



**STATE BANK OF PAKISTAN
SBP BANKING SERVICES CORPORATION (BANK)**

TENDER DOCUMENTS

VOLUME – II (B)

SPECIFICATIONS – SPECIAL PROVISIONS

FOR

CONSTRUCTION OF SBP NEW OFFICE BUILDING

AT

D.I. KHAN

STATE BANK OF PAKISTAN, SBP BSC (BANK)
CONSTRUCTION OF SBP NEW OFFICE BUILDING AT D.I. KHAN

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SPECIFICATIONS – SPECIAL PROVISIONS

1. GENERAL

- 1.1 Specifications – Special Provisions shall form an integral part of Bid & Contract documents.
- 1.2 The Contractor shall notify all sub-contractors of the provisions of these Special Provisions

2. DESCRIPTION OF PROJECT, WORKS INVOLVED AND SITE

State Bank of Pakistan intends to construct its new Office Building at D.I.Khan.

The scope of works mainly comprises civil , electrical , plumbing , HVAC and lift works of the Building and related ancillary works lying within the boundaries and limits as shown on the drawings and any such additional areas adjacent thereto as may be designated by the Engineer from time to time for the construction to be performed under the Contract, and all such areas and additional areas shall comprise the Site.

The Employer will give to the Contractor possession of the area designated and defined as the Site and shown on the drawing as may be required to implement as much of the Works, when the Engineer's Notice to Commence the Works is given.

3. CODES, STANDARDS AND CERTIFICATES

A. Applicable Standards

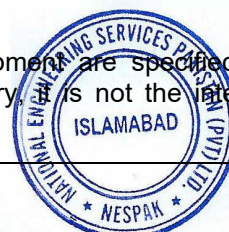
Except as otherwise provided by these Specifications or the Drawings, all materials, equipment and fabrication and testing thereof shall conform to the latest applicable standards and codes referred in the Specifications by use of the abbreviations explained below:

ASCE	American Society of Civil Engineers
ASA	American Standard Association
ACI	- American Concrete Institute (USA)
AISI	- American Iron and Steel Institute (USA)
AISC	- American Institute of Steel Construction (USA)
ANSI	- American National Standard Institute (USA)
ASTM	- American Society for Testing and Materials (USA)
AASHTO	- American Association of State Highway & Transportation Officials.
AWS	- American Welding Society (USA)
BS	- British Standards (UK)
CP	- Codes of Practice (UK)
ICAO	International Civil Aviation Organization
BSICP	British Standard Institute Code of Practice
PS	- Pakistan Standards (Pak)
PCA	Portland Cement Association
PSI	Pakistan Standard Institute
SSPC	- Steel Structures Painting Council (USA)
UBC	- Uniform Building Code (USA)
USBR	- United States Bureau of Reclamation (USA)

If the Contractor, at any time and for any reason, wishes to deviate from the above standards or desires to use material or equipment not covered by the above standards, he shall state the exact nature of the changes, the reason for making the change and shall submit complete specifications of the materials and equipment to the Engineer for approval.

B. Standards other than those Specified

Where requirements for materials or equipment are specified by reference to a standard which has its origin in one country, it is not the intention to restrict the



requirements solely to that standard and that country. Other standards, including standards of other countries, will be accepted provided the requirements thereof, in the sole opinion of the Engineer, are at least equal to the requirements of the standard specified. The Contractor may propose to the Engineer an equivalent standard other than that specified, in which case he shall submit the proposed standard and all other information required and shall submit written proof that his proposed standard is equivalent in all significant respects to the standard specified. All submissions must be made in the English language.

C. Codes and Standards at Site

The Contractor shall supply and have at his site office:-

- a) Copies of all latest editions of codes and standards referred to in these Specifications or equivalent codes and standards as approved by the Engineer.
- b) Catalogues and published recommendations from manufacturers supplying products and materials for the project.
- c) The Contractor shall provide manufacturer's or supplier's materials which must meet the requirements of a specific code or standard as stated in these Specifications.

4. MANUFACTURER'S RECOMMENDATIONS

Installation of manufactured items shall be in accordance with procedures recommended by the manufacturer or as approved by the Engineer.

5. UNITS OF MEASUREMENTS

The FPS System of Units shall be used throughout the Project.

6. EXISTING CONDITION AT SITE

Drawings and information pertaining to existing project conditions are furnished for reference.

Neither the Employer nor the Engineer warrants the adequacy or correctness of these.

7. PROTECTION AND PRECAUTIONS

The Contractor and his sub-contractors shall afford all necessary protection to existing structures and will be required to make good at his own expense any damage done to such structures through his own or his representatives or sub-contractors' fault and negligence.

The Contractor and his sub-contractors shall afford all necessary protection to existing roads in the area. He will clear and make good at his own expense any damage to or debris on these roads through his own fault and negligence. He must at all time ensure the free and normal flow of traffic and shall not cause obstruction to the traffic system. The Contractor and his sub-contractors shall provide and maintain necessary protection and precautionary measures such as warning signs, warning lamps and barricades etc. to prevent accidents.

The Contractor shall promptly correct all such damage to original condition at no additional expense to the Employer.

The Contractor shall cooperate with trades performing work under other Contracts as necessary for completion.



8. SEQUENCE OF CONSTRUCTION

The Contractor shall submit his proposal for approval of the Engineer the sequence of Construction, prior to starting the works. The works shall be executed as per approved sequence of construction

9. LINES AND LEVELS

Survey control points will be established by the Engineer. The Contractor shall be responsible for verifying these and shall be responsible for all requirements necessary for the execution of any work to the locations, lines, and levels specified or shown on the drawings, subject to such modifications as the Engineer may require as work progresses.

10. PLANT, EQUIPMENT AND TOOLS

The Contractor shall provide at his cost modern plant, equipment and tools, adequate and befitting to the nature, magnitude and size of this Contract, in strict compliance with the requirements of the General Conditions of Contract, Conditions of Particular Applications and Technical Specifications.

11. PARTIAL POSSESSION

Whenever, as determined by the Employer any portion of work performed by the Contractor is in a condition suitable for use, the Employer may take possession of or use such portion.

Such use by the Employer shall in no instance be construed as constituting final acceptance, and shall neither relieve the Contractor of any of his responsibilities under the Contract, nor acts a waiver by the Employer of any of the conditions thereof, provided that the Contractor shall not be liable for the cost of repairs, re-work, or renewals which may be required due to ordinary wear and tear resulting from such use. However, if such use increase the cost or delays to the completion of remaining portions of work, the Contractor will be entitled to an equitable adjustment.

If, as a result of the Contractor's failure to comply with the provision of the Contract, such use proves to be unsatisfactory, the Employer will have the right to continue such use until such portion of the work can, without injury to the Employer, be taken out of service for correction of defects, errors, omissions, or replacement of unsatisfactory materials or equipment, as necessary for such work to comply with the Contract; provided that the period of such operation or use pending completion of appropriate remedial action shall not exceed twelve months unless otherwise mutually agreed upon in writing between the parties.

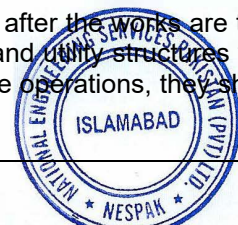
12. EXISTING SERVICES

The Contractor shall search for, find, locate and protect any wiring, cable, duct, pipe work, etc., within or immediately adjoining the site area.

The Contractor shall take full responsibly for safety of existing service lines, utilities and utility structures uncovered or encountered during excavation and construction operations.

The Contractor shall take full responsibility for damaging any such service lines, utility/utility structure and any cost and/or expense that arises or issues from any such damage shall be borne directly by himself. Should any damage to any such service occur the Contractor shall forthwith take remedial action, initiate safety precautions, install temporary services and carryout repair all at his own cost and expense and inform the Engineer and notify all relevant authorities.

Existing utilities, which are to remain in service for or after the works are to be determined by the Contractor. If any existing service lines, utilities and utility structures which are to remain in service are uncovered or encountered during these operations, they shall be safeguarded, protected from damage, and supported.



13. CONSTRUCTION AREA AND ACCESS

The Employer will provide the Contractor possible space within or nearby the area of site of works for the storage of plant, equipment and materials and for Contractor's temporary office, during the currency of the Contract. In case the adjacent area as required by the Contractor is not available within the Project boundary for storage of plant, equipment and machines then the Contractor shall arrange at his own expense possible space for storage of plant, equipment and machines at his own cost and expense. On no account shall such temporary installations conflict/interfere with any of the permanent installations, services and any operational function of Employer. The handling and storage of all plants, equipment and materials at site shall be the sole responsibility of the Contractor and at no risk and cost to the Employer.

The Contractor shall protect all material against corrosion, mechanical damage or deterioration during storage and erection on site. The protection methods shall be to the approval of the Engineer

14. CONSTRUCTION & CHECKING AT SITE

The Contractor shall submit to the Engineer in due time for approval and discussion, his proposals and plans as to the method and procedure to be adopted for the temporary and permanent works involved.

The submitting to these suggestions and arrangements, and the approval thereof by the Engineer shall not relieve the Contractor of his responsibilities and duties under the Contract.

The carrying out of all work included in the Contract is to be supervised by a sufficient number of qualified representatives of the Contractor and full facilities and assistance are to be afforded by the Contractor for the Engineer or his Representative to check & examine the execution of the work.

The Engineer reserves the right to inspect all parts of the works but may at his discretion waive inspection on certain items. This shall in no way absolve the Contractor from his responsibilities. This particularly applies to the checking of materials, the accurate setting out of foundations, and to the leveling, setting and aligning of the various parts, and to the proper fitting and adjustment of manufactured and finished materials and fixtures in position.

If the Engineer or his Representative find that the work progress is slow in such a way that the works or parts thereof will not be completed in the time specified, then he shall order the Contractor to work overtime or in shifts and the Contractor shall comply. These arrangements will be free of all financial encumbrances and at no additional costs to the Employer.

In the event of night work, the Contractor shall provide sufficient and adequate lighting to the satisfaction of the Engineer or his Representative and shall supply the necessary manpower for satisfactory continuation of the work after normal hours.

15. STORAGE & HANDLING FACILITIES

The Contractor shall make his own arrangements for providing the necessary space for the storage of plant, equipment and materials and for Contractor's temporary office, in and around the site of works, during the currency of the Contract.

16. PRODUCT DATA

Manufacturer's standard schematic drawings shall be modified or deleted to indicate only information which is applicable to the project. Such standard information shall be supplemented to provide all additional applicable information.

Manufacturer's catalogue, sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive literature shall be clearly marked to identify



pertinent materials products or models. Dimensions and required clearances shall be indicated. Shop performance characteristics and capacities shall be noted.

17. PRODUCT QUALITY AND HANDLING

Suppliers of local and foreign products and installations specified shall have been regularly engaged in the business of manufacturing, fabricating, installing and/ or servicing work required for a period not less than 5 years. In addition, the Engineer may request as appropriate a:

- list of similar installations that describes project, scope and date of completion.
- complete literature, performance data, and technical data.
- list of services record within Pakistan.
- location of service office from which this installation could be maintained.

For the actual fabrication, installation and testing of the specified work use only thoroughly trained and experienced workmen completely familiar with the items required and with the manufacturers recommended methods of installation. In acceptance or rejection, no allowance will be made for the lack of skill on the part of workmen.

Use all means necessary to protect materials before, during and after installation and to protect the installed work and materials of all other trades. In the event of damage, immediately make all repairs and replacement necessary for approval and at no additional cost to the Employer.

18. INSPECTION & TESTS REPORTS

All equipment and materials furnished under these specifications and all work performed in connection therewith will be subject to rigid inspection by the Engineer or the Engineer's Representative. Acceptance of equipment and material or the waiving off inspection thereof shall in no way relieve the Contractor of his responsibility for meeting the requirements of the Contract.

The Contractor shall furnish the Engineer with certified true copies of test reports of all materials used in the manufacture and fabrication of all equipment and material including metal work, steel pipes, fire bricks etc. The result of these test shall be in such form as to show compliance with the applicable Specifications, standards and codes for the material used.

19. FIELD LABORATORY AND TESTING

19.1 General

The Contractor shall provide and maintain a field laboratory equipped with approved equipment to perform all the tests required by the Engineer. The quality control testing shall be performed by the Contractor's competent personnel in accordance with a site testing and quality control programme to be established by the Contractor and approved by the Engineer. The Engineer may however, require certain tests to be performed in any other laboratory designated by him.

The Contractor shall provide laboratory helpers to the Engineer for testing. The laboratory shall be run by a qualified material Engineer and Laboratory Technician to be employed by the Contractor.

The Field Laboratory, including all equipment and staff shall be placed at the disposal and direction of the Engineer during the Contract.

The Contractor shall keep a complete record of all quality tests performed on site.



All quality control and tests shall be carried out in accordance with applicable standards and codes.

19.2. Field Laboratory Equipment Requirements

The Laboratory shall be equipped with new unused and latest Equipment to perform tests as per Technical Specifications and General Conditions of Contract. Additional equipment/materials shall be supplied by the Contractor as and when required by the Engineer to perform any specified test, at no additional cost to the Employer.

The laboratory shall also be equipped with new unused furniture, fittings and fixtures. If any equipment, furniture, fitting or fixture becomes unserviceable for any reason what so ever, the Contractor shall promptly replace the same as and when directed by the Engineer.

Generally following equipments shall be required:

- Schmidt Hammer
- Vicat Apparatus
- Sieve machine
- Universal Compression Machine
- Thermometer
- Cylinder Moulds
- Soil Compactor
- Atterberg's Testing Equipment
- Sand Replacement Apparatus
- Flasks
- Capping set
- Concrete cube and cylinder moulds
- Length gauge for aggregates
- Digital Balance
- Flakiness and Elongation Apparatus
- Oven

19.3. Testing Laboratory Certificates

The Engineer may accept a certificate from a commercial testing laboratory, satisfactory to him, certifying that the product has been tested within a period acceptable to the Engineer and that it conforms to the requirements of these specifications.

