**SHAHEED MOHTARMA**

**BENAZIR BHUTTO**

**MEDICAL UNIVERSITY**

**L A R K A N A**

**TENDER DOCUMENTS**



**RENOVATION & REHABILITATION (ELECTRIC WORKS) OF MARVI HOSTEL AT CHANDKA MEDICAL COLLEGE LARKANA**

Issued to M/s.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

OFFICE OF THE EXECUTIVE ENIGINEER, SMBBMU LARKANA

Phone # 074-9410911, Fax: 074-475234

**Office of the executive Engineer**

(Engineering wing)

No. SMBBMU/XEN/ADP/2016/120 Dated: 20th May, 2016

**“SAY NO TO CURRUPTION”**

**NOTICE INVITING TENDERS**

All the interested Contractors / firms / parties meeting eligibility criteria, viz. having registration with Federal Board of Revenue (FBR) for Income Tax, Sales Tax in case of procurement of goods, registration with the Sindh Revenue Board in case of procurement of works and services and registration with Pakistan Engineering Council as the case may be and are not black listed in any procuring agency or authority, are invited to participate in sealed percentage / item rate tender for the following works:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S. #** | **Name of Work** | **Tender Fee** | **Estimated Cost (M)** | **Earnest Money** | **Completion Time** |
| 1 | Renovation & Rehabilitation (Electric Works) of Hostel# 01 & 04 at CMC Larkana | 3,000/- | 6.474 | 5% | 06 months |
| 2 | Renovation & Rehabilitation (Electric Works) of Hostel# 03 at CMC Larkana | 3,000/- | 2.823 | 5% | 06 months |
| 3 | Renovation & Rehabilitation (Electric Works) of Hostel# 05 & 06 at CMC Larkana | 3,000/- | 4.241 | 5% | 06 months |
| 4 | Renovation & Rehabilitation (Electric Works) of Marvi Hostel at CMC Larkana | 3,000/- | 4.590 | 5% | 12 months |

**The terms and conditions are given as under:-**

1. The tender documents can be obtained from the office of Executive Engineer or can be downloaded from SPPRA website i.e. [www.pprasindh.gov.pk](http://www.pprasindh.gov.pk/) and University website [www.smbbmu.edu.pk](http://www.smbbmu.edu.pk) on the payment noted above (non-refundable) from 25-05-2016 to 08-06-2016 on any working day. The sealed tender on prescribed proforma along with 5% earnest money of total bid in the form of Pay Order in favor of the Executive Engineer, SMBBMU Larkana shall be submitted by 09-06-2016 up to 11.00 (A.M) and same will be opened on the same day @ 11.30 A.M in respective office, in presence of the Contractors / Suppliers / representatives, who so ever will be present at that time. In case of any unforeseen situation resulting in closure of office on the date of opening or if Government declares Holiday the tender shall be submitted / opened on the next working day at the same time & venue. Any Conditional or un-accompanied of the earnest money, tender will not be considered in the competition.
2. The Bidders shall have PEC Registration in Category C-5 & above for Electric works & License of Regional Electrical Inspector (Larkana Region), Water & Power Department, Govt. of Sindh.
3. The Method of Procurement is Single Stage Two Envelopes.
4. Bid shall comprise a single package containing two separate envelopes. Each envelope shall contain separately the financial proposal and the technical proposal.
5. Envelopes shall be marked as “FINANCIAL PROPOSAL” and “TECHNICAL PROPOSAL” in bold and legible letters to avoid confusion
6. Initially, only the envelope marked “TECHNICAL PROPOSAL” shall be opened.
7. Envelope marked as FINANCIAL PROPOSAL” shall be retained in the custody of the procuring agency without being opened.
8. Procuring agency shall evaluate the technical proposal in a manner prescribed in advance, without reference to the price and reject any proposal which does not conform the specified requirements.
9. No amendments in the technical proposal shall be permitted during the technical evaluation.
10. Financial proposals of technically qualified bids shall be opened publically at a time, date and venue announced and communicated to the bidders in advance.
11. Financial proposal of bids found technically non- responsive shall be returned un-opened to the respective bidders; and
12. The bids found to be lowest evaluated or best evaluated bid shall be accepted.

***The Procuring Agency reserves the right to reject any or all bids subject to relevant provisions of SPP Rules, 2010 and may cancel the bidding process at any time prior to the acceptance of a bid or proposal under Rule-25” of said Rules.***

**Executive Engineer**

SMBB Medical University Larkana

Phone No. 074-9410911 Fax: 074-475234

Email: engineer@smbbmu.edu.pk

**Section I: Evaluation/Qualification Criteria for Technical Proposal.**

*In this section two evaluation criteria are being given for the benefit of the procuring agency. One is based on marks/score and the other is based on pass/fail criteria. Procuring agency may adopt any one of these selection methods while prequalifying the contractors/firms.*

1. **Criteria based on Marks/Score.**

**Mandatory Provisions/Eligibility:**

(i)Firms/Contractors must possess at least 05 year successful experience of same service of any university or large organization. (Experience/ Work Completion Certificates be attached along with copies of work order).

(ii) The Bidders shall have PEC Registration in Category C-5 & above for Electric works & License of Regional Electrical Inspector (Larkana Region), Water And Power Department, Govt. of Sindh.

(iii) valid registration certificate from income tax authority (NTN); and The Bidders should register with tax paying agency which would be verified by concerned agencies.

(iv) is not black listed. *(Attach all certificates and* *affidavit of not black listing).*

(iv) Bidders must have an annual turnover of Rs. 4,000,000.00 to 5,000,000.00 which will be duly verified from the bank.

Aggregate Qualifying Score is 60%, but it is mandatory to obtain at least 30% in each of the following sections.

|  |  |
| --- | --- |
| **Evaluation Criteria (Technical Proposal)** | |
| **Total Marks** | **100** |
| **Qualifying Marks** | **60** |
| **Description** | **Distribution of Marks** |
| **Serial No. issued to Contractor/ Firm** |  |
| **Standing of Firm** |  |
| Valid Registration with PEC in Category C-5 or Above | **Mandatory** |
| Valid Registration of Regional Electrical Inspector (Larkana Region) GoS. | **Mandatory** |
| Income Tax Certificate No. (NTN) | **Mandatory** |
| Valid Registration of Sindh Board of Revenue | **Mandatory** |
| No Involvement in Litigation/ Black listing | **Mandatory** |
| **Period Since Firm/Contractor is in Construction Business** | **10** |
| Upto 5 Years | 5 |
| Upto 10 Years | 8 |
| Above 10 Years | 10 |
| **Office Facilities** | **5** |
| In Pakistan | 5 |
| **Principal Technical Personnel & Their Qualification & Experience** | **15** |
| BE (Electrical) with 10 Years Experience (01 No.) | 10 |
| BE (Electrical) with 05 Years Experience (01 No.) | 5 |
| **List of Other Technical Personnel & Their Qualification & Experience** | **20** |
| Site Supervisor- Diploma with 05 years experience (02 Electrical) | 10 |
| Material/ Electrical Inspector (05 Years Experience) | 5 |
| Electricians 05 Year Experience (05 Nos.) | 5 |
| **List of Tools & Equipment** | **6** |
| Magger (01 No.) | 1 |
| Complete Electrical Tool Kit inclusive of Volt/ Ammeter/ Multi Meter (05 Sets) | 1 |
| Power Generator 5KVA (01 Nos.) | 1 |
| Light Duty Drill Machines (02 Nos.) | 1 |
| Heavy Duty Drill Machines (02 No.) | 1 |
| Lugs Pressing Machine (01 No.) | 1 |
| **List of Electrical works of similar nature completed in last 05 Years (05 for each)** | **15** |
| **List of Electrical works of similar nature in Hand (02 No. for each work)** | **10** |
| **Bankers Certificate showing credit worthiness of the Firm** | **5** |
| Less than 15% of Category Cost | 2 |
| 16-30% of Category Cost | 3 |
| More than 50% of Category Cost | 5 |
| **Satisfactory report from Organization where earlier works are carried out** | **5** |
| **Income Tax Return of last 03 Years** | **5** |
| **Registration with Other Organizations** | **4** |
| **TOTAL MARKS** | **100** |

**General Conditions**

General Provisions

1.1 Definitions

In the Conditions of Contract (“these Conditions”), which include Particular Conditions, Parts A and B, and these General Conditions, the following words and expressions shall have the meanings stated. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

1. **“Employer”** means the Shaheed Mohtarma Benazir Bhutto Medical University (SMBBMU), Larkana solely represented by the vice Chancellor of Shaheed Mohtarma Benazir Bhutto Medical University (SMBBMU), Larkana.
2. **“Contractor”** means the persons or, firm or company, whose tender has been accepted by the Employer and includes Contractors representative, successors and permitted assignees.
3. **“Consultant”** means who prepared the Drawings, design and these documents, will provide consulting services to the Employer during construction.
4. **“Executive Engineer”** means the authorized Officer of the University, who possess the role of Controlling and Co-ordination between University, Consultants and Contractor.
5. **“Works”** means all the works and things to be executed, supplied or done in accordance with the contract.
6. **“University”:** means Shaheed Mohtarma Benazir Bhutto Medical University (SMBBMU), Larkana.

1.1.1 The Contract

1.1.1.1 “Contract” means the Contract Agreement, the Letter of Acceptance, the Letter of Tender, these Conditions, the Specification, the Drawings, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance.

1.1.1.2 “Contract Agreement” means the contract agreement referred to in Sub- Clause 1.6 [ Contract Agreement ].

1.1.1.3 “Letter of Acceptance” means the letter of formal acceptance, signed by the Procuring Agency, of the Letter of Tender, including any annexed memoranda comprising agreements between and signed by both Parties. If there is no such letter of acceptance, the expression “Letter of Acceptance” means the Contract Agreement and the date of issuing or receiving the Letter of Acceptance means the date of signing the Contract Agreement.

1.1.1.4 “Letter of Tender” means the document entitled letter of tender or letter of bid, which was completed by the Contractor and includes the signed offer to the Procuring Agency for the Works.

1.1.1.5 “Specification” means the document entitled specification, as included in the Contract, and any additions and modifications to the specification in accordance with the Contract. Such document specifies the Works.

1.1.1.6 “Drawings” means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Procuring Agency in accordance with the Contract.

1.1.1.7 “Schedules” means the document(s) entitled schedules, completed by the Contractor and submitted with the Letter of Tender, as included in the Contract. Such document may include the Bill of Quantities, data, lists, and schedules of rates and/or prices.

1.1.1.8 “Tender” means the Letter of Tender and all other documents which the Contractor submitted with the Letter of Tender, as included in the Contract.

1.1.1.9 “Bill of Quantities”, “Daywork Schedule” and “Schedule of Payment Currencies” mean the documents so named (if any) which are comprised in the Schedules.

1.1.1.10 “Contract Data” means the pages completed by the Procuring Agency entitled contract data which constitute Part A of the Particular Conditions.

1.1.2 Parties and Persons

1.1.2.1 “Party” means the Procuring Agency or the Contractor, as the context requires.

1.1.2.2 “Procuring Agency” means the person named as employer in the Contract Data and the legal successors in title to this person.

1.1.2.3 “Contractor” means the person(s) named as contractor in the Letter of Tender accepted by the Employer and the legal successors in title to this person(s).

1.1.2.4 “Engineer” means the person appointed by the Procuring Agency to act as the Engineer for the purposes of the Contract and named in the Contract Data, or other person appointed from time to time by the Employer and notified to the Contractor under Sub-Clause 3.4 [ Replacement of the Engineer ].

1.1.2.5 “Contractor’s Representative” means the person named by the Contractor in the Contract or appointed from time to time by the Contractor under Sub-Clause 4.3 [ Contractor’s Representative ], who acts on behalf of the Contractor.

1.1.2.6 “Procuring Agency’s Personnel” means the Engineer, the assistants referred to in Sub-Clause 3.2 [ Delegation by the Engineer ] and all other staff, labour and other employees of the Engineer and of the Procuring Agency; and any other personnel notified to the Contractor, by the Procuring Agency or the Engineer, as Procuring Agency’s Personnel.

1.1.2.7 “Contractor’s Personnel” means the Contractor’s Representative and all personnel whom the Contractor utilizes on Site, who may include the staff, labour and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Works.

1.1.2.8 “Subcontractor” means any person named in the Contract as a subcontractor, or any person appointed as a subcontractor, for a part of the Works; and the legal successors in title to each of these persons.

1.1.2.9 “DB” means the person or three persons appointed under Sub-Clause 20.2 [ Appointment of the Dispute Board ] or Sub-Clause 20.3 [ Failure to Agree on the Composition of the Dispute Board ].

1.1.2.10 “FIDIC” means the Fédération Internationale des Ingénieurs-Conseils, the international federation of consulting engineers.

1.1.2.11 “Bank” means the financing institution (if any) named in the Contract Data.

1.1.2.12 “Borrower” means the person (if any) named as the borrower in the Contract Data.

1.1.3 Dates, Tests, Periods

and Completion

1.1.3.1 “Base Date” means the date 15 days prior to the latest date for submission and completion of the Tender.

1.1.3.2 “Commencement Date” means the date notified under Sub-Clause 8.1 [Commencement of Works ].

1.1.3.3 “Time for Completion” means the time for completing the Works or a Section (as the case may be) under Sub-Clause 8.2 [ Time for Completion ], as stated in the Contract Data (with any extension under Sub-Clause 8.4 [ Extension of Time for Completion ]), calculated from the Commencement Date.

1.1.3.4 “Tests on Completion” means the tests which are specified in the Contract or agreed by both Parties or instructed as a Variation, and which are carried out under Clause 9 [ Tests on Completion ] before the Works or a Section (as the case may be) are taken over by the Procuring Agency.

1.1.3.5 “Taking-Over Certificate” means a certificate issued under Clause 10 [Procuring Agency’s Taking Over ].

1.1.3.6 “Tests after Completion” means the tests (if any) which are specified in the Contract and which are carried out in accordance with the Specification after the Works or a Section (as the case may be) are taken over by the Procuring Agency.

1.1.3.7 “Defects Notification Period” means the period for notifying defects in the Works or a Section (as the case may be) under Sub-Clause 11.1 [ Completion of Outstanding Work and Remedying Defects ], which extends over twelve months except if otherwise stated in the Contract Data (with any extension under Sub-Clause 11.3 [Extension of Defects Notification Period ]), calculated from the date on which the Works or Section is completed as certified under Sub-Clause 10.1 [ Taking Over of the Works and Sections ].

1.1.3.8 “Performance Certificate” means the certificate issued under Sub-Clause 11.9 [ Performance Certificate ].

1.1.3.9 “day” means a calendar day and “year” means 365 days.

1.1.4 Money and Payments

1.1.4.1 “Accepted Contract Amount” means the amount accepted in the Letter of Acceptance for the execution and completion of the works and the remedying of any defects.

1.1.4.2 “Contract Price” means the price defined in Sub-Clause 14.1 [ The Contract Price ] , and includes adjustments in accordance with the Contract.

1.1.4.3 “Cost” means all expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit.

1.1.4.4 “Final Payment Certificate” means the payment certificate issued under Sub-Clause 14.13 [ Issue of Final Payment Certificate ].

1.1.4.5 “Final Statement” means the statement defined in Sub-Clause 14.11 [Application for Final Payment Certificate ].

1.1.4.6 “Foreign Currency” means a currency in which part (or all) of the Contract Price is payable, but not the Local Currency.

1.1.4.7 “Interim Payment Certificate” means a payment certificate issued under Clause 14 [Contract Price and Payment ], other than the Final Payment Certificate.

1.1.4.8 “Local Currency” means the currency of the Country.

1.1.4.9 “Payment Certificate” means a payment certificate issued under Clause 14 [ Contract Price and Payment].

1.1.4.10 “Provisional Sum” means a sum (if any) which is specified in the Contract as a provisional sum, for the execution of any part of the Works or for the supply of Plant, Materials or services under Sub-Clause 13.5 [ Provisional Sums ].

1.1.4.11 “Retention Money” means the accumulated retention moneys which the Procuring Agency retains under Sub-Clause 14.3 [ Application for Interim Payment Certificates ] and pays under Sub-Clause 14.9 [ Payment of Retention Money ].

1.1.4.12 “Statement” means a statement submitted by the Contractor as part of an application, under Clause 14 [Contract Price and Payment ], for a payment certificate.

1.1.5 Works and Goods

1.1.5.1 “Contractor’s Equipment” means all apparatus, machinery, vehicles and other things required for the execution and completion of the Works and the remedying of any defects. However, Contractor’s Equipment excludes Temporary Works, Procuring Agency’s Equipment (if any), Plant, Materials and any other things intended to form or forming part of the Permanent Works.

1.1.5.2 “Goods” means Contractor’s Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.

1.1.5.3 “Materials” means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.

1.1.5.4 “Permanent Works” means the permanent works to be executed by the Contractor under the Contract.

1.1.5.5 “Plant” means the apparatus, machinery and vehicles intended to form or forming part of the Permanent Works, including vehicles purchased for the Procuring Agency and relating to the construction or operation of the Works.

1.1.5.6 “Section” means a part of the Works specified in the Contract Data as a Section (if any).

1.1.5.7 “Temporary Works” means all temporary works of every kind (other than Contractor’s Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.

1.1.5.8 “Works” mean the Permanent Works and the Temporary Works, or either of them as appropriate.

1.1.6 Other Definitions

1.1.6.1 “Contractor’s Documents” means the calculations, computer programs and other software, drawings, manuals, models and other documents of a technical nature (if any) supplied by the Contractor under the Contract.

1.1.6.2 “Country” means the country in which the Site (or most of it) is located, where the Permanent Works are to be executed.

1.1.6.3 “Procuring Agency’s Equipment” means the apparatus, machinery and vehicles (if any) made available by the Employer for the use of the Contractor in the execution of the Works, as stated in the Specification; but does not include Plant which has not been taken over by the Employer.

1.1.6.4 “Force Majeure” is defined in Clause 19 [ Force Majeure ].

1.1.6.5 “Laws” means all national (or state) legislation, statutes, ordinances and other laws, and regulations and by-laws of any legally constituted public authority.

1.1.6.6 “Performance Security” means the security (or securities, if any) under Sub-Clause 4.2 [ Performance Security ].

1.1.6.7 “Site” means the places where the Permanent Works are to be executed, including storage and working areas, and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site.

1.1.6.8 “Unforeseeable” means not reasonably foreseeable by an experienced contractor by the Base Date.

1.1.6.9 “Variation” means any change to the Works, which is instructed or approved as a variation under Clause 13 [Variations and Adjustments ].

1.2 Interpretation In the Contract, except where the context requires otherwise:

(a) words indicating one gender include all genders;

(b) words indicating the singular also include the plural and words indicating the plural also include the singular;

(c) provisions including the word “agree”, “agreed” or “agreement” require the agreement to be record in writing;

(d) “written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record; and

(e) the word “tender” is synonymous with “bid”, and “tenderer” with “bidder” and the words “tender documents” with “bidding documents".

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

In these Conditions, provisions including the expression “Cost plus profit” require this profit to be one-twentieth (5%) of this Cost unless otherwise indicated in the Contract Data.

1.3 Communications

Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

1. in writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the Contract Data; and

(b) delivered, sent or transmitted to the address for the recipient’s communications as stated in the Contract Data. However:

(i) if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and

(ii) if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued. Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Engineer, a copy shall be sent to the Engineer or the other Party, as the case may be.

1.4 Law and Language

The Contract shall be governed by the law of the country or other jurisdiction stated in the Contract Data.

The ruling language of the Contract shall be that stated in the Contract Data.

The language for communications shall be that stated in the Contract Data. If no language is stated there, the language for communications shall be the ruling language of the Contract.

1.5 Priority of Documents

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence:

(a) the Contract Agreement (if any),

(b) the Letter of Acceptance,

(c) the Tender,

(d) the Particular Conditions - Part A,

(e) the Particular Conditions - Part B,

(f) these General Conditions,

(g) the Specification,

(h) the Drawings, and

(i) the Schedules and any other documents forming part of the Contract.

If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction.

**TABLE OF CONTENTS**

PART II **-** SPECIAL/PARTICULAR CONDITIONS OF

CONTRACT

|  |  |  |
| --- | --- | --- |
| **Clause** | **Title** | **Page** |
| 1.1 | Definitions |  |
| 3.1 | Engineer’s Duties and Authority |  |
| 4.3 | Contractor’s Representative |  |
| 6.10 | Records of Contractor’s Personnel and equipment |  |
| 7.9 | Use of Pakistani Materials and Services |  |
| 8.1 | Commencement of Works |  |
| 8.11 | Prolonged Suspension |  |
| 8.3 | Program |  |
| 13.1 | Right to vary |  |
| 13.3 | Variation procedure |  |
| 13.8 | Adjustment for changes in cost |  |
| 14.1 | Contract Price |  |
| 14.2 | Advance payment |  |
| 14.5 | Plants and Materials intended for Works |  |
| 14.8 | Delayed Payments |  |
| 15.2 | Termination by Employer/Procuring Agency |  |
| 15.6 | Corrupt and fraudulent Practices (Integrity Pact). |  |
| 16.4 | Payment on Termination |  |
| 17.3 | Procuring Agency’s/Procuring Agency’s Risks |  |
| 18.1 | General Requirements for Insurance |  |
| 19.6 | Optimal Termination, Payment and release by the Procuring Agency |  |
| 20.1 | Contractor’s Claims |  |
| 20.2 | Appointment of the Dispute Board/ Notification of the Committee |  |
| 20.3 | Failure to agree on the composition of the Dispute Board. |  |
| 20.4 | Obtaining Dispute Board’s Decision |  |
| 20.5 | Amicable Settlement. |  |
| 20.6 | Arbitration |  |
| 20.7 | Failure to comply with Dispute Board’s Decision |  |
| 20.8 | Expiry of Dispute Board’s Appointment. |  |
| APPE  NDIX. | General Conditions of Dispute Board Agreement |  |
| Annex | PROCEDURAL RULES |  |

**PART II - SPECIAL** /PARTICULAR **CONDITIONS OF CONTRACT**

**1.1 Definitions**

1.1.1.4 “Form of Bid” is synonymous with “Letter of Tender”.

1.1.1.5 “Bid” is synonymous with “Tender”.

1.1.1.10“Bidding” is synonymous with “contract”. *The following paragraph is added:*

1.1.1.11“Programme” means the program to be submitted by the contractor in accordance with Sub-Clause 8.3 and any approved revisions thereto.

1.12.2 “Procuring Agency” is synonymous with “Procuring Agency” 1.1.2.9 “DB” is synonymous with “Committee”. 1.1.3.1 Replace 28 days by 7 days in LCB and 15 days in ICB.

1.1.3.7 “Defects notification Period” is synonymous with “Defects liability Period”.

1.15 **Inspections and Audit by the Bank** Deleted *Procuring Agency can retain this clause with or without changes, in case of contracts under Project, Bank and donor’s program.*

***Not Applicable.***

**3.1 Engineer’s Duties and Authority.**

*The following paragraph is added after duties:*

Procuring agency shall ensure that the Engineer’s Representative/Staff is a professional engineer as defined in the Pakistan Engineering Council Act 1975 (V of 1976)

**4.3 Contractor’s Representative**

*The following text is to be added after last line:*

The contractor’s authorized representative and his other professional engineers working at site shall register themselves with the Pakistan Engineering Council.

**6.10 Records of Contractor’s Personnel and Equipment**

*The following paragraph is added:*

The Contractor shall, upon request by the Engineer at any time in relation to any item of hired Contractor’s Equipment, forthwith notify the Engineer in writing the name and address of the Owner of the equipment and shall certify that the agreement for the hire thereof contains a provision in accordance with the requirements set forth above.

*The following sub-clause 7.9 is added in (GCC):*

**7.9 Use of Pakistani Materials and Services**

The contractor shall, so far as may be consistent with the contract, make the maximum use of materials, supplies, plant and equipment indigenous to or produced or fabricated in Pakistan and services, available in Pakistan provided such materials, supplies, plant, equipment and services shall be of required standard.

**8.1 Commencement of Works**

The last para is deleted and substituted with the following: The contractor shall commence the works on site within the period named in Appendix-A to Bid from the date of receipt by him from the Engineer of a written Notice to Commence. Thereafter, the contractor shall proceed with the works with due expedition and without delay.

8.2 **Prolonged Suspension**

Replace 84 days by **120 days**.

**8.3 Programme**

*The following text is to be added after [Commencement of Works]* The programme shall be submitted in the either form of Bar Chart identifying the critical activities.

**13.1 Right to vary**

In the last line of Para, after the word “Variation", the word “in writing” is added.

**13.3 Variation procedure**

In the tenth line, after the words “as soon as practicable” following is added: “and within a period not exceeding one-eighth of the completion time”

**13.8 Adjustment for changes in cost**

***Not applicable***

Similarly reduction in the cost of these materials will also be recovered from the contractor accordingly

14.1 The Contract Price

Sub-para (d) is deleted.

**14.2 Advance Payment**

***See Special Conditions.***

**Mobilization Advance/Advance Payment**

***See Special Conditions.***

**14.5 Plants and Materials intended for Works**

*Add the following paragraph as sub-clause 14.5 (d) for Secured Advance on non – perishable materials and sub-clauses (a), (b) and (c) will be applicable for plants only :-*

1. The Contractor shall be entitled to receive from the procuring agency Secured Advance against an **INDENTURE BOND** in Public Works Account Form No.31 (Fin. R. Form No. 2) acceptable to the procuring agency of such sum as the Engineer may consider proper in respect of non-perishable materials brought at the site but not yet incorporated in the Permanent Works provided that:
2. The materials are in accordance with the specifications for the permanent works;
3. Such materials have been delivered to the site and are properly stored and protected against loss or damage or deterioration to the satisfaction and verification of the Engineer/Assistant Engineer but at the risk and cost of the Contractor;
4. The Contractor’s records of the requirements, orders, receipts and use of materials are kept in a form approved by the Engineer, and such records shall be available for inspection by the Engineer;
5. The Contractor shall submit with his monthly statement the estimated value of the materials on site together with such documents as may be required by the Engineer for the purpose of valuation of materials and providing evidence of ownership and payment therefore;

**BIDDING**

**DATA**

**Contract/Bidding Data**

The following specific data for the works to be tendered shall complement, amend, or supplement the provisions in the Instructions to Bidders. Wherever there is a conflict, the provisions herein shall prevail over those in the Instructions to Bidders.

