



**REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION**

Harbata Governmental Hospital

VOLUME 2- SPECIFICATIONS

PARTICULAR REQUIREMENTS

MAY 2025

Table of Contents

1. SUMMARY OF WORKS	1
2. MECHANICAL AND ELECTRICAL COORDINATION	2
3. CONTRACTOR'S TEMPORARY FACILITIES.....	2
4. SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS.....	2
5. TEMPORARY FIRST AID FACILITIES.....	2
6. TEMPORARY SIGN BOARDS	3
7. CONSTRUCTION PROGRAMME	3
8. SHOP DRAWINGS AND SAMPLES.....	8
9. ENGINEER'S REPRESENTATIVE REVIEW OF SUBMITTALS.....	10
10. ADJOINING PROPERTIES.....	11
11. SUBMITTALS OF RECORDS	11
12. SITE MEETINGS.....	11
13. ASSISTANCE TO THE ENGINEER'S REPRESENTATIVE	11
14. SITE SURVEYS AND RECORDS	11
15. LIMIT OF PROJECT	12
16. SUB-SURFACE INVESTIGATIONS.....	12
17. CODES AND STANDARDS	12
18. BRAND NAMES	12
19. MATERIALS, PLANT AND EQUIPMENT.....	13
20. CONTRACTOR'S DESIGN AND ENGINEERING DATA, DRAWINGS, PRODUCT DATA AND SAMPLES.....	13
21. AS BUILT DRAWINGS	14
22. CERTIFICATES BY AN INTERNATIONAL INSPECTION OFFICE.....	14
23. TEMPORARY SITE & OFFICE FACILITIES FOR THE ENGINEER AND / OR EMPLOYER	14
24. CLEANING.....	17
25. WARRANTIES AND BONDS	18
26. PROTECTION AND MAKING GOOD.....	18
27. MEASUREMENT AND PAYMENT	19
28. BILL OF QUANTITIES	19

Division 1**PARTICULAR REQUIREMENTS****1. SUMMARY OF WORKS****A. Scope**

This Specification covers the construction, completion and remedy defects maintenance of the “Deir El Kamar Governmental Hospital”, which is to be provided as shown on the drawings and as detailed in the Contract Documents.

B. Performance and standards

The performance required of materials and products and the standards to be complied with are specified in subsequent sections of the Specifications.

C. Related Items

Mechanical and Electrical Coordination.

D. Description of the project

The project consists in the construction of the works as shown and described on the drawings:

The works encompasses, but is not limited to, the construction of a 77 beds Hospital at Harbata area located in the Bekaa region. This facility comprises two floors: a ground floor with a total area of 3,320 square meters and a technical first floor covering 595 square meters. The total built-up area of the hospital is approximately 4,600 square meters. In Particular, The Ground Floor consists of the following departments:

- Emergency Department (ER)
- Intensive Care Units
- NICU
- Medical Imaginary Department
- Laboratories
- Central Sterile Supply Department
- Surgery Department (For One Day with 15 Beds Capacity).
- Pediatric Department
- Outpatient Clinics
- Pharmacy
- Kitchen
- Associated Services (Mortuary, Laundry, Utilities etc.)

The External Works include all related infrastructure and site plan works, Landscaped Areas, fence and Gates etc.

2. MECHANICAL AND ELECTRICAL COORDINATION

A. Scope

- 1- This section specifies the Contractor's responsibilities in coordinating the Mechanical, HVAC and Electrical Works.
- 2- The Contractor shall ensure that the Mechanical, HVAC and Electrical Works are carried out in proper sequence having regard to the progress of the work, and that the necessary provision is made for locating, routing, supporting and fixing the engineering services, providing the necessary holes, chases and access for them, and in all respects fully integrating them with the building fabrics.

B. Performance and standards

The Contractor shall obtain all necessary approval from the Engineer before starting any connection works of the infrastructures.

3. CONTRACTOR'S TEMPORARY FACILITIES

- A.** The Contractor shall be responsible for and shall make his own arrangements in respect of all temporary facilities required by him for the execution of the Works including but not limited to:
 - Necessary land and site offices (min 25 m²) for the Contractor's use and the use of his Sub-Contractors
 - Yards and stores
 - Sheds & hard standings, access roads and fencing and the like together with all necessary services, water supply, drainage, sewerage, electricity, power, communications, first aid, fire protection and other facilities.
- B.** The Engineer's approval is to be obtained for the intended siting of all spoil heaps, Temporary Works and services.
- C.** Temporary Works are to be constructed to recognized standards and codes of practice so that they are fit for their purpose. Drawings and details of proposed Temporary Works are to be provided by the Contractor if requested by the Engineer.

4. SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS

The Contractor shall comply with all the requirements of the CDR "Safety, Health and Environmental Regulations" included in Appendix I to the Conditions of Contract.

In the event of any contradiction between these Specifications and the Safety, Health and Environmental Regulations the requirements of the latter shall govern.

5. TEMPORARY FIRST AID FACILITIES

The Contractor shall make his own arrangements for treatment of casualties on the Site in such first-aid units as may be considered necessary and shall provide an adequate number of first-aid units and personnel suitably trained in first-aid treatment, and shall provide for

the removal in ambulances of injured or sick persons to hospitals or to their place of residence.

6. TEMPORARY SIGN BOARDS

The Contractor shall provide and erect at locations agreed with the Engineer one signboard 3.00 x 1.20m , consist of painted galvanized steel frames, painted steel sheets and reinforced concrete base, indicating such particulars as names of Employer, Engineer and Contractor, project name, execution period, etc., all to the approval of the Engineer. The signboard shall be erected within two (2) weeks from commencement and shall be removed upon completion of Works.

7. CONSTRUCTION PROGRAMME

The Contractor shall prepare a Construction Programme showing the order and method in which he proposes to execute the works and the dates upon which the various elements, trades and sections of the works will be started and completed including dates for submittal and approval of shop drawings and samples; for procurement and delivery of materials and equipment; for construction, installation, inspection, testing and commissioning.

The project shall be subdivided into phases and parts to be approved by the Engineer and to be compatible with the programme of work.

A. The Construction Programme shall be in the form of Computerized Network Precedence Diagrams incorporating activities for all work to be performed by the Contractor, his Sub-Contractors and other Contractors to be employed in or about the site, supported by computer analysis and schedules and prepared in accordance with the principles of Critical Path Method (CPM) programming showing at least 300 activities.

The Construction Programme shall be the latest version of PRIMAVERA project planner or other approved software.

B. The Construction Programme shall be prepared by a qualified Network Analysis Engineer in collaboration with the Contractor. The Network Analysis Engineer shall be approved by the Engineer and shall be skilled and experienced in construction programming of the kind specified for this project. The Network Analysis Engineer shall provide the Engineer an access to the Engineer's database for loading into the Engineer's computer, whether by means of floppy diskettes or dataline communications.

C. The network diagrams shall be clearly and accurately presented with work activities relating to specific locations or levels grouped for ease of reference. Each work activity shall have the following information shown in the diagram:

- Activity number.
- Concise description of the work.
- Specification reference or trade code.
- Location of work or area code.
- Duration in calendar days.

D. Computer Analysis

1- In addition to the network diagrams the Contractor shall submit the following computer analysis output:

- Activity Status Report.
- Master Working Report: chronological listing by early start of all activities and milestones.
- Milestone Report: Chronological listing by early start of all milestones.
- Contractor Reports; individual reports, sorted chronologically by early start, for each Contractor. These reports will only have the early start and early finish dates for distribution to Contractors.
- Material Procurement Report: based on the early start Construction Programme, for all material items. This report shall include dates for submittal, approval release for ordering/fabrication, shipping and delivery to site.
- Shop Drawings and Samples Reports: This schedule shall detail the dates for submission and approval of shop drawings and samples required by the Contract Documents, including those required from Contractors shall make due allowance for reasonable time of processing of shop drawings by the Engineer.
- Manpower Report: a listing of all activities displaying estimated crew sizes and manpower requirements for each activity.
- Current Status Report: a listing of actual start and finish dates, activities already started and completed and percentage completion of activities still in progress.
- Cash Flow Report: showing projected monthly and cumulative expenditure.

2- The activity status report shall have the following minimum data for each activity:

- Activity number.
- Concise description of the work.
- Specification reference or trade code.
- Location of work or area code.
- Duration in calendar days.
- Early start date (calendar).
- Early finish date (calendar).
- Late start date (calendar).
- Late finish date (calendar).
- Total float (calendar days).
- Estimate crew size.
- Percentage completion.
- Remaining duration in calendar days.

E. Supporting Data

1- The Contractor shall also prepare and submit in narrative form the number mentioned supporting data with the submittal of his Construction Programme. Any changes in this information shall be submitted with successive updates and revision.

- The proposed number of working days per week.

