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ARAB ENGINEERING BUREAU

7 SUBMITTALS

7.1 GENERAL

7.1.1 Scope

- 1 This Part specifies the general procedures and requirements for submittals.
- 2 Related Parts and Sections are as follows:

This Section

Part 9..... Materials

Part 10..... Occupational Health and Safety

Part 13..... Setting-out of the Works

Part 21..... Final Inspection and Handover Procedures

Section 2 Quality Assurance and Quality Control

Section 11 Health and Safety

7.1.2 Format of Submittals

- 1 The format of submittals (electronic and hard copy) shall be as required by the Engineer or stated in the Contract.

7.1.3 Mistakes in Information

- 1 The Contractor shall be responsible for and shall pay the extra cost, if any, occasioned by any discrepancies, errors, or omissions in submittals supplied by him, whether they have been approved by the Engineer or not.

7.2 DEFINITIONS / INTERPRETATION

7.2.1 Product Data and Shop Drawings

- 1 Product Data and Shop Drawings include drawings, diagrams, illustrations, brochures, schedules, bills of materials and other data prepared specifically for the Works.
- 2 The information may be prepared by the Contractor, his sub-contractors, suppliers or distributors, manufacturers or fabricators.
- 3 The information must illustrate or describe the manufacture, fabrication, construction and installation of the Works or a portion thereof.

7.2.2 As-Built Survey Drawings

- 1 As-Built Surveys are topographical surveys that show changes to topography as a result of the construction of the Works. Changes to topography include the construction of new structures and roads, demolition of existing structures and roads and the like. The As-Built Survey Drawings shall form a comprehensive record of the topographical changes resulting from the construction of the Works in all respects.
- 2 As-Built Surveys shall also show all sub-surface elements of the Works. Sub-surface elements include pipelines, ducts, cables, chambers, manholes and the like. The As-Built Survey Drawings shall form a comprehensive record of the sub-surface elements of the Works as constructed in all respects.

7.2.3 As-Built Record Drawings

- 1 As-Built Record Drawings are drawings that show the Works as constructed in all respects. They are in addition to the elements of the Works shown on the As-Built Survey Drawings.

- 2 In addition to the above, the As-Built record drawings shall include all finished horizontal and vertical alignments, chainage, setting out, levels, and details. It shall also include all underground services, utilities, surface features, and any additional information deemed necessary to comprehensively represent the works.
- 3 Tagging / Numbering for Assets in the as built drawings: The Contractor shall coordinate with the end user to obtain the latest Tagging / Numbering for Assets prior to submission of as-built drawings.

7.2.4 Manufacturer's Representative

- 1 Manufacturer's representatives are persons actively working at the manufacturer's factory with a minimum of 5 years' experience. They should be familiar with the actual process of manufacturing, installing, and operating the product they represent.
- 2 Sales representatives or agents are not an acceptable alternative to manufacturer's representatives.

7.2.5 Temporary Works Drawings

- 1 Temporary Works Drawings are plans for temporary structures and facilities prepared by the Contractor specifically for the Works.
- 2 Elements of work that may affect the safety of persons or property shall be checked and certified by an approved safety inspector.
- 3 Calculations demonstrating adequacy of Contractor's design shall be submitted with the Temporary Works Drawings.

7.2.6 Samples

- 1 Samples are physical examples illustrating materials, equipment, or workmanship and shall be used to establish standards by which the work will be judged.

7.2.7 Manuals

- 1 Manuals are manufacturer's written installation, start-up, operating, maintenance and repair instructions. They shall include parts lists, pictures, sketches and diagrams specific to the equipment supplied.

7.3 SUBMITTAL PROCEDURES

7.3.1 General

- 1 The Contractor shall submit to the Engineer for his review and approval all drawings and data as called for in the Project Documentation, this part or subsequently covered by variations.
- 2 Submittals and their contents shall be properly prepared, identified, and transmitted in accordance with the Project Documentation or as the Engineer may otherwise direct. Where possible and practicable, the Contractor shall present submittals on A4 size paper.
- 3 All submittals shall be in triplicate and electronic format unless otherwise specified in the Project Documentation.

7.3.2 Schedule of Submittals

- 1 The Contractor shall prepare and submit a list of all submittals, required by the Contract or otherwise, showing the forecast date for submission of each item within thirty (30) days of the award of the Contract.

