

DIVISION 01000 – GENERAL REQUIREMENTS**01010 SUMMARY OF WORK****01011 GENERAL**

Name of Project: **Infrastructure Development of 500 Acres Land at S.I.T.E. Larkana**

The project comprises of:

- a) Road Network
- b) Water Supply Network
- c) Sewerage Network
- d) Storm Water Drainage Network
- e) Construction of UGWT, OHWT & Pump Room and Intake Water Line from source to UGWT
- f) Installation of Tube Well
- g) Installation of Street Lights
- h) Construction of SITE Office Building
- i) Construction of Masjid & Ablution
- j) Construction of Product Display Centre
- k) Construction of Security Office & Gate
- l) Construction of Hospital (Clinic)
- m) Construction of School
- n) Construction of Recreation Centre
- o) Construction of Fire Brigade Station Building

01012 SCOPE OF WORK

The project's scope includes sub-structure, superstructure, finishes and other related works to complete the works in accordance with tender / contract documents.

01013 SCOPE OF CONTRACT

The Contractor shall provide all materials and machinery / plant / equipment and perform all work necessary for the complete execution and completion of the Works as shown on drawings and mentioned in the tender documents / Bill of Quantities.

All the material tests will be carried out in the presence of Consultant from self-raised laboratories on site or approved laboratory (approved by the Consultant and the Client). Material testing and verification reports must be attached with all the IPCs (Interim Payment Certificates).

01014 WORK INCLUDED

General Civil Works, internal Electrical Works, internal Public Health (Plumbing) Works, and Lifts / Escalators and any other work required for completion of project are included in this contract.

01015 EMPLOYER FURNISHED ITEMS

No material or equipment shall be supplied by the Employer.

01040 COORDINATION

01041 PROJECT COORDINATION

The Engineer's approval of the programme of works shall not absolve Contractor from his responsibility to properly co-ordinate his and his sub-contractor's work and he shall take such steps as are necessary at all times to ensure that the works are carried out and controlled in such a way that the contract is completed in a workmanlike manner and by the stipulated date of completion.

01042 PROGRESS AND IMPLEMENTATION

The Employer and the Engineer shall convene regular meetings with the Contractor, who shall report to the Engineer and the Employer his own and his subcontractors; progress and shall other matters affecting the works. The Contractor can also convene meeting to deal with outstanding technical matters if they can not be dealt with in regular meeting. The contents of the meeting shall be recorded in the form of minutes. The Employer may introduce procedures and systems from time to time for correspondence, meetings, submittals, approvals, variations, billings, invoicing, record keeping, testing and commissioning and the like through a regularly updated manual for implementation of the Works and taking over thereof. The Contractor shall strictly follow the instruction in the manual and act and supply information and data accordingly.

01310 CONSTRUCTION SCHEDULE, PROGRESS AND MONITORING REPORTS

01311 CONSTRUCTION SCHEDULES

The Contractor shall within ten (10) calendar days from and after the Contractor's receipt of written Letter of Award, submit to the Engineer for approval a detailed EPC (Engineering, Procurement, and Construction) schedule based on a critical path analysis of construction activities and sequence of operations needed for the orderly performance and completion of any separable parts of any and all work in accordance with the Contract. The schedule shall be Critical Path Method (CPM) type in the form of a network diagram with resource and activity listings, the network and sub-networks diagrams shall be shown in detail and in the order of sequence of all relevant activities, their descriptions, duration and restraints necessary and required for completing all work and any separable parts thereof. The critical paths will be highlighted. The activity listing printouts shall be provided to the Engineer no later than thirty (30) days after acceptance of the network diagram. One listing shall be sorted by work items; and one shall be sorted by "early start" items; an one shall be sorted by "late finish: work items.

The activity listings shall show the following information for each activity on the network.

- Identification by work item number.
- Duration (by work day schedule)
- Description
- Earliest start and finish dates
- Latest start and finish dates
- Total float time

The Contractor shall pursue the steps of development and analysis so that the first full network diagram can be accepted and placed into unrestricted use no later than ten (10) days following the Letter of Award.

1. Conduct educational workshops to train and inform key project personnel, including subcontractor personnel, in the proper methods of providing data and utilizing the progress schedule information.

2. Establish regular procedures for monitoring, updating and reporting, coordinated with progress meeting dates and payment request dates.
 - Do not make non-essential changes in the logic before updating unless reviewed with the Engineer.
 - Updated when no longer possible to utilize the critical plan of work.
3. Engage a consultant who is a recognized expert in CPM schedule and operations, to assist with the progress schedule procedure. When demonstrated to the Engineer's satisfaction that Contractor's personnel are sufficiently skilled; experienced and equipped for CPM scheduling, the requirements for an engaged consultant may be waived.
4. Select and use an EDP software / hardware system which has programs that will provide the necessary output data, is intended for building construction progress schedule management, and is acceptable to the Engineer.

01312 PROCEDURES AND UPDATES

The Contractor shall establish procedures and processing routines and include data to whatever extent is consistent with the complexity of the work, and necessary to achieve a high degree of effectiveness and accuracy in the development of an "optimum" progress schedule. Use "one calendar day" as the unit of time.

- a) Activities: Before attempting to produce a network diagram, prepare a listing of activities involved: include every activity having a possible bearing on the time required to complete the work. List each activity's requirements in relation to other activities; impart the best logic which can be foreseen for the whole construction process.
- b) Organization: Utilize the preliminary progress schedule (if any), and sketch the first anticipation of a skeleton network to help understand the essence of a probable critical path.
- c) Processing: Input the prepared data to the EDP programme and process to produce the output or computer-drawn network (draw network by hand if equipment unable to do so). Revise data, reorganize necessary sequences, and reproduce within the limitations of the contract time. Display full network on a single (or pieced together) sheet, with critical paths marked and located near centre of network, and locate paths with most float near edges. Sub-networks are permissible on separate sheets for activities clearly off the critical path; however, a sub-network for typical floor structural and finishing should be included in the master network.
- d) Initial Issue: Prepare initial of progress schedule network from a listing of straight "early start total float" sort. For each identified and described activity, show associated events, duration, float and dates for early start/finish and late start/finish. In listing, identify which items are critical. Produce a listing of Pakistani rupees – volumes of total work performed calculated at intervals matching the projected times for payment requests. (Projected Cash Flow Curves).

The Contractor shall promptly inform the Engineer of any proposed change in the schedule and shall furnish a revised schedule within ten (10) calendar days after approval of such change. The schedule shall be kept up to date, taking into account the actual progress of work and shall be revised, if necessary, every thirty (30) calendar days. The revised schedule shall be sufficient to meet the requirements for the completion of the several parts of any and all work as set forth in the Contract.

