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ARAB ENGINEERING BUREAU

9 MATERIALS

9.1 GENERAL

9.1.1 Scope

- 1 This Part specifies the requirements for materials incorporated in the Works. In the context of this Part, components and items of equipment are to be considered as materials and all requirements applicable to materials are likewise applicable to components and items of equipment.
- 2 The following Sections and Parts are referred to in this part:

This Section

Part 7 Submittals

Section 2 Quality Assurance and Quality Control

9.1.2 Materials from Gulf Cooperation Council (GCC) States

- 1 All materials and components for the Works shall be locally sourced where practicably possible. Where a locally sourced material or component is not available then it shall be sourced from a GCC member state or other source required by the Government of the State of Qatar.
- 2 The source of any material shall be approved in writing by the Engineer..
- 3 Notwithstanding the available source of any material, the selection shall be based upon quality and its ability to meet the minimum requirements of the QCS over cost.

9.1.3 Product Data

- 1 Unless otherwise agreed with the Engineer, the Contractor shall submit product data for all materials to be incorporated in the Works.
- 2 Product data shall be explicit with regard to the actual material to be incorporated in the Works.
- 3 Product data shall include, but not be limited to:
 - (a) Size and dimensions of product.
 - (b) Fittings and fixings associated with product.
 - (c) Colour and surface finish of product.
- 4 The product data shall provide sufficient information for the Engineer to determine that the products submitted conform to the requirements of the Project Documentation.
- 5 Where product data submittals include manufacturer's catalogues which detail more than one product or size, capacity etc. of the same product, the Contractor shall clearly indicate which product is being presented for approval.
- 6 Product data shall be presented on A4 size paper and electronic format whenever possible.

9.1.4 Quality of Materials

- 1 All materials required to comply with a particular national or international standard shall be marked with the certified trade mark associated with the organisation responsible for the standard. The mark of conformity of any approved third party certification body or an equivalent mark shall be an acceptable alternative to this requirement.

- 2 The requirements of Clause 9.1.4 (1) shall not apply where the Engineer is satisfied and confirms to the Contractor in writing that third party quality assured materials are not readily available or appropriate. In such cases, and where materials are required to comply with a particular standard or its equivalent, the Contractor shall submit to the Engineer test certificates, furnished by the supplier or manufacturer of the materials, indicating compliance with the relevant standard.
- 3 As soon as possible after the Contract has been awarded, the Contractor shall submit to the Engineer for his approval a list of proposed suppliers and sources of materials required for the execution of the Works.
- 4 Names of additional suppliers and sources of materials may be submitted by the Contractor during the execution of the Contract, but no source of supply shall be changed without the Engineer's approval.
- 5 A single source of supply shall be used for materials which have characteristics that:
 - (a) Differ according to source of supply or manufacture.
 - (b) Could affect the appearance of the completed Works.
 - (c) Could affect the performance of the completed Works.
- 6 All materials and equipment incorporated in the Works shall be designed and manufactured or constructed to withstand the climatic conditions experienced in Qatar.

9.1.5 Manufacturer's Instructions

- 1 Unless otherwise described in the Project Documentation, the use, installation, application or fixing of materials shall be in accordance with all applicable recommendations and instructions of the manufacturers.
- 2 The Contractor shall obtain the manufacturer's instructions and recommendations relating to all materials and proprietary articles and systems to be incorporated in the Works, and shall keep copies of the same on site at all times for the information of the Engineer. Such instructions and recommendation shall be considered to be part of this Specification.
- 3 Where appropriate, the Contractor shall make use of any technical advisory service offered by manufacturers regarding use and installation of materials.

9.1.6 Samples

- 1 Samples shall be provided when requested by the Engineer or instructed by the Project Documentation. Materials subsequently supplied shall conform to the quality of the samples which have been approved by the Engineer.
- 2 Each sample shall bear a securely fixed label bearing the following information:
 - (a) Project identification.
 - (b) Contractor identification.
 - (c) Sample identification including all information as to manufacturer, model, catalogue number, finish, etc.
 - (d) Space for approval signature of the Engineer.
- 3 Where approval of materials is required, samples or other evidence of suitability shall be submitted to the Engineer for approval. No such material shall be ordered or used until written approval is received from the Engineer.

- 4 Where samples of finished work are specified, works shall not proceed until the Engineer has approved the sample of the finished work. Samples of finished work shall be made under conditions similar to those which will be experienced during the construction of the Works.
- 5 Samples which have been approved shall be carefully protected and maintained in a manner which will not allow them to deteriorate. Unless otherwise specified or forming part of the finished Works, samples shall be removed when no longer required by the Engineer.
- 6 All materials and workmanship shall be up to the standard of the approved samples.
- 7 Samples shall be of sufficient size to indicate the general visual effect. The minimum acceptable size of sheet materials shall be 300 x 300 mm.