- 2 Drawings and data shall be submitted to meet the time schedules stipulated in the Project Documentation and where such time schedules are not specified, to meet the requirements of the approved programme. Unless specified otherwise, the Contractor shall allow not less than thirty (30) days for the review of submittals by the Engineer (excluding the time necessary for delivery or postage) and shall cause no delay in the work or the work of any other Contractor.
- 3 Extension of time will not be granted because of the Contractor's failure to make timely and correctly prepared and presented submittals with allowance for the checking and review periods.

7.3.3 Method of Submittal

- 1 The Contractor shall deliver submittals by means of dated, signed, and sequence numbered transmittals. The transmittal shall be on the Contractor's letterhead and shall fully describe the submittal contents. Submittals are not acceptable directly from sub-contractors, suppliers, or manufacturers.
- 2 In each transmittal the Contractor shall state the Drawing numbers and Specification Sections, Parts, and Paragraphs to which the submittal pertains. Accompanying data sheets, catalogues and brochures shall be identified in the same manner. Where several types or models are included in a single data sheet, catalogue or brochure, the Contractor shall delete non-applicable portions or specifically indicate which portions are intended and applicable.

7.3.4 Contractor's Review and Approval

- 1 Every submittal shall bear the Contractor's review and approval stamp certifying that the Contractor has:
 - (a) Reviewed, checked, and approved the submittal.
 - (b) Co-ordinated the contents with the requirements of the Works, the Project Documentation and any related work.
 - (c) Determined and verified all quantities, field measurements, field construction criteria, materials, equipment, catalogue numbers, and similar data.

7.3.5 Corrections and Re-submission

- 1 The Contractor shall make all required corrections and shall resubmit corrected submittals until approved.
- 2 The Contractor shall direct specific attention in writing to revisions other than the corrections called for on previous submittals.
- 3 The Contractor shall identify each re-submission with the sequential number of the original submittal followed by consecutive letters starting with "A" for first re-submission "B" for second re-submission etc.

7.3.6 Check of Returned Submittals

- 1 The Contractor shall check submittals returned to him for correction and ascertain if the corrections result in extra cost to him above that included and allowed for under the Project Documentation and the Contract. The Contractor shall give written notice to the Engineer within five (5) days if, in his opinion, such extra cost results from corrections.
- 2 By failing to so notify the Engineer or by starting any Work covered by a submittal, the Contractor waives all claims for extra costs resulting from required corrections.

7.3.7 Review and Approval

- 1 Submittals will be reviewed only for conformance with the design concept of the Project and with information given in the Project Documentation. The approval of a separate item as such shall not indicate approval of the assembly in which the item functions.
- 2 The approval of submittals shall not relieve the Contractor of responsibility for any deviation from the requirements of the Project Documentation unless otherwise agreed with, and confirmed in writing by, the Engineer.
- 3 Any approval from the Engineer shall not relieve the Contractor of responsibility for errors or omissions in the submittals.

7.3.8 Incomplete Submittals

- 1 Submittals which are incomplete, including those not correctly transmitted, not correctly titled and identified, or not bearing the Contractor's review and approval stamp, may be returned to the Contractor without review.

7.3.9 Conformance

- 1 Work shall conform to the approved submittals and all other requirements of the Project Documentation and the Contract unless subsequently revised by an appropriate variation order, in which case the Contractor shall prepare and submit revised submittals as may be required.

7.3.10 Interrelated Submittals

- 1 Except where the preparation of a submittal is dependent upon the approval of a prior submittal, all submittals pertaining to the same portion of the Works shall be submitted simultaneously.
- 2 The Contractor shall not proceed with any related work which may be affected by the work covered under submittals until the applicable submittals have been approved.

7.4 PROGRAMME

7.4.1 Programme of Works

- 1 The Contractor shall prepare and submit to the Engineer a Programme of Works in accordance with Clause 14 of the General Conditions of Contract.
- 2 The Contractor shall update the Programme of Works as required during the construction of the Works.
- 3 When instructed by the Engineer, the Contractor shall prepare and submit a detailed programme for a particular section of the Works. The detailed programme shall be an elaboration of the overall programme and shall be in an appropriate form.
- 4 The Contractor shall incorporate the times of occupation of all sub-contractors in the programme and shall make provisions for the access of other contractors as required by the Engineer.
- 5 The Contractor shall submit a Programme of Works that shall include, but not be limited to the following:
 - (a) General description of the arrangements and methods proposed by the Contractor to carry out the Works.
 - (b) Detailed list of the Contractor's resources (plant, equipment, vehicles, materials, laboratory, workshop, professional personnel, specialists, labour, organization chart, etc.) assigned to the Works.

