**INVITATION FOR BIDS**

**SUPPLY, INSTALLATION. TESTING & COMMISSIONING, OPERATION AND**

**MAINTENANCE OF TWO (02) PANORAMIC ELEVATORS ALONGWITH**

**CIVIL/MECHANICAL STRUCTURE AND MISCELLANEOUS WORKS AT STATE**

**LIFE TOWER, ISLAMABAD**

**Bid Reference No.SLIC/RE/ISB/CIVIL/MECH/NESPAK/01/02/2025**

1. **State Life Insurance Corporation, Pakistan**, (the “Employer”) invites electronic bids through E-PADS Single Stage Two Envelopes Bidding Procedure, from firms registered with Income Tax and Sales Tax Department licensed by Pakistan Engineering Council in category C-4 (specialization code ME-03 & CE-10), In case of Joint Venture (JV) each member shall have C-5 or higher category, for Supply, Installation, Testing, Commissioning Operation & Maintenance of Two (02) Panoramic Elevators along with Civil/Mechanical Structure And Miscellaneous Works At State Life Tower, Islamabad.

1. e-bidding documents as per regulations, containing detailed terms and conditions, specifications and requirements etc. are available for the registered bidders on EPADS at [(www.eprocure.gov.pk)](http://www.eprocure.gov.pk/)

1. The electronicbids, must be submitted by using EPADSon or before 1100 hours, on 23-072025. Manual bids, shall not be accepted. ElectronicBids (Technical Bids) will be opened at 1130 hours on the same day, in the presence of bidders’ representatives who choose to attend at the same address. This invitation is also available on websites of **PPRA** [(www.ppra.org.pk)](http://www.ppra.org.pk/).

1. All Price bids must be accompanied with a Bid Security in the PKR amount of

2,500,000/- or an equivalent amount in a freely convertible currency.

1. Scanned copies of all documents as mentioned in the Bidding documents shall be uploaded through E-PADS while submitting e-bid However, bid security instrument amounting PKR 2,500,000/- or an equivalent amount in a freely convertible currency (in original) shall also be submitted to below mentioned office.

**DGM/ In charge (RE)**

**State Life Building No. 5 Phase-II (Basement)**

**Blue Area, Islamabad-44000 Ph.: +92 (051) 9202324**



# STATE LIFE INSURANCE CORPORATION PAKISTAN

**SUPPLY, INSTALLATION. TESTING & COMMISSIONING, OPERATION**

**AND MAINTENANCE OF TWO (02) PANORAMIC ELEVATORS**

**ALONGWITH CIVIL/MECHANICAL STRUCTURE AND**

**MISCELLANEOUS WORKS AT STATE LIFE TOWER, ISLAMABAD**



**VOLUME-I**

# JUNE 2025

National Engineering Services Pakistan (Pvt) Limited

New Ventures Division

IEEEP Building, 17-C-1, Faisal Town, Lahore 54700, Pakistan

[Phone:](https://www.google.com/search?safe=strict&client=firefox-b&q=punjab+mass+transit+authority+phone&ludocid=15923822371896249155&sa=X&ved=2ahUKEwiux7Pow-TdAhUGQRoKHfZjD3EQ6BMwF3oECAgQRQ) +92-42-99232261-74 Ext 112 Fax: +92-42-99232275

Email: nvd@nespak.com.pk, hvac\_bsd@hotmail.com

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| Clearance Code |  | Doc No. |  | Rev No. | 02 |

## STATE LIFE INSURANCE CORPORATION PAKISTAN

**SUPPLY, INSTALLATION. TESTING & COMMISSIONING, OPERATION AND**

**MAINTENANCE OF TWO (02) PANORAMIC ELEVATORS ALONGWITH**

**CIVIL/MECHANICAL STRUCTURE AND MISCELLANEOUS WORKS AT STATE LIFE**

**TOWER, ISLAMABAD**

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Invitation for Bids

# INVITATION FOR BIDS

**INVITATION FOR BIDS**

**SUPPLY, INSTALLATION. TESTING & COMMISSIONING, OPERATION**

**AND MAINTENANCE OF TWO (02) PANORAMIC ELEVATORS**

**ALONGWITH CIVIL/MECHANICAL STRUCTURE AND MISCELLANEOUS**

## WORKS AT STATE LIFE TOWER, ISLAMABAD

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Bid Reference No.: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. State Life Insurance Corporation, Pakistan, (the “Employer”) invites electronic bids through E-PADS Single Stage Two Envelopes Bidding Procedure, from firms registered with Income Tax and Sales Tax Department licensed by Pakistan Engineering Council in category C-4 (specialization code ME-03 & CE-10), In case of Joint Venture (JV) each member shall have C-5 or higher category, for Supply, Installation, Testing, Commissioning Operation & Maintenance of Two (02) Panoramic Elevators along with Civil/Mechanical Structure And Miscellaneous Works At State Life Tower, Islamabad.

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**DGM/ In charge (RE)**

**State Life Building No. 5 Phase-II (Basement)**

**Blue Area, Islamabad-44000**

**Ph.: +92 (051) 9202324**

# INSTRUCTIONS TO BIDDERS (IBs)

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### INSTRUCTIONS TO BIDDERS

#### A. GENERAL

**IB.1 Scope of Bid** 1.1 The Employer as defined in the **Bidding Data** hereinafter

called “the Employer” wishes to receive bids for the construction and completion of works as described in these Bidding Documents, and summarized in the **Bidding Data** hereinafter referred to as the “Works”.

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|  |  | 1.2 | The successful Bidder will be expected to complete the Works within the time specified in the **Bidding Data**. |
| **IB.2**          **IB.3** | **Source of Funds**  **Eligible**  **Bidders** | 2.1  3.1 | The Employer has applied for/received a funding from the source(s) in various currencies towards the cost of the project specified in the **Bidding Data** and it is intended that part of the proceeds of this funding will be applied to eligible payments under the Contract for which these Bidding Documents are issued.  This Invitation for Bids is open to all Bidders meeting the following requirements at the time of submission of Bids and thereafter: |

1. Duly eligible for this bidding process;
2. Duly licensed by the Pakistan Engineering Council (PEC) in the category relevant to the value of the Works in the relevant field of specialization.

