

**Annex II-F**

**QUALITY CONTROL PLAN**

**JERICHO-POLICE TRAINING FACILITY**

## Table of Contents

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Section 1:	Introduction.....	1
1.1	Quality Program Overview .....	1
1.2	Quality Control .....	2
1.3	Quality Management Plan.....	9
1.4	Organization Of UNOPS Quality Control Plan .....	9
Section 2:	Project Quality Control Organization .....	11
2.1	Responsibilities And Authorities Of Organizations .....	11
2.2	Structure Of Quality Control Organization.....	12
2.3	Responsibilities And Authorities Of Key Personnel .....	13
Section 3:	Submittals .....	16
3.1	Submittal Schedule .....	16
3.2	Process, Review And Acceptance.....	16
3.3	Storage .....	17
Section 4:	Performance Monitoring Requirements.....	18
4.1	Reporting.....	18
Section 5:	Inspection And Verification Activities .....	20
5.1	General Construction Inspection & Verification Requirements .....	20
5.2	Construction Acceptance Criteria .....	24
5.3	Compliance With Handling, Storage, Packaging, Preservation And Delivery Requirements .....	25
5.4	Material Identification And Traceability .....	25
Section 6:	Construction Deficiencies .....	25
6.1	Deficiency Identification .....	25
6.2	Quality Control Deficiency Identification And Control .....	25
6.3	Non-Conformance Report.....	26
6.4	Quality Control Deficiency Correction.....	26
6.5	Preventive Actions .....	27
Section 7:	Documentation .....	27
7.1	Daily Record Keeping.....	27
7.2	Daily Construction Report .....	27
7.3	Inspection And Testing Report Forms .....	28
7.4	Record Drawings .....	29
7.5	Control Of Quality Records .....	29
Section 8:	Field Revisions.....	30
8.1	Quality Control Plan Revisions .....	30
8.2	Contractors Quality Plan Revisions .....	30
Section 9:	Final Reporting .....	31
9.1	Work Completion Report:.....	31

## Appendices

Appendix A: Sample Qualification Test Schedules

Appendix B: Sample Inspection Schedules

Appendix C: Sample Test Schedules

Appendix D: Typical Construction Forms

Appendix E: List of Quality Control Staff (Pending)

## Glossary of Acronyms

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PNA	Palestinian National Authority
NCR	Non-Conformance Report
UNOPS	United Nations Office for Project Services
TBN	To be notified
The Engineer	The nominated UNOPS Engineer & QC Project Engineer
QCMT	Quality Control Management Team
QCP	Quality Control Plan

## **Section 1: Introduction**

Quality Control is fundamental to the works and services undertaken by the United Nations Office for Project Services (UNOPS) and shall be practiced by all personnel of the Organization in their daily activities.

Quality is enhanced by working systematically, according to formalized procedures, designed to prevent or eliminate errors from occurring.

It shall be the responsibility of UNOPS Project Managers to ensure that these procedures are implemented consistently and effectively, and that they are reviewed regularly to reflect the requirements of the Contracts throughout the duration of works.

It shall be the responsibility of the Quality Control Manager to constantly monitor the implementation of the Quality Control Plan to establish and put into practice necessary systems and procedures, and ensure adherence to the Quality Control Plan through regular auditing. The UNOPS quality Control Manager for this project will be its nominated Engineer - TBN

### **1.1 Quality Program Overview**

The Quality Control Plan details the systems and controls that UNOPS has put in place so that the quality of the project will meet the requirements of the client and end user. The quality of the PTF will be ensured through an integrated system of quality control performed by UNOPS.

The Quality Control Plan establishes:

- project procedures and general responsibilities for the quality control program; and
- protocols to ensure that the Implementation Plan will be executed in accordance with the related requirements.

UNOPS's Quality Control is the systematic implementation of a program of inspections and production controls to attain the required standards of quality and to preclude problems resulting from noncompliance.

Pursuant to UNOPS Technical Specification, Contractor Quality Program Requirements, each construction contractor will establish an independent QC program in line with the UNOPS Quality Control Plan and write a Contractor Quality Control Plan. The Contractor Quality Control Plan shall provide for tests and inspections pursuant to various technical specifications. It will define procedures to ensure that activities affecting quality are properly documented and accomplished in accordance with contract documents; written instructions; and industry standards, codes and procedures. Furthermore, the Contractor Quality Control Plan will define methods for ensuring that activities affecting quality will be accomplished under controlled conditions.

Independently of the construction contractors, UNOPS Engineer will provide Quality Control through daily monitoring and scheduled inspections to verify the effectiveness of the Contractor's Quality Control

program and assure that the quality and contract requirements are met by the contractors. The Engineer assures that the Contractor's Quality Control is working effectively and that the resulting construction complies with the quality requirements established by the contract.

The objectives of this Quality Control Plan are to:

- Describe a quality program to be implemented so that the project is constructed in accordance with the contract requirements and industry standards;
- Describe guidelines for inspection and documentation of construction activities;
- Provide reasonable assurance that the completed work will meet or exceed the requirements of the construction drawings and specifications; and
- Describe how any unexpected changes or conditions that could affect the construction quality will be detected, documented, and addressed during construction.

## **1.2 Quality Control**

The role of the UNOPS Quality Control Manager is to assure that the quality requirements of the PTF have been satisfied.

The UNOPS Quality Control Plan requires that the UNOPS implement the program and use its provisions daily to control quality of the work. Effective Quality Control requires a serious and concentrated effort on the part of the supervisory and inspection personnel. The tools for the accomplishment of effective Quality Control are as follows:

1. Quality Control personnel are described as to education, experience, and capability.
2. Before start of construction, the UNOPS Quality Control Manager shall conduct a Start-up Meeting with the contractor and discuss the contractor's quality control system. The Start-up Meeting and submittal/acceptance of at least the interim Contractor Quality Control Plan should take place within 10 days of Award. The Contractor Quality Control Plan will be viewed with a critical eye.
3. The UNOPS Quality Control Manager will assure that the Contractor Quality Control Plan is sufficient to obtain the quality of construction designed in the contract plans and specifications.
4. Quality assurance monitors and confirms quality, but quality control must provide it.

### **1.2.1 Quality Control Plan Phasing**

This Quality Control Plan will comprise the following 3 phases:

- **Preparatory Phase Meetings:** Quality Control meetings will be held before each definable feature of work to ensure that the documentation is complete, materials are on hand, and the people who are to perform the work understand what they need to know about the feature of work. Both the actual contract specifications and those referenced in the contract specifications shall be in the Contractor's library and available to the Quality Control inspector(s). If the Quality Control inspector(s) does not have the required specifications, they cannot know or enforce these provisions.
- **Initial Inspections:** Quality Control inspections shall be conducted in a timely manner—at the beginning of a definable feature of work. A check of the preliminary work will determine whether or not the Contractor, through his Contractor Quality Control organization and the craftsmen involved, thoroughly understands and is capable of accomplishing the work as specified.
- **Follow-up Inspections:** Follow-up inspections, also conducted by UNOPS and Contractor's quality control staff, occur daily when work is in progress and are for the purpose of assuring that the controls established in the earlier phases of inspection continue to provide work which conforms to the contract requirements. Most of the comments in both the Contractor Quality Control and Quality Control daily reports result from these inspections.