- (c) Time schedule of the mobilisation and deployment of the required resources and their estimated average production rates to complete the Contract within the time for completion.
 - (d) The Programme required under the General Conditions of Contract.
 - (e) Cash-flow statement showing anticipated payments due under the Contract.
- 6 The Programme shall be a linked and resourced Gantt chart produced on approved project programming software and shall show the following:
- (a) The order in which the Works are to be constructed.
 - (b) Design periods (if applicable).
 - (c) Submission and approval periods for design, Operations & Maintenance (O&M) manuals, record drawings, etc.
 - (d) Detailed activities for each task such as excavation, pipe laying, backfill, reinstatement, etc.
 - (e) Procurement, installation and commissioning periods for Mechanical, Electrical, Instrumentation, Control and Automation (MEICA) works.
 - (f) Power and other services connections.
 - (g) Tests before and after (if applicable) completion.
- 7 The Contractor shall programme his work in accordance with the Contract and in such a way that he shall not impede any other Contractor working on or adjacent to the Site.
- 8 For sewerage works, unless otherwise instructed by the Engineer, the Contractor shall programme his works such that he commences at the downstream manholes and continues upstream in a logical sequence.
- 9 The Programme of Work shall identify when access to areas of live plant are required and when shutdowns are required.
- 10 Any Programme of Work submitted with the tender documents shall be fully updated before the start of the Works.
- 11 The Engineer shall give his comments on the programme within 7 days of its submission. The Contractor shall not commence the permanent works until the Engineer has approved his Programme of Work.
- 12 The approval by the Engineer of the Programme of Work shall not relieve the Contractor of any of his duties or responsibilities under the Contract.
- 13 The programme shall be submitted in electronic format and as a paper print. The paper print may hide (roll up) activities for individual tasks in order to reduce the size and number of prints required. The electronic version shall be fully detailed.

7.5 ORGANIZATION CHARTS

7.5.1 Staff Organisation Chart

- 1 The Contractor shall submit a Staff Organisation Chart for the Engineer's approval within ten (10) days of the award of the Contract.
- 2 The chart shall show the organisation of executive, administrative and supervisory personnel associated with the Project and indicate the relationship between them where appropriate. It shall include all personnel from Project Manager down to foreman level and give a full description of their duties. The qualifications and experience of all personnel shown on the chart shall be provided.

3 The Engineer may interview any of the personnel proposed by the Contractor prior to approval.

4 The Contractor shall update the chart whenever key personnel are reassigned.

7.5.2 Health and Safety Organisation Chart

1 The Contractor shall submit a Health and Safety Organisation chart for Engineer's approval within Thirty (30) days of the award of the Contract.

2 The Chart shall be as detailed in Part 10 Occupational Health and Safety, of this section.

7.5.3 Quality Organisation Plan

1 The Contractor shall submit a Quality Organisation Plan to the Engineer for approval no later than 30 days from the award of the contract.

2 The plan shall be as detailed in Section 2 Quality Assurance and Quality Control

7.6 PLANS

7.6.1 Health and Safety Plan

1 The Contractor shall submit his Health and Safety Plan to the Engineer for approval no later than thirty (30) days of the award of the Contract.

2 The plan shall be as detailed in Part 10 Occupational Health and Safety, of this Section.

7.6.2 Quality Assurance Plan

1 The Contractor shall submit his Quality Assurance Plan to the Engineer for approval no later than thirty (30) days of the award of the Contract.

2 The plan shall be as detailed in Section 2 Quality Assurance and Quality Control.

7.6.3 Inspection and Test Plan (ITP) Schedule

1 The Contractor shall submit his ITP Schedule to the Engineer for approval no later 30 days from the award of the contract.