9.1.7 Shop Drawings

- 1 The Contractor shall prepare Shop Drawings in accordance with the relevant provisions of Part 7, Submittals, of this Section. The Shop Drawings shall include material description and identification where applicable.

9.1.8 Alternative Materials

- 1 The Contractor may propose the use of alternatives to materials specified in the Project documentation. Such proposals shall be complete with all supporting information showing that the alternative is equal or better than the specified material in all respects.
- 2 The use of alternative materials shall only be permitted if approved by the Engineer in writing.

9.1.9 Owner Furnished Materials

- 1 Materials to be furnished by the Owner and installed by the Contractor shall be as specified in the Project Documentation.
- 2 The Contractor shall be responsible for the collection and delivery to the Site of materials to be furnished by the Owner and installed by the Contractor. The collection location of such materials shall be as detailed in the Project Documentation.
- 3 The Owner reserves the right to place and install items of equipment, furniture, furnishings, partitions etc., in completed or partially completed parts of the Works upon the understanding that the exercising of such a right will not substantially interfere with the regular progress and completion of the Works.

9.1.10 Delivery of Materials to Government Stores

- 1 Materials to be delivered to the Government stores shall be as detailed in the Project Documentation.
- 2 Prior to delivery to store, the Contractor shall make all items available for inspection by the Engineer's Representative.
- 3 The Contractor shall be instructed where to deliver the items and the date on which the delivery is to be made.
- 4 Each delivery to store shall be accompanied by a detailed delivery note, which shall be prepared by the Contractor, in a format approved by the Engineer.
- 5 On arrival at store, all items shall be re-inspected by the Engineer's Representative, before being accepted.
- 6 The Contractor shall be issued with a receipt for the delivered items, which have been accepted.

9.2 MATERIALS

9.2.1 Ordering Materials

- 1 The Contractor shall notify the Engineer of any material which he is unable to order due to lack of information, non-availability, or for any other reason, within sixty (60) days of the acceptance of the Contract.
- 2 The Contractor shall ascertain the quantities of materials for ordering from the Project Documentation. The Bill of Quantities alone shall not be used as a basis for ordering materials.
- 3 The Contractor shall be responsible for any delays to the Contract due to non-compliance with this Clause.

9.2.2 Delivery of Materials to the Site

- 1 Materials shall be new and shall bear complete identification. Such identification shall include, but not be limited to, the class, model, number and type of the material. Where materials are not so identified, the Contractor shall furnish copies of invoices or certificates providing complete identification.
- 2 Deliveries shall be programmed to minimise handling and deterioration due to site storage.

9.2.3 Handling of Materials

- 1 Materials shall be handled in such a manner as to avoid any damage or contamination, and in accordance with all applicable recommendations of the manufacturers.
- 2 Particular care shall be taken when handling components with lifting equipment. Slings, lifting hooks, forks and the like should only be applied at the points indicated as being suitable for application by the manufacturer.

9.2.4 Storage of Materials on the Site

- 1 The Contractor shall allow for delivery of all materials & equipment to site, as well as multiple handling required in the Works. The Contractor shall also provide for adequate storage of all materials and equipment used in the Works for the whole period of the Contract. The said storage shall be as per the applicable Specifications of all concerned authorities and departments.
- 2 Materials shall be stored in such a manner as to preserve their quality and condition to the standards required by this Specification. Any recommendations made by the manufacturer which relate to storage of materials and equipment shall be fully complied with.
- 3 The quantity of materials and equipment stored on the Site shall be consistent with that necessary for efficient working.
- 4 Incompatible materials shall be separately stored.
- 5 Storage shall be such that any particular consignment can be readily identified by its delivery ticket, test certificate, etc.
- 6 Materials which are liable to deteriorate shall be used in the order of delivery.

9.2.5 Protection of Materials

- 1 Adequate protection against any form of damage or deterioration to materials shall be provided and shall include protective tapes, casing and the like which shall be cleared away on completion of the Works. Tarpaulins shall be provided where necessary.

- 2 Particular care shall be taken to protect finished surfaces during the application of adjacent work.
- 3 Materials which are subject to deterioration by ultra violet light shall be stored so that they are not exposed to direct sunlight.