In all projects, there is work that is 'cut and cover'—that is, work that cannot be inspected "after the fact". This includes concrete, where the size, number and location of reinforcing steel cannot be readily determined after the concrete is placed. Most of the underground utilities cannot be inspected after covering. Work of this nature shall be closely controlled and monitored.

A disadvantage with the system arises from the fact that Contractor Quality Control personnel, as employees of the contractor, are unlikely to readily take actions which will result in delay and expense to the contractor for the sake of quality. For example, if concrete is to be placed with a maximum slump of 6 cm, it is unlikely that a load with 10cm or 12 cm slump will be rejected. If roofing bituminous material is overheated, it is unlikely that it will be rejected. The deficiencies occasioned by these conditions may become latent defects revealed long after any possible contractor liability can be enforced.

The UNOPS Quality Control Manager has a vital role in assuring that these and similar situations do not occur.

The UNOPS Quality Control Manager shall closely monitor the Contractor Quality Control program to assure that the 3-phase control system is being correctly performed and that the contractor is effectively controlling all operations. In the event that Contractor Quality Control personnel are not capable and/or are not inspecting properly, the Project Manager shall be notified immediately and shall correct performance by using one or more of the enforcement tools provided for in the construction contract. Records and reports will document all facts.

### 1.2.2 Plans and Specifications

1. UNOPS Quality Control Manager will monitor the preparation of design documentation, including plans and specifications, and will:
  - a) Watch for omissions;
  - b) Watch for discrepancies between plans and specifications;
  - c) Check plans and specifications against requirements of which problems occurred on similar jobs;
  - d) Compare elevations, grades and details shown on plans as existing, with those at the actual site; and
  - e) Report all errors, omissions, discrepancies, and deficiencies to the Design Office Manager and Project Manager.
2. Always keep a posted and marked up set of plans and specifications convenient for ready reference.
3. Make sure that the construction contractor has this same information.
4. Anticipate the construction contractor's operations by reviewing the plans and specifications for each operation before it begins.
  - a) Discuss contract requirements in each Preparatory Phase Meeting with the construction contractor before each operation begins.
  - b) Highlight and/or make notes of those provisions which need special attention, such as:
    1. Unusual requirements.
    2. Those which other contractors have overlooked.
    3. Repetitive deficiencies.
    4. Use the checklists in these guides to help find significant items in the plans and specifications.

### 1.2.3 Shop Drawings

UNOPS Quality Control Manager will utilize the following Quality Control checklist for shop drawings. The Quality Control Manager shall:

1. Prepare submittal register for plans, and specifications. Check submittal register for inclusion of all shop drawings required including layouts of equipment, equipment rooms, etc.
2. Ensure that the contractor enters data onto the submittal register and submits it to the Quality Control Officer. Compare this submittal with the check list.
3. Ensure that the contractor periodically updates the submittal register.
4. Make continual checks of the submittal register to avoid untimely and omitted submittals so as to avoid delay of construction.
5. Compare the shop drawings to the contract requirements and report apparent differences to the Design Office Manager and Project Manager. (Approved shop drawings do not constitute a waiver of a contract requirement.)
6. Make sure each detail on the shop drawing is clearly understood by the construction contractor.
7. Ensure that the contractor makes note on his submittal of items which deviate from contract requirements.
8. Check material being installed against the approved shop drawing. (If the contractor installs unapproved material, inform him in writing that the material, if not subsequently approved, will be removed at his expense.)

### 1.2.4 Pre-Construction Conference

The UNOPS Engineer, the Quality Assurance Team, UNOPS Project Manager, UNOPS PM and contractor representative shall attend this conference.

Minutes of the conference shall be available to each of the quality assurance/quality control representatives assigned.

The subject of the proposed Quality Control Plan shall be well documented.

### **1.2.5 Equipment Proposal**

UNOPS checklist for equipment proposal:

1. Does equipment proposed by the contractor have the UNOPS Engineer approval (more applicable to civil works projects)?
2. Certain equipment requires a safety test or check before initial operation at the site.
3. Some equipment requires a permit or license before use.

### **1.2.6 Claims**

UNOPS checklist for Claims:

1. Always be alert to possible claims or matters of possible dispute.
2. When it is discovered that a claim or dispute is in the making, the UNOPS Project Manager shall be notified immediately. All facts are to be recorded in the quality control daily reports.
3. Make sure that adequate and accurate records of facts, materials, labor and equipment associated with the claim or dispute are on file.
4. Situation photographs may be appropriate to supplement the record.
5. Differing site conditions may be cause for claim — contractor shall notify the Engineer in writing before disturbing conditions.

### **1.2.7 Labor Enforcement**

UNOPS checklist for labor enforcement:

1. Keep informed of the labor provisions of the contracts on which you are working.
2. Always avoid taking part in any labor disputes.
3. Promptly inform your supervisor of any labor problems and disputes.
4. Assist office personnel in assuring that:
  - a. Each laborer and each machine is classified in accordance with the particular work function.
  - b. Make spot checks with Contractor's employees to verify that payments correspond to the work classification being performed.

### 1.2.8 Storage of Materials

UNOPS checklist for storage of materials:

1. Ensure that adequate space has been set aside by/for the contractor for operations and storage areas.
2. Ensure that approval has been obtained for temporary sheds, buildings, etc., which the contractor proposes to install.
3. Ensure that material and equipment are properly stored and protected.
4. Ensure that safety requirements, especially in the storage of flammable or explosive materials, are adhered to.
5. Ensure temporary structures are secured against wind damage.
6. Ensure the necessary heating and ventilating systems are provided.

### 1.2.9 Contractor's Payment Estimates

UNOPS checklist for contractor's payment estimates:

1. Confirm specifications for method of measurement and payment for each item of work to be accomplished.
2. Be familiar with schedules of prices and methods of measurement and payment.
3. Assist the in preparation of partial pay estimates.
  - a) Make timely measurements of work completed and work accomplished each pay period.
  - b) Keep orderly, neat and accurate records of measurements.
4. Check material on hand for which payment is being made for:
  - a) Fair market value of materials;
  - b) Conformance with contract requirements (see submittal);
  - c) Proper storage and protection; and
  - d) Reduction in quantity by amount of material placed in the work.
5. Be alert to all increases or decreases in quantity of work shown on the unit price schedules.

- a) Make as accurate an estimate as possible of variations in quantities.
- b) Report these variations in quantities promptly to the supervisor.

### **1.2.10 Rights-of-Way**

UNOPS will ensure that all rights-of-way are obtained prior to entrance on property.

1. Require written evidence if contractor-obtained.
2. Check contract provisions if Government-obtained.
3. Know the limits of rights-of-way and locations of benchmarks that may be used to determine location and elevations.