2 The plan shall be as detailed in Section 2 Quality Assurance and Quality Control.

7.7 SITE DIARY

7.7.1 General

1 A Site Diary shall be kept on site by the Contractor and entered daily for the duration of the Contract. The diary must be entered neatly and legibly in English and should indicate all visitors to the Site and the reason for the visit. The diary shall also record the following:

- (a) Labour on site by trade and its allocation.
- (b) Sub-contractors working on site.
- (c) Material and equipment delivered to site.
- (d) Material and equipment utilised.
- (e) Plant, equipment and tools brought on to or removed from site including hired plant.
- (f) Work progress during the day.
- (g) Verbal instructions requiring written confirmation.
- (h) Temperature and weather conditions.
- (i) Details of any occurrence which may affect the progress of the Works.

- 2 The Contractor shall also supply to the Engineer, weekly returns as to the number of men and Construction Plant employed and the nature of the Works on which they were employed.
- 3 The diary shall become the property of the Engineer on completion of the Works

7.8 REPORTS

7.8.1 General

- 1 Where relevant, reports should be referenced to the Programme of Works.
- 2 The Contractor shall submit three copies of each report unless otherwise specified.

7.8.2 Procurement Status Reports

- 1 The Contractor shall prepare and submit a Procurement Status Report on a weekly basis for the duration of the Contract. The report shall include the following:
 - (a) A list of materials and items procured.
 - (b) A list of items delivered to the site.
 - (c) References to all correspondence and transmittals between the Contractor and the Engineer regarding approval of such materials and items.

7.8.3 Progress Report

- 1 The Contractor shall prepare and submit a Progress Report on a monthly basis for the duration of the Contract. The report shall be submitted to the Engineer before the seventh day of each month. The report shall include the following:
 - (a) Labour employed on the Site divided into supervisory staff, tradesmen and others giving daily totals.
 - (b) Labour employed on the Site by sub-contractors divided into supervisory staff, tradesmen and others giving daily totals.
 - (c) Plant, tools and equipment in working order on the Site on each day.
 - (d) Accidents to anyone working on the Site which required medical attention.
 - (e) Details of monthly progress and status of the Works in general terms.
 - (f) The date of commencement and completion of all critical activities.
 - (g) Details of problem areas.
 - (h) Details of current or anticipated causes of delay along with their estimated impact on progress and the corrective measures taken or proposed.
 - (i) Progress photographs.

7.9 PHOTOGRAPHS

7.9.1 General

- 1 The Contractor shall obtain a photographic record of the execution of the Works by taking photographs from various points as the Engineer shall specify from time to time. Any photograph which is not clear and distinct, double exposed, over exposed, etc. shall be retaken until approved by the Engineer at the Contractor's expense.
- 2 Photographs taken in connection with the Project shall not be utilised by the Contractor for commercial advertisement either of his organisation or of any materials or equipment used on the Works, without the written approval of the Engineer.
- 3 The Contractor shall supply to the Engineer, two number photographic albums suitable for mounting all site and progress photographs.

- 4 All photographic records shall consist of the required number of colour prints on photographic paper and a digital copy
- 5 The Contractor shall provide six digital cameras and one digital video camera for the exclusive use of the Engineer or his designated representative and supply software, batteries, cables and USB flash drives or external hard drives as required. The Digital camera shall have a minimum specification of 35-105 zoom, with a minimum of 16.0 megapixels for prints up to 20"×30", 8GB internal memory and video/audio facility. The cameras shall be returned to the contractor at the end of the contract period.

7.9.2 Pre-Construction Photographs

- 1 .The Contractor shall arrange to obtain a photographic and video record of the site before the start of the works to fully record the existing conditions of the site and other matters of interest in connection with the works or their surroundings of the project, by taking photographs and videos films from positions agreed with the engineer within 7 days of the photographs /videos being taken. Any photograph/video which is not clear and distinct, double exposed, over exposed, blurred, etc., shall be retaken until approved by the Engineer at the contractor's expense.
- 2 The number of photographs taken shall be sufficient to clearly indicate the condition of existing conditions.
- 3 After approval, the Contractor shall supply two (2) prints, which shall be mounted and labelled by the Contractor, and these shall then be signed and dated by the Contractor and the Engineer. One set of prints shall be returned to the Contractor.

