SPECIAL PROVISIONS

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SPECIFICATIONS – SPECIAL PROVISIONS

SP-1 GENERAL

The Ravi Urban Development Authority (RUDA) aims to rehabilitate and develop the dying River Ravi into a perennial freshwater body, to allow high quality waterfront urban development on the reclaimed and adjoining land.

The project aims to provide a modern, well-planned, and facilitated healthy living environment for every walk of life. The project will offer modern and feasible living standards within the Metropolitan city of Lahore, along with recreational facilities in the location. The Proposed site is intended to provide locations for regional-serving retail, office and residential uses that will provide a vibrant mixed-use setting that fosters positive day and night-time activity.

SP-2 DESCRIPTION OF THE WORKS

2.1 The works included in this Contract are as follows but not limited to these items only:

- Earthwork and Allied Activities
- Sub-Base & Base Course;
- Surface Courses & Pavement;
- Tuff Pavers & Ancillary Works;
- Drainage Works;
- Construction of Dispensary;
- Rehabilitation of School;
- Rehabilitation of Filtration Plant and Tube Well;
- Electrical Works (Road/Street lighting Network based on LED road Lighting Fixtures);
- Entry Gate;
- Horticulture Works;
- Waste Management Works;
- Pre-Cast Boundary Wall.

SP-3 SITE OF WORKS

The Employer will give to the Contractor possession of as much of the area designated and defined as the Site and shown on the drawings as may be required to implement the Works, but subject to any restrictions set out in the Contract, when the Engineer's Notice to Commence work is given.

The Site is subject to seismic disturbances and dust storms. Insects and vermin are prevalent. Attention is drawn to the necessity for allowing for these factors in the design and specifications of Temporary Works, materials and equipment for which the Contractor shall be responsible.

SP-4 SETTING OUT

Setting out data and control points for the construction of the buildings will be provided by the Engineer following the 'Notice to Commence' but in any case prior

to start of work of each building.

SP-5 CLIMATOLOGICAL DATA

Lahore features a five-season semi-arid climate: foggy winter (30 Nov – 15 Feb) with few western disturbances causing rain; pleasant spring (16 Feb – 15 April); summer (15 April – 30 June) with dust, rain storms and heat wave periods; rainy monsoon (1 July – 16 September); and dry autumn (16 September –14 November). The hottest month is June, where average highs routinely exceed 40 °C (104.0 °F). The wettest month is July, with heavy rainfalls and evening thunderstorms with the possibility of cloudbursts. The coolest month is January with dense fog.
The city's record high temperature was 50.4 °C (122.7 °F), recorded on 5 June 2003. On 10 June 2007, a temperature of 48 °C (118 °F) was recorded; The lowest temperature recorded in Lahore is –2.2 °C, recorded on 17 January 1935.

SP-6 UTILITIES

The Contractor shall directly enquire from the utility companies about availability of connections of electric power supply and telephone lines for his use at the Site. In case of non-availability of electric power supply from national grid to meet his requirements, the Contractor shall provide at his own cost electric power generators as necessary for supply of power for the various parts of the Works including his camps, offices, stores, workshops and other installations as well as for the Engineer's Site office provided under Sub-Clause SP 20.1. The Contractor shall bear all costs for constructing, operating and maintaining the generation system, including the standby generation system, and distribution system including providing diesel, oil or other consumables and all services and necessary attendance to ensure uninterrupted power supply at all times.

The Contractor shall make his own investigations and arrangements for supply of water of acceptable quality for construction requirements and safe drinking water for his staff and workmen and for the staff of the Engineer.

No separate payment will be made to the Contractor for works performed under this Clause and the costs thereof shall be deemed to be included in the rates and prices of the various items in the Bill of Quantities.

SP-7 TOPOGRAPHY AND GEOLOGY OF THE SITE

The details of Topography and Geology of the site shall be furnished by the Employer.

SP-8 EXTENT OF WORK

The Contractor shall remove all debris and unsuitable construction. Any depressions shall be filled by the contractor and compacted to the Engineer's satisfaction with no additional cost.

The Contractor shall construct the Works in accordance with the Drawings and Specifications and as directed by the Engineer. The Contractor shall procure, furnish, provide and arrange all the necessary construction materials, equipment, transportation, fuel, electric power, water and services; be responsible for the construction and maintenance of the construction camps, offices, workshops and warehouses that he may require, and perform all other work necessary for completion of the Works described herein, in complete conformity with the

Contract.

