

Quality Control Plan

For

Project Name Title

Project Design Picture

(ENTER DATE)

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Glossary of Acronyms

AC	Assigned Certifier
CAD	Computer Aided Design
CGI	Corrugated Galvanized Iron
CMT	Contractor's Monitoring Team
CQA	Construction Quality Assurance
CQAP	Construction Quality Assurance Plan
CQCO	Construction Quality Control Officer
CQCP	Construction Quality Control Plan
CQP	Construction Quality Plan
CWN	CWN Project Management Limited
EPP	Environmental Protection Plan
GI	Galvanized Iron
HASP	Health and Safety Plan
Kg	Kilo gram
KN	Kilo Newton
kVA	Kilo-Volt-Ampere
M	Ministry of (to be defined)
MRI	Magnetic Resonance Imaging
NCR	Non-Conformance Report
O&M	Operation and Maintenance
PM	Project Manager
PSCS	Project Supervisor Construction Stage
PSDS	Project Supervisor Design Stage
PVC	Poly Vinyl Chloride
QA	Quality Assurance
QC	Quality Control
QCM	Quality Control Systems Manager
QCP	Quality Control Plan
QMP	Quality Management Plan
QMS	Quality Management System
RCC	Reinforced Cement Concrete
SME	Site Monitoring Engineer
SOW	Scope of Work

Section 1. Introduction

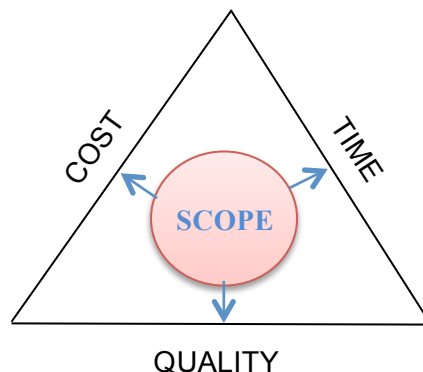
Quality Control is fundamental to the works and services undertaken by CWN Project Management Ltd (CWN) and shall be practiced by all personnel of the Organisation in their daily activities.

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

It shall be the responsibility of CWN 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 durations of works. It shall be the responsibility of the Assigned Certifier to constantly monitor the implementation of Quality Control Plan to establish and put into practice necessary systems and procedure, and ensure adherence to the Quality Control Plan through regular auditing.

1.1 Project Setting

CWN is responsible for supporting any project sponsors by providing professional engineering services, accountable project management, and quality construction management of below illustrated construction activities for the *(enter Authority Name, Project Title, Address)*. The period of performance of the Programme is from *(dd-mm-yyyy to dd-mm-yyyy)*



The above diagram represents a balanced triangle for the project. Any change to one of the constraints will affect the other constraints, which will require a re-balancing of all the constraints.

1.2 *(Authority)* Construction Plan

The current Construction Plan for *(Project Title)* is described below

1.2.1 Construction of buildings and provision of facilities:

1.2.1.1 Building for office spaces

- To be defined

1.2.1.2 External storage

To be defined.

1.2.1.3 External Electrical Work

To be defined.

1.2.1.4 Central Heating System including Boiler Plant

To be defined.

1.2.1.5 External Thermal Insulation Work

To be defined.

1.3 Quality Program Overview

Under the terms of the Cooperative Agreement with *(Name of Authority)*, CWN is responsible for Quality Control and the Design team for the Quality Assurance.

The Quality Control Plan details the systems and control that CWN has put in place so that the quality of the project will meet the requirement specified by the Cooperative Agreement. The Quality of *(Authority name – Project title)* project will be ensured through an integrated system of Quality Control performed by CWN and Quality Assurance provided by the Design Team. CWN is responsible for the day-to-day supervision and coordination of quality measures in the field.

This Quality Control Plan is a companion document to *(Authority name – Project title)* construction Plan and a required submittal under the terms of the Cooperative Agreement. Should there be any contradiction between the Cooperative Agreement and the Quality Control Plan, the Agreement shall prevail the Quality Control Plan establishes.

- Project procedures and general responsibilities for the quality control programme: and
- Protocols to ensure that the Construction Plan will be executed in accordance with the related requirements

The Prime Contractor will be responsible for the construction of work in accordance with the plans and specifications. CWN's Quality Control is the systematic implementation of a programme of inspections and production control to attain the required standards of quality and to preclude problems resulting from noncompliance.

Pursuant to CWN technical specification, Section 1.3 Contractor Quality programme requirements, each construction contractor will establish an independent QC programme in line with the CWN Quality Control Plan and write a Contractor Quality control Plan. The Contractor Quality Control Plan shall provide for test 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, CWN Engineer will provide Quality Control through periodic monitoring and scheduled inspections to verify the effectiveness of the Contractor's Quality Control programme 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 contract.

The objectives of this Quality Control Plan are to:

- Describe a quality programme 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

1.4 Quality Control

The role of CWN is to assure that the quality requirements of the (*Authority name – Project title*) project have been satisfied.

The CWN Quality Control Plan requires that CWN Quality Control team implement the programme and use its provisions *periodically* 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:

Quality Control personnel are described as to education, experience and capability.

Before start of construction, CWN PM & QCM shall conduct a mutual understanding meeting with the contractor and discuss the contractor's quality control system, the construction phase start date will be delayed until after the mutual understanding meeting and submittal/ acceptance of at least the interim contractor quality control plan. The contractor quality control plan will be viewed with a critical eye.

The CWN QCM will assure that the contractor Quality Control plan is sufficient to obtain quality of construction designed in the contract plans and specifications.

Quality assurance monitoring and confirmations quality, but quality control must provide it

1.4.1 Quality Control Plan Phasing

This Quality Control Plan will comprise the following 3 phases:

- **Preparatory phase meetings:** Quality Control meeting 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 inspections. If the Quality Control inspection 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 organisation and the craftsmen involved, thoroughly understand and is capable of accomplishing the work as specified.

- **Follow-up Inspections:** follow-up inspections. Also conducted by CWN and the contractor's quality control staff, occur *regularly* 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 6cm, it is unlikely that a load with 10cm or 12cm 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 CWN QCM has a vital role in assuring that these and similar situations do not occur. Responsibility for compliance shall not be left wholly to the contractor.

The CWN QCM shall closely monitor the contractor Quality Control programme 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.

1.4.2 Plans and Specifications

1. CWN QCM & AC will monitor the preparation of design documentation including plans and Specifications and will:
 - Watch for omissions;
 - Watch for discrepancies between plans and specifications;
 - Check plans and specifications against requirements of which problems occurred on similar jobs;
 - Compare elevations, grades and details shown on plans as existing, with those at the actual site; and
 - Report all errors, omissions, discrepancies, and deficiencies to the design office Manager and Project Manager

Always keep a posted and marked up set of plans and specifications convenient for ready reference.