### **1.2.11 Photographs**

The Engineer and the QC Contractors representative checklist for photographs:

1. UNOPS shall take and review digital photographs of:
  - a) Multiple view of construction works during various stages of progress.
  - b) Materials or construction related to changed conditions, claims, or potential claims.
  - c) Work in place for which removal has been ordered because of noncompliance with plans and specifications.
  - d) Construction in which unusual difficulties have been overcome or where the subject is of technical interest.
  - e) Alternate methods of construction implemented by construction contractor(s).
  - f) Property or material damages.
  - g) Emergency conditions and safety violations.
  - h) Accident scenes.
  - i) Defective work.
2. Each picture taken is completely described, identified, and dated.
3. Ensure that each photograph is properly stored as part of the project record.

### 1.2.12 Record Drawings

UNOPS checklist for record drawings:

1. The contractor's record drawings shall be reviewed monthly by UNOPS project and design office staff to ensure that they are correct.
2. Ensure that as soon as a change or addition is made in construction it is noted on the record drawing.
3. See that the following items are considered in the changes for Record Drawings:
  - a) Size, type, and location of existing and new utility lines.
  - b) Layout and schematic drawings of electrical circuits and piping.
  - c) Dimensions and details transferred from shop drawings.
  - d) Verification of alignment, cross section, and layout of earthwork.
  - e) Actual locations of anchors, construction and control joints. etc. in concrete, where they are different from those shown on contract drawings.
  - f) Changes in location of equipment and architectural features.
  - g) Cross out such words, phrases and details for optional or equal requirements and list or detail specifically the items provided.

### 1.3 Quality Management Plan

UNOPS will carry out work on this project in accordance with this UNOPS Quality Management Plan.

### 1.4 Organization of UNOPS Quality Control Plan

This Quality Control Plan is organized into eleven sections.

- Section 1- Introduction: Describes, the contract and related documents, and the Quality Control Plan overview.
- Section 2- Project Quality Control Organization: Presents the organizations and key personnel involved in the construction of the facility, their responsibilities and authorities, the structure of the Quality Control organization and the minimum training and experience of the Quality Control Officer and personnel.
- Section 3 - Submittals: Presents the procedures for processing submittals from contractors and vendors.

- Section 4 - Performance Monitoring Requirements: Addresses Quality Control for performance monitoring requirements.
- Section 5 - Inspection and Verification Activities: Provides procedures for tracking construction inspection and verification activities for the contract, construction acceptance criteria, and construction audits.
- Section 6 - Construction Deficiencies: Describes the procedures for tracking construction deficiencies from identification through acceptable corrective action.
- Section 7 - Documentation: Describes the procedures for the project documents that will be managed through a combination of a secure document filing and storage system and computerized Document Tracking System.
- Section 8 - Approvals: describes approvals.
- Section 9 - Field Changes: Describes handling of quality plan changes to assure Quality Control objectives are met.
- Section 10 - Final Reporting: Describes the Quality Control documentation.
- Section 11 - References: Provides bibliographic references to key documents referred to in the body of the plan.

## **Section 2: Project Quality Control Organization**

This section presents the responsibilities and authorities of organizations and key personnel involved in the construction of the facility, the structure of the Quality Control organization, the minimum training and experience of the Quality Control personnel, and the Quality Control training given to all onsite workers.

### **2.1 Responsibilities and Authorities Of Organizations**

The organizations involved in the Police Training Facility Project and their Quality Control roles and responsibilities are as follows.

#### **2.1.1 UNOPS**

UNOPS is responsible for implementing the Program and for maintaining Quality Control, including ensuring that its contractors and subcontractors perform construction in accordance with the contract documents, specifications and related documents.

The Quality Control Plan details the systems UNOPS has put in place in order that its responsibilities to quality are met.

The UNOPS Project Manager provides professional construction project management and related services in connection with the project. The UNOPS Project Manager is responsible for implementation of this Quality Control Plan. The UNOPS Project Manager will manage construction contracts on behalf of UNOPS and serve as the primary point of contact with the contractors for all communications to and from the UNOPS. The UNOPS Project Manager will delegate the Quality Control Management Team (QCMT) and the UNOPS Project Engineer to all day to day supervision of site works to his appointed Engineer(s). UNOPS will provide Quality Control and monitor the day-by-day construction quality control activities performed by construction contractors to verify compliance with the contract plans and specifications. This is to include, but not limited to the management, coordination and administration of all Quality Control activities and requirements, including subcontractors.

#### **2.1.2 Quality Assurance**

The UNOPS PM and his team are responsible for the Quality Assurance plan. The purpose and goals of Quality Assurance is to verify and ensure that levels of workmanship and quality of materials stipulated in contract specifications are met for each building project by the UNOPS, its staff, and any contractor(s) hired by it to undertake the work.

#### **2.1.3 Construction Contractors**

The construction contractors are retained by UNOPS to provide the labor, materials and equipment required to construct the project in accordance with the contract documents.

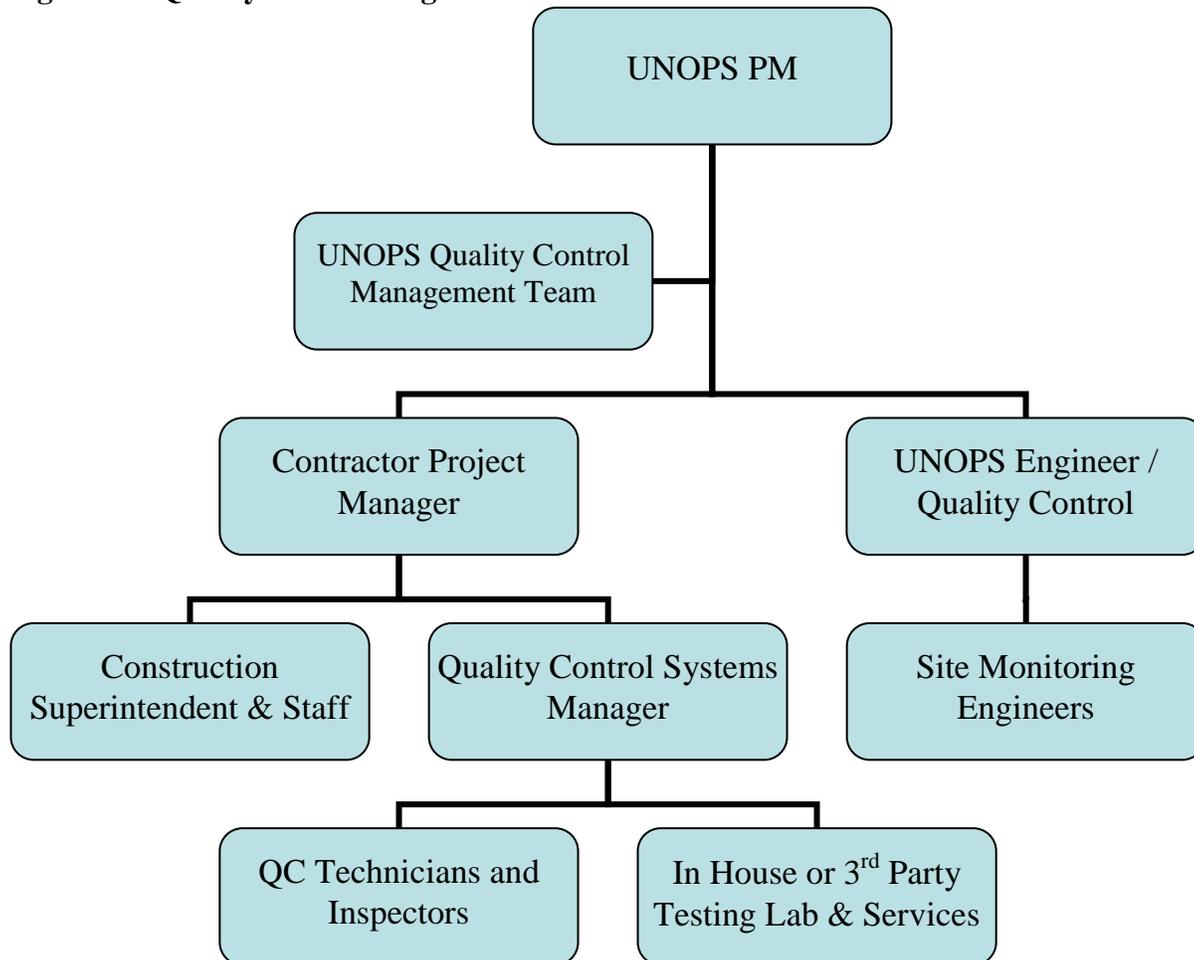
Construction contractors are responsible for the quality control of their constructed work product as well as the necessary inspections and tests required to ensure that their work complies with the contract