19.4. Method of Payment

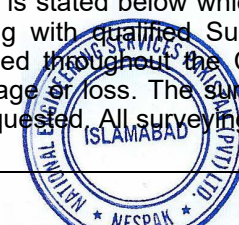
The cost of providing running and maintenance of the laboratory, equipment, materials and staff, testing charges for materials supplied by the Employer and all other tests to be performed in any other laboratory designated by the Engineer shall be deemed to be included in the price quoted by the Contractor and no separate claim for payment on this account shall be entertained by the Engineer. Furthermore, the cost of any additional laboratory, field and shop tests required through the resubmission of samples because of failure of compliance with Specifications shall be borne by the Contractor.

In case the Contractor does not provide the specified equipment and testing facility, cost of testing plus 100 percent overheads shall be recovered from his bills.

20. SURVEYING INSTRUMENTS

20.1 General

The minimum quantity of survey equipment is stated below which shall be available with the Contractor at site of Works along with qualified Surveyors and Survey Helpers. The equipment shall be maintained throughout the Contract Period and replaced by the Contractor in case of damage or loss. The survey equipment shall be made available to the Engineer when requested. All surveying equipment shall be



in good working condition.

20.2 Surveying Equipment Required

The Contractor shall provide and maintain the following surveying equipment at site.

- | | | |
|----|---|---------|
| a) | Total Station | 01 No. |
| b) | Automatic Levels with tripods | 02 Nos. |
| c) | Steel measuring tapes 50 m long | 02 Nos. |
| c) | Staff | 02 Nos. |
| d) | All other miscellaneous tools, equipment and materials required in surveying. | |

21. APPROVAL OF MATERIALS AND PLANT

21.1 Quality of Materials

All materials, fixtures, fittings, supplies and plant furnished under the Contract shall be new and unused, standard first grade quality and of the best workmanship and design. No inferior or low-grade materials, supplies or articles will be either approved or accepted, and all work of assembly and construction shall be done in a first-class and workmanlike manner. In asking for prices for materials intended for delivery to the Site and incorporation in the Works under any portion of these Specifications, the Contractor shall provide the manufacturer or supplier with complete information as may be necessary to secure compliance to this Clause and, in every case, he shall quote this Clause in full to each such manufacturer or supplier.

21.2 Submission of Samples and Data

- 21.2.1 The Contractor shall furnish for approval of the Engineer with reasonable promptness all samples as directed by the Engineer or specifically called for in the Specifications and in accordance with the time schedule provided in the schedule of submittals. The Engineer shall check and approve such samples with reasonable promptness only for conformance with the design concept of the Works and for compliance with the information given in the Contract Documents. All work shall be in accordance with approved samples.
- 21.2.2 Samples shall be furnished so as not to delay fabrication, allowing the Engineer reasonable time for consideration of the sample submitted.
- 21.2.3 Each sample shall be properly labeled with the name and quality of the material, manufacturer's name, name of the project, the Contractor's name and the date of submission, and the Specifications Article number to which the sample refers.
- 21.2.4 The manufacturer's installation directions shall be provided with each sample. The Contractor shall pay all transportation costs and deliver samples to the Engineer's office, Site or testing laboratory as directed by the Engineer.
- 21.2.5 Samples shall be of adequate size to permit proper evaluation of the material by the Engineer. Where variations in colour, texture, dimensions or other characteristics are to be expected, the Contractor shall submit samples showing the maximum range of variation. Materials exceeding the range of variation of the approved samples shall not be used on the Work.
- 21.2.6 In order to permit coordinated selection of colours and finishes, the Contractor shall deliver samples of all related items to the Engineer at one time. Samples of such materials will not be approved until all related samples have been submitted.



21.2.7 If both Shop Drawings and samples are required for the same item, the Engineer may require both to be submitted before approving either.

21.2.8 The Contractor shall erect Mock-up samples of finished items where specifically called for in the documents or as directed by the Engineer.

The Mock-up samples shall be preserved/protected by the Contractor till the end of the project or as directed by the Engineer.

21.2.9 No acceptance or approval of any Shop Drawings or sample, or any indication or request by the Engineer on any Shop Drawings shall constitute an authorization for any increase in the Contract Sum.

21.3 Inspection

All material and Plant furnished and all work performed under this Contract will be subject to inspection by the Engineer at all times and in all states of completion both off-Site and on-Site. The Contractor shall furnish promptly without additional charge, all facilities, labour and materials reasonably needed for performing such inspection and testing as may be required by the Engineer.

21.4 Approved Sample At Site

The Contractor shall, at all times, keep on the Site approved samples. All such samples shall be made available to the Engineer as and when required.

22. BAR BENDING SCHEDULE

Bar bending (reinforcement bars) schedule of all structural drawings shall be prepared by the Contractor and submitted in triplicate to the Engineer for approval.

23. DRAWINGS

23.1 Bid Drawings

Bid Drawings issued with the Bid Documents, called the Bid Drawings, show scope of the work to be performed by the Contractor. The Drawings are generally in sufficient detail so as to be used as a basis for construction, fabrication and for placing orders for materials subject to corrections based on the future issue of supplementary Drawings as provided under Sub-Clause 12.2 hereof.

23.2 Construction Drawings, Supplementary Drawings

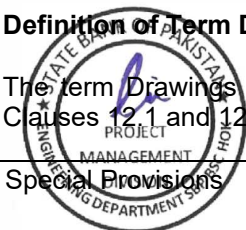
Upon commencement of the works and furnishing by the Contractor stake out survey plan & natural ground levels, the Engineer shall issue Construction Drawings to the Contractor. The Construction drawings may be issued in stages, where necessary.

The Engineer shall have authority to issue to the Contractor, from time to time, such supplementary Drawings and instructions as shall be necessary for the purpose of the proper and adequate execution and completion of the Works and the remedying of any defects therein. The Contractor shall follow these drawings.

When additional information regarding the geological formations or other conditions becomes available, the Engineer may find it desirable to change dimensions or design of one or more of the features of the Works to conform to the newly disclosed conditions. The Engineer reserves the right to make such reasonable changes, and the Contractor's operations shall be conducted so as to accommodate any such reasonable changes in the Works.

23.3 Definition of Term Drawings

The term Drawings as used in the Specifications means the Drawings referred in Clauses 12.1 and 12.2 above.



23.4 Checking of Drawings

The Contractor shall check all Drawings carefully as soon as practicable after receipt thereof, and shall promptly notify the Engineer of any errors discovered.

23.5 Copies of Drawings

Drawings will be issued to the Contractor as described below:

23.5.1 Construction Drawings

Two (2) sets of the Construction Drawings will be issued to the Contractor as stated above, free of charge. Additional sets will be provided at cost of reproduction upon written request of the Contractor.

23.5.2 Supplementary Drawings

Two (2) prints of each supplementary Drawing will be issued to the Contractor free of charge. Additional sets will be provided at cost of reproduction upon written request of the Contractor.

23.6 Drawings to Be Furnished By the Contractor

The Contractor shall submit to the Engineer for review, such drawings as are required under the Contract, sufficiently in advance of the work intended to be executed.

23.6.1 Reinforcement Drawings

Reinforcement placement drawings and bar bending schedules (to be provided by the Contractor as per clause 11 above) of all RCC work shall be prepared by the Contractor and submitted in triplicate to the Engineer for approval, sufficiently in advance of the works in which they are intended to be used.

23.6.2 Shop Drawings

- (a) The Contractor shall submit to the Engineer for review three (3) copies of all drawings to be issued for setting out, fabrication, supply order and construction; based on data, requirements, dimensions, details, codes, standards and design provided in the drawings issued by the Engineer. Such drawings shall be submitted at least twenty-eight (28) days before they are required for use. If within a period of fourteen (14) days after submission, the Engineer notifies the Contractor that a drawing fails to comply with the relevant requirement of the Contract, it shall be rectified and resubmitted for approval at the Contractor's cost. Fabrication or construction shall not commence on any part of the Works until the shop drawings or construction drawings for that part of the Works have been approved by the Engineer.

The Works shall be executed in accordance with the drawings as approved by the Engineer. If the Contractor wishes to modify any approved drawings, he shall immediately notify the Engineer and submit revised drawings for approval. If the Engineer instructs that further drawings are necessary for executing the Works, the Contractor shall prepare such drawings and submit them for approval.

The Contractor at his cost shall rectify errors, omission, ambiguities, inadequacies and other defects.



Approval by the Engineer, in accordance with this paragraph, shall not relieve the Contractor of any of his responsibilities under the Contract.

- (b) The shop drawings shall be properly identified indicating the part of the Works, the name of the contractor / supplier etc., the date of preparation and the dates of all revisions. The Shop Drawings shall be complete and shall show the design dimensions, proposed materials to be used, finishes, type of shop paint and all other details in connection thereto.
- (c) Where adjoining work requires shop drawings, the Contractor shall prepare and submit composite shop drawings, which shall show and define the work under all affected trades. If the Contractor executes work before coordinating with other trades so as to cause interference with work of those trades, he shall make changes necessary to correct the conditions without extra cost to the Employer.
- (d) No changes shall be made by the Contractor in the resubmitted shop drawings in excess of the corrections spelled out by the Engineer and in a separate note on the shop drawings.
- (e) No work in the shop shall be started and no material or plant ordered until the Engineer has approved the shop drawings. It shall be the responsibility of the Contractor to submit the shop drawings on a schedule that allows reasonable time for checking and approval and subsequent fabrication. Failure to submit shop drawings in ample time for checking, correcting, and rechecking will not justify extension of time for completion of the Works.
- (f) The Contractor shall also check and verify all site measurements whenever requested by other Specialist Contractors or by other Sub-Contractors to enable them to prepare their own shop drawings and pass on the information with sufficient promptness, so as not to delay the work in any way. A copy of all such information passed on shall be given to the Engineer.

23.6.3 As-Built Drawings

The Contractor shall, at all times, keep on Site a separate set of prints of all drawings on which all significant changes between the work shown on the Drawings and that which is actually constructed, shall be noted neatly, accurately and promptly as the work progresses. The Subcontractor(s) for plumbing, mechanical and electrical shall, at all times, keep on Site, a separate set of prints of the drawings (showing their parts of the Works) on which all significant changes between the work shown on the Drawings and that which is actually constructed, shall be noted neatly, accurately and promptly as the work progresses. Such drawings shall show the exact physical location and configuration of the works as actually installed.

The Contractor shall, within fourteen (14) days of issuance of Taking-Over Certificate for whole of the Works, furnish to the Engineer for his approval two (2) copies of such marked up drawings. One (1) copy of each of the marked up drawings approved by the Engineer shall be returned to the Contractor by the Engineer and these shall be used for the preparation of the As - Built Drawings.

The Contractor shall furnish to the Engineer six (6) complete sets and one reproducible copy of all As -Built Drawings within twenty-eight (28) days of receipt of drawings stated above, from the Engineer.



24. PROTECTION OF THE WORKS

The Contractor shall whenever necessary cover up and protect the works from weather and damage by his own or other workmen performing subsequent operation. The Contractor shall provide all necessary dustsheets, barriers and guard rails and clear away the same at completion.

25. RESTORATION AND CLEANING

Upon completion of the works the Contractor shall restore all items covered by the Contract to the satisfaction of the Engineer.

The Contractor shall do regular cleaning and clear away all rubbish and excess materials that may accumulate from time to time on completion and before handing over. Upon completion of the works he shall obliterate all signs of temporary construction facilities such as work areas, structures, foundations of temporary structures, stock piles of excess or waste materials, or any other vestiges of construction, as directed by the Engineer. All buildings shall be cleaned; floors and paving scrubbed and the works and site shall be left in a clean and satisfactory state for immediate use and occupation. Care shall be taken not to use any cleaning materials, which may cause damage to the surface to be cleaned.

The Contractor shall also take all necessary precautions to keep the works and site free from vermin during construction and he shall leave the works vermin free on completion. Application of pest control agents shall not commence until the specific product, name, method and extent of application have been submitted to and approved of by the Engineer.

26. SITE OFFICE AND TEMPORARY FACILITIES TO BE PROVIDED BY THE CONTRACTOR

26.1 Contractor's Office, Facilities Etc.

The Contractor shall establish and maintain a Site office. The Contractor shall provide all facilities in connection with the execution, completion, of the Works, remedying defects therein and maintenance of the utilities services. The facilities shall not be limited to the Contractor's Site Office, labour camps, work yard and storage areas, temporary water supply, waste water disposal, temporary electricity, medical unit, temporary roads, fire protection and fire fighting equipment etc. The Contractor shall be solely responsible for arranging all utilities and the Contractor shall setup, maintain and operate an architectural and engineering facility at site with adequate number of technical and support staff as well as equipment required for particular nature of job covered under the Contract to prepare drawings/shop drawings for approval of the Engineer.

The Contractor shall arrange his labour camp, work yard, storage area and site office.

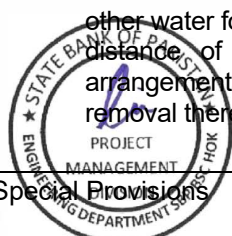
26.2 Temporary Roads

The Contractor shall prepare and maintain such temporary roads as may be necessary, from the site to the nearest road and also within the plot. Such roads shall be positioned strictly in accordance with the Engineer's instructions and the Contractor shall reduce or control any dust nuisance by regularly spraying water and compaction as directed.