Make sure that construction contractor has this same information.

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:
- Unusual requirements.
 - Those, which other contractors have overlooked.
 - Repetitive deficiencies.
 - Use the checklists in these guides to help find significant items in the plans and specifications.

1.4.3 Shop Drawings

CWN QCM & AC will utilise the following Quality Control checklist for shop drawings. The QCM & AC 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 checklist.
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 constructions.
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 drawings is clearly understood by the constructions contract requirements.
7. Ensure that the contractor makes note on his submittal of items that deviate from contract requirements.
8. Check materials 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 this expense.)

1.4.4 Pre- Constructions Meeting

The QCM, AC, Project Manager and Contractor representative shall attend this meeting, in addition to the (*Authority Name*) representative. Minutes of the meeting 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.

1.4.5 Equipment Proposal

CWN checklist for Claims:

1. Always be alert to possible claims or matters of possible dispute.

When it is discovered that a claim or dispute is in the making, the Project Manager shall be notified immediately. All facts are to be recorded in the quality control daily reports.

Make sure that adequate and accurate records of facts, materials, labour and equipment associated with the claim or dispute are on file.

Situations photographs may be appropriate to supplement the record.

Differing site conditions may be cause for claim- contractor shall notify Quality Control Manager in Writing before disturbing conditions.

1.4.6 Labour Enforcement

CWN checklist for labour enforcement:

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

1.4.7 Storage of Materials

CWN checklist for storage of materials:

1. Ensure that adequate space is available for the contractor's 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 materials and equipment's 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.

1.4.8 Contractor's Payment Estimates

CWN 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 in preparation of partial pay estimates.
 - Make timely measurements of work completed and work accomplished each pay period.
 - Keep orderly, neat and accurate records of measurements.
4. Checklist material on hand for which payment is being made for:
 - Fair market value of materials;
 - Conformance with contract requirements (see submittal)

- Proper storage and protection; and
 - 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.
- Make as accurate an estimate as possible of variations in quantities.
 - Report these variations in quantities promptly to the supervisor.

1.4.9 Rights of Way

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

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

1.4.10 Photographs

CWN checklist for Photographs:

- Multiple view of construction works during various stages of progress.
- Materials or construction related to changed conditions, claims, or potential
- Claims
- Work in place for which removal has been ordered because of noncompliance
- With plans and specifications
- Construction in which unusual difficulties have been overcome or where the
- Subject is of technical interest.
- Alternate methods of construction implemented by construction contractor(s).
- Property or material damages.
- Emergency conditions and safety violations.
- Accident scenes.
- Defective work.

CWN shall ensure that each picture taken is completely described, identified and dated.

CWN shall ensure that each photograph is properly stored as part of the project record.

1.4.11 Record Drawings

CWN checklist for record drawings:

1. The contractor's record drawings shall be reviewed monthly by CWN
2. Project and design office staff to ensure that they are correct
3. Ensure that as soon as a change or addition is made in construction it is noted on the record drawing
4. See that the following items are considered in the changes for Record
5. Drawings:

- Size, type, and location of existing and new utility lines
- Layout and schematic drawings of electrical circuits and piping
- Dimensions and details transferred from shop drawings.
- Verification of alignment, cross section, and layout of earthwork
- Actual locations of anchors, construction and control joints. Etc. in concrete
- Where they are different from those shown on contract drawings
- Changes in location of equipment and architectural features
- Cross out such words, phrases and details for optional or equal requirements and list or detail specifically the items provided.

1.5 Quality Management Plan

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

1.6 Organisation of CWN Quality Control Plan

This Quality Control Plan is organised into eleven sections.

- **Section 1-** Introduction: Describes the project setting, the contract and related documents, and the Quality Control Plan overview
- **Section 2-** Project Quality Control Organisation: Presents the organisation and key personnel involved in the construction of the (*Authority Name, Project Title*), their responsibilities and authorities, the structure of the Quality Control organisation and the minimum training and experience of the Quality Control officer and personnel,
- **Section 3-** Submittals: presents the procedures for processing submittal 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 secure documents filing and storage system.
- **Section 8-** Approvals: describe approvals.
- **Section 9-** Field Changes: describe handling of quality plan changes to assure Quality Control objective are met.
- **Section 10-** Final Reporting: Describe the Quality Control documentation and submittal of Certificate of compliance to the Building Control Authority.
- **Section 11-** References: Provides bibliographic references to key document referred to in the body of the plan.

Section 2. Project Quality Control Organisation

This section presents the responsibilities and authorities of organisations and key personnel involved in the construction of the *(Authority Name, Project Title)*, the structure of the Quality Control organisation, the minimum training and experience of the Quality Control Personnel and the Quality Control training given to all onsite works.

2.1 Responsibilities and Authorities of Organisations ---

The organisations involved in the new *(Project Title)* project and their Quality Control roles and responsibilities are as follows.

2.1.1 CWN ---

CWN is responsible for implementing the *(Authority's name)* project plan and for maintaining Quality Control including ensuring that contractors and subcontractors perform construction in accordance with the contract documents, specifications and related documents.

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

CWN Project Manager provides professional construction project management and related services in connection with the project. The Project Manager is responsible for the implementation of this Quality Control Plan. The Project Manager will manage construction contractors on behalf of CWN and serve as the primary point of contact with the contractors for all communications to and from the contractors. The Project Manager 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. The Project Manager will also manage, coordinate, and administer all Quality Control activities and requirements, including subcontractors.

2.1.2 Design Team Quality Control Assurance ---

The Design Team is responsible for Quality Assurance, which they provide through the services. The purpose and goals of Quality Assurance services 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 CWN Quality Control Plan is being satisfactorily followed on site by the appointed contractors.

2.1.3 Constructions Contractors. ---

The construction contractors are retained by *(Authority's name)* / CWN to provide the labour, materials and equipment required to construct the project in accordance with the contract documents.