**Instructions to Bidders**

Clause Reference

* 1. Name and address of the procuring agency: **Shaheed Benazir Bhutto Medical University,**

**Larkana.**

1.2 Name of the Project and Summary of the works: **Renovation and Rehabilitation (ELECTRIC WORKS) of Marvi Hostel at Chandka Medical College Larkana.**

2.1 Name of the Borrower/Source of Financing/Funding Agency/Funding Source;

**ADP Scheme # 462 (2015-16) Tilted “Renovation & Rehabilitation of Chandka Medical College and Construction of New Noori Girls Hostel of SMBB Medical University Larkana”**

2.1 Amount and Type of Financing/Scheme Cost and Allocated Funds. **Rs: 4.590 (Million)**

8.1 Time limit for clarification: **05 days.**

10.1 Bid language: **English**

11.1 (a) Prequalification Information to be updated (where applicable): N/A

*.*

11.1 (b) Furnish and Technical Proposal (*in case of two envelope method*) or Company Profile in single stage single envelope: N/A.

The bidder has to submit a technical proposal in sufficient detail to demonstrate the adequacy of the bid in meeting requirements for timely completion of the works.

*3.1 Bidders to quote entirely in Pak. rupees but specify the percentages of foreign currency they require, if applicable.* ***N/A.***

14.1 Period of Bid Validity: **90 days.**

15.1 Amount of Bid Security: **10%**

**(5% at the time of Bid Submission and 5% deductible from the running bills).**

17.1 Venue, time, and date of the pre-Bid meeting: **N/A**.

18.4 Number of copies of the bid to be completed and returned: **N/A**.

19.2 (a) Procuring Agency's address for the purpose of bid submission:

**Office of the Executive Engineer, SMBBMU, Larkana.**

(b) Name and Identification Number of the Contract: **Renovation and Rehabilitation (ELECTRIC WORKS) of Marvi Hostel at Chandka Medical College Larkana.**

20.1 (a) Deadline for submission of bids: **09-06-2016** **up to 11.00 A.M.**

(b) Venue, time, and date of bid opening: **Office of the Executive Engineer, SMBBMU, Larkana on 09-06-2016 at 11:30 A.M.**

32.1 Standard form and amount of Performance Security **5%** acceptable to the procuring agency:

32.3 Stamp duty:

**0.30%** or notified by the Govt. of Sindh, will be paid by successful bidder as stamp duty.

**FORM OF BID**

**AND**

**APPENDICES TO BID**

**FB-1**

**FORM OF BID**

Bid Reference No. **Renovation and Rehabilitation (ELECTRIC WORKS) of Marvi Hostel at Chandka Medical College Larkana.**

To:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_

1. Having examined the bidding documents including Instructions to Bidders, Bidding Data, and Conditions of Contract, Specifications, Drawings and Bill of Quantities and Addenda Nos. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for the execution of the above-named work, we/I, the undersigned, offer to execute and complete the work and remedy any defects therein in conformity with the Conditions of Contract, Specifications, Drawings, Bill of Quantities and Addenda for the sum of Rs. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Rupees \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) or such other sum as may be ascertained in accordance with the said conditions.

2. We/I understand that all the Appendices attached hereto form part of this bid.

3. As security for due performance of the undertakings and obligations of this bid, we/I submit herewith a bid security in the amount of Rupees \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Rs. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) drawn in your favour or made payable to procuring agency and valid for a period of \_\_\_\_\_\_\_\_\_\_\_days beginning from the date, bid is opened.

4. We/I undertake, if our bid is accepted, to commence the works and to complete the whole of the works comprised in the contract within the time stated in Appendix-A to Bid.

5. We/I agree to abide by this bid for the period of \_\_\_\_\_\_ days from the date fixed for opening the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

6. Unless and until a formal Agreement is prepared and executed, this bid, together with your written acceptance thereof, shall constitute a binding contract between us.

7. We do hereby declare that the bid is made without any collusion, comparison of

figures or arrangement with any other bidder for the works.

We understand that you are not bound to accept the lowest or any bid you may receive.

9. We undertake, if our/my bid is accepted, to execute the Performance Security referred to in Clause 10 of Conditions of Contract for the due performance of the Contract.

10. We confirm, if our bid is accepted, that all partners of the joint venture shall be liable jointly and severally for the execution of the Contract and the composition or the constitution of the joint venture shall not be altered without the prior consent of the procuring agency. *(Please delete this in case of Bid form a single bidder)*

in the capacity of \_\_\_\_\_\_\_duly authorized to sign Bids for and on behalf of

Dated this \_\_\_\_\_\_\_\_\_\_\_day of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_20\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Name of Bidder in Block Capitals)

(Seal)

Address:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Witness:

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Occupation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*.*

**Appendix-A to Bid**

**SPECIAL STIPULATIONS**

**Clause**

**Conditions of Contract**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | Engineer representing Consulting Firm hired by the procuring agency to issue variation in case of emergency. | 3.1 | *Up to 2% of the* contract price stated in the Letter of Acceptance. |
| 2. | Amount of Performance Security | 4.2 | *Up to 10% of contract price*. |
| 3. | Time for Furnishing Program | 8.3 | Within 07 days from the date of receipt of Letter of Acceptance. |
| 4. | Minimum amount of Third Party Insurance | 18.3 | Rs. \_\_\_\_\_\_\_\_\_ per occurrence with number of occurrences unlimited. **N/A.** |
| 5. | Time for Commencement | 8.1 | Within 07 days from the date of receipt of Engineer’s Notice to Commence, this shall be issued within fourteen (14) days after signing of Contract Agreement. |
| 6. | Time for Completion (works & sections) | 8.2 &  10.2 | 12 Months from the date of receipt of Engineer’s Notice to Commence. |
| 7. | Amount of Liquidity Damages/Delay Damages/Penalties | 8.7 | **0.05%** Damages per day but total amount will not be more than 10% of contract Price*.* |
| 8. | Defects Liability Period | 11.1 | **180** days from the effective date of Taking Over Certificate. |
| 9. | Percentage of Retention Money | 14.2 | **5%** of the amount of Interim/Running Payment Certificate. |
| 10. | Limit of Retention Money | 14.2 | **10%** of Contract Price stated in the Letter of Acceptance. |
| 11. | Minimum amount of Interim/Running Payment Certificates | 14.2 | Rs. 1,000,000.00 |
| 12. | Time of Payment from delivery of Engineer’s Interim/Running Payment Certificate to the procuring agency. | 14.7 | **30** days. |
| 13. | Mobilization Advance. | 14.2 | **10%** of Contract Price stated in the Letter of Acceptance. |
| 14. | Escalation |  | Escalation shall be paid separately as per Notifications issued by Govt. of Sindh from time to time after the opening date. |
| 15 | Action when whole of the security deposit is forfeited: | Clause- 1. | In any case in which under any clause or clauses of this contract the Contractor shall have  rendered himself liable to pay compensation amounting to the whole of his security deposit ( whether paid in one sum or deducting by installment) I or in the case of abandonment of the work owing to the serious illness or death of the Contractor or any other case, the Executive Engineer , on behalf of the SMBBMU, Larkana shall have power to adopt any of the following courses, as he may deem best suited to the interests of University.  (a) To rescind the contract ( of which rescission notice in writing to the contractor under the hand of the Executive Engineer shall be conclusive evidence ) and in that case the security deposit of the Contractor shall stand forfeited and absolutely at the disposal of University.  (b) To employ labour paid by the University to carry out the work, or any part of the work, debiting the Contractor with the cost of the labour ( as to the correctness of which cost and price the certificate of Executive Engineer shall be final and conclusive against the Contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same rates as if it had been carried out by the Contractor under the terms of his contract; and in that case the certificate of the Executive Engineer as to the value of the work done shall be final and conclusive against the Contractor.  (c) To measure up the work of the Contractor and to take such part thereof as shall be unexpected out of his hands, and to give it to another Contractor to complete it, in which case any expenses which may be incurred in excess of the sum which would have been paid to the original Contractor if the whole work had been executed by him ( as to the amount of which excess expenses the certificates in writing of the Executive Engineer shall be final and conclusive ) shall be borne and paid by the original Contractor and shall be deducted from any money due to him by University under the contractor or otherwise or from his security deposit or the proceeds of sale thereof, or a sufficient part thereof.  In the event of any of the above courses being adopted by the Executive Engineer Contractor shall have no claim to compensation for any loss sustained by him-by reason of his having  purchased or procured any materials, or entered into any engagements, or made any advance on account of or with a view to the execution of the work or the performance of the contract. And in case the contract shall be rescinded under the provision aforesaid, the Contractor shall not be entitled to recover or be paid any sum for any work therefore actually performed by him under this contract unless and until the Executive Engineer shall have certified in writing the performance of such work and the amount payable in respect thereof, and he shall only be entitled to be paid the amount so certified. |
| 16 | Action when the progress of any particular position of the work is unsatisfactory: | Clause-2 | If the progress of any particular portion of the work is unsatisfactory. Executive Engineer on recommendation of Engineer, shall not withstanding that the general progress of the work is in accordance with the conditions, be entitled to take action under clause 1 (b) after giving the Contractor 10 days notice in writing. The Contractor will have no claim for compensation; for any loss sustained by him owing to such no claim for compensation, for any loss sustained by him owing to such action. |
| 17 | Contractor remains liable to pay compensation if action not taken under clause 3 and 4.  power to take possession of or required removal of or sell contractor's plant | Clause-3 | In any case in which any of the power conferred upon the Executive Engineer by clause 1 and 2 hereof shall have become exercisable and the same shall not have been exercised the non-exercised thereof shall not constitute a waiver of any of the conditions hereof and -such powers shall notwithstanding be exercisable in the event of any future case of default by the Contractor for which under any clause or clauses hereof he is declared liable to any compensation amounting if the whole of his security deposit and the liability of the Contractor for past and future compensation shall remain unaffected. In the event of the Executive Engineer taking action under sub-clause (a) or (c) of clause 1, he may, if he so desires, take possession of all or any tools, plant, materials and stores in or upon the works, of the site thereof or belonging to the Contractor or procured by him and intended to be used for the execution of the work or any part thereof, paying or allowing for the same in account at the contract rate, or in the case of contract not being applicable, at current market rates, to be certified by the Executive Engineer whose certificate thereof shall be final. In the alternative, the Executive Engineer may, after  giving notice in writing to the Contractor or his clerk of the work foreman or other authorized agent, required him to remove such tools, plant materials, or stores from the premises within a time to be specified in such notice, and in the event of the Contractor is failing to comply with any such requisition, the Executive Engineer may remove them at the Contractor's expense or sell them by auction or private sale on account of the Contractor and at his risk in all respects, and the certificate of the Executive Engineer as to the expense of any such removal and the amount of the proceeds and expense of any such sale shall be final and conclusive against the Contractor. |
| 18 | Extension Of Time | Clause-4 | If the Contractor shall desire an extension of the time for completion of the work on the ground of his having been unavoidable hindered in its execution or on any other ground, he shall apply in writing to the Executive Engineer within 30 days from the date of which the execution of the work, was hindered as aforesaid or on which the ground for asking for extension arose and in any case before the date of completion of the work and the Executive Engineer may, if in his opinion, there are reasonable grounds for granting an extension, grant such extension as he thinks necessary or proper. The decision of the Executive Engineer in this matter shall be final.  Provided that where the Contractor is hindered in the execution of the work on account of any act or omission on the part of the University or its authorized officers, the Executive Engineer may at any time before the date of completion and on his own initiative extend the time for completion of the work for such period as he may think necessary or proper.  Where time has been extended under this or any other clause of this agreement the date for completion of the work shall be the date fixed by the order giving the extension or by the aggregate of all such orders, made under this agreement.  When time has been extended as aforesaid, it shall continue to be the essence of the contract and all clauses of the contract shall continue to be operative during the extended period. |
| 19 | Final Certificate | Clause-5 | On completion of the work the Contractor shall be furnished with a certificate by the Engineer  of such completion, but no such certificate shall be given nor shall the work be considered to be complete until the Contractor shall have removed from premises on which the work shall have been executed all scaffolding surplus materials and rubbish and shall have cleaned the site of work in and around the structures / works completed and shall have cleaned off the dirt from all woodwork, doors, windows, walls, floors, or other parts of any building in or upon which the work has been executed, or of which he may have had possession for the purpose of executing the work, nor until the work shall have been measured by the Engineer or where the measurements have been taken by his subordinate until they have received the approval of the Executive Engineer, the said measurements being binding and conclusive against the Contractor If the Contractor shall fail to comply with the requirements of this clause is to the removal of scaffolding, surplus materials and rubbish and shall have cleared the site of work in and around the structures/works completed and dispose of the same as he thinks fit and clean of such dirt as aforesaid; and the contracts shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any such actually realized by the sale thereof. |
| 20 | Payment Of Intermediate Certificate To Be Regarded As Advance | Clause-6 | No payment shall be made for any work, estimated to cost less than rupees **ten thousand** till after the whole of the work shall have been completed and a certificate of completion given. But in the case of work estimated to cost more than rupees ten thousands, the Contractor shall on submitting bill therefore, as provided in Clause-10 be entitled to receive payment proportionate to the part of the work then approved and passed by the Engineer and Executive Engineer, whose certificate such approval and passing of the sum so payable shall be final and conclusive against the Contractor. All such intermediate payments shall be regarded as payments by way of advance against the final payments only and not as payment for work actually done and completed, and .shall not preclude the Engineer and Executive Engineer from requiring any bad, unsound, imperfect or unskillful work to be removed or taken away and reconstructed, or re-erected, nor shall any such payment be considered as an admission of the due performance of the contract or any part thereof  in any respect or the occurring of any claims; nor shall it conclude, determine, or affect in any other way the powers of the Executive Engineer as to the final settlement and adjustment of the accounts or otherwise, or in any way very or effect the contract. The final bill shall be submitted y the Contractor within one month of the date fixed for the completion of the work otherwise Engineers certificate of the measurements and of the total amount payable for the work shall be final and binding on all parties. |
| 21 | payment at reduced rates of account of item of work not accepted as completed to be at the discretion of the Executive Engineer | Caluse-7 | The rates for several items of works estimated to cost more than 1,000.00, agreed to within shall be valid only when the item concerned is accepted as having been completed fully in accordance with the sanctioned specifications. In cases where the items of work are not accepted as so completed the Engineer may certify payment on account of such items at such reduced rates as he may consider reasonable in the preparation of final or on account bills. |
| 22 | Bills to be submitted monthly | Clause-8 | A bill shall be submitted by the Contractor as frequently the progress of the work may justify for all the work executed and not included in any previous bill and the Engineer shall take or cause to be taken the; requisite measurements for the purpose of having the same verified and the claims, as far as admissible, adjusted, if possible before the expiry of 21 days from the presentation of the bill at any time depute a subordinate to measure up the said work in the presence of the Contractor or his authorized agent, whose counter signature to the measurement list will be sufficient warrant and the Executive Engineer may prepare a bill from such list which shall be binding on tilted Contractor in all respects. In case the Contractor or his authorized agent is not present at the site of work at the time fixed for recording measurements, or being present, does not counter sign the measurement list, the measurements recorded by the Engineer or his authorized subordinate shall be treated by the Engineer or his authorized subordinate shall be treated as correct and binding on the Contractor unless the Contractor within seven days of date of recording such measurements submit to the Executive Engineer a detailed letter pointing out the errors or omissions in the record measurements. In case of such  disagreement, the Executive Engineer shall held or cause to be hold the site investigations and give his decision. The decision of the Executive Engineer shall be final. |
| 23 | Bills to Be Printed On Forms | Clause-9 | The Contractor shall submit all bills on his own primed forms. The bills shall be submitted to the Engineer in triplicate who will then scrutinize these bills and forward two copies to the Executive Engineer and retain one copy in their office. The charges to be made in the bills shall always be entered at the rates specified in the tender or in the case of any extra work ordered in pursuance of these conditions, and not mentioned or provided for in the tender at the rates hereinafter provided for such work. |
| 24 | Store Supplied By University | Clause-10 | If the specification or estimate of the work provides for the use of an' special description of materials to be supplied from the store of the University or if it is required that the Contractor shall use certain stores to be provided by the Executive Engineer such material and stores, and the prices to be charged therefore as hereinafter mentioned being so far as practicable for the convenience of the Contractor but not so as any way to control the meaning of effect of this contract specified in the schedule or memorandum hereto annexed, required from time to time to be used by him for the purpose of the contract only and the value of the full quantity of the materials and stores so supplied shall be sent off or deducted from any sums then due, or thereafter to become due to the Contractor under the contract, otherwise, or from the security deposits, or the proceed of sale thereof, if the security deposit as held in Government securities the same or a sufficient portion hereof shall in that case be sold for the absolute property of University and shall on no account remove from the site of the work, and shall at all times be open to inspection by the Executive Engineer. Any such materials unused and perfectly good condition at the time of completion or determination of the contracts shall be returned to the University Stores, if the Executive Engineer so requires by a notice in writing under his hand, but the Contractor shall not be entitled to return any such materials except with the consent of the Executive Engineer and he shall have no claim for compensation on account of any such material supplied to him as aforesaid but remaining  unused by him or for, any, wastage in or damage to any such materials. |
| 25 | Works to be executed in accordance with specifications. Drawings. Orders etc. | Clause-11 | The Contractor shall execute the whole and every part of the work in he most substantial and workmanlike manner and both as regards materials and all other matters in strict accordance with the specifications lodged in the office of the Executive Engineer and initialed by the parties, the said specification being a part of the contract. The contractor shall also conform exactly, fully and faithfully to the designs, drawings and instruction in writing relating to the work signed by the Executive Engineer and lodged in his office and to which the Contractor shall be entitled to have access at such office or on the site of work for the purpose of inspection during office hours and the Contractor shall if he so requires, be entitled at his own expenses to make or cause to be made copies of the specifications, and of all such designs drawings and instructions as aforesaid |
| 26 | Alterations in specifications and design. Not to invalidate contracts | Clause-12 | The Executive Engineer on the recommendation of Engineer shall have power to make any alterations in, or additions to the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work and the contractor shall be bound to carry out of the work, in accordance with any instructions in this connection which may be given to him in writing by the Executive Engineer and such alterations shall, not invalidate the contract; and any altered or additional work which the Contractor may be directed to do in the mentioned above specified subject to the limit laid down in clause 37 below as part of the work shall be carried out by the Contractor on the same conditions in all respects on which he agreed to do the main work and at the same rate as re specified in the tender for the main work. The time for completion of the work shall be extended in the proportion that the additional work bears to the original contract work, and the certificate of the Executive Engineer as to such proportion shall be conclusive. And if the altered or additional work includes any class of work for which no rate is specified in its contract, then such class of work shall be paid for at ( ) percent below/above the rates shown for such work in the Government of Sind Schedule of rates 2004, as amended from time to time and  if such last mentioned class of work is not entered in the Government of Sind Schedule of Rates 2004 as of the date of receipt by him of the order to carry out the work, inform the Executive Engineer through the Consultants of the rate which it is his intention to charge for such class of work, and if the Executive Engineer and the Consultants are satisfied with the rate analysis, then he shall allow him that rate, but if the Owner does not agree to this rate, he shall be notified in writing be at liberty to cancel his order to carry out such class of work, and arrange to carry it out in such manner as he may consider advisable, provided always that if the Contractor shall commence work or incur any expenditure in regard thereto before the rates shall have been detonated as lastly hereinbefore mentioned then in such case he shall only be entitled to be paid in respect of the work carried out for expenditure incurred by him prior the work carried out for expenditure incurred by him prior to the date of the determination of the rate as aforesaid according to such rate or rates as shall be fixed by the Owner. In the event of a dispute, the decision of the Project Director will be final, conclusive and binding. |
| 27 | No Claim To Any Payment Or Compensation For Alteration In Or Restriction Of Work | Clause-13 | If at any time after the execution of the contract documents the Executive Engineer shall for any reason whatsoever in the tender to be carried out at all or carried out in part by the Contractor, he shall give notice in writing of the fact to the Contractor, who shall thereupon have no claim to any payment of compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not so derive in consequence of the full amount of the work not having been carried out, neither shall he have any claim for compensation by reason of any alterations, having been made in the original specifications, drawings, designs, and instruction, which may involve any curtailment of the work as original contemplated. Where materials have already been collected at site of the work before the receipt of the said notice to stop or curtail the work, the Contractor shall be paid for such materials at the rates determined by the Executive Engineer provided they are not in excess of requirements and are of approved  quality. |
| 28 | Time Limit for Unforeseen Claims | Clause-14 | Under no circumstances whatsoever shall the contractor be entitled to any compensation from Authority on any account unless the Contractor shall have submitted a claim in writing to the Executive Engineer within one month of the cause of such claim occurring. The Contractor shall give full details of such claim, indicating the part of the work is the subject matter of such claim, the reasons giving rise to the said claim and submit as far as possible, documentary evidence in support of the reasons and the calculations for such claim. The claim shall not be considered as valid or payable unless it has been scrutinized & accepted by the Engineer and Executive Engineer & will become payable only to the extent up to which it has been accepted by the Project Director. |
| 29 | Action and Compensation In Case Of Bad Work | Clause-15 | If at any time before the security deposit is refunded to the Contractor, it shall appear to the Executive Engineer or his subordinate-Incharge of the work, that any work lies been executed with unsound, imperfect of unskilled workmanship or with materials of inferior quality, or that any materials or articles provided by him for the execution office work are unsound, or of quality inferior to that contracted for, or are otherwise not in accordance with the contract, shall be lawful for the Executive Engineer to intimate this fact in writing to the Contractor and then notwithstanding the fact that the work, materials or articles complained of any have been inadvertently passed, certified and paid for the Contractor shall be bound forthwith to rectify or remove and reconstruct the work so specified in whole or in part, as the case may require, or if so required shall remove the materials or articles, and provide other proper and suitable materials or articles at his own proper charge and cost; and in the event of his failing to do so within a period to be specified by the Executive Engineer in the writing intimation aforesaid, the Contractor shall be liable to pay compensation at the rate of one percent, on the amount of the estimate for every day not exceeding ten days, during which the failure so continues, and in the case of any such failure the Executive Engineer may rectify or remove, and re-execute the work or remove and replace the materials or articles complained of as the case may be as the risk and expense in  all respects of the Contractor. Should the Executive Engineer consider that any such inferior work or materials as described above may be accepted or made use of it shall be within the discretion to accept the same at such reduced rates as he may fix thereof. |
| 30 | Work To Be Open To Inspection Contractor Or Responsible Agent To Be Present | Clause-16 | All works under or in course of execution or executed in pursuance of the contract shall at all times be open to the inspection and supervision of the Engineer and Executive Engineer or his subordinates, and the Contractor shall all times during the usual working hours, and at all other times at which reasonable notice of the intention of the Engineer and Executive Engineer or his subordinate to visit the work shall have been given to the Contractor, either himself be present to receive orders and instructions, or have responsible agent duly accredited in writing present for that purpose. Orders given to the Contractor's duly authorized agent shall be considered to have the same force and effect as if they had been given to the Contractor himself. |
| 31 | Notice To Be Given Before Work Is Covered Up | Clause-17 | The Contractor shall give not less than five days notice in writing to the Engineer and Executive Engineer or his subordinate-in-charge of the work before covering up or otherwise placing beyond the reach of check, inspection & measurement any work in order that the same may be verified, checked, inspected and measured, and correct dimensions thereof taken before the same is so covered up or planned beyond the reach of verification check, inspection & measurement, and shall not cover up or place beyond the reach of verification, check, inspection and measurement any work without the consent in writing of the Engineer and Executive Engineer or his subordinate-Incharge of the work, and if any work shall be covered up or placed beyond the reach of verification, check, inspection & measurement any work without the consent in writing of the Executive Engineer or his subordinates Incharge of the work, and if any work shall be covered up or placed beyond the reach of verification, check inspection & measurement without such notice having been given to consent obtained, the same shall be uncovered at the Contractor's expense, and in default thereof no payment or allowance shall be made for such work, or for the materials with which the same was  executed. |
| 32 | Contractor Liable For Damage Done And For Imperfections For Three Months After Certificate | Clause-18 | If the Contractor or his workmen, or servants shall break, deface, destroy any part of a building in which they may be working, or any building, road, fence, enclosure or overhead or underground service lines of water supply, sewerage, electricity, telephone, gas etc. or grass land or cultivated ground continuous to the premises on which the work or any part thereof is being executed, or if any damage shall be done to the work, while it is in progress from any cause whatever or if any part thereof in being executed, or if any damage shall be done to the work, while it is in progress from any cause whatever or if any imperfections become apparent in it within three months of the grant of a certificate of completion, final or otherwise, by the Executive Engineer, the Contractor shall make good the same his own expense, or in default the Executive Engineer may cause the same to be made good by other workmen, and deduct the expenses of ( which the certificate of the Executive Engineer shall be final ) from any sums that may then be due or may thereafter become due to the Contractor, or from his security deposits or the proceeds of sale thereof, or of a sufficient portion thereof or any of his dues available against other works with the University or as arrears of land revenue in case no dues are available or the amount available falls short of the total recoveries. |
| 33 | Contractor to supply plant ladders. Scaffolding etc. And is liable for damages arising on provision of lights. Fencing etc. | Clause-19 | The Contractor shall supply at his own cost all materials, plant, tools, appliances, implement, ladders, cordage, tackle, scaffolding and temporary work requisite or proper for the execution of the work, whether in the original, altered or substituted form, and whether included in the specification, or other documents, forming part of the contract or referred to in these conditions or not, and which may be necessary for the purpose of satisfying or complying with the requirements of the Executive Engineer as to any matters as to which under these conditions he is entitled to be satisfied or which he is entitled to require together with carriage therefore to and from the work. The Contractor shall also supply without charge the requisite number of persons with the means and materials necessary for the purpose of setting out works, and counting, weighing and assisting in the measurement or  examination at any time and from time to time of the work or the materials. Failing this the same may be provided by the Executive Engineer at the expense of the Contractor and the expenses may be deducted from any money due to the Contractor under the contract, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The Contract or shall provide all necessary fencing and lights required to protect the public from accident, and shall also be bound to bear the expenses of defense of every suit, action or other legal proceedings, that may be brought by any person for injury sustained owing to neglect of the above; precautions, and to pay any damages and costs which may be awarded in any such, suit action or proceeding to any such person, or which may with the consent of the Contractor be paid for comprising any claim by any such person. |
| 34 | Measure For Prevention Of Fire | Clause-20 | The Contractor shall not set fire to any standing jungle, trees, bush-wood or grass without a written permit from the Executive Engineer.  When such permit is given, and also all cases when destroying cut or dug up trees, brushwood, grass etc., by fire; the Contractor shall take necessary measures to prevent such fire spreading to otherwise damaging surrounding property.  The Contractor shall make his own arrangements at his cost and expense for providing drinking water and water for domestic use of his labour employed in connection with the execution of the works as also for the use of his labour employed in connection with the execution of the works as also for use on the works itself. |
| 35 | Liability Of Contractor For Any Damage Done In Or Outside Work Area | Clause-21 | Compensation for all damage done intentionally or unintentionally by Contractor's labour whether in or beyond the limits of University property including any damage, caused by the spreading of fire mentioned in clause 22 shall be estimated by the Executive Engineer or such other officer as he may appoint and the estimates of the Executive Engineer shall be final and the Contractor shall be bound to pay the amount of the assessed compensation on demand failing which the same will be recovered from the Contractor as damages in the manner prescribed in clause 1 or deducted by the Executive Engineer from any sums that  may be due or become due from University of the Contractor under this contract or otherwise.  The Contractor shall bear the expenses of defending any action or other legal proceedings that maybe brought by any person, party or authority for injury sustained "by him owing to neglect of precaution to prevent the spread of fire and he shall pay any damages and cost that may be awarded by the court in consequence. |
| 36 | Employment Of Female Labour | Clause-22 | The employment of female labour on works in the neighborhood of soldiers' barracks should be avoided as for as possible. |
| 37 | Work On Sunday | Clause-23 | No work shall be done on a Sunday or a public holiday without the prior sanction in writing of the Executive Engineer. |
| 38 | Work not be sublet. Contractor may be rescinded & security deposit forfeited for subletting it without approval" | Clause-24 | The Contractor shall not be assigned or sub-let without the written approval of the Executive Engineer. And if the Contractor shall assign or sublet his contract, or attempt to do, or become insolvent or make any composition with his creditors or attempt to do, the Executive Engineer may, by notice in writing rescind the contract.  The Contractor shall keep full and true accounts in respect of the contract works in the regular course of business and shall whenever called upon by the Executive Engineer by notice in writing, produce them for inspection by him or by any officer appointed by him in that behalf. Also if any bribe, gratuity, gifts, loan, reward or advantage pecuniary or otherwise, shall either directly or indirectly be given, promised or offered by the Contractor or any of his servants or agents to any public officer or person in the employment of University in any way relating to his office or employment or if any such officer or person shall become in any way directly or indirectly interested in the contract or if the Contractor does not keep account or fails to produce them as aforesaid, the Executive Engineer may give notice in writing rescind the contract. In the event of a Contract being rescinded the security deposit of the Contractor shall thereupon stand forfeited and be absolutely at the disposal of University and the same consequences shall ensure as if the contract had been rescind under clause 3 hereof and in addition the Contractor shall not be entitled to recover or be paid for any work therefore actually performed under the  contract. |
| 39 | Sum Payable By Way Of Compensation To Be Considered As Reasonable Compensation Without Reference To Actual Loss | Clause-25 | All sums payable by a Contractor by way of compensation under any of these conditions shall be considered as a reasonable compensation to be applied to the use of University without reference to the actual loss or damage sustained and whether any damage has or has not been sustained. |
| 40 | Changes In The Constitution Of Firm To Be Notified | Clause-26 | In the cases of a tender by partners any change in the constitution of a firm shall be forthwith notified by the Contractor to the Executive Engineer for his information. |
| 41 | Work To Be Under Direction Of Engineer, Consultant And Executive Engineer (Works) | Clause-27 | All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer and Executive Engineer for the time being, who shall be entitled to direct at what point or points and in what-manner they are to be commenced, and from time to time carried on. |
| 42 | Decision Of Project Director To Be Final | Clause-28 | Except where otherwise specified in the contract and subject to The powers delegated to him by authority under the Code rules then in force, the decision of the Project Director shall be final, conclusive, and binding on all parties to the contract upon all questions relating to the meaning of the specifications, design, drawings, and instructions hereinbefore mentioned and as to the quality of workmanship, or materials used on the work, or as to any other question claim, right, matter or the thing whatsoever in any way arising out of, or relating to the contract, design, drawings, specifications, estimates, instructions, orders of these conditions, or otherwise considering the works, or the execution, or failure to execute the same, whether arising, during the progress or the work, or after the completion on abandonment thereof. |
| 43 | Lump Sum In Estimates | Clause-29 | When the estimate on which a tender is based includes one or more items with lump sum rates or lump sum amount the Contractor shall be entitled to payment in respect of such items on the rates entered in this contract with the detailed specifications and the analysis of the rates on which the contract price is calculated. Where part of the work is done or the specifications are altered the Contractor will submit his own rate and payment shall be controlled in the same way as if the item of  work was done outside the current Government Schedule of Rates applicable in the case in accordance with the procedure laid down in Clause 14.  Provided always that in case of the percent Rate tenders, no premium as quoted for the main tender as also that quoted in clause 14 ( which will be the same premium as for the main tender) shall be payable for any items of work including the lump sum items or market rates which are outside the Current Government Schedule of Rates. |
| 44 | Action Where No Specification | Clause-30 | In the case of any class of work for which there is no such specification as is mentioned in Rule I such work shall be carried out in accordance with the Sind P.W.D. specifications and in the event of there being no Sind P.W.D. specification, then in such case the work shall be carried out in all respects in accordance with the instructions and requirements of the Executive Engineer. The payment for such items of work shall be made in accordance with the procedure laid down in Clause 14 for items of work outside the Current Government Schedule of Rates. |
| 45 | Contractors Percentage Whether Applied To Net Or Gross Amount Of Bill | Clause-31 | The percentage referred to in the tender shall be deducted from/added to the gross amount of the bill before deduction the value of any stock issued. |
| 46 | Refund Of Quarry Fees And Royalties | Clause-32 | All quarry fees; royalist, octroi, dues, ground rents, local and Government taxes and Rates etc. relating directly or indirectly to the execution of the works under this contract shall be paid by the contractor as a final charge and no refund on this account shall be allowed by the University. |
| 47 | Compensation under the workmen's compensation act. | Clause-33 | The Contractor shall be responsible for and shall pay any compensation Act, 1923 (VIII of 1923), (hereinafter called the said Act) as amended upto date for injuries caused to the workmen. If such compensation is paid by University as principal under sub-section (1) of section 12 of the said Act on behalf of the Contractor; it shall be recoverable by University from the Contractor under sub-section (2) of the said section such, compensation shall be recovered in the manner laid down in Clause above. The contractor shall also discharge all other  liabilities in relation to the current Government or local legislation with respect. to the Labour Laws and other Fringe benefits like Health and Insurance cover. Old Age Benefits etc. for all his labour including the administrative and supervisory staff. |
| 48 | Claim For Quantities As Per Scope Of Work Shown On Drawings | Clause-34A | The quantities of different items of work shown in the schedule B attached to this tender, are only approximate The actual quantities of different items as done at Site will be controlled by the detailed drawings and the actual requirements at site of work. No claim whatsoever will be entertained on account of excess or reduction in the scope of work as shown on the drawings. |
| 49 | ----- do---- | Clause-34B | Where due to the change of specification or scope or work or due to additions in size and quantum of the work the total cost of the work increases up to 30% at the cost as shown in the MEMORANDUM ( Excluding those case there the total cost the increased due to any claim of the contractor or the escalation in the rates/cost subject to its sanction ) the Contractor shall be bound to car y out the same at the same rates and under the same conditions as for the same at the same rates and under the same conditions as for the main tender. In case where the total cost is likely to increase beyond 30% of the amount shown in the MEMORANDUM it will be optional for the Contractor to decline to take up the additional work provided always that no work shall be left in incomplete or in unfinished shape irrespective of the total Cost of the work. Where, however, the Contractor agrees to take up the additional work, there shall be no financial limit to it and that the entire work shall be done at the same rates and under the same terms and conditions as the main tender. |
| 50 | Employment Of Feminine Labour | Clause-35 | The Contractor shall employ any feminine; convict or other labour of a particular kind of class if ordered in writing to do so by the Executive Engineer. |
| 51 | Claim For Compensation For Delay In The Execution Of Work | Clause-36 | No compensation shall be allowed for any delay caused in the starting of the work on account of acquisition of land or, in the case of clearance works on account of any delay in accordance with the sanction to estimates. |
| 52 |  | Clause-37 | No compensation shall be allowed for any delay in the execution of the work on account of water standing in borrow pits or compartments or on the land or the approach road etc. The rates are inclusive of hard or cracked soil, excavation mud, subsoil water or water standing in borrow pits and no claim for an extra rate shall be entertained, unless otherwise expressly specified. |
| 53 | Entering Upon Or Commencing Any Portion Of Work | Clasue-38 | The Contractor shall not enter upon or commence any portion of work except with the written authority and instructions of the Executive Engineer or of his subordinate- Incharge of the work. Failing such authority the contractor shall have not claim to ask for measurements of or payment for work. |
| 54 | Minimum age of persons employed. The employment of donkeys or other animals | Clasue-39 | (i) No contractor shall employ any person who is under the .age of 12 years.  (ii) No contractor shall employ donkeys or other animals with breeching of string or thin rope. The breeching must be at least thread should be of tape (Nawar).  (iii) No animal suffering from sores, lameness or emaciation or which is immature shall be employed or the work.  (iv) The Contractor shall not employ any labour who has any contagious disease or is a habitual narcotic user or is as sick and unfit for manual labour as to create a hazard for his health or life.  (v) The Executive Engineer or his subordinate is authorized to remove from the work any person or animal found working which does not satisfy these conditions and no responsibility shall be accepted by the University for any delay caused in the completion of the work by such removal.  Any Contractor who does not accept these conditions shall not be allowed to tender for works and his name shall be removed from the list of Contractors. |
| 54 | Pakistan Timber to Be Used | Clause-40 | As for as possible Pakistan Timbers shall be used and where for any reason this is not practicable preference shall be given to imported timber of approved origin and quality. |
| 55 | Certificate For Concessionary Freight Of Charges From The Railway | Clause-41 | If any materials are required to be conveyed by rail, the Contractors will be granted certificates  by the Executive Engineer to the effect that the materials are required for University works thereby enabling them to have the benefit as allowed under the rules from the railway. In case, however, such a concession is withdrawn by the railway at any time', no claim shall be made against University on this account. |
| 56 | Recovery Of Dues From Contractor As Arrears Of As Land Revenue | Clause-42 | Any sum due to the University by the Contractor shall be liable for recovery as arrears of Land Revenue. |
| 57 | Partnership Of M.L.As Is Forbidden | Clause-43 | The Contractor shall certify that no member of Legislative Assembly is in partnership with him and that University will have the right to terminate the contract at any stage if it is discovered that a member of Legislative Assembly or Parliament is a partner in the Contract. |
| 58 | Payment Of Taxes | Clasue-44 | The contractor firmly holds himself responsible to get himself registered under Income Tax and Sales Tax Rules and to pay these and all other Government and local taxes due to him from time to time in accordance with the Government instructions. |
| 59 | Interest Or Share Of University Servant In The Work | Clause-45 | The Contractor shall certify that no University Servant, Government servants or a servant of a Corporate Body directly controlled by the Government has directly or indirectly any share or interest in this work. |
| 60 |  | Clause-46 | The Contractor will not be allowed to withdraw his tender and ask For the return of earnest money before expiry of the period of three months, commencing from the date of opening of the tender and that if it is withdrawn in violation of this condition earnest money shall be forfeited. |
| 61 |  | Clause-47 | Notwithstanding anything contained in any clause of this contract and further notwithstanding the fact that the final completion Certificate has been awarded to the Contractor and his 50% Security deposit refunded, the liability of the Contractor for the purpose of" Defect Liability" shall extend for the period of 12 months from the date of issue of the completion Certificate for removal including replacement of any defect found in the works due to construction or any other cause directly attributed to and a result of defective work or negligence in carrying out the work. The remaining 50% security deposit will be refunded  after 12 months after removal of defects, if any. |
| 62 |  | Clause-48 | The Contractor shall employ at his cost at the site of work for effective planning, supervision and control of the work, adequate, full time Project Director Engineering staff and trained and experience licensed electricians and mechanics of respective trade in addition to the usual team of following scales:  Work costing up to Rs. 15.0 lacs :  A Diploma holder.  Work costing over Rs. 15.0 Lacs :  A Professional Engineer Registered with Pakistan Engineering Council.  Such persons work on the job shall be deemed to the authorized agents at site of the Contractor and shall receive all orders & instructions of the Executive Engineer, Engineer and Consultants or their authorized representatives and shall also be responsible to maintain a work-order book and other registers at Site and shall forth with take actions to carry out the orders and instructions. |
| 63 |  | Clause-49 | If any question, difference or objection whatsoever shall arise in any way contracted with or arising out of this instrument or the meaning or objections of any part thereof, the rights, duties or liabilities of either party, then save in so far as the decision of any such matter is hereinbefore provide for as has been so decided, every such matter including whether its decisions has been otherwise provided for and or regards the right of and obligations of the parties as the result of such termination shall be referred for arbitration to such person or a board with the mutual consent of the Executive Engineer and the Contractor and his decision shall be final and binding and where the matter involves a claim for or the payment recovery or deduction of money, only the amount, if any awarded in such arbitration shall be payable or recoverable in respect of the matter so referred. |
| 64 | Force Majeure | Clause-50 | The parties shall not be considered to be at default in the execution of their contractual obligations or any of them to the extent that the execution of such obligations or any of them is delayed or omitted by cause of force  Majeure. Each part will advise the other party by written notice within 30 days of the occurrence of any such case force Majeure employed therein shall mean acts of the Public enemy wars (whether declared or not) hostilities, revolutions, civil disturbances, epidemics, fires, floods, earth quakes, weather causes of similarly nature which render the performance of this agreement unfeasible and in spite of the exercise is unable to overcome. |
| 65 | Mobilization Advance | Clause-51 | Mobilization Advance up to 10 % of the Contract Price stated in the Letter of  Acceptance shall be paid by the Procuring Agency to the Contractor on the on following conditions:  (i) on submission by the Contractor of a Mobilization Advance Guarantee  for the full amount of the Advance in the specified form from a  Scheduled Bank in Pakistan to the Procuring Agency;  (ii) Contractor will pay interest on the mobilization advance at the rate of  10% per annum on the advance; and  (iii) This Advance including the interest shall be recovered in 5 equal  installments from the five (05) R.A bills and in case the number of bills  is less than five (05) then 1/5th of the advance inclusive of the interest  thereon shall be recovered from each bill and the balance together with  interest be recovered from the final bill. It may be insured that there is  sufficient amount in the final bill to enable recovery of the  Mobilization Advance. |