26.3 Temporary Services

26.3.1 Temporary Water Supply

The Contractor shall supply in sufficient quantity all necessary potable and other water for construction purposes for all trades at points within a reasonable distance of any building being constructed. The Contractor shall make arrangements and pay charges for water service installation, maintenance and removal thereof, and pay the costs of water for all trades.



At completion of the work, the temporary water services equipment and piping shall be removed by the Contractor at his own expense.

26.3.2 Temporary Electricity

The Contractor shall make all the necessary arrangements for a temporary electricity service, pay all expense in connection with the installation, operation and removal thereof and pay the costs of electricity consumed by all trades. The Contractor shall arrange and furnish an Electric Power Generating set at site and maintain the generating set in perfect working condition through-out the duration of Contract. The generating power of the set shall be sufficient to operate all plant and equipment as well as the camps and offices of the Contractor and the offices of the Engineer/Employer, during construction at site. Should the set fail to meet the required demand at site or fail to function or operate, the Contractor shall immediately replace the same with other generating set/s to the satisfaction of the Employer as well as the Engineer.

A temporary lighting system shall be furnished, installed and maintained by the Contractor as required to satisfy the minimum requirements for safety and security and to the satisfaction of the Engineer.

When the permanent electrical power and lighting systems are in an operating condition, they may be used for temporary power and lighting for construction purposes provided that the Contractor obtains the written approval of the Engineer and the Employer and assumes full responsibility for the entire power and lighting system and pays all costs for operation and maintenance of the system.

At completion of construction work, or at such time as the Contractor makes use of permanent electrical equipment and devices, temporary electricity services shall be removed by the Contractor at his own expense.

26.3.3 Waste Disposal

The Contractor shall make such temporary provisions as may be required in order to dispose of any chemicals, fuels, oils, grease, bituminous materials, waste and soil waste and the like without causing pollution to either the site or the environment. Disposal of any materials, wastes, effluent, garbage, oil, grease, chemicals and the like shall be in areas specified by the concerned local authority proposed by the Contractor and subject to the approval of the Engineer. If any waste material is dumped in unauthorized areas the Contractor shall remove the material and restore the area to the condition of the adjacent undisturbed area. If necessary, contaminated ground shall be excavated, disposed off as directed by the Engineer and replaced with suitable fill material compacted and finished with topsoil all at the expense of the Contractor.

26.3.4 Fire Protection

The Contractor shall provide and maintain adequate fire protection in the form of barrels of water with buckets, fire bucket tanks, fire extinguisher, or other effective means ready for instant use, distributed around the project and in and about temporary inflammable structures during construction of the works.

Gasoline and other flammable liquids shall be stored in and dispensed from safety containers approved by the Engineer and storage shall not be within building.

Torch-cutting and welding operations performed by the Contractor shall have the approval of the Engineer before such work is started and a chemical extinguisher is to be available at the location where such work is in progress.



The Contractor shall follow the instructions and specifications of the Civil Defense Department or any other local department concerned with such activities.

27 CONSTRUCTION SCHEDULE

A Construction schedule shall be maintained in accordance with the provisions of the General Conditions of Contract.

The schedule shall be accompanied with sufficient data and information including all necessary particulars of constructional plant, equipment machinery, temporary Works, arrival of plant, equipment at site and their installation, method of operation, work forces employed, etc., for activities of the Works.

Should the Engineer consider any alteration or addition in the programme and time schedule, the Contractor shall conform thereto without any cost to the Employer.

Whenever necessary and wherever the progress of the actual work shows departure, the programme and time schedule shall be undated and submitted to the Engineer for his approval.

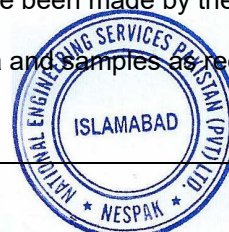
28 SUBMISSION REQUIREMENTS

- 28.1 Schedule submission at least sixty days before the dates when reviewed submittals will be needed.
- 28.2 Submit Shop Drawings as per provision given in Sub-Clause 19.5 (a) and number of copies of Product Data which the Contractor requires for distribution plus four copies which will be retained by the Engineer.
- 28.3 Submit three samples unless otherwise specified.
- 28.4 Accompany submittals with transmittal letter, in duplicate, containing:
 - Date
 - Project title and number
 - Contractor's name and address
 - The number of each Shop Drawing, Product Data and the Sample submitted.
 - Notification of deviations from Contract Documents.
 - Other pertinent data.

29 RESUBMISSION REQUIREMENTS

Shop Drawings:

- Revise initial drawings as required and resubmit as specified for initial submittal.
- Indicate on drawings any changes which have been made by the Engineer.
- Product Data and Samples: Submit new data and Samples as required for initial submittal.



30 WEEKLY PROGRESS REPORT AND PHOTOGRAPHS

- 30.1 During the continuance of the Contract, the Contractor shall submit weekly progress on forms as approved by the Engineer. Such weekly reports shall show the actual progress completed as of date of the report plotted against the schedule as given by the Contractor at the start of work and shall be broken down so as to indicate status of all activities associated with mobilization design, material procurement, manufacture, surveys works, tests with regard to the agreed contract programme.
- 30.2 The Employer and the Engineer reserve the right to coordinate the schedules of this Contractor and other Contractors working at the Site, and to adjust and/or change any and all such schedules as required during the course of construction in order to achieve a coordinated project in harmony with the Employer's completion date.
- 30.3 Commencing after the first week of construction, and continuing every week until completion, the Contractor shall take and submit photographs to the Engineer's Representative, to show progress of his work and completion of each structure or major feature.

31 CONTRACTOR TO NOTIFY DELAYS ETC.

Any delay which will affect the completion of Works shall be detailed by the Contractor who shall state the action he is taking for effective completion of the Contract programme.

The Contractor shall submit a report in respect of the various sections of the Works, the equipment in use or held in readiness, a return of labour and supervisory staff, and details of any matters arising which may generally affect the progress of the work.

The Contractor shall give a summary of the detailed progress report giving the position with regard to the agreed Contract programme.

The progress reports shall be set out in a format to the approval of the Engineer, and forwarded promptly so that on receipt the information contained therein is not more than 21 days out of date.

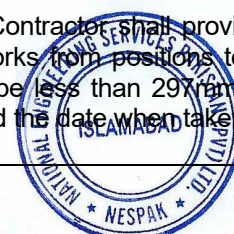
If during execution of the Contract, the Employer considers the progress position of any section of the work to be unsatisfactory, or for any other reason relating to the Contract, he will be at liberty to convene a meeting and the Contractor's Representatives are to attend such meeting.

The Contractor's Site Office shall prepare and submit 6 copies of a weekly progress report to the Employer and Engineer's Site Office. This report shall summarize site activities and record and details where difficulties in maintaining the agreed programme are being experienced or are likely to cause subsequent delay.

The Contractor's Site Office shall also prepare and submit to the Engineer's Site Office 2 copies of Daily Activity Report summarizing the main activities to be undertaken each day, noting special activities such as tests, alignment checks, etc. The Contractor shall be responsible for expediting the delivery of all material and equipment to be provided by him and his subcontractors.

32 PHOTOGRAPHS

As soon as work commences on Site, the Contractor shall provide at least 10 to 12 photographs (along with soft copy) of the works from positions to be selected by the Engineer. Each photographic print shall not be less than 297mm x 210mm and shall bear a printed description, a serial number and the date when taken.



The negatives/soft copy of all photographs shall be held at the Contractor's Site Office, numbered and handed over to the Employer at the completion of the Contract.

33 SIGN BOARD

The Contractor shall erect and maintain at the Site in a location to be approved by the Engineer two (2) Sign Boards of dimensions approved by the Engineer. The Sign Boards shall be made of metal. It shall be mounted on steel posts securely anchored and braced. The Contractor shall paint on the Sign Boards, the name of the Works, and the names of the Employer, Engineer and the Contractor both in English and Urdu Language.

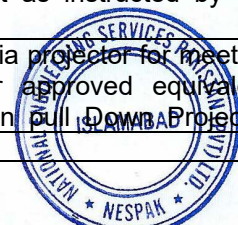
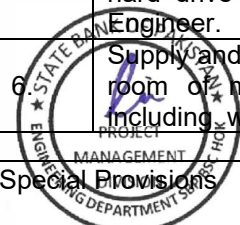
34 Site Office(s) and Facilities for the Employer/ Employer's Staff

The Contractor shall construct, provide, furnish and maintain for the Employer, a site office as approved by the Engineer/Employer along with stabilized access road.

The Contractor shall provide the said site office facility in fully furnished portable containers of minimum size 8'x40'. In case of space limitation, double storey containers alongwith staircase and front platform, for access to the offices at the upper level, can also be provided. The Contractor shall provide office facility for 5 officers of the Employer which includes an executive office chair along-with desk, side rack and two visiting chairs for each officer of the Employer or as approved by the Engineer/Employer. The Contractor shall also provide file cabinets of 100sft with lock and key for the said site office. The Contractor shall also provide a meeting room with a meeting/conference table and chairs for 10 persons or as approved by the Engineer/Employer. The Contractor shall provide 02 Nos. portable toilets with all sanitary fittings & fixtures and hot and cold water supply & sewerage system necessary for its operation at the site.

In addition to above, the Contractor is also responsible for provision of the following:

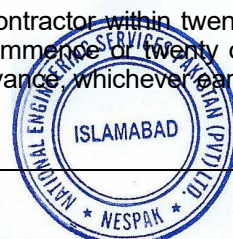
Sr. #	Brief Description of Item	Qty	Unit
1.	Providing of 5 seater Sofa Set of Master Offisys Sofa MO-SOF-06 type with center table or approved equivalent or as instructed by the Engineer including the cost of carriage to the site.	1	No
2.	Providing and installation of Split Inverter Reversible Type AC units of 1.5 ton capacity of Gree or approved equivalent to be installed on the office containers including cost of carriage, installation, operation and maintenance throughout the duration of the Contract complete in all respect as instructed by the Engineer.	4	Nos
3.	Providing and installation of UPS 5KVA (For PCs backup power supply) with batteries complete in all respect as instructed by the Engineer including maintenance throughout the duration of the Contract.	1	No
4.	Supply and installation of A3 size Black Laserjet network multifunction printer with duplex printing, scanning, and copying of make HP LaserJet MFP M440NDA or approved equivalent complete in all respect as instructed by the Engineer.	1	No
5.	Providing of Laptop Computer of make HP or equivalent professional series having processor of Intel Core i-7 latest generation, at least 8 GB RAM with at least 1 TB hard drive or approved equivalent as instructed by the Engineer.	05	No
6.	Supply and installation of Multimedia projector for meeting room of make BenQ MX720 or approved equivalent including wall mounted Automation pull Down Projector	1	No



Sr. #	Brief Description of Item	Qty	Unit
	screen complete in all respects as instructed by the Engineer.		
7.	Supply and Installation of A3 Size Color Deskjet printer of make HP or approved equivalent including networking function complete in all respects as instructed by the Engineer.	1	No
8.	Supply of Hot & Cold Water Dispenser of DAWLANCE WD 1060 type or approved equivalent complete in all respect as instructed by the Engineer.	1	No
	Other Facilities		
9.	Providing and fixing of Sand buckets with sand along with stand complete in all respect as approved by the Engineer.	3	Nos
10.	Providing & fixing dry chemical powder fire extinguisher 6 Kg capacity, stored pressure type, SFFECO or approved equivalent including clamping/ brackets.	5	Nos
11.	Providing of Measuring tape of at least 10m length or as instructed by the Engineer.	2	Nos
	Communication Facilities		
12.	Providing and installation of Phone line and telephone set of make Panasonic type KX-TS880 or approved equivalent complete in all respect as instructed by the Engineer.	5	Nos
13.	Providing and installation of Internet Connection Wired and wireless with a speed of at least 10 Mbps including setting up/connection with all desktop PCs and laptop of the Employer's staff complete in all respect as instructed by the Engineer.	1	No
14.	Providing of High Resolution Digital Camera make Sony HX99 Compact Camera or approved equivalent as instructed by the Engineer.	2	Nos
15.	Providing of USB 3.0 of at least storage capacity of 16 GB of make Transcend or approved equivalent as instructed by the Engineer.	2	Nos
16.	License for cloud based video conferencing platform (zoom) with provision for 100 participants, up to 30 hours per meeting duration & 5 GB of cloud recording storage.	1	No.
	Health and Safety Equipment		
17.	Providing of Safety Helmets of make 3M or approved equivalent as instructed by the Engineer.	15	Nos
18.	Providing of Safety Jackets of make 3M or approved equivalent as instructed by the Engineer.	15	Nos
19.	Providing Safety Shoes of make 3M or approved equivalent as instructed by the Engineer.	15	Nos
20.	Providing of Safety Restraint belts with Shock Absorbing Lanyard of make 3M or equivalent as instructed by the Engineer.	5	Nos

The Contractor shall provide replacement of the equipment(s), if any of the above mentioned equipment(s) is temporarily or permanently rendered unserviceable for any reason(s) or declared to be beyond repair by the Employer/The Employer's staff at no additional cost to the Employer.

The said office(s) shall be provided by the Contractor within twenty eight (28) days of the receipt by the Contractor of Notice to Commence or twenty one (21) days of the payment of the first half of the Mobilization Advance, whichever is earlier. The site office(s)



shall be maintained by the Contractor till issuance of Taking-Over Certificate of the whole of the Works by the Employer/Engineer .

The site office(s) along with all fittings, fixtures and gadgets shall remain property of the Contractor after the completion of the Works and shall be removed from the site. In such case, the area shall be developed in accordance with the drawings or to its natural state and as per the instructions of the Employer/Engineer.

If the Contractor fails to provide Site office(s) and facilities as stipulated above, then in any such case the Employer may deduct an amount of Rs. 500,000/- per month, which shall be deducted from the Contractor's monthly payment statements for the entire Contract period or till such time that site office(s) and facilities as stipulated above is provided by him. Further, the Employer's office facility, as stated above, will be arranged by the Employer at the risk and cost of the Contractor and its complete cost will also be deducted from Contractor's monthly payments.