SP-9 DRAWINGS

9.1 Bidding Drawings

The Drawings provided as separate volume (IV) of Bidding Documents and hereinafter referred to as Bidding Drawings show the scope of the work to be performed by the Contractor. The Bidding Drawings shall not be used as a basis for fabrication or construction, but may be used as the basis for planning, scheduling and placing preliminary orders for materials, subject to corrections based on future issue of Construction Drawings. Any other Drawings, if issued through Addenda, before opening of Tenders, shall become part of the Bidding Drawings.

9.2 Construction Drawings

After award of Contract, Bidding Drawings will be replaced by Drawings issued by the Engineer for Construction, with such modifications as may be necessary. The Drawings Issued for Construction will include Bidding Drawings re-issued, Bidding Drawings modified and additional Drawings as required to develop in greater detail and shall be referred to hereinafter as “Construction Drawings”. The Construction Drawings that show changes from the Tender Drawings and Specifications, will be reviewed by the Engineer for determination of adjustments, if any, of the Contract Price in accordance with the provisions of Clause 51.1, Variations, of the Conditions of Contract. The work shall be executed in conformity with the Construction Drawings.

The Engineer and Contractor shall jointly prepare a schedule for issuance of Drawings Issued for Construction of the various parts of the Works based on a list of drawings provided by the Engineer.

9.3 Checking Drawings

The Contractor shall carefully check all Construction Drawings as soon as practicable after receipt thereof, and shall promptly advise the Engineer of any discrepancy / errors if discovered.

SP-10 RIGHT TO CHANGE

The Engineer may find it desirable to change location, alignment, dimensions or design of one or more of the features of the Works to conform to the newly found conditions. Toward this end, the Engineer reserves the right to make such reasonable changes, and the Contractor’s operations shall be conducted so as to accommodate any such changes in the Works.

SP-11 DRAWINGS AND DATA TO BE FURNISHED BY THE EMPLOYER / ENGINEER

11.1 Procedure for Submittal of Contractor’s Drawings

All drawings showing construction details shall be provided by the Employer/Engineer.

11.2 Other Drawings

Other drawings additional to those referred to hereinabove required by the Specifications showing proposed methods of constructing Temporary Works and all bar bending schedules shall also be submitted by the Contractor to the Engineer for approval.

11.3 Ownership of Drawings etc.

All the drawings, details, bills of materials Employer/Engineer and any other information or documents furnished by the Engineer shall become the property of the Employer/Engineer.

SP-12 CONSTRUCTION PROGRAMME

12.1 GENERAL

The program of work submitted by the Contractor in accordance with Sub-Clause 14.1 “Programme to be submitted” of the General Conditions of the Contract shall be supplemented by submittal of a detailed schedule based on a computerized system, Primavera Enterprise for Engineering & Construction (P6) software or equivalent, covering all construction activities and furnished to the Engineer on paper and a soft copy on the following dates:

- **Construction Schedule:** Along with the Bid Documents.
- **Baseline Schedule:** within 21 days after receipt of Letter of Acceptance.
- **Revised Baseline Schedule:** After 3 months of the approval of Baseline Schedule and thereafter quarterly.
- **Recovery Schedule:** As and when required by the Engineer.

The Baseline Schedule, as approved by the Engineer in consultation with the Employer, will form an integral part of the Contract and will establish Contract completion dates for the various activities as mentioned in the Contract.

All schedules, project plans, progress updates and reports shall be in the form of readable computer printouts as well as in soft data format.

12.2 REQUIREMENTS & PROCEDURES

12.2.1 GENERAL REQUIREMENTS

- The narrative report accompanying the submittal shall describe the construction methods; plant and equipment proposed to be used and shall explain the expected production rates that are the basis of the scheduled durations of different activities.
- Start Date of the Project.
- Dates on which different site possession will be required.
- General administrative items like, Performance guarantee, Mobilization Advance Guarantee, Insurance etc.
- Unique Activity ID, description and duration.
- Activities’ earliest start and finish dates, latest start and finish dates.
- All activities with zero float.
- Critical path with listing of all activities on the path.
- Dates for Employer furnished material or equipment if any.
- Required dates of Drawings from the Engineer.
- Dates for submittals like Method Statements etc.
- Work Breakdown Structure (WBS) and activity codes.

