

# MANUAL QUALITY CONTROL & QUALITY ASSURANCE



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## **Section 1**

# **QUALITY POLICY AND AUTHORITY**

## **QUALITY POLICY and AUTHORITY**

Metrotec Engineering LLC recognizes that in today's competitive marketplace, effective quality systems are essential when providing quality cost effective services to our clients. Management is totally committed to providing Commercial and Residential General Contracting & Interiors fitout Services that comply fully with the specifications and expectations of our valued clients. Therefore, it is the policy of Our company to adhere strictly to this quality control program and to insure that this program and the requirements of our customers are met on each and every project we execute.

Full authority for the implementation and administration of the quality controls described in this manual has been delegated to the Operation Manager "OM". The OM has the responsibility and organizational freedom to identify quality control problems, stop work, recommend solutions and verify resolution of such problems.

Project Managers are responsible for their assigned project's QA/QC activities. They may delegate the performance of their assigned duties to qualified individuals, but they shall retain full responsibility for completing their projects in strict accordance with established quality control policies and the client's specifications.

The quality of all subcontractors and vendors shall be the joint responsibility of the OM and the applicable Project Manager. All projects will be executed in a manner that emphasizes safety, quality, schedule and maximum cost effectiveness.

Any commitment, conflicts, or non-conformance issues not resolved using current established Quality Assurance / Quality Control Procedures shall be brought to the attention of the undersigned for final resolution.

**Eng. Ajeet Raisinghani**  
**Managing Director**

## **Section 2**

# **MANAGEMENT RESPONSIBILITY**

## **MANAGEMENT RESPONSIBILITY**

### **2.1 RESPONSIBILITY**

Management has the responsibility to define and document its policy and objectives for, and commitment to, quality. Management will ensure that its policy is understood, implemented, and maintained at all levels of the organization.

All employees have the responsibility and authority for implementation of established QA/QC activities. Resolution of conflicts in QA/QC policies shall flow through the organizational chain of command as follows:

1. Field Employees
2. Craft Leaders
3. General Foreman
4. Field Superintendents
5. General Superintendent
6. Project QA/QC Manager
7. Project Manager
8. Operation Manager
9. Managing Director

It is the responsibility of any employee that manages, performs, or verifies work affecting quality to:

- a. Initiate action to prevent the occurrence of work or service non-conformity;
- b. Identify and record any quality problems;
- c. Initiate, recommend, or provide solutions through designated channels;
- d. Verify the implementation of solutions;
- e. Control further processing, delivery, or installation of non-conforming work until the deficiency or unsatisfactory condition has been corrected.

### **2.2 ALLOCATION OF RESOURCES AND PERSONNEL**

Management shall identify in-house requirements and provide adequate resources and trained personnel as needed to support required QA/QC verification activities. Verification activities shall include inspection, testing and monitoring of the construction / installation processes and audits of the quality systems. These activities shall be carried out by personnel independent of those having direct responsibility for the project being executed.

### **2.3 MANAGEMENT REVIEW**

The established QA/QC policies and procedures shall be reviewed at appropriate intervals by management to ensure continuing suitability and effectiveness. These reviews will include assessment of the results of internal audits and shall assess overall conformance to client's requirements and expectations. Records of such reviews and audits shall be maintained.

## **Section 3**

# **QUALITY SYSTEMS**

## QUALITY SYSTEMS

Metrotec Engineering LLC's staff has established and shall maintain and document this QA/QC system as a means of ensuring that the services we provide our clients conform to specified requirements. This QA/QC system shall include:

- a) Documented quality system procedures and instructions to ensure that all activities are performed in accordance with established requirements;
- b) Effective management support to ensure compliance and the use of the QA/QC procedures and instructions.

All employees of Metrotec Engineering LLC shall strive to improve the quality of our services to our clients. The QA/QC program is a process of continuous improvement which requires input from everyone in our organization. Everyone in our organization shall comply and endeavor to improve the process where possible. An effective QA/QC program consists of the following key components;

- a) Established QA/QC procedures and instructions that comply with generally accepted industry standards, Federal, State, and Local regulating authorities, and the project specifications and standards established by the client;
- b) The identification and timely issuance to the project team any required controls, processes, inspection equipment, fixtures, tools, materials and labor skills needed to properly execute the project;
- c) Updating, as necessary, of quality control, inspection, and testing techniques, including the development of new methods and procedures;
- d) Identification of any commitments made which exceeds available resources in sufficient time to properly acquire the required resources;
- e) Clarification of the standards of acceptability as required to support the overall QA/QC program and our client's objectives;
- f) Review of the project process, construction, installation, inspection, and test procedures to ensure that applicable documentation reflects how activities are actually performed;
- g) Effective maintenance of quality records to document and track performance and improvement.