7.9.3 Monthly Photographs

- 1 .The Contractor shall obtain a photographic record of the execution of the works by taking photographs from various points agreed with the Engineer at the commencement of the works, and also as he may specify from time to time during the course of the works. Photographs shall be taken at each of the specified points on a monthly basis until the completion works. The number of photographs to be taken shall be as specified by the Engineer. Any photograph which is not clear and distinct, double exposed, over exposed, etc. shall be retaken until approved by the Engineer at the contractor's expense. Two number 125x90 mm prints of each photograph and a digital copy on CD shall be submitted to the Engineer with 7 days of the photographs being taken. The Contractor's shall also obtain video records showing the progress of the works, at locations and times as specified by the Engineer. The quality and length of the video shall be as specified by the Engineer and may be required to record specialised events or other matters of interest in connection with the works. The video shall include the actual audio recording taken at the time and it shall be in sync with the visual recording. Any video which is not clear and distinct, double exposed, over exposed, blurred, etc. shall be retaken until approved by the Engineer at the Contractor's expense. A digital copy of the video on CD shall be submitted to the Engineer within 7 days of the recordings being taken.
- 2 .A selection of those photographs as agreed with the Engineer shall be included in the monthly reports as described in clause 7.8.3 of this part complete with labels and any pertinent support text.

7.10 DRAWINGS

7.10.1 Working Drawings and Shop Drawings

- 1 Each submitted drawing shall be complete with respect to dimensions, design criteria, materials, connections, bases, foundations, anchors, and the like, and shall be accompanied by technical and performance data and by calculations as necessary to support the information shown on the drawings.
- 2 Unless otherwise specified, each submittal shall include six (6) sets of copies and shall be submitted at least thirty (30) days prior to beginning the work to which the drawings are related. Three sets of copies will be returned to the Contractor marked to show the required corrections or approval.

7.10.2 As-Built Record Drawings

- 1 The Contractor shall prepare As-Built Record Drawings and submit them to the Engineer for approval. Upon approval, the Contractor shall submit a further four (4) copies of each As-Built Record Drawing to the Engineer. All As-Built Record Drawings shall be prepared on clear white polyester film or other durable and easily reproducible medium approved by the Engineer.
- 2 The Contractor shall also submit two digital copies of As-Built Record Drawings. The As-Built Record Drawings shall be accompanied by operation and maintenance manuals, service literature and list of spare parts where applicable.
- 3 The Contractor must prepare the As-Built drawings according to the latest specifications and requirements of utility departments, including production and data delivery.
- 4 The Contractor may be required to obtain approvals from utility departments on the As-Built drawings as a pre-requisite for the Engineer's final approval.
- 5 As-Built Record Drawings and other documents shall be submitted before the expiry of the period of maintenance named in the Contract. The final completion certificate will not be issued, and therefore the final payment will not be released before the submission by the Contractor, and approval by the Engineer of all drawings, documents, and records of the project. One copy of each drawing and document shall be marked for archival storage.
- 6 No final payment shall be made until the As-Built Record Drawings are complete in all respects and approved by the Engineer. The Contractor shall not be entitled to any extra payment or extension of time for the preparation of the As-Built Record Drawings.

7.10.3 As-Built Survey Drawings

- 1 The Contractor shall arrange for As-Built Survey Drawings to be prepared. The survey shall be to the specification of the Ministry of Municipality and shall be undertaken by a survey company on the Ministry of Municipality list of approved survey companies.
- 2 Where a permanent feature has been added, changed or removed the Contractor shall conduct a topographical survey engaging an approved survey company as described in item 1 of this Clause.
- 3 The Contractor shall submit one (1) set of As-Built survey Drawings to the Engineer for approval. Upon approval, the Contractor shall submit a further four (4) sets to the Engineer. All As-Built Survey Drawings shall be prepared on clear white polyester film or other durable and easily reproducible medium approved by the Engineer.

- 4 Unless otherwise stated in the Contract Documentation, the Contractor shall arrange for the As-Built Survey Drawings to be prepared in digital (electronic) format. The digital format shall be in accordance with requirements of the Centre for Geographic Information Systems (CGIS). The Contractor shall also submit two digital copies of As-Built Survey Drawings. It is the Contractor's responsibility to ensure that the digital data compiled by the approved survey company is comprehensive and complete. The Contractor shall at all times during construction, maintain a comprehensive record of all setting-out details and data for chainage, offsets, levels and all sub-surface elements, including pipe works, ducts, cables and any other installation required under the Contract. These records shall be verified by the Engineer. The records shall be incorporated into the As-Built survey undertaken by the approved survey company to form a comprehensive and complete record of the works.
- 5 No final payment shall be made until the As-built Survey Drawings are complete in all respects. The Contractor shall not be entitled to any extra payment or extension of time for the preparation of the As-built Survey Drawings. As-Built Survey Drawings and other documents shall be submitted before the expiry of the period of maintenance named in the Contract. The final completion certificate will not be issued, and therefore the final payment will not be released before the submission by the Contractor, and approval by the Engineer of all drawings, documents, and records of the project. One copy of each drawing and document shall be marked for archival storage.