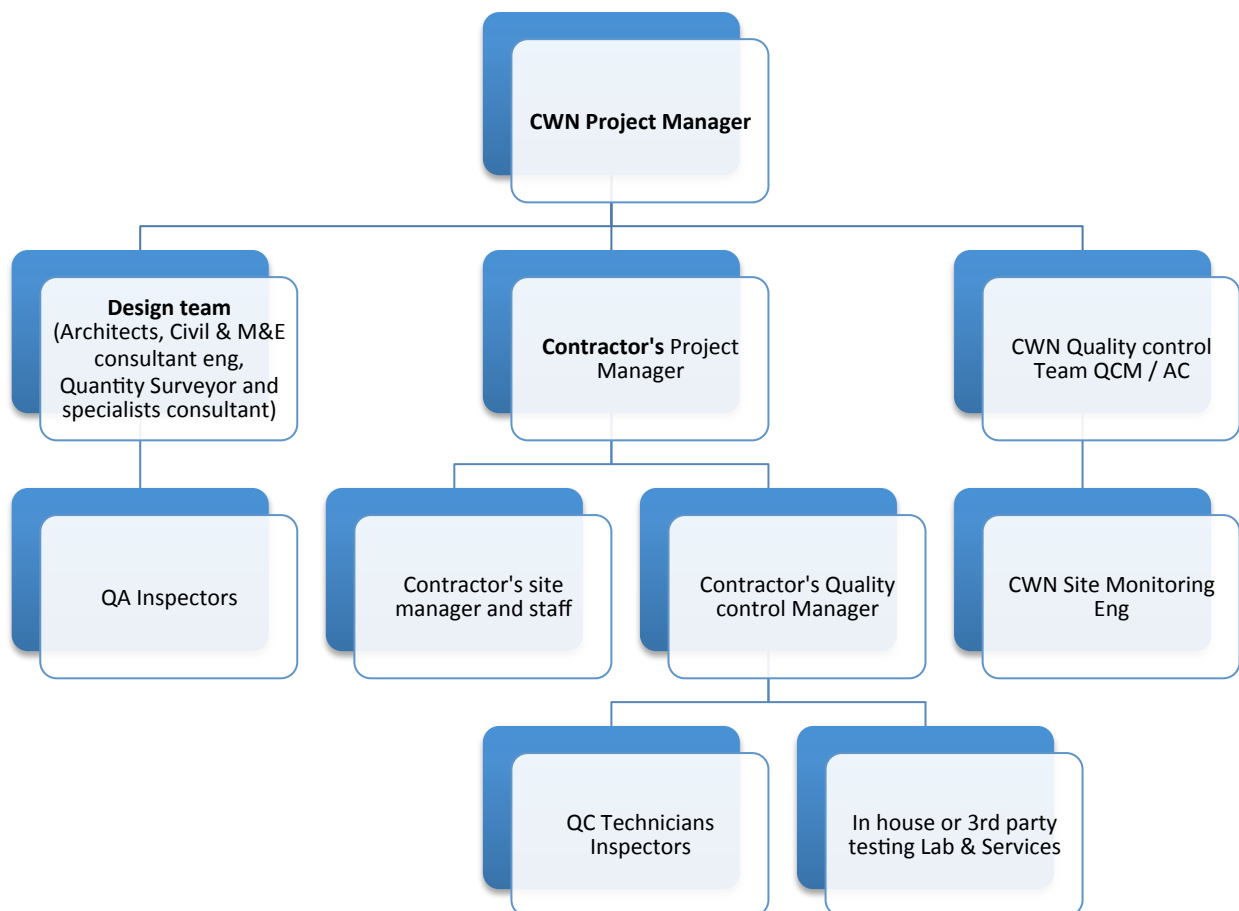
Construction contractors are responsible for the quality control of their constructed work product as well as the necessary inspections and tests required to ensure that their work complies with the contract documents. They exercise authority over their workforce, including Quality Control personnel and their third-party Quality Control support services. Pursuant to CWN Technical Specification sections 1.3 Contractor Quality Programme Requirements each contractor will submit a Quality Control organisation 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 (*Authority's name*) / CWN. The requirements for the Quality Control organisation 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 Organisation

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

Figure 2-1 Quality Control Organisation



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 *(Authority's name)* 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 CWN Project Manager will maintain Quality Control Staffing List of personnel assignments including the description of each position, along with information on the responsible organisation. When personnel changes occur, CWN PM will revise the Quality Control Staffing List accordingly.

2.3.1 CWN 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 the *(Authority's name)*, including the following details for each personnel: name, main responsibilities, qualifications and years of work experience in the same field.

A. CWN Project Manager

CWN Project Manager is the primary point of contact for *(Authority's name)* on all construction management issues. The Project Manager is responsible for the overall management of activities related to the construction programme, including the implementation of the Quality Control Plan and the health and safety programme. 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. CWN Site Monitoring Engineer

CWN Site Monitoring Engineers manage the field implementation of the Quality Control Plan at the project sites under control of Quality Control Manager. CWN Site Monitoring 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, CWN Site Monitoring Engineers 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.

CWN Site Monitoring Engineers 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 site manager, and/or other representative. CWN Site Monitoring Engineers 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. CWN Quality Control Manager (Assigned Certifier)

The CWN Quality Control Manager is consultant engaged by CWN. The Quality Control Manager shall have a minimum of five years' experience in related construction and prior Quality Control experience on a project of comparable size and scope to this project. Additional qualifications for the Quality Control Manager include one or more of the following requirements:

- Three years of related experience acceptable to CWN with a Bachelor of Science Degree in civil engineering, civil engineering technology, or construction and is a registered Chartered Engineer.
- The Quality Control Manager reports directly to the Project Manager. The Quality Control Manager will have full authority delegated by the Engineer and CWN 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 Quality Control Manager is assigned to the programme full time.
- The Quality Control Manager works with 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 Quality Control Manager coordinates oversees the CWN Site Monitoring Engineers 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 Quality Control Manager tracks and reports non-conformances to the Project Manager. The Quality Control Manager also has full authority to obtain direct access to contractor Quality Control files.

Other Quality Control Manager responsibilities include;

- Reviewing contractor Quality Control reports, tests, and inspection results;
- Facilitating the implementation of the four-phase inspection programme and participating in the required inspections; and
- Ensuring that Quality Control personnel conducting inspections, including CWN Site Monitoring Engineers, 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 CWN, including the following details for each personnel: name, main responsibilities, qualifications and years of work experience in the same field.

A. Contractor's Quality Control Manager

The Contractor Quality Control Manager is a full-time employee of the contractor, or a consultant engaged by the contractor. The Quality Control 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 Manager will have full authority to institute any and all actions necessary for the successful implementation of the Quality Control programme to ensure compliance with the contract plans and technical specifications. The Quality Control Manager shall report directly to a

responsible officer of the construction contractor. The Quality Control Manager is assigned to this project full time.

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 Engineer's approval.

Section 3. Submittals

This section describes the procedures for submittals. The Project Manager shall administer, control, and process submittals from the construction contractor(s). CWN 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 log report, which will be signed, dated and recorded. If required, CWN 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 CWN review shall be recorded and available for review.

3.1 Submittal Schedule

The construction contractor will prepare and submit a submittal schedule to CWN Project Manager. The schedule will be initially submitted within 14 days after the award of the contract and updated on a monthly basis. The Project Manager shall work with the contractor to prioritise 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 CWN for resource availability planning.