The QA/QC manual is not a controlled document. A copy is available to all employees through their immediate supervisor. **The QA/QC manual is designed to convey basic QA/QC procedures and instructions that must be followed by all employees and subcontractors of Metrotec Engineering LLC.**

Specific QA/QC procedures and instructions for individual activities are maintained by the OM and issued to Project Managers as controlled documents. It is the Project Manager's responsibility to ensure specific activity QA/QC procedures and instructions are conveyed to the individuals or subcontractors performing the specified activities.



**Section 4**

**PROJECT REVIEW**

**and**

**SETUP**

## **PROJECT REVIEW and SETUP**

### **4.1 PROPOSAL SUBMISSION AND RESPONSIBILITY ASSIGNMENT**

Upon receipt of a Request for Proposal (RFQ) from a client, management will review the requirements of the RFQ and determine if a proposal will be submitted to perform the work. If management decides to submit a proposal for the work, a Project Manager is assigned the responsibility of generating the proposal to perform the work. The proposal must include all costs related to completing the work in accordance with the client's specifications.

### **4.2 RFQ and CONTRACTUAL REVIEW**

The Project Manager shall review the contract documents contained in the RFQ and establish and maintain procedures to ensure that:

- a) The requirements and acceptance specifications of the client are adequately defined and documented;
- b) Any requirements differing from those included in the proposal are resolved or clarified in the proposal;
- c) That Metrotec Engineering LLC has the capability to meet all contractual requirements of the RFQ and any ensuing contract;
- d) Records of such contract reviews shall be maintained for future reference.

The RFQ and contract review activities, interfaces, and communication shall be coordinated with the client as required to clarify all issues and to ensure that the responsibilities of both parties are well defined and documented.

### **4.3 PROPOSAL PREPARATION**

The Project Manager shall set up the project structure as the proposal for the work is generated. It is the responsibility of the Project Manager to ensure that all costs related to executing the work in accordance with established QA/QC procedures and the contract requirements are included.

The process of identifying all material and subcontractor requirements shall be in accordance with established QA/QC procedures. Proper sourcing during the proposal stage will make actual purchasing and subcontracting activities much more efficient after award of the work.

Once all costs have been identified and a execution/staffing plan has been developed, the Project Manager shall schedule a meeting with management to review the proposal's risks and contingencies. Final decisions concerning proposal pricing and clarifications shall be management's responsibility.

#### **4.4 PROJECT SETUP**

Upon award, the Project Manager shall immediately setup the project in accordance with the execution and staffing plan established during the proposal. All key staff members shall be notified and sent as much information concerning their responsibilities to the project as soon as possible.

The Project Manager shall develop a project QA/QC file containing the basic QA/QC manual and all related specific activities' QA/QC procedures and instructions. The project QA/QC manual shall be reviewed and approved by the OM.

## **Section 5**

**DOCUMENT**

**CONTROL**

## **DOCUMENT CONTROL**

### **5.1 CONTROL OF QA/QC MANUALS, PROCEDURES and INSTRUCTIONS**

Specific QA/QC procedures and instructions for individual activities are maintained by the OM and issued to Project Managers as controlled documents. It is the Project Manager's responsibility to ensure specific activity QA/QC procedures and instructions are conveyed to the individuals or subcontractors performing the specific activities.

Revisions to the QA/QC documents shall be by section and approved for adequacy by authorized personnel prior to issue. A revised table of contents indicating the newly issued approved and accepted revision shall accompany the revised sections. In the case of sample forms a revised "Listing of Exhibits" shall indicate the latest exhibit revisions.

The OM shall ensure that:

- a) All pertinent issues of appropriate QA/QC documents are available at all locations where operations essential to the effective functioning of the quality system are performed;
- b) All obsolete documents are promptly removed from all points of issue or use.

A master list or equivalent document control procedure shall be established to identify the current revision of documents in order to preclude the use of non-applicable documents. Documents shall be re-issued after a practical number of changes have been made.

### **5.2 CONTROL OF PROJECT RELATED DOCUMENTS**

Upon award, each project is assigned a project number and the Project Manager establishes a "Project Job File". This file shall contain a complete set of all project related contract documents, specifications, drawings, etc. All information generated during the life of the project shall be maintained in this job file.