7.10.4 Data Delivery

- 1 The mapping co-ordinate system for Public Works Authority projects (horizontal and vertical control) is based on Qatar National Grid 1995. The following parameters shall be applied for the digital data submittal.
 - (a) The unit of measurement is the International Metre
 - (b) Transverse Mercator projection, International (Hayford Spheroid)
 - (c) Latitude of Origin 240 27'00" North
 - (d) Longitude of Origin 510 13'00" East
 - (e) False Easting 200,000
 - (f) False Northing 300,000
 - (g) Semi major Axis 6 378 388.000
 - (h) Semi minor Axis 6 356 911.945
 - (i) Scale factor at Central Meridian (51 13' E) 0.999 99
 - (j) 1/f 1/297
 - (k) e^2 0.006 722 670
- 2 The digital data shall be submitted in the following formats:
 - (a) DXF files for use in AutoCAD shall be ASCII text files or otherwise agreed with Engineer. File names should have a maximum of eight characters plus the three-character extension (DXF).
 - (b) DWG files for use in AutoCAD should have a maximum of eight characters plus the three-character extension (DWG).
 - (c) A digital terrain model, including break lines and contours shall also be supplied in a recognised format: ASCII data files, SDR MAP File, MX GENIO file or as otherwise agreed with the Engineer.
- 3 The scale used shall be one-to-one scale.
- 4 The precision shall be double precision.

- 5 Feature accuracy shall be at least 0.01 metres.
- 6 In addition to the following and other pertinent requirements, the Contractor shall obtain the "RD_CGIS LAYERING" *.dxf convention files from the relevant department, and arrange it as per item 8 hereunder or otherwise agreed with Engineer.
- 7 Each layer shall contain only one feature type. If necessary, text may be added to a separate layer to explain the feature type. Colours and line type of features shall be specified by and not individual entities or blocks. Features shall not be duplicated across layers. The Contractor shall obtain from the Engineer the most current specification detailing colour and line type conventions.
- 8 Features should not be represented with user defined symbols. The following representation shall be applied.
 - (a) Polygons must comprise of lines to form closed areas where possible.
 - (b) Line entities must be continuous, not a series of consecutive segments.
 - (c) Arc must be continuous radius, not a series of consecutive segments.
 - (d) Block entities are not allowed.
 - (e) User defined symbols, fonts or line types must not be used on any layer.
- 9 Layer names should be general descriptions of features (eg. Road centreline, kerb, walls, bollards). A list of all layers and associated descriptions shall be provided in the submittal and the list shall be stored in an ASCII text file called: "layers.txt". Layer name should have up to 16 characters only and shall be restricted to letters and digits with the first character of the name being a letter. Names shall not contain special characters such as: \$, -, #. The Contractor shall obtain from the Engineer the current specification detailing naming conventions.
- 10 When the surface and other features are substantially in place, the contractor shall submit the required *.dxf As-Built drawing files (for CGIS to execute the survey verification and immediate update of CGIS Vector Database).
- 11 All information shall be supplied on CDs in the appropriate format.

7.11 MATERIALS APPROVALS

7.11.1 General

- 1 Submittals shall be approved before the materials or equipment covered by the submittals are shipped out in the case of foreign supplies and delivered to the Site in the case of local supplies.

7.11.2 List of Materials

- 1 The Contractor shall prepare and submit a list of the materials to be used in the Construction of the Works within thirty (30) days of the award of the Contract. The materials list shall be neatly bound and shall have an index listing the contents.
- 2 The data for each item listed shall be explicit with regard to details of the actual items being furnished and shall include sufficient information for the Engineer to determine that the products submitted conform to the requirements of the Project Documentation. Such information shall include but not be limited to:
 - (a) Manufacturer's name and address.
 - (b) Trade or brand name.
 - (c) Local supplier's name and address.