3.2 Process, Review and Acceptance

Submittals will be managed as follows:

- 1) Contractors will number and certify the completeness of all submittals before submitting to CWN;
- 2) Contractors shall also complete submittal transmittal forms and submit six paper copies and one electronic copy of all required submittals to CWN Project Manager;
- 3) Upon receiving the submittal, the Project Manager 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.
- 4) The original submittal transmittal and all copied attachments will be logged into the document tracking system.
- 5) The Project Manager 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.
- 6) CWN will return a copy of the submittal to the contractor with an original stamp of the action required.
- 7) The six actions that may be taken for each submittal which are;
 - i. Approved – Submittal meets contract requirements. No additional copies will be required of the contractor.
 - ii. 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

- iii. 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.
 - iv. 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.
 - v. For Information Only – Submitted for information only; no response action required.
 - vi. Received, No Action Taken – Receipt of submittal is noted; no further action required.
- 8) 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 CWN submittal process will then be repeated.

The Project Manager 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 Project Manager 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 Project Manager 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 Project Manager will maintain all submittal files via a secure document filing and storage system. All submittal records will be provided to *(Authority's name)* as part of the project closeout documentation.

Section 4. Performance Monitoring Requirements

The performance monitoring requirements are applicable to the (*Authority Name, Project Title*) project. CWN Technical Specifications impose these requirements upon the contractors and require specific plans for contractor compliance and related work-area monitoring. The Project Manager will perform Quality Control oversight of contractor compliance and related work-area monitoring pursuant to the submitted plans.

4.1 Environmental Protection Plan

Environmental Protection Plan (EPP) outlines the steps that contractor will follow to minimize any adverse impact upon the environment in accordance with client requirements for the implementation of this project to realise that there are threats to the environment from the project operations that must be eliminated or minimised. It is the contractor intention to spare no effort to prevent environmental pollution during and as a result of construction operations under this contract. Contractor will comply with all local, regional or Irish government laws, rules, regulations or standards concerning environmental pollution control, abatement and all applicable provisions of the Safety, Health and Welfare construction regulations 2013 issued by the Health and Safety Authority and elsewhere in the contract specifications.

Contractor will respond immediately to all inquiries and / or notifications made by any of the Irish authorities or by the Client representatives. This plan is focused on environmental pollution due to the presence of chemical, physical, or biological elements, which can adversely affect human health or welfare. The control of environmental pollution requires direct attention to wildlife, air, water, and land resources and includes the management of visual aesthetics; noise, solid, chemical, and liquid waste; radiant energy; and other pollutants.

Clauses have been written into the Contract Documents for the construction to ensure that the Contractor is aware of their responsibilities. A summary of contractual obligations imposed on the contractor is presented in contract document, the contract clause ensure that the Contractor adopt appropriate practices with respect to the following;

- Environmental protection,
- Minimising negative impacts on local communities, and,
- Securing the Health, Safety and Welfare of the workforce

This Quality Assurance Plan identifies the responsibility of the Contractor in the implementation of environmental and social protection measures. It also reviews the key activities that require monitoring during the construction stages and summarises the measures that may need to be implemented to ensure environmental and social protection.

Typically potential negative impacts associated with construction activities can be eliminated or minimised by good engineering practices including consultation with affected parties and thoughtful planning.

4.1.1 Contractor's Responsibilities

The Contractor shall be responsible for implementing environmentally and socially sound execution of the works (temporary and permanent) associated with the new build of the Horizontal and vertical structure projects.

In particular, when providing facilities and carrying out construction activities, the Contractor must ensure the following;

- Implement all environmental and social protection/mitigation activities as specified in the contract documents.
- Safeguard all workers from any hazards associated with the construction activities and ensure protection of their Health and Safety.
- Ensure protection of the Health, Safety and Welfare of project side communities by minimising nuisance (including traffic disruption and pollution), friction and by establishing effective channels of communications.
- Observe the National Environmental Laws and other existing regulations of Ireland.
- Liaise with statutory undertakers for smooth and efficient operation and completion of projects.

4.1.2 Contract Conditions for Compliance

There are various provisions for environmental and social protection embodied within the Contract Documents both in Contract Conditions, and Technical Specification, the Contract documents which the lead persons in the Quality Assurance Team are responsible for imparting to their subordinates.

4.1.3 Duties and Responsibilities of the Contractor's Monitoring Team

The Head of the Contractor's Monitoring Team (CMT) and his support staff will carry day-to-day monitoring of social and environmental protection measures.

Based on the field observations, environmental compliance sheets will be prepared by the Head through the Project Manager for submission to the CWN QA/QC. Photographic reports will, as practical as possible, be used to support such reports.

Any non-compliance with the environmental and social protection measures that is observed shall be immediately reported and then monitored until further corrective actions have been carried out and completed.

4.1.4 Key Activities for Monitoring During Construction

The core issues that will be subject to environmental and social protection monitoring during construction are as follows;

- Site compound and Workshops
- Effluent and solid waste disposal
- General road safety management particularly with respect to diversions, construction through settlements, construction traffic and maintenance of existing road surfaces.
- Health, safety and welfare of the workforce
- Community relations and mitigation of social tensions
- Impact levels of nuisance such as dust and noise.

Monitoring for compliance shall be a day-to-day affair carried out by all Contractor's concerned personnel and staff.

4.1.4.1 Construction Compound, Workshops and Associated Facilities

Through covering a relatively small area, the Contractor's compound can, if not controlled, cause significant environmental damage for a considerable time. The major causes are pollution due to all forms of waste, spillage of oils and fuel, land take, dust and noise of construction traffic. The following aspects shall be strictly complied;

- Safety and security of personnel
- Separate storage and security of flammable (gas, fuel, etc.), materials and poisonous materials.
- Safety in relation to transportation
 - Project vehicles shall be maintained properly
 - Experienced drivers shall be employed
 - Access roads to be kept free from mud and dust, proper drainage measures to be constructed, maintenance of footpath accesses to building

Health and sanitation in compound

- Provision of health and first aid facilities
- Prevention of fire hazards
- Used of non-wood fuel

4.1.4.2 Road and Road Detours

Roads to be constructed in half-widths to limit the number of detours

- All diversions to be constructed shall have the prior approval by the Engineer.
- Keep the detours as close as possible to the road line.
- Planning shall be undertaken to reduce the length of detours in operations during monsoon season.

4.1.4.3 Health and Safety Provisions

The Contractor shall maintain undertake adequate measures to mitigate the health and safety risks to the workforce.

- The activities of the works shall be performed with minimal hindrance to the local community.
- The contractor shall be taken safety measures for its personnel and workers
- The contractor shall comply with the local community standards for the prevention of pollution generated by the execution of the works.