However, a Foreign Constructor can submit provisional licence with its Bid but the Foreign Constructor will be required to submit standard licence after award of Contract and before start of work.

Foreign Constructor shall not be eligible to participate in bidding individually. Foreign Constructor shall enter into joint venture with Pakistani Constructor registered with the Pakistan Engineering Council in equivalent/compatible category and submit the joint venture agreement to the Employer before participating in bidding in accordance with PEC Construction and Operation of Engineering Works Bye-laws, 1987;

1. Pakistani Constructor must be on Active Taxpayer List of the Federal Board of Revenue and provincial revenue authority/ board where applicable; and
2. All partners constituting the Bidder including proposed subcontractors do not appear in the list of debarred/ blacklisted firms and individuals on the websites of PEC and Federal & Provincial Procurement Regulatory Authorities and have not been declared debarred/ blacklisted by foreign country, international organizations or other foreign institutions.

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| **IB.4** | **Eligible**  **Materials, Equipment and Services** | 4.1 | All materials, equipment and services to be supplied under this Contract shall have their origin in eligible countries described under paragraph 4.4 hereunder. |
|  |  | 4.2 | For purpose of this Clause, “origin” means the place where the Goods are mined, grown or produced or from where the ancillary services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components. |
|  |  | 4.3 | The origin of Goods and Services is distinct from the nationality of the Bidder. |
|  |  | 4.4 | Eligible countries to participate in this bidding process are those which have been notified by Ministry of Interior, Government of Pakistan as Business Friendly Countries (BVL); information can be accessed through following link: <http://www.dgip.gov.pk/Files/Visa%20Categories.aspx#L> |
| **IB.5** | **One Bid per Bidder** | 5.1 Each Bidder shall submit only one Bid either by himself, or as a partner in a joint venture. A Bidder who submits or participates in more than one Bid (other than alternatives pursuant to Clause IB.17) will be disqualified. | |
| **IB.6 Site Visit** | | 6.1 The Bidders are advised to visit and examine the Site of Works and its surroundings and obtain for themselves on their own responsibility all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. All cost in this respect shall be at the Bidder’s own expense.  6.2 The Bidders and any of their personnel or agents will be granted permission by the Employer to enter upon his premises and lands for the purpose of such inspection, but only upon the express condition that the Bidders, their personnel and agents, will release and indemnify the Employer, his personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of such inspection.  **B. BIDDING DOCUMENTS** | |
| **IB.7 Contents of Bidding**  **Documents** | | **7.1** The Bidding Documents, in addition to Invitation for Bids, are those stated below and should be read in conjunction with any Addenda issued in accordance with Clause IB.9: | |

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|  |  |  | 1. Instructions to Bidders; 2. Bidding Data; 3. Evaluation Criteria and Qualification Updating Forms; 4. General Conditions (GC); 5. Particular Conditions (PC): Part A - Contract Data; Part B - Special Provisions; 5. Specifications (SP):   Part A - Specific Provisions;  Part B - Technical Provisions;   1. Letter of Bid; 8. Schedules to Bid; 2. Standard Forms:    1. Form of Bid Security;    2. Letter of Acceptance;   (iii)Form of Contract Agreement;   * 1. Form of Performance Security;   2. DAAB Agreement;   3. Form of Mobilization Advance Guarantee;  1. Drawings. |
|  |  | 7.2 | The Bidders are expected to examine carefully the contents of all the above documents. Failure to comply with the requirements of Bid submission will be at the Bidder’s own risk. Pursuant to Clause IB.26, bids which are not substantially responsive to the requirements of the Bidding Documents will be rejected. |
| **IB.8** | **Clarification of Bidding Documents,**  **Pre-Bid**  **Meeting** | 8.1 | Any prospective Bidder requiring any clarification(s) in respect of the Bidding Documents may notify the Employer in writing at the Employer’s address indicated in the Invitation for Bids. The Employer will respond to any request for clarification which he receives earlier than the period specified in the **Bidding Data**, prior to the deadline for submission of bids. |
|  | | 8.2 | Copies of the Employer’s response will be forwarded to all purchasers of the Bidding Documents, including a description of the enquiry but without identifying its source. |
|  | | 8.3 | The Employer may, on his own or at the request of any prospective Bidder(s), hold a pre-bid meeting to clarify issues and to answer any questions on matters related to the Bidding Documents. The date, time and venue of pre-bid meeting, if convened, are as stipulated in the **Bidding Data**. All prospective Bidders or their authorized representatives shall be invited to attend such a pre-bid meeting. |
|  | | 8.4 | The Bidders are requested to submit questions, if any, in writing so as to reach the Employer not later than seven (7) days before the proposed pre-bid meeting. |

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| **IB.9** | **Amendment** | | 8.5  8.6  9.1  9.2  9.3 | Minutes of the pre-bid meeting, including the text of the questions raised and the replies given, will be transmitted without delay to all purchasers of the Bidding Documents. Any modification of the Bidding Documents listed in SubClause IB.7.1 hereof which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause IB.9 and not through the minutes of the pre-bid meeting.  Absence at the pre-bid meeting will not be a cause for disqualification of a Bidder.  At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by issuing addendum.  Any addendum thus issued shall be part of the Bidding Documents listed in Sub-Clause IB.7.1 hereof and shall be communicated in writing to all purchasers of the Bidding Documents. Prospective Bidders shall acknowledge receipt of each addendum in writing to the Employer.  Such addendum shall be issued not later than number of days prior to the deadline for submission of bids, specified in the **Bidding Data**. To afford prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may extend the deadline for submission of bids in accordance with Clause IB.20.  **C. PREPARATION OF BIDS** |
| **of Bidding**  **Documents** |  |
| **IB.10 Cost of**  **Bidding**        **IB.11 Language of Bid**                **IB.12 Documents** | | 10.1 The Bidders shall bear all costs associated with the preparation and submission of their respective bids and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.  11.1 The Bid and all correspondence and documents related to the  Bid exchanged by a Bidder and the Employer shall be in the  Bid language stipulated in the **Bidding Data** and Particular Conditions of Contract. Supporting documents and printed literature furnished by the Bidders may be in any other language provided the same are accompanied by duly certified translation of the relevant parts in the Bid language, in which case, for purposes of evaluation of the bid, the translation in Bid language shall prevail.  12.1 Each Bidder shall:  (a) submit duly filled in, signed and stamped Letter of Bid and completed Schedules to Bid as required, including priced Bill of Quantities, in accordance with Clause IB.18 hereof; | |
| **Comprising the Bid** | | |