- The holidays, and other non-working days (except Sundays) observed during the duration of the Contract (by date).
- The planned number of shifts per day.
- The number of hours per shift.
- The planned usage of major construction plant and equipment on the site, on a monthly basis.
- The planned procurement and delivery of local and imported materials.
- The average weekly manpower usage for each trade to be employed for the works.
- The productivity rates for each major work sequence or for any specific activities required by the Engineer.
- Explanation of all changes in logic, durations, manpower, plant and equipment.
- Actual start and finish dates of activities already completed, and percentage completion of activities still in progress.

F. Forty five (45) Day Programme

At monthly intervals, the Contractor shall submit a separate programme developed from the approved Construction Programme covering a period of forty five calendar days and denoting the Contractor's and Sub-Contractor's daily work activities and their interrelationship with the work of other Contractors, if any.

G. Construction Programme Revisions and Updates

- 1- Once the initial Construction Programme is submitted and approved by the Engineer, the Network analysis Engineer shall perform monthly updates in collaboration with the Contractor. The update will follow a visit to the job site where in the presence of the Engineer, the Network Analysis Engineer and the Contractor will record the actual starts and percentages complete and, using this data, update the computer analysis. The updated analysis will be accompanied by a narrative report containing the supporting data referred to herein before, which shall indicate the necessary action dates and requirements for material, labour and plant acquisition. The narrative report shall also focus upon the construction progress and shall particularly note conditions that may delay progress of the work. In the event of such delays, the Contractor shall describe actions proposed to overcome the adverse conditions to maintain the planned Construction Programme.
- 2- Site progress meetings attended by the Engineer, the Contractor, the Network Analysis Engineer and the principal Sub-Contractors, will be held monthly immediately following the monthly site visit referred to in the previous paragraph, specifically to review the progress of the work. At this meeting the latest update of the last approved Construction Programme will be examined with reference to the records made during the said site visit in order to verify the following:
 - Actual start and finish dates of activities completed during the period since the previous update or revision.
 - Remaining durations and percentage of completion for all activities in progress.

- Logic, time and cost data for variation order work that will be incorporated into the Construction Programme.
- Contractor's measures to rectify delays from the planned dates.

3- The Contractor shall perform the work in accordance with the latest approved Construction Programme. If any work is found not to be on programme during any regular review of the work, the Contractor shall immediately advise the Engineer in writing of action proposed to bring the work on programme. The Contractor shall thereupon prepare and submit a revised Construction Programme indicating such action, together with a list of revisions to programme logic. Correction and updating of the Programme will be done as often as necessary until the project is on Programme.

4- Within five (5) working days after receipt of a notice from the Engineer, the Contractor shall submit a revised Construction Programme for any of the following reasons:

- When delays in completion of any activity or group of activities indicates a slippage of the Contract completion date or a Milestone date by fourteen (14) calendar days or ten percent (10%) of the remaining duration of the Contract period, whichever is less.
- When delays in submittals or deliveries or work stoppage area encountered which make replanning of the work necessary.
- When the Programme does not represent the actual execution and progress of the work being performed in the field.
- Where a change in the work sequence is proposed or has been instituted by the Contractor. Any such change should not, in any case, be made without the Engineer's approval.
- Where the issue of a change order or other instruction would significantly effect the programme and/or progress of the works.

5- In the event the Contractor requests an extension of time for completion of the works or requests an extension to the specified milestone dates, he shall furnish such justification and supporting data as the Engineer may deem necessary for the evaluation thereof. Submission of proper substantiation based on revised activity logic, durations and costs is obligatory with any such request.

6- Float belongs to the project and must be used in the best interest of completing the project on time. Accordingly, any existing float shall be used to the maximum extent possible to offset unexpected delays which occur in connection with the Contractor's work, acts of God, and authorized variations in the scope of the work.

H. Programme Submittal Procedures and Requirements

1- Submittal of the initial Construction Programme for approval shall be in accordance with the following procedure:

- The Contractor shall submit his initial Construction Programme, in four copies and one digital, within 3 weeks of the date of signing of the Contract. Such initial Construction Programme shall include the following completed documents:
 - Network Precedence Diagram showing the sequence and interdependence of all items of work required under the Contract and Milestone dates.