- Definition of calendars with non-working days or periods i.e. planned closures, flood seasons etc.
- Loading of key resources.
- Milestone dates.
- Network logic Diagram.
- List of constraints i.e. reason and type of constraint.
- Full S – Curve and Critical S – Curve (for critical activities only).
- Cost/ Resource Histograms.
- Planning assumptions and any external relationships
- Explain any discretionary dependencies.
- Appropriate quantity of direct resources (material, labour, equipment) should be allocated to all activities and showed in submitted construction schedule. Labour resource should be divided according to related trades (e.g. Mason, Operator, helper etc.) Contractor should make sure that no resource is being overallocated.
- BOQ amount should be loaded to each construction activity. Earned Value Management Reporting to be ensured accordingly.

12.2.2 CONSTRUCTION SCHEDULE

Construction Schedule will be submitted along with Bid Document and will be prepared in accordance with the Sub-Clause 11.2.1 hereof.

12.2.3 BASELINE SCHEDULE

Baseline Schedule to be submitted within 21 days after the letter of acceptance and will be prepared in accordance with the General Requirements mentioned under the Sub-clause 11.2.1 hereof. Start date will be the date of Notice to Commence.

12.2.4 REVISED BASELINE SCHEDULE

Besides, the General Requirements mentioned above, following will be the additional requirements for or quarterly Baseline Schedule:

- The revised narrative report depicting the actual situation and submittal describing the construction methods, plant and equipment proposed to be used and shall explain the expected production rates that are the basis of the revision of scheduled durations of different activities.
- Start Date will be taken as Notice to Proceed.
- Change in strategy to achieve the target Completion Date describing the additional resources if required, change in sequence of activities etc.
- Actual start and finish dates.
- Incorporation of effects of all approved changes that have occurred during last three months i.e. any change order which will affect the Completion Date of the Project. Any change in Completion Date for milestones shall be on the basis of prior extension if any granted by the Engineer.

- Comparison with the target Baseline Schedule. The narrative of any deviation from the Baseline.

12.2.5 RECOVERY SCHEDULE

The Recovery schedule will be submitted to the Engineer as and when required by the Engineer. If in the opinion of the Engineer any project milestone is likely to be missed, mitigation strategy for recovering the project will be submitted in the form of Recovery Schedule.

12.3 EXPLANATION & DEFINITIONS OF DIFFERENT TERMS

12.3.1 ACTIVITY CODES

Activity codes will include the following details:

- Type of Structure
- Area / RDs
- Work Restrictions (Closure etc.)
- Responsibility if identified, in the Contract to be shared with an agency other than the Contractor.

12.3.2 WORK BREAKDOWN STRUCTURE

The Work Breakdown Structure (WBS) shall divide the project scope into hierarchical, manageable, definable packages of work that will clearly indicate the scope and budget for the element. The WBS elements shall clearly reflect project's purpose and objectives, functional/ performance design criteria, project scope, technical performance requirements, and other technical attributes. The WBS to be submitted by the contractor will be based on the following parameters:

- The WBS submitted by the contractor will include and be a part of the high level WBS provided by the Engineer.
- Each WBS element will represent a single tangible deliverable.
- Each WBS element will represent an aggregation of all subordinate WBS elements listed immediately below it.
- Each subordinate WBS element must belong to only one single parent (or superior) WBS element.
- The deliverables should be logically decomposed to the level that represents how they will be produced (designed, purchased, sub-contracted, fabricated). The partitioning of the deliverables from higher levels within the WBS to lower levels must be logically related.
- Deliverables must be unique and distinct peers, and should be decomposed to the level of detail needed to plan and manage the work to obtain or create them.
- Deliverables should be clearly defined to eliminate duplication of effort within WBS elements, across organizations, or between individuals responsible for completing the work.

- Deliverables should be limited in size and definition for effective control – but not so small as to make cost of control excessive and not so large as to make the item unmanageable or the risk unacceptable.
- A coding scheme for WBS elements that clearly represents the hierarchical structure when viewed in text format will be used.

12.4 PROGRESS MEASURING SYSTEM

The Contractor will agree with the Engineer the Progress Measuring System after award of the Contract and before submission of Sub-Clause 14.1 Schedule.

