

## QUALITY ASSURANCE & INSPECTION PLAN

### 1.0 QUALITY ASSURANCE & QUALITY CONTROL POLICY

Arab Diar Trad. & Cont. Co. W.L.L. hereby establishes a program for QUALITY ASSURANCE (QA) AND

QUALITY CONTROL (QC) for its contracting works. In this manual, we clearly define all requirements of Quality Assurance & Quality Control for the procurement and execution of a project.

This program is prepared to meet the basic requirements of any given project concerned with networks systems construction.

The Management vow to implement this manual in its true meaning in the various ages of similar projects. The senior QA/QC Engineer make sure that a copy of this manual is distributed to all participants, all employees are made aware of the project QA/QC requirements and its adherence throughout the project execution. The senior QA/QC Engineer will monitor and verify its conformance through audits.

Mr. Shah Faisal

**PROJECT CONTROLAR MANAGER**

## 2.0 KEY-PERSONNEL JOB RESPONSIBILITIES

### 2.1 Project Manager

The Project Manager shall be responsible for overall execution of the project. He shall ensure that all deliveries of materials and deployment of manpower and equipment in accordance with specifications as reflected in the contract/project specification. He shall review the progress at all times and shall take immediate action for any deficiency and factors affecting the progress. The Project Manager ensures that all specifications stated on technical documents are correct. He shall classify the document distribution and distributed through document controller. He shall ensure that the execution of the project in accordance with the specifications and drawings as per contract and as reflected in this manual, and liaise on with client/ consultant.

### 2.2 QA/QC Officers/Engineer

The Senior Engineer shall verify by signature all activities and reports provided by QC Inspectors and if satisfy that the construction/materials conforms to specification and drawings. Senior QA/QC Engineer is also responsible for maintaining a weekly quality control report and copies shall be distributed to Project Manager and to client, if required. The Senior QA/QC Engineer shall ensure compliance with applicable standards, specifications and approved design drawings. Any discrepancy pertaining construction/materials shall be brought to the attention of client for resolution. Requisition of materials shall be reviewed by senior QA/QC Engineer prior to submission for approval.

### 2.3 QA Inspectors (Civil)

The QA Inspector/ Civil will ensure his inspection with regard to civil work should carry out as per standard specifications and approved drawings and procedures and also in accordance with this Quality Plan. He shall also ensure that receiving of materials meets the required quality in accordance with the standard specifications. He shall also ensure that all testing as regard to Ready Mix Concrete, Portland, Cement, Excavation, Backfilling, Compaction testing and other related activities as required by the contract are as per the Engineering Standards and Specifications decided by the client. After having satisfied that the construction/materials conforms to client specifications and drawing a RFI shall be generated and pass on to Senior QA/QC Engineer for obtaining approval from client inspection and approval.

### 2.4 Document Controller

The document Controller shall be responsible for all the documents pertaining to the concern project for which he should establish the following methods:

1. Maintain a log book that will index all documents which are to be controlled.
2. Maintain a filing system exclusively for the given project.
3. A master list of quality related documentation shall be maintained, clearly denoting the edition number and dates of the up to-date issues.

4. Prepare additional copies and distribute, after obtaining permission from the Project Manager or other authorized persons.
5. He shall expedite distribution of all documents.
6. He shall also retrieve all antiquated documents from all parties after distributing the new revised or superseded documents and dispose off in accordance with contract requirements.

#### 2.5 Safety Engineer

The safety Engineer shall ensure equipment to be used in construction work is safe. Ensure that the Equipment Operators are trained, qualified, authorized and licensed to operate or handle excavator, crane, roller and other types of heavy equipment. Check that periodic testing, routine inaction and preventive maintenance schedule are carried out on due dates. Attends promptly to equipment defects and advise Project Manager to take dangerous equipment out of service until repaired. Ensure suitable deep excavation. Ensure availability of First Aid Kit and stretcher at job site. Conduct weekly safety meeting at job in which client representatives could be invited, shall maintain proper site safety record and safety minutes at job site. Ensure proper hygiene and sanitation requirement.