1. submit Bid Security in accordance with Clause IB.16 hereof;
2. submit alternative proposal, if permissible in accordance with Clause IB.17;

1. submit a written power of attorney authorizing the signatory of the Bid to act for and on behalf of the Bidder. The name and position held by each person signing the authorization must be typed or printed below the signature;
2. submit the Qualification Updating Forms duly filled in, signed and stamped along with requisite attachments, to establish that the Bidder continues to meet the Eligibility and Qualification Criteria set out in the Pre-

Qualification Documents and as provided in the Section

“Evaluation Criteria and Qualification Updating Forms”;

1. furnish a technical proposal taking into account the various Schedules to Bid, specially the following: Schedule-C to Bid, Proposed Construction Schedule;

Schedule-D to Bid, Method of Performing the Work;

Schedule-E to Bid, List of Major Equipment;

Schedule-F to Bid, Organization Chart for Supervisory

Staff;

and other pertinent information, such as mobilization programme, etc.

12.2 Bids submitted by a joint venture of two (2) or more firms specified in **Bidding Data**, shall comply with the following requirements:

1. the bid, and in case of a successful bid, the Form of Contract Agreement shall be signed by all members so as to be legally binding on all partners;
2. one of the joint venture partners shall be nominated as being in-charge; and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the joint venture partners;
3. the partner-in-charge shall always be duly authorized to deal with the Employer regarding all matters related with and/or incidental to the execution of Works as per the terms and Conditions of Contract and in this regard to incur any and all liabilities, receive instructions, give binding undertakings and receive payments on behalf of the joint venture;
4. all partners of the joint venture shall at all times and under all circumstances be liable jointly and severally for the execution of the Contract in accordance with the

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|  |  |  | Contract terms and a statement to this effect shall be included in the authorization mentioned under SubPara(b) above as well as in the Letter of Bid and in the Form of Contract Agreement (in case of a successful bid); and |
|  |  |  | (e) a copy of the agreement entered into by the joint venture partners shall be submitted with the bid stating the conditions under which it will function, its period of duration, the persons authorized to represent and obligate it and which persons will be directly responsible for due performance of the Contract and can give valid receipts on behalf of the joint venture, the proportionate participation and corresponding duties & responsibilities of the several firms forming the joint venture, and any other information necessary to permit a full appraisal of its functioning. No amendments/ modifications whatsoever in the joint venture agreement shall be agreed to between the joint venture partners without prior written consent of the Employer. |
|  |  | 12.3 | Bidders shall also submit proposals of work methods and schedule, in sufficient detail to demonstrate the adequacy of the Bidders’ proposals to meet the technical specifications and the completion time referred to in Sub-Clause IB.1.2 hereof. |
| **IB.13 Bid Prices** |  | 13.1 | The price and discount if any quoted by the Bidders in the Letter of Bid and in the Bill of Quantity shall conform to the requirement specified below: |
|  |  | 13.2 | The Bidder shall quote any discounts and the methodology for their application. |
|  |  | 13.3 | If bids are being invited for individual lots (contracts) or for any combination of lots, the Bidders can offer discounts for the individual lots (contracts) as well as for award of more than one Contract and shall specify in their bid. |
|  |  | 13.4 | Unless stated otherwise in the Bidding Documents, the  Contract shall be for the whole of the Works as described in Sub-Clause IB.1.1 hereof, based on the unit rates and/or prices. |
|  |  | 13.5 | The Bidders shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by a Bidder will not be paid for by the Employer when executed and shall be deemed covered by rates and prices for other items in the Bill of Quantities. |
|  |  | 13.6 | All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior to the deadline for submission of bids shall be included in the rates and prices and the total Bid Price submitted by a Bidder. |

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| **IB.14 Currencies**  **of Bid and Payment** | Additional/reduced duties, taxes and levies due to subsequent additions or changes in legislation shall be reimbursed/ deducted as per Sub Clause 13.6 [*Adjustment for Changes in Laws*] of the Conditions of Contract.  13.7 The rates and prices quoted by the Bidders are subject to | |
| 14.1 | adjustment during the performance of the Contract in accordance with the provisions of Sub-Clause 13.7 [*Adjustments for Changes in Cost*] of the General Conditions of Contract. The Bidders shall furnish the prescribed information for the price adjustment formulae in Schedule-A to Bid, and shall submit with their bids such other requisite supporting information if required under the said Schedule.  The unit rates and the prices shall be quoted by the Bidder entirely PKR.  A Bidder expecting to incur expenditures in other currencies for inputs to the Works supplied from outside the Employer’s country (referred to as the “Foreign Currency Requirements”) shall indicate in Table III of Schedule-A to Bid the proportion of the Bid Price (excluding Provisional Sums) needed by him for the payment of such Foreign Currency Requirements; in such case the unit rates and the prices shall be quoted by the Bidder in Equivalent PKR. |
|  | 14.2 | The rates of exchange to be used by the Bidder for currency conversion shall be the TT Selling Rates published or authorized by the State Bank of Pakistan prevailing on the date twenty eight (28) days prior to the deadline for submission of bids. Such rates shall be notified by the Employer not later than fourteen (14) days prior to the deadline for submission of Bids. |

For the purpose of payments, the exchange rates used in Bid preparation shall apply for the duration of the Contract.