12.4.1 ACTIVITY DEFINITION

Activity definition will involve identifying and documenting the specific activities that must be performed to produce the deliverables and sub deliverables identified in the Work Breakdown Structure (WBS). Within the context of the process of Activity Definition, decomposition will include identifying and documenting a list of activities that will be performed on the project. It will be organized as an extension to the WBS and will not include any activities that are not required as part of the project scope. The adequate level of detail must be carefully planned for the intent of the schedule based on the following parameters:

- The list of activities should lead to the identification and achievement of major deliverables of the project, including project management.
- Cost, resource and duration estimates will be loaded for the activities.
- Progress Measurement Criteria and Activity Weights Definition will be devised for progress reporting.
- Each Activity will be assigned a unique Activity ID based on a coding structure. The coding structure logic will also be indicated and communicated to the Engineer.

12.4.2 ACTIVITY SEQUENCING

Activity sequencing will involve identifying and documenting interactivity logical relationships. Activities will be sequenced accurately to support development of a realistic and achievable schedule. A project network diagram using Precedence Diagramming Method (PDM) will be utilized for showing dependencies between the activities.

12.4.3 ACTIVITY DURATION ESTIMATION

Activity durations will be estimated based on the work quantity, productivity and resources applied to the activity. Calendar dates will be utilized for all duration estimation with a minimum time unit of days. Calendars, constraints and assumptions will be documented and reported.

12.4.4 SCHEDULE DEVELOPMENT

The schedule will be developed to indicate the start and finish dates for project activities. The schedule developed will be iterated during the project according to the frequency of progress reporting. Critical Path Method (CPM) will be used for mathematical analysis of the schedule for calculation of Early and Late dates. As-Built construction schedules submitted by the Contractor periodically shall form the basis of evaluation of claim for Extension of Time, if any.

12.5 REPORTING REQUIREMENT

12.5.1 EXECUTIVE SUMMARY

Briefly set out the key issues together with recommendations for actions to be taken relating to the reporting period. The following topics may be covered:

- Cash flow utilization: actual versus planned.
- Physical progress: main progress activities during the month vs planned milestones.
- Main risks, challenges, and issues encountered during the month.
- Main mitigation, preventive, or corrective measures envisaged and person(s) responsible to carry out such measures.

12.5.2 CONTRACT STARTUP ACTIVITIES

- List all activities that should take place from the issuance of the letter of acceptance by the Employer to the selected bidder until 60 days after the commencement date, mentioning due date, actual date and responsibility.
- Mobilization Activities (planned date as per programme, actual date and remarks

12.5.3 RISK MANAGEMENT

- Include risk identification, risk assessment, and risk mitigation in a comprehensive Risk Register.

12.5.4 PROGRAMME MONITORING

Including but not limited to the following

- Tabular form of progress – planned dates, actual dates, variances Graphical form – line graph illustrating actual verses planned progress
- Pie chart – overall progress (%), time elapsed, time remaining
- One month look ahead table with target dates
- A short paragraph commenting on the critical path and the progress recorded to date.
- Description of all work carried out since the last report;
- Earned Value Analysis

12.5.5 PERFORMANCE SECURITY / GUARANTEES & INSURANCES DETAILS

12.5.6 CHANGE MANAGEMENT

Variation and Claim Register

12.5.7 FINANCIAL MANAGEMENT

- Payment Schedule
- Evolution of Contract Price

12.5.8 ENVIRONMENTAL MANAGEMENT HEALTH & SAFETY

Complete Compliance Report

12.5.9 COMPLETION OF WORKS AND CONTRACT CLOSURE

List all activities with due date, actual date and responsibility

12.5.10 PHOTOGRAPHS TO ILLUSTRATE PROGRESS

The caption shall be typed on each photograph

- Title of Project
- Identification of subject shown
- Station point of camera and direction of view
- Date & Time (automatically displayed on the photos)
- Name of Employer / Engineer and Contractor

SP-13 COOPERATION WITH OTHER CONTRACTORS

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 Works in accordance with the approved programme and the Engineer's instructions.

SP-14 QUALITY OF MATERIALS

All materials, fixtures, fittings, and supplies furnished under the Contract shall be new and unused, of standard first grade quality and of the best workmanship and design. No inferior or low grade materials and supplies 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 of 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 with these requirements and, in every case, the Contractor shall quote this Clause in full to each such manufacturer or supplier.