A listing shall be made of all drawings, specifications, vendor data, etc. that are to be submitted to the client for review and approval. A copy of all documents returned by the client approved, or approved as noted, shall be maintained in the job file.

Any revisions to the contract documents shall be date stamped on the date received and reviewed by the Project Manager for any possible impact to the project. All changes after contract award shall be properly documented and any associated addition or deduction to the contract price shall be immediately identified and submitted to the client for review and approval.

A complete set of all documents required for proper execution of the work shall be maintained at the project site. Any revisions received shall be immediately forwarded to the project site for use while executing the project. Any field changes to the work shall be properly noted on the project site set of the drawings. The project site set of the drawings shall show the work exactly as the work was built. (Hereinafter referred to as the "As-Built" set of drawings.)

**Section 6**

**PURCHASING**

**and**

**MATERIAL CONTROL**

## **PURCHASING and MATERIAL CONTROL**

### **6.1 GENERAL PURCHASING REQUIREMENTS**

The Project Manager has the overall responsibility to ensure that all materials and services purchased are in accordance with the established QA/QC procedures, the project specifications, and drawings.

### **6.2 SUBCONTRACTING REQUIREMENTS**

All subcontractors shall be selected on the basis of their ability to meet subcontract requirements, including established quality requirements. Metrotec Engineering LLC has established a list of qualified subcontractors for services typically subcontracted. Award of a subcontract to a company not on the approved subcontractors list requires written approval of the OM.

The selection of subcontractors, and the type and extent of control exercised by the Project Manager shall be dependent upon the type of service, client requirements, and, where appropriate, on records of subcontractors' previously demonstrated capability and performance. The Project Manager shall ensure that applicable QA/QC procedures are followed by all subcontractors performing services for Metrotec Engineering LLC. Applicable client contract requirements and liabilities shall be agreed upon in writing by all subcontractors.

### **6.3 MAINTENANCE OF PURCHASING DATA**

All purchasing documents shall contain data clearly describing the material or service ordered, including, where applicable:

- a) The type, class, style, grade, or other precise identification of items purchased;
- b) The title or other positive identification, and applicable issue dates of specifications, drawings, process requirements, inspection instructions, and other relevant technical data, including requirements for approval or qualification of product, procedures, process equipment, and personnel;
- c) The title, number, and issue of the quality system standard to be applied to the product.

The Project Manager shall review and approve purchasing documents for adequacy of specified requirements prior to release.

### **6.4 VERIFICATION OF PURCHASED PRODUCTS**

Where specified in the contract, the client or the client's representative shall be afforded the right to verify at source or upon receipt that purchased materials or work conforms to specified requirements. Verification by the client shall not absolve the Project Manager of the responsibility to ensure that acceptable materials are used in the performance of the work.



The client's verification at a vendor or subcontractor's plant shall not be used by the Project Manager as evidence of effective control of quality by the vendor or subcontractor.

## **Section 7**

# **MATERIAL CERTIFICATION**

**and**

# **TRACEABILITY**

## **MATERIAL CERTIFICATION and TRACEABILITY**

### **7.1 CLIENT SUPPLIED MATERIALS and EQUIPMENT**

The Project Manager shall ensure that all materials and equipment furnished by the client are verified, stored, and maintained until incorporation into the work. Any such items that are damaged or otherwise unsuitable for use shall be recorded and reported to the client immediately. Proper notification to the client of receipt of any unusable materials or equipment must be made in order to ensure that the client retains the responsibility for providing useable materials or equipment.

### **7.2 PRODUCT IDENTIFICATION AND TRACEABILITY**

Where appropriate, the Project Manager shall establish and maintain procedures for identifying materials and equipment from applicable drawings, specifications, or other documents, during all stages of production, delivery, and installation.

Where, and to the extent that, trace ability is a specified requirement of the contract, individual products or product batches shall have a unique identification. This identification shall be recorded in the Job File and issued to the client with specified "As-Built" data.

## **Section 8**

# **PROCESS CONTROLS**

## **PROCESS CONTROLS**

### **8.1 MANAGEMENT OF PROCESS CONTROLS**

During project setup the Project Manager develops the project QA/QC plan covering all construction activities and applicable processes which directly affect quality. The Project Manager shall ensure that these processes are carried out under controlled conditions.

The controlled conditions shall include the following:

- a) Documented work instructions defining the manner of executing the work to ensure that an acceptable level of quality is maintained at all times. The instructions shall also specify equipment, materials, skills and working environments required to comply with applicable standards, codes, and quality plans;
- b) Monitoring and control of suitable process and work characteristics during execution of the work;
- c) Clear identification of the required approval of processes;
- d) Criteria for workmanship which shall be stipulated, to the greatest practicable extent, in written standards or by means of representative samples.