documents. They exercise authority over their workforce, including Quality Control personnel and their third-party Quality Control support services. Pursuant to UNOPS Technical Specification the Contractor Quality Program Requirements each contractor will submit a Quality Control organization chart developed to show all Quality Control personnel and how these personnel integrate with other management, production and construction functions and personnel. All Quality Control staff members are subject to acceptance by UNOPS. The requirements for the Quality Control organization include a Quality Control Systems Manager and a sufficient number of additional qualified personnel to ensure contract compliance. The contractor is to provide a Quality Control organization that is represented on the site at all times during progress of the work and with authority to take any action necessary to ensure compliance with the contract.

## 2.2 Structure of Quality Control Organization

The Quality Control and Quality Assurance functions of the project organizations are functionally integrated although contractually separate. Figure 2.1 shows the functional structure of the project Quality Control team.

**Figure 2-1 Quality Control Organization**



## **2.3 Responsibilities and Authorities of Key Personnel**

Quality Control Representatives shall be thoroughly familiar with all the provisions of the contract documents, including submittals. Plans and specifications shall include all revisions, changes, and amendments. In addition, thorough familiarity with the administrative policies of the Engineers is expected. The general requirements for quality control and quality assurance are given in paragraph Quality Control.

Key personnel involved in the project and their Quality Control roles and responsibilities are described below in Section 2.3.1 and Section 2.3.2. Since personnel assignments are subject to change over time, the UNOPS Project Manager will maintain Quality Control Staffing List of personnel assignments including the description of each position, along with information on the responsible organization. This Quality Control Staffing List is provided in Appendix E. When a change in personnel occurs, UNOPS will revise Appendix E accordingly.

### **2.3.1 UNOPS Quality Control Personnel**

The following key quality control personnel will be identified prior to the start of any construction works. A list of all quality control personnel will be compiled, including the following details for each personnel: name, main responsibilities, qualifications and years of work experience in the same field.

#### **A. UNOPS Project Manager**

The UNOPS Project Manager is the primary point of contact for UNOPS on all construction management issues. The Project Manager is responsible for the overall management of activities related to the construction program, including the implementation of the Quality Control Plan and the health and safety program. As such, the Project Manager will exercise approval authority over contractor submittals including the Quality Control Plan. The Quality Control Plan shall include the names and qualifications of contractor's Quality Control personnel pursuant to Section 2.3.2 below.

#### **B. UNOPS Site Project Engineer**

The UNOPS Engineer(s) monitor the field implementation of the Quality Control Plan at the project sites under control of Quality Control Manager. Engineers will monitor the day-to-day activities of the contractor. This includes ensuring that contractors comply with the plans and specifications, applicable building codes, good workmanship, and the Quality Control requirements of the contract.

As part of this effort, the Engineer(s) will:

- conduct independent inspections to verify the quality of the work;
- participate in contractor four phase inspections;
- review test and inspection reports; and
- ensure that the required documentation is submitted.

The Engineer(s) shall be alert to detecting, recording, and reporting any deviation from the contract documents, including calling any deficient item to the attention of the contractor's superintendent, and/or other representative. The Engineer(s) shall keep accurate and detailed records of the contractor's performance and progress, delivery of materials, and other pertinent matters, including the daily inspection report.

**C. Quality Control Management – UNOPS Design Team**

Each of the Quality Control Management Team members shall have a minimum of five years of experience in related construction and prior Quality Control experience on a project of comparable size and scope to this project. The Quality Control Manager will be nominated by the PM. Additional qualifications for the Quality Control Management Team (QCMT) include one or more of the following requirements:

- Three years of related experience acceptable to UNOPS with a Bachelor of Science Degree in civil engineering, civil engineering technology, or construction.
- Three years of related experience acceptable to UNOPS with a Bachelor of Science Degree in either a Mechanical or Electrical engineering, Facilities or Project Management engineering and/or Health & Safety.
- The QCMT reports directly to the Project Manager. The QCMT will have full authority delegated by the UNOPS PM to institute actions necessary for the successful implementation of the QC program to ensure compliance with the contract plans and technical specifications (including stop-work authority). The QCMT is assigned to the program full time.
- The QCMT works with the Project Manager to administer and implement the Quality Control Plan. This includes controlling this Quality Control Plan, making revisions as necessary, and implementing systematic actions to ensure compliance with the plan. The QCMT coordinates oversees the Engineer(s) to ensure that inspection staff, third party inspection and testing firms as well as contractor Quality Control staff carry out the requirements of the Quality Control Plan.
- The QCMT and reports non-conformances to the Engineer and Contractor's PM. The QCMT also has full authority to obtain direct access to contractor Quality Control files.

Other QCMT responsibilities include:

- Reviewing contractor Quality Control reports, tests, and inspection results;
- Facilitating the implementation of the four-phase inspection program and participating in the required inspections; and

- Ensuring that Quality Control personnel conducting inspections, including the Engineer(s), are adequately trained and understand assignment limits and time frames.

### **2.3.2 Contractor's Quality Control Personnel**

The following key quality control personnel will be identified prior to the start of any construction works. A list of all quality control personnel will be provided to UNOPS, including the following details for each personnel: name, main responsibilities, qualifications and years of work experience in the same field.

#### **A. Contractor Quality Control Systems Manager**

The Contractor Quality Control Systems Manager is a full-time employee of the contractor, or a consultant engaged by the contractor. The Quality Control Systems Manager shall have a minimum of five years of experience in related construction, prior Quality Control experience on a project of comparable size and scope to the contractor's scope of work on this project and shall have Bachelor of Science Degree in civil engineering, civil engineering technology, or construction.