- (d) Catalogues, brochures and cuts, marked to indicate the items proposed the intended use.
 - (e) Terms and conditions of the manufacturer's guarantee and warranty.
 - (f) Material inspection and testing agency.
 - (g) Any other information to fully describe the item.
 - (h) Supplementary information as may be required for approval.
- 3 Unless otherwise specified, five (5) bound copies of the materials list shall be submitted, two (2) of which will be returned to the Contractor marked to show the required corrections or approval.

7.11.3 Samples

- 1 Unless otherwise specified, each submittal shall include two sets of samples. One set of approved samples and all disapproved samples will be returned to the Contractor.
- 2 Samples shall be taken in accordance with the provisions of relevant standards where appropriate.
- 3 Unless otherwise specified, samples shall be labelled and properly identified with the following:
 - (a) Date.
 - (b) Part of the Works for which offered.
 - (c) Specification Section, Part and applicable Paragraph numbers.
 - (d) Supplier/manufacturer.
 - (e) Product identification (trade name).
- 4 Samples shall be accompanied by an approved transmittal form along with specifications and other pertinent data required for the Engineer to determine that the material conforms to the requirements of the Project Documentation.
- 5 If requested in writing by the Contractor, samples of value will be returned to the Contractor after completion of the Work.
- 6 Approved samples returned to the Contractor may only be incorporated into the Works upon written approval of the Engineer.

7.11.4 Certificates

- 1 When stated in the Project Documentation or requested by the Engineer in writing, the Contractor shall submit manufacturer's certificates indicating that test results, component manufacture or installation complies with the requirements of the Project Documentation.
- 2 A statement from the Contractor, sub-contractor, equipment supplier, or agent indicating the product installation complies with the requirements of the Project Documentation shall not be considered as a certificate.

7.11.5 Manufacturer's Guarantees and Warranties

- 1 Manufacturer's Guarantees and Warranties shall be submitted prior to handover and final acceptance.

7.12 INSTRUCTION MANUALS

7.12.1 Final Dossier

- 1 The contractor shall submit final dossiers covering all civil, mechanical, electrical activities and machinery installed in the work.

- 2 Contractor shall submit index of final dossiers to engineer for approval. This index shall be included with the below points but not limited to:
- (a) Engineering Documents (detailed as below, but not limited to):
 - (i) Philosophy.
 - (ii) Latest revision of the project specifications.
 - (iii) Geotechnical investigation reports (profile, survey, etc.).
 - (iv) Technical approvals.
 - (b) Quality Records:
 - (i) Construction inspection records as per QC Plan(s) or ITP(s).
 - (ii) Authorised certifications (i.e. lifting equipment, lab records, etc.).
 - (iii) Calibration test certificates.
 - (iv) Process and/or personal qualification records.
 - (v) Non conformities reports.
 - (c) Operation & Maintenance Manuals (soft and hard copy):
 - (i) Guarantees & warranties.
 - (ii) List of equipment (brand name, type, model, range and serial numbers).
 - (iii) Original catalogues.
 - (iv) Manufacturers' final documents and certifications.
 - (v) Manufacturers' operation & maintenance guidelines.
 - (vi) Circuit drawings of brought out electrical equipment i.e. panel, generator, fire alarm system etc.
 - (vii) Part lists and equipment drawings.
 - (viii) Spare part lists (for regular and overhauling maintenance separately and easy to use).
 - (ix) Special tools (The Operation & Maintenance Manual shall highlight and include a brief description of any special tools required).
 - (d) Health, Safety & Environment (HSE) - Documents & Records
 - (e) Training
 - (i) Orientation plan.
 - (ii) Training material.
 - (iii) Training records.
 - (f) As-Built Drawings (soft and hard copy):
 - (i) List of As-Built drawing including revisions which are to be divided unit wise and/or discipline wise.
 - (ii) As-Built drawings.
 - (g) Project Commissioning & Handover Records:
 - (i) Commissioning plan.
 - (ii) Commissioning records & certificates.
 - (iii) Handing over records including closed snag lists.
 - (h) Photographs.
 - (i) Asset list / register and life cycle cost.

