10 LABORATORIES

10.1 GENERAL

1 Compliance with this Part are mandatory and considered to be part of the contract conditions.

2 The Contractor shall comply with regular circulars regarding testing and laboratories, quality forms, safety forms etc., which are issued from the relevant authorities.

10.2 INDEPENDENT TESTING LABORATORIES

10.2.1 General

1 Unless otherwise agreed with the Engineer in writing, the Contractor shall submit a list of three or more independent laboratories he intends to use for testing purposes during the course of the Contract to the Engineer for approval no later than thirty (30) days from the start of the Contract.

2 The Engineer or Engineers Representative shall approve one or more Laboratories from the laboratories listed by the Contractor and assign it/them to serve in the project.

3 The Engineer or Engineers Representative shall ensure the capability of the assigned Laboratory/Laboratories to cover the required testing quantity and quality.

4 The Engineer or Engineers Representative shall ensure that the assigned Laboratory / Laboratories for sampling are ISO/IEC 17025 accredited in sampling.

5 The Engineer or Engineers Representative shall ensure that there is no conflict of interest between assigned lab/labs and the other parties serving in the project.

6 The Contractor shall ensure that copies of all testing results are sent directly from the laboratory to the Engineer and/or to any other party specified in the Contract.

7 It is the responsibility of the Contractor to ensure that the project's test result information made available to the relevant authorities is maintained up to date and current.

8 The Contractor shall coordinate, accompany and cooperate with Independent Laboratory staff during site testing, and report all nonconformities to the Engineer. He shall also ensure that proper records are maintained on the issuance of Nonconformity and produce upon request by the relevant authority.

9 The Contractor shall ensure that the samples for testing are collected and delivered by the appointed laboratory under complete supervision and responsibility of the Engineer or Engineers Representative. Samples may be collected by competent personnel and delivered to the appointed laboratory under complete supervision and responsibility of the Owner or delegated authority.

10 The Engineer or Engineers Representative shall supervise the sampling and testing process, including sampling locations, collection and transportation.

11 A site laboratory can be used for project testing, only when the Engineer or relevant authorities approve the site laboratory to be operated by one of the independent laboratories and if the site laboratory satisfies the requirements specified in this part and any other requirement of the Owner or delegated authority.

10.2.2 Laboratories And Material Testing

1 The assigned Laboratory shall be ISO/IEC 17025 accredited and shall comply with the following requirements:

(a) Organization

The Laboratory shall:

(i) Be a legal entity, or a defined part of a legal entity, and hold valid legal or conformity certificates required by the State of Qatar.

(ii) Define and document the range of laboratory activities for which it accredited or approved from relevant authorities.

(iii) Specify the responsibility, authority and interrelationship of all personnel who manage, perform or verify work affecting the results the laboratory.

(iv) Document its procedures to the extent necessary to assure the consistent application of its laboratory activities and the validity of the results.

(v) Shall have managerial personnel who, irrespective of other responsibilities, have the authority and resources needed to carry out their duties.

(b) Personnel

The Laboratory shall:

(i) Ensure all personnel of the laboratory, either internal or external, that could influence the laboratory activities shall act impartially, be competent and work in accordance with the laboratory's management system.

(ii) Document the competency requirements for each function influencing the results of laboratory, including requirements for education, qualification, training, technical knowledge, skills and experience.

(iii) Ensure that the management of the laboratory shall communicate to personnel their duties, responsibilities and authorities.

(iv) Ensure and document that the personnel have the competence to perform laboratory testing for which they are responsible and to evaluate the significance of deviations.

(v) Authorize personnel to perform specific laboratory activities such as reporting, reviewing and authorizing the results.

(c) Facilities and environmental conditions

The Laboratory shall:

(i) Ensure that environmental conditions are suitable for the laboratory testing activities and shall not adversely affect the validity of results.

(ii) Document the requirements for facilities and environmental conditions necessary for the performance of the laboratory activities.

(iii) Monitor, control and record environmental conditions in accordance with relevant specifications, methods or procedures or where they influence the validity of the results.

(iv) When the laboratory performs laboratory activities at sites or facilities outside its permanent control, it shall ensure that the requirements related to facilities and environmental conditions are met.

(d) Equipment

The Laboratory shall:

(i) Have access to equipment which is required for the correct performance of testing activities and which can influence the laboratory result.