The Quality Control Systems Manager will have full authority to institute any and all actions necessary for the successful implementation of the Quality Control program to ensure compliance with the contract plans and technical specifications. The Quality Control Systems Manager shall report directly to a responsible officer of the construction contractor. The Quality Control Systems Manager is the assigned and designated contractor's representative for QA/QC.

#### **B. Contractor Quality Control Technicians**

The contractors Quality Control Technicians perform the following functions:

- Inspect all materials, construction, plant, and equipment for conformance with the technical specifications; and
- Perform all Quality Control tests as required by the technical specifications.

Contractor Quality Control Technicians will be engineers or engineering technicians, and will have a minimum of two years of experience in their area of expertise. Additional experience and training may be substituted for educational requirements, subject to the Engineer's approval.

**Section 3: Submittals**

This section describes the procedures for submittals. The Engineer shall administer, control, and process submittals from the construction contractor(s). The Engineer shall review all contractor submittals, and related supporting documents, to ensure compliance with project specifications and drawings. The submittals disposition will be noted on the submittal, which will be signed, dated and recorded. If required, The Engineer will return the submittal to the contractor for revision, incorporating the comments. The contractor shall resubmit it for review and verification for compliance. Submittals will be logged and copies will be retained in the project files. Results of QCMT review shall be recorded and available for review.

**3.1 Submittal Schedule**

The construction contractor will prepare and submit a submittal schedule to the Engineer, which will then be provided to UNOPS project manager. The schedule will be initially submitted within 10 days after the award of the contract and updated on a monthly basis. The QCNT shall work with the contractor to prioritize and sequence submittals so that the most critical submittals are received and processed first. The submittal schedule will become the baseline against which receipt of all required submittals will be compared. The approved submittal schedule will be forwarded to the UNOPS PM for resource availability planning.

**3.2 Process, Review and Acceptance**

Submittals will be managed as follows:

- A. Contractors will number and certify the completeness of all submittals before submitting to the Engineer;
- B. Contractors shall also complete submittal transmittal forms and submit six paper copies and one electronic copy of all required submittals to the DCMT;
- C. Upon receiving the submittal, the Engineer will log the submittal and provide a review to ascertain whether the package is complete. If the submittal is incomplete the submittal will be returned to the contractor.
- D. The original submittal transmittal and all copied attachments will be logged into the document tracking system.
- E. The Engineer shall review the submittal for general conformance with contract design documents, will coordinate concurrent discipline reviews within the design team, and consolidate responses into a single coordinated action.
- F. The DCMT will return a copy of the submittal to the contractor with an original stamp of the action required.

G. The six actions that may be taken for each submittal are:

1. APPROVED – Submittal meets contract requirements. No additional copies will be required of the contractor.
2. APPROVED AS NOTED – Submittal meets contract requirements with minor corrections noted. Re-submittal is not required. Contractor shall incorporate the required corrections into the work in the field. No additional copies will be required of the contractor.
3. REVISE AND RESUBMIT – Submittal has some selected areas that do not meet requirements. These areas can be revised to meet requirements, and the entire submittal shall be re-submitted for review and approval. No work will begin in the field until the revised submittal has been approved.
4. REJECTED – Submittal is inadequate and does not meet contract requirements. Revise the complete submittal and resubmit for approval. No work will begin in the field until the revised submittal has been approved.
5. FOR INFORMATION ONLY – Submitted for information only; no response action required.
6. RECEIVED, NO ACTION TAKEN – Receipt of submittal is noted; no further action required.

H. When a submittal is to be revised and resubmitted, the contractor will revise the submittal and indicate this revision by incrementing the revision number. The UNOPS submittal process will then be repeated.

The QCMT is responsible for tracking the submittal package during the entire review process and advising all concerned of any schedule impacts to ensure that the review process timeframe is adhered to. The QCMT will retain copies of all submittal documents and revisions and ensure that an accurate file is available for ready retrieval during the life of the project. The QCMT will maintain all submittal files. These files will be filed by numeric sequence. Each submittal file will contain a complete submittal copy of the submittal before and after the review process.

### **3.3 Storage**

The QCMT will maintain all submittal files via a combination of a secure document filing and storage system, and a computerized document tracking system. All submittal records will be available for review by all stakeholders. All submittal records will be provided to the UNOPS PM as part of the project closeout documentation.

**Section 4: Performance Monitoring Requirements**

The performance monitoring requirements are applicable to the PTF project. The UNOPS Technical Specifications impose these requirements upon the contractors and require specific plans for contractor compliance and related work-area monitoring. The QCMT will perform Quality Control oversight of contractor compliance and related work-area monitoring pursuant to the submitted plans.

**4.1 Reporting**

The monitoring data obtained by the QCMT during construction work will be included in the weekly progress report.

**4.1.1 QUALITY CONTROL REPORT**

Prepare a complete and accurate daily report. Check for inclusion of the following:

1. Conditions — weather, moisture, soil conditions, etc. (Note when and how adverse condition hampered or shut down a Contractor's operation).]
2. Activities — work phases, including locations (include description of each activity and the inspection phase, i.e., Preparatory, Initial, Follow-up).
3. Controversial matters — disputes, questionable items, etc. (Also, note if they were settled and, if so, how they were settled).
4. Deficiencies and violations — description, location and corrective action.
5. Instructions given and received - identify recipient and source.
6. Progress information - report all delays, action taken or action contemplated.
7. Equipment — report arrival and departure of each major item of equipment by manufacturer, model, serial number and capacity: report equipment in use and idle equipment.
8. Reports — make sure quality assurance reports are identified, dated and signed.

Do not repeat, in the Quality Control daily reports, items that have already been listed on the QCP daily reports.

Check the Quality Control Plan (QCP) daily report each day for accuracy and to assure that instructions received are noted. Effectiveness of the Quality Control Plan inspections reported shall be checked during the job site visit.

#### **4.1.2 PROGRESS SCHEDULES**

1. Render any necessary assistance to the contractor for his preparation of initial and revised progress schedules.
2. Encourage contractor to submit timely updates.
3. Be familiar with the approved progress schedule and carefully watch for any slippage in progress.
4. Anticipate slow downs and delays affecting progress.
5. Promptly report to the supervisor and record in the daily Quality Control reports, all indications of any slippage in progress.
6. When construction falls behind schedule, carefully examine the construction operations for ways progress can be improved.
7. Be very careful not to direct or dictate the contractor's operation (the QCMT may want to direct the contractor to take steps to improve his progress).

Keep informed of the required contract completion date and know the advance notice required by higher authorities for pre-final and final inspections.

**Section 5: Inspection and Verification Activities**

The Quality Control, verification, and acceptance testing plans set out the Quality Control inspections and testing for implementation of each technical specification applicable to the contractor's scope of work. The plans will cover the type, test standard, frequency, control requirements, and assigned responsibility for inspections and tests. The QCMT will review and approve these plans as part of the contractor Quality Control Plan submittals.

After being approved by the QCMT, the contractor Quality Control Plan is available upon request for informational purposes only.