**CLAUSE - 52**

**Environmental Health & Safety/ Construction Safety**

Construction and renovation activities that could be classified as construction include building renovations, excavation and trenching operations, painting, masonry, and certain activities associated with building systems such as HVAC, plumbing, and electrical supply.

Construction work can be particularly hazardous. The use of personal protective equipment, fall protection, fire safety, electrical safety, and other precautions are essential for safe construction work.

The following rules apply to construction sites:

* Heed all warning signs that have been posted.
* Do not walk, stand, or work under suspended loads. If you raise the load, be sure to crib, block, or otherwise secure the load as soon as possible.
* Avoid placing unusual strain on equipment or materials.
* Be prepared for unexpected hazards. BE ALERT!
* Fatigue is a serious risk on the job. If you are tired, slow down, get help, or switch to a task that doesn't require as much precision. Never let too little sleep jeopardize your safety.
* If you are not sure what to do or how to do it, ask. Never go ahead on a job unless you know what you are doing, what the risks are, and how to protect yourself.
* Think of safety as one of your most important job responsibilities. Before starting each job, plan it out. Think about tools, materials, and protective equipment you will need and the procedures you will follow.
* Keep your work area clear of potential hazards such as items that you could trip over or bump into, materials that could catch fire, or chemicals that could spill.
* Never ignore a safety hazard. Either fix it or report it.
* Report all incidents and near misses to your supervisor and the Office of Safety.
* Know what to do in an emergency. There isn't time to review procedures when an emergency situation occurs. If you are unsure, ask your supervisor before you begin the job.

**CLAUSE - 53**

The cost difference in the prices specified in the schedule of rates for following items shall be paid separately and as per actual consumption / quantities executed and in accordance with Notifications issued by Standing Rates Committee, Government of Sindh from time to time.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item** | **Rate provided in Schedule of Rates** | **Unit** | **Rate Allowed**  **w.e.f**  **01-07-2011** | **Cost Difference payable/ recoverable w.e.f.** | **Remarks** |
| M.S. Bars (Tor) |  |  |  |  |  |
| Cement (OPC) |  |  |  |  |  |
| Bricks  9”x4 ½”x3” (First Class) |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Deodar Wood (First Quality) |  |  |  |  |  |
| Partal Wood |  |  |  |  |  |
| Bitumen |  |  |  |  |  |
| Any other item if notified by Standing Rates Committee, Government of Sindh |  |  |  |  |  |

Any change in the above price by Standing Rates Committee Government of Sindh during the currency of contract, the difference will be payable to or, as the case may be recoverable from the contractor. The effect of the revision of the prices will be confined to the quantity of the items which is actually consumed after the date of such revision.

**Not Applicable** (N/A)

**CLAUSE - 54**

The electric and water connection will be provided at one point respectively near the site of work. The Contractor will be responsible for further distribution where ever required including making complete arrangements for shortage of water. The cost of electric energy consumed as per prevailing tariff including service charges of WAPDA will be paid by the contractor. The cost of water consumed in the work will be recovered from the bills of the contractor at 2% (two percent) of the cost of these items of works on which water is used.

**CONTRACTOR. ENGINEER**.

**Witness. Witness**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Executive Engineer**

Certified that the Tender/Agreement has been prepared/executed under our supervision and we are satisfied that it has been correctly prepared/executed.

**BB-1**

**Appendix-B to Bid**

**FOREIGN CURRENCY REQUIREMENTS**

1. The bidder may indicate herein below his requirements of foreign currency (if any), with reference to various inputs to the works.

2. Foreign Currency Requirement as percentage of the bid price excluding Provisional Sums \_\_\_\_\_\_\_%.

|  |  |
| --- | --- |
| 3. Table of Exchange Rates  **Unit of Currency** | **Equivalent in Pak. Rupees** |
| Australian Dollar | -------------------------- |
| Euro | -------------------------- |
| Japanese Yen | -------------------------- |
| U.K. Pound | -------------------------- |
| U.S. Dollars | -------------------------- |
| --------------------------- | -------------------------- |
| --------------------------- | -------------------------- |

**Not Applicable**

**BC-1**

**Appendix-C to Bid**

**PRICE ADJUSTMENT UNDER CLAUSE 70/13.8**

**OF CONDITIONS OF CONTRACT**

**A. Weight ages or coefficients are used for price adjustment**.

The source of indices and the weight ages or coefficients for use in the adjustment formula under Clause 13.8 shall be as follows:

(*To be filled by the procuring agency)*

|  |  |  |  |
| --- | --- | --- | --- |
| **Cost**  **Element** | **Description** | **Weight ages** | **Applicable index** |
| **1** | **2** | **3** | **4** |
| (i) | Fixed Portion | 0.350 |  |
| (ii) | Local Labor |  | Government of Pakistan (GoP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin. |
| (iii) | Cement – in bags |  | “ “ “ |
| (iv) | Reinforcing Steel |  | “ “ “ |
| (v) | High Speed Diesel (HSD) |  | “ “ “ |
| (vi) | Bricks |  | “ “ “ |
| (vii) | Bitumen |  |  |
| (viii) |  |  |  |
|  | Total | 1.000 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Not Applicable.** |  |  |  |

**Notes:**

**1)** Indices for “(ii)” to “(vii)” are taken from the Government of Pakistan Federal Bureau of Statistics, Monthly Statistical Bulletin. The base cost indices or prices shall be those applying 15 days prior to the latest day for submission of bids. Current indices or prices shall be those applying 28 days prior to the last day of the billing period.

**2)** Any fluctuation in the indices or prices of materials other than those given above shall not be subject to adjustment of the Contract Price.

**3)** Fixed portion shown here is for typical road project, procuring agency to determine the weight age of Fixed Portion considering only those cost elements having cost impact of seven (7) percent or more on his specific project.

**B When Escalation is allowed on the materials only.**

Price adjustment on following items shall be allowed:

|  |  |  |  |
| --- | --- | --- | --- |
| Cost  Element | Description | Weight ages | Applicable index |
| 1 | 2 | 3 | 4 |
| (i) | Cement – in bags |  | Government of Pakistan (GoP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin. “ “ |
| (ii) | Reinforcing Steel |  | “ “ “ |
| (iii) | Bricks |  | “ “ “ |
| (iv) | Bitumen |  | “ “ “ |
| (v) | Wood (Composite item) |  | “ “ “ |
|  | Total five items |  |  |

**Not Applicable**

**Appendix-D to Bid**

**BILL OF QUANTITIES**

**A. Preamble**

1. The Bill of Quantities shall be read in conjunction with the Conditions of Contract, Specifications and Drawings.

2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work executed and measured by the Contractor and verified by the Engineer and valued at the rates and prices entered in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix as per the Contract ( in case of item not mentioned in Bill of Quantities).

3. The rates and prices entered in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the contract include all costs of contractor’s plant, labour, supervision, materials, execution, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the contract. Furthermore all duties, taxes and other levies payable by the contractor under the contract, or for any other cause, as on the date 14 days prior to deadline for submission of Bids in case of ICB/NCB respectively, shall be included in the rates and prices and the total bid price submitted by the bidder.

4. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the contractor will have failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities and shall not be paid separately.

5. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Bill of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of the works.

6. General directions and description of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the bidding documents shall be made before entering prices against each item in the priced Bill of Quantities.

7. Provisional sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with sub-clause 13.5 of Part I, General Conditions of Contract.

**Not Applicable**

**BD-10**

**Appendix-D to Bid**

**BILL OF QUANTITIES**

**C. Day work Schedule**

**General**

1. Reference is made to Sub-Clause 13.6 of the General Conditions of Contract. Work shall not be executed on a day work basis except by written order of the Engineer. Bidders shall enter basic rates for day work items in the Schedules, which rates shall apply to any quantity of day work ordered by the Engineer. Nominal quantities have been indicated against each item of day work, and the extended total for day work shall be carried forward to the bid price.

**Day work Labour**

2. In calculating payments due to the contractor for the execution of day work, the actual time of classes of labour directly doing the day work ordered by the Engineer and for which they are competent to perform will be measured excluding meal breaks and rest periods. The time of gangers (charge hands) actually doing work with the gang will also be measured but not the time of foreman or other supervisory personnel.

3. The contractor shall be entitled to payment in respect of the total time that labour is employed on day work, calculated at the basic rates entered by him in the Schedule of day work Rates for labour together with an additional percentage, payment on basic rates representing the contractor’s profit, overheads, etc., as described below:

1. the basic rates for labour shall cover all direct costs to the contractor, including (but not limited to) the amount of wages paid to such labour, transportation time, overtime, subsistence allowances and any sums paid to or on behalf of such labour for social benefits in accordance with Pakistan law. The basic rates will be payable in local currency only; and
2. the additional percentage payment to be quoted by the bidder and applied to costs incurred under (a) above shall be deemed to cover the Contractor’s profit, overheads, superintendence, liabilities and insurances and allowances to labour timekeeping and clerical and office work; the use of consumable stores, water, lighting and power; the use and repair of staging‟s, scaffolding, workshops and stores, portable power tools, manual plant and tools; supervision by the Contractor’s staff, foremen and other supervisory personnel; and charges incidental to the foregoing.