Prior to procurement, the Contractor shall furnish to the Engineer, for his approval, the names of the manufacturers of all equipment and materials which he contemplates incorporating in the Works. With this information the Contractor shall also furnish such pertinent information as to capacities, efficiencies, sizes, and such other information as may be required by the Engineer. Samples of materials shall be submitted to the Engineer for approval unless waived off by the Engineer.

Equipment, materials, supplies and articles installed or used without the Engineer's approval shall be at the risk of subsequent rejection.

Aggregate from the river Jhelum deposits and the vicinity of site are alkali reactive. The Contractor shall use non-reactive aggregates from suitable quarries for concrete work. The Contractor shall use deformed steel reinforcement bars rolled from Pakistan Steel Mills billet or equivalent from re-rolling mills proposed by the Contractor and approved by the Engineer.

SP-15 INSPECTIONS AND TESTS

15.1 Inspection

All equipment and materials furnished under the Contract and all work performed in connection therewith under the Contract shall be subject to inspection and testing by the Engineer or his authorized representatives at all times and in all stages of completion. Inspection at the manufacturer's plant may be made to determine that the equipment and materials meet the requirements of these Specifications. The Contractor shall notify the Engineer not less than 21 days in advance of the date and place that the equipment or materials will be available for inspection and testing. No equipment or materials shall be transported until inspection at the manufacturer's plant has been made. Acceptance of equipment and materials or waiving of the inspection and testing thereof shall in no way relieve the Contractor of his responsibility for furnishing equipment and materials meeting the requirements of the Contract Documents. Confirmatory tests shall also be carried out at the Site or at an approved laboratory, as instructed by the Engineer. These tests shall be witnessed by the Engineer and performed at no additional cost to the Employer.

15.2 Testing

The Engineer will make such tests on concrete, aggregates, fill materials, reinforcing steel and other materials as he may from time to time select, and the Contractor shall provide at his own cost such samples or assistance in sampling materials at the Site as the Engineer may reasonably require. Testing by the Engineer shall in no way relieve the Contractor of his responsibility to test materials to ensure that they meet all the specified requirements and to control their quality. The Engineer may accept the items manufactured away from the Site meeting the specified requirements without further testing subject to the Contractor furnishing satisfactory proof of compliance with these Specifications in one or more of the ways described below:

15.3 Manufacturer's Certificate of Compliance

In the case of standard labelled stock products of standard manufacture which have a record of satisfactory performance in similar work over a period of not less than five years, the Engineer may accept a notarised statement from the approved manufacturer certifying that the product conforms to the applicable specifications.

15.4 Mill Certificates

Regarding materials for which such practice is usual, the Engineer may accept the approved manufacturer's certified mill and laboratory certificates.

15.5 Testing Laboratory Certificates

The Engineer may accept a certificate from a renowned 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. The material tests shall be carried out from laboratories approved by the Engineer.

15.6 Cost

Further to the provisions of Sub-Clause 36.3, Conditions of Contract, the cost of any laboratory, field and shop tests required from any agency of compliance with under Specifications shall be borne by the Contractor.

SP-16 CONSTRUCTION PROGRAMME

16.1 General

The Contractor shall submit his programme for execution of the Works in accordance with Clause 14.1 – Programme to be Submitted, under the Conditions of Contract, to the Engineer for approval. The programme may contain adjustments, if any, to the CPM (Critical Path Method) based Bar Chart and Network Construction Schedules submitted with the Bid. The completion date, milestones, and key targets indicated in Appendix-E to Bid, or dates earlier than the said milestone and key target dates, shall be shown on the construction programme to be submitted by the Contractor. Other dates including rates of progress for various parts of the Works in the construction programme may be changed by the Contractor prior to submission for approval. The operations under each section of the programme submitted by the Contractor shall be broken down in greater detail than those shown on the Schedule submitted with the Bid.

The programme shall also show the timings of provision of any facilities the Contractor is required to supply for use by the Employer and the Engineer, in such manner that these shall be available as stipulated in the Contract and instructed by the Engineer.