No payment shall be made to the Contractor for the works involved under this Sub-Clause. The cost thereof shall be deemed to have been included in the total price quoted by the Contractor for the works

35 Transport for the Employer/ Employer's staff

The Contractor shall provide brand new 1300cc (min.) 01 No. Sedan vehicle (with A.C) along with driver for the Employer's staff to meet transportation needs (anywhere in Pakistan) till issuance of Defects Liability Period. The Contractor shall be wholly responsible for providing at all times satisfactory vehicle operating services including POL, repair/ maintenance, tolls and insurance cost etc.. In-case of outstation transportation requirement, the contractor will make arrangements for boarding/ lodging of the driver at its own cost. The vehicle shall be provided by the Contractor within twenty-eight (28) days of the receipt by the Contractor of Notice to Commence or twenty-one (21) days of the payment of the first half of the Mobilization Advance, whichever earlier.

Failure of the Contractor to provide the transport facility as stipulated above shall make him liable to bear its cost up to Rs. 240,000/- per month, which shall be deducted from the Contractor's monthly payment statements for the entire Contract period or till such time that transport as stipulated above is provided by him. Further, the Employer's transport facility, as stated above, will be arranged by the Employer at the risk and cost of the Contractor and its complete cost will also be deducted from Contractor's monthly payments.

No separate payment shall be made to the Contractor for the facilities involved under this Clause. The cost thereof shall be deemed to have been included in the total price quoted by the Contractor for the Works.

36 Accommodation Facility for the Engineer/ Employer's Staff

The Contractor shall provide and maintain accommodation facility having at least five (05) fully furnished bedrooms each having minimum 1.5 TR AC with attach bathrooms (with hot and cold water supply), kitchen and drawing/dining room duly furnished (dining table, chairs, 40" LED TV etc.) for the Employer's team to meet the housing needs till issuance of Taking-Over Certificate of the whole of the Works. The said facility shall be preferably within 2 KMs distance from the construction site of the project. The Contractor shall be wholly responsible for payment of all the utility bills including Electricity, Gas, POL, TV Cable & 10 Mbps Internet and back-up power generator(s) etc. for the lodging facility.

In addition to above, the Contractor is also responsible for provision of the following:

Sr. #	Brief Description of Item	Qty	Unit
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1.	Providing and installation of Refrigerator of 16Cft Capacity of Make Dawalance or approved equivalent complete in all respect as instructed by the Engineer.	1	No
2.	Providing & installation of Electric stove/Induction Cooker of Phillips make hd4932/000 or approved equivalent complete in all respect as instructed by the Engineer.	1	No
3.	Providing of Dinner set of at-least 42 pieces for six persons or as instructed by the Engineer.	1	No
4.	Providing of Hot & Cold Water Dispenser of DAWLANCE WD 1060 type or approved equivalent complete in all respect as instructed by the Engineer.	1	No
5.	Providing of Microwave Oven of make Dawalance DBMO-25IG type or approved equivalent complete in all respect as approved by the Engineer.	1	No

The Contractor shall provide replacement of the equipment(s), if any of the above mentioned equipment(s) is temporarily or permanently rendered unserviceable for any reason(s) or declared to be beyond repair by the Employer/The Employer's staff at no additional cost to the Employer

The said facility shall be provided by the Contractor within twenty-eight (28) days of the receipt by the Contractor of Notice to Commence or twenty one (21) days of the payment of the first half of the Mobilization Advance, whichever earlier.

Failure of the Contractor to provide the accommodation/ lodging facility as stipulated above shall make him liable to bear its cost up to Rs. 500,000/- per month, which shall be deducted from the Contractor's monthly payment statements for the entire Contract period or till such time that accommodation/ lodging facility as stipulated above is provided by him. Further, the Employer's accommodation facility, as stated above, will be arranged by the Employer at the risk and cost of the Contractor and its complete cost will also be deducted from Contractor's monthly payments.

No separate payment shall be made to the Contractor for the facilities involved under this clause. The cost thereof shall be deemed to have been included in the total price quoted by the Contractor for the Works.

37 Coordination of Work at Site

The Contractor shall take cognizance that during the execution of the project, other Contractor will be working concurrently on this site.

All works of his responsibility shall be coordinated by the Contractor so as to give the necessary facilities to other Contractor or their workman or any other employ, who execute or supervise any work on the site.

The Contractor shall ensure that the necessary safety precaution will be observed and interferences shall be avoided specially for the works executed side by side by different Contractors.

Due consideration must be given to permit access to sections of the work as required by other Contractors for the extension of their works. With a view to coordinate the works, the Engineer may from time to time direct the order of the works to be carried out.

No payment shall be made to the Contractor for the works involved under this sub clause.



38 Site Facilities to be Provided by The Contractor

38.1 General

Without prejudice to the generality of the various clauses of the Contract, particular attention is drawn to the obligation of the Contractor to make his own arrangement at his own expense for the following.

38.2 Labour Camps and Staff Residences

The Contractor shall provide, operate and maintain labour camps and staff residences and are required for the proper and efficient progress of the work to house his own employees. For the purposes of operation and maintenance of the Camps and Residences, the Contractor shall comply with the rules of Pakistan Labour Camp Rules 1960 and all other applicable provisions of the Pakistan Labour Laws.

38.3 Administrative and Field Office

The Contractor shall provide, operate and maintain administrative and field offices required for his staff and would be responsible for Operation and Maintenance, furniture, equipment, appliances, janitor services and security of the same.

38.4 Work yards and Storage Areas

The Contractor shall provide, operate and maintain all sheds, fencing, foundations and all above ground structures required to store material or equipment brought on to the site by him. The Contractor shall be responsible for the security of his entire camps, residence, site and field offices work yard and storage area.

38.5 Water Supply, Sewerage System and Electricity

The Contractor shall make his own arrangement, at his own expense for provision, operation and maintenance of electric supply, reasonable supplies of raw and potable water and sewerage system at the site of works and his labour camps, staff residences and offices. The Contractor shall pay all fees, and charges (including bills) of whatsoever nature to the concerned departments (if any) in order to procure connections of the above facilities and thereafter using these facilities.

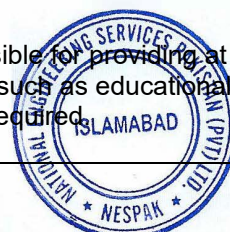
38.6 Medical Care

The Contractor shall arrange provision of adequate medical facilities for his employees.

Adequately equipped and properly staffed first aid stations or dispensaries shall be provided by the Contractor at camps and other strategic locations, to administer first aid treatment at all times free of charge to all persons on the Site, including personnel of the Engineer and the Employer. The nature, number and location of facilities furnished and the Contractor's staff for administering first-aid treatment shall meet the requirements of the Health Services of the Government of Pakistan and of Section III of the Manual "Safety Requirements for Construction by Contract", published by the Employer, and shall be subject to approval by the Engineer.

38.7 Other Facilities

The Contractor shall also be responsible for providing at his own cost other facilities for his own staff and labour such as educational, recreational, transport, telephone and catering if required.



39. CONSTRUCTION PROCEDURES

The Contractor shall advise the Engineer of proposed construction procedures in accordance with the General Conditions of Contract.

If the Engineer shall see that the work progress is slow in such a way that the work will not be completed in the time specified, then he shall order the Contractor to work overtime or in more shifts and the Contractor shall obey these orders without any additional payments and without any objections or request for compensation.

40. NOTIFICATION TO ENGINEER

The Engineer shall be notified daily in writing of the nature and location of the Works the Contractor intends to perform the next day so as to enable necessary inspection and measurement to be carried out. The Engineer may, if necessary, direct that longer notice be given of certain operations.

41. NIGHT WORK

When work is done at night the Contractor shall maintain from sunset to sunrise such lights on or about his work and plant as the Engineer may deem necessary for the proper observations of the work and the efficient execution thereof.

42. WEATHER

No work is to be undertaken when, in the opinion of the Engineer, the weather is so unsuitable that proper protection of the work cannot be ensured.

43. CO-ORDINATION WITH OTHER CONTRACTORS

It shall be the responsibility of the Contractor to keep-up good relations with other Contractors employed on site by the Employer. The Contractor shall cooperate and coordinate his work with that of the other Contractors working at the Site, to whatever extent may be necessary to complete the Project in accordance with the approved programme of the Works and in accordance with the Engineer's instructions. Should a disagreement or dispute arise between the Contractor and other contractors, the same shall be referred without delay to the Engineer for his decision. Upon such decision, the Contractor shall proceed with the work in accordance therewith. In case the access to the works of other contractors is through the Site area of the Contractor, the Contractor shall coordinate with and permit all reasonable access to other Contractors.

44. ACCIDENT PREVENTION, SAFETY MEASURES AND PROTECTIVE EQUIPMENT

The Contractor shall comply and enforce compliance by all his sub- contractors with the highest standards of safety and accident prevention in accordance with international standards and in compliance with all applicable laws, ordinances and statutory provisions.

All requisite barriers, fences, warning signs, lights and other safety precautions as required for the protection of persons and property on or adjacent to the site shall be provided at the Contractor's cost.

All false work, scaffolding and handrails shall be well constructed and secured at all times. Where overhead work is being carried out, warning signs shall be installed at ground level clearly warning of the overhead work.

All warning signs shall be in two languages, English and Urdu, and shall at all times be maintained in a clean and legible condition, to the satisfaction of the Engineer.

Trash shall be removed at frequent intervals to the satisfaction of the Engineer.

Netting shall be provided at all levels where work is in progress, all around the building.



45. SETTING OUT OF WORK AND SURVEY

45.1 Reference Points, Lines

The Contractor shall establish benchmarks and / or reference line at the Site in accordance with the instructions of the Engineer. The Contractor shall set out its work from these benchmarks and lines. The Contractor shall supply plant, equipment, materials and labour for checking if required of the survey control by the Engineer. Slope stakes will be set by the Contractor before commencement of excavation and will be re-established as required during progress of work using established bench-marks and reference points.

45.2 Verification

The Engineer may make checks as the work progress to verify lines and grades established by the Contractor and to determine the conformance of the work as it progresses with the requirements of the Drawings and Specifications. Such checking by the Engineer shall not relieve the Contractor of his responsibility to perform all work in accordance with the Drawings and Specifications and the lines and grades given therein.

Based upon the basic control, the Contractor shall provide his own primary control points, as needed for the Works, and shall preserve and maintain them until otherwise authorized.

The Contractor shall be responsible for maintaining all survey markers/monuments, and property corners. If any markers/monuments are destroyed by the Contractor, the Contractor shall arrange, at his own cost, to retrace and replace them to the entire satisfaction of the Engineer. If a monument cannot be replaced in its original position, the Contractor shall install a witness corner. The Contractor shall complete and file monument reference cards on all monuments as per instructions of the Engineer.

The Contractor shall provide experienced construction surveyors with adequate experience in the construction surveys similar in nature as required by this Contract.

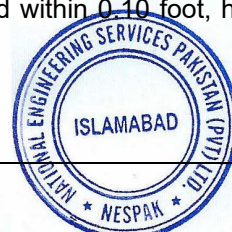
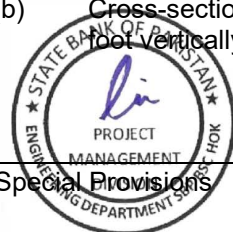
Based upon established basic control monuments the Contractor shall establish all lines and grades necessary to control the Works, and shall be responsible for all measurements that may be required for execution of the Works to the tolerance prescribed below.

The Contractor shall perform such surveys and computations as are necessary to determine quantities of work performed or placed during each progress payment period, and shall also perform all surveys necessary for the Engineer to determine final quantities of work in place. The Engineer will determine final quantities based on original ground levels determined by the Contractor and agreed by the Engineer.

The Contractor shall notify the Engineer at least 24 hours before performing a quantity survey and, unless specifically waived, quantity surveys shall be performed in the presence of an authorized representative of the Engineer.

Degree of accuracy for the survey works shall satisfy the following specified tolerances:

- (a) Structure points shall be set within 0.01 foot accuracy from point to point, except where tighter tolerances are required.
- (b) Cross-section points shall be located within 0.10 foot, horizontally and 0.01 foot vertically.



- (c) Permissible closing error for a levelling line meant for establishing Temporary Bench Mark (TBMs) shall not exceed $0.045 \times \sqrt{M}$ foot, where M is in miles. The permissible closing error shall be duly adjusted.

The Contractor shall provide all materials, equipment and labour required for surveying work, including, but not limited to, instruments, stakes, spikes, steel pins, templates, platforms, and tools, and except as required to be incorporated in the work or left in place, all such materials and equipment, shall remain the property of the Contractor. Surveying instruments shall be in perfect working condition and shall be subject to rigid inspection for proper operation at least after every two weeks of use. Defective instruments shall be promptly replaced or repaired and adjusted to the satisfaction of the Engineer.

Survey data shall be recorded in accordance with recognized professional surveying standards. Original field notes, computations, and other surveying data shall be recorded in the Contractor furnished field books. Notes or data not in accordance with standard formats will be rejected. Illegible notes or data, or use of erasures on any page of a field book will be considered sufficient cause for rejection of part or the entire field book. Copied notes or data will not be permitted; therefore, rejection of part or all of a field book may necessitate re-surveying. Corrections by ruling or lining out errors will be satisfactory.

The cost of all materials, equipment, surveyors and labour required for surveys for the Works and quantity surveys required by this clause shall be deemed to be included in the rates and prices of the various items in the Bill of Quantities and no separate measurement and payment in their respect shall be made.