#### 4. DOCUMENT CONTROL

In order to maintain proper records all documents such as documents such as drawings, scope of work, specifications, data sheets, manual, procedures, correspondence and samples should be controlled and maintained as follows:

1. Document will be distributed to those concerned to ensure that all affected persons receive copies.
2. A complete set of contract drawings, specifications, standards and samples shall be kept and maintained in site office.

3. Any revisions shall be clearly marked as „ Revised and superseded” reflecting the revision levels in red ink.
4. Obsolete documents should promptly be cancelled and removed from the work place.
5. All documents should be in English.

#### 4.1 Document Control

For any project, we appoint and maintain a Document Controller who is responsible and shall perform the following functions:

1. Maintain a log book that will index all documents those are to be controlled.
2. Maintain a filing system exclusively for the given project.
3. A master list of quality related documentation shall be maintained, clearly denoting the edition number and dates of the up to dates issues.
4. Make copies and distribute, after obtaining permission from the Project Manager or other authorized.
5. He shall expedite distribution of all documents.
6. He shall also retrieve all antiquated documents from all parties after distributing the new revised or superseded documents and dispose off in accordance with contract requirements.

#### 5. QUALITY PLAN

The Quality Plan shall include functional Quality Control (QC) instructions or work procedures for the applicable work phase and work elements described in the contract document and this documents.

The QATALUM shall provide procedures that describe in details who, how and when from ADCO will test and

Inspect the characteristics of any given item, in all phases of the work.

“As Built” documentation and completion of the Facility Item List (FEIL) with ADCO signed off per the contract specification will provide the objective evidence concerning compliance with the contract requirements.

ADCO shall provide a QP for review and concurrence by the client each work phase. The QATALUM shall address the following areas as applicable:

- a. Engineering and design qualification, evaluation and validation.
- b. Materials or facilities, or positions thereof, to be inspected and tested.
- c. Materials received and handling.
- d. Witnessing / and hold points.
- e. Frequency and location for Inspection and testing
- f. Inspection and testing method(s) , plans and procedures.
- g. Acceptance criteria.
- h. Record of Inspection or tests.
- i. ADCO procedures for the qualification and certification of Non -destructive Testing (NDT) personnel, criteria coating personnel per SAEP-316, alloy verification per SAES-A-206 and all other special processes applicable for planned work activities.

- j. Third party inspection companies and the services they will provide.
- k. ADCO inspection personnel listing by discipline and name per work phase.

ADCO shall require its sub-contractors / vendors to submit manufacturing and test reports which provide sufficient information to establish that the equipment or item has passed the necessary tests and inspections against specified criteria. These records shall be reviewed by ADCO prior to issuing the inspection release. A copy shall be provided to client for concurrent review and comment.

## 6. PROCUREMENT PHASE

ADCO shall define the procurement QA / QC activities, including the identification of critical materials that will require specific Inspection and Testing Plans (ITP.S) and pre-inspection meeting in its QATALUM to assure that procurement and vendor performance are properly monitored by qualified personnel. Activities and methods used to assure that procured equipment, materials and services conform to the contract requirement shall also be defined.

ADCO procurement activities shall start with review of requisition packages to ensure the requirements of the client and standard drawings and project procedures are in place and acceptable at the quotation stage.

A final inspection and testing plan that details all witness, hold and certification points found by combining all these associated requirements of the specifications shall be included in the order and shall be reviewed by the client after placement of the order and prior to start the work. The Inspection and testing plan shall be confirmed at the pre-inspection meeting on all major purchase order and sub-contracts. The client shall approve the inspection levels for ADCO at a specific vendor and / or sub-vendors.

## 7. INSPECTION & TESTING PLAN

- (a) All material should be inspected on its arrival at site for specification conformance.
- (b) Non-conformance will be referred to non-conformance & corrective action section of this manual.
- (c) All inspection testing will be documented as per plan/program of this manual.
- (d) For Geo-technical test, non-destructive test etc, we shall avail the facilities of third party independent laboratories.
- (e) Senior QA/QC Engineer and QC inspector will carry out and witness all inspection and testing in accordance with the approved procedures.

## 8.0 PROCUREMENT

ADCO Purchasing Department comprises of multinational properly trained and experienced in their line of work.