16.2 Contractor's Construction Schedule Network

The Contractor shall prepare a Critical Path Method construction network in PDM (Precedence Designator Method) format on Primavera or MS Project software. The network shall show the order and interdependence of calendar dates. Activities shown on the network shall consist not only of the actual construction operations but shall also include submittal and approval of shop drawings and samples.

16.3 Schedule Coding

Appropriate coding structure shall be incorporated in the construction schedule. The basic Work Breakdown Structure (WBS) will be encoded in the activity I.D. Other coding will be developed as the Project progresses and specific coding needs arise.

16.4 Resource Loading of the Schedule

Resources like the equipment, manpower, materials, land, etc. needed for planned execution and completion of the Works shall be allocated to each activity in the schedule. The Engineer may at the time of approval of the Schedule direct the Contractor to demonstrate the sufficiency of the planned resources to achieve the project completion date.

16.5 Submittals

(a) The initial submittal of network analysis shall include a description of the major items of construction equipment planned to be used. The description

of the equipment shall include the type, number of units, their capacity, etc. The forecast shall include the estimated dates on which each major item of construction equipment will be on the job. The Bar Chart and the Network Analysis shall be submitted within 21 days after receipt of the Letter of Acceptance.

The submittal shall consist of:

(i) 4 copies of the Bar Chart.

(ii) A narrative summary of the construction plan.

(iii) A backup of the schedule files on re-writable CD disks.

The Engineer will review the construction schedule and the approved initial submittal will be the Project Baseline Schedule by which the performance of the Contractor will be measured as per Sub-Clause 15.6 below:

(b) Monthly submittals shall show completed progress of each activity during the past month, with forecast for the coming month. Hammock networks shall be incorporated on the Base Line Schedule of activities. Each monthly submittal shall contain:

(i) 4 copies of the Bar Chart.

(ii) 4 copies of a time scaled logic diagram for the next three months.

(iii) A narrative summary of the schedule related issues and status. The narrative shall include discussion of pending schedule changes submitted to the Engineer in the past month.

(iv) A backup of the schedule files on rewritable CDs.

16.6 Progress Schedule

Both the bar charts and network analysis schedules shall be continuously monitored and kept current and updated by the Contractor throughout the work, and at least on every milestone date and submitted for approval. The Contractor's schedules shall be available for examination during normal business hours. All revisions shall be accompanied by a detailed explanation of the reasons for the changes and describing any new or modified construction procedure proposed and, if applicable, any steps being taken to improve progress to achieve completion within the Time for Completion.

SP-17 LAY OUT OF WORKS

17.1 Reference Points, Lines and Levels

The Engineer will layout a reference line or lines in the field with accompanying points and/or bench-marks to enable the Contractor to establish there from survey control for construction.

17.2 Verification

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

17.3 Primary Control Points

Based upon the Engineer's 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 disturbed or 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.

17.4 Construction Surveyors

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

17.5 Basic Control Monument

Based upon the Engineer's 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 in Sub-Clause 16.7 below.

17.6 Surveys and Computations

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 required by 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 and agreed by an authorized representative of the Engineer.

17.7 Tolerances

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

(a) Alignment of tangents and curves shall be within 0.1 foot for 1,000 feet i.e., an accuracy of 1:10,000.

(b) Structure points shall be set within 0.01 foot accuracy from point to point, except where tighter tolerances are required.

(c) Cross-section points shall be located within 0.10 foot, horizontally and 0.01 foot vertically.

(d) 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.

17.8 Material and Equipment

The Contractor shall provide all materials, equipment and manpower required for the works.

SP-18 STANDARDS AND SPECIFICATIONS

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 Specifications contained in the following list or to equivalent applicable Standards and Specifications. Copies of these Standards and Specifications may be purchased from the indicated agency, which publishes the same:

- American Society for Testing and Materials — ASTM
- American Association of Highway & Transportation Officials — AASHTO
- Unified Soil Classification System — USCS
- American Concrete Institute — ACI

Where relevant Standards and Codes of Practice now quote metric units only, those are to be interpreted as required to the nearest equivalent imperial (foot/pound) unit for the purposes of this Contract.

All materials and workmanship not fully specified herein or covered by an approved Standard shall be of such a kind as is used in first class work and suitable to the climate in the Project Area.

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.