45.3 Survey Instruments

The Contractor shall maintain at the Site the requisite surveying instruments in perfect working conditions to enable the Engineer's Representative to check levels and lines of the work at all times.

46. ENVIRONMENTAL PROTECTION

The Contractor shall exercise care to protect the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of works. Except where clearing is required for the Permanent works, approved construction roads and the Temporary Works, and for excavation operations, all trees and native vegetation shall be preserved and shall be protected from damage which may be caused by the Contractor's construction operations and equipment. On completion of the works, all work areas shall be smoothed and graded in a manner to conform to the natural appearance of the landscape. Where unnecessary destruction, scarring, damage or defacing may occur as a result of the Contractor's operations, it shall be repaired, replanted, or otherwise corrected as directed by the Engineer at no additional cost to the Employer.

47. PAYMENT OF WORK

No payment shall be made for the works involved within the scope of this section of specification unless otherwise specifically stated in the Bills of Quantities or herein.

The cost thereof shall be deemed to have been included in the total price quoted by the Contractor for the Works.



Contractor shall commission, operate and maintain all the systems for a period specified in clause SP-22 "Defect Liability Period".

Specifications are only general guidelines and by no means cover details of each equipment. These only spell out the intent of the requirement. The details have to be provided by the Bidders along with details of performance, construction and technical literature with the Tender. The specifications are to be read in conjunction with Drawings.

All equipment and materials shall be brand new bearing stamped ratings as required and must be approved by the Engineer prior to their use. Any doubts about the practicability and implementation of Specifications and details shown on Drawings must be expressed and clarification sought before submission of Tender. Inability of the Contractor to implement these specifications after the acceptance of the contract shall be considered breach of contract.

SP-02.2 Services by the Contractor

a) Erection Supervisor

The Contractor shall provide competent Erection Supervisor to direct and be responsible for the erection, starting and operation of the Equipment supplied by the Contractor until such Commissioning Tests and Reliability Trial Tests as required by the Engineer are completed. Further details concerning Erection Supervisor are covered in Clause SP-17, "Erection Supervisor and Operating Staff". In addition, the Contractor shall also provide services of Factory Engineer authorised by manufacturer to direct and supervise the installation, testing and commissioning of all major HVAC equipments including Water Cooled Screw Chiller, Cooling Tower, Fans, AHUs, Pumps, and HVAC BMS.

b) Not Used

c) Training of Employer's Operative Personnel

The Contractor shall arrange for free of cost on-site training of operative personnel, nominated by the Employer, in the operations and maintenance of all HVAC equipment and system. The period of training shall not be less than 15 (fifteen) days.

The group of operative personnel will comprise of Engineers/ Supervisors and Technicians. The training shall be imparted by a qualified Engineer having atleast 10 (Ten) years experience in the operation and maintenance of similar HVAC systems.

The Trainer shall fully orient the group with the actual system and impart thorough training in the operation and maintenance of the system and equipment with the help of drawings, charts, hand-outs, diagrams, video aids, lectures, etc. Details and time of training shall be approved by the Employer/Engineer before training is commenced.

SP-02.3 Erection Plant

The Contractor shall furnish special erection plant and tools in accordance with the requirements of Clause SP-15.



SP-02.4 Related Works

The Contractor shall provide all works related to HVAC system, whether specifically mentioned or not, except those specifically stated in exclusion Clause SP-03, "Work Not Included in this Contract". These related works shall include, but not limited to:

- a) Electrical Works as specified in technical provisions.
- b) (Not used)
- c) All works related to water and cooling coil condensate disposal from HVAC system upto points shown on the relevant trade drawings shall be the responsibility of the HVAC Contractor.
- d) Cutting, patching and repairing of civil works in accordance with Clause 1-06 of Section 1 of Technical specifications.
- e) Providing written information/shop drawings regarding location and sizes of access panels required in false ceiling to the persons responsible for false ceiling, through the Engineer.
- f) Providing written information regarding location and sizes of door louvers, door undercuts, where required, to the persons responsible for door louvers and door undercuts, through the Engineer.
- g) All wood-work required for satisfactory completion of the project as specified except decorative wood work provided to conceal HVAC equipment.
- h) Providing written information regarding Concrete Pads and foundations for HVAC equipment.
- i) Providing steel frames and springs for inertia pads and cork sheet/neoprene sheet for other pads.
- j) Coordinating HVAC installation with other trades' work, by way of study of other trades' drawings and pointing out the areas of conflict to the Engineer before installing items of HVAC system.
- k) All concrete foundations, including thickened structural slabs, housekeeping pads and concrete for inertia pads.

SP-03 WORK NOT INCLUDED IN THIS CONTRACT

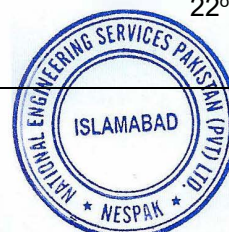
NOT USED

SP-04 DESIGN CONDITIONS

HVAC System has been designed for the conditions listed hereunder. These conditions unless stated otherwise are being given for the information of the Contractor to enable him to select HVAC equipment, material and perform specified tests under these conditions.

SP-04.1 Outside Design Conditions

- a) Summer Dry Bulb Temp: 112° F (44.4° C)
Wet Bulb Temp: 84° F (28.9° C)
Daily range: 22° F (12.2° C)



- b) Winter Dry Bulb Temp: 35.1° F (1.7° C)
- c) Latitude: 31.5° North.
- d) Altitude above mean sea level: 568 ft (173m)

SP-04.2 **Inside Design Conditions (air-conditioned areas)**

Summer

- a) Air-conditioned areas (Generally) 75°F±2°F (24°C±1°C)
50% + 10% RH
- b) Cafeteria, Prayer Hall 77°F±2°F (25°C±1°C)
50% + 10% RH
- c) Server Room 70°F±2°F (21°C±1°C)
30% - 50% RH

Winter

- a) All Heated areas (Generally) 72°F±2°F (22°C±1°C)
50% + 10% RH
- b) Cafeteria, Prayer Hall 72°F±2°F (22°C±1°C)
50% + 10% RH
- c) Server Room 68°F±2°F (20°C±1°C)
30% - 50% RH

SP-04.3 **Noise Criteria:**

All HVAC equipment and air inlets/Outlets shall be selected by the Contractor such that the following noise criteria are not exceeded:

- Air-conditioned areas NC 30-40
- Toilets and other Ventilated areas NC 40-45

SP-05 **DRAWINGS, EQUIPMENT SUBMITTALS, INFORMATION MANUALS, SAMPLES & CONTRACTOR'S OTHER SUBMISSIONS**

SP-05.1 **General**

All drawings, other information and samples must be supplied to the Engineer as laid down in these Specifications and as and when agreed during site meetings, in the Progress Chart or as instructed by the Engineer.

The Contractor shall submit for approval, detailed submittals as specified and no material or equipment may be delivered to the job site or installed until the Contractor has in his possession the approved Data Sheet, Catalogue cuts or samples of particular material. All submittals shall be in English Language, easily readable and shall be supplied free of cost.

Submittals shall be giving full information as to capacity; performance at different operating and ambient conditions, dimensions, materials, electrical data and all other information pertinent to the adequacy of the submitted equipment or material shall be submitted for approval.

All submittals shall be made atleast in triplicate with atleast one in Original.



Approval rendered on submittals shall not be considered as a guarantee of measurements or building conditions. Where submittals are approved, said approval does not in any way relieve the Contractor from his responsibility for necessity of furnishing material, equipment or performing work as required by the Drawings and Specifications.

Failure of the Contractor in providing submittals drawings and information in ample time for checking shall not entitle him to an extension of Contract time and no claim for extension by reason of such default will be allowed.

SP-05.2 Omitted Particulars

All works and materials omitted from the Contract but which may reasonably be implied or inferred from them and in the opinion of the Engineer obviously are necessary for the efficiency, stability, completion and maintenance of the works and which are ordered by the Engineer to be carried out shall be executed by the Contractor accordingly as if they had been expressly described in or shown on the Contract documents and the costs thereof shall be deemed to be included in and covered by the Contract Price.

SP-05.3 Drawings

The drawings issued with tender documents show the Scope of Work to be performed by the Contractor. These Drawings shall not be used as a basis for fabrication, construction or installation but shall be used for estimation for bidding purpose only. These drawings are not to be considered for defining the design of HVAC equipment to be furnished or defining the exact details of the installation under this Contract, but are only illustrative of the Specifications and HVAC System and show the general layout of the equipment forming part of HVAC System and schematic diagrams explaining the system flow, controls and sequence of operation. These drawings are not to be scaled.

These drawings do not show every off-set, bend or elbow which may be required in piping or duct work for the installation in the space provided. The routes and sizes of the duct work, piping, air inlets and outlets shown on these drawings are subject to change depending on the make of major HVAC equipment to be provided by the Contractor. These design parameters shall be adjusted at the shop drawing stage.

Work shown on Drawings and not mentioned in the Specifications or described in the Specifications without being shown on Drawings, shall nevertheless be held to be included in the Contract in the same manner as if they had been specifically shown upon the Drawings and described in the Specifications.

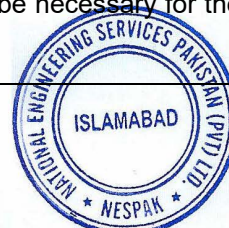
Reference Drawings

Following reference drawings will be issued to the Contractor (successful Tenderer) after award of Contract:

All drawings of Civil Contract for the Building already issued todate to the Civil Contractor.

SP-05.4 Drawings Supplied by Engineer

The Engineer may supply to the Contractor, during the progress of the work, detail drawings and instructions as may be necessary for the guidance of the



Contractor in the construction, completion and maintenance of the works, and the Contractor shall execute, obey and be bound by the same.

The Contractor shall not be entitled to any payment in addition to the Contract Price in respect of any work shown or directed to be done by such detail drawings or instructions unless the Engineer shall have given and approved a variation order for the same.

Any additional drawings found necessary or desirable by the Contractor to show different combinations of drawings supplied by the Engineer shall be prepared by the Contractor at his own expense. The Contractor shall carefully check all drawings and advise the Engineer of any errors or omissions discovered. The Contractor shall be furnished with one copy of all detail drawings and graphic instructions prepared by the Engineer. Additional copies, within reasonable quantity, shall be furnished to the Contractor, upon request, at cost.

The Contractor shall be furnished with one copy of all textual instructions as may be issued by the Engineer.

SP-05.5

Shop Drawings

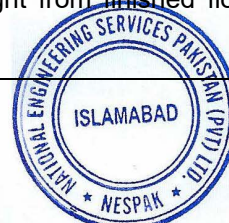
The Contractor shall make a detailed analysis of the requirements of work. Based upon such analysis he shall revise and amplify the Drawings and shall prepare detailed Shop Drawings for complete HVAC System and Equipment. Initially he shall submit 2 preliminary copies each of all such Shop Drawings to the Engineer for obtaining approval. Once basic agreement is reached with the Engineer regarding the details then the Contractor shall submit 6 (six) copies each of all such Shop Drawings and one sepia to the Engineer for obtaining approval of the Engineer. After obtaining approval and after having in possession these approved Shop Drawings, the Contractor shall use these Shop Drawings for fabrication, construction and installation.

The work described on any shop drawing submitted shall carefully be checked by the Contractor for all clearances, field conditions, maintenance of architectural conditions and proper coordination with all trades on the job. To this end, the Contractor during the shop drawing stage, shall ensure that he receives drawings of all other trades that might interfere with the proper installation of his work. No payment shall be made for any variations or alterations on site due to lack of knowledge of other trades. Any unresolved conflict between trades shall be referred to the Engineer for decision.

Equipment layout is to be detailed on shop drawings, showing the exact method of installing and clearly illustrating components to be used in making all connections.

The Contractor shall submit shop drawings of all sheet metal work for approval, before commencing any fabrication and installation work. Ductwork drawings must show clearances between ductwork and civil structure. All dampers, splitter dampers, fresh air inlets, exhaust outlets, connections to equipment and methods of support and any other details necessary for the satisfactory installation of the system must be indicated. Each type of grille, register, diffuser and louvre is to be referenced in a schedule and the type and size clearly indicated at each location. Taper and flat sides of ductwork at all transitions must be indicated, and all equipment, piping and ductwork must be located exactly by showing exact dimensions with column lines or other reference lines.

Duct bottom and piping centre-line height from finished floor level shall be marked with every change in level.



Position of hangers and supports with type and method of installation of each hanger shall be given, detailing the type of hanger fixing with a reference number for each type.

Piping drawings must be fully detailed, showing all piping in double line and indicating the precise sizes of fittings, valves and equipment.

All general layout drawings shall be drawn to 1':1/4" (1:50) scale. Details of hangers, methods of fixing of pipes and ducts, detailed cross section of pipe, ducts and risers, details of control and piping hook-ups to equipment shall be drawn to 1':1" (1:10) scale.

The Contractor shall prepare Drawings and Schedules showing precise details of holes in concrete, masonry, etc. and necessary sleeves required for passage of ducts and pipes. Drawings and Schedules, approved by the Engineer must be available before any structural work requiring holes or other modifications, is constructed.

Signed and approved drawings shall not be deviated from unless a signed variation order or site instruction is issued in writing by the Engineer. Drawings returned to the Contractor for alteration or amendment are to be resubmitted for approval.

Amended or altered drawings shall show the nature of the amendment or alteration in a revision block on the drawing, together with revision number or letter and the date of the revision.

The Contractor shall be responsible for any discrepancies, errors or omissions in the drawings and other particulars supplied by him whether such drawings and particulars have been approved by the Engineer or not.