**IB.15 Bid Validity** 15.1 Bids shall remain valid for the period stipulated in the **Bidding Data** after the date of Bid Opening specified in Clause IB.23.

15.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Employer may request that the Bidders extend the period of validity for a specified additional period which normally may not be more than the original bid validity period. The request and the responses thereto shall be made in writing. A Bidder may refuse the request without forfeiting his Bid Security. A Bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his Bid Security for the period of the extension, and in compliance with Clause IB.16 in all respects.

**IB.16 Bid Security** 16.1 Each Bidder shall furnish, as part of his bid, a Bid Security in original form in the amount stipulated in the **Bidding Data** in PKR or an equivalent amount in a freely convertible currency.

16.2 The Bid Security shall be, at the option of the Bidder, in the form of Call Deposit Receipt (CDR)/ Pay Order or a Security issued in the prescribed form included in the Bidding Documents, by (a) a Scheduled Bank in Pakistan or (b) a foreign bank duly counter-guaranteed by a Scheduled Bank in Pakistan or (c) an Insurance Company listed in the **Bidding Data** and rated by PACRA/VIS of rating as provided in Table below in favour of the Employer valid for a period 14 days beyond the Bid Validity date. The Bid Security of Joint Venture shall be in the name of Joint Venture or Lead/either Firm of the JV or in ratio of shares of the individual JV partners, submitting the bid.

|  |  |
| --- | --- |
| Bid Price (In Eq. million PKR) | Minimum Rating of Insurance Companies |
| Up to 1000 | A (+) |
| 1001 to no limit | AA |
| *[Note: Insurance Company includes Joint Ventures of*  *Insurance Companies also]* | |
|  |  |  | |
| **IB.17 Alternative**  **Proposals by**  **Bidder** | 16.3  16.4  16.5  16.7  17.1 | Any Bid not accompanied by an acceptable Bid Security shall be rejected by the Employer as non-responsive.  The Bid Securities of the Bidders except the lowest three will be returned by the Employer within twenty eight (28) days from the opening of Bids, provided a Bidder requests for the return of its Bid Security, or upon the expiry of original validity of Bid Security or as extended, whichever is earlier.  The Bid Security of the lowest three Bidders including the successful Bidder will be returned when the successful Bidder has furnished the required Performance Security.  16.6 The Bid Security may be forfeited:   1. if the Bidder withdraws his bid except as provided in Sub Clause IB.22.1; 2. if the Bidder does not accept the correction of his Bid Price pursuant to Sub Clause IB.28.2 hereof; or 3. in the case of successful Bidder, fails to furnish the required Performance Security.   In case of annulment, all Bids submitted and specially, Bid securities, shall be returned to the Bidders within 14 days of annulment.  Unless otherwise specified in the **Bidding Data**, alternative proposal(s) shall not be considered. | |
|  | 17.2 | Should any Bidder consider that he can offer any advantages to the Employer by a modification to the designs, specifications or other conditions, he may, in addition to his Bid to be submitted in strict compliance with the Bidding  Documents, submit any alternative proposal(s) containing | |

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|  |  | (a) relevant design calculations; (b) technical specifications; (c) proposed construction methodology; and (d) any other relevant details/conditions, provided always that the total sum entered on the Letter of Bid shall be that which represents complete compliance with the Bidding Documents. |
|  | 17.3 | Alternative proposal(s), if any, of the Bidder having submitted most advantageous Bid only may be considered by the Employer as the basis for the award of Contract to such Bidder. |
| **IB.18 Format and**  **Signing of Bid** | 18.1 | Bidders are particularly directed that the amount entered on the Letter of Bid shall be for performing the Contract strictly in accordance with the Bidding Documents. |
|  | 18.2 | All Schedules to Bid are to be properly completed and signed. |
|  | 18.3 | No alteration is to be made in the Letter of Bid nor in the Schedules thereto except in filling up the blanks as directed. If any such alterations be made or if these instructions be not fully complied with, the Bid may be rejected. |
|  | 18.4 | Each Bidder shall prepare by filling in the forms completely and without alterations one (1) original and number of copies, specified in the **Bidding Data**, of the documents comprising the Bid as described in Clause IB.12 and clearly mark them “ORIGINAL” and ‘COPY” as appropriate. In the event of discrepancy between them, the original shall prevail. |
|  |  | The Bidder shall also provide complete searchable PDF versions as well as Word, Excel, etc., versions of the Bid if so required in the **Bidding Data**. |
|  | 18.5 | The original of the Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder pursuant to Sub-Clause IB.12.1(d) hereof. All pages of the Bid shall be initialled and stamped by the person or persons signing the bid. |
|  | 18.6 | The Bid shall contain no alterations, omissions or additions, except to comply with instructions issued by the Employer, or as are necessary to correct errors made by the Bidder, in which case such corrections shall be initialled by the person or persons signing the Bid. |
|  | 18.7 | Bidders shall indicate in the space provided in the Letter of Bid their full and proper addresses at which notices may be legally served on them and to which all correspondence in connection with their bids and the Contract is to be sent. |
|  | 18.8 | Bidders should retain a copy of the Bidding Documents and the Bid as their file copy. |
|  | 18.9 | All documents executed outside Pakistan required to be submitted with the Bid must be certified by Pakistani Embassy in the respective country(ies). |