(ii) In the case where the laboratory uses equipment outside its permanent control, the laboratory shall ensure that the ISO/IEC 17025 requirements for equipment are met.

(iii) Ensure that the equipment used for testing are capable to achieving the measurement accuracy or measurement uncertainty required to provide a valid result.

(iv) Verify that equipment conforms to specified testing requirements before being used or returned into service after maintenance and calibration.

(v) Have a documented procedure for handling, transport, storage, use and planned maintenance of equipment to ensure proper functioning.

(vi) Have a documented procedure for calibration of testing equipment.

(vii) Ensure that all measuring equipment used in testing are calibrated.

(viii) Ensure measuring equipment shall be re-calibrated when the measurement accuracy or measurement uncertainty affects the validity of the test results even though the calibration period has not expired.

(ix) All equipment requiring calibration or which has a defined period of validity shall be labelled, coded or identified to allow the user of the equipment to readily identify the status of calibration or period of validity.

(x) Make intermediate checks to check the measuring equipment drift and maintain confidence in the performance of equipment; these checks shall be carried out according to a documented procedure.

(xi) When calibration and reference material data include reference values or correction factors, that the reference values and correction factors are updated and implemented.

(xii) Ensure equipment that has been shown to be defective or outside the specified requirements, shall be taken out of service. It shall be isolated to prevent its use or clearly labelled or marked as being out of service until it has been verified to perform correctly.

(xiii) Ensure that measurement results are traceable to the International System of Units (SI) through calibration provided by ISO/IEC 17025 accredited calibration service provider.

(xiv) Communicate its calibration requirements to external calibration service providers for:

- The purpose of calibration services to be provided.
- The acceptance criteria.
- The required uncertainty.

(xv) Ensure that calibration services provided conform to the laboratory's established requirements, before they place the calibrated equipment for use.

(xvi) Ensure a laboratory performing calibrations, including of its own equipment, evaluate the measurement uncertainty for all calibrations.

(e) Selection and verification of testing methods

The Laboratory shall:

(i) Have a documented procedure for the review of testing requests, The procedure shall ensure that:

- The requirements are adequately defined, documented and understood.
- The laboratory has the capability and resources to meet the requirements
- In case of subcontracted testing activities are used, the laboratory advises the customer of the specific laboratory activities to be performed by the external provider and gains the customer's approval.
- The appropriate methods or procedures are selected and are capable of meeting the customers' requirements.

(ii) Inform the customer when the method requested by the customer is considered inappropriate or out of date. When the customer does not specify the method to be used, the laboratory shall select an appropriate method and inform the customer of the method chosen.

(iii) When the customer requests a statement of conformity to a specification or test standard (e.g. pass/fail, in-tolerance/out-of-tolerance) that the specification or standard, and the decision rule be clearly defined. Unless inherent in the requested specification or standard, the decision rule selected shall be communicated to, and agreed with, the customer.

(iv) Ensure all testing methods, procedures work instructions, standards, manuals and reference data relevant to the laboratory activities, be kept up to date and be made readily available to its personnel.

(v) Ensure that it uses the latest valid version of a method unless it is not appropriate or possible to do so.

(vi) Validate non-standard methods, laboratory-developed methods and standard methods used outside their intended scope or otherwise modified. When changes are made to a validated method, new method validation shall be performed.

(f) Sampling and Samples Handling

(i) The laboratory shall undertake sampling according to a defined documented sampling method; this method shall address the factors to be controlled to ensure the validity of testing results.

(ii) The sampling method shall describe as a minimum:

- The selection of samples or sites.
- The sampling plan.
- Preparation and treatment of sample(s) for subsequent testing.

(iii) The laboratory shall have a documented procedure for the transportation, receipt, handling, protection, storage, retention, and disposal or return of samples including all provisions necessary to protect the integrity of the sample. Precautions shall be taken to avoid deterioration, contamination, loss or damage to the samples during handling, transporting, storing/waiting, and preparation for, testing.

(iv) The laboratory shall have a system for the unambiguous identification of samples. The identification shall be retained while the sample is under the responsibility of the laboratory.

(v) Upon receipt of sample, deviations from specified conditions shall be recorded. When there is doubt about the suitability of sample for test, or when sample does not conform to the description provided, the laboratory shall consult the customer for further instructions before proceeding and shall record the results of this consultation. When the customer requires the sample to be tested acknowledging a deviation from specified conditions, the laboratory shall include a disclaimer in the report indicating which results may be affected by the deviation.