### **8.2 SPECIFIC ACTIVITY PROCESS CONTROLS**

Specific Activity Process Controls are for activities where the results cannot be fully verified by subsequent inspection and testing. Accordingly, continuous monitoring and / or compliance with documented procedures are required to ensure that the specified requirements are met.

Management shall continue review of established QA/QC procedures to ensure ongoing suitability and effectiveness. As the need for new activity QA/QC process procedures is identified they will be created and implemented. Records shall be maintained for qualified processes, equipment, and personnel, as appropriate.

The following Specific Activity QA/QC Procedures shall be followed when performing applicable activities:

- a. Business Acquisition, Estimating and Proposal Preparation
- b. Purchasing, Material Control and Subcontracting
- c. Project Management and Cost\Document Control
- d. Civil and Site Work
- e. Concrete Foundations
- f. Buildings and Structures
- g. Mechanical Systems
- h. Electrical Systems
- i. HVAC Systems

## Section 9

INSPECTION

AND

TESTING

## **INSPECTION and TESTING**

### **9.1 INSPECTION AND TESTING OF PURCHASED MATERIALS AND EQUIPMENT**

All materials and equipment shall be inspected and tested to ensure conformance with the project requirements before it is released for use. Verification that all items conform to specified requirements of the quality plan shall be documented and filed in the project QA/QC file. In determining the amount and nature of inspections, consideration should be given to the control exercised at the manufacturing source and documented evidence of quality conformance provided from the supplier.

Where incoming materials are released for urgent construction purposes, it shall be positively identified and recorded in order to permit immediate recall and replacement in the event of nonconformance to specified requirements.

### **9.2 INSPECTION AND TESTING DURING CONSTRUCTION**

During actual construction of a project, the Project Manager shall ensure that:

- a) All inspection and testing activities are performed in accordance with the quality plan and documented procedures;
- b) Ensure specification and drawing conformance by the use of established process monitoring and control methods;
- c) Ensure that all required inspections and tests have been completed and necessary reports have been received and verified before the finished work is released to the client.
- d) Identify and correct any nonconforming work.

### **9.3 FINAL INSPECTION AND TESTING**

The quality plan or documented procedures for final inspection and testing require that all specified inspection and tests, including those specified either by established quality procedures or the client, are carried out and that the work meets specified requirements.

The Project Manager shall ensure that all final inspections and testing activities are in accordance with the quality plan and documented procedures. Upon completion, all

associated data and documentation shall be properly filed in the project QA/QC file and submitted to the client as required.

#### **9.4 INSPECTION AND TEST RECORDS**

The Project Manager shall ensure that all records which give evidence that the work has passed specified inspection and / or testing acceptance criteria are maintained in the project QA/QC file for future reference.

#### **9.5 INSPECTION AND TEST STATUS**

The inspection and test status of the work shall be identified by using markings, authorized stamps, tags, labels, routing cards, inspection records, test software, physical location, or other suitable means, which indicate the conformance or nonconformance of work with regard to inspections and tests performed. The identification of inspection and test status shall be maintained, as necessary, throughout the project to ensure that all work has passed the required inspections and testing specified.

Records shall identify the inspection authority responsible for the release of conforming work.



Section 10

INSPECTION,  
MEASURING,  
and  
TEST  
EQUIPMENT

## INSPECTION, MEASURING, and TEST EQUIPMENT

The OM shall ensure that all inspection, measuring, and test equipment is controlled, calibrated, and maintained, whether owned by Metrotec Engineering LLC, on loan, or provided by the client. Equipment shall be used in a manner which ensures that measurement uncertainty is known and is consistent with the required measurement capability.

The OM shall:

- a) Identify the measurements to be made, the accuracy required, and select the appropriate inspection, measuring, and test equipment;
- b) Identify, calibrate, and adjust all inspection, measuring, and test equipment and devices that can affect work quality at set intervals to ensure that certified equipment having a known valid relationship to nationally recognized standards - where no such standards exist, the basis used for calibration shall be documented;
- c) Establish, document, and maintain calibration procedures, including details of equipment type, identification number, location, frequency of checks, check method, acceptance criteria, and the action to be taken when results are unsatisfactory;
- d) Ensure that the inspection, measuring, and test equipment is capable of the accuracy and precision necessary;
- e) Identify inspection, measuring, and test equipment with a suitable indicator or approved identification record to show the calibration status;
- f) Maintain calibration records for inspection, measuring, and test equipment;
- g) Assess and document the validity of previous inspection and test results when inspection, measuring, and test equipment is found to be out of calibration;
- h) Ensure that the environmental conditions are suitable for the calibrations, inspections, measurements, and tests being carried out;
- i) Ensure that the handling, preservation, and storage of inspection, measuring, and test equipment is such that the accuracy and fitness for use is maintained;

- j) Safeguard inspection, measuring, and test facilities, including both test hardware and test software, from adjustments which would invalidate the calibration setting.