01313 MANPOWER & PROCUREMENT SCHEDULE

The Contractor shall within ten (10) calendar days from and after the Contractor's receipt of written Notice to proceed, submit and obtain approval of a manpower schedule; equipment and material shipping (procurement) schedule and material and commodity schedule for the entire duration of the contract period. Thereafter, the Contractor shall resubmit every fifteen (15) calendar days an update of these schedules. Should the overall construction schedule be revised, new forecast schedules will be prepared by the Contractor. Format, content and selection of items to be included shall be as directed by the Engineer.

01314 SUBMITTAL AND DISTRIBUTION

In preparing the man-hour schedule and equipment and materials quantity schedule, the Contractor shall utilize the same sub-division of work activities as developed in the construction schedule. The selection of specific activities and details of these reports will be mutually agreed so as to avoid having the Contractor keep two sets of books. As part of the above items the Contractor shall submit to the Engineer for acceptance 3 copies of the following data on a weekly basis:

- a) Use of Manpower – Technical, Skilled and Unskilled
- b) Use of Equipment / Machinery on site
- c) Material Procurement and its utilization
- d) Any related drawings / details if applicable.

01315 PROGRESS REPORTS

During the currency of the Contract, the Contractor shall submit to the Engineer, on a regular basis on an approved format, monthly progress reports in quadruplicate on the actual progress of the work. Such progress reports shall include the following:

- a) A copy of the construction summary and details level schedule outlining progress to date for the various major items of work together with the latest updated construction, manpower and other schedules mentioned herein.
- b) A list of the construction equipment used on work during the reporting period and any equipment idle during the reporting period.
- c) A list of the numbers of personnel by trade used on work during the reporting period, with such total stated separately as to office, supervisory and manual personnel.
- d) A manpower and equipment forecast for the succeeding thirty (30) calendar days, stating the total number of workers, and separately stating such total as to office, supervisory and manual personnel.
- e) A narrative summation of the first three items above indicating the status of the work performed and other pertinent activities including the actual percentage of work completed and an estimate of the percentage of work completion in the succeeding thirty (30) calendar days.
- f) Cash Flow Analysis and projected demands for the next three months based on anticipated progress projections.

01340 CONTRACTOR MATERIALS, EQUIPMENT, AND DRAWING SUBMITTALS

01341 SCHEDULE OF REQUIRED SUBMITTALS

Within ten (10) calendar days after receipt of Letter of Award, the Contractor shall submit in duplicate, a schedule listing all material submittals, equipment submittals and drawings to be furnished for review and approval.

The schedule shall include, but not be limited to, shop drawings and materials submittals, equipment submittals and certificates; spare parts data; samples. The schedule shall indicate the type of items, contract requirement reference, the Contractor's proposed dates for submitting the above items and projected need for approvals, and procurement dates. In preparing the schedule, adequate time shall be allowed for review, approval and possible re-submittals, and revision and update of the schedule as required. Such revised schedules shall be made available to the Engineer for reviewing in the same manner as the original submittal.

The Contractor shall recognize and allow for the lead time required for manufacture, fabrication and delivery to the site and for subcontractor's and Engineer's review.

The Contractor shall arrange the schedule in orderly sequence with, as far as practicable, each item in the order in which it will be needed so as to cause no delay in the work.

Request for approval of substitutions materials or systems, or for deviations from the Contract Documents shall be submitted according to section 01636, SUBSTITUTIONS and shall Preliminary submittals with allowances for the time for review prior to submittal of material, equipment or drawing submittals.

01342 GENERAL

All Material, Equipment, or Drawing submittals shall be identified in accordance with the submittal numbering system. Shop drawings must show dimensions of all materials to be built in.

The Contractor shall make all corrections required by the Engineer and resubmit the required number of drawings of material or equipment submittals until all required corrections are made.

The Contractor shall direct specific attention in writing to all deviations from the Contract Documents in his original submittal.

Prior to receipt of drawings and submittals noted "Review Not Required: Work May Proceed" any action or commitment which the Contractor may make on the basis of said drawings or samples shall be at the Contractor's sole risk.

The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Engineer's acceptance of shop drawings, or material or equipment submittals, unless the Contractor has informed the Engineer in writing of such deviation at the time of submission and the Engineer has given written acceptance to the specification. The Contractor shall not be relieved from responsibility for errors or omissions in the shop drawings, or material or equipment submittals, or samples by the acceptance thereof.

The Contractor shall direct specific attention, by notation on resubmitted shop drawings, or material or equipment submittals, to revision other than those requested by the Engineer on previous submittals.

No portion of the work requiring submission of shop drawings, or material or equipment submittals, shall be commenced until the submittal has been approved as provided herein. All such portions of the work shall be in accordance with approved submittals.

Where required by the specification lists of materials and equipment shall be submitted by the Contractor. These lists shall be by sufficient descriptive material, such as catalogues, cuts, diagrams, and other data published by the manufacturer, as well as evidence of compliance with safety and performance standards, to demonstrate conformance to the specification requirement: catalogue numbers alone will not be acceptable.

Materials and equipment will not be approved for use at capacity ratings in excess of manufacturer's published data.

Approval of materials and equipment will be tentative subject to submission of complete shop drawings indicating compliance with the Contract Documents.

01343 MATERIAL SUBMITTALS

For every request for acceptance of material, the Contractor shall submit, as required by the Engineer, as a condition precedent to acceptance of the proposed material, certificates, samples, and other data and information related to following:

- Product Certification
- Manufacturer's Review
- Approved Application or installer
- On Site Instruction
- Manufacturer's Supervision

The Contractor shall submit a description of the complete system of which the proposed material forms a part, listing all proposed components and specifically denoting all, adjacent materials which are in contact with, or function as a part of the system.

Any certificate required for demonstrating proof of the compliance of the material with Specification requirements, including mill certificates, shall be executed in quadruplicate. It shall be the Contractor's responsibility to renew all certificates before submissions are made to the Engineer to ensure compliance with the Specification requirement.

Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if after tests are performed on selected samples, the material is found not to meet the specification requirements.

When the Contractor submits, in support of a material submittal, manufacturer's standard documents, the contractor shall:

- ** For drawings and similar documents printed from original transparencies: Modify drawings to delete information which is not applicable to the project, provide additional information where required and submit as a transparency.
- ** For brochures and other preprinted data: clearly mark each copy as follows:
 - Identify pertinent material, product, make,
 - Refer each item to applicable Contract Document or shop drawings;
 - Show dimensions and clearances required;

- Delete all options, or variations from the Contract Documents, except where such items are specifically noted as proposed deviations.
- Where proper installation of the work requires that other work be set to special detail, held to tolerance, or dimension be established, so indicate in the submittal.
- All catalogue data, materials lists and equipment schedules shall be submitted in English language.