9.3 TESTING OF MATERIALS

9.3.1 General

- 1 The Engineer may test any materials before they leave the manufacturer's premises or after delivery to the Site.
- 2 The Engineer may reject any materials after delivery to the Site should he consider them unsatisfactory, notwithstanding any preliminary test and approval of the materials at the manufacturer's premises.
- 3 The costs of all tests necessary to ensure compliance with the Contract, including the cost of delivery to the testing laboratory, shall be borne by the Contractor.
- 4 Should the Engineer not inspect any materials or goods at the place of manufacture, the Contractor shall without cost to the Contract obtain certificates of test from the supplier of such goods and shall send such certificates to the Engineer. Such certificates shall certify that the materials or goods concerned have been tested in accordance with the requirements of the Specification and shall include the results of all tests carried out. The Contractor shall provide adequate means of identifying the materials and goods delivered to the site with the corresponding certificates.
- 5 The Engineer may require samples of materials for additional tests. The Contractor shall provide attendance as required by the Engineer to witness sample collection and testing carried out by the Contractor.
- 6 The Contractor shall be responsible for the appointment of an accredited Independent Testing Laboratory approved by the engineer to carry out all the testing of materials as required by the Engineer, defined in the Contract or as specified in the QCS. The Contractor shall supply full details of the testing laboratory he proposes to appoint including facilities, personnel, etc. for the Engineer's approval within 7 days of the Engineer's order to commence work on site. This Independent Testing Laboratory shall be chosen from any approved accredited laboratory list required by the Owner or Engineer or as defined in the Contract.
- 7 All testing for compliance with the Specification shall only be carried out using laboratory equipment, which has been calibrated and certified by an Approved calibration service company. Approval requirements of any such company shall be as defined by the Government of the State of Qatar, by the Engineer or as stated in the Contract.
- 8 All samples and records shall be preserved for as long as the Engineer may direct and they should be kept and labelled in an orderly fashion. Testing equipment and all samples and records shall be open to inspection by the Engineer or his representative at all times.
- 9 The laboratory shall be provided with equipment and trained personnel sufficient for carrying out all tests referred to in the Specification applicable to the contractor's scope of work as defined in the contract. The laboratory shall be capable of carrying out all the relevant tests at the frequency required by the Specification and by the rate of progress required by the Contractor's approved programme for the works.

9.3.2 In-situ Testing and Nuclear Density Measuring Devices

- 1 No person, company nor organisation will be permitted to determine in-situ density by means of a nuclear type density measuring device without complying with the following requirements:
 - (a) Each device held by any organisation shall have a valid calibration certificate issued by the MOE. The validity of any such certificate shall not exceed six months.
 - (b) Calibration certificates will only be issued for any particular device if MOE is satisfied that the identified storage location of the device is, suitable and safe, and that an approved radiation officer has been appointed by the organisation.
 - (c) General and detailed storage location plan is to be provided to MOE for each device. A letter of undertaking from the organisation stating that for each device should there be a need for it to be stored elsewhere at anytime overnight MOE will be so notified in advance to ensure compliance of safe storage requirements.
 - (d) Only persons holding a valid user certificate issued by MOE shall be permitted to operate these devices. Such certificates shall only be issued after the applicant has demonstrated competence in operating the device both technically and safely. The validity of any certificate shall not exceed six months.
 - (e) During operation of the device the operator and any assistance shall wear suitable film badges or a personnel radiation warning alarms. Evidence of the organisation having these available during the intended validity of a user certificate shall be required prior to the issue of such user certificates.
 - (f) Non-adherence to the above requirements will be reported to the relevant authorities for suitable action.

9.3.3 Test Certificates

- 1 Materials which have been tested shall be issued with a test certificate. The test certificate shall clearly indicate whether the material has passed or failed any test or tests performed. The test certificates shall also clearly indicate whether the tested material is suitable for use or inclusion in the Works.
- 2 Test certificates shall be issued by the manufacturer, an approved third party accredited testing laboratory or other organisation as designated in the Project Documentation or as directed by the Engineer.

9.4 SPECIAL MATERIALS

9.4.1 Proprietary Articles and Systems

- 1 The specification of proprietary articles and systems supplied by particular firms is not necessarily binding upon the Contractor. If approval is obtained, the Contractor may order from other sources supplying articles of equal quality.
- 2 The Contractor shall submit full details and samples of the alternatives offered together with samples of the items specified to enable a proper comparison to be made. A minimum of twenty one (21) days shall be allowed from the date all information required by the Engineer has been submitted for his decision as to the acceptability or otherwise of the alternative offered.
- 3 The Contractor shall be deemed to have included for the specified item in the Contract price, not his proposed alternative.
- 4 If so directed, the Contractor shall have the proposed alternative tested for quality, strength, durability, finish or efficiency by an approved accredited testing laboratory.

- 5 If the Engineer accepts an alternative, any costs resulting, including all engineering and design services, and changes or adjustments in materials or work directly or indirectly brought about by the substitution, shall be borne by the Contractor.
- 6 On completion of the Contract, all instructions and recommendations for proprietary articles and systems shall be neatly assembled in suitable folders or binders, provided with a contents list and handed to the Engineer.

END OF PART

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