**Not Applicable**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Subject:-Renovation & Rehabilitation (ELECTRIC WORKS) of Marvi Girls Hostel at CMC, Larkana** | | | | | |
| **A- Schedule items** | | | | | |
| **S#** | **Description** | **Qty** | **Unit** | **Rate (Rs.)** | **Amount (Rs.)** |
| **1** | **Wiring for light or fan point with 3/.029 PVC insulated wire in 20mm (3/4") PVC conduit recessed in the wall or column as required (S.NO.124,P.NO.15) SR-2012** | 40 | P.Point | 1130 | 45200 |
| **2** | **Wiring for light or fan point with 3/.029 PVC insulated wire in 20mm (3/4") channel patti on surface as required (S.NO.129,P.NO.15) SR-2012** | 10 | P.Point | 910 | 9100 |
| **3** | **Wiring for plug point with 3/.029 PVC insulated wire in 20mm (3/4") conduit recessed in the wall or column as required (S.NO.126,P.NO.15) SR-2012** | 30 | P.Point | 985 | 29550 |
| **4** | **Wiring for call bell point with 3/.029 PVC insulated wire in 20mm (3/4") PVC conduit recessed in the wall or column as required (S.NO.128,P.NO.15) SR-2012** | 1 | P.Point | 1764 | 1764 |
| **5** | **Providing and laying (MAIN or SUB MAIN )PVC insulated with size 2-7/.029 Copper conductor in 3/4" dia PVC conduit recessed in the wall or column as required (S.NO.10, P.NO.2) SR-2012** | 1200 | P.Meter | 222 | 266400 |
| **6** | **Providing and laying (MAIN or SUB MAIN )PVC insulated with size 2-7/.044 Copper conductor in 3/4" dia PVC conduit recessed in the wall or column as required (S.NO.12, P.NO.2) SR-2012** | 350 | P.Meter | 341 | 119350 |
| **7** | **Providing and laying MAIN or SUB MAIN) PVC insulated with size 2-7/.064 (16mm2) Copper conductor in 3/4" dia PVC conduit conduit recessed in the wall or column as required (S.NO.14, P.NO.2) SR-2012** | 200 | P.Meter | 641 | 128200 |
| **8** | **Providing & Fixing one way SP switch flush type (S.No. 219, P.No. 33) SR-2012** | 1100 | Per No. | 54 | 59400 |
| **9** | **Providing & Fixing two pin 5amp plug & Socket flush type (S.No. 225, P.No. 33) SR-2012** | 500 | Per No. | 83 | 41500 |
| **10** | **Providing & fixing Brass Battern holder (S.NO.232,P.NO.33) SR-2012** | 700 | Per No. | 70 | 49000 |
| **11** | **Providing & Fixing three pin 10/15amp plug & Socket flush type (S.No. 227, P.No. 33) SR-2012** | 430 | Per No. | 162 | 69660 |
| **12** | **Providing & fixing Bakelite ceiling rose with two  terminals (S.NO.228,P.NO.33) SR-2012** | 200 | Per No. | 72 | 14400 |
| **13** | **Providing & Fixing circuit breakers 6,10,15,20,30,40,50 & 63amps SP (TB/5S) on prepared board as required (S.NO.203,P.NO.31) SR-2012** | 440 | Per No. | 916 | 403040 |
| **14** | **Providing & Fixing circuit breaker 125,150,200 &225 TP (XS-225NS) on prepared board as reqired (S.No. 208, P. 31) SR-2012** | 3 | Per No. | 25541 | 76623 |
| **15** | **Providing & fixing Brass ceiling fan 56" (good quality) (S.NO.235,P.NO.34) SR-2012** | 55 | Per No. | 3185 | 175175 |
| **16** | **Providing & Fixing circuit breaker 400amp TP setting 250-400amp (XS-400CJ) on prepared board as reqired (S.No. 210, P. 31) SR-2012** | 4 | Per No. | 39401 | 157604 |
| **17** | **Providing and laying MAIN or SUB MAIN) PVC insulated & PVC sheeted with 4 core copper conductor 600/1000 volts size 185mm2 (S.NO.110, P.NO.13) SR-2012** | 150 | P.Meter | 12478 | 1871700 |
| **18** | **Providing & Fixing circuit Breaker 15, 20, 30, 40,50,60,75 & 100amp TP (XS-100NS) on prepared board as required (S.No.207, P.No. 31) SR- 2012** | 22 | Per No. | 9261 | 203742 |
| **19** | **Providing & Fixing of Flood light 400 Watts (SON) having IP65 classification with 400w lamp, chowk, capacitor, igniter & Internal wiring complete in all respects at the height oup to 40ft with the help of hydraulic crane and manual labor as per site requirement and instruction of EI. (S,No,166, P.No.26) SR-2012** | 10 | Per No. | 17585 | 175850 |
| **Sub-Total (A)** | | | | | **3,897,258.00** |
| **Premium Quoted by the Contractor….% Above/ Below…..** | | | | |  |
| **Total-Schedule Items (A)** | | | | |  |
| **B- Non Schedule Items** | | | | | |
| **1** | **Providing & Fixing A.C ceiling fan regulator (Heavy or equivalent) on S.W board by making all necessary connections, complete in all respects.** | 200 | Each |  |  |
| **2** | **Providing, marking and testing of earth points with 2' x 2' x 1/8" thick copper plate buried 5 meter deep or to the depth of permanent water level whichever is less covered with charcoal and lime in specified ratio including bare copper wire connected to MDB as per site requirement confirming to specificatin and drawing.** | 1 | Per Job |  |  |
| **3** | **Providing & fixing flush type electric bell push button with box & necessary connections, complete in all respects.** | 2 | Each |  |  |
| **4** | **Providing & Fixing main panel board (14 SWG) double shutter to accommodate heavy duty circuit breaker bus bar making all connections i/c. painting with enameled paint, for other similar job recessed in wall or column (Size: 2'x3')** | 12 | Per No. |  |  |
| **5** | **Providing & Fixing Energy saver (25W) including fixing on existing holder etc. complete in all respects. Recommended Make: Phillips or equivalent** | 300 | Each |  |  |
| **6** | **Providing & Fixing Good Quality Exhaust Fan (Iron/ PVC) of Size 12” by making hole as per required size by making all the necessary connections available with ceiling rose. Recommended: GFC Fan, Millat Fan, Royal Fan, Pak Voldam Fan or equivalent.** | 25 | Per No. |  |  |
| **7** | **Providing & Fixing fiber made Gate Llights with base & cover (Pair/ Large Size) with Energy saver (23W) by making all the necessary connections laid already at the location.** | 2 | P.Pair |  |  |
| **8** | **Providing & Fixing Lawn/ Garden/ Walk way Fiber Pole (Double Arm) at the height of 8.5’, 3" dia including Fancy Globes/Lights/Covers hanged (side by side) on it including LED light of 37 Watts (Each) of Good Quality fixed on Ground by excavation of any type to the depth of 2' by concreting with ratio 1:2:4 as per required size of pole base with anchor nuts/ bolts, wiring and back filling as required and approved by EI, complete in all respects.** | 20 | Per Job |  |  |
| **9** | **Providing & Fixing A.C. or D.C. Electric Bell 200/250 volts of good quality duly approved by E.I by making all the necessary connections, complete in all respects.** | 1 | Each |  |  |
| **Total-Non Schedule Items (B)** | | | | |  |
| **Grand Total (A+B)** | | | | |  |

**Appendix-D to Bid**

**SCHEDULE OF DAYWORK RATES**

**I. Labour**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Item**  **No.** | **Description** | **Unit** | **Nominal Quantity** | **Rate (Rs)**  **in Figure** | **Rate (Rs)**  in Words | **Extended Amount (Rs.)** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| D101 | Ganger | Hr | 500 |  |  |  |
| D102 | Labourer | Hr | 5,000 |  |  |  |
| D103 | Brick layer | Hr | 500 |  |  |  |
| D104 | Mason | Hr | 500 |  |  |  |
| D105 | Carpenter | Hr | 500 |  |  |  |
| D106 | Steel work Erector | Hr | 500 |  |  |  |
|  | ------etc------- | Hr | 500 |  |  |  |
| D113 | Driver for vehicle up to 10 tons | Hr | 1,000 |  |  |  |
| D114 | Operator for excavator, dragline, shovel or crane | Hr | 500 |  |  |  |
| D115 | Operator for tractor, (tracked) with dozer blade or ripper | Hr | 500 |  |  |  |
| D122 | **Sub-Total**  Allow \_\_\_\_\_\_\_\_\_\_\_\_\_ percent of subtotal for Contractor’s overhead, profit, etc, in accordance with Paragraph 3(b) of Day work Schedule \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Total for Day work: Labour : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  (Carried forward to Day work Summary) | | | | | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | |  |  | |  |  | |  |
|  |  | |  |  | |  |  | |  |
| **(Not Applicable)** | |  | | |  | | |  | |
|  | |  | | |  | | |  | |
|  | |  | | |  | | |  | |
|  | |  | | |  | | |  | |
|  | |  | | |  | | |  | |

**BD-12**

**Appendix-D to Bid**

**Day work Material**

4. The contractor shall be entitled to payment in respect of materials used for day work (except for materials for which the cost is included in the percentage addition to labour costs as detailed heretofore), at the basic rates entered by him in the Schedule of Day work Rates for materials together with an additional percentage payment on the basic rates to cover overhead charges and profit, as follows:

1. the basic rates for materials shall be calculated on the basis of the invoiced price, freight, insurance, handling expenses, damage, losses, etc., and shall provide for delivery to store for stockpiling at the site. The basic rates shall be stated in local currency but payment will be made in the currency or currencies expended upon presentation of supporting documentation;
2. the additional percentage payment shall be quoted by the bidder and applied to the equivalent local currency payments made under Sub-Para(a) above; and
3. the cost of hauling materials used on work ordered to be carried out as Day work from the store or stockpile on the site to the place where it is to be use d will be paid in accordance with the terms for Labour and Constructional Plant in this Schedule.

***(Not Applicable)***

**BD-13**

**Appendix-D to Bid**

**SCHEDULE OF DAYWORK RATES**

**II. Materials**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Item**  **No.** | **Description** | **Unit** | **Nominal Quantity** | **Rate (Rs)**  **in Figure** | **Rate (Rs)**  in Words | **Extended Amount (Rs.)** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| D201 | Cement, ordinary Portland or equivalent in bags | M: Ton | 200 |  |  |  |
| D202 | Mild Steel reinforcing bar up to 16mm diameter to BS 4449 or equivalent | M: Ton | 100 |  |  |  |
| D203 | Fine aggregate for concrete as specified in Clause\_\_\_\_\_\_\_\_\_\_\_\_ | Cu: M | 1,000 |  |  |  |
| D204 | -------etc-------- |  |  |  |  |  |
| D222 | Gelignite (Noble Special Gelatine 60 % or equivalent) including caps, fuse, wire and requisite accessories | M: Ton | 10 |  |  |  |
| D223 | **Sub-Total**  Allow \_\_\_\_\_\_\_\_\_\_\_\_\_ percent of subtotal for Contractor’s overhead, profit, etc., in accordance with Paragraph 4(b) of Day work Schedule \_\_\_\_\_\_\_\_\_\_\_\_  Total for Day work: Materials \_\_\_\_\_\_\_\_\_\_\_\_\_  (Carried forward to Day work Summary) | | | | | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | |  |  | |  |  | |  |
|  |  | |  |  | |  |  | |  |
| **(Not Applicable)** | |  | | |  | | |  | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | |  |  | |  |  | |  |
|  |  | |  |  | |  |  | |  |
|  | |  | | |  | | |  | | |
|  | |  | | |  | | |  | | |
|  | |  | | |  | | |  | | |
|  | | | | |  | | | | | |

**BD-14**

**Appendix-D to Bid**

**Day Work Constructional Plant**

5. The contractor shall be entitled to payments in respect of constructional plant already on site and employed on Day work at the basic rental rates entered by him in the Schedule of Day work Rates for constructional plant. The said rates shall be deemed to include complete allowance for depreciation, interest, indemnity and insurance, repairs, maintenance, supplies, fuel, lubricants, and other consumables, and all overhead, profit and administrative costs related to the use of such equipment. The cost of drivers, operators and assistants will be paid for separately as described under the section on Day work Labour.

6. In calculating the payment due to the Contractor for constructional plant employed on Day work, only the actual number of working hours will be eligible for payment, except that where applicable and agreed with the Engineer, the travelling time from the part of the site where the constructional plant was located when ordered by the Engineer to be employed on Day work and the time for return journey thereto shall be included for payment.

7. The basic rental rates for constructional plant employed on Day work shall be stated in Pakistani Rupees.

**(Not Applicable)**

**BD-15**

**Appendix-D to Bid**

**SCHEDULE OF DAYWORK RATES**

**III. Constructional Plant**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Item**  **No.** | **Description** | **Unit** | **Nominal Quantity** | **Rate (Rs.)**  **in Figure** | **Rate Rs.)**  **in Words** | **Extended Amount (Rs.)** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| D301 | Excavator ,face shovel or dragline: |  |  |  |  |  |
|  | 1. Up-to and including 1 Cu.M. | Hr | 500 |  |  |  |
|  | 2. Over 1 Cu.M to 2 Cu. M. | Hr | 400 |  |  |  |
|  | 3. Over 2 Cu. M | Hr | 100 |  |  |  |
| D302 | Tractor (tracked) including bull or angle dozer: |  |  |  |  |  |
|  | 1. Up-to and including 150 HP | Hr | 500 |  |  |  |
|  | 2. Over 150 to 200 HP | Hr | 400 |  |  |  |
|  | 3. Over 200 to 250 HP | Hr | 200 |  |  |  |
| D303 | Tractor with ripper: |  |  |  |  |  |
|  | 1. Up-to and including 200 HP |  | 400 |  |  |  |
|  | 2. Over 200 to 250 HP |  | 200 |  |  |  |
| D304 | -----------etc---------- |  |  |  |  |  |
|  | Total for day work: Constructional Plant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  (Carried forward to day work summary) | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |

***(Not Applicable)***

**BD-16**

**Appendix-D to Bid**

**DAYWORK**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Summary (Day work)**   |  |  |  | | --- | --- | --- | |  |  | **Amount (Rs.)** | | (I) | Total for day work: Labour | \_\_\_\_\_\_\_\_\_\_\_\_ | | (II) | Total for day work: Materials | \_\_\_\_\_\_\_\_\_\_\_\_ | | (III) | Total for day work: Constructional Plant | \_\_\_\_\_\_\_\_\_\_\_\_ | |  | Total for day work \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  (Carried forward to summary page of Bill of Quantities) | | |

***(Not Applicable)***

**BE-1**

**Appendix-E to Bid**

**PROPOSED CONSTRUCTION SCHEDULE**

Pursuant to Sub-Clause 43.1 of the General Conditions of Contract, the works shall be completed on or before the date stated in Appendix-A to Bid. The bidder shall provide as Appendix-E to Bid, the Construction Schedule in the bar chart (CPM, PERT or any other to be specified herein) showing the sequence of work items and the period of time during which he proposes to complete each work item in such a manner that his proposed programme for completion of the whole of the works and parts of the works may meet procuring agency’s completion targets in days noted below and counted from the date of receipt of Engineer’s Notice to Commence (Attach sheets as required for the specified form of Construction Schedule):

**Description Time for Completion**

1) Whole works \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ days

2) Part-A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ days

3) Part-B \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ days

4) \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ days

5) \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ days

**BF-1**

**Appendix-F to Bid**

**METHOD OF PERFORMING THE WORK**

[The bidder is required to submit a narrative outlining the method of performing the work. The narrative should indicate in detail and include but not be limited to:

1. Organization Chart indicating head office and field office personnel involved in management and supervision, engineering, equipment maintenance and purchasing.

2. Mobilization in Pakistan, the type of facilities including personnel accommodation, office accommodation, provision for maintenance and for storage, communications, security and other services to be used.

3. The method of executing the works, the procedures for installation of equipment and machinery and transportation of equipment and materials to the site.

**BG-1**

**Appendix-G to Bid**

**LIST OF MAJOR EQUIPMENT – RELATED ITEMS**

[The bidder will provide on Sheet 2 of this Appendix a list of all major equipment and related items, under separate heading for items owned, to be purchased or to be arranged on lease by him to carry out the works. The information shall include make, type, capacity, and anticipated period of utilization for all equipment which shall be in sufficient detail to demonstrate fully that the equipment will meet all requirements of the Specifications.]

**BG-2**

**Appendix-G to Bid**

**LIST OF MAJOR EQUIPMENT (SAMPLE)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Owned Purchased or Leased** | **Description of Unit (Make, Model, Year)** | **Capacity HP Rating** | **Condition** | **Present Location or Source** | **Date of Delivery at Site** | **Period of Work on Project** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| a. Owned |  |  |  |  |  |  |
| b. To be Purchased |  |  |  |  |  |  |
| c. To be arranged on Lease |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  | | | | | | |
|  | | | | | | |
|  | | | | | | |

**BH-1**

**Appendix-H to Bid**

**CONSTRUCTION CAMP AND HOUSING FACILITIES**

The Contractor in accordance with Clause 6 of the Conditions of Contract shall provide description of his construction camp’s facilities and staff housing requirements.

The contractor shall be responsible for pumps, electrical power, water and electrical distribution systems, and sewerage system including all fittings, pipes and other items necessary for servicing the contractor’s construction camp.

The bidder shall list or explain his plans for providing these facilities for the service of the contract as follows:

1. Site Preparation (clearing, land preparation, etc.).

2. Provision of Services.

a) Power (expected power load, etc.).

b) Water (required amount and system proposed).

c) Sanitation (sewage disposal system, etc.).

3. Construction of Facilities

a) Contractor’s Office. Workshop and Work Areas (areas required and proposed layout, type of construction of buildings, etc.).

b) Warehouses and Storage Areas (area required, type of construction and layout).

c) Housing and Staff Facilities (Plans for housing for proposed staff, layout, type of construction, etc.).

4. Construction Equipment Assembly and Preparation (detailed plans for carrying out this activity).

5. Other Items Proposed (Security services, etc.).

**BI-1**

**Appendix-I to Bid**

**LIST OF SUBCONTRACTORS**

I/We intend to subcontract the following parts of the work to subcontractors. In my/our opinion, the subcontractors named hereunder are reliable and competent to perform that part of the work for which each is listed.

Enclosed are documentation outlining experience of subcontractors, the curriculum vitae and experience of their key personnel who will be assigned to the contract, equipment to be supplied by them, size, location and type of contracts carried out in the past.

|  |  |
| --- | --- |
| **Part of Works**  **(Give Details)** | **Subcontractor**  **(With Complete Address)** |
| **1** | **2** |
|  |  |

|  |  |
| --- | --- |
| **(Not Applicable)** |  |
|  |  |

**BJ-1**

**Appendix-J to Bid**

**ESTIMATED PROGRESS PAYMENTS (SAMPLE)**

Bidder‟s estimate of the value of work which would be executed by him during each of the periods stated below, based on his Programme of the works and the Rates in the Bill of Quantities, expressed in Pakistani Rupees:

|  |  |
| --- | --- |
| **Quarter/ Year/ Period** | **Amounts**  **(in thousands)** |
| **1** | **2** |
| Ist Quarter |  |
| 2nd Quarter |  |
| 3rd Quarter |  |
| 4th Quarter |  |
| 5th Quarter |  |
| 6th Quarter |  |
| 7th Quarter |  |
| 8th Quarter |  |
| 9th Quarter |  |
| **Bid Price** |  |

**BK-1**

**Appendix-K to Bid**

**ORGANIZATION CHART**

**FOR THE**

**SUPERVISORY STAFF AND LABOUR**

(To be filled in by the bidder)

**BL-1**

**Appendix-L to Bid**

**(INTEGRITY PACT)**

**DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC; PAYABLE BY CONTRACTORS.**

(FOR CONTRACTS WORTH RS. 10.00 MILLION OR MORE)

Contract No.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Contract Value: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Contract Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

………………………………… [name of Contractor] hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Sindh (GoS) or any administrative subdivision or agency thereof or any other entity owned or controlled by it (GoS) through any corrupt business practice.

Without limiting the generality of the foregoing, [name of Contractor] represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder’s fee or kickback, whether described as consultation fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from, from Procuring Agency (PA) except that which has been expressly declared pursuant hereto.

[name of Contractor] accepts full responsibility and strict liability that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with PA and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

[name of Contractor] accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other rights and remedies available to PA under any law, contract or other instrument, be voidable at the option of PA.

Notwithstanding any rights and remedies exercised by PA in this regard, [name of Supplier/Contractor/Consultant] agrees to indemnify PA for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to PA in an amount equivalent to ten time the sum of any commission, gratification, bribe, finder’s fee or kickback given by [name of Contractor] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from PA.

………………………

[ Executive Engineer (Works ] [Contractor]

|  |  |
| --- | --- |
|  |  |
|  |  |
| **FORMS**  **BID SECURITY**  **PERFORMANCE SECURITY**  **CONTRACT AGREEMENT**  **MOBILIZATION ADVANCE GUARANTEE**  **INDENTURE BOND FOR SECURED ADVANCE** | |

**BS-1**

**BID SECURITY**

(**Bank Guarantee)**

Security Executed on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Date)

Name of Surety (Bank) with Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Scheduled Bank in Pakistan)

Name of Principal (Bidder) with Address \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Penal Sum of Security Rupees. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Rs. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

Bid Reference No. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the bid and at the request of the said Principal (Bidder) we, the Surety above named, are held and firmly bound unto \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(hereinafter called the 'Procuring Agency') in the sum stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Bidder has submitted the accompanying bid dated \_\_\_\_\_\_ for Bid No. \_\_\_\_\_\_\_ for\_\_\_\_\_\_\_(Particulars of Bid) to the said Procuring Agency; and

WHEREAS, the Procuring Agency has required as a condition for considering said bid that the **bidder** furnishes a bid security in the above said sum from a Scheduled Bank in Pakistan or from a foreign bank duly counter-guaranteed by a Scheduled Bank in Pakistan, to the procuring agency, conditioned as under:

(1) that the bid security shall remain in force up to and including the date 28 days after the deadline for validity of bids as stated in the Instructions to bidders or as it may be extended by the procuring agency, notice of which extension(s) to the Surety is hereby waived;

(2) that the bid security of unsuccessful bidders will be returned by the procuring agency after expiry of its validity or upon signing of the Contract Agreement; and

(3) that in the event of failure of the successful bidder to execute the proposed Contract Agreement for such work and furnish the required Performance Security, the entire said sum be paid immediately to the said procuring agency pursuant to Clause 15.6 of the Instruction to bidders for the successful bidder's failure to perform.

NOW THEREFORE, if the successful bidder shall, within the period specified therefore, on the prescribed form presented to him for signature enter into a formal Contract with the said procuring agency in accordance with his bid as accepted and furnish within twenty eight (28) days of his being requested to do so, a Performance Security with good and sufficient surety, as may be required, upon the form prescribed by the said procuring agency for the faithful performance and proper fulfillment of the said Contract or in the event of non-withdrawal of the said bid within the time specified for its validity then this obligation shall be void and of no effect, but otherwise to remain in full force and effect.

PROVIDED THAT the Surety shall forthwith pay the procuring agency, the said sum upon first written demand of the procuring agency (without cavil or argument) and without requiring the procuring

agency to prove or to show grounds or reasons for such demand, notice of which shall be sent by the procuring agency by registered post duly addressed to the Surety at its address given above.

PROVIDED ALSO THAT the procuring agency shall be the sole and final judge for deciding whether the Principal (Bidder) has duly performed his obligations to sign the Contract Agreement and to furnish the requisite Performance Security within the time stated above, or has defaulted in fulfilling said requirements and the Surety shall pay without objection the said sum upon demand from the procuring agency forthwith and without any reference to the Principal (Bidder) or any other person.

IN WITNESS WHEREOF, the above bounden Surety has executed the instrument under its seal on the date indicated above, the name and seal of the Surety being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

**SURETY (Bank):**

WITNESS:

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Title \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Corporate Secretary (Seal) Corporate Guarantor (Seal)

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name, Title & Address

**PS-1**

**FORM OF PERFORMANCE SECURITY**

**(Bank Guarantee)**

Guarantee No.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Executed on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Expiry date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[Letter by the Guarantor to the Procuring Agency]

Name of Guarantor (Bank) with address:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Scheduled Bank in Pakistan)

Name of Principal (Contractor) with address:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Penal Sum of Security (express in words and figures)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Letter of Acceptance No. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Dated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the bidding documents and above said Letter of Acceptance (hereinafter called the Documents) and at the request of the said Principal we, the Guarantor above named, are held and firmly bound unto the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hereinafter called the procuring agency) in the penal sum of the amount stated above for the payment of which sum well and truly to be made to the said procuring agency, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has accepted the procuring agency's above said Letter of Acceptance for \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Name of Contract) for the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Name of Project).

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the procuring agency, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract and of any and all modifications of said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause 49, Defects Liability, of Conditions of Contract are fulfilled.

Our total liability under this Guarantee is limited to the sum stated above and it is a condition of any liability attaching to us under this Guarantee that the claim for payment in writing shall be received by us within the validity period of this Guarantee, failing which we shall be discharged of our liability, if any, under this Guarantee.

We, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (the Guarantor), waiving all objections and defenses under the Contract, do hereby irrevocably and independently guarantee to pay to the procuring agency without delay upon the procuring agency's first written demand without

cavil or arguments and without requiring the procuring agency to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the procuring agency's written declaration that the Principal has refused or failed to perform the obligations under the Contract which payment will be effected by the Guarantor to Procuring Agency’s designated Bank & Account Number.

PROVIDED ALSO THAT the procuring agency shall be the sole and final judge for deciding whether the Principal (Contractor) has duly performed his obligations under the Contract or has defaulted in fulfilling said obligations and the Guarantor shall pay without objection any sum or sums up to the amount stated above upon first written demand from the procuring agency forthwith and without any reference to the Principal or any other person.

IN WITNESS WHEREOF, the above-bounden Guarantor has executed this Instrument under its seal on the date indicated above, the name and corporate seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Guarantor (Bank)

Witness:

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Corporate Secretary (Seal)

Title \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name, Title & Address Corporate Guarantor (Seal)

**CA-1**

**FORM OF CONTRACT AGREEMENT**

THIS CONTRACT AGREEMENT (hereinafter called the “Agreement”) made on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ day of\_\_\_\_\_\_\_\_\_\_(month) 20\_\_\_\_\_ between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hereafter called the “Procuring Agency”) of the one part and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hereafter called the “Contractor”) of the other part.

WHEREAS the Procuring Agency is desirous that certain works, viz \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ should be executed by the Contractor and has accepted a bid by the Contractor for the execution and completion of such works and the remedying of any defects therein.

NOW this Agreement witnesseth- as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.

2. The following documents after incorporating addenda, if any, except those parts relating to Instructions to bidders shall be deemed to form and be read and construed as part of this Agreement, viz:

(a) The Contract Agreement;

(b) The Letter of Acceptance;

(c) The completed Form of Bid;

(d) Special Stipulations (Appendix-A to Bid);

(e) The Special Conditions of Contract – Part II;

(f) The General Conditions – Part I;

(g) The priced Bill of Quantities (Appendix-D to Bid);

(h) The completed Appendices to Bid (B, C, E to L);

(i) The Drawings;

(j) The Specifications.

(k) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (any other)

3. In consideration of the payments to be made by the procuring agency to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the procuring agency to execute and complete the works and remedy defects therein in conformity and in all respects with the provisions of the contract.

4. Procuring agency hereby covenants to pay the contractor, in consideration of the execution and completion of the works as per provisions of the contract, the contract Price or such other sum as may become payable under the provisions of the contract at the times and in the manner prescribed by the contract.

**CA-2**

IN WITNESS WHEREOF the parties hereto have caused this Agreement to be executed on the day, month and year first before written in accordance with their respective laws.

Signature of the Contactor Signature of Procuring Agency

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Seal) (Seal)

Signed, Sealed and Delivered in the presence of:

Witness: Witness:

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

(Name, Title and Address) (Name, Title and Address)

**MG-1**

**MOBILIZATION ADVANCE GUARANTEE**

Bank Guarantee No.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

WHEREAS \_\_\_\_\_\_\_\_\_\_\_\_\_\_(hereinafter called the 'Procuring Agency') has entered into a Contract for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Particulars of Contract)

with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hereinafter called the "Contractor').

AND WHEREAS, the Procuring Agency has agreed to advance to the Contractor, at the Contractor's request, an amount of Rupees \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Rs \_\_\_\_\_\_\_\_\_ ) which amount shall be advanced to the Contractor as per provisions of the Contract.

AND WHEREAS, the Procuring Agency has asked the Contractor to furnish Guarantee to secure the mobilization advance for the performance of his obligations under the said Contract.

AND WHEREAS, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Scheduled Bank in Pakistan)

(Hereinafter called the “Guarantor”) at the request of the Contractor and in consideration of the **procuring agency** agreeing to make the above advance to the Contractor, has agreed to furnish the said Guarantee.

NOW, THEREFORE, the Guarantor hereby guarantees that the Contractor shall use the advance for the purpose of above mentioned Contract and if he fails and commits default in fulfillment of any of his obligations for which the advance payment is made, the Guarantor shall be liable to the procuring agency for payment not exceeding the aforementioned amount.

Notice in writing of any default, of which the procuring agency shall be the sole and final judge, on the part of the Contractor, shall be given by the procuring agency to the Guarantor, and on such first written demand, payment shall be made by the Guarantor of all sums then due under this Guarantee without any reference to the Contractor and without any objection.

This Guarantee shall remain in force until the advance is fully adjusted against payments from the Interim Payment Certificates of the Contractor or until \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_whichever is earlier.

(Date)

The Guarantor's liability under this Guarantee shall not in any case exceed the sum of Rupees \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(Rs \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_).

This Guarantee shall remain valid up to the aforesaid date and shall be null and void after the aforesaid date or earlier if the advance made to the Contractor is fully adjusted against payments from Interim Payment Certificates of the Contractor provided that the Guarantor agrees that the aforesaid period of validity shall be deemed to be extended if on the above mentioned date the advance payment is not fully adjusted.