- All the computer analysis reports required under this Contract.
- 2- After approval of the Contractor's initial Construction Programme, all subsequent revision and monthly update submittals shall comprise the following:
 - Two (2) prints of the Network Diagrams from the last approved Construction Programme, suitably marked up in red ink to show all revisions, and signed by the Contractor and all Sub-Contractors.
 - Two (2) copies of the updated Activity Status Report.
 - Two (2) copies of all supporting data.
 - Two (2) copies of the updated master working report.
- 3- Revisions and monthly updates to the Construction Programme shall be submitted within five (5) working days of the data date for inputting revised/updated information to create the revision/updated computer analysis. The data date for the first monthly update shall be one month after approval by the Engineer of the Contractor's initial Construction Programme, and successive data dates shall be at monthly intervals. The said data date should coincide with the date of the site progress meeting at which time the records of progress are verified.
- 4- Each programme submitted shall be signed by all principal Sub-Contractors and Nominated Sub-Contractors before being submitted to the Engineer thereby confirming that they have reviewed the said programme. If any Sub-Contractor has reservations regarding his ability to comply with the requirements of the programme to which he has appended his signature, the Contractor shall instruct the Sub-Contractor to list such reservations in writing and a copy thereof shall be submitted to the Engineer with the programme submittal for his information. No reservation by any Sub-Contractor, nor the fact of informing the Engineer in respect thereof, shall relieve the Contractor of his responsibilities under the Contract in the times prescribed therein.

8. SHOP DRAWINGS AND SAMPLES

Shop drawings shall establish actual details of manufactured or fabricated item and of work to be executed; they shall clearly identify materials, dimensions, thicknesses, components, attachments, relation with adjoining work and spaces, and all other pertinent information. Shop drawings shall be based on the actual existing remeasured structure and shall clarify and amplify the design drawings and other design requirements and shall, subject to the Engineer's approval, incorporate minor changes in design or construction as may be necessary or otherwise desirable to suit the requirements of the work. Where the Contract Documents require the Contractor to submit samples, the same shall satisfactorily establish that the quality, construction, workmanship, finish, colour, pattern and any other characteristics of the material or equipment to be provided, are in conformance with the Contract requirements and to the Engineer's reasonable satisfaction.

- A.** The Contractor shall prepare, review, coordinate and submit to the Engineer for his approval (7 days to 14 days) such shop drawings and samples as are required by the Contract Documents or as may be required by the Engineer during the course of the works.
- B.** At the time of making his submission, the Contractor shall inform the Engineer in writing of any deviation between shop drawings/samples being submitted and the requirements stipulated or reasonably implied by the Contract Documents.
- C.** By submitting shop drawings and samples the Contractor thereby represents that he has determined and verified all dimensions, relations to existing work, coordination with work to be installed later, coordination with information in previously submitted shop drawings and has verified their compliance with all the requirements of the Contract Documents. The accuracy of all such information is the responsibility of the Contractor and in reviewing shop drawings and samples the Engineer shall be entitled to rely upon the Contractor's representation that such information is correct and accurate. The Contractor shall be responsible for and shall make any alterations in the work due to discrepancies, errors or omissions in the shop drawings and samples supplied by him whether or not such shop drawings and samples have been approved by the Engineer, provided that such discrepancies, errors or omissions are not due to inaccurate information or particulars furnished in writing to the Contractor by the Engineer. The Contractor shall be responsible for the correct locations of his work, irrespective of approval by the Engineer, and shall pay all costs and expenses incurred by others due to improper location of his work.
- D.** Sub-Contractors shall submit their shop drawings and samples through the Contractor who shall review and coordinate with his own and other Sub-Contractor's drawings and/or samples before submitting to the Engineer. The Contractor shall be responsible in all respects for his Sub-Contractor's shop drawings and samples as if they were his own.
- E.** Neither the fabrication of prefabricated items, nor the ordering of any work, materials or equipment, nor the execution of any work on site, shall commence until shop drawings and samples, relevant to the said items, work, etc., and required by the specifications, have been submitted and approved in writing by the Engineer.

- F.** Shop drawings to be prepared by the Contractor and by his Sub-Contractors for structural, architectural and electro-mechanical works, shall be prepared on the site to facilitate proper liaison and coordination between trades and so as to allow the Engineer ready access for review during the preparation process.
- G.** Shop drawings and samples shall be prepared after site dimensions have been taken. Shop drawings shall be prepared on reproducible transparencies, and using metric units of measurement.
- H.** Shop drawings shall describe accurately the method of fabrication, installation, applied finishes, types and sizes of all members and fixings, and shall, where applicable, indicate methods of marking components for site erection. Shop drawings shall be to scales approved by the Engineer.
- J.** The Contractor shall verify all dimensions and field conditions and shall check and coordinate the shop drawings and samples required in connection with a particular trade or section of the works with the requirements of other trades or section related thereto.
- K.** In order to ensure proper coordination, shop drawings and samples for each system or element of work shall be submitted in a single package. The Engineer may require in writing that all relevant part of a system or element be submitted before any component item is approved.
- L.** Except for finish, pattern, colour and other matters in respect of which the Engineer's decision is required in accordance with the Contract Documents, the Engineer's review and approval of shop drawings and samples submitted by the Contractor is for general conformance with the design concept and specifications and shall not relieve the Contractor from responsibility for any deviation from, or errors or omissions in respect of the requirements of the Contract Documents, unless the Contractor has informed the Engineer in writing of specific deviations and the Engineer has given written approval thereto.
- M.** The Contractor shall make any corrections or amendments required by the Engineer's review of shop drawings and samples and shall resubmit until the "APPROVED" status is achieved. All such corrections or amendments shall be clearly indicated on the resubmitted drawings by the use of revision numbers in circles or triangles, or other method approved by the Engineer.
- N.** The Contractor shall direct specific attention in writing or resubmitted shop drawings and samples to revisions other than the corrections requested by the Engineer or previous submissions. Unless such written notice has been given, approval of a resubmitted shop drawing or sample shall not constitute approval of any changes not requested on the prior submission.