Ongoing Quality Control monitoring and oversight of contractor Quality Control inspections and testing will be performed by the UNOPS Engineer on a day to day basis with weekly review being undertaken by the QCMT. In this manner, the inspections and tests required to measure compliance with the relevant portions.

**5.1 General Construction Inspection & Verification Requirements**

Contractors shall perform the inspections and tests as prescribed in the technical specifications for Contracts. Quality Control inspection and testing will be used to verify the adequacy and effectiveness of the contractor Quality Control program. The Quality Control inspection and testing frequency will be at the discretion of the Engineer based on results of Quality Control tests, evaluation of daily reports, audits of the Quality Control program and verification testing conducted by UNOPS and the contractor's in-house or third party testing firm. Should information become available that indicates a potential problem, the Engineer will review in detail all pertinent information and order additional verification testing if necessary. Contractor Quality Control, verification, and acceptance testing plans set out the contractor's specific Quality Control testing and inspection pursuant to Specification and the relevant design specification.

**Example: Inspection and Testing Plan**

Materials qualification testing will be done prior to construction to verify that the materials comply with the requirements of the specifications. The contractor will obtain representative samples of the materials designated as the proposed source of the materials. Test samples will be sent by the contractor to a Testing Laboratory approved in advance by UNOPS. The Testing Laboratory will report all test results for determination of material meeting the acceptance criteria. For soils, sampling and analysis will be performed by the contractor on the onsite borrow material source. The Engineer or designee will periodically inspect material being used. If determined that the characteristics of the material being used differ from the material initially tested, the Engineer designees will direct the contractor to repeat the qualification testing. If the new material qualification test results meet the criteria of the technical specification as determined by the Engineer; a record is to be made and the new materials may be used for the work; otherwise, previously approved materials shall be used or other acceptable materials shall be

sampled and tested as noted above prior to incorporating into the work. Inspection and testing is summarized in Table 5.1

### 5.1.1 Inspections

The contractor shall establish a program for inspection of activities affecting quality and shall cover all construction site and laboratory operations, including both onsite and offsite operations. Inspections shall be performed to verify compliance with documented instructions, drawings, procedures, and specifications as required by the contract. All inspections shall be documented by the contractor as required by Technical Specification Contractor Quality Program Requirements.

The checklists below will be used during inspection.

A. Checklists: Please see the attached checklist.

B. Inspection Program: A four-phase inspection program shall be followed for each definable feature of the work.

The four phases of inspection are:

1. **Preparatory Inspection:** The contractor and UNOPS perform preparatory inspections prior to beginning any work on any definable feature of the work.
  - a) Ensure that preparatory inspections include a review of contract requirements.
  - b) Ensure that all materials and /or equipment have been tested, submitted, and approved.
  - c) Ensure that provisions have been made to provide required testing.
  - d) Examine work area to ascertain that all preliminary work has been completed.
  - e) Examine materials, equipment, and samples to ensure that they conform to approved shop drawings or submittal data, that all materials and/or equipment are on hand, and that all monitoring and measuring equipment is properly calibrated and in proper working condition.
  - f) Record preparatory inspections in the contractor's Quality Control documentation as required by Technical Specification Contractor Quality Program Requirements
2. **Initial Inspection:** The contractor and UNOPS perform an initial inspection as soon as a representative portion of the particular feature of work has been accomplished.
  - a) Examine the quality of workmanship.
  - b) Review control testing for compliance with contract requirements.

- c) Review dimensional aspects of the work.
  - d) Record initial inspections in the contractor's Quality Control documentation as required by Technical Specification Contractor Quality Program Requirements Specification
3. **Follow-up Inspection:** The contractor and UNOPS perform follow-up inspections daily.
- a) Ensure continuing compliance with Contract requirements.
  - b) Ensure continuing compliance with control testing until completion of particular feature of work.
  - c) Contractor Quality Control Manager records follow-up inspection in daily Quality Control reports.
  - d) UNOPS inspection staff records follow-up inspections in their daily inspection report.
  - e) Conduct final follow-up inspections and correct test deficiencies prior to the addition of new features of work.
4. **Completion Inspection:** The contractor and UNOPS perform a completion inspection of the work.
- a) Develop a "punch list" of items that do not conform to the approved plans and specifications.
  - b) Include the punch list in the construction Quality Control documentation. As required by the QCMT.
  - c) Technical Specification Contractor Quality Program Requirements, include the estimated date by which the deficiencies will be corrected.
  - d) Perform a second completion inspection after punch list items have been completed and the Engineer has been notified by the contractor.

The daily inspection reports shall identify inspections conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective action taken or proposed.

Additional Quality Control inspections may include inspection of third-party lab testing facilities, fabrication facilities, and suppliers. Other inspections outside of the four-phase program described above will be ordered or performed by UNOPS to verify compliance with building code and standards. These

inspections shall be performed and conducted at various points of construction that would typically require code compliance inspections.

When deficiencies are discovered during the four-phase or other inspection processes, focused inspection shall be considered by the Engineer. When material, performed work, or installation is found on the basis of focused inspections to be deficient and/or does not meet the project specifications, the Engineer will assure deficiency correction is implemented, as discussed in Section 6.

Representatives of Donor and/or its designees shall be allowed to participate in any and all inspections as observers.

### **5.1.2 Contractor Quality Control Testing**

As required by the contract specifications, the contractor shall establish a test program to ensure that all required testing is properly identified, planned, documented and performed under controlled and suitable environmental conditions, including cleanliness. Testing shall be performed in accordance with written test procedures in the Quality Control Plan. Such test procedures shall incorporate or reference the requirements as contained in the contract technical specifications, codes, and industry standards. Per the Quality Control Plan, the contractor shall submit the test procedures to the Engineer for review and acceptance prior to their implementation.

The contractor shall propose a materials testing laboratory as part of the workplan. UNOPS approval of the proposed laboratory shall be provided in accordance with the following criteria:

- Qualification of key personnel and laboratory technicians.
- Calibration documentation for all testing equipment for required tests.
- Availability, condition, and capacity of facilities and testing equipment.

The contractor shall be responsible for establishing a system of daily test reports that will record all Quality Control test results. Test results from each day's work period shall be submitted to the Engineer prior to the start of the next day's work period. When required by the technical specifications, the contractor shall maintain statistical Quality Control charts. The contractor's responsible technician shall sign the daily test reports. The Engineer will review test results on a daily basis and identify any non-conforming test results for discussion with the contractor regarding potential corrective action.

### **5.1.3 UNOPS Quality Control Testing**

The Engineer will be responsible for the Quality Control materials sampling and testing program. UNOPS Quality Control testing is provided for the verification of the adequacy and effectiveness of the contractor's Quality Control testing. Quality Control testing is assured by the Engineer. QC testing may be performed on a pre-established schedule or as directed by the Engineer. Quality Control testing will be performed by or under supervision of the Quality Control staff to validate the contractor's Quality Control sampling and testing. Such testing may be performed by third party testing services.

The typical test frequency will be one (1) UNOPS Quality Control test for every ten (10) to fifteen (15) of the construction contractor's Quality Control tests.