4.1.4.4 Construction Traffic

- Experience and reliable drivers shall be employed
- Drivers are to be regularly briefed on the job and associated hazards
- Imposed maximum limits of speed within settlements
- Damaged pavements/structures to be repaired promptly

4.1.4.5 Work Activities and Safety

The following shall be ensured during normal work activities;

- Safety and workers from hazards, including handling of materials and exposure to inclement weather (rain, flooding, heat) and dangerous traffic conditions.
- Stability of embankment and prevent fill materials escaping beyond embankment slope.
- Careful stripping of topsoil and storage for after use at suitable location.
- Salvage/storage of usable materials
- Disposal of unsuitable materials to locations approved for the purpose.

4.1.4.6 Avoidance of Pollution from Spillage and Waste Material Disposal

Under the conditions of the contract, the Contractor shall be responsible for disposal of unusable materials and wastes. The following measures shall be taken to ensure compliance;

- Earth mounds shall be provided to contain leakage of oil, fuel, bitumen and traps for grease at vehicle/plant washing facilities and at servicing and fuelling areas.
- Cleaning up of any environmental pollution and compensation for damages at his own cost
- Prevention of spillage and leakage of materials with potential to pollute water resources.

4.1.4.7 Air and Noise Pollution

- Plant and machinery shall be well maintained at all times and use filters/covers to trap dust.
- Dust emissions from asphalt plant shall be minimised and mixing plant dryer shall be equipped with a dust collector.
- Regular spraying of water to control soil dust over access roads and diversions

4.1.4.8 Mitigation of Social Tensions

- Potential conflicts with local population most commonly arise on construction project and mitigation measures shall be taken to help prevent the conflict, as follows;
- Employment of local labour
- Reasonable precautions shall be taken to reduce impacts on adjoining communities of dusts and nuisances.

4.2 Reporting

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

4.2.1 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 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.

4.2.2 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 slowdowns 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 Quality Control Manager 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 Project Manager will review and approve these plans as part of the contractor Quality Control Plan submittals.

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

On going Quality Control monitoring and oversight of contractor Quality Control inspections and testing will be performed by CWN Project Manager. In this manner, the inspections and tests required measuring 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 Quality Control Manager based on results of Quality Control tests, evaluation of daily reports, audits of the Quality Control program and verification testing conducted by CWN and the contractor's in-house or third party testing firm. Should information become available that indicates a potential problem, the Quality Control Manager 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 Section 1.3 and the relevant design specification. Appendices A, B, and C provide supporting detail to the inspection and testing plan applicable to the SFPA new Port Office building and storages project. Further discussion follows the example. [Note: the example below and Appendices A, B, C are for illustration only and are not intended to replace or modify contract specifications that will form the basis of actual Quality Control Plan submittals.

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. The contractor will send test samples to a Testing Laboratory approved in advance by CWN. The Testing Laboratory will report all test results for determination of material meeting the acceptance criteria. The contractor on the site will perform soils, sampling and analysis borrow material source. The Quality Control Manager or Design Team members will periodically inspect material being used. If determined that the characteristics of the material being used differ from the material initially tested, the Quality Control Manager 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 of Record, 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 programme 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. The contractor as required by Technical Specification Contractor Quality Programme Requirements Section 1.3 shall document all inspections

The below checklists will be used during inspection.

- **Checklists:** Please see the attached checklist.
- **Inspection Programme:** A four-phase inspection programme shall be followed for each definable feature of the work.

The four phases of inspection are:

1. **Preparatory Inspection:** The contractor and CWN 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 Programme Requirements Section 1.3
2. **Initial Inspection:** The contractor and CWN 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 Programme Requirements Specification Section 1.3
3. **Follow-up Inspection:** The contractor and CWN 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) CWN 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 CWN perform a completion inspection of the work.
- a) Develop a “snag list” of items that do not conform to the approved plans and specifications.
 - b) Include the snag list in the construction Quality Control documentation.
 - c) Technical Specification Contractor Quality Programme Requirements, Section 1.3, 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 contractor has notified the Engineer.

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 programme described above will be ordered or performed by CWN to verify compliance with building code and standards. These inspections shall be performed and conducted at various points of the construction process that would typically require code compliance inspections.

When deficiencies are discovered during the four-phase or other inspection processes, the Quality Control Manager shall consider focused inspection. 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 Quality Control Manager will assure deficiency correction is implemented, as discussed in Section 6.

Representatives of *(Authority’s Name)* and/or its Design Team shall be allowed to participate in any and all inspections as observers. CWN will provide an inspection schedule to the *(Authority’s Name)* and/or its Design Team to facilitate observation of the material submittal process.

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 CWN 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

CWN 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

CWN 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 Quality Control Manager (or designee) shall ensure that the non-conforming material, work, or installation is identified and controlled to prevent unintended use or delivery. CWN 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 CWN. 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 CWN. 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 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, Project Manager, and to the *(Authority's Name)*.

The Quality Control Manager shall follow up on the Non-conformance report as required to verify that corrective action has been completed. CWN 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 non-conformance 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 Quality Control Manager will assure deficiency correction is implemented.

The Quality Control Manager 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 Quality Control Manager is responsible for documenting the non-conformance in a NCR as specified in Section 6.3, Non-Conformance Report.

CWN 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 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. CWN 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 Project Manager and Quality Control Manager are to monitor, inspect, and audit processes used to prevent erroneous information or construction products from being passed to the owner. The Project Manager and Quality Control Manager 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 Programme Requirements Section 1.3 includes documentation and reporting requirements. Contractor's Quality Control documentation shall cover all aspects of Quality Control programme 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. On going Quality Control oversight will be documented by the Project Manager.

Section 7. Documentation

7.1 Daily Record Keeping

Project documents will be managed through a document filing and storage 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. CWN QCM / AC 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 Quality Control Manager or delegated authority. The Project Manager shall be provided at least one copy of each daily inspection and test report on the following the day of the record.

7.2 Daily Construction Report

A daily construction report will be prepared and signed by the 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 Quality Control Manager.

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 Design Team for review and prepare final record drawings based on the Design Team 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. A copy of the final record drawings shall be submitted to *(Authority's Name)*/CWN.

7.4.1 Responsibilities

The Project Manager working with the contractor will be responsible for assuring that record drawings are maintained daily throughout the construction process. These record drawings will be used to update the construction 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 recording 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 contractor will mark up the original construction drawings 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 drawings, the contractor will submit the mark-up drawings to the Project Manager for review. The Project Manager will provide the mark-ups to the Design Team who will incorporate the mark-ups and issue the final as-built drawings to the Project Manager. Final as-built drawings shall be provided to the *(Authority's Name)* and the local Building control Authority.

7.5 Control of Quality Records

The Quality Control Manager 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 centralised 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 *(Authority's Name)* and the local building control Authority and Health & Safety Authority.

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 Project Manager, Site Monitoring Engineers, or Quality Control Manager 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 Quality Control Manager for the Project Manager's and *(Authority's Name)* approval. Updates to Quality Control Plan staffing will be made by CWN notification to the *(Authority's Name)* as described in Section 2.3 without submission of a fully revised Quality Control Plan.