**GUARANTOR**

1. Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Title \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

WITNESS

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Corporate Secretary (Seal)

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Name Title & Address) Corporate Guarantor (Seal)

**INDENTURE FOR SECURED ADVANCES.**

(For use in cases in which is contract is for finished work and the contractor has entered into an agreement for the execution of a certain specified quantity of work in a given time).

This INDENTURE made the ……………………….. day of ...............................

…………………. 20……….……… BETWEEN (hereinafter called "the Contractor" which expression shall where the context so admits or implied be deemed to include his heirs, executors, administrators and assigns) of the one part and THE GOVERNOR OF SINDH (hereinafter called "the Government" of the other part).

WHEREAS by an agreement, dated (hereinafter called the said agreement, the contractor has agreed to perform the under-mentioned works (hereinafter referred to as the said work):-

(Here enter (the description of the works).1

AND WHEREAS the contractor has applied to the ………………………………….. ……..…………………..for an advance to him of Rupees ……………..……………………………..

(Rs. .................. ) on the security of materials absolutely belonging to him and brought by him to the site of the said works the subject of the said agreement for use in the construction of such of the said works as he has undertaken to execute at rates fixed for the finished work (inclusive of the cost of materials and labour and other charge) AND WHEREAS the Government has agreed to advance to the Contractor the sum of Rupees, (Rs. ......................... ) on the security of materials the quantities and other particulars of which are detailed in Part II of Running Account Bill (B). The said works signed by the contractor

Fin R.Form.l7.A

On ……………………………. and on such covenants and conditions as are hereinafter contained and the Government has reserved to itself the option of marking any further advance or advances on the security of other materials brought by the Contractor to the site of the said works.

NOW THIS INDENTURE WTTNESSETH that in pursuance of the said agreement and in consideration of the sum of Rupees…………………………………(Rs. ……………………) on or before the execution of these presents paid to the Contractor by the Government (the receipt whereof the Contractor doth hereby acknowledge) and of such further advances (if any) as may be made to him as aforesaid (all of which advances are hereinafter collectively referred to as the said amount) the Contractor doth hereby assign unto the Government the said materials by way of security for the said amount.

And doth hereby covenant and agree with the Government and declare ay follow:-

(1) That the said sum of Rupees. …………………………………………… RS. …………………… ) so advanced by the Government to the Contractor as aforesaid and all or any further sum or sums which may be advanced as aforesaid shall be employed by the contractor in or towards expending the execution of the said works and for no other purpose whatsoever.

(2) That the materials detailed in the said Running Account Bill (B) which have been offered to and accepted by ( he Government as security for the said amount are

absolutely by the Contractors own property free from encumbrances of any kind and the Contractor will not make any application for or receive a further advance on the security of materials which are

not absolutely his own property and free from encumbrances of any kind and the contractor hereby agrees, at all times, to indemnify and save harmless the Government against all claims whatsoever to any materials in respect of which an advance has been made to him as aforesaid.

(3) That the said materials detailed in the said Running Account Bill (B) and all other materials on the security of which any further advance or advances may hereafter be made as aforesaid (hereinafter called the said materials) shall be used by the Contractor solely in *the* execution of the said works in accordance with the directions of the Divisional Officer (hereinafter called the Divisional Officer) and in the terms of the said agreement.

(4) That the Contractor shall make at his own cost all necessary and adequate arrangement for the proper watch, safe custody and protection against all risks of the said material and that until used in construction as aforesaid the said materials shall remain at the site of the said works in the Contractor's custody and at his own risk and on his own responsibility and shall at all times be open to inspection by (he Divisional Officer or any officer authorized by him. In the event of the said materials of any part (hereof being stolen, destroyed or damaged or becoming deteriorated in a greater degree than is due to reasonable use and wear thereof Contractor will forthwith replace the same with other materials of like qualify or repair and make good the same as required by the Divisional Officer and the materials so brought to replace the said materials so repaired and made good shall also be considered as security for the said amount.

(5) 'Hurt the said materials shall not on any account be removed from the site of the said works except with the written permission of the Divisional Officer or an officer authorized by him in that behalf

(6) That the said amount shall be payable in full when or before the Contractor receives payment, from the Government of the price payable to him for the said works under the terms and provisions of the said agreement PROVIDED THAT if any intermediate payments are made to the contractor on account of work done then on the occasion of each such payment the Government will be at liberty to make a recovery from the Contractors Bill for such payment by deducting there from in the value of the said materials (hen actually used in the construction and in respect of which recovery has not been made previously the value for this purpose being determined in respect of each description of material at (he rates at which the amount of the advances made under these presents were calculated.

(7) at if the Contractor shall at any time make any default in the performance or observation in any respect of any of the terms and provisions of the said agreement or of these presents the total amount of the advance or advances that may still be owing to the Government shall immediately on the happening of such default be repayable by the Contractor to the Government together with interest thereon at twelve percent per annum from the date or respective dates of such advance or advances to the date or repayment and with all costs, charges, damages and expenses incurred by the Government in or for the recovery thereof or the

enforcement of this security or otherwise by reason of (he default of the Contractor and any moneys so becoming due and payable shall constitute a debt due from the Contractor to the Government and the

Contractor hereby covenants and agrees with the Government to repay and the same respectively to it accordingly.

(8) That the Contractor hereby charges all the said materials with the repayment to the Government of the said sum of Rupees .............. ............................... (Rs. ............................................................................................. ) and any further sum or sums which may be advanced as aforesaid and all costs charges damages and expenses payable under these present PROVIDED ALWAYS and it is hereby agreed and declared that not, withstanding anything in the said agreement and without prejudice to the powers contained therein if and whether the covenant for payment and repayment hereinbefore contained shall become enforceable and the money owing shall not be paid to accordingly.

Once there with the Government may at any time thereafter adopt all or any of following courses as it may deem best ;-

(a) Seize and utilize the said materials or any part thereof in the completion of the said works on behalf of the Contractor in accordance with the provisions in that behalf contained in the said agreement debiting the Contractor with the actual cost of effecting such completion the amount due in respect of advances under these presents and crediting the Contractor with the value of work done as he had carried it out in accordance with the said agreement and at the rates thereby provided. If the balance is against the Contractor he is to pay the same to the Government on demand.

(b) Remove and sell by public auction the seized materials or any part thereof and out of the moneys arising from the sale retain all the sums aforesaid repayable to the Government under these presents and pay over the surplus (if any) to the Contractor.

(c) Deduct all or any part of the moneys owing out of the security deposit or any sum due to the Contractor under the said agreement.

(9) That except as is expressly provided by the presents interest on the said advance shall not be payable.

(10) That in the event of any conflict between the provisions of these presents and the said agreement the provisions of these presents shall prevail and in the event of any dispute or difference arising over the construction or effect of these presents the settlement of which has not been hereinbefore expressly provided for the same shall be referred to the Superintending Engineer/Executive District Officer/Officer one grade higher to officer signed the agreement Circle whose……………. decision shall be final and the provisions of the Arbitration Act 1940 for the time being in force so far as they are applicable shall apply to any such reference.

Signed, sealed and delivered by\*

In the presence of

1st witness

2nd witness

Signed, sealed and delivered by\*

In the presence of

SEAL

1st witness

2nd witness

SEAL

69

70

69

70

69**SPECIFICATIONS FOR ELECTRICAL WORKS**

**ARTICLES DESCRIPTION**

1. Switches ……………………………………………………………

2. Socket Outlets………………………………………………………

3. Outlets Boxes……………………………………………………….

4. Outlets Covers ………………………………………………………

5. Lighting Fixtures……………………………………………………

6. Ceiling Fans…………………………………………………………

7. Conduit and Wiring Accessories…………………………………….

8. Low Tension Cables…………………………………………………

9. L.T. Cable Glands, Clips & Lugs……………………………………

10. Distributions Panel…………………………………………………..

11. Earthing………………………………………………………………

12. Voice System………………………………………………………...

13. Data networking System……………………………………………..

14. Public Addressing System……………………………………………

15. UPS Power Backup System…………………………………………..

71

**SPECIFICATIONS FOR ELECTRICAL WORKS**

**A – GENERAL REQUIREMENTS**

**1 SCOPE OF CONTRACT**

1.1 The item rates of the contract shall include supply equipment and material except

the equipment and material to be specifically provided by the owner, erection

including all load and lift, installation, completion and testing of the individual

components and finally the whole installation in accordance with the

specifications. The work shall be carried out to the

complete satisfaction of the Inspector.

1.2 For the materials listed as free issue “materials in this tender, it will be

responsibility of the Contractor to take delivery of such material from the stores

of the Employee supply of the necessary electrical installation including testing

and commissioning.

**2. GENERAL REQUIREMENTS**

2.1 The Contractor shall carry out all the work in accordance with this specification

and in conformity with the Indian Electricity Act and Rules as adopted in Pakistan

and the latest edition of the wiring Rules of the Institute of Electrical Engineers

London (hereinafter referred to as the (I.E.E.) Wiring Rules) but where these

specifications differ from these rules, these specifications shall be followed.

2.2 Any special requirements of the Electric Inspection shall be to the entire

satisfaction of the Employer or The electric works shall be carried out only by

Licensed Workmen authorized by the Government to Undertake such class of

works under the provision of the India Electricity Act and Rules as adopted in

Pakistan under the direct supervision of whole time electrical supervision and

particulars of commencement of works. The works shall further be under direct

supervision of whole time qualified Engineer, a Bio-data of whom shall be

submitted for staff. Any conflict b/w documents shall be brought to the attention

of the employer and resolved in writing before work is performed.

2.3 If during preparation of the Tender, the Contractor finds any points that need

clarification he shall raise these with the Employer accepts no responsibility for

the failure of the Contractor to obtain clarification on any areas of uncertainty.

Any installation not complying with the specification shall be corrected by the

contractor with no cost to the Employer.

72

2.4 It is the Contractor’s responsibility to protect equipment and materials from

damage from the time of taking over Certificate is issued by the Employer after

the plant has been commissioned.

2.5 Any deviations from these Specifications or any of the requirements of the

Contract shall be clearly defined at the tender stage under Exceptions to the

Contractors Specifications. Unless such exceptions are so made, the Employer

will assume there are no exceptions other than those specifically included in BOQs. No other exceptions will be considered after

the Contract has been executed. The contractor shall produce comprehensive

documents of individual testing, calibration and installation together with an

overall record of the state of completion of the installation Contract which is to be

submitted to the Employer at regular intervals as required.

2.6 If the contractor requires clarification of any point, this must be obtained from the

Employer accepts no responsibility for the Contractor’s failures to obtain

clarification on any areas of uncertainty.

2.7 The Contractor requires should state his ability and willingness to comply with

the enclosed Construction Program. All necessary civil and builders works shall

be under taker by others except minor civil works by the Contractor.

**3. ELECTRICAL EQUIPMENT AND MATERIALS**

3.1 Except for the items mentioned in the enclosed Free Issue list the contractor shall

supply all materials, tools, plant, scoff folding, hardware, supports and fixings as

necessary to provide a complete and satisfactory installation. Where any materials

is the Contractor’s Supply are specified in Bill of Quantities,

the Employer. When the ‘Free Issue‘ materials have been received by the

contractor he at his own expense any missing or damage items.

3.2 In the event of any Free Issue items bec0ming surplus to requirements the

Contractor shall notify the Employer who shall Issue Instructions for its disposal.

3.3 The Contractors will be required to collect free issue materials from the

Employer’s site stores.

3.4 Any material supplied by the Contractor shall be new and good quality, type and

standard as detailed in this specification. Where equipment, materials or articles

are referred to in the specifications as “equal to” any particular standard the

choice and approval.

73

**4. PROGRAM OF WORKS**

4.1 The Contractor shall within fifteen days after the acceptance of his tender submit

in writing for approval of the Engineer a program showing the order

or precedence and method in which he proposes to carry out the works.

4.2 The program which the contractor is required to furnish shall be such as to allow

the completion of the data mentioned in the tender as required by Employer.

4.3 The program which the cover the full period of works from the data of the

acceptance of the completion of the installation, testing and handing over of the

plants and installations in working orders.

4.4 The program shall submitted by the contractor shall be amended if any part of it is

not the satisfaction of the Employer and it shall not be carried into effect until it

has been approved (in an amended form if necessary by the Employer).

4.5 The Contractor may at any time during the period of the contractor submit to the

Employer for his approval, proposals for amending the program of the works such

amendments shall not be carried out into effect unless these have been approved

by the Employer.

4.6 If the employer requires the Contractor to amend his program of work, the

contractor shall not thereby be entitled to any adjustment in contract price or to

any extension of time.

4.7 The contractor shall furnish in writing such further information concerning his

arraignments for the carrying out of the works and of the constructional plant or

temporally works he intends to supply, use of construct and of his arrangements

for the direction and administration of his performance of the contract as the

Employer may from time to time required.

4.8 The submission to or approval by the Employer of such program or the furnishing

of such particulars or information shall not relieve the contractor of any of his

duties or responsibilities under the contract.

**5. SATISFACTION OF THE ELECTRICAL INSPECTOR &**

**INSURANCE COMPANY**

The work shall be carried out in accordance with IEE Rules

Rules and regulations as adopted in Pakistan, to satisfy the requirements of the Govt.

Electrical Inspector, as Well as those of fire office insuring the building furniture etc.,

and the work is to pass the survey of their respective inspectors.

74

**6. PROTECTIONS**

The constructors shall be effectively protect his on work from damage during and as may

be necessary, after installation, and he shall likewise protect adjoining work of other

trades from damage resulting from installation of Electrical work.

**7. BUILDING WORK**

**7.1** The information of channels foundations brick work, basis, recessed for board etc.

will be carried out free of charge for contractor by the civil contractor if

specifically indicated during the constructions work only.

**7.2** All necessary working drawings which may be necessary for the contractor

to carry out the above referred work shall be supplied to him by well in time.

The contractor shall however be responsible for the proper marking

out of such work at side and for ensuring that all brackets and sleeves etc. are

correctly build in.

**7.3** provision and fixing off brackets, clips, supports and stay etc., to the fixed to

wood Iron masonry or other such materials shall be the responsibility of the

contractor.

**8. CODES AND STANDARDS ETC.**

**8.1** The latest published rules of the national Electrical code, so far as applicable to

this works, B.S.S. and I.E.E. Rules and regulations off local city authorities shall

be considered included as parts of these specifications and all requirements under

then shall be fully met all wiring shall be carried out in looping system.

**8.2** The entire Installations shall be free from improper grounds, open and short

circuit faults. Tests shall be made in accordance with section “E” of I.E.E.

Regulation for the Electrical Equipment of building “1966” Edition in presence of

a representative for the Engineer. Each panel shall be tested with

mains connected to the riser, branches connected lamps removed or omitted,

sockets and wall switches closed. Each individual power line shall be tasted with

the power equipment connected for proper and intended operations. In no case

shall the Installation resistance by lease then that allowed by the regulations for

Electrical Equipment of Building failure shall be corrected in a manner

satisfactory to the Engineer.

**8.3** It shall be the responsibility of the Contractor to test all system of the entire

Electrical Installations as well as those Installations where sequence Operations is

75

required. The Electrical Contractor shall test for Proper sequence and he shall

leave the Entire Electrical Installations in satisfactory working Conditions.

**8.4** The contractor shall guaranteed that the Electrical system including all component

and accessories used there in are free of all grounds, short and open circuit faults

and defective workmanship and materials, any Electrical as well as mechanical

defects known compliance of specification in any respect and will remain so, for

the period of maintenance after the that of acceptance of the work, any defects,

appearing with in the aforesaid period, shall be remedied by the contractor at his

own Expense.

**8.5** All electrical Installations in “Explosion hazardous zones” should comply to the

institute of petroleum code of saves practices part-I Electrical.

**9. OPERATION AND MAINTENANCE MANUALS**

During the Time of Contact and before final approval of Electrical Installations, The

Contractor shall submit to principal 2 (Two) copies descriptive literature maintenance

and operation that and part list of each Item of Equipment installed under this contract.

**10 ELECTRICAL SERVICE CONNECTION**

**10.1** It shall be the Contractor’s responsibility to give all notices to the power supply

authority for provision of any load required as a result of this work and to seek

Quotation for the Installation, furnishing and connection of the required electrical

load complete in all respect.

**10.2** When the Installation is complete, the contractor shall intimate the power supply

Authority and make such tests as required by them to demonstrate conformance

With their regulations prior to their connection to the Installation. The Extant of

work herein specified represents the minimum requirement and the Extent of

work shall be extended as required to include at no increase in coast all that is

required by the local power supply authority for an installation of this type.

**10.3** If inspection by the Government constituted body is to be carried out, the

contractor shall be responsible for carrying out the same. If any fee is paid for

such inspection the same shall not be reimbursed to the contractor to arrange all

temporary power requirements during the construction work at his own risk and

cost.

76

**11. MODIFICATION TO COMPLY WITH LOCAL STANDARD ETC**

**11.1** The Electrical works in general has been designed complying to National

Electrical Code, B.S.S. and I.E.E. (London) Standards. The contractors Shall

carefully check the Drawing (if provided) and applicable portions of the specifications and he

shall modify with local standard and have them incorporated in the “**SHOP**

**DRAWING**”. In the event contract drawings (if provided) are modified, it shall be the

responsibility of the contractor to supply these modifications to all circuit work,

panel boards, feeders, conduit switch points, sockets outlets, and in.

**11.2** Any changes from the contract drawings (if provided) and specifications due to manufacture

requirement which may add to the cost of the Electrical works shall be taken into

Consideration by the contractor and such additional costs, if any, shall be included

in the tender at the time of submitting the tender.

**12. RECORD DRAWINGS**

**12.1** The contractor shall during the progress of the work, keep a careful installation

differs from that shown on the CONTRACT or SHOP DRAWINGS. Upon

completion of work the contractor shall prepare completion drawings on tracing

cloth in a neat and accurate manner, from the signed record of all changes and

revisions of the original design, to represent true installation in the completed

work. These completion drawings shall be scrutinized and finalized by the

ENGINEER and two sets of prints handed over to the contractor.

The Original tracings shall be retained by the OWNER. Final payment shall be

withheld until receipt of these completion drawings in tracing cloth and subject to

general terms and other clauses of the contract.

**13. LOCATION OF WIRING OUTLETS**

**13.1** The contractor shall coordinate his work with all trades involved so that

Exhalative locations may be obtained for all Outlets, apparatus, appliances and

wiring. The circuit numbers for lighting and power circuits are indicated currently against the location of the outlet controls.

**13.2** The Contractor shall provide for all power from main distribution switches board

to all power boards and thereafter to all socket and socket outlets.

77

**13.3** The power leads to all motors shall be in Conduit. Where motors have conduit

terminal boxes, the feeder conduit shall be connected directly to boxes, the feeder

conduit shall be connected directly into the same, except of fans and pumps which

shall have at least 18 inches of armored flexible conduit from end of rigid conduit

to motor terminal box. Under no circumstances shall rigid conduit terminals be

used or be fastened to motor foundation. Armored Flexible conduit shall be

Installed motors having sliding base. Provision shall also be made for the

movement of Motors bolted to equipment.

**13.4** The Location of outlets shown on location wiring plans shall be considered

as approximate and it shall be incumbent upon the contractor, before installation

outlets Boxes.

**13.5** In centering outlets due allowance shall be made for overhead piping, ducts,

windows and door trim, variations in thickness of furring, plastering, etc. Outlets incorrectly located shall be properly located at the contractor’s expense.

Local switches which are shown near door shall be at the strike side of the door as

finally hung regardless swing.

78

**B – SPECIFICATIONS**

**14. SWITCHES**

**14.1** Switches controlling light and fan points shall be 5 Amperes or above, 250 Volts

single or double pole, one way or two way, flush type as stated in Bill of

Quantities The Switches shall be mounted on wall flushed steel back boxes,

where the it indicates two or more switches or switches and sockets side by

side, they shall be mounted in a multiple gang box. If molded case switches are

specified, the combination of standard gang switches shall be used with back

boxes for each gang.

**14.2** samples shall be provided to the Engineer Incharge for his prior approval before

purchase.

**15. SOCKET OUTLETS**

**15.1** Socket outlets and plugging assembly shall 5 Amps, 2 round pins, line-neutral,5

Amps, 3 round pin, line-neutral-ground or 13/15 Amps, 3 pin, line-neutral-ground

These Shall be made of Bakelite and shall be suitable mounting flush with wall or

column or surface mounting as called for in Bill of Quantities.

**15.2** Each socket outlet shall have its control switch by the side of it one a common

board if it is not of combined type switch-socket unit.

**15.3** Where the socket and switch units or switch-socket outlets are to be Installed in a

or wet or damp area, they shall be of whether proof type.

**15.4 S**amples shall be provided to the Engineer Incharge for his prior approval before

purchase.

**16. OUTLETS BOXES**

**16.1** Each outlet in the wire form conduit system shall be provided with an outlet box

to suit The Condition encountered. Where outlets boxes are exposed to the

weather or in normally we location including flush and surface or exterior

masonry walls and in explosive location shall be of the cost metal type having

threaded hubs. Boxes in all other location shall be either of PVC conduit or of

black enameled arsenic-coated sheet steel type. Each box shall have sufficient

volume to accommodate the number requirements. Ceiling and bracket Outlets

79

boxes shall be not less than 3” square except the smaller boxes may be used

where by Engineer Incharge. Recessed fixture shall be provided with separate junction

boxes. Boxes to be Installed in concealed locations all with the proper type

extension rings or plaster covers where required.

**16.2** Boxes for use with conduit system shall not be less 1-1/2” except where shallow

boxes are required by structural conditions and as provided by Engineer.

Switched and socket outlets boxes shall be not less than 3” x 3”. All boxes shall

be concrete tight whether installed in concrete or in fluid material.

**16.3** Pull boxes shall not less than the minimum size required by the codes and shall be

constructed of galvanized cast iron or teak wood. Boxes shall be furnished with

screw-fastened covers. For multiple cables passing through a common pull box,

feeders shall be tagged to indicate clearly the electrical characteristics circuit number and panel designation.

**17. OUTLET COVERS**

Where not integral with the devices, the outlet plates shall be on-piece type. These shall

be provided for outlets to suit the devices installed. Bakelite, plastic or Formica sheets as

specified elsewhere in the tender documents. Screws for fastening of the plates/covers

shall be of non-ferrous metal with counter sunk heads. The covers sheet shall be installed

with all four edges in continuous contract with finished wall surface without use of mats

or similar devices. The use of sectional type outlet covers shall not be permitted.

**18. LIGHTING FIXTURES**

**18.1 General**

18.1.1 The lighting fixtures type are given as per instructions of the Engineer Incharge and each type is specified in detail in the items of specified in detail in the items of bill of quantities. Where a definite manufacture’s type and catalogue number is

specified, it shall also serve as an illustration of type and if the particular

type and if the particular of fixture specified is not available approved

equivalent fixture may be accepted.

18.1.2 The determination of quality will be based on certificate photometric data

covering the coefficient of utilization average brightness data, as well as

equivalent of construction, the Engineer’s approval is necessary. The

contractor shall submit samples of each and every lighting fixture

80

specified and obtain approval of the Engineer before commencing

installation.

**18.2 Fluorescent Light Fixtures**

18.2.1 The industrial type fluorescent light fixtures shall have lamps and ballast

of proper type and wattage as specified in the items of Bill of Quantities.

The fluorescent lamps shall be 4 ft. 40 watts. The fluorescent color shall

be white, cool day-light or day-light in that order of performance- the

lamps shall be hyson or Philips make or equivalent.

18.2.2 The lamp holders shall be rotary, lock-in type. The starter shall be Philips

make or approved equivalent.

18.2.3 The internal wiring of the fluorescent light fixtures with heat resistance

wires shall be done at the manufacture’s factory. Two or more than two

lamps fixtures shall be provided with power factor improvement capacitor

to give a power factor of 0.9. In addition to power factor improvement

capacitor, capacitor for anti-ratio Interference shall be provided in each

fluorescent fixture. The fluorescent light fixture shall be have with stove

enameled sheet steel reflector white stove enameled inside and gray

outside. The sheet steel shall not be thinner than 20 gauge. Appropriate

size bushed wire entry holes, fixing holes, etc. shall be provided.

**18.3 Incandescent Light Fittings**

18.3.1 The glass shade or globe incandescent light fitting shall be of first quality

glass free from any air double or voids. The Glass shall be opal white

color unless otherwise specified.

18.3.2 The surface mounting incandescent light fitting shall have white stove

enameled sheet body. The fixing shall match the outlet box. The wall

brackets incandescent light fittings shall have back plate with holes

matching those of the conduit outlet box.

18.2.3 The incandescent fittings shall have bi-pin lamp holders of brass. The

lamps shall be Hyson’s or Philips make.

81

**19. CEILING FANS**

**19.1** Ceiling Fans shall be capacitor type, five speeds, suitable for 250 volts, single

phase, 50 c/s a.c. The displacement shall be 10,0000e.f.m. for 48” (1219 m)

sweep and 12,00 ef.m.for 56” (1423 mm) sweep at maximum speed. The fan

motor shall be capacitor type and bearings shall be groove type to give noiseless

operation. The fan regulator shall have laminated high grade sheet steel and

regulators shall be recessed mounting type. The fan and regulator shall be of

Millat or National Lahore, make or approved equivalent.

**19.2** The fan shall be made of 15.8 mm (5/8”) dia mild steel rod to shape of approved

design. It should be in the form of loop about 87.5 mm (3-1/2”) Long and about

50 mm (2”) wide. The rod should be bents to have at least 200 mm extension on

both sides for type to the reinforcement steel of the slab.

**19.3** The fan hook shall be installed in the R.C.C. Ceiling at the time of pouring of

concrete. The fan hook extending rods shall be tied to the reinforcement steel

firmly so as no to be distributed during pouring of concrete.

**19.4** The installation of fan shall include fixing of blades down rod, clamp and far

regulator and wiring of down rod from the ceiling rose to the fan terminals,

testing and commissioning the down rod shall have long threads and shall be

provided both of the fan clamps for safety. Any as cartouches on the body of the

fan or quality paints as provided by the manufactures.

**20. CONDUIT AND WIRING ACCESSORIES**

**20.1** Section B of the regulation for the electrical equipment of the Building, issued by

the Institute of Electrical Engineers London 14th Edition (Referred Hereinafter as

wiring regulation) shall be complied with as far as applicable to this installation.

**20.2** The conduit wherever concealed in masonry shall be of rigid PVC b-Class

6kg/cm2 pressure manufactured by Pakistan PVC D-Class 12 kg/cm2 pressure.