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| **IB.19 Sealing and**  **Marking of**  **Bids**                                          **IB.20 Deadline for** | **D. SUBMISSION OF BIDS** | |
| 19.1  19.2  19.3  19.4  20.1 | Each Bidder shall submit his Bid as under:   1. ORIGINAL and each copy of the Bid shall be separately sealed and put in separate envelopes and marked as such. 2. The envelopes containing the ORIGINAL and copies will be put in one sealed envelope and addressed / identified as given in Sub Clause IB.19.2 hereof.   The inner and outer envelopes shall:   1. be addressed to the Employer at the address provided in the **Bidding Data**; 2. bear the specific identification of this bidding process as specified in the **Bidding Data**; and 3. provide a warning not to open before the time and date for bid opening, as specified in the **Bidding Data**.   In addition to the identification required in Sub-Clause IB.19.2 hereof, the inner envelope shall indicate the name and address of the Bidder to enable the Bid to be returned unopened in case it is declared “late” pursuant to Clause IB.21.  If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.  (a) Bids must be received by the Employer at the address specified no later than the time and date stipulated in the **Bidding Data**. |
| **Submission of Bids** |

1. Bids with charges payable will not be accepted, nor will arrangements be undertaken to collect the bids from any delivery point other than that specified above. Bidders shall bear all expenses incurred in the preparation and delivery of Bids. No claims will be entertained for refund of such expenses.
2. Where delivery of a Bid is by mail and the Bidder wishes to receive an acknowledgment of receipt of such Bid, he shall make a request for such acknowledgment in a separate letter attached to but not included in the sealed Bid envelope.
3. Upon request, acknowledgment of receipt of Bids will be provided to those making delivery in person or by messenger.

20.2 The Employer may, at his discretion, extend the deadline for submission of Bids by issuing an amendment in accordance with Clause IB.9, in which case all rights and obligations of the Employer and the Bidders previously subject to the original deadline will thereafter be subject to the deadline as extended.

**IB.21 Late Bids** 21.1 (a) Any Bid received by the Employer after the deadline for submission of bids prescribed in Clause IB.20 shall be declared late, rejected and returned unopened to such Bidder.

(b) Delays in the mail, delays of person in transit, or delivery of a Bid to the wrong office shall not be accepted as an excuse for failure to deliver a Bid at the proper place and time. It shall be the Bidder’s responsibility to determine the manner in which timely delivery of his Bid will be accomplished either in person, by messenger or by mail.

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| **IB.22 Modification, Substitution and**  **Withdrawal of**  **Bids** | 22.1  22.2 | Any Bidder may modify**,** substitute or withdraw his Bid after Bid submission provided that the modification, substitution or written notice of withdrawal is received by the Employer prior to the deadline for submission of bids.  The modification, substitution, or notice for withdrawal of any Bid shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause IB.19 with the outer and inner envelopes additionally marked  “MODIFICATION”, “SUBSTITUTION” or  “WITHDRAWAL” as appropriate. |
|  | 22.3 | No Bid may be modified by a Bidder after the deadline for submission of Bids except in accordance with Sub Clauses IB.22.1 and 28.2. |
|  | 22.4 | Withdrawal of a Bid during the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified in the Letter of Bid may result in forfeiture of the Bid security in pursuance to Clause IB.16. |

#### E. BID OPENING AND EVALUATION

**IB.23 Bid Opening** 23.1 The Employer will open the Bids including withdrawals, substitution and modifications made pursuant to Clause IB.22, in the presence of Bidders’ representatives who choose to attend, at the time, date and location stipulated in the **Bidding Data**. The Bidders’ representatives who are present shall sign a register evidencing their attendance.

23.2 Envelopes marked “MODIFICATION”, “SUBSTITUTION” or “WITHDRAWAL” shall be opened and read out first. Bids for which an acceptable notice of withdrawal has been submitted pursuant to Clause IB.22 shall not be opened. Only bids that are opened and read out at Bid opening shall be considered further.

23.3 The Bidder’s name, total Bid Price and price of any alternative proposal(s), any discounts, Bid modifications**,** substitution and withdrawals, the presence or absence of Bid security, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening of Bids. Only discounts and alternative proposals

**IB.24 Process to be Confidential**

**IB.25 Clarification of**

#### Bids

read out at Bid opening shall be considered for evaluation. The Letter of Bid and the Summary Bill of Quantities are to be initialled by representative(s) of the Employer attending Bid opening. The Employer shall neither discuss the merits of any Bid nor reject any Bid (except for late Bids, in accordance with Sub-Clause IB 21.1).

23.4 The Employer shall prepare minutes of the Bid opening, including the information disclosed to those present in accordance with the Sub-Clause IB.23.3.

24.1 Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of Contract shall not be disclosed to Bidders or any other person not officially concerned with such process before the announcement of the result of Bid evaluation in the form of final evaluation report giving justification for acceptance or rejection of Bids which shall be done at least fifteen (15) days prior to award of Contract. The announcement to all Bidders will include table(s) comprising read out prices, discounted prices, price adjustments made, final evaluated prices and recommendations against all the Bids evaluated. Any effort by a Bidder to influence the Employer’s processing of Bids or Contract award decisions may result in the rejection of such Bidder’s Bid. Whereas any Bidder feeling aggrieved may lodge a written complaint not later than five (5) days after the announcement of the final evaluation report.

25.1 To assist in the examination, evaluation and comparison of Bids, the Employer may, at his discretion, ask any Bidder for clarification of his Bid, including breakdowns of unit rates and lump sum prices. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The request for clarification and the response shall be in writing. No change in the price or substance of the Bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids in accordance with Clause IB.28.

25.2 The Employer may, at his discretion, ask any Bidder for confirmation/submission of missing information to clarify its Bid. However, the Employer does not have an obligation to request any additional information or clarification with respect to missing or deficient information in a Bid. The Employer may reject any Bid as non-responsive if found materially incomplete, obscure, irregular or omitting any material information required to be submitted in accordance with the Bidding Documents.

25.3 If a Bidder does not provide clarifications of its Bid by the date and time set reasonably (not less than seven (7) days) in the Employer’s request for clarification, the Employer may proceed with the evaluation based on the information submitted in the Bid without waiting for the Bidder’s response.