- P.** In the event of written rejection by the Engineer to a particular material of sample, the Contractor shall submit within fourteen (14) calendar days of such rejection, samples of three alternative materials for the Engineer's approval and the Engineer shall reject or approve all or any of these materials within fourteen (14) days of their submission. This procedure shall be repeated until such time as a sample of material is approved by the Engineer. Failure on the part of the Contractor to obtain the Engineer's approval, which shall not be withheld unreasonably, to all or any one sample or material shall in no way relieve the Contractor of his liabilities and obligations under the Contract.
- Q.** The Engineer may at any time call upon the Contractor to submit samples of any material used or to be used in the work, including those specified in the Contract by "Brand Name", for comparison with the specification and/or approved sample. Should any such sample fail to meet the requirements of the specification and/or standard of the accepted sample, then all materials from which the sample has been taken shall be removed from the site immediately and all work executed incorporating such material shall be cut out and made good to the satisfaction of the Engineer all at the expense of the Contractor.
- R.** No acceptance or approval by the Engineer or any shop drawing or sample submission made by the Contractor, nor any notes, comments, stipulations, requests for clarifications, etc., made by the Engineer upon such submissions during his review and approval thereof, shall constitute an authorization to any variation in the Contract Price or to any extra Time for Completion of the Works.

9. ENGINEER'S REPRESENTATIVE REVIEW OF SUBMITTALS

- 1- The Engineer's Representative will process the submission and indicate the appropriate action on the submission and the transmittal.
- 2- The Engineer's Representative will process transmittals in the following sequence:
 - a. Date Received
Date arriving in the Engineer's Representative office.
 - b. Date Return
Date leaving the Engineer's Representative office to the Contractor.
 - c. To/Date
Name of Engineer to whom submission is sent for review and date leaving the Engineer's Representative office.
 - d. From/Date
Name of Engineer reviewing submission and date arriving in the Engineer's Representative office.
 - e. Action
Indicate action taken on submission.
 - f. Distribution
Number of copies distributed and type of material distributed (sepia, print, brochure or sample, etc.).
 - g. Engineer's and Engineer's Representative Remarks
Note major deviations from the Engineer's Contract Documents or reasons for resubmit if there are not notes on the material submitted.

10. ADJOINING PROPERTIES

The Contractor shall prevent damage to existing buildings fences, walls, if any and other properties on the Site or adjacent there to which are to remain in position during execution of the Works. All precautions are to be taken by the Contractor to prevent damage to adjoining property, including ground movements, subsidence, loss of support, movement cracks, etc, as a result of the execution of the Works. Any such damage shall be made good by the Contractor to the satisfaction of the owners of the affected property.

11. SUBMITTALS OF RECORDS

The Contractor shall submit to the Engineer in formats agreed with the Engineer the following records:

- Labour Record each week showing the daily number types and designations of staff and labour;
- Equipment Record each week showing the daily number types and designations of the Contractor's equipment;
- Work Record daily showing the activities and work locations actually carried out and relevant quantities;
- Materials and Plant Record each week showing the type, quantity and designation of all materials and Plant delivered to the Site;
- Weather Record weekly showing daily weather conditions of temperature, humidity, rainfall and winds;
- Monthly Progress Report monthly showing programme; progress; activities carried out and planned,; and any relevant project-related matter;
- Monthly financial report showing actual and projected cash flow.
- Photographs at monthly intervals to show statue of the work taken from 10 approved locations as minimum, 3 prints of 16x20 cm of each photograph monthly.

12. SITE MEETINGS

The Engineer's Representative will hold site meetings with the Contractor at intervals not exceeding 2 weeks to discuss project-related matters. Minutes will be recorded and distributed by the Engineer's Representative to all attendees.