We have established a rapport with reliable suppliers to procure materials from within the Qatar. Our Procurement department is operating with the following standards and principals.

1. PROCUREMENT MANAGER Co-ordinates with our Project Managers, Engineers for all materials we would be supplying for the Projects, except Client supplied materials.
2. Procurement of materials shall be strictly controlled by proper documents.

3. In order to strictly maintain Quality of purchased material, the requirements shall be coarse through at least 3(three) competitive suppliers incorporating following data's:

1. Detailed description of materials.
2. Type, class, grade of materials.
3. Vendor and Country of Origin
4. Delivery and design data.
5. All applicable specification.
6. Inspection requirements.

4. Obtained description, data specification, sample (if any) shall be submitted to Client in "Transmittal Form" for approval prior to placing any order.

5. ADCO had established a standard operating program that all our suppliers to agree that their materials warranty shall directly enforce against them by our client.

6. All permanent materials which we shall be supplying shall be complete with the following literature for Client use.

1. Vendor's brochure
2. Drawings
3. Specifications
4. Parts List/Spare Parts Cataloging
5. Maintenance and operating system

7. ADCO shall verify that QC is maintained at all phases. Periodic checking when required by A175 shall be done at supplier's facility before shipping materials.
8. ADCO shall maintain an effective system for continuity of order identification to ensure that all required specification, drawing and inspection requirement are properly looked into.
9. Our QA/QC Engineer shall verify purchase order documents, material and its conformity to the requirement including provision and inclusion of any special quality requirements.
- 10 During procurement phase, all necessary documents will be complied for Client's Inspection Records.
11. ADCO maintains a project summary records which are available for audit whenever required.
- 12 ADCO will use only acceptable Suppliers, having proven records of quality & timely deliveries.
- 13 Client inspection requirements as required on from 175 will be adhered to and quoted in the purchase order.
- 14 Inspection assignment package shall be submitted to Client approval along with the un priced Purchase Orders. The following procedure shall be adopted for the issuance of inspection assignments.
- 15 Within 10 days if issuance of order to a Vendor AAG shall compile and forward to Client the AAG inspection assignment. This shall include:
  - a. Complete copy of the AAG un priced purchase order including all attachment

- b. Copies of sub-vendor purchase order.
- c. Information required performing the inspection.
- d. An inspection assignment sheet specifying QC person agency that will perform the QC function.

## 9.0 MATERIAL CONTROL AND STORAGE

ADCO maintains a procedure with proper documentation for receiving, proper storage, delivery of material and Equipment.

- a) We maintain an effective system for continuity of order identification which ensure that specification, Drawing and Inspection requirements are properly transmitted to Vendors at the time of placing order.
- b) Every effort will be made to avoid damage to materials during handling and transportation. Damaged goods shall be rejected and removed from the job site.
- c) Material shall be inspected at regular interval to assess my damage or deterioration.
- d) On receipt of materials our QC Inspectors shall inspect the materials against the Purchase Order and Supervise arrangement for proper storage. The material receiver form shall be used for documentation.
- e) Sr. QA/QC Engineer as required, inspect and verify Vendors, suppliers for conformance of required Client Standards.
- f) Sr. QA/QC Engineer periodically inspects quality control at ready mix concrete batch plant.
- g) Welding and all consumable shall be stored in accordance with Client requirements.

- h) The material controller shall produce necessary documents with appropriate approvals before material is released for the project.
- i) Material movements shall be monitored to ensure that specified quantities, size type of materials are delivered at job site.

#### 10.0 NON-CONFORMANCE AND CORRECTIVE ACTION

ADCO will maintain a system for control of Non-Conforming Products, Conditions and Activity and corrective action.

1. Senior QA/QC Engineer is responsible to investigate the cause of non-conformance. He will be documenting the same and make sure that corrective action is taken. QA/QC Engineer will notify that Non-Conformance to the Project Manager, and Project Manager will correct any non-conformance immediately.
2. QA/QC Personnel of this project must report non-conformance to Project Manager.
3. System of documentation will be established by way of Log Books and Filing Records.
4. All non-conformances will be reported to Client. A log of non conformance will be maintained and status reported to Client.
5. All non-conformance products will be disposed or corrected as per the following options.
  1. Scrap
  2. Rework (Subject to approval by Client)
  3. Repair (Subject to approval by Client)

4. Use as is (Subject to approval by Client)
6. QC Inspectors will TEST/INSPECT the works as per required standards and notify the Project Manager, if any non-conformance. Project Manager will rectify the work immediately and will ask QC Inspector to retest.
7. All corrective actions to be notified to Client and get approval for corrective actions, prior to the re-testing.