SP-19 ACCESS TO SITE

19.1 Right of Way for Access and Haul Routes

The Contractor shall be responsible for providing and maintaining access routes for the Works. The right of way for access to the Works from existing roads will be provided by the Employer. The Contractor shall make his own investigations of the condition of available public or private roads and of clearances, restrictions, bridge load limits and other limitations that affect or may affect transportation and ingress and egress at the job sites. The repair and reinstatement of roadways, drain and canal banks if damaged during operation shall be the responsibility of the Contractor without any additional cost to the Employer. The Employer controlled right of way shall be the Right of Way (ROW) available to the Contractor for carrying out the Works.

19.2 Restoration of Site

On completion of the Works, the Site shall be restored by the Contractor to its original conditions as far as practicable and left in tidy condition.

SP-20 FACILITIES TO BE PROVIDED BY THE CONTRACTOR AT SITE

20.1 Contractor's Camps

a) Pursuant to the provisions of Sub-Clauses 34.4 to 34.7 of the Particular Conditions of Contract Part II. The Contractor may arrange these facilities in the nearby area of the Project or may request the Employer to provide land for providing temporary arrangements.

20.2 Temporary Sanitary Facilities

(a) The Contractor shall provide adequate temporary sanitary conveniences for the use of his employees and persons engaged on the work, including the Engineer and his employees. He shall ensure that his employees and labour make proper use of the latrines and do not foul the Site.

(b) In addition to toilet facilities, suitable and adequate washing facilities shall be provided.

(c) Sanitary facilities shall be located as directed or approved by the Engineer and shall be maintained in a clean and sanitary condition during the entire course of the work.

(d) The septic tank and/or temporary holding tank(s) shall be kept pumped out at such intervals that the tank(s) will not overflow and contaminate the ground, flowing streams or surface drainage.

(e) On completion of the Works, sanitary facilities shall be properly disinfected and all evidence of same including temporary buried tanks and foundations removed from the Site.

20.3 Medical Facilities

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

Adequately equipped dispensary/ies with qualified and experienced staff shall be provided by the Contractor at his camps. In addition suitably equipped first aid stations manned by trained staff shall be provided at 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.

20.4 Operation and Maintenance of the Camps and Facilities

For the purpose of operation and maintenance of the camps and facilities provided as above, the Contractor shall comply with all applicable provisions of the Labour Laws of Pakistan and specifically to the following requirements:

(a) Camp areas shall be kept dry and free from dense vegetation. Measures shall be taken to control dust within the camp area, by water or oil spraying or other approved means.

(b) Any ponded water around a camp shall be sprayed regularly with oil or other approved anti-malaria / dengue liquid.

(c) The Contractor shall provide garbage collection and disposal services for his construction camps and the Engineer's office. Disposal shall be by burial (landfill) and/or incineration. Disposal area shall be located a sufficient distance away and downwind from camp facilities and offices so as not to create objectionable odours or health hazards. Equipment, methods of collection and disposal and location of disposal areas shall be submitted to the Engineer for approval.

(d) The interior walls and ceilings of buildings shall be lime washed or painted. The whole of the open spaces around the buildings shall be swept each day and all rubbish removed. The living areas shall be suitable for the climatic conditions. Roof height shall not be less than 10.5 ft. and adequate number of ceiling fans shall be provided.

(e) Adequate sanitary conveniences, including washing and bathing places shall be maintained at each of the camps. All sanitary fixtures, receptacles, toilet rooms, lavatories and wash rooms shall be cleaned and disinfected at least once every day.

20.5 Drainage

The ground around the buildings shall be graded to slope away from building perimeters so as to provide adequate drainage and shall be thoroughly compacted. Excavated material shall be disposed off by filling in low areas or as otherwise directed by the Engineer.

20.6 Water Supply

The Contractor shall arrange for the water supply for his staff residences, labour camps, site offices, work yards, workshops, and various camp facilities. Construction of pumps, storage tanks, overhead tank, distribution system, and their proper running and maintenance shall be his responsibility. Water shall be supplied to the camps 24 hours a day. Adequate supply of water, cooled in summer, shall be ensured in camps and sites of work. Water samples shall be tested periodically to ensure that it is fit for human consumption.

20.7 Electricity Supply

The Contractor shall provide electricity required for the Works including labour camps, staff residences, offices including the Engineer's Site office and various camp facilities. The Contractor shall also provide sufficient standby electricity supply arrangements for his needs.