More frequent testing during initial startup may be necessary to verify that the process is under control and complies with the technical specifications of the construction contracts. In lieu of performing independent tests the Engineer may choose to witness Quality Control testing or conduct tests on split samples from Quality Control testing. When UNOPS and contractor Quality Control test results do not compare or have wide variances, additional testing may be needed to validate the results. Additional tests to be performed by Field Inspectors or the third party testing services will be at the direction of the Engineer. The need for Quality Control testing shall be based on the following considerations:

- a) Importance of the item as to its reliability, etc;
- b) Need to perform quality checks for fabrication sequences not available for inspection at completion; and
- c) Deficiencies are discovered;

QC testing shall be performed in accordance with the following:

- a) The Engineer shall develop a weekly quality test and inspection schedule using the construction activity forecast as a guide. The schedule shall: identify the Quality Assurance test activities; and identify the hold points.
- b) The weekly quality test schedule shall be distributed to the Engineer, QCMT and Engineers field staff.
- c) The contractor shall be provided a one-day advance notice of impending hold points.

Site Monitoring Engineers conducting the quality tests and inspections shall complete the Daily Construction Report included in Appendix D. The Daily Construction Report shall be distributed to the Engineer, UNOPS Project Manager, any Monitoring Engineer(s), contractor Project Manager and/or QCMT. The Engineer will review Quality Control tests and maintain files for all field Quality Control documentation.

## **5.2 Construction Acceptance Criteria**

Construction acceptance criteria for materials qualifications, inspection, and testing are established by technical specifications as illustrated in the example Quality Control tables included in Appendices A (materials qualifications), B (inspection), and C (testing). Criteria for materials and equipment shall be submitted to the QCMT in accordance with the applicable codes and standards, and by manufacturers' recommendations. Contractor submittals are to document conformance with acceptance criteria as detailed in their Quality Control Plan (control, verification, and acceptance testing plan).

### **5.3 Compliance with Handling, Storage, Packaging, Preservation And Delivery Requirements**

UNOPS field staff will inspect the construction contractor's activities to ensure technical compliance in identification, handling, storage, packaging, preservation, and delivery of materials, parts, assemblies, and end products. Related quality records and documents will be maintained and controlled in accordance with the procedures provided in Section 7 of this Quality Control Plan.

### **5.4 Material Identification and Traceability**

UNOPS field staff will monitor the construction contractor to ensure that identification and traceability requirements are met. Products and materials shall be traced from receipt through all project stages to installation. Documentation such as project control checklists, material receipts, material tracking forms, procedures, sample and test documentation, and reports will ensure that the applicable material item traceability is maintained. Project specifications and/or procedures define product identification and traceability requirements, which generally include the following:

- a) Materials or equipment intended for use in construction are identified and segregated until inspection confirms that they conform to technical and quality requirements, and
- b) Materials are traceable to documents attesting to their conformance with technical requirements that are stated in specifications or drawings. Testing of materials will also be conducted as necessary to verify conformance with material specifications.

## **Section 6: Construction Deficiencies**

This section provides procedures for tracking construction deficiencies (non-compliance) from identification through acceptable corrective action. It defines the controls and related responsibilities and authorities for dealing with noncompliant products or services.

### **6.1 Deficiency Identification**

Deficiency occurs when a material, performed work, or installation does not meet the plans and/or specifications for the project.

### **6.2 Quality Control Deficiency Identification and Control**

When material, performed work, or installation is found deficient, the Engineer (or designee) shall ensure that the non-conforming material, work, or installation is identified and controlled to prevent unintended use or delivery. UNOPS will notify the contractor of non-compliance with any of the foregoing requirements. The contractor shall, after receipt of such notice, immediately take corrective action.

Minor deficiencies noted during test or inspection are to be verbally reported to the contractor's representative and noted on the Daily Construction Report. Minor deficiencies are items that do not require significant rework or repair work to correct, and will not result in significant deviations from required quality standard if corrected immediately.

Control and disposition of such deficiencies shall be by the originator of the Daily Construction Report and the contractor's supervisor responsible for the work and do not require formal action by UNOPS. Ideally, such minor deficiencies can be corrected on the spot by agreement with the contractor's supervisor.

Non-conformances are major deviations from the contract requirement and/or accepted standard of quality, which shall be formally documented for corrective action by UNOPS field staff or the third party testing group. Failure by a contractor to correct a minor deficiency after having been put on notice will also result in a non-conformance if it is not corrected within 5 days of notification. Non conformances shall be formally documented on the example Non Conformance Report (NCR) form shown in Appendix D. A log shall be maintained for all Non-conformance reports in accordance with the example form shown in Appendix D. The Non-conformance report shall be distributed to the contractor Quality Control Manager, UNOPS Project Manager and the QCMT.

The Engineer shall follow up on the Non-conformance report as required to verify that corrective action has been completed. UNOPS shall verify and accept the corrected work by actual inspection.

### **6.3 Non-Conformance Report**

The Non-Conformance Report (NCR) is a formal notification to the contractor that work does not meet the plans or the specifications for the project. Any item of work found to be deficient - out of conformance with the construction drawings and/or specifications - will be identified by the inspector on the nonconformance report as described in this section. Non-conformance reports will be included on the non-conformance log and tracked through verification that the non-conformance has been corrected.

### **6.4 Quality Control Deficiency Correction**

When material, performed work or installation is found to be deficient and/or does not meet the project specifications, the Engineer will assure deficiency correction is implemented. The Engineer designee shall ensure that the non-conforming material, work or installation is identified and controlled to prevent unintended use or delivery. The non-conforming material or item shall be tagged and segregated by the construction contractor, when practical, from conforming material or items to preclude their inadvertent use. If segregation is impractical or impossible because of the physical characteristics of the item or other reasons, the non-conformance tag shall be displayed prominently to preclude inadvertent use. The Engineer is responsible for documenting the non-conformance in a NCR as specified in Section 6.3, Non-Conformance Report.

UNOPS will implement corrective actions to remedy work that is not in accordance with the drawings and specifications. The corrective actions will include removal and replacement of deficient work using methods approved by the UNOPS Project Manager. Removal shall be done in a manner that does not disturb work that meets Quality Control criteria; otherwise, the disturbed material shall also be removed and replaced. Replacement shall be done in accordance with the corresponding technical specifications. Replacement will be subjected to the same scope of Quality Control inspection and testing as the original

work. If the replacement work is not in accordance with the drawings and specifications, the replacement work will be removed, replaced, re inspected, and re-tested.

## **6.5 Preventive Actions**

Preventive actions are to be taken to eliminate the cause of a potential non-conformity. For example, defects that appear on the surface of concrete during construction or within a relatively short time after completion are usually caused by poor quality materials, improper mix design, lack of proper placing and curing procedures, or poor workmanship. UNOPS shall take preventive actions as necessary to eliminate the causes of potential deficiencies so as to prevent their occurrence. Contractor's Quality Control Plans are to include quality improvement practices to continually improve construction practices and address quality problems at their source. The QCMT and the Engineer are to monitor, inspect, and audit processes used to prevent erroneous information or construction products from being passed to the owner. The UNOPS PM and the Engineer have the authority to implement, verify and review the project's preventive and corrective action effectiveness. They are empowered to improve the project's work processes to eliminate the causes of potential non-conformities.