13. ASSISTANCE TO THE ENGINEER'S REPRESENTATIVE

The Contractor shall provide to the Engineer's Representative and his staff at all times during the continuance of the Contract all necessary tools, instruments, labour and assistance in the execution of his and their duties as the Engineer's Representative may require.

14. SITE SURVEYS AND RECORDS

The Contractor shall prepare and maintain documentary records of existing topographic surveys of the Site, sub-surface investigations and all other condition surveys prior to commencement of the work and at all stages during execution. Such surveys and records shall be made available for review as the Engineer may require.

15. LIMIT OF PROJECT

- A.** The Contractor is fully and entirely responsible to set out the exact limits of the project by legal and authorized surveyors (من دوائر المساحة) in accordance with the expropriation decrees and limits of adjoining properties.
- B.** Any conflict in the limits with private properties, whether it is raised during or after the execution and completion of the work, shall remain the full and entire responsibility of the Contractor, and he shall assume all consequences resulting from this conflict.
- C.** The cost of this work shall be deemed to be included in the total price, and will be deducted if not instructed by the Engineer.

16. SUB-SURFACE INVESTIGATIONS

- A.** The Contractor shall carry out all additional sub-surface soil investigations and tests to determine the nature and characteristics of soil strata, bearing capacities, water table and other data required for the execution of the Works on the Site, for the Contractor's construction operations and for ascertaining the adequacy of sub-surface conditions below foundations and structures.
- B.** Such investigations and tests shall be performed in accordance with recognized standards and procedures and conducted at the locations and in the manner approved by the Engineer.
- C.** The cost of this work shall be deemed to be included in the total price, and will be deducted if not instructed by the Engineer.

17. CODES AND STANDARDS

- A.** Reference to codes and standards in the Contractor Documents shall be deemed to include the latest edition or issue except when specifically indicated.
- B.** Where codes or standards are not specifically mentioned in the Contract Documents, work, material, Plant, equipment, performance, tests, manufacture, installation, etc..., shall conform as a minimum to acceptable relevant national or international codes and standards.
- C.** If the Contractor proposes to adopt codes or standards other than those particularly specified, he shall submit to the Engineer complete data with respect to such codes or standards including detailed list of differences between those proposed and specified and a confirmation that the proposed codes and standards meet, as a minimum those specified. The decision of the Employer and the Engineer in respect of such proposals shall be final.

18. BRAND NAMES

Where brand names, manufacturers' or suppliers' names or catalogue numbers or types are mentioned in the Contract Documents, such are for guidance on quality, function, size, design, and working space requirements and the Contractor may offer any equivalent or superior model or make subject to the approval of the Engineer.

19. MATERIALS, PLANT AND EQUIPMENT

- A.** All materials, Plant and equipment incorporated or to be incorporated in the works shall be the best of their respective kind, obtained from reputed suppliers and manufacturers and shall be in accordance with the requirements of the Contract Documents. Materials and Plant shall be suitable for long and trouble-free service and suitable for the intended purpose.
- B.** Defective materials or Plant or those damaged in the course of manufacture, transport, storage, installation, testing or operation shall not be used in the Works and shall be replaced or, subject to the Engineer's approval, repaired in a satisfactory manner to meet the requirements of the Contract Documents.
- C.** In the choice of materials and Plant due regard shall be given to the conditions to which such materials and Plant may be exposed during their service life.
- D.** The Contractor shall, when required submit to the Engineer for review detailed description of all procedures of manufacture, calibration, quality control criteria, testing, examination, performance, etc., in connection with materials, Plant or equipment. The Contractor shall make available to the Engineer upon request detailed production schedules of all materials Plant and equipment to be incorporated in the Works.
- E.** Where and to the extent that materials, products and workmanship are not fully specified they shall be of a standard appropriate to the Works and suitable for the intended purpose stated in or reasonably inferred from the Contract Documents and in accordance with recognized current standards of good practice.
- F.** All the material and equipment used in the project for the various works shall be as per general and technical specifications, drawings, list of approved materials and B.O.Q. or approved equal. In case of equal materials and equipment are proposed, the Contractor to submit all supported document from relevant authorities justifying the equivalent quality and technical performance.

The approval of the Engineer for the proposed materials or equipment shall be within fourteen (14 days) from the date of submission of these materials by the Engineer.