SP-05.6 As-Built Drawings

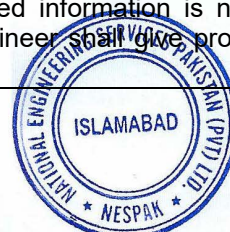
The Contractor shall supply to the Engineer a set of "As-Built" drawings showing the Contract works as installed, together with any other information necessary for operation and maintenance. Six hard copies of each drawing and other information shall be supplied, along with a reproducible copy in the form of soft sets in CAD and PDF formats in CDs.

SP-05.7 Manufacturer's Data

Manufacturer's performance data, certified factory drawings and/or curves of apparatus giving full information as to capacity, performance at different operating and ambient conditions, dimensions, materials electrical data and all other information pertinent to the adequacy of the submitted equipment shall be submitted for approval. Initially the Contractor shall submit one original published catalogue with other papers and one copy thereof. Once basic agreement is reached with the Engineer regarding the details then the Contractor shall submit four copies each of all approved material.

Manufacturers' names, sizes, catalogue numbers and/or samples of all materials shall also be submitted for approval. Samples of imported materials and devices, literature of which has been approved, will not be required. All submittals shall be made in English language and shall be easily readable.

Orders for equipment submitted for approval must be accompanied by relevant drawings, curves, technical data, catalogues and samples. Where data, certified drawings or other required information is not available until after orders have been placed, the Engineer shall give provisional approval



until all requested drawings and information have been supplied to the Engineer and approved by him. It is the Contractor's responsibility to ensure that all necessary information is supplied to the Engineer in accordance with the progress of works.

Should the Engineer give provisional approval only for an order due to lack of complete information and should the missing information not eventually meet with the approval, the Engineer shall not be held responsible for any delay incurred. For equipment where information from the manufacturers is likely to be delayed, it is essential that the Contractor places provisionally approved orders at the earliest possible date so as to ensure approval of orders in complete conformity with the progress of the works.

Submittals and shop drawings should, as far as possible, be complementary so that drawings and submittals can be cross-checked.

SP-05.8

Samples

Contractor shall provide at his cost, samples of materials, instruments, accessories, electrical items, etc. for approval by the Engineer before order is placed for the same. Sample or sample boards shall be appropriate and shall be properly labeled to have a unique Identification or reference number. These samples shall include, but not limited to:

- i) G.I. Sheet, each gauge to be used.
- ii) Pipes and Fittings, each size to be used.
- iii) Valves, (all types)
- iv) Strainers, check valves, air vents, flexible pipe connections, etc.
- v) Duct insulation, sound liner and canvas cloth, metal cladding.
- vi) Pipe insulation, canvas cloth, metal cladding.
- vii) Insulation adhesive and tapes.
- viii) Diffusers, grilles and registers.
- ix) OA/EA louvers.
- x) All types of dampers.
- xi) Power and Control Cables.
- xii) Pressure Gauges, thermometers (all types), etc.
- xiii) Electrical items; push buttons, HOA and toggle switches, pilot lamp, contractors, relays, circuit breakers, isolating switches.
- xiv) Vibration isolating springs, cork sheet, pipe hangers, supports and rollers.
- xv) Flexible duct connections.
- xvi) Pipe flexible connection/expansion joints.
- xvii) Air filters (where specified local).



- xviii) Electrical conduits and fittings.
- xix) Paints / coating (all types).
- xx) Anchor bolts studs, threaded rods, hangers and supports, etc. for hanging and supports arrangements.
- xxi) Round insulated flexible duct.
- xxii) Any other item required by the Engineer.

Samples of imported items, literature of which has been approved will not be required. Test certificate of sample as direct by the Engineer for selected samples shall be submitted.

SP-05.9 Sound Ratings

The Contractor shall provide certified sound ratings for HVAC equipment, air terminals, etc. to ensure conformance to specifications.

SP-05.10 Photographs and Progress Reports

The Contractor shall arrange, at his cost, colour photographs of Works in progress at Site. At least six photographs per month shall be taken from approved locations, commencing with the first month upto the completion of the Works. The Contractor shall submit, not later than seventh of each month, a soft copy and three prints of each photograph of size 10"x8" taken during the previous month, with brief report indicating progress of works to date.

SP-06 APPROVAL OF MATERIALS AND EQUIPMENT

As soon as practicable after award of Contract, the Contractor shall submit for the approval of the Engineer, specifications, drawings, original catalogues, diagrams and other descriptive data for all materials, components and equipment which the Contractor proposes to use under this Contract. For certain materials and equipment, data may be required to be submitted in accordance with a detailed form furnished by the Engineer. Items submitted shall be properly labeled to indicate the Contract number, BOQ number, relevant specification clause, project, manufacturer, source of supply, Supplier Contact information, Contract Item number, BOQ Item No. and other data required by the Specifications. All items shall be submitted in sufficient time to permit proper consideration and action thereon without delaying the construction schedule. Data regarding each BOQ item shall be submitted bound in separate covers for each item and labeled accordingly. These data shall include original copies of Performa invoices for placing orders, a type written specification sheet of each BOQ item, and technical literature (complete bound published catalogue) with relevant portions highlighted by a marker. Accessories to be included shall clearly be marked in catalogue and indicated in specification sheet.

SP-07 TIME FOR DELIVERY

All imported equipment, plant and machinery shall be ready for shipment at Site on such dates so as to ensure adherence to the work programme agreed with the Engineer later after award of the Contract. The Contractor shall keep the Engineer informed of the progress of manufacturing and notify approximately 3 weeks in advance in writing, as to when the equipment will be ready for inspection by the Engineer/ Employer's representative and shall



supply lists covering each consignment in sufficient detail to enable Engineer to check the contents of the packages, if he so desires.

SP-08 **STANDARDS AND CODE REQUIREMENTS**

SP-08.1 All equipment and materials under HVAC Scope of Works shall be furnished in conformity with latest edition of applicable Standards of ASME, ASHRAE, AHRI, SMACNA, TIMA, AMCA etc. and applicable Government and Local Codes governing the same. In case of conflict, the stricter requirements shown/ specified shall govern. All equipment shall be rated and tested as per standards listed in ASHRAE Handbook (Latest Edition).

SP-08.2 Abbreviations for Codes and Standards referred in the Contract are as under:

1. ASME - American Society of Mechanical Engineers, USA
2. ASTM - American Society for Testing Materials, USA
3. ASHRAE - American Society of Heating, Refrigerating and Airconditioning Engineers, USA
4. NFPA - National Fire Protection Association, USA
5. AHRI - Air-conditioning, Heating and Refrigeration Institute, USA
6. SMACNA - Sheet Metal and Airconditioning Contractors National Association, USA
7. GOVERNMENT Government of Pakistan
8. LOCAL - Local authorities of the city where project is located
9. I.E.E. - Institute of Electrical Engineers, London.
10. NEMA - National Electrical Manufacturers Association, USA
11. AMCA - Air Moving and Control Association Inc. USA.
12. P.S. - Pakistan Standards
13. B.S. - British Standards
14. TIMA - Thermal Insulation Manufacturer's Association, USA.
15. EN - European Norm
16. EUROVENT - All relevant standards as applicable.



SP-09 STANDARDS OTHER THAN THOSE SPECIFIED

Where the specifications provide requirements for material or equipment by specifying a standard such as for example, one of the American Society of Heating, Refrigerating and Air-conditioning Engineers, which has its origin in one country, it is not the intention to restrict the requirements solely to that standard and that country. Other standard, including standards of other countries, will be accepted provided the requirements thereof, in the sole opinion of the Engineer are atleast equal to the requirements of the standards specified. The Contractor may propose to the Engineer an equivalent standard other than that specified, in which case he shall submit the proposed standards and all other information to demonstrate and prove his proposed standard is equivalent in all significant respects to the standard specified. All submissions must be made in the English language.

SP-10 PERMITS

The Contractor shall secure and pay for any necessary approvals, permits and inspections from Government or other controlling agencies where applicable as required by law, before commencing any work so as to avoid all delays during erection and turn over the official records of granting of permits to the Engineer. No reimbursements shall be made for such payments.

SP-11 INSPECTION, TESTING, DAMAGES AND MATERIAL ORDERS

SP-11.1 Inspection and Testing at Manufacturer's Shop

All major imported equipments to be supplied under this contract which has been manufactured or shop assembled in or outside Pakistan shall be inspected and tested by manufacturer and certificate of compliance to specified ratings, capacities, etc. be issued by the manufacturer.

SP-11.2 Inspection at Site of Works

All equipment/materials supplied by the Contractor shall be inspected by the Engineer after delivery of the same at site to assess any damage or short of quantities and any other requirements of the specifications. The Engineer will issue an inspection certificate if the supplied items of equipment and material are found to be satisfactory.

SP-11.3 Damages, During Transportation, Storage & Installation

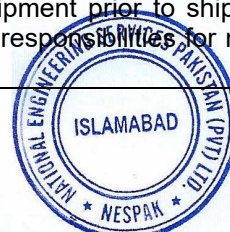
The Contractor shall be responsible for any damage of the Equipment/ material during transportation to site, storage and installation until satisfactory handling over the works to the Employer. The Contractor shall replace any damaged equipment/ materials at his own cost.

SP-11.4 Material Orders

Triplicate copies of material or equipment orders and lists of stock required in this Contract shall be furnished to the Engineer. All orders and stock lists shall state the specification designation under which the material is to be furnished and shall bear reference to the drawing and part number, if any, pertinent thereto. Orders shall also state that material is subjected to testing and shall show the required date of delivery of the material to destination.

SP-11.5 Acceptance of Materials

The acceptance of any material or equipment prior to shipment shall in no way relieve the Contractor of any of his responsibilities for meeting all of the



requirements of the specification's / Contract document and shall not prevent subsequent rejection if such material or equipment is later found to be defective.

SP-12 NAME PLATES

Each piece of equipment shall bear Factory supplied durable and adequate metal name plate giving the name and address of the manufacturer, date of manufacturer and other rating data and details. Name plates of Equipment Installed outside shall be able to withstand severe weather and environment effects without any loss or damage to its data or information Printed/Marked on it. All ratings shall be in the unit system adopted for the Project, unless otherwise authorized by the Engineer.

SP-13 DIRECTED AND REQUIRED ETC.

Unless otherwise stated, wherever in the Specifications or upon the Drawings the words, "directed", "required", "Permitted", "ordered", "designated", "prescribed" or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer is intended, and similarly the words "approved", "accepted", or words of like import shall mean approved by, or acceptable or satisfactory to the Engineer unless otherwise indicated.

SP-14 SEQUENCE OF ERECTION

The sequence of erection of the Equipment shall conform to the requirements of the civil construction and of the Erection Instructions. Such information will be furnished to the Contractor by the Engineer upon request. Contractor's Work Programme shall confirm to Construction Schedule shown on Drawings, or as directed by the Engineer.

SP-15 INSTALLATION, ERECTION AND MAINTENANCE PLANT & TOOLS

The Contractor shall furnish all plant and tools including special plant and tools for the complete and proper installation erection and maintenance of the HVAC System and Equipment. Tools shall include the type of tools not normally available in the market as standard tools and are generally manufactured especially for use with the HVAC Equipment. All lifting devices shall be accurately machined to fit the parts to be handled. The wrenches and tools for maintenance, insofar as practicable, shall be mounted on a suitable hardwood or steel board arranged for wall mounting and provided with means for ready identification. The Contractor shall also provide refrigerant charging Plant if and when required. The Contractor may withdraw the Plant and Tools after its use.

A complete set of brand new tools in proper tool boxes shall be supplied for use of the employer as per BOQ of Essential Spare Parts. The Contractor shall list in this BOQ complete set of tools required for normal maintenance of the HVAC System including all equipment.

SP-16 MATERIALS AND EQUIPMENT TO BE IMPORTED

All major equipment and materials listed as under shall be of imported origin from approved manufacturers:

- (1) Water Cooled Screw Chillers
- (2) Cooling towers
- (3) Air Handling Units and Air Cooled Condensing Units



- (4) Fan-Coil Units and Split Type AC Units
- (5) Chilled water & Condenser water piping including all fittings and flanges
- (6) Water Valves & piping specialties
- (7) Automatic Chemical Feed System including chemicals
- (8) Instruments & Gauges
- (9) Building Management / Automation System
- (10) Flexible joints for Pumps and other equipment
- (11) Thermal Expansion Joints
- (12) Automatic Air Vents
- (13) Testing & maintenance Instruments
- (14) Vibration Isolators for equipment.
- (15) Duct and pipe Insulation, Sound Liner, Insulation tape, Duct sealer, sealing tape, and adhesives.
- (16) Electrical Circuit breakers, contactors, relays, indication and measuring instruments and other components used in Electrical Control Panels, etc.
- (17) Rawl bolts, Foundation bolts, hangers and supports, etc.
- (18) Pipes (over 10" nom. Dia), pipe fittings and flanges (all sizes)
- (19) Flexible connections for duct work and Equipment.
- (20) HVAC Fans
- (21) Pumps as stated
- (22) Humidifiers

The country of manufacture of imported equipment/materials shall be U.S.A., Western Europe or Japan unless otherwise mentioned in the list of recommended manufacturers.

The equipment/materials shall be imported by the Contractor with his own, import license and foreign exchange resources.

All rates and amounts filled in the BOQ and Appendices by the Contractor for equipment/material whether locally procured or imported under his own, import license shall be according to clause SP-26.

SP-17 ERECTION SUPERVISOR AND OPERATING STAFF

SP-17.1 General

The Contractor shall provide the services of Erection Supervisors and Operating Staff in accordance with the requirements of the Conditions of Contract, of sub-clause SP-02.2 "Services by the Contractor," and as specified herein.