The Technical Specification Contractor Quality Program Requirements includes documentation and reporting requirements. Contractor's Quality Control documentation shall cover all aspects of Quality Control program activities, and includes Daily Inspection Reports and Daily Test Reports. After Quality Control Plan approval by the Project Manager, the contractors will document the Quality Control activities pursuant to the Quality Control Plan. Ongoing Quality Control oversight will be documented by the UNOPS Project Manager.

## **Section 7: Documentation**

### **7.1 Daily Record Keeping**

Project documents will be managed through a combination of a secure document filing and storage system and a computerized document tracking system. Sufficient records shall be prepared and maintained as work is performed to furnish documentary evidence of the quality of construction and laboratory analysis and of activities affecting quality. The Engineer or his assigned representative shall maintain a daily log of all inspections performed for both contractor and subcontractor operations. The Daily Inspection and Daily Test reports shall be signed by Engineer or delegated authority. The Engineer shall be provided at least one copy of each daily inspection and test report on the work day following the day of record.

### **7.2 Daily Construction Report**

A daily construction report will be prepared and signed by the UNOPS Project Manager or delegated authority. The report will include a summary of the contractor's daily construction activities. Supporting inspection data sheets will be attached to the daily report where needed. Example forms are provided in Appendix D.

At a minimum, the daily construction report will include the following information:

- a) Date, project name, location, and other identification
- b) Description of weather conditions, including temperature, cloud cover, and precipitation
- c) Reports on any meetings held and their results
- d) Record of visitors to site
- e) Locations of construction underway during that day
- f) Equipment and personnel working in each activity, including subcontractors
- g) Descriptions of work being inspected
- h) Decisions made regarding approval of units of material or of work, and corrective actions to be taken
- i) Description of problems or delays and resolution
- j) Communications with contractor staff
- k) Construction activities completed and/or in progress
- l) Progress photos, where applicable
- m) Signature of the report preparer

As described in Section 7.6, the daily construction reports will be routed on a daily basis to the project Quality Control files and will be maintained as part of the permanent project record. These reports are reviewed by the Project Manager, and also distributed to the Engineer.

### **7.3 Inspection and Testing Report Forms**

Report forms will be completed for inspections and tests conducted. The forms vary depending on inspection or test type. Representative forms for several types of inspection and testing reports are included in Appendix D. These forms include:

- a) Description or title of the inspection activity
- b) Location of the inspection activity or location from which the sample was obtained
- c) Recorded observation or test data
- d) Results of the inspection activity
- e) Personnel involved in the inspection activity

- f) Signature of the inspector

## **7.4 Record Drawings**

Contractors will submit draft record drawings to the UNOPS Project Manager for review and prepare final record drawings based on UNOPS Project Manager comments. The draft record drawings shall be submitted on one set of CD-ROM disks. Record drawings submitted on CD-ROM shall be the latest version of AutoCAD by AutoDesk Inc and in accordance with the UNOPS drawing convention/file management system. A copy of the final record drawings shall be submitted to Health and Safety file that will be handed over to the end user on project completion.

### **7.4.1 Responsibilities**

The Project Manager working with the contractor will be responsible for assuring that red-line record drawings are maintained daily throughout the construction process. These red-line record drawings will be used to update the design drawings to as-built status at the completion of the work.

### **7.4.2 Preparation of As-Built Drawings**

The contractor will be responsible for red-lining construction drawings in the field as preparation for as-built drawings. The as-built drawings will record approved actual field conditions upon completion of the work. The original design drawings will be marked up by the contractor as the project progresses to indicate as-built conditions. Where there was a change to a specified material, dimension, location, or other feature, the as-built drawing will indicate the work performed.

### **7.4.3 Review of As-Built Drawings**

Upon the completion of the as-built red-line drawings, the contractor will submit the red-line mark-up drawings to the QCMT for review. The Engineer will provide the mark-ups back to the contractor for correction. The contractor will then provide final as built drawings to QCMT who will forward them to UNOPS PM. Final as-built drawings shall be submitted to Health and Safety file that will be handed over to the end user on project completion.

## **7.5 Control of Quality Records**

The Engineer verifies Quality Control record accuracy and maintains copies of all quality-related documentation. This includes, but may not be limited to:

- a) Daily construction Quality Control logs and records;
- b) Inspection checklists and reports;
- c) Surveillance reports;
- d) Non-conformance reports;

- e) Material receiving reports; and
- f) Monitoring and test data.

These records will be stored in files maintained in the project document control files.

The Project Manager has primary responsibility for the centralized document control files for the project and construction documentation.

Pursuant to the contract specifications, the contractor provides an electronic or paper copy (suitable for scanning) of Quality Control documentation associated with the work to document control within three business days of the generation of such documents; and one electronic copy of all required submittals to the Project Manager. The Project Manager shall maintain a fire-resistant storage facility at the processing facility site. The facility shall contain all inspection reports, test records, contract documents, project, and daily field reports.

All records shall be available for inspection and audit, at any time, by the client or their designated representative.

## **Section 8: Field Revisions**

Field revisions for Quality Control will be limited to Quality Control Plan and Quality Control Plan changes. Changes to construction processes or design plans and specifications are governed by the contract and design change order procedures.

### **8.1 Quality Control Plan Revisions**

The Engineer or designee, Site Monitoring Engineers, may initiate revisions to this Quality Control Plan. The Quality Control Plan may be revised when it becomes apparent that the Quality Control Plan procedures or controls are inadequate to support work being produced in conformance with the specified quality requirements or are deemed to be more excessive than required to support work being produced in conformance with the specified quality requirements. Changes to Quality Control procedures necessitating modification to this Quality Control Plan will be initiated by the Engineer for Project Manager's approval. Updates to Quality Control Plan staffing will be made by UNOPS

### **8.2 Contractors Quality Plan Revisions**

The contractor's Quality Control Plan required by Technical Specification Contractor Quality Program Requirements may require revisions as necessary to correct unsatisfactory performance. At any time after approval by the Project Manager, the Engineer may require the contractor to make changes to the Quality Control Plan, including personnel changes, as necessary to obtain the quality specified. Moreover, the contractor may initiate Quality Control Plan changes to correct Quality Control process problems, and is required to notify the Project Manager in writing of any desired changes; all changes are subject to Project Manager's acceptance. Revisions to the Quality Control Plan will be provided to the Client upon request.

**Section 9: Final Reporting**

The following quality related documents will be generated during implementation of the PPS Program and will be submitted to the Health and Safety file that will be handed over to the end user on project completion.

**9.1 Work Completion Report:**

- Record (as-built) drawings;
- Operation and maintenance manuals; and
- Results of the Start-up and Testing Plan and the Commissioning Plan implemented for each major piece of equipment or system before system turnover, in accordance with Technical Specification Contractor Quality Program Requirements.