The Contractor, at his expense, shall furnish for approval, of Engineer samples required by the Specifications or by the Engineer. Materials for which samples are required shall not be used in the works until approved by the Engineer.

Samples, in general, are required for all materials which are an exposed part of the finished project. Samples of concealed components and standard materials will be reviewed if submitted. However, such samples are not required unless specifically called for by the Engineer.

Typical samples shall be taken from production run material and shall be representative examples of proposed quality and finish.

Preliminary samples shall, as far as possible, anticipate the quality and finish of production run material.

Samples will be retained at the job site for comparison purposes. Samples of manufactured items will be returned to the Contractor for installation in the work at locations where directed after approval of materials.

Each sample shall be labelled and indicate:

- Name of project
- Name of contractor and subcontractor, if applicable
- Material or equipment represented
- Place of origin
- Name of producer and brand (if any)
- Location in project
- Specification, section and paragraph number
- Data submitted.

The Contractor shall transmit to the Engineer under separate cover a statement in triplicate for each shipment of samples containing the information required above. The Contractor shall, enclose a copy of this statement with the shipment. Approval of a sample shall be for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirement. Substitutions will not be permitted unless they are considered to be in the Employer's best interests.

Failure of any material to pass the specified tests will be sufficient cause for refusal to consider under this Contract any further samples of the same brand or make of that material.

The Employer reserves the right to disapprove any material which previously has proved unsatisfactory in service, whether on this Contract or elsewhere.

When tests are required, only one test of each sample proposed for use will be made at the expense of the Employer. Samples which do not meet specification requirements will be rejected. Re-testing of additional samples will be arranged by the Employer at the expense of the Contractor.

Sample Types:

- a) Preliminary Samples: Hand made or simulated examples of proposed materials submitted to demonstrate anticipated finished appearance.
- b) Product Samples: Representative examples of materials proposed for use.
- c) Range Samples: Samples showing extremes of variation in appearance, texture or color and the limits within which the Contractor agrees to hold the materials used in the work.
- d) Sample Installation: Trial run or initial example provided for review and acceptance by the Engineer before continuing with the work.
- e) Test Samples: Samples provided for purpose of physical or chemical test analysis. If samples are submitted directly to the testing laboratory, submit copy of letter of transmittal.

The Contractor shall submit all material submittals sufficiently in advance of manufacture, shipping, custom clearance requirements etc. to permit no less than forty five (45) calendar days for review and appropriate action by the Engineer.

If material submittals show variations from the Contract requirements because of standard shop practice or for, other reasons the Contractor shall briefly described such variations in the body of the submittal. If acceptable, the Engineer may approve any or all such variations, if Contractor fails to describe such variations, he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though items shown in such submittals have been permitted to proceed for procurement or manufacture.

If a material submittal describes variations as per the above paragraph and show a departure from the Contract requirements which the Engineer finds to be in the interest of the Employer and to be so minor as not to involve a change in the Contract price or time for performance, the Engineer may permit the Contractor to proceed with procurement of the material presented in the submittal.

Two (2) copies of each complete material submittal will be returned marked with one of the following notations:

Notation 1: Work may proceed

Notation 2 Work may proceed. Submit final documentation.

Notation 3: Revise and resubmit. Work may proceed subject to incorporation of changes indicated.

Notation 4: Revise and resubmit. Work may not proceed.

Notation 5: Review not required. Work may proceed

Copies of drawings returned to the Contractor marked with either Notation "1", "2" or "3" authorize the Contractor to proceed with the fabricating, manufacture, or local procurement of material depicted by such returned copies, provided that such fabrication, manufacture, or local procurement shall be subject to the comments, if any, shown on such returned copies. Although work may proceed on a Notation "3" review (with comments), the Contractor, shall incorporate the comments, resubmit, and obtain Notation "1" or "2" before the approval cycle is considered complete by the Engineer.

Permission to proceed shall not constitute acceptance or approval of design details, calculations, analysis, test methods, or material developed or selected by the Contractor and shall not relieve the Contractor from full compliance with contractual obligations.

The Contractor shall be responsible for, and bear all costs of damages which may result from the ordering of any material prior to receiving permission to proceed from the Engineer.

01344 DRAWING SUBMITTALS

The Contractor shall submit all drawings sufficiently in advance of fabrication/manufacture or construction requirements to permit not less fifteen (15) calendar days for review and appropriate action by the Engineer.

Drawings Types:

a) Shop Drawings

- (i) Preliminary Shop Drawings: Drawings and other data submitted prior to acceptance of systems and only required to show information necessary for evaluation and co-ordination with other work.
- (ii) Project Shop Drawings: Drawings and other data illustrating materials and assemblies proposed for the project.

b) Working Drawings

Drawing for temporary structures such as bulkheads, support of excavation, ground work, control systems, forming false work and for such other work as may be required for construction but does not become an integral part of the completed project.

c) As Built Drawings

Drawings worked-up by the Contractor on reproducible for as-built information for the work as completed.

A- **Shop Drawings:**

The Contractor shall submit one (1) reproducible and three (3) legible prints of all shop drawings to the Engineer to obtain permission to proceed with fabrication/manufacture or construction. These drawings shall be complete and detailed. Shop drawings shall include but not be limited to design, detail, fabrication, assembly, erection and, setting drawings, schedule drawings, manufacturer's scale drawings, wiring and control diagrams.

Shop drawings shall be checked and coordinated by the Contractor with the work of all disciplines involved before they are submitted to the Engineer and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Shop drawings submitted without this stamp of approval may be returned to the Contractor for resubmission.

All shop drawings shall have a blank area eight (8) cm high by ten (10) cm wide, located adjacent to the title block to accommodate the Engineer's review stamp.

The title block shall display the following:-

- Number and title of the drawing
- Date of drawing and revision
- Name of project building or facility
- Name of Contractor and sub-contractor, if applicable, submitting drawings.
- Clear identification of contents and location of the work.
- Specification section and paragraph number
- Contract title and number

Shop drawings shall be prepared by a qualified detailer and shall be complete including erection diagrams showing the fabrication and construction of all items required for complete assembly and shall:

- Provide pertinent information relating to installation and connection to work of other trades, and co-ordinate with work of other trades as required for proper placing, anchorage and support of the work. Indicate in detail the precise location and spacing of all embedded anchor bolts, sleeves and other features required to be placed in the concrete structural steel or masonry or otherwise required to be built into the structure.
- Identify details by reference to the Contract requirements because of standard shop practice or for other reason the Contractor shall briefly describe such variations in the drawing notes. If acceptable, the Engineer may approve any or all such variations. If the Contractor fails to describe such variations he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though work shown on such drawings has been permitted to proceed for fabrication, manufacture, or construction.