7.12.2 Structure of Operation & Maintenance (O&M) Manual

- 1 This specification defines the production of installation, operation and maintenance manuals and similar documents so that they provide information about plant and processes in a consistent and informative way that shall make the documents easy to use. Manuals shall be presented electronically and on paper. Documents from an electronic source shall, when printed, conform to the requirements for documents presented on paper.
- 2 General Requirements:
 - (a) The plant operating manuals shall contain information relevant to the operation of the plant installed. This information shall include descriptions of the plant together with operating instructions and maintenance requirements.
 - (b) The content shall be suitable for plant operators who are experienced in the operation of similar equipment and have a basic technical knowledge. The descriptions shall be clear and concise. Illustrations and schematics shall be used where necessary
 - (c) Manuals shall be produced using word processor for text and CAD for drawings.
 - (d) Text produced by the contractor/consultant describing the specific operation and/or maintenance of an asset, which is contained within an operations manual, shall be generated via a word processor and supplied to the Owner in Adobe Acrobat format or otherwise agreed with Engineer.
 - (e) Technical manuals when provided on paper shall be contained in A4 size, 4-ring, and durable, hard-backed, white standard PVC covered binders, strong enough to last the expected life duration of the plant.
 - (f) The manual shall be provided in several volumes as appropriate to the size and complexity of the plant. Each of the volumes shall not be greater than 38mm thick when printed.
 - (g) The covers shall have a clear PVC pocket on the front and on the spine for top entry insertion of a white title card on which shall be printed the following information:
 - (i) Owner.
 - (ii) Name of location.
 - (iii) Title of manual (name of the plant).
 - (iv) Description of manual.
 - (v) Volume of manual in the series.
 - (vi) Reference/sequence number of the manual.
 - (vii) Content of the volume.
 - (viii) Contract reference number.
 - (ix) Full name, address, telephone number and fax numbers of the supplier.
 - (x) Name of author or editor of the manual.

3 Writing Operating Instructions

- (a) All operations instructions shall use 'plain English language' to reduce reader difficulties. Statements shall be simple and short for easy comprehension; equipment locations shall be clearly stated.
- (b) It may be valuable to begin the instructions with:
 - (i) A condition:
 - (ii) "If the pressure drops more than 5 bars, raise the..."
 - (iii) A time phrase/clause:
 - (iv) "When the meter displays Y, close the..."
 - (v) A location phrase/clause:

- (vi) "In the control room, turn..."
- (vii) A specification of tool or piece of equipment:
- (viii) "Using a screwdriver, remove..."
- (ix) A sitting phrase/clause:
- (x) "At instruments a, switch..."

4 Page and Sheet Layout

- (a) Text sheets shall be A4 size (portrait) having 4 No. punched holes and A3 size drawings (landscape), folded twice with title in bottom right hand corner.
- (b) Full size drawings in plastic wallet placed at rear.
- (c) The bottom of each page shall define the manual reference number, issue number with date (month/year) and page number.
- (d) The issue number commences at '1' on initial printing and shall be raised each time the page is altered in any way.
- (e) Each page within a volume shall be numbered in sequence, including illustrations pages, starting at the first page of the contents list.

7.13 SURVEY AND LAYOUT DETAILS

7.13.1 Setting-out of the Works

- 1 Submittals associated with setting-out of the Works shall comply with the relevant provisions of Part 13 of this Section, Setting out of the Works.

7.14 METHOD STATEMENTS

7.14.1 General

- 1 There is a legal requirement for Contractor including employers and self-employed to develop and submit for comments to the Engineer suitable and sufficient written method of work (commonly known as method statement) for his work activities.
- 2 The above is also to be completed as and when instructed by the Engineer for any identified work activity and submitted as per the timescales to be specified by the Engineer.
- 3 The legal requirement is in the Regulatory Document Section 11 Part 1 in particular section 1.1.7 (Risk Assessments and Method Statement).
- 4 Guidance on compliance with the requirement in regards to method statement is found in Section 11 Part 2 in particular section 2.4 (Risk Assessment and Method Statement)

7.15 APPLICATIONS AND INVOICES FOR COMPLETED WORKS

7.15.1 General

- 1 Applications and invoices for completed Works shall be submitted in accordance with the Conditions of Contract.

7.15.2 Measurement of Quantities

- 1 The Contractor shall provide the Engineer with all assistance, as and when required for the measurement of all quantities. The Contractor shall be responsible for the preparation and duplication of all calculations, cross-sections and other drawings related to quantities in interim payments. These shall be submitted in draft to the Engineer in sufficient time to enable him to check and agree them before submission for payments.

END OF PART

ARAB ENGINEERING BUREAU