results. The contractor has to provide further evidence of compliance (e.g. 3rd party approval certificate or test report) in accordance to MoW specifications.

Audit Report

Individual Project Quality Audit Reports tracked by unique numbers will be produced after each audit. CPA will be numbered sequentially regardless of whether it is issued from audit or inspection or testing. Project Quality Audit Report shall be issued to PM for his issuance to Auditees on a timely basis.

Quarterly Report

MED submits a Quality Assurance (QA) Report to H.E. the Minister of Works via the AUS Technical Services on a quarterly basis containing reporting of activities carried out, including Project Quality Audits, CPA Status Log, Etc. These are interim cumulative reports from the start of QA implementation in the project up to the reporting date.

Audit Program Outcome

Feedback Memos

Prepared and sent to each projects directorate on a quarterly basis along with the quarterly report presenting the cumulative findings, analysis & Recommendations based on the Corrective/Preventive Action Requests (CPA) raised during the Quality Assurance Audits.

Feedback on the Performance of Contractors involved in the QAP

Based on the strategic initiative “MOW-P01-i04” MED started reflecting the performance of contractors in the QAP throughout memos sent to all associated directorates on a quarterly basis to be incorporated in their quarterly review.

1

Total coverage by Q4-2025

2

To focus on Quality requirements built into the Contracts:

Project Quality Plan (PQP) Method
Statement/Inspection & Test Plan/Risk Assessment
QAP in Contract & QA Testing
MED properly-assessed materials/products used for projects.

3

Enhance cooperation between Project Directorates & MED to view QAP holistically.

To date, there is a healthy and positive acceptance/ response towards the Quality Assurance program. To improve the cooperation further and similar to other quarters, the following are recommended which are based on overall observations :

□ Project Manager/Contractor Enhanced Role in Quality Assurance program

- Prompt submission of prerequisite required documents i.e. works program/ work schedule, contract specs, drawings, Project Quality Plan (as per checklist).
- Commit to the implementation of QA program in the projects and ensure involvement of all responsible parties in the audits/ inspections including MoW's site personnel, site staff of Contractor, as well as Consultant, if any.

□ Project Manager/Quality Manager Role in Quality Assurance program:

- Develop close rapport/ liaison between Quality Manager and Project Manager/Consultants to ensure smooth flow of information, dissemination of requirements and expectations.
- Ensure follow-up and closure of any Corrective/ Preventive Action Request issued to the auditees.
- Highlight any insufficiencies and be open for any room for improvement in the QA process.

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Thank You شكرا لاستماعكم



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