If the shop drawings as submitted describe variations per the above paragraph and show a departure from the Contract requirements which the Engineer finds to be in the interest of the Employer and to be so minor as not to involve a change in the Contract price or time for performance, the Engineer may permit the Contractor to proceed with the work shown on the shop drawings.

Shop drawings shall not indicate any material for which acceptance has not been received, unless accompanied by a separate request for approval. In no case shall Engineer's review and return of shop drawings constitute an acceptance of either specified or substitute manufactures or materials.

One reproducible and two (2) copies of each shop or working drawing, as further defined herein, will be returned marked with one of the following notations:

- Notation 1: Work may proceed
- Notation 2: Work may proceed. Submit final documentation.
- Notation 3: Revise and Work may proceed subject to incorporation of changes indicated.
- Notation 4: Revise and resubmit. Work may not proceed
- Notation 5: Contract title and number

Copies of drawings returned to the Contractor marked with either Notation "1", "2" or "3" authorize the Contractor to proceed with the fabrication, manufacture, or construction covered by such returned copies, provided that such fabrication, manufacture, or construction shall be subject to the comments, if any, shown on such returned copies. Although fabrication, manufacture, or construction may proceed on a Notation "3" review (with comments), the Contractor shall incorporate the comments, resubmit, and obtain Notation "1" or "2" before the approval cycle is considered complete by the Engineer.

Permission to proceed shall not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the Contractor and shall not relieve the Contractor from full compliance with contractual obligations.

Copies of drawings returned to the Contractor marked with Notation "4" shall be corrected as required, and such drawings shall be resubmitted in the same manner as before.

Copies of drawings returned to the Contractor marked with Notation "5" authorize the Contractor to proceed with the fabrication/manufacture or construction covered by such drawings.

Copies of drawings returned to the Contractor marked with either Notation "3" or "4" shall be resubmitted to the Engineer not later than five (5) calendar days after date of receipt by the Contractor of such copies of drawings and in no case later than ten (10) calendar days after the date of the Engineer's transmittal.

Review of the Contractor's drawings by the Engineer shall not be held to relieve the Contractor of any of his obligations to meet all the requirements of the Contract or relieve the Contractor of the responsibility for the correctness of such drawings. The Contractor shall, at its expense, make any changes in the design, which are necessary to make the work conform to the provisions and Intent of the Contract.

Resubmittals of drawings will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, on the resubmitted drawings, to revisions other than the comments made by the Engineer on previous submissions. The Contractor shall make any corrections required by the Engineer.

When the drawings have been satisfactorily completed, the Contractor shall carry out the fabrication, manufacture, or construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

In the event that a change occurs to a previously reviewed drawing and the Contractor has received from the Engineer authorization to proceed with the change, the Contractor shall revise the previously reviewed drawing to reflect the latest reviewed change and resubmit the drawing to the Engineer. The Contractor shall be responsible for, and bear all costs of damages which may result from the ordering of any material or equipment or from proceeding with any part of the work prior to receiving permission to proceed from the Engineer.

Shop Drawing types to be as follows unless otherwise specified:

- (01) Preliminary Shop Drawings
 - i) Preliminary, shop drawings shall be provided for portions of the work where interpretations or variations from the Contract Documents are proposed, or otherwise required.

- ii) Show major dimensions, location of structure supports, working points, clearance lines and all other preliminary information required to determine the extent to which the proposed installation affect other portions of the work.
- iii) Include descriptions of all construction loads, dead loads and special details including clearances and tolerances required for installation.
- iv) Drawings as required to evaluate the total effect on the cost of the work will be required prior to approval of materials and manufacturer if building layout or detail changes are necessary.
- v) Additional changes and the cost thereof, after review of preliminary shop drawings will be the sole responsibility of the Contractor.

(02) Project Shop Drawings

- i) Project shop drawings shall be complete, consistent with preliminary shop drawings and mock-up shop drawings, as corrected. Show all changes to building details to co-ordinate with required modifications and indicate approval by other trades for required modifications to their work.
- ii) Where shop drawings are based on the use of a particular material, such material shall follow the normal material approval procedure independently of the shop drawings.

B- Working Drawings

"Working Drawings" shall mean Contractor's plans for temporary structures such as temporary bulkheads, support of excavation, ground water control systems, forming and false work and for such other work as may be required for construction but does not become an integral part of the completed project.

One (1) reproducible and three (3) legible copies of working drawings shall be submitted to the Engineer where required by the specifications, or requested by the Engineer, and shall be submitted at least ten (10) calendar days (unless otherwise specified by the Engineer) in advance of their being required for the work. The Engineer will review and return the drawings to the Contractor following procedures outlined above for Shop Drawings.

Working drawings as submitted shall be certified by a professional engineer whose qualifications are acceptable to the Engineer and shall convey, or be accompanied by, calculations or other sufficient information to completely explain the structure or system described and its intended manner of use. Prior to commencing such work, working drawings must have been reviewed and work shown on such drawings must have been permitted to proceed by the Engineer, which review and permission will not relieve the Contractor in any way from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error are assumed by the Contractor, and the Employer and the Engineer shall have no responsibility therefore.

Permission to proceed with the work shown on the Contractor's working drawings shall not relieve the Contractor of any responsibility, including but not limited to, responsibility for accuracy of dimensions and details, and for mutual agreement of dimensions and details. The Contractor shall remain responsible for agreement and conformity of its working drawing with the Contract Drawings and Technical Specifications.

C- As-Built Drawings

The Employer furnished drawings shall be marked up by the Contractor on reproducible for as-built information as the work is completed and shall be submitted to the Engineer together with six (6) copies of each on a continuous basis, but in all cases prior to issuance of the Certificate of Completion of the Works.

Contractor furnished drawings shall be revised up by the Contractor on reproducible of Mylar quality for as-built information as the work is completed and shall be submitted to the Engineer together with six (6) copies of each on a continuous basis, but in all cases prior to issuance of the Certificate of Completion of the Works.

01345 SUBMITTAL NUMBERING SYSTEM

The Engineer has established a drawing numbering system used to number the design drawings. The Contractor shall use the identical system to number and control all drawings created during construction including all material and equipment submittals, shop drawings, erection drawings and the like, being sure to assign to each a unique, previously unused number.