Where no permitted because of dampness of fire, steel conduit of 16 SWG shall

be installed the Conduit systems shall be installed in accordance with regulation

B-87-100 of the wiring relation. The conduit system shall be concealed in

masonry wall, floor with required minimum concrete over it where not possible

due to structural reasons; the conduit shall be exposed clipped to wall or roof.

**20.3** Separate conduit shall be laid for different system, the mains, power such circuit

and control wiring b/w control and the outlet.

82

**20.4** The current route indicates the suggestive runs for the various routes of the wiring as

well as position of outlet. Other changes to suit actual construction shall be

acceptable for which special and specific details be indicated in future for approval of the Engineer. The contractor shall keep true record of all conduit layouts and submit as installed drawings before finally handing over the installation.

**20.5** For the jointing of PVC conduit, PVC adhesive solution of approved make shall be

applied to all joint and junction boxes to ensure proper sealing. Exposed conduit

wherever utilized shall be securely fastened in place by means of approved conduit

supports and fasteners. Where Conduit/pipe are to be fastened to masonry walls,

floor or portion use of wooden block will not permitted. Metal saddles of approved

type not more Then 4’ apart shall be used for fixing exposed conduit.

**20.6** The conduit shall be fastened to the box coupling and lock nut and insulating

bushing approved make and type.

**21. LOW TENSION CABLE**

**21.1** All the low tension cables shall be of size specified are stated in the

schedule of Quantities, single core, 3 core, or 3-1/2 core as required, polyvinyl

chlorides (PVC) insulated and PVC sheathed. The cables shall be used either in

floor in floor trenches ir in conduit and thereof should be suitable fir above

conditions.

**21.2** The copper used in manufacture of cables should conform to B.S.S. 10 or

equivalent standard, having an electrical conductivity of not BSS 2004 & 2746 and

should have heat stability and volume resistivity in accordance with the standard

laid down by cable manufactures association (U.K.)

**21.3** All the cables should comply the test requirements of B.S.S. 200:1961.

**21.4** The low tension cables shall be four cores with reduced neutral or 3 core as

described having copper conductors of standard, a healed, electrolytic, high

conductivity copper wires PVC insulated and PVC compound sheathed armored

and non-armored and non-armored. The voltage grade shall be 1000/600 volts. The

cables shall conform to B.S.6346:1969 and I.E.C. standard 502-1:1978.

**21.5** The copper conductor will meet the requirements M.S. 6360:1969 and EC grade

specifications of ASTM.

83

**21.6** Core identification shall be by colors. Red, Yellow, and blue will indicate the three

phase and black, the neutral.

**21.7** The cables shall comprise of shaped stranded copper conductor, PVC insulated,

tapped bedding galvanized steel wire armor and PVC over sheath.

**21.8** The cables shall be capable of operating at a maximum continues temperature of

70 0C and short circuit temperature of 150 0C. The cables shall be suitable for

operation on 415 Volts 4 wire 50 Hz AC system with the neutral point solidly

earthed at transformer.

**21.9** Technical particular of L.T. PVC/PVC cable shall be furnished for each size of the

cable offered and mentioned in B.O.Q.

**22. L.T. CABLE GLANDS, CLIPS & LUGS**

**22.1** Cable glands shall comprise of gland body, compression ring. Armor ring (Where

required) gland and conduit thread.

**22.2** Cable glands shall be suitable for size of cable used and shall conform to BS

6121:1973.

**22.3** All termination of PVC insulated cable shall be in compression connectors and

termination. The lugs shall be manufactured from high conductivity copper, electro

plated to resist corrosion and give good electrical continuity. Lugs shall be fitted

by Compression tools made for the purpose.

**22.4** Correct type of cable clamps and clips shall be used where needed. These shall be

selected according to cable manufactures recommendations.

**23. DISTRIBUTION PANELS**

**23.1** The Distribution panels shall be totally enclosed metal clad, safety dead front type

with hinged door and built – in concealed locks. The panels shall be suitable for

working Voltage for which the equipment incorporated there in is designed for and

tested in accordance with B.S. 116/1952.

**23.2** The panels shall be constructed from 14 SWG sheet steel and shall accommodate

circuit breakers, fuse switches distribution board, metering equipment, bus bars

supports, cable glands and other relevant equipment.

84

**23.3** The panels shall be finished inside and outside the hammer light gray air drying

enamel and two finishing coats shall be applied after basic coat of anticorrosive

primer. & Oven baked.

**23.4** The mountings on the panel shall be earthed by means of earthling the entire pane

through the two earthling terminals specifically provided for this purpose.

**23.5** The panel shall be equipped with a terminal block of suitable rating and all out

going connections shall be brought to that terminal block. The terminal block shall

have a minimum 20% spare capacity for future use.

**23.6** All panel enclosures shall have protection class I.P.54 as per DIN 4050 and I.E.C

regulation.

**23.7 Panel Boards**

The protective devices in the boards shall be miniature circuit breakers (MCBs) of

the Quantities and ratings specified in the Bill of Quantities. The

Circuits Shall be connected to the respective/MCBs. The MCBs shall be suitable

for minimum 5 KA rupturing Capacity and designed for 2000 switching operation.

**24. EARTHING**

**24.1** All exposed non-current carrying metallic part of the of the electrical equipment,

flexible conduit switch gear shall be efficiently earthed.

**24.2** The earthing shall be done to comply with the following rules.

24.2.1 Indian Electricity Rules as adopted in Pakistan.

24.2.2 Section ‘D’ of part of the regulations for the electrical equipment of

Buildings published by the Institution of Electrical Engineers London, 14th

Edition.

24.2.3 British **standard Code of Practice No. CP. 1013:1956.**

**24.3** The specifications are given here as under:

24.3.1 The earthing of the individual distribution points etc., shall be done as

specified exclusively and Independently of the sub-station earthing.

24.3.2 For earthing of L.T. equipment earths shall be provided with copper plate

earthing electrode. The earthing connections to the Neutral point shall bear

distinct indicates, ‘NOT TO DISCOUNT’. Excavation of the pit in the soil

85

does the site refilling the pit with earth, lime and Charcoal, watering

consolidation and ramming the layers to full compactness.

24.3.3 The earth shall consist of 2x2’1/8” copper plate as specified hereafter and

buried in the ground at a depth of 15 feet or more according to the moisture

in the strata Two earthing leads of the required size (circular) pipe of the

size specified straight from the earth plate upto the point in the installation

to the earth. A tee shall be provided at the vertical and extended in a

manhole of 12”x12” size of inject water casually.

24.3.4 The earth lead shall be of soft annealed electrolytic copper strip. Size 1 ½”

x1/4’ two such leads shall be brought out from each earth plate conforming

to B.S.S. No.899 and shall be run in a 4” diameter hums pipe, as far as in the

ground till it trench of the sub-station, where it shall be properly fixed on

saddle and support.

24.3.5 The upper end of hums pipe, shall be terminated in a manhole so as to inject

the water for improving the earth resistance, as and when necessary.

24.3.6 The earthing leads shall be terminated on the earthing block.

24.3.7 The connection between earth lead, earth plate or earth LR lead/earth bar

shall be with 3/16” diameter bolts conforming to B.S.S. NO. CP. 326.101 of

1948. The contact surface shall be silver coated before fixing and silver

soldered after fixing. The connection with earth plate shall be at two distinct

suitably spaced points.

24.3.8 There shall be no joint in the earthing leads between the earthing plate and

earth block.

24.3.9 The earthing bar for the sub-station earth shall be cast and machined in

electrolytic copper, conforming to B.S.S.I., 400. The size of earthing block

shall be least 4”x12”x5/8”. The earthing block shall be suitable for

interconnections of two sets of earth leas 1-1/2x1/8” suitable number of brass

bolt terminals shall be provided for terminating the earth leads from various

load points as well as sheathing of all the outgoing cables.

24.3.10The earth leads of sot annealed, electrolytic copper strip, size 1’x1/8”

conforming to B.S.S. 899 shall be used to earth all the control panels

installed in the sub-station and a separate lead of 1 ½” x ¼” for earthing

neutral point. All the other equipment shall be earthed by circular copper

conductors or as specified otherwise.

86

24.3.11 All the joints made in the strips shall be riveted in accordance with clause

No.802 of G.P. 326 101. The surface, before riveting shall be silver plated,

and soldered after riveting.

24.3.12The ends of the circular earth conductors shall be tinned after twisting, so as

to ensure the minimum contact resistance throughout its useful life.

24.3.13The earth plates, for different earth shall be buried at least 30 feet apart so

that their resistance shall not overlap.

24.3.14The shortest route to the earth the electrode shall be adopted but sharp bends

and joints shall in all cases be avoided. The earthing leads shall be

connected to the earthing electrodes by means of sweating sockets, bars

nuts, bolts and double washers so fixed to make a permanent and positive

connection with the earthing electrode.

24.3.15The maximum continuity resistance from any point in the installation

including earthing leads to the earth plate shall not be exceed 1 ohm. The

contractor therefore, must ensure that the earth leads are efficiently bonded

to all metal works other than the current carrying parts so that the above

resistance limit is no exceeded. Contractor shall arrange testing in the

presence of the Engineer as required under I.E.E. **‘WIRING**

**REGULATIONS’** and submit certified copies to the Engineer.

**25. VOICE SYSTEM**

**25.1 General**

The telephone system shall comprise of a Main Telephone Distribution Board,

Sub-Telephone Distribution Boards floor mounting type telephone socket Outlets.

The contractor shall be responsible for furnishing and installing all the above

equipment. Cables conduits back boxes etc., according the specifications

described herein. The contractor shall carry out the work in accordance with the

Electrical code of practice CP 32.101, CP 327.102 of England, to the local

applicable codes and to the entire satisfaction of telephone Department. The

Contractor shall make all necessary arrangement with telephone and telegraph

Depart for the incoming cable (s). The contractor shall perform all the work to the

satisfaction of T&T Department. The contractor shall guarantee the proper

functioning and defect free working of the system for period of one year for the

date the system shall be commissioned.

87

**25.2 Installation Work**

The installation of non-equipment work shall include delivery, unloading,

uncrossing setting in place, fastening to walls, floor, ceiling and other structures

etc., and the completed conducting according to the specifications given in

conduit installation including fixing of junction/pull boxes, pulling and

connecting of cables installation of Telephone Distribution Board.

**25.3 Telephone Distribution Boards**

The telephone distribution boards shall be made of superior quality teak wood

10mm thick and enclosed in tight fitting in black enameled steel outer box of 16

SWG, the two being fastened together by means of nuts and bolts. A sheet steel

door 16 SWG antitrust treated and painted, with locking arrangement shall be

fixed on the box. The TDB,s will be either flush or surface mounting type as

specified in Bill of Quantities In case of flush mounting type TDB’s, The steel

door will flush with the surface of the wall.

The door shall match the wall color. The TDBs shall be of appropriates size to

accommodate terminal strips. The terminal strips fixed in the TDBS shall be made

to copper. These shall be made of Telephone Industries of Pakistan.

**25.4 Conduit and conduit Accessories**

The contractor shall furnish and Install complete conduit system with associated

outlet boxes and terminal boxes, so as to be complete in all respects for

installation of wire and cable. Conduits shall be 1”Dia PVC. The specification for

conduit accessories remains same as given before of these specifications. At each

telephone outlet location, the contractor shall furnish

heavy gauge Sheet box black enameled inside and out install flush with the

surface of wall suitable for mounting the telephone rosette.

**26. DATA NETWORKING SYSTEM**

In the Data System, the following equipments will have the electrical/mechanical

characteristics/features as detailed below;

(i) Rack Mount Fiber Patch Panel

(ii) Category 6 Patch Panels

88

(iii) Data Communication Racks

(iv) Category 6 Cable

**26.1 Rack Mount Fiber Patch Panel**

This Panel shall have the following mechanical/electrical characteristics features.

**26.1.1 Mechanical Characteristics**

(i) Material Box-powder coated aluminum alloy

(ii) Spool Flame Retardant Grade (FR grade ) of ABS

sheet Material

(iii) Cable Grommets FR grade nylon

(iv) Splice Tray Aluminum + ABS

(v) Splice Tray Dimensions 140 x 125 x 10mm

(vi) Dimensions 370 x 350 x80 (H x W x D)

**26.1.2 Product Features**

(i) Aluminum housing with durable epoxy powder coating

(ii) Suitable for 19” rack mountable cabinet.

(iii) Allow minimum two cable entries

(iv) Flame retardant plastic high impact resistance cable spool

(v) Qualifies as per ISO/IEC 11801

(vi) EN 20173

**26.2 Category 6 Patch Panels**

This Panel shall have the following mechanical/electrical characteristics features.

**26.2.1 Electrical Characteristics**

(i) Dielectric Strength 1000V RMS at 60 Hz for 1 minute

(ii) Current Rating 1.5 Amp maximum

(iii) Insulation Resistance 200 M Ω minimum

(iv) Contact Resistance 1 m Ω per contact

(v) Temperature Range - 40 ºC to +70 ºC

(vi) Transmission performance Exceeds ISO/IEC 11801 Class E AS/NZS

3080:2003 Class

89

**26.2.2 Mechanical Characteristics**

**Modular Connector**

(i) RJ45 8-Pin Connector FC part 68, Subpart F and IEC-60603-7

compliant

(ii) Durability 1000 mating cycles

(iii) Material Phosphor bronze with 50 micro-inches of

Gold over 100 micro inches nickel plating

**IDC Connector**

(i) IDC connector Insulation slicing of 22 to 24 AWG (0.64

mm to 0.41 mm).

(ii) Insulation Diameter (wire) 0.70 mm – 1.40 mm

(iii) Connector material phosphor bronze with nickel plating

**26.2.3 Product Features**

(i) Removable rear cable management tray

(ii) Compatible with standard 19” equipment frames

(iii) IDC termination using a Actassi or other compatible tools

(iv) Fully compliant to AS/NZS 3080:2003, ISO/IEC 11801 Edition 2 2002

And ANSI/TIA/EIA-568-B series connecting hardware standards

**26.3 Data Communication Racks**

(i) Frames shall be manufactured from SPCC cold rolled steel and thickness

of steel sheet as below.

a. Mounting rail 2.0 mm

b. Mounting angle 1.5 mm

c. Others 1.2 mm

(ii) 19” standard installation with adjustable dimension.

(iii) Side doors with locks for protection.

(iv) Static loading capacity of 1000 kg or above.

(v) Must have IP 20 degree of protection.

**26.4 Category 6 UTP Cables**

This Cable shall have the following technical information and product features.

90

**26.4.1 TECHNICAL INFORMATION**

Physical Specifications

Rated Temperature 75˚C

Flammability Test CMR, CM, LSZH

Application Horizontal Wiring in LAN

Reference Standard UL Subject 444, EIA/TIA 568-B.2 &

ISO/IEC 11801, IEC61156-5

**26.4.2 CONSTRUCTION**

Conductor Solid Bare Copper

AWG 23

Conductor Dia. Nom. (mm) 0.57

Insulation PE

Average Thickness (mm) 0.22

Min. Point Thickness (mm) 0.18

Insulation Diameter (±0.10mm) 0.95

Twisting Lay Length (mm) 30 underneath

Cabling Lay Length (mm) 200 underneath

Filler PE

Jacket PVC

Average Thickness (±0.05mm) 0.50

Min. Point Thickness (mm) 0.43

Outer Diameter (±0.2mm) 6.00

Rip Cord Yes

1.0-100.0MHz Input Impedance (Ohms) 100±6

100-250MHz Input Impedance (Ohms) 100±6

1.0-250.0MHz Delay Skew (ns/100m) ≤45

Pair-to-Ground Capacitance Unbalance (pF/100m) ≤330

Max. Conductor DC Resistance 20˚C (Ohms/km) 73.2

Resistance Unbalance (%) ≤5

**26.4.3 Product Features**

**I.** complies with category 6 ANSI/TIA/EIA-568 & ISO/IEC 11801 standard.

**II.** 23 AWG conductors and the transmission is certified to 250 MHz.

**III.** UL listed CM fire rated.

**IV.** Exceeds category 6 ANSI/TIA/EIA-568 & ISO/IEC 11801 standards.

**V.** Supports transmission of digital and analogue voice, data and video signal.

**VI.** Supports gigabit Ethernet (1000 Base-T)

**27. PUBLIC ADDRESSING SYSTEM**

**27.1 A-1724 Mixer Power Amplifier:**

Equipped with 6 Microphone inputs and 5 AUX inputs (simultaneous use of 9 inputs possible),

the A-1724 PA amplifier of 240 W is designed to suit the following PA system applications:

announcements, BGM, and broadcasting in mosques, churches, large rooms, and factories.

**Specifications:**

\* 0 dB = 1 V

Power Source 220 - 230 V AC, 50/60 Hz

Rated Output 240 W

Power/Current

Consumption

532 W (rated output), 220 W (EN60065), 60 mA or less (when power

switch is OFF)

Frequency

Response

50 Hz - 20 kHz (±3 dB)

Distortion 2 % or less at 1 kHz, rated power

Input

MIC 1 - 6: -60 dB\*, 600 Ω, electronically-balanced,

combined type of XLR-3-31 equivalent and phone jack

AUX 1 - 2: -20 dB\*, 600 Ω, electronically-balanced,

combined type of XLR-3-31 equivalent and phone jack

(Either MIC 5 or AUX 1, and either MIC 6 or AUX 2 selectable)

AUX 3 - 4: -20 dB\*, 10 kΩ, unbalanced, RCA pin jack

AUX 5: -20 dB\*, 10 kΩ, unbalanced,

combined type of XLR-3-31 equivalent and phone jack

PWR AMP IN: 0 dB\*, 600 Ω, unbalanced, RCA pin jack

(An equalizer or other signal processor connectable between LINE OUT

and PWR AMP IN terminals)

Output

REC: 0 dB\*, 600 Ω, unbalanced, RCA pin jack

LINE: 0 dB\*, 600 Ω, unbalanced, RCA pin jack

SPEAKER SELECTOR: 2 zone, high impedance (100 V line/42 Ω),

individual selector key,

M4 screw terminal

DIRECT SPEAKER OUT: High impedance (100 V line/42 Ω), M4 screw

terminal

Low impedance (4 - 16 Ω), M4 screw terminal

(Both Low and High impedance terminals cannot be used at the same time.)

Page. 90 (A)

Phantom Power ON or OFF for each MIC1 - 6 with switch setting (+17 V DC)

S/N Ratio (Band

Pass : 20 Hz - 20

kHz)

100 dB or more (Master volume: min)

76 dB or more (Master volume: max)

60 dB or more (MIC 1 - MIC 4)

53 dB or more (MIC 5, MIC 6)

76 dB or more (AUX 1 - AUX 5)

Tone Control Bass: ±10 dB at 100 Hz, Treble: ±10 dB at 10 kHz

Control Input

REMOTE VOLUME: M3 screw terminal

POWER REMOTE: No-voltage make contact input,

open voltage: 28 V DC (when the unit's power is OFF),

short-circuit: 10 mA or less, M3 screw terminal

Indicator 5 point LED output level meter, Power indicator LED, Zone indicator LED

Operating

Temperature

-10 ℃ to +40 ℃

Finish

Panel: ABS resin, black, hairline

Case: Steel plate, black

Dimensions 420 (W) × 107.7 (H) × 367 (D) mm

Weight 13.5 kg

Accessory

Power cord ……1, Terminal block cover ……1, Terminal block cover

mounting screw ……2

Option

Rack mounting bracket: MB-25B

Volume control cover: YA-920

**27.2 BS-1030W Universal Speaker**

The BS-1030W is a small, 2-way bass-reflex type speaker featuring a wide frequency range

suitable for use for announcements and music playback. The BS-1030W can be used for both

high-impedance and low-impedance applications. The speaker's splash-proof construction

permits it to be installed under the eaves where the speaker is not directly exposed to rain.

**Specification:**

Enclosure 2-way bass-reflex type

Rated Input 30 W

Rated Impedance 8 Ω

Page. 90 (B)

100 V line: 330 Ω (30 W), 500 Ω (20 W), 670 Ω (15 W), 1 kΩ (10 W), 2 kΩ

(5 W)

70 V line: 170 Ω (30 W), 250 Ω (20 W), 330 Ω (15 W), 500 Ω (10 W), 1 kΩ

(5 W)

Sound Pressure

Level

90 dB (1 W, 1 m)

Frequency

Response

80 Hz - 20 kHz

Speaker

Component

12 cm cone-type + dome-type

Speaker Cord 2-core cabtyre cord with diameter of 6 mm

Operating

Temperature

-10 ℃ to +50 ℃

Water Protection IPX4 (can be installed vertically or horizontally.\*)

Finish

Enclosure: ABS resin, white (RAL9010 PURE WHITE), paint

Net: Surface treated steel plate, white (RAL9010 PURE WHITE), powder

coating

Bracket: Surface treated steel plate, white equivalent to RAL9010 PURE

WHITE,

powder coating

Dimension 196 (W) × 290 (H) × 150 (D) mm (unit only)

Weight 2.5 kg (unit only)

Accessory Bracket…1, Bracket mounting screw…2, Bracket mounting washer…2

Option

Mounting bracket: SP-420

Applicable bracket: WCB-13W, SP-410

Applicable stand: ST-16A

**27.3 PE-304 Pendent Speaker**

The PE-304 is a pendant speaker designed for ceiling suspension installations. Considered in

architectural design, it can blend in with lighting equipment. A directly-attached 5 m (16.4 ft)

cable allows the speaker to be suspended from the high ceiling. The PE-304 is driven on both

high-impedance (100 V and 70 V) and low-impedance (8 Ω) lines. The input power (impedance)

can be easily changed at the upper side of the speaker. The speaker is easy to repaint so as to

meet a wide range of design needs.

Page. 90 (C)

**Specifications:**

Enclosure Bass-reflex type

Rated Input 30 W (100 V, 70 V line, 8 Ω)

Rated Impedance

100 V line: 330 Ω (30 W), 500 Ω (20 W), 670 Ω (15 W), 1 kΩ (10 W), 2 kΩ

(5 W)

70 V line: 170 Ω (30 W), 250 Ω (20 W), 330 Ω (15 W), 500 Ω (10 W), 1 kΩ

(5 W)

8 Ω

Sensitivity 91 dB (1 W, 1 m) (500 - 5,000 Hz, pink noise)

Frequency

Response

70 - 20,000 Hz (peak -20 dB)

Speaker

Component

12 cm (5") cone-type + balanced dome-tweeter

Speaker Cord 2-core cabtyre cord 5 m (16.4 ft)

Applicable Cable

600 V vinyl-insulated cable (IV wire or HIV wire)

Solid copper wire: φ0.8 - φ1.6 mm (equivalent to AWG 20 - 14)

7-core twisted copper wire: 0.75 - 1.25 m㎡ (equivalent to AWG 18 - 16)

Connection Push-in connector (bridging terminal-2 branch type)

Finish

Enclosure: HIPS resin, off-white (RAL 9010 or equivalent color)

Grille: Surface-treated steel plate net, off-white (RAL 9010 or equivalent

color), paint

Dimensions φ186 × 251 (H) mm (φ7.32" × 9.88") (unit only)

Weight 2.1 kg (4.63 lb) (unit only)

Accessory

Ceiling bracket …1, Mounting hanger …1, Ceiling cover …1,

Speaker mounting screw (4 × 16)…4

Page. 90 (D)

**27.4 DM-1100 Unidirectional Microphone**

The DM-1100 is a multi-purpose microphone featuring high intelligibility.

**Specifications:**

Type Moving coil microphone

Directivity Unidirectional

Rated Impedance 600 Ω, unbalanced

Rated Sensitivity -55 dB (1 kHz 0 dB=1 V/Pa)

Frequency

Response

100 Hz - 12 kHz

Connection Cable Single-core shielded cable

Cable Length 7.5 m

Terminal of Cable Phone plug

Talk Switch Short-off, slide switch

Finish

Body: Die-cast aluminum, black

Head: ABS resin/zinc-plated steel wire, black

Dimensions φ55 × 178 mm (microphone body)

Weight 155 g (without connection cable)

Accessory Microphone holder (U5/16, NS5/8)

Page. 90 (E)

27.5 UHF WIRELESS MICROPHONE WS-5200

Page. 90 (F)

Page. 90 (G)

**27.6 Da-Lite 70 x 70" Floor-Standing Projection Screen**

The Da-Lite 70 x 70" Floor-Standing Projection Screen is lightweight and easy to carry, and

designed with high-low case adjustment to accommodate low ceilings. The keystone eliminator

compensates for picture distortion by tilting the screen forward, and the matte-white screen

surface is washable, flame retardant and mildew-resistant for impressive durability.

**Features**

Type Floor-standing

Operation Manual

Aspect Ratio AV/Square 1:1

Viewing Angle 60 degrees

Size (in.) 70 x 70

Closed Height (in.) 6.5

Closed Width (in.) 77.25

Closed Depth (in.) 3.25

Brand Da-Lite

**27.7 PT-LB2VEA**

**Features:**

1. A 5,000-hour lamp replacement cycle saves operating costs.

2. Intelligent Power Management function allows resistance to sudden voltage fluctuations.

3. Mobile projector, but can also be used on a desktop or mounted to the ceiling.

4. Setup is fast and easy thanks to features like Speed Start.

Page. 90 (H)

**Specifications:**

General Power supply 100 - 240 V AC, 50/60 Hz

Power consumption 290 W 0.4 W at 220-240 V AC, 0.3 W at

100-120 V AC when standby mode set to

eco\*1, 15 W when standby mode set to

normal, 18 W when standby mode set to

normal and audio monitor out.

Optical system Dichroic mirror separation/prism synthesis

system

LCD panel Panel size 16 mm (0.63") diagonal, 4:3 aspect ratio

Display method Transparent LCD panel (x 3, R/G/B)

Drive method Active matrix

Pixels 786,432 (1,024 x 768) x 3, total of

2,359,296 pixels

Pixel configuration Stripe

Lens Manual zoom (1:1-1:1.2), manual focus, F

2.00-2.20, f 19.22-22.68 mm, throw ratio:

1.5-1.7:1

Lamp 220 W UHM lamp (The lamp replacement

cycle is 5,000 hours.\*2)

Projection size 0.84–7.62 m (33–300 inches) diagonally

(4:3 aspect ratio)

Colors Full color (16,777,216 colors)

Brightness\*sup3/sup 2,600 lumens

Center-to-corner uniformity

ratio\*sup3/sup

85 %

Contrast ratio\*sup3/sup 600:1 (full on/full off)

Page. 90 (I)

Resolution (RGB)\*sup4/sup 1,024 x 768 pixels (Input signals that

exceed this resolution will be converted to

1,024 x 768 pixels.)