Until all nonconformance's are corrected and inspected/approval by Client, the next phase of activity will not be continued

8. NCR form shall be generated by Senior QA/QC Engineer for Client Concurrence/review for disposition. An NCR Form is exhibited in Form VIII.

#### 11.0 QUALITY ASSURANCE RECORDS

A quality record system shall be established and maintained by ADCO to demonstrate achievement of the required quality and the effective operation of the quality program. Sr. QA/QC Engineer shall be responsible for the establishment of all quality record system under the guidance of Project Manager.

1. Records shall be prepared as work is performed to document items and activities affecting quality.
2. Inspection and test records shall as a minimum identify.
  1. Date and time of inspection or test.
  2. Inspection of the data record.
  3. Type of observation.

4. Procedure used.
5. Results.
6. Acceptability and the action taken in connection with any deficiencies noted.
3. All records shall include the results of inspection, tests monitoring of work performances, material analysis and fabrication or installation/construction logs.
4. Contractor shall finally compile all necessary documentation required to complete the project inspection record books as required by Client Engineering procedures. The Project inspection record books shall be forwarded to the Company representative for review, comment and approval prior to facility completion.
5. QA Record:
  1. Inspection Check List (before concreting).
  2. Field Density Test.
  3. Compaction Test.
  4. Asphalt Concrete Test.
  5. Concrete Strength Test.
  6. Non conformance Report.
  7. Material Test Report.
  8. Vendor inspection report.
  9. Audit Reports.

## 12.0 INTERNAL AUDITS

Project Support Services Co (ADCO), shall develop and implement an internal audit program and schedule covering all Work Phases. This shall include audits of the ADCO quality function and obligations per this document.

ADCO shall submit a Quality Audit to GPT for review and concurrence within 60 days of Contract award. As a minimum, audits shall be carried out at a 30% and 80% complete stage for each Work Phase. All audits shall be executed by ADCO Quality Assurance personnel, separate from the project QA/QC assigned personnel, or by

A qualified third party contract agency. Audits shall be performed in accordance with pre-established written procedures or checklists and conducted by trained personnel not having direct project responsibilities in the areas being audited.

ADCO shall initiate corrective actions. Implementation of corrective actions shall be verified through re-audit of the activity. Copies of all audit reports shall be submitted by ADCO within two (2) weeks of completion of the scheduled audit.

As a minimum, the audit report shall follow the below format:

1. Cover Sheet
2. Audit Report Fax
3. Attendance Register
4. Audit Notification
5. Non-Conformance Reports (NCR's) Worksheets (Copy) and Corrective Action Requests
6. Any attachment useful to the report.

The Audit report test shall include the following:

1. Summary
2. Introduction
3. Audit Objective
4. Opening Meeting
5. Basis of Audit (i.e. listing of documents in preparing the audit, including references to prior audits).
6. Details of audit/results (i.e. references to NCR's/ Worksheets (WS's), Audit Observation and Outstanding Waiver Actions)
7. Agreed Corrective Actions
8. Conclusions.
9. Recommendations

ADCO Representatives shall be invited to participate in the in the Audit.

### 13.0 TRAINING

- a) Sr. QA/QC Engineer is responsible for the training of all personnel's on and QA/QC.
- b) Sr. QA/QC Engineer will conduct periodical Orientation/Training to the required personnel's, whose work effect quality.
- c) Sr. QA/QC Engineer will train QA/QC Inspectors prior to the project start up and Periodical Joint Inspections.

- d) Sr. QA/QC Engineer will train additional Internal Auditors to assist in internal audits.
- e) All training records will be maintained for the audit purpose.
- f) The Client will be invited to participate/attend initial QA/QC indoctrination training.