8.2 Contractors Quality Plan Revisions

The contractor's Quality Control Plan required by Technical Specification Contractor Quality Programme Requirements Section 1.3 may require revisions as necessary to correct unsatisfactory performance. At any time after approval by the Project Manager, the Project Manager 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 *(Authority's Name)* for information only.

Section 9. Final Reporting

The following quality related documents will be generated during implementation of the *(Authority Name, Project Title)* and will be submitted to the Building Control Authority and to the *(Authority's Name)*.

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 Section 1.3 Contractor Quality Program Requirements.
- Certificate of compliances:
- Record of calculations, specifications and particulars.

Section 10. Appendices

Appendix A: Sample Qualification Test Schedules

Table A-1: Example Qualification Test Schedule

Site preparation Materials			
Test Parameter	Test Method	Minimum QC Testing Frequency by Contractor	Acceptance Criteria (Verified by QA)
Soil Classification	TGD C	1 per 1,000 m3 and source change	In accordance with section 1
Radon	TGD C		In accordance with Section 2
Pyrate		1 per 1,000 m3 and source change	In accordance with Section
Moisture Content	TGD C	1 per 1,000 m3 and source change	In accordance with Section 3

Notes:

1. Note: this table is for illustration only and is not intended to replace or modify contract specifications that will form the basis of actual CQP submittals

Table A-2: Example of Qualification Test Schedule

Aggregate Materials			
Test Parameter	Test Method	Minimum QC Testing Frequency by Contractor	Acceptance Criteria (verified by QA)
<i>Coarse Aggregate</i>			
Grain-Size Distribution			
Moisture Content			
Compaction Characteristics			
<i>Fine Aggregate</i>			
Grain-Size Distribution			
Moisture Content			
Compaction Characteristics			

Note: this table is for illustration only and is not intended to replace or modify contract specifications that will form the basis of actual CQP submittals

Table A-3: Example Qualification Test Schedule

Stone Aggregate Materials			
Test Parameter	Test Method	Minimum QC Testing Frequency by Contractor	Acceptance Criteria (verified by QA)
Sieve Analysis			
Organic Impurities			
Soundness			
Abrasion			
Deleterious Materials			
Material Finer 200 Sieve			
Alkali Reactivity			
Cleanliness and Equivalent Sand			

Note: this table is for illustration only and is not intended to replace or modify contract specifications that will form the basis of actual CQP submittals

Table A-4: Qualification Test Schedule

Concrete Mix			
Test Parameter	Test Method	Minimum QC Testing Frequency By Contractor	Acceptance Criteria (verified by QA)
Compressive Strength			
Water/Cement Ratio			
Slump Test			

Notes

Preliminary testing of the mix design will be performed by Construction Contractor's Independent Testing Laboratory (Third Party lab services).

This table is for illustration only and is not intended to replace or modify contract specifications that will form the basis of actual CQP submittals

Appendix B: Sample Inspection Schedules

Table B-1: EXAMPLE INSPECTION SCHEDULE

ON SITE BORROW MATERIALS PLACEMENT

Inspection Parameter	Minimum QC Inspection Frequency by Contractor	Acceptance Criteria (verified by QA)
Soil Texture and Colour	Continuous	Similar to approved material
Presence of Foreign Objects and Materials	Continuous	Free of visible contamination, organic Material, rubbish, debris, and other Unsatisfactory materials
Maximum Clod Size	Continuous	No fragments larger than 3 - inch that will not breakdown under hand compression.
Equipment Size and Type	Daily	In accordance with approved Work Plan
Method of Placement	Daily	In accordance with approved Work Plan
Lift Thickness for Earthen Berm	1 per lift	First lift 12-inch max. loose, subsequent lifts 8-inch max. loose, final lift 4-inch max loose, hand placed lifts 3-inch max. loose
Lift Thickness for all other applications	1 per lift	Max. 8-inch loose per lift

Note: this table is for illustration only and is not intended to replace or modify contract specifications that will form the basis of actual CQP submittals

Table B-2: EXAMPLE OF INSPECTION SCHEDULE

AGGREGATE PLACEMENT		
Inspection Parameter	Minimum QC Inspection Frequency by Contractor	Acceptance Criteria (verified by QA)
Coarse Aggregate		
Material Characteristic	Continuous	NYSDOT Type 2, may include up to 50% of reclaimed materials
Maximum Size	Continuous	1 ~- inch
Equipment Size and Type	Daily	In accordance with approved Work Plan
Method of Placement	Daily	In accordance with approved Work Plan
Lift Thickness	1 per lift	8-inch loose per lift
Fine Aggregate		
Material Characteristic	Continuous	NYSDOT Type 2, may include up to 50% of reclaimed materials
Maximum Size	Continuous	%-inch
Equipment Size and Type	Daily	In accordance with approved Work Plan
Method of Aggregate Placement	Daily	In accordance with approved Work Plan
Lift Thickness	1 per lift	Min. 8-inch loose per lift

Note: this table is for illustration only and is not intended to replace or modify contract specifications that will form the basis of actual CQP submittals

Table B-3: EXAMPLE OF INSPECTION SCHEDULE
REINFORCING, FORMWORK AND CAST - IN - PLACE CONCRETE

Inspection Parameter	Minimum QC Inspection Frequency by Contractor	Acceptance Criteria (verified by QA)
Reinforcing Material Condition	Upon receipt at Site	No visible defects or damage, no unscheduled kinks or bends
Reinforcing Bundle Identification	Upon receipt at Site	Bundled and tagged with information as specified in Section 03200
Reinforcing Material Storage	Daily	In accordance with Manufacturer's recommendations & approved Work Plan
In-Place Reinforcing	Prior to closing forms and continuous during pouring	In accordance with approved Work Plan, free of old mortar, oils, mill scale and other encrustations or coatings
In-Place Formwork	Prior to pouring of concrete	In accordance with approved Work Plan; no excess water, hardened concrete, debris or foreign materials inside of forms, wet wood forms sufficiently to tighten up cracks
Concrete Truck	Upon arrival at Site	Load accompanied by weightmaster bonded certificate, water container full, water added to concrete mixture in accordance with Section 03301
Subgrade Preparation	Prior to pouring of concrete	Fine grade earth and aggregate smooth and level
Concrete Placement	Continuous during Pouring of concrete	In accordance with approved Work Plan, height of concrete drop not to exceed 5 feet, place and compact within 60 minutes after water is first added, do not place after evidence of initial set
Equipment Size and Type	Continuous during Pouring of concrete	In accordance with approved Work Plan
Concrete Lift Thickness	Continuous during Pouring of concrete	Max. 18 inches per lift in continuous approximately horizontal layers
Maximum Deviation	Continuous during compaction of concrete	1/4-inch from 10-foot straightedge for exposed finishes, no low spots to impound water
Formed Concrete Curing	Daily during curing of concrete	Forms maintained in wet condition until removed, concrete continuously moist for min of 7 days after pouring
Formed Concrete Finishing	After finishing of concrete	Fill holes and patch surfaces in accordance with Section 03301
Slabs and Flatwork Curing	Daily during curing of concrete	Concrete continuously wet for entire curing period