01400 QUALITY CONTROL**01401 QUALITY SYSTEM**

The Contractor shall prepare, manage, and control a quality system for the construction and installation of the Works in accordance with ISO 9002 as prescribed in Clause 36.8 of the Conditions of Particular Application Part II. ISO 9002 shall be regarded as a basic minimum requirement as to the proper execution of all quality assurance on the Works. The standards and controls stipulated herein are meant as supplement and introductory to the quality system to be introduced by the Contractor in accordance with Clause 36.8 mentioned above.

01402 QUALITY STANDARDS

Except where expressly, provided all material and equipment provided for incorporation into the permanent works shall be new. Where there is not a detailed specification to cover any item of material or equipment then the same shall be chosen to meet the demands of its intended use. All workmanship shall be in accordance with recognized practices acceptable to the Engineer.

All work shall be executed by suitably skilled craftsmen in strict accordance with the approved drawings and in a proper workmanlike manner.

Materials and equipment shall be installed in conformity with the instruction of their manufacturer and with requirements of the applicable code. Fabrication and installation shall be in accordance with the requirements of the drawings as to line, level and plumb. Due consideration shall be given to the necessity of adjustment for field connections and alignment with other works and for joints and intersections and for anchoring requirements. Anchors shall be designed such that expansions and contractions arising from temperature changes will not distort the Works nor over stress fasteners, fittings and connections, which latter shall as a general rule be concealed from view.

The quality levels specified are intended to serve as minimum standards for the Works. Except where otherwise provided the Contractor may (at his discretion and with the approval of the Engineer) exceed these standards within specified limits and tolerances. Where surface coatings are being applied or surface cladding or covering

put in place, the Contractor shall ensure prior to such activity that the surfaces to be coated or covered are clean, free from inequalities and projections, and that all necessary cants and chamfers have been provided. Surfaces shall conform to requirements prior to any application or installation being commenced. Where the application of solvents or other coating materials require special ventilation to ensure healthy and safe working conditions then the Contractor shall make suitable facilities available to achieve this goal.

01403 QUALITY CONTROL PROGRAMME

A- Quality Control Plan

The quality system including plan for quality control to be submitted by the Contractor as specified in section 1401 above shall detail the procedures which the Contractor will follow to ensure due and proper Quality Control, the documentation and reports to be produced and the chain of responsibility for Quality Control within the Contractor's Organization. No construction work shall commence until the Quality Control Plan relevant to such work has been approved by the Engineer.

The Quality Control Plan shall divide the overall Works into work packages where each work package shall consist of work of a particular kind. For each work package, the Quality Control Plan shall establish:

- The Quality Control Organization of the Contractor;
- Details of the quality inspectors, including number, qualifications, authority and responsibilities for the inspections;
- Details of the inspection methods, including arrangements for the inspection of work executed by sub-contractors;
- Testing methods and testing resources;
- Documentation and records to be established;
- The detailed instructions to which the Contractor's representative for quality for the relevant work package is subject with respect to the assurance for quality control.

B- Quality Meetings

After the Notice to Proceed the Contractor shall meet the Engineer formally to discuss and review Quality Control requirements.

The meeting shall agree upon the breakdown of the Works into work packages and upon the contents of each package. Levels of quality control for individual items within each package shall be agreed upon. The systems for ensuring Quality Control, for assurance of the implementation of Quality Control and the recording and documentation of the execution of the Works shall be agreed upon. The Engineer and the Contractor shall develop a mutual understanding of these systems, and of the roles to be played by the Engineer and by the Contractor in the implementation thereof.

C- Quality Control Personnel

The Contractor shall ensure that at all time the responsibilities for Quality Control defined in the Quality Policy and Plan are delegated to authorized and competent

members of the Contractor's staff who have been given the instructions necessary to perform their tasks.

D- Recurring Deficiencies

Where the recurrence of non-conformance during the construction of the Works indicates deficiencies in the Quality Control Plan then the Contractor shall propose to the Engineer the corrective action necessary to remedy such deficiencies.

E- Inspection

The inspection procedures determined upon for each work package shall be carried out by the Contractor. The Engineer shall have the right to observe all such inspections at his discretion, and the Contractor shall make available to the Engineer all information regarding the time and place of any such inspections, the access to the work to be inspected, and the drawings and documents relevant to such inspections.

The Engineer shall have full and free access to such premises of the Contractor, his subcontractors and suppliers as may be the location of fabrication or manufacture of any materials or equipment to be incorporated in the Works to ensure compliance with the requirements of the specifications.

Where any work is covered by the Contractor prior to an inspection by the Engineer to which due notice has not been given, then the Contractor shall bear the cost of the necessary uncovering and replacement. The failure by the Engineer to make any inspection or to discover any default in workmanship, materials or equipment, or payment by the Employer to the Contractor for any such work, material or equipment shall not relieve the Contractor of his responsibility in relation thereto nor prejudice the rights of the Engineer to correct or reject the same as provided in the Contract.

F- Test Procedures and Test Results

Where required by the Specifications, the test procedure and test results shall be provided by the Contractor in quadruplicate. All items required by the Specification shall be covered by test procedures.

01500 TEMPORARY FACILITIES AND SERVICES

01510 TEMPORARY UTILITIES

01511 ELECTRICITY

The Contractor shall make all necessary arrangements for a temporary electrical service, pay all expenses in connection with the installation, operation and removal thereof and pay the cost of electricity consumed by all trades including his subcontractors. A temporary lighting system shall be furnished. Installed and maintained as required to satisfy the minimum requirements of safety and security.

01514 TELEPHONE AND RADIO COMMUNICATION FACILITY

The Contractor, after approval from the Employer and Engineer, shall provide and operate a radio communications system, for the purpose of communication between offices and the various locations within the job site, at his own expense. The Contractor shall be solely responsible for obtaining necessary permits and authorizations. He must only use those wave bands or radio frequencies as authorized and must not use functions. The Contractor shall cease to use this radio equipment if directed by the Employer.

01515 WATER

The Contractor shall supply in sufficient quantity all necessary potable and other water for all trades. He shall make arrangements and pay charges for water service installation, maintenance and removal thereof, and pay the cost of water for all trades including sub-contractors.

The Contractor shall provide satisfactory facilities to prevent the production of any substance or materials into any body of water including ground water which may pollute the water or constitute substances or materials therein which may be injurious to life.

01516 WASTE DISPOSAL

The Contractor shall make such temporary provisions as may be required in order to dispose of any chemicals, fuels, oils, greases, bituminous materials, waste and soil waste and the like without causing pollution to either the site or the environment. Disposal of all such materials and wastes shall be made outside the site in accordance with local authority's instructions and approvals.