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| **IB.26 Examination of Bids and Determination**  **of**  **Responsiveness** | 26.1  26.2 | Prior to the comparison of Bids, the Employer will determine whether each Bid is substantially responsive to the requirements of the Bidding Documents.  The Employer’s determination of a Bid’s responsiveness is to be based on the contents of the Bid itself, as defined in Sub- Clause IB.12. |
|  | 26.3 | A substantially responsive Bid is one which meets the requirements of the Bidding Documents, without material deviation, reservation or omission. A material deviation, reservation or omission is one that, (a) if accepted, would:   1. affect in any substantial way the scope, quality or performance of the Works; or 2. limit in any substantial way, inconsistent with the   Bidding Documents, the Employer’s rights or the Bidder’s obligations under the proposed Contract; or  (b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids. |
|  | 26.4 | During the evaluation of Bids, the following definitions apply: |
| 1. “Deviation” is a departure from the requirements specified in the Bidding Documents; 2. “Reservation” is the setting of limiting conditions or withholding from complete acceptance of the   requirements specified in the Bidding Documents; and   1. “Omission” is the failure to submit part or all of the information or documentation required in the Bidding Documents.    1. The Employer shall examine the technical aspects of the Bid submitted in accordance with Sub-Clause IB.12.1(f), in particular, to confirm that all requirements stated in Specifications have been met without any material deviation, reservation or omission.    2. If a Bid is not substantially responsive to the requirements of the Bidding Documents, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation, reservation or omission. | |
| **IB.27 Nonmaterial** | 27.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid*.* | |
| **Nonconformities**  27.2 Provided that a Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Bid related to documentation requirements. Requesting information or | | |

documentation on such nonconformities shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

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| **IB.28 Correction of**  **Arithmetic**  **Errors** | 27.3 Provided that a Bid is substantially responsive, the Employer | |
| 28.1 | shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component, by adding the average price of the item or component quoted by other lowest two evaluated substantially responsive Bidders. If the price of the item or component cannot be derived from the price of other substantially responsive Bids, the Employer shall use a suitable CSR, adjusted to the date 28 days earlier to the Bid submission date or its best assessment.  Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:   1. where there is a discrepancy between the amounts in figures and in words, the amount in words will govern. 2. where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer there is an obviously gross misplacement of the decimal point in the unit rate, in which case the line item total as quoted will govern and the unit rate will be corrected. 3. if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected. |
|  | 28.2 | The amount stated in the Letter of Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and with the concurrence of the Bidder, shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected Bid Price, his Bid will be rejected, and the Bid security shall be forfeited in accordance with Sub Clause IB.16.6(b) hereof. |
| **IB.29 Evaluation and Comparison of**  **Bids** | 29.1 | The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Clause IB.26. The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted. |
|  | 29.2 | In evaluating and comparing the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows: |

(a) making any correction for arithmetic errors pursuant to Clause IB.28;

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| **IB.30 Abnormally**  **Low Bids** | 1. price adjustment due to discounts offered in accordance with Sub-Clause IB.23.3; 2. excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities, but including competitively priced daywork; 3. making an appropriate price adjustment for any quantifiable nonmaterial nonconformities in accordance with Sub-Clause IB.27.3; and 4. the additional evaluation factors are specified in Section Evaluation Criteria and Qualification Updating Forms.   29.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in Bids’ comparison.  30.1 If the Bid Price of the successful Bidder is more than 15% below the lower of the Employer’s estimate of the cost of work to be performed under the Contract or average of other lowest two evaluated substantially responsive Bids, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Bill of Quantities to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, the Employer may require an additional Performance Security by 10% of the difference of the Bid Price as determined hereinabove upto issuance of Taking Over Certificate at the expense of the successful Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract. The Bids having Bid Price lower than 25% shall be liable to be rejected.  31.1 If the Bid of the successful Bidder is seriously unbalanced (Front Loaded) in relation to the average of other evaluated substantially responsive Bids, the Employer during execution of contract may pay against measured quantities of significantly higher quoted line item(s) rate(s) with respect to same line item(s) rate(s) determined from the average of other lowest two evaluated substantially responsive Bids as instructed by the Engineer. The balance line item(s) rate(s) may be paid against the same measured quantities at the time of issuance of Taking Over Certificate or as instructed by the Engineer. |
| **IB.31 Unbalanced or**  **Front Loaded**  **Bids** |

#### F. AWARD OF CONTRACT

**IB.32 Award** 32.1 Subject to Clauses IB.33 and IB.39, the Employer will award

**Criteria** the Contract to the Bidder whose Bid has been determined as most advantageous Bid (substantially responsive to requirements of the Bidding Documents with the lowest evaluated Bid Price).

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| **IB.33 Employer’s Right to Annul the Bidding Process** | 33.1 | Notwithstanding Clause IB.32, the Employer reserves the right to annul the bidding process and reject all Bids, at any time prior to award of Contract, without thereby incurring any liability to the affected Bidders or any obligation. |
|  |  | The Employer shall upon request communicate to any Bidder who submitted a Bid, the grounds for its rejection of all Bids but is not required to justify those grounds. Rejection of all Bids shall be notified to all Bidders promptly. |
| **IB.34 Notification of Award** | 34.1 | Prior to expiration of the period of Bid validity prescribed by the Employer, the Employer will notify the successful Bidder in writing (“Letter of Acceptance”) that his Bid has been accepted. This letter shall name the sum which the Employer will pay the Contractor in consideration of the execution and completion of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Conditions of Contract called the “Accepted Contract Amount”). |
|  |  | The Letter of Acceptance will also state the remedies with respect to Sub-Clauses IB.30 & IB.31 if applicable. |
|  | 34.2 | No negotiation with the Bidder having submitted most advantageous Bid or any other Bidder shall be permitted, however, Employer may have clarification meetings before issuing Letter of Acceptance to get clarified any item in the Bid evaluation report. |
|  | 34.3 | The Letter of Acceptance/ notification of award and its acknowledgement/acceptance by the Bidder will constitute the formation of the Contract, binding the Employer and the Bidder till signing of the formal Contract Agreement. |
|  | 34.4 | Upon furnishing by the successful Bidder of a Performance Security, the Employer will promptly notify the other Bidders that their Bids have been unsuccessful and return their Bid securities in accordance with Sub-Clause IB.16.5. |
| **IB.35 Performance Security** | 35.1 | The successful Bidder shall furnish to the Employer a Performance Security in the form and the amount stipulated in the Conditions of Contract and additional Performance Security if applicable under IB.30 as stated in the Letter of Acceptance, within a period of 28 days after the receipt of Letter of Acceptance. |
|  | 35.2 | Failure of the successful Bidder to comply with the requirements of Sub Clause IB.35.1 or Clauses IB.36 or IB.37 shall constitute sufficient grounds for the annulment of the award, forfeiture of the Bid security and to award the Contract to the Bidder having submitted next advantageous Bid. |
| **IB.36 Signing of Contract**  **Agreement** | 36.1 | Within 14 days from the date of furnishing of acceptable  Performance Security under the Conditions of Contract, the Employer will notify the successful Bidder to depute its representative with appropriate Power of Attorney to sign the Contract Agreement in the form provided in the Bidding Documents, incorporating all agreements between the parties. |