(vi) When samples have to be stored or conditioned under specified environmental conditions, these conditions shall be maintained, monitored and recorded.

(g) Records

(i) The laboratory shall implement the controls needed for the identification, storage, protection, back up, archive, retrieval, retention time, and disposal of its records.

(ii) The laboratory shall retain records for a period consistent with its contractual and legal obligations. Access to these records shall be consistent with the confidentiality commitments and records shall be readily available.

(iii) The laboratory shall ensure that technical records for the following are retained:

1- Personnel:

- determination of the competency requirements;
- selection of personnel;
- training of personnel;
- supervision of personnel;
- authorization of personnel;
- monitoring of competence of personnel.

2- Equipment :

- The identity of equipment, including software and its current location.
- The manufacturer's name, type identification, and serial number or other unique identification.

- Evidence of verification that equipment conforms with specified requirements.
- Calibration dates, results of calibrations, adjustments, acceptance criteria, and the due date of the next calibration or the calibration interval
- Documentation of reference materials, results, acceptance criteria, relevant dates and the period of validity;
- The maintenance plan and maintenance carried out dates and details of any damage, malfunction, modification to, or repair.

3- Selection and verification of testing methods:

- Testing request reviews, including any significant changes.
- Records of the verification that the laboratory can properly perform the requested test methods.

4- Method validation:

- The validation procedure used;
- Specification of the requirements;
- Determination of the performance characteristics of the method;
- Results obtained
- A statement on the validity of the method, detailing its fitness for the intended use.

5- Sampling:

- Reference to the sampling method used;
- Date and time of sampling;
- Data to identify and describe the sample including sampling location
- Identification of the personnel performing sampling and identification of the equipment used.
- Environmental or transport condition
- Deviations, additions to or exclusions from the sampling method

6- Testing observation:

- Original observations, data and calculations shall be recorded at the time they are made and shall be traceable. Calculations and data transfers shall be checked in systematic manner.
- All issued reports shall be retained as technical records.

7- Nonconformity:

- the nature of the nonconformity, cause(s) and any subsequent actions taken;
- The results of any corrective action.

(iv) When laboratory is using computerized systems to record the test observation and make calculations, this system shall be protected from unauthorized access, be safeguarded against tampering or loss and be maintained in a manner that ensures the integrity of the data and information.

(h) Assuring the validity of test results

(i) The laboratory shall have a documented procedure for monitoring the validity of its results. This monitoring shall be planned and reviewed and shall include but not be limited to:

- Review of reported results,
- use of reference materials or quality control materials,
- intermediate checks on measuring equipment,
- functional check(s) of testing equipment ,
- replicate tests using the same or different methods,
- use of check or working standards with control charts,
- retesting of retained items;
- testing of blind sample,
- Inter-laboratory comparisons,
- Internal audits.

(ii) The laboratory shall monitor its performance by comparison with results of other laboratories. This monitoring shall be planned and reviewed and shall be either :

- Participation in proficiency testing.
- Participation in inter-laboratory comparisons other than proficiency testing.

(iii) Data from monitoring activities shall be analysed and used to control, improve the laboratory's performance. If the results of the analysis of data from monitoring activities are found to be outside pre-defined criteria, appropriate action shall be taken to prevent incorrect results from being reported.

(i) Reporting of results

(i) The results shall be reviewed and authorized prior to release.

(ii) The results shall be provided accurately, clearly, unambiguously and objectively, usually in a report. Report shall include all the information needed by the customer and necessary for the interpretation of the results and all information required by the method used.

(iii) Each report shall include at least the following information, unless the laboratory has valid reasons for not doing so;

- A title.
- the name and address of the laboratory,
- the location of performance of the laboratory activities, including when performed at sites away from the laboratory's permanent facilities, or in associated temporary or mobile facilities,

- unique identification that all its components are recognized as a portion of a complete report and a clear identification of the end;
- identification of the method used;
- the date of receipt of the test item(s), and the date of sampling,
- the date(s) of performance of the laboratory activity,
- the date of issue of the report,
- reference to the sampling plan and sampling method used by the laboratory
- a statement to the effect that the results relate only to the items tested,
- the results with the units of measurement,
- additions to, deviations, or exclusions from the method,
- identification of the person(s) authorizing the report ,
- clear identification when results are from external providers.