01517 MEDICAL SERVICES

The Contractor shall provide first-aid services for all his employees and his subcontractor's employees employed on the works in accordance with the standards to be determined by the Ministry of Labor in collaboration with the Government of Pakistan.

The Contractor shall maintain a record of all employees and families inoculations and he shall arrange for the revaccination at no cost to them.

In the event any of the Contractor's employees or his subcontractor's employees requires the services of an ambulance, hospital or physician, Contractor or its subcontractor will promptly pay all charges thereof directly to the providers of such services.

In the event of an epidemic or if otherwise needed, the Contractor shall make appropriate arrangement to vaccinate all personnel as directed by the Ministry of Health and the World Health Organization.

01518 AIR POLLUTION CONTROL

The Contractor shall so perform its work as not to discharge into the atmosphere from any source whatever, smoke, dust or other air contaminant in violation of the laws, rules, and regulations of the governmental entities having jurisdiction.

01519 DUST CONTROL

The Contractor, for the duration of the Contract, shall maintain all excavations, embankments, haul roads, access roads, plant sites, waste disposal areas, borrow areas, and all other work areas free from dust, as determined by the Engineer.

Industry accepted methods of dust control suitable to the area involved, such as sprinkling, chemical treatment, light bituminous treatment or similar methods are acceptable.

01520 CONSTRUCTION SITE DRAINAGE

The Contractor shall:

- Take charge of and maintain the existing construction site drainage systems.
- Establish and construct additional temporary site drainage systems where required to adequately drain the surfaces so that storm water is diverted from the construction site. Such water shall drain into existing public drains, without hazard or damage to public streets, adjacent properties and existing utilities.

Where no public system is available for Contractor's use, he shall remove water by tanker truck as required.

Provide properly sloped drainage ditches at top of all slopes to prevent surface drainage from causing erosion on cut slopes. The Contractor shall cover cut slopes adjacent to existing structures and at construction driveways within the Site with polyethylene sheeting when not protected satisfactorily by other means.

01521 DEWATERING

Subsurface explorations indicate that structure foundations and basements will be below normal water table levels.

The Contractor shall provide and operate dewatering system including pumping, well-points and the like at his own cost, as required to maintain excavation free of standing water throughout the period underground work is in progress as described in relevant sections of these specifications.

Pumping shall be continued 24 hours daily, seven days each week, if necessary, until the permanent works are safe from damage by ground water, after which time the temporary dewatering apparatus shall be removed.

01540 SAFETY, FIRE PREVENTION AND SECURITY PROGRAMS

Within ten (10) days following the Notice to Proceed, and before any work is performed at the site, the Contractor shall, in addition of his responsibilities under Clause 19 of Conditions of Contract, "SAFETY, SECURITY, AND PROTECTION OF ENVIRONMENT", submit to the Employer for approval, his Safety, Fire Protection and Prevention, and Security Programs, in conformance with the following minimum requirements:

A- Safety Program

1. Provide for the designation of a Safety Representative who shall be responsible for the implementation and enforcement of the Contractor's Safety Program, and who shall coordinate matters of safety with the Employer.
2. Provide for specific review by the designated Safety Representative of all Contractor Work plans and methods.
3. Provide for periodic inspection by the designated Safety Representative of all Contractor's work and storage areas to assume safe conditions and practices.

4. Provide for the immediate reporting of all deaths, injuries, and property damage to the Employer.
5. Provide for availability of first aid and ambulance services.
6. Provide for full co-operation in the conduct of inspections by the Employer or other agencies of competent jurisdiction.
7. Provide for active compliance with all applicable laws and regulations of Pakistan and other agencies of competent jurisdiction.
8. Provide for the delegation to the designated Safety Representative of adequate authority to fulfill the responsibilities placed upon him by the Contractor's Safety Programme.

B- Fire Prevention and Protection Programme

1. Provide for the designation of a Fire Prevention and Protection Representative who shall be responsible for the implementation and enforcement of the Contractor's Fire Prevention and Protection Programme. This may be the same individual designated as Safety Representative.
2. Provide for the assignment of fire fighters, trained to prevent and/or control fire, for all welding and metal burning operations.
3. Provide for the proper identification, tagging, labelling, storing, handling and use of flammable material to prevent accidental ignition.
4. Provide adequate fire extinguishing equipment appropriate for the operation being performed, and provide employees training in the maintenance and use of fire extinguishing equipment.
5. Develop and provide evacuation procedures and conduct evacuation and fire drills as required by the Employer.
6. Security guard room facility and gate for main site entrance.

The Contractor shall remain solely responsible for safety, first aid, security, and fire prevention at the site.

01541 WEATHER PROTECTION AND VENTILATION

The Contractor shall provide protective covers and/or enclosures where and as required for protection of the work and shall protect materials against extremes of hot temperatures, precipitation, wind blown water, sand, dust, other foreign materials, sun or rapid drying.

The Contractor shall:

- Provide and maintain the enclosure of the building, or any portion thereof, for the entire term of the Contract.
- Exercise complete control over the adequacy of ventilation and proper drying out of the work in to the new building or any portions thereof, for the entire construction period until date of substantial completion. Any of the work damaged by dirt, abuses, cold or dampness, or by insufficient or abnormal heat, shall be removed and replaced to restore as new conditions as specified.

- Provide supplementary ventilation as required to control humidity and to promote drying and prevent damage to materials from excess or too rapid drying.

01580 PROJECT SIGN

The Contractor shall provide four (4) 2.5 x 3.5 m project signs of the site for the entire term of the Contract: Two English and two Urdu and shall locate the project signs as directed by the Employer.

The Contractor shall employ an expert sign painter to letter the sign according to drawings and directions provided by the Engineer. Sign lettering shall include the following items in "Helvetica" style letters ranging from 100 mm down to 40 mm and shall include the following:-

- Project Name
- Employer's Name
- Consultants / Sub-Consultants
- General Contractor
- Subcontractors (as directed)

The Contractor shall maintain sign in good repair and condition, and upon completion of the work of this contract, remove and dispose of sign.

Except for warning and other signs required by law and ordinance, the Contractor shall place no other signs or advertisements on the premises

01590 OFFICES, VEHICLES, SHEDS & EQUIPMENT

All offices, sheds, equipment, vehicles, and personnel etc. as required under terms of Clauses 54.9 to 54.13 of Conditions of Particular Application Part-II shall be furnished, constructed, operated, maintained, and removed from the site at appropriate time. The Contractor shall submit to the Engineer, prior to the commencement of any temporary installation, plans showing the details of proposed facilities. All habitable rooms shall be properly insulated, shall have dust sealed windows, with sun protection and fly screens and shall be equipped with electric lights, air conditioning and mechanical ventilation where required, and all supporting facilities including water, sewerage, and electrical facilities.