Where test hardware (jigs, fixtures, templates, patterns) or test software is used as suitable forms of inspection, they shall be checked to prove that they are capable of verifying the acceptability of the work prior to use during construction. All test hardware shall be rechecked at prescribed intervals. The Project Manager shall establish the extent and frequency of such checks and shall maintain records as evidence of control. Measurement design data shall be made available, when required by the client or his representative, for verification that it is functionally adequate.

## Section 11

# CONTROL OF NONCONFORMING ACTIONS

and

# CORRECTIVE ACTIONS

## CONTROL OF NONCONFORMING ACTIONS and CORRECTIVE ACTIONS

### **11.1 CONTROL OF NONCONFORMING WORK**

The Project Manger shall establish and maintain procedures to ensure that any work that does not conform to specified requirements is prevented from inadvertent release to the client. Control shall provide for identification, documentation, evaluation, segregation when practical, disposition of nonconforming work, and for notification to management as required.

### **11.2 NONCONFORMITY REVIEW AND DISPOSITION**

Nonconforming work shall be reviewed in accordance with documented procedures.

The nonconforming work may be:

- a) Reworked to meet the specified requirements
- b) Accepted with or without repair by concession of the client
- c) Reused for alternative applications
- d) Rejected, torn out, scrapped and new work performed.

Where required by the contract, the proposed use or repair of the nonconforming work to specified requirements shall be reported for concession to the client or his representative. The description of nonconformity that has been accepted, and of repairs, shall be recorded to denote the actual condition.

Repaired and reworked work shall be re-inspected in accordance with documented procedures.

### **11.3 CORRECTIVE ACTION**

The Project Manager shall establish, document, and maintain procedures for:

- a) Investigating the cause of nonconforming work and the corrective action needed to prevent recurrence;
  
- b) Analyzing all processes, work operations, concessions, quality records, service reports, and customer complaints to detect and eliminate potential causes of nonconforming work;
  
- c) Initiating preventative actions to deal with problems in relation to the risks encountered;
  
- d) Applying controls to ensure that corrective actions are taken and their effectiveness;
  
- e) Implementing and recording changes in procedures resulting from corrective actions.

**Section 12**

**AUDITS,**

**RECORDS**

**and**

**TRAINING**

**RECORDS**

## **AUDITS, RECORDS and TRAINING**

### **12.1 INTERNAL QUALITY AUDITS**

The OM shall carry out internal audits to verify whether quality activities comply with planned arrangements and to determine the effectiveness of the quality system. The OM shall maintain records on the performance and adequacy of each project's QA/QC activities.

Audits shall be scheduled on the basis of the status and importance of the activity. The audits and follow-up actions shall be carried out in accordance with documented procedures established to ensure improvement to overall company QA/QC program.

The results of the audits shall be documented and brought to the attention of the president within 10 days or sooner when critical action is required, after each internal quality audit. Each audit report shall have the actions started and planned by the OM and Project Manager for any nonconforming activities found.

### **12.2 QUALITY RECORDS**

The OM shall follow established procedures for identification, collection, indexing, filing, storage, maintenance, and disposition of quality records.

Quality records are to be maintained to demonstrate achievement of the required quality and the effective operation of the quality system. Pertinent sub-contractor quality records shall be an element of this data.

All quality records shall be legible and identifiable to the project involved. Quality records shall be stored and maintained in such a way that they are readily retrievable in facilities that provide a suitable environment to minimize deterioration or damage to prevent loss of the records. Retention times of quality records shall be a minimum of seven (7) years, longer if required by specific project requirements. Where agreed contractually quality records shall be made available for evaluation by the client.

### **12.3 TRAINING**

The OM, the Project Managers and management are all responsible for identifying the training needs of all personnel performing activities affecting quality during production and installation. Personnel performing specific assigned tasks shall be qualified on the basis of appropriate education, training, and / or experience, as required. Appropriate records of training shall be maintained on each individual's training and qualifications.