Scanning

frequency

RGB (analog) Horizontal: 15–91 kHz, Vertical: 50–85 Hz

YPsubB/subPsubR/sub 480i (525i): fH 15.75 kHz; fv 60 Hz 576i

(625i): fH 15.63 kHz; fv 50 Hz 480p

(525p): fH 31.50 kHz; fv 60 Hz 576p

(625p): fH 31.25 kHz; fv 50 Hz 720

(750)/60p: fH 45.00 kHz; fv 60 Hz 720

(750)/50p: fH 37.50 kHz; fv 50 Hz 1080

(1125)/60i: fH 33.75 kHz; fv 60 Hz 1080

(1125)/50i: fH 28.13 kHz; fv 50 Hz 1080

(1125)/60p: fH 67.50 kHz; fv 60 Hz 1080

(1125)/50p: fH 56.25 kHz; fv 50 Hz

Video/S-Video NTSC, NTSC4.43, PAL-M, PAL60:

fH15.75 kHz; fv 60 Hz PAL, SECAM,

PAL-N: fH15.63 kHz; fv 50 Hz

Optical axis shift 5:1 (fixed)

Keystone correction range Vertical: approx. ±30°

On-screen menu 17 languages: English, French, German,

Spanish, Italian, Korean, Russian, Chinese,

Japanese, Swedish, Norwegian, Danish,

Portuguese, Polish, Hungarian, Czech, and

Thai

Installation Front/rear, ceiling/desk (menu selection)

Built-in speaker 1 W (monaural), Size: 4 x 2 cm (1-1/16" x

25/32") x 1, oval

Terminals COMPUTER (RGB) 1

IN

D-sub HD 15-pin (female) x 1 RGB signal:

G: 0.7 V [p-p] (1.0 V [p-p] for sync on

green signals), 75 ohms, R, B: 0.7 V [p-p],

75 ohms, HD/SYNC, VD: TTL

(positive/negative polarity compatible)

YPBPR signal: Y: 1.0 V [p-p] (including

sync signal), 75 ohms, PB, PR: 0.7 V [p-p],

75 ohms

Page. 90 (J)

COMPUTER IN 2 /

MONITOR OUT

-sub HD 15-pin (female) x 1 RGB signal:

G: 0.7 V [p-p] (1.0 V [p-p] for sync on

green signals), 75 ohms, R, B: 0.7 V [p-p],

75 ohms, HD/SYNC, VD: TTL

(positive/negative polarity compatible)

YPBPR signal: Y: 1.0 V [p-p] (including

sync signal), 75 ohms, PB, PR: 0.7 V [p-p],

75 ohms

VIDEO IN RCA pin x 1, 1.0 V [p-p], 75 ohms

S-VIDEO IN Mini DIN 4-pin x 1, Y: 1.0 V [p-p], C:

0.286 V [p-p], 75 ohms

AUDIO IN M3 (L, R) x 2, 0.5 V [rms]

VARIABLE AUDIO

OUT

M3 (L, R) x 1, 0 –2.0 V [rms]

SERIAL D-sub 9-pin x 1, for external control (RS-

232C compliant)

LAN RJ-45 x 1, compatible with PJLink™ (class

1), 10BASE-T/100BASE-TX

Power cord length 2 m (6.6&)

Cabinet materials Moulded plastic (PC+ABS)

Dimensions (W × H × D)\*sup5/sup 307 x 69 x 210 mm (12-3/32" x 2-23/32" x

8-9/32")

Weight\*sup6/sup Approx. 2.3 kg (5.07 lbs.)

Operating environment Temperature: 0°–40°C (32°–104°F)

\*7 Humidity: 20%–80% (no condensation)

Supplied accessories Power cord, Power cord secure lock,

Wireless remote control, Batteries for

remote control ( AAA type for North/South

America, R03 type for Europe/Asia) x2,

VGA cable, Carrying bag, Application

software (CD-ROM)

Page. 90 (K)

Optional

accessories

ET-PKB2 Ceiling mount bracket

ET-KFB2 Highly durable filter unit

ET-RFB2 Replacement air filter for ET-KFB2

ET-LAB2 Replacement lamp unit

Page. 90 (L)

**28. UPS Power Backup System:**

**28.1 Inverter 24 Volts, 2 kVA, Homage:**

**Specifications:**

Page. 90 (M)

**28.2 Batteries (GEL) SBB - 12 V, 200 AH:**

**Specifications:**

Model

Rated

Voltage

(V)

Rated

Capacity

(Ah)

Terminal

type

Dimension (mm/in) Approx

Approx

Length Width Height Weight

Total

Height

mm

(inches)

mm

(inches)

mm

(inches)

mm

(inches)

Kg (lbs)

6-GFM-150 12 150 B5

486

(19.13)

170 (6.69)

244

(9.61)

244 (9.61) 43 (94.8)

6-GFM-160 12 160 B5

522

(20.55)

207 (8.15)

215

(8.46)

220 (8.66) 49.2 (108.4)

6-GFM-180 12 180 B5

522

(20.55)

240 (9.45)

218

(8.58)

223 (8.78) 53 (116.8)

6-GFM-

200A

12 200 B5

522

(20.55)

240 (9.45)

218

(8.58)

223 (8.78) 58 (127.8)

6-GFM-

200B

12 200 B5

522

(20.55)

240 (9.45)

218

(8.58)

223 (8.78) 60 (132.3)

6-GFM-220 12 220 B5

522

(20.55)

209 (8.23)

203

(7.99)

206 (8.11) 63.4 (139.7)

6-GFM-250 12 250

520

(20.47)

268

(10.55)

220

(8.66)

225 (8.86) 67 (147.7)

Page. 90 (N)

91

**SPECIFICATIONS**

**OF**

**INSTALLATION**

92

**INDEX**

**OF**

**SPECIFICATION FOR ELECTRICAL WORKS**

**C- INSTALLATION**

**ARTICLES DESCRIPTION**

1.1 General Instruction for installation…………………………………….

1.2 Earthing Installation……………………………………………………

1.3 Wire and Cable Installation…………………………………………….

93

**1. SPECIFICATION FOR INSTALLATION**

**1.1. General Instruction For Installation**

1.1.1 The Contractor shall furnish all labor and materials, tools and equipment required

to install, connect, test and commission all electrical equipment specified here,

whether or not such equipment is furnished by him or others. The equipment and

materials to be supplied by the Employer and to be installed by the contractor

shall be issued to the contractor to check the equipment at the time of delivery

from the site store, and to transport, load and lift it and his rates shall cover all

expanses for labor and equipment required.

1.1.2 For all equipment to be installed by the contractor the contractor shall supply and

install all installation materials such as foundation bolts, leveling steel, shims

clamps, cable sockets, lugs, solder, wall plugs, washers, nuts and bolts etc., as

required and without any additional cost.

1.1.3 The contractor shall himself set out the works as per specifications and shall properly position the equipment on given foundation/locations. In

general the manufacturer’s instructions for installation shall be followed. Any

defect of faulty operation of equipment due to the contractor not following the

manufacture’s instruction shall be corrected and repaired by the contractor at his

own cost. For any departures from the working that are deemed

necessary by the contractor due to site conditions he shall submit the details and

obtain the Engineer’s approval before starting such work.

**1.2. Earthing Installation**

1.2.1 **General**

1.2.1.1 A complete Earthing system as shown on drawing shall be installed by

the contractor. The system shall give earth resistance, including the

resistance of soil, earth leads and E.C.C. equal to or less than 1 ohm.

1.2.1.2 The contractor shall supply and install all installation materials such as

sockets, thimbles, clamps, saddles, pins, nuts, bolts, Washers, copper

brazing etc., without and addition cost. At all connections of earth

continuity conductor to body of transformer, switch boards, cable end

boxes or any other metallic body, proper size copper or brass sockets,

thimbles or lug shall be used to which the copper wire shall be welded

by copper brazing. Soldering of copper wire at joints or termination

94

shall be not allowed. At main earth loop copper conductor all tee-off

connections shall be by copper brazing. After brazing the joint surface

shall be protected by oxide inhibiting compound of low electrical

resistance. For connections to metallic body the surface shall be

thoroughly cleaned to the bright metal surface before bolting the lug or

socket. Transformer body, switchboard body, bus-duct cover etc. shall

be connected at least two points by two independent earth wires tapped

from the earth loop or from the earth connecting point.

1.2.1.3 The copper earth wire shall be general run exposed on the surface of

wall, cable trench or cable trays. For under floor runs these shall be

installed in steel conduit of appropriate sizes except where laid along

underground cables.

1.2.2 **Earth Electrode:-**

1.2.2.1 For Installation of earth electrode, a pit of 1500 mm. Diameter and up to

the depth of 4.5 meters or as decided at site shall be first executed in the

bare ground.

1.2.2.2 The earth electrode shall be installed upright in the pit and shall be

surrounded of choral and slot in 3:1 ratio in 1500 diameter around the pipe

& electrode up to 3000 mm depth of the pit and packed hard.

1.2.2.3 The remaining pit shall be back filled with excavated earth rammed and

tamped in layers. At the ground level an inspection chamber of 1:2:4

cement concrete as shown on the drawing shall be constructed. The

inspection chamber shall be covered with heavy duty R.C.C. cover to

finish flush with the general ground level.

**1.2.3 Earth Continuity Conductor**

The earth continuity conductor of sizes shown on the drawing shall be installed all

along the cable trenches, cable runs on over head trays and in steel conduits. This

shall be connected to switch board’s body at ends. The E.C.C. When installed in

under floor R.C.C. cable trench shall be fixed within the power cable clamps.

95

**1.3 Wire and Cable Installation**

1.3.1 Every type of wiring system shall in general comply with the relevant

requirements of Regulation B 1-78 of I.E.E. wiring Regulation.

1.3.2 The contractor shall furnish all material and Labor to install wires and

cables as listed in the schedule of Quantities. A

part from the material specified under heading Material Specification, the

contractor shall provide, without any extra cost, material for terminating

the wires and cables such as filing compound. Identification tag, Earthing

cables such as straps shall likewise be furnished for a complete wiring

Installation in accordance with best Latest practice.

1.3.3 All wires and cable shall be arranged to provide bends of reasonably large

radius, whether they are run in conduit, radius not less than specified in

Table B-1 of I.E.E. Wiring Regulation. Wiring shall be continuous

between termination and use of connectors or joints will not be allowed.

Looping in system shall be followed throughout.

1.3.4 Cores of the cable beyond the metallic enclosure for the purpose of

termination in an Outlet etc., Shall be enclosed suitably as defined in

Regulation B-69 of I.E.E. Wiring Regulations. No portion of the cable

shall thus remain exposed.

1.3.5 Where joints in cable conductors and bare conductors are required, they

shall be mechanically and electrically sound and, except in cables buried

underground they shall be accessible for inspection. Joints in non-flexible

cables shall be made either by soldering or by means of mechanical

clamps or compression type socket which shall securely retain all the

wires of the conductors.

1.3.6 Every joints in cable shall be provided with insulation not less effective

than that of the cable cores and damage. Soldering fluxes which remain

acidic or corrosive at the completion of the soldering operation shall not

used.

1.3.7 Any joint in a flexible cable or flexible cord shall be effected by means of

a cable coupler.

1.3.8 Cable couplers and connectors shall be mechanically and electrically

sound and shrouded either in metal which can be earthed in accordance

with section D of I.E.E. Wring Regulations or incombustible Insulating

material. Where the apparatus to be connected requires earthing, every

96

cable coupler and connector shall have adequate provision for maintaining

earth continuity.

1.3.9 Cables of A.C circuits Installed in steel conduit shall always be so

bunched that the cable of all phases and the neutral conductor (if any) are

contained in the same conduit.

97

**SPECIFICATIONS**

**FOR**

**TESTING**

98

**INDEX**

**OF**

**SPECIFICATION FOR ELECTRICAL WORKS**

**D- TESTING**

**Articles Description**

1 General…………………………………………………………………

2 Insulation Resistance Tests…………………………………………….

3 Earthing Resistance Tests ………………………………………………

4 Transformer……………………………………………………………..

5 Switchgears……………………………………………………………..

6 Protective Relays………………………………………………………..

**7** Completed Tests………………………………………………………...

99

**SPECIFICATON FOR TESTING**

**1. GENERAL**

**1.1** Upon completion of the installation, the contractor shall perform field tests on all

equipment, materials and system. All tests shall be conducted in the presence of the

Engineer for the purpose of demonstrating equipment or system compliance with

specifications.

**1.2** The contractor shall furnish, install and maintain all tools instruments, tests

equipment, materials etc., and furnish all personnel including supervision and “stand

by” labor required for the testing, setting and adjustment of all electrical facilities

and their components parts, including putting the same in operation.

**1.3** All tests shall be made with proper regard for the protection of the equipment and

the contractor shall be responsible for adequate protection to all personnel during

such tests.

**1.4** The contractor shall record all rest values of the tests made by him on all equipment,

giving both “as found” and “as left” conditions. Three (3) copies of all tests data

shall be given to the Engineer for records purpose. The witnessing of any tests by

the Engineer does not relive the contractor of his guarantees for materials,

equipment and workmanship as specified in the condition of contract.

**2. INSULATION RESISTANCE TESTS**

**2.1** Insulation resistance tests shall be made on all electrical equipment by a meager of

1000 volts.

**2.2** The insulation resistance values of cables, transformers an switchgear, etc., shall be

as per B.S.S. and Pakistan Electricity Rules.

**2.3** Before making connections at the ends of each cable run, the insulation resistance

measurement tests of each cable shall be made. Each conductor of a multi core cable

shall be tasted individually with each other conductor of the group and also the earth.

If insulation resistance test reading are found to be less than the specified minimum

in any conductor, the entire cable shall be replaced and the new cable tests.

**2.4** All (Transformers and switchgears) shall be given an insulation resistance

measurement tests to ground after insulation but before any wiring is connected.

Insulation test shall be made between open contracts of circuit breakers, switches

and between each phase and earth. If the insulation resistance of the circuit under test

is less than that specified above, The cause of the low regarding shall be determined

and remove. Corrective measures shall include dry-out procedure by means of

100

heaters if measures become necessary and the Installation Resistance readings

become necessary and the Insulation resistance readings taken after the correction

has been made, satisfy the requirements specified herein, repeated insulation

resistance measurements shall be made twice and at least 12 hours apart. The

maximum range for each reading in the three successive tests shall exceed 20% of

the average value. After all tests have been the equipment shall reconnected.

**3. EARTHING RESISTANCE TESTS**

**3.1** Earth resistance tests shall be made by the contractor on the earthing system,

separating and reconnecting each earth connecting as may be required by the

Engineer.

**3.2** If it is indicated at solid treatment or other corrective measure are required to lower

The ground resistance values, the Engineer will determine the extent of such

corrective measures.

**3.3** The electrical resistance of the E.C.C. together with the resistance of the earthing

load measured from the connection with earth electrode to any other position in the

completed installation shall not exceed one ohm.

**3.4** Earth resistance tests shall be performed as per electric Inspector’s requirements,

where more earthing sets than one are Installed, the earth resistance tests between

two sets shall be measured by means of Resistance Bridge Instrument. The earth

resistance between two sets shall not exceed one ohm.

**4. TRANSFORMERS**

**4.1** In addition to the Insulation resistance tests on the transformer, Polarity and phase

rotation test shall also be performed, Insulation resistance of the transformer oil shall

be tested in accordance with B.S.S. 148 immediately before use. Auxiliary device,

breather bushels relay etc, shall be tested for satisfactory operation.

**5. SWITCHGEARS**

**5.1** Each circuit breaker shall be electrically and mechanically, ascertaining that handle

mechanism are operating. All inter lock control circuit shall be checked for proper

connections in accordance with the wiring diagrams given by the manufactures.

101

**5.2** The contractor shall identify the phase of all switchgear and power cables by

stenciling the switchgear and tagging the cables so that the phases can be identified

for connection to give proper phase sequence.

**6. PROTECTIVE RELAYS**

**6.1** Protective relays shall be set and calibrated and tests points recorded. Trip circuit

shall be tested for proper operation. C.T. secondary circuit shall be energized and

operation of the relays observed.

**7. COMPLETED TESTS**

**7.1** After any equipment has been tested, checked for operation etc., and is accepted by

the Engineer, the Contractor shall be responsible for the proper protection of the

equipment so that subsequent testing of other equipment of system does not disturb

the completed work.

**SPECIAL NOTES**

Sindh Public Procurement Regulatory Authority | www.pprasindh.gov.pk 102

**SPECIAL NOTES**

**1.** All the quantities related with cables given in Bill of Quantities are approximate. It is

the responsibility of the Contractor to determine the actual quantities. Payment shall

be made against the quantities actually executed at site according to measurement.

**2.** The contractor will place the order for all the material to be used at site and in his

scope of works well in time so that delivery of these materials should not affect the

schedule of completion of works. No excuse for the late delivery of the materials by

other manufacturers shall be accepted in this regard.

**3.** Connections on both sides of the cables shall be performed.

**4.** The contractor shall include in his rates the cost of the cable accessories such as

copper busbars copper lugs, glands, cable end box etc, wherever required. Increase in

rate(s), will not be possible after approval of the rate(s) and during execution of

works.

**5.** For extra works carried out according to instructions of the Client and/or Engineer,

or their representatives, the rates claimed for these works will be approved by the

Client/Engineer after mutual discussion with contractor.

**6.** Quoted Tender documents and Addendum (if any) etc, shall be

submitted on the date Tender opening.

**7.** Contractors/Bidders are advised to visit and understand the quantum of works

unvalued in existing areas before filling the BOQ.

**8.** Contractors/Bidders may contact Engineer for clarification of each and every query

before filling the BOQ. No alteration in the rates will be entertained after submission /

approval of the Tender documents.

**9.** Contactor is required to submit list of materials required from owner, such as Power

Plug etc and get the same from the owner. If the total quantity is not available with

client then acquire partial quantities from client and partial from market as per site

condition

Sindh Public Procurement Regulatory Authority | www.pprasindh.gov.pk 103

69

**A- GENERAL REQUIREMENT**

**ARTICLES DESCRIPTION**

1 Scope of contract………………………………………………………………

2 General Requirements……………………………………………………………

3 Electrical Equipment & Materials……………………………………………….

4 Program of Work………………………………………………………………...

5 Satisfaction of the Electrical Installations & Insurance Company………………

6 Protection……………………………………………………………………..…

7 Building work……………………………………………………………………

8 Codes & Standards etc…………………………………………………………..

9 Operations and Maintenance Manuals…………………………………………..

10 Electrical services Connections………………………………………………….

11 Modification to comply with local standard…………………………………….

12 Record Drawings………………………………………………………………...

13 Location of Wiring Outlets………………………………………………………

70

**INDEX**

**OF**

**SPECIFICATIONS FOR ELECTRICAL WORKS**

**B- SPECIFICATION**

**ARTICLES DESCRIPTION**

14. Switches ……………………………………………………………

15. Socket Outlets………………………………………………………

16. Outlets Boxes……………………………………………………….

17. Outlets Covers ………………………………………………………

18. Lighting Fixtures……………………………………………………

19. Ceiling Fans…………………………………………………………

20. Conduit and Wiring Accessories…………………………………….

21. Low Tension Cables…………………………………………………

22. L.T. Cable Glands, Clips & Lugs……………………………………

23. Distributions Panel…………………………………………………..

24. Earthing………………………………………………………………

25. Voice System………………………………………………………...

26. Data networking System……………………………………………..

27. Public Addressing System……………………………………………

28. UPS Power Backup System…………………………………………..

71

**SPECIFICATIONS FOR ELECTRICAL WORKS**

**A – GENERAL REQUIREMENTS**

**1 SCOPE OF CONTRACT**

1.1 The item rates of the contract shall include supply equipment and material except

the equipment and material to be specifically provided by the owner, erection

including all load and lift, installation, completion and testing of the individual

components and finally the whole installation in accordance with the

specifications. The work shall be carried out to the

complete satisfaction of the Inspector.

1.2 For the materials listed as free issue “materials in this tender, it will be

responsibility of the Contractor to take delivery of such material from the stores

of the Employee supply of the necessary electrical installation including testing

and commissioning.

**2. GENERAL REQUIREMENTS**

2.1 The Contractor shall carry out all the work in accordance with this specification

and in conformity with the Indian Electricity Act and Rules as adopted in Pakistan

and the latest edition of the wiring Rules of the Institute of Electrical Engineers

London (hereinafter referred to as the (I.E.E.) Wiring Rules) but where these

specifications differ from these rules, these specifications shall be followed.

2.2 Any special requirements of the Electric Inspection shall be to the entire

satisfaction of the Employer or The electric works shall be carried out only by

Licensed Workmen authorized by the Government to Undertake such class of

works under the provision of the India Electricity Act and Rules as adopted in

Pakistan under the direct supervision of whole time electrical supervision and

particulars of commencement of works. The works shall further be under direct

supervision of whole time qualified Engineer, a Bio-data of whom shall be

submitted for staff. Any conflict b/w documents shall be brought to the attention

of the employer and resolved in writing before work is performed.

2.3 If during preparation of the Tender, the Contractor finds any points that need

clarification he shall raise these with the Employer accepts no responsibility for

the failure of the Contractor to obtain clarification on any areas of uncertainty.

Any installation not complying with the specification shall be corrected by the

contractor with no cost to the Employer.

72

2.4 It is the Contractor’s responsibility to protect equipment and materials from

damage from the time of taking over Certificate is issued by the Employer after

the plant has been commissioned.

2.5 Any deviations from these Specifications or any of the requirements of the

Contract shall be clearly defined at the tender stage under Exceptions to the

Contractors Specifications. Unless such exceptions are so made, the Employer

will assume there are no exceptions other than those specifically included,. No other exceptions will be considered after

the Contract has been executed. The contractor shall produce comprehensive

documents of individual testing, calibration and installation together with an

overall record of the state of completion of the installation Contract which is to be

submitted to the Employer at regular intervals as required.

2.6 If the contractor requires clarification of any point, this must be obtained from the

Employer accepts no responsibility for the Contractor’s failures to obtain

clarification on any areas of uncertainty.

2.7 The Contractor requires should state his ability and willingness to comply with

the enclosed Construction Program. All necessary civil and builders works shall

be under taker by others except minor civil works by the Contractor.

**3. ELECTRICAL EQUIPMENT AND MATERIALS**

3.1 Except for the items mentioned in the enclosed Free Issue list the contractor shall

supply all materials, tools, plant, scoff folding, hardware, supports and fixings as

necessary to provide a complete and satisfactory installation. Where any material

is the Contractor’s Supply are specified in Bill of Quantities,

the Employer. When the ‘Free Issue‘ materials have been received by the

contractor he at his own expense any missing or damage items.

3.2 In the event of any Free Issue items bec0ming surplus to requirements the

Contractor shall notify the Employer who shall Issue Instructions for its disposal.

3.3 The Contractors will be required to collect free issue materials from the

Employer’s site stores.

3.4 Any material supplied by the Contractor shall be new and good quality, type and

standard as detailed in this specification. Where equipment, materials or articles

are referred to in the specifications as “equal to” any particular standard the

choice and approval.

73

**4. PROGRAM OF WORKS**

4.1 The Contractor shall within fifteen days after the acceptance of his tender submit

in writing for approval of the Employer. Engineer a program showing the order

or precedence and method in which he proposes to carry out the works.

4.2 The program which the contractor is required to furnish shall be such as to allow

the completion of the data mentioned in the tender as required by Employer.

4.3 The program which the cover the full period of works from the data of the

acceptance of the completion of the installation, testing and handing over of the

plants and installations in working orders.

4.4 The program shall submitted by the contractor shall be amended if any part of it is

not the satisfaction of the Employer and it shall not be carried into effect until it

has been approved (in an amended form if necessary by the Employer).

4.5 The Contractor may at any time during the period of the contractor submit to the

Employer for his approval, proposals for amending the program of the works such

amendments shall not be carried out into effect unless these have been approved

by the Employer.

4.6 If the employer requires the Contractor to amend his program of work, the

contractor shall not thereby be entitled to any adjustment in contract price or to

any extension of time.

4.7 The contractor shall furnish in writing such further information concerning his

arraignments for the carrying out of the works and of the constructional plant or

temporally works he intends to supply, use of construct and of his arrangements

for the direction and administration of his performance of the contract as the

Employer may from time to time required.

4.8 The submission to or approval by the Employer of such program or the furnishing

of such particulars or information shall not relieve the contractor of any of his

duties or responsibilities under the contract.

**5. SATISFACTION OF THE ELECTRICAL INSPECTOR &**

**INSURANCE COMPANY**

The work shall be carried out in accordance with IEE Rules

Rules and regulations as adopted in Pakistan, to satisfy the requirements of the Govt.

Electrical Inspector, as Well as those of fire office insuring the building furniture etc.,

and the work is to pass the survey of their respective inspectors.

74

**6. PROTECTIONS**

The constructors shall be effectively protect his on work from damage during and as may

be necessary, after installation, and he shall likewise protect adjoining work of other

trades from damage resulting from installation of Electrical work.

**7. BUILDING WORK**

**7.1** The information of channels foundations brick work, basis, recessed for board etc.

will be carried out free of charge for contractor by the civil contractor if

specifically indicated during the constructions work only.

**7.2** All necessary working drawings which may be necessary for the civil contractor

to carry out the above referred work shall be supplied to him by the contractor

well in time. The contractor shall however be responsible for the proper marking

out of such work at side and for ensuring that all brackets and sleeves etc. are

correctly build in.

**7.3** provision and fixing off brackets, clips, supports and stay etc., to the fixed to

wood Iron masonry or other such materials shall be the responsibility of the

contractor.

**8. CODES AND STANDARDS ETC**

**8.1** The latest published rules of the national Electrical code, so far as applicable to

this works, B.S.S. and I.E.E. Rules and regulations off local city authorities shall

be considered included as parts of these specifications and all requirements under

then shall be fully met all wiring shall be carried out in looping system.

**8.2** The entire Installations shall be free from improper grounds, open and short

circuit faults. Tests shall be made in accordance with section “E” of I.E.E.

Regulation for the Electrical Equipment of building “1966” Edition in presence of

a representative for the Employer / Engineer. Each panel shall be tested with

mains connected to the riser, branches connected lamps removed or omitted,

sockets and wall switches closed. Each individual power line shall be tasted with

the power equipment connected for proper and intended operations. In no case

shall the Installation resistance by lease then that allowed by the regulations for

Electrical Equipment of Building failure shall be corrected in a manner

satisfactory to the Engineer.

**8.3** It shall be the responsibility of the Contractor to test all system of the entire

Electrical Installations as well as those Installations where sequence Operations is

75

required. The Electrical Contractor shall test for Proper sequence and he shall

leave the Entire Electrical Installations in satisfactory working Conditions.