SP-17.2 Work by Erection Supervisor

- a) The Erection Supervisor shall direct the activities of Contractor's employees as they concern the installation, testing and commissioning of the Equipment furnished under this Contract. The Contractor through his Erection Supervisor shall cooperate with other Contractors to whatever extent is necessary to produce an installation satisfactory to the Engineer in accordance with the requirements of the time schedule, Drawings and the Specifications.
- b) Erection Supervisor shall be present on Site within 15 (fifteen) days of receipt of Engineer's order to commence work and remain on Site until the time specified in Clause SP-02.2 "Services by the Contractor"

- c) Should a disagreement arise between other Contractors and the Erection supervisor the matter shall be submitted without delay to the Engineer for his decision. Upon such decision, the Erection Supervisor shall proceed with the work in accordance therewith, immediately.
- d) Erection Supervisor shall be a at least graduate HVAC or mechanical engineer, registered with Pakistan Engineering Council, having at least 7-8 years' experience in HVAC installation works of similar nature.
- e) If the Contractor fails to fulfil his obligations under clause SP 02.2(a) and also fails to provide the Services of the Erection Supervisor having the minimum qualifications as stated in sub-clause (d) of this Clause, then the Contractor would be obligated to pay to the Employer an amount of Rs. 4,000 per day for the number of days when the services of such Erection Supervisor are not provided. Thus any loss suffered by the Employer for not having competent Erection Supervisor at the Site, the Employer would be entitled to deduct the amount due from the Contractor in this regard from his running Bill/ any payable sums.
- f) Provisions of (e) above shall not apply when the Erection Supervisor is on authorised legal leave (casual/sick) with the consent of the Engineer/Employer. His absence upto period of seven consecutive days will also be allowed when the Contractor intends to replace the Erection Supervisor with the consent of the Engineer.

SP-17.3 **Not Used**

SP-18 **RIGHT TO OPERATE PLANT**

The Employer reserves the right to operate any and all Equipment after it has passed the Commissioning Tests and prior to Final Acceptance. All repairs or alterations found to be necessary during such operations, required of the Contractor, shall be made by the Contractor at such time as directed by the Engineer. The repairs or alterations shall be made in such a manner and at such a time as will cause the minimum interruption in the use of the Equipment by the Employer.

SP-19 **ERECTION INSTRUCTIONS, OPERATION & MAINTENANCE MANUAL**

Erection Instructions, Operation and maintenance instructions, in form of published manuals, as furnished by the manufacturer of each HVAC equipment listed hereunder, shall be provided by the Contractor:

1. Air Handling Units
2. Cooling Towers
3. Chillers
4. Pumps
5. Building Management / Automation System
6. Major Components of Electrical Panels
7. Expansion Tank and Separators
8. Air Cooled Condensing Units
9. Fan Coil Units
10. Piping Specialties
11. Chemical Feed Equipment, Controls and Accessories
12. Instruments and Gauges
13. HVAC Fans



14. Split Type AC units
15. Any other equipment / material Engineer demand necessary

These instructions shall include full and detailed instructions for the guidance of the Erection Supervisor as to all procedures and precautions to be observed in erecting, assembling and adjusting the Equipment and as to the use of the Erection Plant. It shall include or be accompanied by drawings, clearly showing erection marking and particularly any matchmaking and shall embody in particular a full statement as to erection tolerances to be observed.

The Contractor shall also provide manufacturer's certified foundation drawings for the equipment and submit 4 (four) copies to the Engineer for approval.

Operation and maintenance manuals shall include full instructions for operation and maintenance of the Equipment not only during the period of Contractor's liability but more specifically during its operating life. The directions shall be set out simply, clearly and systematically. In particular, this section shall include a full list of all routine checks and their timing, directions as to fault finding, detail of all routine attentions (such as greasing), in the form of check sheets for daily, weekly, monthly, quarterly, half-yearly, yearly and any other periodic checks recommended by the manufacturer. This section should also provide detailed and complete instructions for trouble shooting, maintenance and all necessary adjustments to the Equipment. Technical leaflets and brochures in respect of all equipment supplied under the Contract including all relays, instruments, switches, controllers, regulators etc, should be supplied with the erection instruction. This should also include complete catalogue of spare parts with exploded views of the equipment and relevant part numbers to facilitate identification and ordering of spares throughout the operating life of the Equipment.

The Contractor shall submit 2 (Two) copies of all manuals to the Engineer for approval. After approval and incorporating all requirement pointed out by the Engineer, the Contractor shall submit 5 (five) sets of these manuals in proper folders and CDs in hard and soft forms for use of the Employer.

All Erection manuals, operation and Maintenance manuals, drawings, SOPs, etc., shall be supplied in original and free of cost.

SP-20 WATER AND POWER SUPPLY

SP-20.1 For Erection and Preliminary Testing

Power supply for erection and preliminary testing shall be the responsibility of the Contractor to be provided at his own cost.

SP-20.2 For Commissioning and Final Testing

Water and Power Supply for commissioning and final testing will be provided by the Employer at his own cost.

SP-21 SPARE PARTS

The Contractor shall furnish spare parts as per list given in the BOQ of Essential Spare Parts. The Contractor shall also furnish recommended spare parts with the recommendation of manufacturer of equipment and provide a list of such spares in the BOQ of Essential Spare Parts. The spare parts listed shall serve all Equipment furnished.



These spare parts shall not be used during Defects Liability Period, or earlier, unless otherwise authorised by the Engineer/ Employer, in which case these shall be replenished by the Contractor at his cost before issue of final completion certificate.

The complete spare parts manual shall be submitted which shall indicate the parts numbers and show exploded view.

The Contractor shall supply, free of cost any spare parts required during the Defects Liability Period.

SP-22 DEFECT LIABILITY PERIOD

The Contractor shall include the guarantees of the whole of the HVAC Works as laid down in the Contract. During this term, the Contractor shall remedy and/ or replace all defective parts or items and correct any omissions certified by the Engineer.

The Contractor will also be held liable for any costs of dismantling or re-erection which may have to be undertaken in order to replace defective parts.

SP-23 APPROVAL FROM GOVERNMENT

The Contractor shall arrange and be responsible for all tests, test reports and approvals regarding electrical works and other works under this Contract requiring tests/Government approvals. The Contractor shall bear the cost of all the requirements to be completed for this purpose, whether specified or not. The Contractor shall handover all test results and approval certificates to the Engineer within one week of obtaining such approval.

SP-24 PERFORMANCE GUARANTEE

The Contractor shall guarantee performance as specified of HVAC equipment in conformity with the Provisions of the Contract.

SP-25 SITE FACILITIES

Except for the Site facilities specifically stated in Conditions of Contract and/or Special Provisions, no other site facility shall be provided by the Employer to the Contractor.

SP-26 SUFFICIENCY OF RATES AND CURRENCY OF PAYMENT

All rates and amounts filled in the BOQ by the Contractor for equipment/material whether locally procured or imported shall be deemed to include, but not limited to, the cost of items, custom duties, sales tax and surcharges, freight, marine insurance, local duties, sales tax and surcharges, clearance charges, inland transport and insurance, octroi, L/C opening charges, bank charges etc. Payments to the Contractor shall be made in local currency.

SP-27 IMPORT LICENCE & FOREIGN EXCHANGE FOR IMPORT OF EQUIPMENT AND MATERIALS

The Contractor shall arrange for his own, import licence and foreign exchange for import of all equipment and materials.



SP-28 PACKING OF EQUIPMENT AND MATERIALS

All equipment and material shall be adequately packed at the manufacturer's works to protect them against damage, scratching, corrosion, dust, rain and moisture during handling, transportation and storage. The packaging shall be rigid enough to withstand normal service incidental to shipping and handling. Wherever necessary, crates/boxes shall be provided with lifting hooks attached by means of vertical rods or plates to strong bottom supports to enable rigging.

The following information shall appear inside all packages:

- a) Stock or identification number
- b) Description of contents/packing list
- c) Quantity of each item
- d) Invoice number
- e) Year of manufacture

SP-29 SITE FACILITY FOR THE ENGINEER

Fully furnished and air-conditioned site office including but not limited to furniture, latest computer, printer, telephone, vehicle, fax machine and photocopier shall be provided by the Contractor.

SP-30 NOT USED

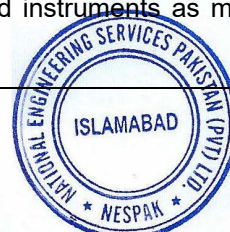
SP-31 INSPECTION AND TESTS AT SITE

SP-31.1 Inspection by Engineer

The Engineer shall inspect the works in progress as and when considered necessary by the Engineer and the Contractor shall provide full access and assistance to the Engineer for carrying out inspection to verify the conformity of works to general lay-out of HVAC System as designed and as shown on Drawings and as specified. Such inspection if made shall not relieve the Contractor from any obligations under the Contract.

SP-31.2 Tests

- a) General
 - i) All tests as specified shall be carried out by the Contractor's workmen. The Engineer shall witness the tests.
 - ii) The Contractor shall give the Engineer at least seven days notice in writing of the date on which any equipment will be ready for testing as provided in the Specifications and unless the Engineer shall attend within seven days of the date which the Contractor has stated in his notice, the Contractor may proceed with the tests in the Engineers absence and shall forthwith forward to the Engineer five duly certified copies of test readings, on the forms prescribed by the Engineer. The Engineer shall give twenty-four hours notice in writing of his intention to attend any test.
 - iii) The Contractor shall provide all labor, materials, electricity, fuel, stores, apparatus, machines and instruments as may be necessary to carry out tests.



- iv) The cost of all Tests under this Clause shall be borne by the Contractor.
- v) As and when any equipment or HVAC System or part thereof shall have passed any test the Engineer shall furnish to the Contractor a certificate in writing to that effect.
- vi) The Engineer may reject any part or parts of Equipment, and HVAC System which he shall after testing decide is not performing in accordance with the Specifications and Drawings and he shall give to the Contractor within fourteen days of such testing notice in writing of such rejection stating therein the grounds upon which his decision is based.

The results shall be filled out by the Contractor in the forms prescribed by the Engineer. Six copies of filled out forms shall be submitted to the Engineer for review and approval.

b) Preliminary Tests

Preliminary Tests as specified in Technical Specifications shall be carried out on all major HVAC equipment and such other equipment as the Engineer may require, on completion of installation of that equipment or at such time which the Engineer may require.

c) Pre-Start and Commissioning Tests

Pre-start and Commissioning Tests shall be carried out on all equipment, as Specified in Technical Specifications, when the HVAC System as a whole is ready for operation and the Building has been sealed and door shutters and fenestration installed.

d) Performance Tests

These tests as specified in Technical Provisions shall be carried out after successful completion of Commissioning Tests, during appropriate season. Performance Tests may be carried out during Maintenance Period.

e) Reliability Trial Tests

On successful completion of Performance Tests on all equipment, and after having obtained certificate to that effect, in pursuant of sub-clause a (v) hereof, the Contractor shall inform the Engineer in writing of his readiness to commence the Reliability Trial Test of HVAC System. Cooling Tests shall be carried in appropriate season and the Engineer shall, within fourteen days of receipt of such information forward his consent for commencement of Reliability Trial Test as specified in Technical Specifications, after having satisfied that all the requirements for such Tests have been completed.

If any Reliability Trial Test is not to the satisfaction of the Engineer, such test shall be repeated at such time at the Engineer may direct.



SP-32

PAYMENT OF WORK

No payment shall be made for the works involved within the scope of this section of specification unless otherwise specifically stated in the Bills of Quantities or herein.

The cost thereof shall be deemed to have been included in the total price quoted by the Contractor for the Works.



SPECIFICATIONS – SPECIAL PROVISIONS LIFT WORKS

01. SCOPE OF WORK

The scope of work given in relevant sections of lifts works shall include but not necessarily be limited to the following:

- Design and preparation of all relevant installation/ erection drawings, obtaining government and/ or Employer required approvals and/ or certificates, fabrication, installation, testing, commissioning, and maintenance thereafter for the stipulated period of equipment including training of Employer's staff.
- All wiring and controls including necessary material and accessories beyond the power supply point provided at the load break switch near the equipment.
- All other miscellaneous equipment and/ or work required to render the equipment ready for continuous, safe and efficient operation.
- Cutting, patching and repairing of damaged civil works required during installation of equipment.
- Inspection of already constructed related civil works immediately after award of work and confirmation of its suitability for the equipment.
- Provide all required installation, operation and maintenance manuals, spares lists, drawings and diagrams, inspection test certificates and submission of misc. requisite documentation.
- Providing training to Employer's Staff at site regarding operation and maintenance of the equipment.

02. CODES AND STANDARDS

All equipment & materials under this works shall be furnished in conformity with latest edition of applicable standards of ASME, BS, AWS, NFPA, ASTM, NEMA, IEE, etc. and applicable Government and Local Codes governing the same. In case of conflict, the structure requirements shown/ specified shall govern. All equipment shall be rated and tested as per relevant standard (latest edition).

Where possible, the same codes and standards shall be used throughout a particular facility. However, the final decision on with codes and standards shall be applied shall remain with the Engineer.

Abbreviation for codes and standards referred in the contract are as under:

- | | |
|---------|---|
| - ASME | American Society of Mechanical Engineers, USA |
| - BS/EN | British Standards / European Norms |
| - AWS | American Welding Society |
| - NFPA | National Fire Protection Association |
| - ASTM | American Society for Testing and Materials, USA |
| - NEMA | National Electrical Manufacturer's Association |
| - IEE | Institute of Electrical Engineers, London |
| - AISC | American Institute of Steel Construction |
| - ICC | International Building Code |
| - BCP | Building Code of Pakistan |



03. QUALITY STANDARD

To guarantee a high quality standard in the field of designing, fabricating, installing and maintaining the said equipment, only manufacturers and installer/ supplier with a proven record of following criteria will be considered. To verify the manufacturer's and installer/ supplier's experience, a reference list with completed projects should be submitted.