Note: this table is for illustration only and is not intended to replace or modify contract specifications that will form the basis of actual CQP submittals

Appendix C: Sample test Schedules

Table C-1: EXAMPLE OF TESTING SCHEDULE

ON SITE BORROW MATERIAL PLACEMENT			
Test Parameter	Test Method	Minimum QC Testing Frequency	Acceptance Criteria
Compaction for Earthen Berm			
Compaction for all other applications			
In-Place Density			
In-Place Moisture Content			

Note: this table is for illustration only and is not intended to replace or modify contract specifications that will form the basis of actual CQP submittals

Table C-2: EXAMPLE TESTING SCHEDULE
AGGREGATE MATERIAL PLACEMENT

Test Parameter	Test Method	Minimum QC Testing Frequency	Acceptance Criteria
Coarse Aggregate			
Compaction			
In-Place Density			
In-Place Moisture Content			
Fine Aggregate			
Compaction			
In-Place Density			
In-Place Moisture Content			

Note: this table is for illustration only and is not intended to replace or modify contract specifications that will form the basis of actual CQP submittals

Table C-3: EXAMPLE TESTING

SCHEDULE CONCRETE			
Test Parameter	Test Method	Minimum QC Testing Frequency	Acceptance Criteria
Compressive Strength		1 per X CM or fraction thereof from each day's placing; test at 7 and 28 days	
Air Content		When compression test cylinders are cast	
Slump Test		When compression test cylinders are cast	

Note: this table is for illustration only and is not intended to replace or modify contract specifications that will form the basis of actual CQP submittals

Appendix D: Typical Construction forms

The format, layout, content and method used to fill out the forms will be reviewed periodically during the course of construction and modified as required to ensure that the necessary information required for management of the construction contracts and controlling the progress and quality of the work is being obtained.

Concrete Compressive Strength Test Report											
(CYLINDRICAL-CUBE)									DATE : NUMBER :		
CLASS OF CONCRETE :						CRUSHING DATE OF SAMPLES					
MOULD: MM. CUBE- CYLINDER											
STRENGTH - CURE			AGE 3 DAYS IF REQUIRED			AGE 7 DAYS			AGE 28 DAYS		
ITEM NU.	SAMPL E NU.	PLACE & TYPE OF STRUCTURE	WEIGHT (g)	STRENGTH		WEIGHT (g)	STRENGTH		WEIGHT (g)	STRENGTH	
				KN	kg / cm2		KN	kg / cm2		KN	kg / cm2
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
SPECIFICATION :											
REMARKS:											

CONCRETE INSPECTION AND TESTING PLAN						
SUBJECT	INS / TEST	ACTION	QUALITY CONTROL DOC.	VERIFICATION LOG	REQ. OF MONITORING	COMMENTS
Controls before Concreting						
1	REINFORCEMENT: Compliance with Specs & Drwg., Rust Clearance – cleaning of elevation & axis	Quality Control / Project Manager	Drawings Specifications	Reports, certificates Control list before concreting		
2	CONCRETE Premixed Concrete	Quality Control	Specifications	Water, material, additive reports Concrete mix & cement reports		
3	FORMWORK Elevation axes, Formwork Grease, Cleaning	Project Managers	Construction Drawings Specifications	Control list before concreting		
4	OTHERS Location of embedded elements Water Retainers, Anchorage	Site Engineers	Construction Drawings Specifications	Control list before concreting		
Concreting						
5	Permeability Test, Taking Concrete Samples, Slump, Cubes, Temperature of the Medium, Concrete Temperature	Quality control		Test Results Recording		All the recording of a conc. work is filed all together. (control list conc, air temp. cube resistance results etc.)

6	Concreting Location Controls	Site Engineers		A Nonconformance report is issued if needed.		The Site Eng. should be present to see to it that concreting complies
7	Compacting Control	Site Engineers		A nonconformance report is issued if needed.		The Site Eng should attend Compacting
After Concreting						
8	Controlling Curing	Site Engineers		A nonconformance report is issued if needed.		
9	Topographic Controls After Concreting	Site Engineers	Turkish Standards Drawings	A nonconformance report is issued if needed.	Should contain the corrective actions suggested to correct the faults determined after concreting & also the	Segregation, air particles opening the formwork etc.
10	Fault Areas and Fixing	Site Engineers		A nonconformance report is issued if needed.	information stating that these actions are finalized as required. (If necessary these records should include the repeated test)	Segregation, air particles opening the formwork etc. Segregasyon, Hava Kabarcığı,
11	Controlling the Concrete Equipment	Site Engineers				

PRE-CONCRETING INSPECTION FORM									
Explanation :					Related Drawings :				
Formwork Check		Reinforcement Check		Surveying Check		Mechanical Check		Elektrical Check	
Supports	<input type="checkbox"/>	Size	<input type="checkbox"/>	Lining	<input type="checkbox"/>	Embedments	<input type="checkbox"/>	Embedments	<input type="checkbox"/>
Ties	<input type="checkbox"/>	Spacing	<input type="checkbox"/>	Level	<input type="checkbox"/>	Blockouts	<input type="checkbox"/>	Blockouts	<input type="checkbox"/>
Waterstops	<input type="checkbox"/>	Laps	<input type="checkbox"/>	Position	<input type="checkbox"/>	Notes		Notes	
Joint Prepare	<input type="checkbox"/>	Concrete Cover	<input type="checkbox"/>	Sketch	<input type="checkbox"/>				
Cleanliness	<input type="checkbox"/>	Cleanliness	<input type="checkbox"/>						
Form oil	<input type="checkbox"/>	Quantity	<input type="checkbox"/>						
Embedments	<input type="checkbox"/>								
Blockouts	<input type="checkbox"/>								
Contractor		Contractor		Contractor		Contractor		Contractor	
Name		Name		Name		Name		Name	
Date		Date		Date		Date		Date	
Sign		Sign		Sign		Sign		Sign	
Responsible Engineer		Responsible Engineer		Responsible Engineer		Responsible Engineer		Responsible Engineer	
Name		Name		Name		Name		Name	
Date		Date		Date		Date		Date	
Sign		Sign		Sign		Sign		Sign	
Permission Given to Pour									

Employer's Representative

Name :

Date :

Sign :

Date of Concreting

Type of Concrete

Slump

Site Manager

Notes :