36.2 The formal Agreement between the Employer and the successful Bidder shall be executed within 14 days of the receipt of the above stated notification by the successful Bidder from the Employer.

**IB.37 Integrity Pact** 37.1 The Bidder shall sign and stamp the Integrity Pact provided at

Schedule-J to Bid in the Bidding Documents for all Federal Government procurement contracts exceeding PKR ten million. Failure to provide such Integrity Pact shall make the Bidder non-responsive.

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| **IB.38 Instructions**  **not Part of Contract**      **IB.39 Corrupt and Fraudulent**  **Practices** | 38.1 Bids shall be prepared and submitted in accordance with the | |
| 39.1 | Instructions to Bidders which are provided to assist the Bidders in preparing Bids but do not constitute part of the Contract.  The Employer will reject a Bid if it determines that the Bidder recommended for award, or any of its personnel, or its agents, or its sub-contractors, service providers, suppliers and/or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract under this bidding. |
|  | 39.2 | The Employer will blacklist and hence forthwith debar a Constructor or individual, at any time, in accordance with the prevailing Public Procurement Rules 2004. |

# BIDDING DATA (BD)

**BIDDING DATA**

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| **IB Clause Reference** | **Bidding Data** |
| **1.1** | Entire text of Sub-Clause 1.1 is deleted and replaced with the following:    The Employer as defined, herein below, hereinafter called “the Employer” wishes to receive bids on EPADS for the construction and completion of works as described in these Bidding Documents, and summarized, herein below, hereinafter referred to as the “Works”.    **Name and address of the Employer:**    **DGM/ In charge (Real Estate Department)**  State Life Building No. 5 Phase-II (Basement)  Blue Area, Islamabad-44000 Ph.: +92 (051) 9202324    **Name of the Project & Summary of the Works:**    Supply, Installation. Testing & Commissioning, Operation and Maintenance of Two (02) Panoramic Elevators along with  Civil/Mechanical Structure and Miscellaneous Works at State Life Tower, Islamabad |
| **1.2** | Time for Completion for the Works: 210 days |
| **2.1** | Name of the Borrower/Source of Funding:  The Employer has arranged funds from its own sources. |
| **3.1(b)** | The Bidder shall be duly licensed by the Pakistan Engineering Council  (PEC) in the category C-4 or higher (in specialization code ME-03 and CE-10), In case of Joint Venture (JV) each member shall have C-5 or higher category. |
| **8.1** | Entire text of Sub-Clause 8.1 is deleted and replaced with the following:    Any prospective Bidder requiring any clarification(s) in respect of the Bidding Documents may notify the Employer in writing on EPADS. The Employer will respond on EPADS to any request for clarification which he receives earlier than the period as specified in Bidding Data 8.4, prior to the deadline for submission of bids. The Employer’s response shall be on EPADS & Email to all Bidders who have acquired the Bidding Document including a description of the enquiry but without identifying its source. It will be responsibility of bidders to check website for clarifications. |

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| **8.3** | Venue, time, and date of the pre-Bid meeting:    **Venue:** Office of DGM/ In charge (Real Estate Department)  State Life Building No. 5 Phase-II (Basement), Blue Area, Islamabad-44000  **Time:** 1100 Hours  **Date:** On 11th day from date of Advertisement |
| **8.4** | Entire text of Sub-Clause 8.4 is deleted and replaced with the following:    The Bidders are requested to submit questions, if any, in Writing on EPADS so as to reach the Employer not later than one (01) day before the proposed pre-bid meeting. |
| **8.5** | The following line is added at the end of the Sub-Clause 8.5:    All such minutes, including the text of the questions raised and the replies given will be uploaded on the EPADS & sent through email. |
| **9.1** | The following line is added at the end of the Sub-Clause 9.1:    All such addenda shall be uploaded on the EPADS. |
| **9.2** | The following line is added at the end of the Sub-Clause 9.2:    The acknowledge receipt of each addendum by the Bidders shall be submitted on the EPADS. |
| **9.3** | Number of days: Seven (07)    The following line is added at the end of the Sub-Clause 9.3:    All such information will be shared through EPADS. |
| **11.1** | Bid language: English |
| **12.1** | Entire text of Sub-Clause 12.1 is deleted and replaced with the following:    The Bid shall comprise two envelopes submitted simultaneously on EPADS, one called the Technical Bid and the other the Price Bid, containing the following documents:    **(A) Technical Bid**  a) Duly filled in, signed and stamped Letter of Technical Bid in |