The Contractor shall, for his own use, furnish and maintain suitable offices, stores, and auxiliary facilities on the site. He shall also include for general use vehicle parking and a sample room.

01600 MATERIAL AND EQUIPMENT**01610 MATERIAL HANDLING, STORAGE AND DELIVERY**

The Contractor shall, where applicable, deliver all packaged materials to the site in manufacturer's original unopened containers.

The Contractor shall ensure proper packing of all materials in appropriate containers for shipment, identification of contents with piece marks referenced to shop drawings, and as far as possible in sequence of erection. The Contractor shall provide packing,

wrapping, and other protection as required to ensure satisfactory condition of materials and finishes at time of erection. Inspection and acceptance will be made on the basis of materials as delivered to the job Site.

The Contractor shall provide adequate quantities to allow for damage and breakage during shipment and delivery, and for replacement of all materials damaged prior to final acceptance. All such replacement of damaged materials shall be at no additional cost to Employer.

The Contractor shall store materials and equipment, which are subject to degradation by outside exposure in a weather tight enclosure.

01630 APPROVAL PROCEDURE AND PRODUCT SUBSTITUTIONS

01631 PRODUCT CERTIFICATION

Product certification is a statement by the manufacturer that to the best of his knowledge, the material has not failed to perform when previously used for similar purposes and under similar conditions of use.

The Contractor shall obtain and submit statements from manufacturers and fabricators of materials, assemblies and component parts of assemblies that the product as delivered conforms to their published data.

The Contractor shall obtain manufacturer's approval for all variations from published recommendations for installation, operations and conditions of use.

It shall be the duty of the Contractor to obtain from the supplier of any material on this work, upon request, evidence that his material is in compliance with the applicable codes, ordinances and standards referenced therein, in the method in which the material is used in this project.

01632 MANUFACTURER'S REVIEW

Manufacturer's review of documents and conditions of use is a statement by the manufacturer, his representative or his agent, that he has reviewed the documents pertaining to the work and verified the proposed use of the material, including the providing of details and instructions for its application or installation, a statement that the material is suitable for its intended purpose, and has performed satisfactorily under similar conditions of use.

The Contractor shall, whenever required, obtain and submit a statement from the manufacturer indicating that he has no objection to the proposed details or method of installation, or obtain instructions concerning which details, applications, or installation procedures are not in conformance with manufacturer's recommendations and all additional precautions or protective measures which should be taken.

Manufacturer's review shall recognize adjacent materials and state if there is, in his opinion, a serious question of compatibility including possibility of damage to other materials, or damage to the material or assembly of other materials. Such conditions shall be reconsidered and adjustments made previous approvals notwithstanding, at the Contractor's sole expense.

01633 APPROVED APPLICATOR OR INSTALLER

An approved applicator or installer is one whom the manufacturer has reason to believe is experienced and qualified in the work and is familiar with the product and with the manufacturer's recommendations for use and installation.

The Contractor shall obtain and submit a statement from the manufacturer that the proposed applicator or installer is approved and indicate whether or not this approval is subject to review and observation of the work by the manufacturer's representative.

The manufacturer shall not approve an applicator, if because of past history of performance or other reasons, there is a reasonable doubt that he cannot be relied upon to perform in accordance with the Contract Documents.

Upon completion of the work, the manufacturer shall certify that approved material in the proper quantities have been delivered to the approved applicator for use on the Project.

In the event that a manufacturer declines to approve a proposed applicator, the manufacturer shall submit a statement as to whether or not On Site instructions or manufacturer's supervision is recommended. Where these services are specified, they are considered to be an integral part of the proposed system. A proposal to delete any specified service will be considered as a reduction in scope, subject to general conditions for changes in the work.

If any of the services specified in this clause are not scheduled as a requirement but are normally recommended by the manufacturer, the Contractor shall notify the Engineer of such recommendation.

01634 ON SITE INSTRUCTION

On Site instruction is performed by a qualified representative of the manufacturer.

Where required by the Specification, the Contractor shall obtain and submit a statement from the manufacturer that his authorized representative will provide the specified inspection and instruction and submit a record of the date (s) on which specified services were provided.

Site Instruction Service shall consist of:

- Preliminary inspection of substrates and all other conditions which would affect the performance of the material or equipment to be installed.
- Giving notice of all unacceptable conditions and recommending remedial action.
- Verifying that workmen are qualified and have received proper instructions.

Where these services are specified, they are considered to be an integral part of the proposed system. A proposal to delete any specified service will be considered as a reduction in scope, subject to general conditions for changes in the work.

If any of the services specified in this section are not scheduled as a requirement but are normally recommended by the manufacturer, the Contractor shall notify the Engineer of such recommendation.

01635 MANUFACTURER'S SUPERVISION

Manufacturer's supervision, in addition to all services specified for on site onset instruction, consists of continuing inspection and verification that the work has been performed in accordance with the Contract. If required by the Engineer, the Contractor shall obtain and submit a statement from the manufacturer that complete

supervision will be provided. Where supervision is required, all costs are included in the Contract Price.

Upon completion of the manufacturer's supervision the Contractor shall obtain a report from the manufacturer giving dates of inspections, including pertinent information as applicable to the particular trade such as procedures, coats, coverage, and tests as necessary to verify conformance and certifying that the proper types and quantities of materials were installed.

Where these services are specified, they are considered to be an integral part of the proposed system. A proposal to delete any specified service will be considered as a reduction in scope, subject to general conditions for changes in the work.

If any of the services specified in this section are not scheduled as a requirement but are normally recommended by the manufacturer, the Contractor shall notify the Engineer of such recommendation.

01636 SUBSTITUTIONS

The Contract Documents indicate and call for certain articles, devices, products, materials and work by named or approved manufacturers. The Contract shall be based on materials and work manufactured and supplied by those named Manufacturers and trade names as specified to establish a standard. The fact that a product is named does not constitute a guarantee by the Engineer the named manufacturers have agreed to provide or to modify their product in order to meet all requirements of the Contract Documents. It is the responsibility of the Contractor to obtain assurances from his suppliers that the product he proposes to use will meet all requirements of the Contract Documents. The fact that material or manufacturer is a substitution shall not act to either increase or decrease the Contractor's responsibility for performance.

Substitutions will be considered for any manufacturer except those followed by the words "No Substitutions" in the Specifications.

In all cases where substitutions are proposed by the Contractor, it shall be the sole responsibility of the Contractor to provide adequate data and samples as required by the Engineer to evaluate the substitution.

