

## **SECTION 01 45 00 – PROJECT QUALITY CONTROL**

### **PART 1: GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including Uniform General and Supplementary General Conditions for University of Texas System Building Construction Contracts (UGC) and other Division 1 – 48 Specification Sections, apply to this Section. In the event of conflict between specific requirements of the various documents, the more restrictive, more extensive (i.e., more expensive) requirement shall govern.

#### **1.2 DEFINITIONS**

##### **A. Quality Control**

- 1. Quality Control shall be the sole responsibility of the Contractor, unless specifically noted otherwise. The Contractor shall be responsible for all testing, coordination, start-up, operational checkout and commissioning of all items of work included in the project, unless specifically noted otherwise. All costs for these services shall be included in the Contractor's cost of work and general conditions.

##### **B. Quality Assurance**

- 1. Quality Assurance is performed by the Owner or their delegated representatives. These procedures may include observations, inspections, testing, verification, monitoring and any other procedures deemed necessary to ensure compliance with the contract documents.
- 2. The Contractor shall cooperate with and provide assistance to the Owner for all aspects of this endeavor. This shall include providing ladders, lifts, scaffolds, lighting, protection, safety equipment and any other devices and/or equipment (including operators if required) deemed necessary by the Owner to access the work for observation/inspection.

#### **1.3 SUMMARY**

- A. This section provides administrative and procedural requirements for Contractor quality control on the project.
- B. Specific quality-control requirements for individual construction activities are specified in the Sections that govern those activities. Requirements in those Sections may also cover production of manufactured products.
- C. Specified tests, inspections, and related actions do not limit Contractor's quality control obligations to comply fully with the Contract Document requirements in all regards.
- D. Provisions of this Section do not limit the requirements for the Contractor to provide quality control services required by the contract documents or the Authority Having Jurisdiction.
- E. The following quality issues are addressed in detail in this Section:
  - 1. Quality Control
  - 2. Quality Assurance
  - 3. Testing Agency
  - 4. Testing
  - 5. Inspections
  - 6. Pre-installation Meetings
  - 7. Mock-ups

#### **1.4 TESTING AGENCY**

- A. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.
- B. Owner will employ services of independent testing agencies to perform certain specified testing, as it deems necessary.
- C. The Contractor shall employ and pay for services of an independent testing agency to perform all specified testing requiring an independent agency, unless noted otherwise.
- D. Employment of agency in no way relieves the Contractor of the obligation to perform work in accordance with requirements of Contract Documents.
- E. The Contractor Employed Agency:
  - 1. Testing agency shall comply with requirements of ASTM E 329, ASTM E 548, ASTM E 543, ASTM C 1021, ASTM C 1077, and ASTM C 1093.
  - 2. Laboratory shall maintain a full time Engineer on staff to review services. Engineer shall be licensed in the state of Texas.
  - 3. Testing Equipment: Calibrate devices at reasonable intervals (minimum yearly) with accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.
- F. The Contractor shall not employ the same testing entity engaged by the Owner for the project, unless agreed to in writing by the Owner.

#### 1.5 TESTING

- A. Where specific testing is specified in a technical section of the Specifications or indicated in the Contract Documents, the Contractor shall bear all costs of such tests unless they are specifically stated to be paid by the Owner.
- B. Testing specifically identified to be conducted by Owner will be performed by an independent entity and will be arranged and paid for by the Owner unless otherwise indicated in the Contract Documents. Should the test return unacceptable results, the Contractor shall bear all costs of retesting and re-inspection as well as the cost of all material consumed by testing, and replacement of unsatisfactory material and/or workmanship.
- C. The Owner's Designated Representative (ODR) will schedule the Owner's testing services unless otherwise directed in writing by the Owner. The Contractor is required to coordinate with the ODR to facilitate timeliness of such testing services.
- D. The Owner may engage additional consultants for testing, air balancing, or other special services. The activities of any such Owner consultants are in addition to Contractor testing of materials or systems necessary to prove that performance is in compliance with requirements. The Contractor must cooperate with persons and firms engaged in these activities in accordance with the Contract.
  - 1. The Contractor is required to self-perform various tests to verify performance and/or operation of various systems. These test reports shall be consecutively numbered and defined by scope and extent of test.

#### 1.6 INSPECTIONS

- A. It is the intent of the Contract Documents that all work be subjected to inspection and verification of correct operation prior to 100% payment of the line item(s) pertaining to that aspect of the Work.