20.8 Utility Lines

The Contractor Shall conduct his operations, make necessary arrangements, take suitable precautions and perform all required work incidental to the protection of and avoidance of interference with power, telephone, water and other utilities within the areas of his operations in connection with the Contract. No separate payment shall be made for such incidental work. In case the utility lines are required to be relocated, the Employer shall assist the Contractor in relocation of the same, with the concerned departments and organizations.

20.9 Handing Over/Removal after Completion

Upon completion of the Works, the Contractor shall remove all the Contractor's camps, labour and staff accommodation, site office, other installations and buildings constructed and all facilities provided by the Contractor under this Clause,

and the Site cleared and reinstated to the satisfaction of the Engineer.

20.10 Measurement and Payment

Except as provided in SP-19.8 no separate payment will be made for the work included under the Clause SP-19; the cost thereof is deemed to be included in the rates and prices of other items entered in the Bill of Quantities.

SP-21 PROVISION OF FACILITIES FOR THE ENGINEER/EMPLOYER

21.1 Site Office for the Employer / Engineer

The text is deleted and not included in the document.

21.2 Transportation

The Contractor is required to furnish 01 Nos. 2400cc double cabin vehicle, not more than 03 year old model with driver (on rental basis), for the field staff of the Employer and Employer's Representative for site inspection, within one week (07 days) of signing the Contract.

Contractor shall be responsible for POL (upto 300L per vehicle per month) and maintenance of the vehicles till completion of Defects Liability Period.

No separate claim of the Contractor shall be admissible for these facilities and shall be deemed to have been covered in the Contractor's overhead & profit.

21.3 Measurement and Payment

No separate claim of the Contractor shall be admissible for these facilities and shall be deemed to have been covered in the Contractor's overhead & profit.

In case of failure of the Contractor to provide any of facilities stipulated under SP-20, the same will be arranged by the Engineer from the open market at the Contractor's risk and cost and the actual charges so incurred shall be payable by the Contractor and shall be recovered from the Contractor through Interim Payment Certificates. The Engineer's certificate about the charges so incurred and recoverable from the Contractor shall be conclusive and binding.

SP-22 PROGRESS PHOTOGRAPHS

The Contractor shall furnish to the Engineer every month, for the site of each building, twelve colour photographs on CD and 4 colour prints of each photograph taken with a digital camera to clearly show the progress of construction. Each photograph shall be submitted in four prints of size 20 cm x 25 cm. Each print shall be marked on the back side with the caption of the activity, date and serial number. There shall be no writing, lettering or marking on the face of the photograph. Progress photographs shall be submitted from the month following the month in which Notice to Commence is issued and continued till completion of the Works.

No separate payment will be made for the work specified herein and the cost thereof shall be deemed to be included in the other items of the Bill of Quantities.

SP-23 SITE FACILITIES TO BE PROVIDED BY THE EMPLOYER

23.1 General

Without prejudice to the generality of the various clauses of the Contract and

except for the facilities referred to hereinafter, particular attention is drawn to the obligations of the Contractor to make his own arrangements for providing, maintenance and furnishing of labour camps, staff residences, offices, workshops, stores watching and guarding thereof.

The Contractor shall submit his written demand of his requirements of land for his Site Facilities as herein specified, at least 28 days in advance.

23.2 Area for Storage and Workshop

The Employer will provide free of charge to the Contractor an open area of adequate size for the facilities listed in Appendix-H to Tender and approved by the Engineer, for use as storage, and workshop areas. The Contractor shall provide and maintain at his own cost, all fencing, any necessary clearing, land levelling, foundations and above ground structures for sheds, covered areas, workshops, electricity, telephone, water distribution and waste water disposal etc, as he may need to meet his requirements.

SP-24 SAFETY MEASURES AT CONSTRUCTION SITE

a) Pursuant to the provisions of Sub-Clause, for Safety Measures the Contractor shall observe high standards of safety for manpower and equipment at all times and with regard to safety.

b) The Contractor shall take all possible measures to protect his personnel from harm. In case of any casualty or injury to any person due to the Contractor's operations, the Contractor shall ensure quality medical treatment and payment of due compensation.

c) The Contractor shall not permit casual observers to come close to the sites where excavation and other hazardous operations are being performed.

SP-25 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 the 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.