**8.4** The contractor shall guaranteed that the Electrical system including all component

and accessories used there in are free of all grounds, short and open circuit faults

and defective workmanship and materials, any Electrical as well as mechanical

defects known compliance of specification in any respect and will remain so, for

the period of maintenance after the that of acceptance of the work, any defects,

appearing with in the aforesaid period, shall be remedied by the contractor at his

own Expense.

**8.5** All electrical Installations in “Explosion hazardous zones” should comply to the

institute of petroleum code of saves practices part-I Electrical.

**9. OPERATION AND MAINTENANCE MANUALS**

During the Time of Contact and before final approval of Electrical Installations, The

Contractor shall submit to principal 2 (Two) copies descriptive literature maintenance

and operation that and part list of each Item of Equipment installed under this contract.

**10 ELECTRICAL SERVICE CONNECTION**

**10.1** It shall be the Contractor’s responsibility to give all notices to the power supply

authority for provision of any load required as a result of this work and to seek

Quotation for the Installation, furnishing and connection of the required electrical

load complete in all respect.

**10.2** When the Installation is complete, the contractor shall intimate the power supply

Authority and make such tests as required by them to demonstrate conformance

With their regulations prior to their connection to the Installation. The Extant of

work herein specified represents the minimum requirement and the Extent of

work shall be extended as required to include at no increase in coast all that is

required by the local power supply authority for an installation of this type.

**10.3** If inspection by the Government constituted body is to be carried out, the

contractor shall be responsible for carrying out the same. If any fee is paid for

such inspection the same shall be reimbursed to the contractor to arrange all

temporary power requirements during the construction work at his own risk and

cost.

76

**11. MODIFICATION TO COMPLY WITH LOCAL STANDARD ETC**

**11.1** The Electrical works in general has been designed complying to National

Electrical Code, B.S.S. and I.E.E. (London) Standards. The contractors Shall

carefully check the Drawing and applicable portions of the specifications and he

shall modify with local standard and have them incorporated in the “**SHOP**

**DRAWING**”. In the event contract drawings are modified, it shall be the

responsibility of the contractor to supply these modifications to all circuit work,

panel boards, feeders, conduit switch points, sockets outlets, and in.

**11.2** Any changes from the contract drawings and specifications due to manufacture

requirement which may add to the cost of the Electrical works shall be taken into

Consideration by the contractor and such additional costs, if any, shall be included

in the tender at the time of submitting the tender.

**12. RECORD DRAWINGS**

**12.1** The contractor shall during the progress of the work, keep a careful installation

differs from that shown on the CONTRACT or SHOP DRAWINGS. Upon

completion of work the contractor shall prepare completion drawings on tracing

cloth in a neat and accurate manner, from the signed record of all changes and

revisions of the original design, to represent true installation in the completed

work. These completion drawings shall be scrutinized and finalized by the

ENGINEER and two sets of prints handed over to the contractor.

The Original tracings shall be retained by the OWNER. Final payment shall be

withheld until receipt of these completion drawings in tracing cloth and subject to

general terms and other clauses of the contract.

**13. LOCATION OF WIRING OUTLETS**

**13.1** The contractor shall coordinate his work with all trades involved so that

Exhalative locations may be obtained for all Outlets, apparatus, appliances and

wiring. The circuit numbers for lighting and power circuits are indicated on the

current location of the outlet controls or as per marking of the EI.

**13.2** The Contractor shall provide for all power from main distribution switches board

to all power boards and thereafter to all socket and socket outlets.

77

**13.3** The power leads to all motors shall be in Conduit. Where motors have conduit

terminal boxes, the feeder conduit shall be connected directly to boxes, the feeder

conduit shall be connected directly into the same, except of fans and pumps which

shall have at least 18 inches of armored flexible conduit from end of rigid conduit

to motor terminal box. Under no circumstances shall rigid conduit terminals be

used or be fastened to motor foundation. Armored Flexible conduit shall be

Installed motors having sliding base. Provision shall also be made for the

movement of Motors bolted to equipment.

**13.4** The Location of outlets shown on location will be considered as approximate and it shall be incumbent upon the contractor, before installation

outlets Boxes, to study all pertinent drawings and obtain precise information from

the architectural schedules, scale drawings, large scale and full details of finished

rooms approved shop drawings of the trades etc. from the Engineer.

**13.5** In centering outlets due allowance shall be made for overhead piping, ducts,

windows and door trim, variations in thickness of furring, plastering, etc. as

erected, regardless of conditions which may be otherwise shown on drawings.

Outlets incorrectly located shall be properly located at the contractor’s expense.

Local switches which are shown near door shall be at the strike side of the door as

finally hung regardless swing shown on the drawings.

78

**B – SPECIFICATIONS**

**14. SWITCHES**

**14.1** Switches controlling light and fan points shall be 5 Amperes or above, 250 Volts

single or double pole, one way or two way, flush type as stated in Bill of

Quantities The Switches shall be mounted on wall flushed steel back boxes,

where it indicates two or more switches or switches and sockets side by

side, they shall be mounted in a multiple gang box. If molded case switches are

specified, the combination of standard gang switches shall be used with back

boxes for each gang.

**14.2** samples shall be provided to the Engineer for his prior approval before

purchase.

**15. SOCKET OUTLETS**

**15.1** Socket outlets and plugging assembly shall 5 Amps, 2 round pins, line-neutral,5

Amps, 3 round pin, line-neutral-ground or 13/15 Amps, 3 pin, line-neutral-ground

These Shall be made of Bakelite and shall be suitable mounting flush with wall or

column or surface mounting as called for in Bill of Quantities.

**15.2** Each socket outlet shall have its control switch by the side of it one a common

board if it is not of combined type switch-socket unit.

**15.3** Where the socket and switch units or switch-socket outlets are to be Installed in a

or wet or damp area, they shall be of whether proof type.

**15.4 S**amples shall be provided to the Engineer for his prior approval before

purchase.

**16. OUTLETS BOXES**

**16.1** Each outlet in the wire form conduit system shall be provided with an outlet box

to suit The Condition encountered. Where outlets boxes are exposed to the

weather or in normally we location including flush and surface or exterior

masonry walls and in explosive location shall be of the cost metal type having

threaded hubs. Boxes in all other location shall be either of PVC conduit or of

black enameled arsenic-coated sheet steel type. Each box shall have sufficient

volume to accommodate the number requirements. Ceiling and bracket Outlets

79

boxes shall be not less than 3” square except the smaller boxes may be used

where by Engineer. Recessed fixture shall be provided with separate junction

boxes. Boxes to be Installed in concealed locations all with the proper type

extension rings or plaster covers where required.

**16.2** Boxes for use with conduit system shall not be less 1-1/2” except where shallow

boxes are required by structural conditions and as provided by Engineer.

Switched and socket outlets boxes shall be not less than 3” x 3”. All boxes shall

be concrete tight whether installed in concrete or in fluid material.

**16.3** Pull boxes shall not less than the minimum size required by the codes and shall be

constructed of galvanized cast iron or teak wood. Boxes shall be furnished with

screw-fastened covers. For multiple cables passing through a common pull box,

feeders shall be tagged to indicate clearly the electrical characteristics circuit

number and panel designation.

**17. OUTLET COVERS**

Where not integral with the devices, the outlet plates shall be on-piece type. These shall

be provided for outlets to suit the devices installed. Bakelite, plastic or Formica sheets as

specified elsewhere in the tender documents. Screws for fastening of the plates/covers

shall be of non-ferrous metal with counter sunk heads. The covers sheet shall be installed

with all four edges in continuous contract with finished wall surface without use of mats

or similar devices. The use of sectional type outlet covers shall not be permitted.

**18. LIGHTING FIXTURES**

**18.1 General**

18.1.1 The lighting fixtures type are given on the existing location and each type is

specified in detail in the items of specified in detail in the items of bill of

quantities. Where a definite manufacture’s type and catalogue number is

specified, it shall also serve as an illustration of type and if the particular

type and if the particular of fixture specified is not available approved

equivalent fixture may be accepted.

18.1.2 The determination of quality will be based on certificate photometric data

covering the coefficient of utilization average brightness data, as well as

equivalent of construction, the Engineer’s approval is necessary. The

contractor shall submit samples of each and every lighting fixture

80

specified and obtain approval of the Engineer before commencing

installation.

**18.2 Fluorescent Light Fixtures**

18.2.1 The industrial type fluorescent light fixtures shall have lamps and ballast

of proper type and wattage as specified in the items of Bill of Quantities.

The fluorescent lamps shall be 4 ft. 40 watts. The fluorescent color shall

be white, cool day-light or day-light in that order of performance- the

lamps shall be hyson or Philips make or equivalent.

18.2.2 The lamp holders shall be rotary, lock-in type. The starter shall be Philips

make or approved equivalent.

18.2.3 The internal wiring of the fluorescent light fixtures with heat resistance

wires shall be done at the manufacture’s factory. Two or more than two

lamps fixtures shall be provided with power factor improvement capacitor

to give a power factor of 0.9. In addition to power factor improvement

capacitor, capacitor for anti-ratio Interference shall be provided in each

fluorescent fixture. The fluorescent light fixture shall be have with stove

enameled sheet steel reflector white stove enameled inside and gray

outside. The sheet steel shall not be thinner than 20 gauge. Appropriate

size bushed wire entry holes, fixing holes, etc. shall be provided.

**18.3 Incandescent Light Fittings**

18.3.1 The glass shade or globe incandescent light fitting shall be of first quality

glass free from any air double or voids. The Glass shall be opal white

color unless otherwise specified.

18.3.2 The surface mounting incandescent light fitting shall have white stove

enameled sheet body. The fixing shall match the outlet box. The wall

brackets incandescent light fittings shall have back plate with holes

matching those of the conduit outlet box.

18.2.3 The incandescent fittings shall have bi-pin lamp holders of brass. The

lamps shall be Hyson’s or Philips make.

81

**19. CEILING FANS**

**19.1** Ceiling Fans shall be capacitor type, five speeds, suitable for 250 volts, single

phase, 50 c/s a.c. The displacement shall be 10,0000e.f.m. for 48” (1219 m)

sweep and 12,00 ef.m.for 56” (1423 mm) sweep at maximum speed. The fan

motor shall be capacitor type and bearings shall be groove type to give noiseless

operation. The fan regulator shall have laminated high grade sheet steel and

regulators shall be recessed mounting type. The fan and regulator shall be of

Millat, Heavy or National Lahore, make or approved equivalent.

**19.2** The fan shall be made of 15.8 mm (5/8”) dia mild steel rod to shape of approved

design. It should be in the form of loop about 87.5 mm (3-1/2”) Long and about

50 mm (2”) wide. The rod should be bents to have at least 200 mm extension on

both sides for type to the reinforcement steel of the slab.

**19.3** The fan hook shall be installed in the R.C.C. Ceiling at the time of pouring of

concrete. The fan hook extending rods shall be tied to the reinforcement steel

firmly so as no to be distributed during pouring of concrete.

**19.4** The installation of fan shall include fixing of blades down rod, clamp and far

regulator and wiring of down rod from the ceiling rose to the fan terminals,

testing and commissioning the down rod shall have long threads and shall be

provided both of the fan clamps for safety. Any as cartouches on the body of the

fan or quality paints as provided by the manufactures.

**20. CONDUIT AND WIRING ACCESSORIES**

**20.1** Section B of the regulation for the electrical equipment of the Building, issued by

the Institute of Electrical Engineers London 14th Edition (Referred Hereinafter as

wiring regulation) shall be complied with as far as applicable to this installation.

**20.2** The conduit wherever concealed in masonry shall be of rigid PVC b-Class

6kg/cm2 pressure manufactured by Pakistan PVC D-Class 12 kg/cm2 pressure.

Where no permitted because of dampness of fire, steel conduit of 16 SWG shall

be installed the Conduit systems shall be installed in accordance with regulation

B-87-100 of the wiring relation. The conduit system shall be concealed in

masonry wall, floor with required minimum concrete over it where not possible

due to structural reasons; the conduit shall be exposed clipped to wall or roof.

**20.3** Separate conduit shall be laid for different system, the mains, power such circuit

and control wiring b/w control and the outlet.

82

**20.4** The Current Scenario indicate the suggestive runs for the various routes of the wiring as

well as position of outlet. Minor change to suit actual construction shall be

acceptable for which special and specific details be indicated in coordination of the Engineer. The contractor shall keep true record of all conduit layouts and submit as installed drawings before finally handing over the installation.

**20.5** For the jointing of PVC conduit, PVC adhesive solution of approved make shall be

applied to all joint and junction boxes to ensure proper sealing. Exposed conduit

wherever utilized shall be securely fastened in place by means of approved conduit

supports and fasteners. Where Conduit/pipe are to be fastened to masonry walls,

floor or portion use of wooden block will not permitted. Metal saddles of approved

type not more Then 4’ apart shall be used for fixing exposed conduit.

**20.6** The conduit shall be fastened to the box coupling and lock nut and insulating

bushing approved make and type.

**21. LOW TENSION CABLE**

**21.1** All the low tension cables shall be of size specified as stated in the

schedule of Quantities, single core, 3 core, or 3-1/2 core as required, polyvinyl

chlorides (PVC) insulated and PVC sheathed. The cables shall be used either in

floor in floor trenches ir in conduit and thereof should be suitable fir above

conditions.

**21.2** The copper used in manufacture of cables should conform to B.S.S. 10 or

equivalent standard, having an electrical conductivity of not BSS 2004 & 2746 and

should have heat stability and volume resistivity in accordance with the standard

laid down by cable manufactures association (U.K.)

**21.3** All the cables should comply the test requirements of B.S.S. 200:1961.

**21.4** The low tension cables shall be four cores with reduced neutral or 3 core as

described having copper conductors of standard, a healed, electrolytic, high

conductivity copper wires PVC insulated and PVC compound sheathed armored

and non-armored and non-armored. The voltage grade shall be 1000/600 volts. The

cables shall conform to B.S.6346:1969 and I.E.C. standard 502-1:1978.

**21.5** The copper conductor will meet the requirements M.S. 6360:1969 and EC grade

specifications of ASTM.

83

**21.6** Core identification shall be by colors. Red, Yellow, and blue will indicate the three

phase and black, the neutral.

**21.7** The cables shall comprise of shaped stranded copper conductor, PVC insulated,

tapped bedding galvanized steel wire armor and PVC over sheath.

**21.8** The cables shall be capable of operating at a maximum continues temperature of

70 0C and short circuit temperature of 150 0C. The cables shall be suitable for

operation on 415 Volts 4 wire 50 Hz AC system with the neutral point solidly

earthed at transformer.

**21.9** Technical particular of L.T. PVC/PVC cable shall be furnished for each size of the

cable offered and mentioned in B.O.Q.

**22. L.T. CABLE GLANDS, CLIPS & LUGS**

**22.1** Cable glands shall comprise of gland body, compression ring. Armor ring (Where

required) gland and conduit thread.

**22.2** Cable glands shall be suitable for size of cable used and shall conform to BS

6121:1973.

**22.3** All termination of PVC insulated cable shall be in compression connectors and

termination. The lugs shall be manufactured from high conductivity copper, electro

plated to resist corrosion and give good electrical continuity. Lugs shall be fitted

by Compression tools made for the purpose.

**22.4** Correct type of cable clamps and clips shall be used where needed. These shall be

selected according to cable manufactures recommendations.

**23. DISTRIBUTION PANELS**

**23.1** The Distribution panels shall be totally enclosed metal clad, safety dead front type

with hinged door and built – in concealed locks. The panels shall be suitable for

working Voltage for which the equipment incorporated there in is designed for and

tested in accordance with B.S. 116/1952.

**23.2** The panels shall be constructed from 14 SWG sheet steel and shall accommodate

circuit breakers, fuse switches distribution board, metering equipment, bus bars

supports, cable glands and other relevant equipment.

84

**23.3** The panels shall be finished inside and outside the hammer light gray air drying

enamel and two finishing coats shall be applied after basic coat of anticorrosive

primer. & Oven baked.

**23.4** The mountings on the panel shall be earthed by means of earthling the entire pane

through the two earthling terminals specifically provided for this purpose.

**23.5** The panel shall be equipped with a terminal block of suitable rating and all out

going connections shall be brought to that terminal block. The terminal block shall

have a minimum 20% spare capacity for future use.

**23.6** All panel enclosures shall have protection class I.P.54 as per DIN 4050 and I.E.C

regulation.

**23.7 Panel Boards**

The protective devices in the boards shall be miniature circuit breakers (MCBs) of

the Quantities and ratings specified in the Bill of Quantities. The

Circuits Shall be connected to the respective/MCBs. The MCBs shall be suitable

for minimum 5 KA rupturing Capacity and designed for 2000 switching operation.

**24. EARTHING**

**24.1** All exposed non-current carrying metallic part of the of the electrical equipment,

flexible conduit switch gear shall be efficiently earthed.

**24.2** The earthing shall be done to comply with the following rules.

24.2.1 Indian Electricity Rules as adopted in Pakistan.

24.2.2 Section ‘D’ of part of the regulations for the electrical equipment of

Buildings published by the Institution of Electrical Engineers London, 14th

Edition.

24.2.3 British **standard Code of Practice No. CP. 1013:1956.**

**24.3** The specifications are given here as under:

24.3.1 The earthing of the individual distribution points etc., shall be done as

specified exclusively and Independently of the sub-station earthing.

24.3.2 For earthing of L.T. equipment earths shall be provided with copper plate

earthing electrode. The earthing connections to the Neutral point shall bear

distinct indicates, ‘NOT TO DISCOUNT’. Excavation of the pit in the soil

85

does the site refilling the pit with earth, lime and Charcoal, watering

consolidation and ramming the layers to full compactness.

24.3.3 The earth shall consist of 2x2’1/8” copper plate as specified hereafter and

buried in the ground at a depth of 15 feet or more according to the moisture

in the strata Two earthing leads of the required size (circular) pipe of the

size specified straight from the earth plate upto the point in the installation

to the earth. A tee shall be provided at the vertical and extended in a

manhole of 12”x12” size of inject water casually.

24.3.4 The earth lead shall be of soft annealed electrolytic copper strip. Size 1 ½”

x1/4’ two such leads shall be brought out from each earth plate conforming

to B.S.S. No.899 and shall be run in a 4” diameter hums pipe, as far as in the

ground till it trench of the sub-station, where it shall be properly fixed on

saddle and support.

24.3.5 The upper end of hums pipe, shall be terminated in a manhole so as to inject

the water for improving the earth resistance, as and when necessary.

24.3.6 The earthing leads shall be terminated on the earthing block.

24.3.7 The connection between earth lead, earth plate or earth LR lead/earth bar

shall be with 3/16” diameter bolts conforming to B.S.S. NO. CP. 326.101 of

1948. The contact surface shall be silver coated before fixing and silver

soldered after fixing. The connection with earth plate shall be at two distinct

suitably spaced points.

24.3.8 There shall be no joint in the earthing leads between the earthing plate and

earth block.

24.3.9 The earthing bar for the sub-station earth shall be cast and machined in

electrolytic copper, conforming to B.S.S.I., 400. The size of earthing block

shall be least 4”x12”x5/8”. The earthing block shall be suitable for

interconnections of two sets of earth leas 1-1/2x1/8” suitable number of brass

bolt terminals shall be provided for terminating the earth leads from various

load points as well as sheathing of all the outgoing cables.

24.3.10The earth leads of sot annealed, electrolytic copper strip, size 1’x1/8”

conforming to B.S.S. 899 shall be used to earth all the control panels

installed in the sub-station and a separate lead of 1 ½” x ¼” for earthing

neutral point. All the other equipment shall be earthed by circular copper

conductors or as specified otherwise.

86

24.3.11 All the joints made in the strips shall be riveted in accordance with clause

No.802 of G.P. 326 101. The surface, before riveting shall be silver plated,

and soldered after riveting.

24.3.12The ends of the circular earth conductors shall be tinned after twisting, so as

to ensure the minimum contact resistance throughout its useful life.

24.3.13The earth plates, for different earth shall be buried at least 30 feet apart so

that their resistance shall not overlap.

24.3.14The shortest route to the earth the electrode shall be adopted but sharp bends

and joints shall in all cases be avoided. The earthing leads shall be

connected to the earthing electrodes by means of sweating sockets, bars

nuts, bolts and double washers so fixed to make a permanent and positive

connection with the earthing electrode.

24.3.15The maximum continuity resistance from any point in the installation

including earthing leads to the earth plate shall not be exceed 1 ohm. The

contractor therefore, must ensure that the earth leads are efficiently bonded

to all metal works other than the current carrying parts so that the above

resistance limit is no exceeded. Contractor shall arrange testing in the

presence of the Engineer as required under I.E.E. **‘WIRING**

**REGULATIONS’** and submit certified copies to the Engineer.

**25. VOICE SYSTEM**

**25.1 General**

The telephone system shall comprise of a Main Telephone Distribution Board,

Sub-Telephone Distribution Boards floor mounting type telephone socket Outlets.

The contractor shall be responsible for furnishing and installing all the above

equipment. Cables conduits back boxes etc., according the specifications

described herein. The contractor shall carry out the work in accordance with the

Electrical code of practice CP 32.101, CP 327.102 of England, to the local

applicable codes and to the entire satisfaction of telephone Department. The

Contractor shall make all necessary arrangement with telephone and telegraph

Depart for the incoming cable (s). The contractor shall perform all the work to the

satisfaction of T&T Department. The contractor shall guarantee the proper

functioning and defect free working of the system for period of one year for the

date the system shall be commissioned.

87

**25.2 Installation Work**

The installation of non-equipment work shall include delivery, unloading,

uncrossing setting in place, fastening to walls, floor, ceiling and other structures

etc., and the completed conducting according to the specifications given in

conduit installation including fixing of junction/pull boxes, pulling and

connecting of cables installation of Telephone Distribution Board. The telephone

conduits

shall be laid above the RCC floor slab concealed in floor finish, unless otherwise

specifically shown at the location.

**25.3 Telephone Distribution Boards**

The telephone distribution boards shall be made of superior quality teak wood

10mm thick and enclosed in tight fitting in black enameled steel outer box of 16

SWG, the two being fastened together by means of nuts and bolts. A sheet steel

door 16 SWG antitrust treated and painted, with locking arrangement shall be

fixed on the box. The TDB,s will be either flush or surface mounting type as

specified in Bill of Quantities In case of flush mounting type TDB’s, The steel

door will flush with the surface of the wall.

The door shall match the wall color. The TDBs shall be of appropriates size to

accommodate terminal strips. The terminal strips fixed in the TDBS shall be made

to copper. These shall be made of Telephone Industries of Pakistan.

**25.4 Conduit and conduit Accessories**

The contractor shall furnish and Install complete conduit system with associated

outlet boxes and terminal boxes to be complete in all respects for

installation of wire and cable. Conduits shall be 1”Dia PVC. The specification for

conduit accessories remains same as given before of these specifications. At each

telephone outlet locations, the contractor shall furnish

heavy gauge Sheet box black enameled inside and out install flush with the

surface of wall suitable for mounting the telephone rosette.

**26. ENERGY SAVERS**

26.1 Energy Savers shall be E-27 type, suitable for 220 volts, single

Phase a.c. The Energy Saver shall be of Philips or approved equivalent.

LIST OF APPROVED MANUFACTURERS/ SUPPLIERS OF ELECTRICAL EQUIPMENT

The Bidder shall fill name of only one manufacturer for each equipment/ material on which the tender is based. He shall be bound to supply the equipment from the same manufacturer. In case, the Bidder gives names of more than one manufacturer against any equipment, the Engineer/ Owner can ask the Bidder supply the equipment from any one of them.

At the evaluation stage if it is noted that any material offered by bidder does not meet the specification requirements, the Engineer/ Owner reserves the right to ask the successful bidder to replace his choice of manufacturer/ Supplier for that particular equipment.

Any change in manufacturer/ supplier shall only be entertained if there is sufficient reason that adhering to the original choice of manufacturer/ supplier shall be detrimental to either the project quality or project timeline. Proper approval shall have to be sought for change in the choiced manufacturer/ supplier at least 1 month before the equipment is to be procured.

Samples of all equipment to be got approved prior to their procurement. The bidder has to sign and stamp all the pages of this document.

**Equipment/ Supplier Bidder’s Choice**

M.V (Single & Multi Core)

1. Pakistan Cables
2. Fast Cables
3. Newage Cable

or equivalent

MV/ LV Cable Termination and Jointing Kits

1. 3M
2. Raychem

or equivalent

Transformers

1. Siemens
2. PEL
3. ABB

or equivalent

**Equipment/ Suppplier Bidder’s Choice**

RCC Pipes & Accessories

1. Approved Local Make

L.V Switchboards/ Distribution Boards

/ Lighting Control Panels

1. Hussain & Co.
2. PEL
3. Libra Engineering
4. Sunbeam
5. Siemens
6. Scheneider
7. TAJ Engineering

or Equivalent

Circuit Breakers

1. ABB
2. TERASAKI
3. Scheneider
4. General Electric

or Equivalent

LV Cables & Wires

1. Pakistan Cables
2. Fast Cables
3. Newage Cable

or equivalent

PVC Conduits/ Pipes and Accessories

1. Galco
2. Dadex
3. Jeddah Polymer

or Equivalent

Switch & Socket Outlets

1. Clipsal
2. M.K
3. Hager
4. SOGO

or Equivalent

Energy Savers

1. Philips

or Equivalent

Batten Holder

1. Hero
2. Irfan

or Equivalent

Ceiling Rose

1. SK
2. Hero
3. Irfan

or Equivalent

Back Boxes

1. Hussain & co.
2. Ezzi Engineering
3. Clipsal

Or Equivalent

Fan & accessories

1. Pak Fan
2. GFC Fan
3. Millat Fan
4. Royal Fan
5. SK Fan

or Equivalent

Lighting Pole/ Lighting Fixtures

1. Philips
2. Brightlite
3. Oslo
4. Pierlite

or Equivalent

Lighting Poles

1. Farhan Mechanical Works
2. Jamal Poles
3. Albabtain
4. Valmount

or Equivalent

Data Communication System

1. Clipsal by Scheneider
2. 3M
3. Leviton

or Equivalent

Telephone Cable

1. Pakistan Cables
2. Siemens
3. Pony Japan

or Equivalent

PA System

1. Toa
2. Bosch

or Equivalent

Earthing System

1. W.J Furse- U.K
2. Erico- UK

or Equivalent

Cable tray/ Trunking

1. Electroline
2. Ezzi Engineering

or Equivalent

Generator:

1. Caterpillar
2. F.G Wilson
3. Cummins
4. Siemens

or Equivalent

**Note:** Any other material which is not listed above shall be discussed/ Approved by the Engineer before Procurement of that Equipment.