Request for acceptance of substitution shall be presented at least 30 days in advance of the date on which a decision by the Engineer is needed and shall:

- Include all information required by this Specification.
- State the reason for the substitution.
- Include accurate cost data if the substitute material involves a change in the Contract Sum, or if so requested by the Engineer.
- Provide or make arrangements for the manufacturer to provide complete data describing the proposed substitution, including samples and itemized comparison with the specified materials and work, if requested by the Engineer.

The Engineer shall not be obliged to justify or give his reason for rejecting a proposed substitution.

In the event that a substitution is accepted conditionally on the Contractor's agreement to assume full responsibility for quality and equality of performance, the

Contractor shall provide a full value warranty and agree to make good all damages resulting from the failure of the substitute product.

01700 CONTRACT CLOSE-OUT

01710 PROJECT RECORD DOCUMENTS

A- Definitions

(01) Record Documents

Copies of the Contract Documents shop drawings and material submittals and samples maintained at the site for purpose of recording changes and other project information.

(02) Record "As-Built" Drawings

Except for "as-built" correction to the shop drawings the only record of as-built conditions required will be a clean copy of the Contractor's notations on the record drawings unless otherwise specified.

(03) All of the foregoing documents shall be furnished in English.

B- Drawings and Specifications at the Site

The Contractor shall maintain at the Site for the Employer and available to the Engineer one copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders and other modifications, in good order and marked to record all changes made during construction.

Record Documents: At the date of final completion and as a condition precedent to Final Payment, the Contractor shall furnish the following documents to he Employer:-

- As Built Shop drawings showing the field changes affecting the general construction and other work and indicating the work as actually installed.
- The Contractor shall maintain at the job site one set of Construction Documents and indicate thereon each field change as it occurs.

C- Record Drawings

Record drawings are required to establish the location of concealed work and deviations from details or dimensions indicated on the original construction drawings. Where locations or dimensions of portions of the work are indicated by note on drawings or otherwise indicated to be at the option of the Contractor, the final determination of such options shall be indicated in the record drawings.

Final record copies of all shop drawings shall be submitted showing all corrections made and also indicating all field changes or other variations from the details as originally reviewed by the Engineer.

01740 WARRANTIES

The Contractor warrants all equipment, materials and labor furnished or performed under the Contract (unless furnished by the Employer) against defects in design, materials, and workmanship for a period of six (6) months, unless otherwise specified, from and after the date of the Certificate of Completion, regardless of whether the same were furnished or performed by the Contractor or by any of his

subcontractors of any tier. The Employer shall be entitled to receive, at no additional cost from the Contractor, the benefits of extended warrantee period which is a common industry practice or is available to the Contractor at no extra cost from any of its subcontractors or suppliers. Upon receipt of written notice from the Employer of any defect in any such equipment, materials, or labor during the six (6) months period herein specified, due to defective design, materials, or workmanship, the affected item or parts thereof shall be repaired or replaced by the Contractor at a time acceptable to the Employer.

The Contractor shall perform such tests as the Employer may require to verify that such repairs and replacements comply with the requirements of the Contract. All costs incidental to such repair, replacement and testing including the removal, replacement and reinstallation of equipment and materials necessary to gain access shall be borne by the Contractor. The Contractor warrants such repaired or replaced work against defective design, materials and workmanship for a period of six (6) months, unless otherwise specified, from and after the date of acceptance thereof. Should the Contractor fail to promptly make the necessary repair, replacement and tests, the Employer may perform or cause to be performed the same at the Contractors expense. The Contractor and its surety or its sureties if any shall be liable for the satisfaction and full performance of the warranties as set forth herein.

Notwithstanding the direct warranty obligations placed upon the Contractor by this section, but complimentary thereto, the Contractor shall in every instance, obtain from manufacturers, subcontractors, and suppliers, warranties in favour of the Employer. Such warranties shall be of the types and obtained under the conditions outlined herein.

Warranties shall be submitted prior to requesting full payment for each item for which a warranty is required.

Each warranty shall acknowledge the responsibilities defined by the Contract Documents and shall specifically include:-

- A) The manufacturer's standard warranty that all materials comply with its published standards, comply with the requirements of the Specification and, if required by the Engineer, are adequate for the proposed use.
- B) The installing Subcontractor's warranty that all workmanship comply with the requirements of the Specification and of the Manufacturer.
- C) A statement by the Contractor acknowledging his overall warranty responsibility and accepting specific responsibility for any and all limitations imposed by the Manufacturer in its warranty, except insofar as such limitations have been previously accepted by the Engineer.

The type of warranty required in each case shall be determined by the Engineer at the time of approval of the Contractor's request for approval of materials, and such approval shall be conditioned upon obtaining such warranty from the Manufacturer. No limitation of warranty will be accepted by the Engineer unless submitted by the Contractor and accepted by the Engineer at the time of approval of materials.

Standard Warranties:

A special warranty is a warranty which offers, in addition to the terms normally offered as a standard warranty, other provisions, such as;

- 1 Acknowledgement of specified items specifically noted as being covered by the warranty.
- 2) Acknowledgement of specific conditions of use or exposure.
- 3) Extension of warranty to waive standard exceptions or to extend limits including time limits.
- 4) Requirements for specific performance by other specialties, including methods of protection or separation from, or means of assuring compatibility with, adjacent materials, which will affect the validity.

01770 COMPLETION AND FINAL ACCEPTANCE CERTIFICATE

The Contractor shall complete all of the works entrusted to him under the Contract, including such additions or changes as may be directed by the Engineer by virtue of the rights vested in him thereunder, so that the works may, in every respect, be complete and ready for issuance of the Certificate of Completion on the specified completion date.

Upon receipt of the Contractor's notice of completion of the Works, the Engineer will notify the Contractor of the date set for inspection and the names of the Engineer's representatives who will carry out the inspection after the inspection is made by these representatives and the Contractor, a report on the inspection shall be made in triplicate, one copy of which shall be given to the Contractor, and shall be signed by the representative and the Contractor.

If the inspection reveals that the Works have been completed as required, the Engineer will issue a Certificate of Completion for the Employer in respect of the Works and the date on which the Contractor notified the Engineer of his readiness to effect inspection shall be considered the date of completion of the Works and starting date of the Period of Maintenance.

If inspection reveals that the Works have not been completed as required, this shall be stated in the report. The Certificate of Completion in respect of the work will not be issued until all the Works have been found to have been completed in accordance with the Contract, and in such case the Period of Maintenance of the Works shall commence from the date of such certificate.

If the inspection detects repetitive faults at the site, the inspection will discontinue and will not resume until receipt of a written notice from the Contractor that such repetitive defects have been corrected throughout the entire area alleged to be completed.

*** End of Division 01000 ***