#### 14.0 THIRD PARTY INDEPENDENT LABORTARY SERVICE

We shall employ the services of Independent Third Party Testing Laboratories to perform Civil Testing as required for this project, such as:

- i. Field Density Tests
- ii. Compaction Tests
- iii. Asphalt Concrete Test
- iv. Concrete Cylinder/Cube

#### Quality Control Procedures

##### 1.0 PROCEDURE

1.1 The quality control procedures within this Manual shall be implemented to the extent required to ascertain compliance with the quality controls imposed by the contract specifications operations which affect the quality of items or activities including but not limited to:

1.2 The Project Manager or assigned project staff team member shall monitor all the project

- a. Earthwork-Excavation, backfill

- b. Concrete-predicament, placement, post placement
- c. Structural steel-placement, bolting, welding, painting
- d. Piping and plumbing
- e. Electrical Equipment
- f. Mechanical Equipment, HVAC
- g. Siding
- h. Roofing
- i. Masonry, Drywall
- j. Subcontractor Control
- k. Special Equipment installation

1.3 Subcontractors shall be responsible for the quality control of activities performed by their organization. ADCO shall perform surveillance of the subcontractor's quality control activities to the extent required to ascertain compliance by the subcontractors with the specified requirements, and document the results of the surveillance by the use of checklists or surveillance reports.

1.4 Checklists may vary in format and content dependent upon the activity being monitored. In any case the checklists shall provide sufficient information to assure the subcontractor is adhering to the specified quality controls.

1.5 Checklists for the activities listed in paragraph 1.2 are typical for a construction project. Additional checklists will be added to the project manual or the existing checklists modified to include activities unique to a specific project.

1.6 Surveillance of the construction activities may be performed by follow-up inspections as defined. When the results of follow-up inspections indicate a non-conforming condition the sample size shall be increased and the non-conforming condition resolved.

1.7 non-conforming conditions shall be corrected prior to final inspection.

1.8 Training and indoctrination of ADCO personnel or personnel employed by subcontractors of ADCO in the requirements of this Manual and the project specifications shall be implemented prior to the start of any construction work affecting the quality of a system or portion of system.

The ADCO Project Manager or designer shall ensure that the appropriate supervisory and essential construction personnel receive the training. As a minimum shall but not be limited to:

1. Review of contract specification requirements.
2. Review of examination, inspection and training requirements.
3. Defining all preliminary activities required.
4. Construction practices to be implemented.

## 2.0 ACCEPTANCE CRITERIA

2.1 The acceptance criteria shall be in accordance with the requirements defined within the Project technical specifications and/or documents referenced therein.

2.2 Non-conforming or activities defined by this procedures and identified by ADCO personnel shall be documented on a Non-Conformance report which shall remain open until satisfactory resolution is completed and verified by ADCO.

## 3.0 REPORTS AND RECORDS

3.1 Documentation shall be in accordance with the requirements of the applicable QC procedure for the work performed.

3.2 The results of follow-up inspections will be reported on the applicable checklist for the work being performed and in accordance with the applicable QC procedure. A typical checklist and instructions for completion are included as an attachment to this procedure.

## 4.0 REFERENCES

4.1 Project Technical Specifications

4.2 Project Procedures

## 5.0 ATTACHMENTS

5.1 Non-conformance report

5.2 Checklist and Instructions



NONCONFORMANCE REPORT

NCR/HOLD NO. \_\_\_\_\_

\_\_\_\_\_

PROJECT : \_\_\_\_\_ DATE: \_\_\_\_\_

ITEM : \_\_\_\_\_

\_\_\_\_\_



DESCRIPTION OF NONCONFORMITY:

By: \_\_\_\_\_

DATE: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PROPOSED DISPOSITION:

BY: \_\_\_\_\_ DATE: \_\_\_\_\_

TITLE

\_\_\_\_\_

COMMENTS:

\_\_\_\_\_

CLOSED OUT DISPOSITION COMPLETE & ACCEPTABLE:

---

QUALITY CONTROL DATE

#### 6.0 INSTRUCTION FOR CHECKLISTS COMPLETION

1. Location of work inspected. Where applicable include drawing number location on drawing. Column lines, etc. also include component description i.e. :( Piping system CW-001-1).
2. Number of checklist. Checklists should be filed sequentially.
3. Items to be inspected.
4. Initial and date attributes inspected. Attributes not applicable to inspections should be noted N/A. Attributes not inspected for specific reasons i.e.: work not complete, etc. should be noted N/I and explanation noted in remarks.
5. Note any remarks or comments such as items not inspected or unusual to the inspections. Additional remarks may be made on back of checklist if needed.
6. Note any remark required as a result of the inspections, including work of a non-conforming attribute and work previously performed in a non-conforming condition. Remark should be listed by attribute number and a description of the non-conforming

condition, i.e.: "1.2 - Fill not being placed in specified thickness of layers", additional rework may be added on back of checklist.

7. Add date rework verified satisfactory completed.
8. Signature of individual performing inspections.
9. Title of individual performing inspections.
10. Date all inspections and rework completed.

### Quality Control Procedures

Title: Concrete Placement and Testing

#### 1.0 PURPOSE

1.1 To establish procedures for monitoring the placement and testing of fresh concrete, and the testing of materials used in the batching of concrete.

#### 2.0 SCOPE

2.1 These procedures describe the methods for monitoring concrete placement activities including testing by the qualified testing personnel at the placement site to ensure compliance with the specification requirements.

#### 3.0 DEFINITION

3.1 Fresh Concrete Tests- Those tests which determine the acceptability of the concrete deposited into the forms at the point of discharge.

3.2 Concrete Material Tests-Those tests performed on cement, fly ash and pozzolans, aggregates, water and ice, and admixtures to determine their acceptability for use in the approved concrete design mix.

#### 4.0 RESPONSIBILITIES.

4.1 The ADCO project staff members assigned to monitor concrete placement activities including the tests performed by the independent laboratory is responsible to perform follow-up inspection of the placement and testing activities.

4.2 An independent laboratory shall be responsible for the performance of tests on fresh concrete and aggregates to ascertain that the materials used in the finished work conform to the requirements for which the concrete was designed.

#### 5.0 PROCEDURES

5.1 ADCO project staff members will monitor the concrete placement activities including follow-up inspections of the activities before, during and after placement of the concrete to ensure the activities conform to the specification requirements. The activities will include but not be limited to:

- . Formwork & Reinforcing steel
- . Concrete Delivery
- . Hot & Cold weather conditions
- . Finishing
- . Curing

Additional activities required for each project will be included on

The pre-established checklists for the specific project

5.2 Project staff members shall monitor the testing and control procedures and their implementation performed by the testing laboratory at the project site which includes but is not limited to the following.

- a. Mix recorded on truck delivery tickets versus approved design mix.
- b. Truck time for start of mixing to discharge (limits depend upon specifications and temperature).
- c. Monitor the slump tests on fresh concrete in accordance with ASTM C 143, and air test in accordance with ASTM C 173, or ASTM C 231.
- d. Monitor documentation of temperature of air and fresh at time of placement; and at other times specified when dictated by extreme weather conditions.
- e. Monitor sampling of fresh concrete for making concrete cylinders for compressive strength tests in accordance with ASTM C 39. Test results are documented by the testing lab.
- f. Monitor documentation of all field test results on the concrete test report and concrete mix design data report or the test lab report form.

6.1 Testing frequencies for concrete materials and fresh concrete. ADCO shall monitor the testing laboratory's performance of tests on fresh concrete and concrete materials at frequencies stated in applicable standards with the appropriate test methods

6.2 Designated in contract specifications. Standards or codes referenced in contract documents.

## 6.0 ACCEPTANCE CRITERIA

6.1 All test and controls shall be performed in accordance with applicable standards and contract specifications.

## 7.0 REPORTS AND RECORDS

7.1 ADCO shall monitor records prepared by the Testing laboratory documenting the testing of concrete and concrete materials. Copies shall be submitted to the project manager. Follow-up inspections shall be documented on the attached checklists.

## 8.0 REFERENCES

- a. ACI Manual of Concrete Inspection
- b. Applicable ASTM and ACI standards
- c. Contract Specifications

END OF QUALITY ASSURANCE