SECTION M8 - TESTING AND COMMISSIONING

OBJECTIVE

To ensure that the Mechanical and Electrical Systems of a project are inspected, tested and commissioned:

(a) according to the specified requirement in the contract document.

(b) according to specific Client's requirement.

(c) with inspection and T&C records properly documented and recorded in a controlled manner.

RESPONSIBILITIES

It is usually the responsibility of the Contractor to fully complete the works including testing and commissioning to bring services to a fully operating state to his satisfaction before offering them to the Architect for final checking and acceptance.

It is also the Project Manager's responsibility to ensure that the requirement of the services especially the specific Client's requirement, are reflected in the design.

DEFINITIONS

1. Inspection

The checking of any installation to ensure that:-

(i) The installation has been installed in accordance with the Specification of Work and the Drawings.

(ii) The installation is complied with relevant statutory requirements.

(iii) The installation adheres to all relevant quality standards.

(iv) The installation is practically complete and is in a safe manner to start up or 'make live'.

2. Testing and Commissioning

The advancement of an installation from the stage of static completion to the stage of full working order where:

(i) The installation is functioning correctly to specified requirements.

(ii) The design intent of the installation has been achieved together with the evaluation of the performance of the installation.

PROCEDURES

1. Specification

Generally, the project specification for the Testing and Commissioning shall be used.

2. Clients' Additional Requirements

On receipt of Client's additional requirements for Inspection, Testing and Commissioning of the building services installation during construction, the Project Manager shall review the additional requirements by taking into consideration the budget, programme and manpower resources for the project. Client's additional requirements and authority levels for acceptance shall be established and recorded.

3. Specialist Testing and Commissioning Sub-Contractor

The Contractor shall submit the names and details of all Specialist Testing and Commissioning Sub-Contractors to the Project Manager for review prior to starting works on site.

4. Proposals and Programme for Testing and Commissioning

The Project Manager shall ensure that the Contractor's detailed proposals and programme for Testing and Commissioning of the works are submitted for review in good time.

The review shall ensure that:

(i) The proposals are fully in compliance with the specified requirements.

(ii) The requirements for any tests to be undertaken by the relevant authorities are identified.

(iii) The programme for the Testing and Commissioning is in good order.

When measurements are to be taken during the testing and commissioning process, the Project Manager/Site Staff shall ensure that:-

(i) The instrument used are calibrated

(ii) The Contractor use the instrument correctly

(iii) Where practical, the serial number of the instrument is to be recorded on the inspection/T&C form for traceability

5. Design Criteria for Testing and Commissioning

The Site Staff shall review the Performance Tests to be undertaken and shall ensure that the design criteria applicable for assessment of the test results are recorded into the Test Sheets.

6. Testing and Commissioning Report

6.1 Schedules and Checklists

The Site Staff shall ensure that at a specified time and not less than two weeks before the testing and commissioning starts, the Contractor shall submit for review the following specified Schedules in the form of check lists:-

- Schedule of pre-commissioning checks, as applicable, for each item of plant.
- Schedule of Testing and Commissioning Procedures
- Schedule of Commissioning reports, manufacturer's Test Certificates and site Performance Test Certificates to be included in the reports.

The schedules and checklists shall be reviewed to ensure compliance with the specification. The Site Staff shall use the checklists to monitor the progress.

6.2 Format of Testing and Commissioning Report

The format of Testing and Commissioning Report shall be submitted by the Contractor for review and approval from the Project Manager. Where applicable, format of Testing and Commissioning Report derived from a previous project may be used but shall be modified accordingly to suit the current project requirements.

7. Corrective Action

7.1 Corrective Action by the Contractor

The Site Staff shall ensure that all defects noted during the Testing and Commissioning requiring action by the Contractor shall be recorded. A copy of the defect list shall be sent to the Contractor and copied to the Project Manager.

When the defects have been rectified, the contractor shall sign and date the individual items and return a copy to the Site Staff.

The Site Staff shall, following a satisfactory site check, date and sign-off the defect. A copy shall be sent to the Project Manager for the office records.

7.2 Corrective Action by ACE

Defects noted during the Testing and Commissioning that are a result of a design error shall also be recorded by the Site Staff and reported to the Project Manager.

It is the responsibility of the Project Manager to initiate the Feedback Report Form in accordance with Section QE2 : Feedback Reporting.

In addition, the Site Staff, with due regard to the seriousness of the situation shall either:-

(i) Liaise with the Project Manager, if urgent, direct from the site to enable immediate corrective action to commence.

(ii) Upon returning to the office, shall review the requirement with the Project Manager for corrective action.

The review and authorisation of corrective action shall be in accordance with the Section M4 : Design Change Control.

The Project Manager shall, at his discretion, inform the Project Director and must do so where there is a possible claim against the Company.

8. Authority Levels for Acceptance

Upon satisfactory completion of the Testing and Commissioning procedures, the Contractor shall submit the completed Commissioning and Testing Report to the Project Manager for comments and/or approval.

The Project Manager shall review the report and shall either confirm acceptance of the report or return the report to the Contractor for revision.

9. Records

The Project Manager shall ensure that a copy of the Testing and Commissioning Report and Defects Report are retained in the project files.

10. Certificates of Supervision

On satisfactory completion of all tests, the Project Manager shall ensure that the necessary Certificates of Supervision are drawn up according to the prescribed form and given to the respective Professional Engineers in charge of the project.

The Certificate of Supervision for the Lifts and Escalators shall be issued by the Contractor's Professional Engineer.

A copy of the Certificate of Supervision with any attached documentation shall be filed in the relevant Project "Authority File" or save in the server.