(iv) The laboratory shall be responsible for all the information provided in the report, except when information is provided by the customer. Data provided by a customer shall be clearly identified. In addition, a disclaimer shall be put on the report when the information is supplied by the customer and can affect the validity of results. Where the laboratory has not been responsible for the sampling stage (e.g. the sample has been provided by the customer), it shall state in the report that the results apply to the sample as received.

(v) Test reports shall, where necessary for the interpretation of the test results, include a statement of conformity with requirements or specifications. The laboratory shall document the decision rule employed.

(vi) When opinions and interpretations are expressed, the laboratory shall ensure that only personnel authorized for the expression of opinions and interpretations releases the respective statement. The laboratory shall document the basis upon which the opinions and interpretations have been made. The opinions and interpretations expressed in reports shall be based on the results obtained from the tested item and shall be clearly identified as such.

(vii) When an issued report needs to be changed, amended or re-issued any change of information shall be clearly identified and, where appropriate, the reason for the change included in the report. When it is necessary to issue a complete new report, this shall be uniquely identified and shall contain a reference to the original that it replaces.

(j) Nonconformity

(i) The laboratory shall have a documented procedure that shall be implemented when any aspect of its laboratory activities or results of this work do not conform to its own procedures or the agreed requirements of the customer. The procedure shall ensure that:

- the responsibilities and authorities for the management of nonconforming work are defined;
- actions are based upon the risk levels established by the laboratory;

- an evaluation is made of the significance of the nonconforming work, including an impact analysis on previous results;
- a decision is taken on the acceptability of the nonconforming work
- the customer is notified and work is recalled;
- the responsibility for authorizing the resumption of work is defined .

(ii) When a Nonconformity occurs, the laboratory shall address its consequences and take corrective action to control and correct it, determining the causes of the nonconformity and determining if similar nonconformities exist, or could potentially occur.

(iii) Corrective actions shall be implemented and reviewed of their effectiveness and shall be appropriate to the effects of the nonconformity encountered.

10.3 SITE LABORATORIES

1 Site laboratory is a testing laboratory facility

(a) Set up in a dedicated location or at a customer's premises

(b) Outside of the main or permanent laboratory

(c) Set up for testing purpose for periods not exceeding three years

(d) In close proximity to the main laboratory (usually within 50 miles from the main laboratory)

(e) And operated by an ISO/IEC 17025 accredited main laboratory under the same management system.

2 Site laboratory outside the above limitation shall have its own management system.

3 Independent testing Laboratories can operate site laboratory(s) with the above limitation under its management system if :

(a) The site laboratory(s) is / are not performing any 'key activities' (i.e. policy formulation, process and/or procedure development and, as appropriate, contract review, planning conformity assessments, review, approval and decision on the results of conformity assessments).

(b) Main laboratory ensure the site laboratory activities are not influenced by the contractor.

(c) Site laboratory capable to preform sampling according to defined sampling methods.

(d) Site laboratory testing scope is in the same scope of testing at which the main laboratory is accredited.

(e) Able to have prompt supervisory oversight from the main laboratory. This can be achieved via on-site assessment, record review and frequent internal audits (in frequency not more than 3 months) or any other quality control procedure.

(f) Site laboratory have its own organization structure and personnel technically competent and authorized to perform the given testing activities.

(g) Site laboratory is equipped with equipment, which are required for the correct performance of testing activities.

(h) Site laboratory is approved from the relevant authorities or by Engineer / Engineer Representative.

(i) Site laboratory complies with 10.2.2 requirements of this part.

4 The approved site laboratory shall be approved on basis of its technical personnel. If any essential personnel depart the laboratory this will result in the laboratory losing the approval for those activities the essential personnel were solely responsible for. The laboratory is responsible to inform the Engineer / Engineer Representative or the relevant authorities whenever the status of the essential personnel changes.

5 The approved site laboratory shall be approved on basis of its testing scope. If the site laboratory activities are extended to cover a new testing scope, the laboratory shall seek approval for the new scope from the Engineer / Engineer Representative or from the relevant authorities.

10.4 GOVERNMENT LABORATORY

1 Where requested by the Engineer or directed in the project documentation, samples of materials shall be submitted for testing to the Government Laboratory.

2 The Contractor is responsible for the timely delivery of all samples and materials to the Government Laboratory in accordance with this Part.

END OF PART