20. CONTRACTOR'S DESIGN AND ENGINEERING DATA, DRAWINGS, PRODUCT DATA AND SAMPLES

- A.** The Engineer may supplement the Contract Drawings with further drawings and instructions in accordance with the Conditions of Contract, as he deems necessary.
- B.** The Contractor shall prepare all other drawings required for Temporary Works and for fabrication and coordination of trades, all shop drawings and other drawings and documents required under the Contract, in addition to drawings and data for work to be designed by the Contractor. (refer to paragraph 10).
- C.** The Contractor shall provide and maintain qualified personnel for the coordination, control and development of the detailed construction design of the works. The Contractor is required to develop, where necessary, the Engineer's design intent by providing the detail drawings and data to enable the execution of the works.

- D.** By submitting design and engineering data, drawings, product data and samples, the Contractor represents that he has determined and verified all aspects of the submittals and that he has checked and coordinated the information contained therein with the requirements of the works and the Contract Documents.
- E.** Submission and approval of the design and engineering data, drawings, product data and samples shall precede the commencement of any work to which they relate. No portion of the Permanent Works shall be executed other than in accordance with approved submittals.

21. AS BUILT DRAWINGS

The Contractor shall prepare complete "as built" drawings of the Works and submit to the Engineer for approval. Upon approval or incorporation by the Contractor of any modifications requested by the Engineer, three copies and one reproducible copy of all "as built" drawings and floppy disk shall be submitted by the Contractor upon completion of the Works.

22. CERTIFICATES BY AN INTERNATIONAL INSPECTION OFFICE

The Contractor shall, as required by the Engineer, submit manufacturers' test certificates for materials and Plant intended to be incorporated in the Works. Such certificates shall, to the extent prescribed by the Engineer, be endorsed for authenticity by a recognized international office employed by the Contractor and approved by the Engineer. All manufacturers' test certificates shall be in the English or French language.

23. TEMPORARY SITE & OFFICE FACILITIES FOR THE ENGINEER AND / OR EMPLOYER

- A.** All facilities provided for the Engineer's and / or the Employer's staff by the Contractor shall remain available until the end of the Defects Liability Period or until such earlier time as the Engineer may instruct.

B. Representative Site Offices

B.1. Office

The Contractor shall provide for site of the project prefabricated portable or demountable offices for the exclusive use of the Engineers and/or the Employer's staff, comprising:

- 2 offices size of each approximately 3m x 4m
- 1 meeting room for 6 persons.
- 1 secretary's room approximately 3m x 3m
- 1 kitchen approximately 3m x 3m
- 1 toilet
- 1 store
- entrance area with space for desk

The offices are to be of proprietary manufacture, with hard-wearing, easy to clean surfaces and robust and secure fittings. The Contractor shall submit full

details to the Engineer's Representatives for approval before delivery to the Site.

B.2. Office Furniture and Equipment

B.2.1. Each office shall contain :

- 1 desk with lockable drawers and chairs
- 1 lockable steel filling cabinets
- 1 plan chest with minimum of five drawers
- 1 waste paper baskets

and, in addition, the following shall be provided for the site :

- 1 secretary's desk and swivel chair
- 4 office chairs
- 2 scientific calculators
- 1 photocopying machine
- 2 computer system

all consumables for photocopying machine and computer pinboards and shelves

B.2.2. Conference Room Furniture and Equipment

This shall contain:

- 1 conference table
- 6 chairs
- 2 pinboards

B.2.3. Kitchen Furniture and Equipment

This shall include:

- 1 refrigerator 12 cubic foot capacity
- 1 water filter and cooler
- 2 electric boiling rings
- 1 stainless steel sink and drain
- 1 heat resistant work tops
- 1 set of storage cupboards
- 2 dozen set of crockery and cutlery together with all necessary consumables for making beverages for the duration of the Contract.

B.2.4. Store Room Furniture and Equipment

This shall include :

- shelving units
- drawing hangers and racks.

B.2.5. Toilet Furniture and Equipment

This shall include:

- 1 W-C suite with toilet roll holder
- 1 wash basin with mirror

- 1 towel rail
- 1 soap dispenser together with all necessary consumables.

B.2.6. Computer System

The computer system shall consist as a minimum:

- Computer i5 at least with specifications convenient to all type of work
- 101 key English-Arabic Keyboard.
- Low radiation 17 inch rotating color monitor
- Laser printer similar to HP Laser Jet 5L with paper cassette (A4)
- UPS Uninterruptible Power Supply for all above equipment with minimum 2 hours backup batteries
- Computer table and chair to accommodate computer, monitor, keyboard and printer
- antistatic dust covers for all above equipment
- Loaded with a modem and internet connection

B.2.7. Services and Utilities

The Contractor shall provide and maintain the following for the Site Office:

- electric lighting and power
- heating and air conditioning
- water supply
- sanitary system
- drainage system
- fire fighting appliances
- telephone system with two external lines and extensions and one portable cellular phone (including cost of all local calls).
- one dedicated facsimile service (including cost of all transmissions)
- cleaning and rubbish disposal
- general labour attendance including provision of one full time janitor/tea boy
- full time secretary
- security and guards

B.2.8. Vehicles for use by the Engineer and/or Employer

The Contractor shall provide and maintain for the duration of the Contract the following new vehicles with air conditioning for the exclusive use of the Engineer's Representative and his staff and shall supply all fuel and lubricants; repair and maintain the vehicles to keep them in good roadworthy condition at all times; comprehensively insure each vehicle for any driver at all times; and replace with identical vehicle any vehicle removed for repair or for any other reason.

- 1 No. Four Wheel Drive Vehicles (6 cylinders).

A competent driver, employed by the Contractor for attendance during normal working hours. The vehicles are to remain in the possession of the Engineer's Representative and his staff after normal working hours.

24. CLEANING

A. Scope

- 1- Execute day to day cleaning, during progress of the work, and at completion of the work.
- 2- If the Contractor fails to clean up during construction or at the completion of the work, the Employer may do so and the cost thereof shall be charged to the Contractor.

B. Disposal requirements

Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

C. Materials

- 1- Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- 2- Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

D. Execution during construction

- 1- Execute day to day cleaning to keep the work, the site and adjacent properties free from accumulations of waste material, rubbish and windblown debris, resulting from construction operations.
- 2- Provide on-site containers for the collection of waste materials, debris and rubbish.
- 3- Remove waste materials, debris and rubbish from the site on a daily basis and dispose of at legal disposal areas away from the site.

E. Dust control

- 1- Clean interior spaces to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.
- 2- Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.

F. Final cleaning

- 1- Employ skilled workmen for final cleaning.
- 2- Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- 3- Wash and shine glazing and mirrors.
- 4- Polish glossy surfaces to a clear shine.
- 5- Vacuum clean interior of buildings, including HVAC ducts.
- 6- Hand dust, clean and polish shelving and cabinets.
- 7- Wax and polish finish floors.
- 8- Clean all hardware.
- 9- Clean all fixtures.

- 10- Comply with all special cleaning instructions contained in the specifications.
- 11- Ventilating Systems
 - i. Clean permanent filters and replace disposable filters if units were operated during construction.
 - ii. Clean ducts, blowers and coils if units were operated without filters during construction.
- 12- Remove temporary services, construction equipment, tools and facilities, mock-ups, temporary structures, surplus materials, debris and rubbish from Employer's Property.
- 13- Put site in neat, orderly condition, ready for use. Leave roof areas, pipe spaces, and other spaces clean and free from debris. Clean to normal "Clean" condition for a first-class building cleaning and maintenance programme.
- 14- Broom clean exterior paved surfaced; rake clean other surfaces of the grounds.
- 15- Prior to final completion, or Employer occupancy, conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire work is clean.

25. WARRANTIES AND BONDS

A. Scope

- 1- This section describes the Contractor's responsibility in respect of warranties, guarantees and bonds.
- 2- The Contractor shall ensure that he receives from manufacturers and suppliers all available warranties, guarantees and bonds that are normally offered with the product, fully completed and documented to assure the whole of the benefits which they offer.
- 3- All warranties, guarantees and bonds shall run for the stipulated period commencing at the date of the completion of the Contract.
- 4- Warranties for all mechanical, electrical, waterproofing and other works shall be as called for in the Conditions of Contract.

26. PROTECTION AND MAKING GOOD

A. Scope

- 1- The Contractor shall protect all completed Works from damage until the completion of the Works to the approval of the Engineer.
- 2- Should the Contractor allow any Works to be damaged he shall at his expense make good or replace, as required by the Engineer, to the approval of the Engineer.
- 3- Completed floors shall be secured and protected and uncontrolled access shall be prohibited.

27. MEASUREMENT AND PAYMENT

A. Unless otherwise measured separately in the Bill of Quantities, no separate payment shall be made for any of the requirements specified in this section and all costs and expenses in respect of such requirements shall be deemed to be included in the Contractor's rates and prices for other work measured in the Bill of Quantities.

28. BILL OF QUANTITIES

The Works shall be measured and paid for only against the Pay Items prescribed in the Bill of Quantities. Any work required to be performed or executed by the Contractor in accordance with the Contract Documents, but for which no specific Pay Item is designated in the Bill of Quantities, shall be performed or executed by the Contractor and the price thereof shall be deemed to be included in the Contract Price and the rates and prices inserted by the Contractor against other Pay Items in the Bill of Quantities.