3.1 Manufacturer:

- i) The manufacturer of the equipment shall have a minimum of 30 years' experience in the design and manufacture of similar types of equipment.
- ii) The name of the manufacturer, part numbers and serial numbers shall appear on all major components.
- iii) At least 30 Nos. of offered units should be in successful operation for minimum (03) years in Pakistan.
- iv) All devices, components and equipment shall be new, standard products of the manufacturer's latest design and suitable to perform the functions intended.

3.2 Installer/ Supplier:

- i) The supplier should have authorized sole distributor/ sole dealership/ sole agency holder from the manufacturer of offered equipment in the name of the supplier.
- ii) The supplier should have PEC Registration Certificate in the relevant category and NTN certificate.
- iii) The supplier must have successful experience of supply and installation of offered equipment during last five years as an average of minimum fifty (50) numbers units.
- iv) The supplier must have a successful experience of similar nature of project i.e. supply and installation of at least six (06) numbers of 1000 kg lifts during last ten years.
- v) The supplier must have a successful experience of maintenance of offered equipment during last five years as an average of minimum fifty (50) Nos. units.

04. PRODUCT HANDLING AND STORAGE

It will be the Contractor's entire responsibility to ensure that all necessary precautions are taken during transportation to avoid damage to any of the equipment.

The Contractor must arrange with the supplier of mechanical equipment, well in advance, that there is sufficient clear and load bearing passage at site to be used for shipping the equipment to the installation place. The Contractor shall also liaise with the equipment supplier with regard to adequate openings and lifting points.

Specific handling or storage requirements will be dealt with in the relevant parts of the specifications, where necessary.



05. INSPECTION AND CONTROL

5.1 General

The Contractor shall ensure that the manufacturer continuously conducts his own thorough inspections of all equipment during manufacturing and installation.

The Engineer shall have the power at any time to inspect, examine and test any part of the works, or any materials or plant intended to be used in the Works, either on the site or at any factory or workshop where such parts, materials or plant are being constructed, manufactured or from which they are being obtained.

5.2 Pre-shipment Inspection

Not Used

5.3 Inspection at Site Works

All equipment/ materials supplied by the Contractor shall be inspected by the Engineer after delivery of the same at site to assess any damage or short of quantities and any other requirements of the specifications. The Engineer will issue an inspection certificate if the supplied items of equipment and material are found to be satisfactory.

The Engineer shall inspect the works in progress as and when considered necessary by the Engineer and the Contractor shall provide full access and assistance to the Engineer for carrying out inspection to verify the conformity of works as shown on Drawings and as specified. Such inspection if made shall not relieve the Contractor from any obligations under the Contract.

5.4 Damages during Transportation, Storage & Installation

The Contractor shall be responsible for any damage of the Equipment/ material during transportation to site (if applicable), storage and installation until satisfactory handing over the works to the Employer. The Contractor shall replace any damaged equipment/ materials at his own cost.

06. DRAWINGS AND SUBMITTALS

In general, the following submittals are required for the Works covered under this section. However, the final decision with regard to what should be submitted, to what extent and at which time of the contract period shall remain entirely with the Engineer.

6.1 Technical Data Sheets

The Contractor is required to submit the completed Data Sheets along with a comprehensive range of technical literature of the proposed equipment including make, origin of supply, resourcing info for outsourced components, drawings and brochures/ catalogues to show that their equipment is of a standard make and complies with the laid down specifications.

6.2 Outline Drawings

The Contractor must submit with his Bid submission outline drawings showing the arrangement of the equipment and the relevant electrical installations offered by him



The drawings must be prepared keeping the dimensions shown on the architectural and mechanical drawings in mind.

The outline drawings will constitute part of the Bid evaluation.

6.3 Design Drawings/ Shop Drawings

The successful Bidder shall submit Design Drawings/ Shop Drawings within two (2) weeks from acceptance of Bid to the Engineer for approval.

The drawings must show in reasonable detail installation and design features such as:

- i. Final arrangement of equipment keeping in view the dimensions provided in architectural drawings and civil construction for the Equipment.
- ii. Maximum dynamic and static loads imposed on building structures
- iii. Dimensions and locations of all services, openings in floors and walls, location of embedded parts and location of required electrical connection.
- iv. The Contractor shall review the civil construction drawings related to the equipment and identify any shortcomings/rectifications essentially required for equipment installation prior to construction of civil works.
- v. Wiring and control logic diagrams.
- vi. All other relevant information required by the Engineer.

Approval given by the Engineer is to be understood as an approval to proceed with the Works. The approval does not in any way release the Contractor from his contractual obligation to supply, install and maintain the equipment supplied by him as laid down in the specifications.

6.4 As-Installed Drawings

Such drawings, diagrams and schedules as will, in the opinion of the Engineer, provide an adequate record of the work "As-Installed" shall be submitted to the Engineer for approval before the issuance of Taking-Over Certificate.

The drawings shall include particulars of all items of equipment, including wiring diagrams, etc. As-Installed drawings shall be submitted to the Engineer at least 28 days before issue of handing/ Taking-Over Certificate.

The size of the as-installed drawings shall be of size A1 (minimum). Every item and dimensions in drawings must be legible.

6.5 Installation, Operating and Maintenance Manuals

Two sets of installation manual for the equipment shall be supplied by the Contractor prior to commencement of installation of equipment.

At least 28 days prior to the scheduled date of practical completion, the Contractor shall supply a complete set of operating and maintenance manuals to the Engineer for approval. Once approved, the Contractor shall proceed to prepare and hand to the Engineer four (04) sets of the approved operating and maintenance manuals.



The manuals shall be neatly bound and provided with a suitably captioned hard cover. The contents shall be generally arranged in the following manner unless otherwise specified/required.

- Index
- General description of the complete facility.
- Fault detection and removal instruction during operation.
- Emergency directions of the complete facility.
- Safety control adjustment and settings of all safety protection equipment.
- List of equipment giving manufacturer's and agents' name, and name plate data together with all data sheets published by the equipment manufacturer.
- Dismantling, installation, operating and maintenance instructions for each item of equipment (including lubricating charts).
- List of spare parts for each item of equipment as recommended by the manufacturer.
- List of essential tools recommended by the manufacturer for operation and maintenance.
- As-installed drawings.

All above submission shall be signed and stamped by the Contractor prior to submission and all submission shall be in English. The approval by the Engineer of the above submission shall not be held to relieve the Contractor of any part of his responsibility to meet all of the requirements of this Contract.

07. OPERATION AND MAINTENANCE

7.1 Maintenance During Defects Liability Period

The Contractor shall include the maintenance and guarantees of the whole of the Contract Works as laid down in the General and Special Conditions. During this term, the Contractor shall remedy and/ or replace all defective parts or items and correct any omissions certified by the Engineer.

The Contractor will also be held liable for any costs of dismantling or re-erection which may have to be undertaken in order to replace defective parts.

7.2 Register of Service And Maintenance

The Contractor shall provide a register of service and maintenance for the installation. Where such requirements are specially required by any regulation of authorities having relevant jurisdiction over this contract work this shall be complied with strictly.

The Contractor shall also provide and maintain a record of all services, maintenance and repair work carried out in detail. Such record shall be prepared in duplicate and should be in the form of a maintenance/ repair sheet with one copy to be retained by the Engineer upon the execution of such services.



All registers and records shall be kept by competent persons in the employment of the Contractor during the period for which he is responsible for maintaining the installation.

08. TOOLS & INSTRUMENTS FOR SERVICING AND MAINTENANCE

The Contractor shall supply and deliver to site a complete set of essential tools and other instruments necessary for proper servicing and maintenance of the equipment. Tools shall not include special tools and instruments, which are necessary for overhauling and commissioning of the equipment. The tools shall be supplied in the form of complete kits and shall be contained in well-constructed and compartmented tool boxes. The Contractor will not use these tools during installation, testing, commissioning and Defects Liability Period.

8.1 SPARE PARTS

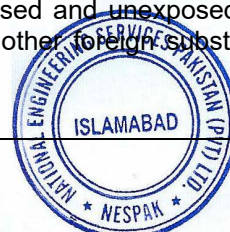
The Contractor shall provide the following spare parts separately for each lift:

- i. MG-6 Fixed & Moving Contact Set
- ii. MRG-62 for (STO, STS, SB)
- iii. Mini Contactor ZB timer RZA Timer
- iv. RA Relay Strips each (Big)
- v. KB, KBI Contact for Break
- vi. Master Card for Digital (HM)
- vii. RA Relay Strip Small
- viii. Micro Switch for ATL
- ix. Steel Wire Rope for ATL 3mm
- x. "C" Cam Bushes
- xi. Car Balancing Rubber
- xii. Car Door Slipper
- xiii. Lubricating Oil for Car & Counter Weight
- xiv. Car Shoe Housing Rubber
- xv. Shaft Information Switches
- xvi. Landing Door Weight Rubber
- xvii. Landing Door Weight
- xviii. Landing Door Weight Slipper
- xix. Landing Door Contact moving part
- xx. Landing Door Track Roller Straight
- xxi. Door Drive Motor Fixing Rubber
- xxii. Door Drive Track Roller Straight
- xxiii. Door Drive Cam Upper
- xxiv. Right side Cam replacement
- xxv. Door Drive Belt Pulley
- xxvi. Indicator Bulbs
- xxvii. Landing & Car Door Rubber Bidding
- xxviii. Door Rubber Stopper
- xxix. Photocell
- xxx. Hydraulic Buffer Oil
- xxxi. Door Drive Cam Lower

These spare parts shall not be used during Defects Liability Period, or earlier, unless otherwise authorised by the Engineer/ Employer, in which case these shall be replenished by the Contractor at his cost before issue of final completion certificate.

09. PAINTING & FINISHES

All equipment, machinery, gears, controls, exposed and unexposed steel work shall be thoroughly cleaned, freed from oil, grease and other foreign substances detrimental to good finishing.



Apply approved primer, undercoats and finishing coats on a properly prepared surface in accordance with the paint manufacturer's recommendation and in accordance with recognized international standards.

The type and shade of paints, particularly of the finishing coat shall be subject to the Employer's/ Engineer's approval.

Enamel (where required) shall also be applied according to the manufacturer's recommendation. Stainless steel finish shall be No. 4 finish or equivalent, unless specified otherwise in the specification. If field touch-ups of abraded and damaged surfaces become necessary, the same type of paint used in the factory shall be employed.

10. TESTING AND COMMISSIONING

On the completion of the Work substantially in accordance with the Contract, the Contractor shall give the Engineer notice in writing thereof and before making the "Testing and Commissioning" shall give the Engineer and the local authority seven (07) days' notice in writing of the date on which he will make the said tests of the work in accordance with relevant codes and in the manner prescribed by the Specification.

Unless otherwise agreed, the Contractor shall commence such tests upon the date and shall carry out the same, in the presence of the Engineer or his authorized representative, whose name shall previously have been communicated in writing to the Contractor and the local authority.

If any portion of the works fails under the tests to fulfill the Contract conditions, the Contractor shall inform the Engineer thereof in writing, and tests of the faulty portions shall, if required by the Engineer be repeated within a reasonable time upon the same terms and conditions.

If the "Testing and Commissioning" is not successfully made by the Contractor within one week after the date fixed by the Contractor for the completion for operational use or for the testing of the works, the Engineer may in writing call upon the Contractor under seven (07) days' notice to make such tests, and on the expiry of such notice such tests shall forthwith be made by some other agency appointed by the Engineer at the expense of Contractor.

The Contractor shall supply all necessary utilities, labour, apparatus and instruments necessary for the prescribed tests. The accuracy of the Contractor's instruments shall be demonstrated if required.

The Contractor shall make for payment of all or any fees charged by the local authorities for the above.

Each section of the installation will be required to operate within the specified limits of its rating either continuously or intermittently as may be required without failure of any kind for a period of one year after the "Testing and Commissioning" of each section, the date of completion of the above being certified by the Engineer.

The installation will be under the charge of the Contractor during this period, at which time the Contractor shall instruct the Employer's personnel on the maintenance, servicing and trouble-shooting of the various plants and system.

11. TEST CERTIFICATES AND REPORTS

The Contractor shall provide copies of all test certificates/ reports including the following:

Test Certificates of critical materials



- (ii) Factory test reports
- (iii) Pre-shipment test report
- (iv) Report of testing & commissioning of equipment

12. TRAINING

On completion of all works, but prior to final Taking -Over, the Contractor shall arrange for free training and instruction to be provided to the Employer's maintenance staff and operators. This training shall cover all aspects of the operation and maintenance of the plant/ equipment and shall ensure that the trainee is provided with at least the necessary fundamentals required for the safe and efficient operation of the plant/ equipment in question. The instructor(s) must be competent and experienced personnel, well acquainted with the task of lecturing. The schedule of offered training highlighting the details of syllabus indicating number of hours for training and field instruction subject to be taught and No. of Clients staff strength to be trained shall be approved by the Engineer.

13. GUARANTEE

The Contractor shall submit two copies of written guarantee that the material and workmanship of the equipment installed is according to recognized international standards and conform to all contractual requirements of this specification that he will make good without extra cost any defects not due to ordinary wear and tear or improper use, which may develop within one year from date of the installation being handed over to the Employer.

During the last month of the guarantee period, the Contractor shall demonstrate to the Engineer that all equipment and accessories are operating to the required specifications.

The guarantee period shall be one year after final commissioning.

In case if equipment remains out of order for more than 10 days or more, guarantee/ maintenance period will be extended accordingly.

14. MEASUREMENT AND PAYMENT

No measurement and payment shall be made for the works involved within the scope of this section of specifications unless otherwise specifically stated in the schedule of prices or herein. The cost thereof shall be deemed to have been included in the quoted unit rate price of other items of the schedule of prices.