Controls after formwork striking	Curing	<input type="checkbox"/>	Employer's Representative	Quality Manager	Control
	Line	<input type="checkbox"/>			
	Level	<input type="checkbox"/>	Name :	Name :	
	Position	<input type="checkbox"/>	Date :	Date :	
	Repairs	<input type="checkbox"/>	Sign :	Sign :	

EARTHWORKS CHECK SHEET		
STRUCTURE :		
PLACE :		
BACKFILL :		
ITEM	RESPONSIBLE	COMMENT
SETTING OUT		
TYPE OF MATERIAL		
PRE-FILL INSPECTION		
METHOD OF COMPACTION		
THICKNESS OF LAYERS		
ACCEPTANCE OF FINISHED LEVEL		
TEST ON COMPACTED FILL MATERIAL		
REFERENCE TEST NU.		
ITEM	COMMENTS	
MOISTURE CONTENT		
DRY DENSITY		
PERCENT COMPACTION		

QUALITY CONTROL REPORT

QUALITY CONTROL REPORT (QCR) DAILY LOG CONSTRUCTION		REPORT NUMBER 000 Page 1 of 2
		DATE
PROJECT		CONTRACT NUMBER
CONTRACTOR	WEATHER	
QC NARRATIVES Activities in Progress: Did anything develop that may lead to a Change Order/Claim? Were there any Delays in Work Progress today? General Comments / QC Issues Verbal Instructions given by Government: Safety: (Inspection made, Deficiencies noted): Safety: Corrective Action taken: Information		
PREP/INITIAL DATES (Preparatory and initial dates held and advance notice)		
ACTIVITY START/FINISH		
QC REQUIREMENTS		
QC PUNCH LIST (Describe QC Punch List items issued, Report QC and QA Punch List items corrected)		
CONTRACTORS ON SITE (Report first and/or last day contractors were on site)		

QUALITY CONTROL REPORT (QCR) DAILY LOG CONSTRUCTION		REPORT NUMBER 000 Page 2 of 2	
		DATE	
PROJECT		CONTRACT NUMBER	
LABOUR HOURS			
EQUIPMENT HOURS			
ACCIDENT REPORTING (Describe accident)			
CONTRACTOR CERTIFICATION		On behalf of the contractor, I certify that this report is complete and correct an all equipment and material used and work performed during this Reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as noted above.	
QC REPRESENTATIVE'S SIGNATURE	DATE	PROJECT MANAGER'S INITIALS	DATE

APPROVAL FORM FOR MATERIALS AND PRODUCTS

APPROVAL FORM FOR MATERIALS / PRODUCTS

Project Name:		
EMPLOYER:	PROJECT SUPERVISOR:	CONTRACTOR:
Submittal No:	Date submitted:	Revision No:
Description of Material / Product (including size, class, grade, type, strength, etc.): <div style="text-align: right; margin-top: 20px;"> <input type="checkbox"/> Civil <input type="checkbox"/> Architectural <input type="checkbox"/> Electrical <input type="checkbox"/> Mechanical <input type="checkbox"/> Other </div>		
Location of Application (where the material will be used):		Quantity:
Spec. Clause (attach relevant parts):	Applicable Standard:	Reference Drawing (attach):
Manufacturer: Address: Phone: Fax:	Supplier: Address: Phone: Fax:	
Country of Origin: Confirm that the following documents are attached: <div style="display: flex; justify-content: space-around;"> <input type="checkbox"/> Manufacturer's Data <input type="checkbox"/> Test Reports <input type="checkbox"/> Certificates <input type="checkbox"/> Samples </div> <input type="checkbox"/> Manufacturer's confirmation of compliance with Specifications/Building regulations/ Construction product regulation		
Contractor (Name, Address, contact details): Date: / /	Validation Authority: Name, signature <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input type="checkbox"/> Recommended <input type="checkbox"/> Recommended as Noted <input type="checkbox"/> Not recommended Project Manager / Assigned Certifier Date: / / </div> <div style="width: 45%;"> <input type="checkbox"/> Recommended <input type="checkbox"/> Recommended as Noted <input type="checkbox"/> Not recommended Design Team (Civil/M&E Engineer, Architect, Surveyor) Date: / / </div> </div>	
Remarks:		
AS of the 1 of July 2013, under the regulation (EU) No. 305/2011 (known as the Construction Products Regulation or the "CPR"), CE marking will be mandatory for all construction products placed on the market for which harmonised standards are in place.		

REQUEST FOR INSPECTION

REQUEST FOR INSPECTION

Project Name:		
EMPLOYER:	PROJECT SUPERVISOR:	CONTRACTOR:
We request your attendance to inspect the following works:		Request No:
Type: <input type="checkbox"/> Buildings <input type="checkbox"/> Roads <input type="checkbox"/> Infrastructure <input type="checkbox"/> Other		
Disciplines: <input type="checkbox"/> Civil <input type="checkbox"/> Mechanical <input type="checkbox"/> Electrical <input type="checkbox"/> Architectural <input type="checkbox"/> Surveying		
Inspection Time:		Date: / /
Location:		
Inspection: <input type="checkbox"/> First <input type="checkbox"/> Second <input type="checkbox"/> Others		
Description of works to be inspected:		
Inspection Requested by Contractor		Received for
Name & Signature: Date: / /		Name & Signature: Date: / /
Inspection Report	Remark (s)	Signature & Date
Surveying <input type="checkbox"/>		
Architectural <input type="checkbox"/>		
Civil <input type="checkbox"/>		
Electrical <input type="checkbox"/>		
Mechanical <input type="checkbox"/>		
QA/QC <input type="checkbox"/>		
Date of Inspection: / /		Time of Inspection:
Comments:		
The works are: <input type="checkbox"/> Approved <input type="checkbox"/> Approved as Noted <input type="checkbox"/> Not recommended <input type="checkbox"/> Witnessed		
Contractor		Inspector
Name & Signature Date: / /		Name & Signature Date: / /
Attach all relevant particular test forms. Existing ground levels and bottom excavation / top of the fill levels should be recorded on a separate sheet.		

NONCONFORMITY REPORT

NONCONFORMITY REPORT

Project Name:		
PROJECT SPONSOR:	ENGINEER:	CONTRACTOR:
Prepared by:	Date:	NC No:
Summary of Nonconformity:		
Summary of disposition plan:		
Approved by:	Company's name:	Date:
Result: <div style="display: flex; align-items: flex-start; margin-top: 10px;"> <div style="margin-right: 20px;"> <input type="checkbox"/> USE AS IT IS <input type="checkbox"/> REPAIR <input type="checkbox"/> REJECT </div> </div>		
CORRECTIVE ACTION COMPLETED		
	Company	Project Manager / Assigned Certifier
Name		
Date		
Signature		

NONCONFORMITY LOG