- B. The Contractor shall incorporate adequate time for performance of all inspections and correction of noted deficiencies into the Work Progress Schedule for the project.
- C. During the course of construction, the Owner, Architect and/or other Owner representatives may visit the site for observation of the work in place. The Contractor shall provide all necessary equipment for safe access to the work to be inspected or observed. This requirement shall extend to all Owner personnel and their representatives. Some of these inspections will be informal and some will require formal notification by the Contractor. The following are typical project inspections:
1. Informal Daily Reviews of project conditions by the Construction Inspector and/or members of the Owner's and/or Design Consultant's team(s). When considered appropriate, results of these reviews will be documented via Observation Report or Memorandum. In addition to cooperating with, and providing safe access for the Owner's agents, the Contractor shall provide a system of tracking all field reports, describing items noted and resolution of each item. This printed report shall be reviewed as necessary, at least on a monthly basis.
  2. Concealed Space Inspections are to be formally scheduled in advance through the Construction Inspector by submitting written notification at least 5 workdays in advance. Subject areas include partitions, structural walls, chases, crawl spaces, ceiling spaces, and any other work which will be difficult or impossible to examine once concealed in the final construction.
  3. Progress Inspections for piping, ductwork, and other systems are to be scheduled with the Construction Inspector as appropriate portions, or sections, of the work are completed. This is in addition to "system-wide" performance verification and tests. The Contractor shall conduct the tests and the ODR will witness and approve the results.
    - a. The Contractor shall coordinate their intended "apportioning" of systems tests with the ODR immediately following formal submission of their Work Project Schedule so that all parties are aware of the intended work and inspection sequence.
  4. Overhead and Above Ceiling Inspections are similar in nature and requirements to the Concealed Space Inspections. Where ceilings are to be fixed in place, such as gypsum board or plaster, it would constitute a Concealed Space. Where ceilings are of "lay-in" type, or where no finish ceiling is scheduled, it would be considered an "overhead" inspection. Such inspections are to be included in the Contractor's Detailed Construction Schedule. Contractor shall provide written inspection request notice to the ODR and Architect at least 5 workdays in advance.
    - a. No finish ceiling material shall be installed until all overhead punch list items have been resolved to the satisfaction of the Owner.
      - 1). Ceiling grid or framework installed
      - 2). All above ceiling electrical work, including light fixtures, installed and operational
      - 3). All HVAC and plumbing work above ceiling complete with diffusers installed and connected
      - 4). Fire sprinkler heads installed
      - 5). All required tests for above ceiling work completed and approved
      - 6). Contractor generated punch list of all areas being requested for inspection
  5. Inspections of Building Systems and Equipment are required to confirm acceptable operation and are to be formally scheduled through the Construction Inspector with the Architect. Refer to Section 01 91 00 for additional requirements pertaining to system start-up, operation, demonstration and acceptance.
- D. On systems/equipment requiring a manufacturer's representative to verify installation/operation, the Contractor is required to perform a thorough check-out of operations with the manufacturer's representatives prior to requesting formal inspection by the Owner be scheduled. Notify the ODR, in advance, as to when the manufacturer's representative is scheduled to arrive.

- E. Inspection of individual equipment and/or system(s) must be accomplished prior to requesting Substantial Completion Inspection(s) for any area affected by that equipment and/or system.
- F. For "building-wide" and/or life safety systems, such as fire alarm, fire sprinkler systems, smoke evacuation systems, toxic gas monitoring, captured exhaust systems, etc., completion and acceptance of Functional Testing is required prior to requesting Substantial Completion Inspection for any area of the Project.
  - 1. The manufacturer's representatives and the installing contractor will be expected to demonstrate both operation and compliance to the Owner's agents and consultants. If coordinated and scheduled appropriately by the Contractor, these equipment and/or systems inspections may also serve to provide the required Owner Training, if approved in advance by the Owner.
  - 2. The Contractor is responsible for requesting that the ODR and Architect arrange for the inspection of materials, equipment and work prior to assembly or enclosure that would make the materials, equipment or work inaccessible for inspection, and at such other times as may be required.
- G. For any requested inspection, the Contractor shall make prior inspection to ensure that items are ready for inspection and acceptance by the Owner and/or Architect. The Contractor will be responsible for any and all costs incurred by Owner and/or Owner representatives, including consultants, resulting from a review or inspection that was scheduled prematurely.
- H. The Contractor shall coordinate the work and schedule the inspections in advance so as not to delay the work. All major inspections should be indicated on the Work Progress Schedule for advance planning and the Contractor should allow a minimum of 5 working days to confirm schedule of requested inspections with Owner and its consultants.
- I. The contractor shall list and track all punch list items. The punch list shall be kept up-to-date reflecting status of work in place and inspections on the project. Copies of this populated and updated matrix shall be supplied to the A/E and the ODR for use during the course of the project.

#### 1.7 PRE-INSTALLATION MEETINGS

- A. The Contractor shall coordinate and conduct meetings to review the installation of major systems/equipment on the project.
- B. The Contractor shall ensure attendance of the installing subcontractor, manufacturer and/or supplier (if appropriate), supporting subcontractors involved in the installation and any other parties involved in the phase of work to be reviewed. The Owner and Architect shall be notified in writing at least 5 days in advance of the meeting.
- C. Each party shall be prepared to discuss in detail the staging, installation procedure, quality control, testing/inspection, safety and any other pertinent items relating to the work being reviewed. Submittal approval shall be a prerequisite of the meeting.
- D. The Contractor shall chair and take minutes of this meeting and distribute to all attending parties.
- E. Whether required in the technical section or not, a pre-installation meeting shall be conducted for the following work, if included in the project:
  - 1. Concrete
  - 2. Masonry
  - 3. Large Steel Fabrications/Erection
  - 4. Waterproofing
  - 5. Roofing
  - 6. Exterior Glazing (including storefront and curtain wall)
  - 7. Door Hardware
  - 8. Security
  - 9. Audio/Visual Equipment

- 10. Air Handling Units
- 11. Medical Gas Systems

1.8 MOCK-UPS

- A. Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required, using materials indicated for the completed Work.
- B. Build mockups in location and of size indicated or, if not indicated, as directed by Architect. The mock-up may be work in place that is intended to remain, unless otherwise directed by the Owner.
- C. Notify Architect and Owner 5 working days in advance of dates and times when mockups will be constructed.
- D. Demonstrate the proposed range of aesthetic effects and workmanship. Include anticipated repairs in mockup, such as stone veneer.
- E. Obtain Architect's and Owner's approval of mockups before starting work, fabrication, or construction.
- F. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
- G. Demolish and remove mockups when directed, unless otherwise indicated.
- H. For any of the following work items included in the project, a mockup shall be prepared whether required by the technical section or if requested by the Owner:
  - 1. Exterior wall system to include: substructure, masonry/stone veneer, plaster, architectural concrete and windows.
  - 2. Roof system
  - 3. Interior lab room
  - 4. Interior wall finishes
  - 5. Ceramic tile
  - 6. Finished flooring

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION (NOT USED)**

END OF SECTION 01 45 00