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|  | accordance with Clause IB.18 hereof,     1. Bid Security in accordance with Clause IB.16 hereof,      1. Written power of attorney authorizing the signatory of the Bid to act for and on behalf of the Bidder. The name and position held by each person signing the authorization must be typed or printed below the signature,      1. Qualification Forms duly filled in, signed and stamped along with requisite attachments, to establish that the Bidder meets the Eligibility and Qualification Criteria set out in the Section “Evaluation   Criteria and Qualification Forms”     1. furnish a technical proposal taking into account following Schedules to Bid duly filled-in and completed in accordance with Clause IB.18:     Schedule-C to Bid [ Construction Schedule]  Schedule-D to Bid [Method of Performing the work]  Schedule-E to Bid [List of Major Equipment]  Schedule-F to Bid [Organization chart for the supervisory staff and labour]  Schedule-G to Bid [List of Subcontractors]  Schedule-I to Bid [Construction camp and housing facilities]  Schedule-J to Bid [Integrity Pact]  Schedule-K to Bid [Specific Works Data]  Schedule-L to Bid [List of Recommended Manufacturers for  Items/Materials/Equipment] Schedule-M to Bid [Bidder’s Equipment Data]  Schedule-N to Bid [Essential and Recommended Spare Parts]     1. JV Agreement (if applicable) in accordance with Clause IB.12.2 hereof, and      1. Any other documents required to be submitted with Technical Bid in accordance with these Bidding Documents.     **(B) Price Bid**     1. Duly filled in, signed and stamped Letter of Price Bid in accordance with Clause IB.18 hereof,      1. Schedule-B to Bid [Bill of Quantities] duly filled-in and completed in accordance with Clause IB.18; and Schedule-H to Bid [Estimated Progress Payments]      1. Any other documents required to be submitted with Price Bid in accordance with these Bidding Documents. |
| **12.2** | Maximum number of JV Partners shall be two (02). |

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| **14.1** | Bidders to quote entirely in Pak. Rs.  Foreign Currency Requirement are not applicable. |
| **15.1** | Period of Bid Validity: 120 days |
| **16.1** | Amount of Bid Security: PKR 2,500,000 (Pak Rupees two million five hundred thousand only)    The following line is added at the end of the Sub-Clause 16.1:    The Bid Security shall be furnished on name of **"REAL ESTATE, STATE LIFE INSURANCE CORPORATION ISLAMABAD"**, as part of Technical Bid. Scanned Copy of bid Security to be attached on EPADS with Technical Bid. The Original Bid Security should be submitted to the Employer on the day of bid opining, failing which bid shall be rejected. |
| **16.2** | The text reading as ‘or (c) an Insurance Company listed in the Bidding Dataand rated by PACRA/VIS of rating as provided in Table below’ and the corresponding table are deleted. |
| **17.1** | Alternative Proposal(s) by the Bidder shall not be considered. |
| **18.4** | The test of sub-clause 18.4 is deleted in its entirety. |
| **19** | The entire Clause IB. 19 is deleted and is replaced with the following:    19.1 Each bidder shall submit his Bid as per procedure and instructions given in training manuals of EPADS (e-Pak Acquisition and Disposal System) on PPRA website in accordance with E-Pak Procurement regulations, 2023. |
| **20.1** | The text of sub-clause IB. 20.1 (a, b, c & d) is deleted and is replaced with the following:    Bids must be received by the Employer through EPADS not later than the time and date stipulated in the Invitation for Bids. |
| **21.1** | The text of sub-clause IB. 21.1 (a & b) is deleted and is replaced with the following:    As per EPADS Procurement Regulations, 2023. |
| **22.1** | The text of sub-clause IB. 22.1 is deleted and is replaced with the following: |

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|  | A Bidder may modify or substitute his Bid on EPADS after Bid submission, prior to the deadline for submission of Bids. |
| **22.2** | The text of sub-clause IB. 22.2 is deleted and is replaced with the following:    The modification, substitution or notice for withdrawal of any bid shall be submitted on EPADS. |
| **23.1** | Entire text of Sub-Clause 23.1 is deleted and replaced with the following:    The Employer will open the Technical Bids including withdrawals, substitution and modifications made pursuant to Clause IB.22 on EPADS, in the presence of Bidders` representatives who choose to attend, at the address, date and time specified in the Invitation for Bids. The Bidders’ representatives who are present shall sign a register evidencing their attendance. The Price Bids will remain unopened until the specified time of their opening.    The ‘Technical Bids’ shall be opened one at a time, and the following read out and recorded:     1. the name of the Bidder; 2. whether there is a modification or substitution; 3. the presence or absence of Bid Security with amount; and 4. any other details as the Employer may consider appropriate. |
| **23.2** | The word “envelopes” on the start of the sub-clause IB. 23.2 is replaced with the word “Bids”. |
| **23.3** | Entire text of Sub-Clause 23.3 is deleted and replaced with the following:    At the end of the evaluation of the Technical Bids, the Employer will invite only those bidders who have submitted substantially responsive Technical Bids to attend the opening of the Price Bids on EPADS. The date, time, and location of the opening of Price Bids will be advised in writing by the Employer on EPADS.   |  |  | | --- | --- | | Price Bids of all Technically non-responsive Bidders shall be remained | | | unopened on EPADS and returned as it is. |  |     The ‘Price Bids shall be opened one at a time on EPADS and the following read out and recorded:    (a) the name of the Bidder; |

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|  | 1. whether there is a modification or substitution; 2. the Bid Prices, including any discounts; and 3. any other details as the Employer may consider appropriate.     Only discounts read out at Bid opening shall be considered for evaluation. The Employer shall neither discuss the merits of any Bid nor reject any Bid (except for late Bids, in accordance with Sub-Clause IB 21.1). |
| **25.1** | The entire text of the sub-clause IB. 25.1 is deleted and replaced with following:    To assist in the examination, evaluation and comparison of Bids, the Employer may, at his discretion, ask any Bidder for clarification of his Bid, including breakdowns of unit rates and lump sum prices on EPADS & Email. Any clarification submitted by a Bidder on EPADS & Email that is not in response to a request by the Employer shall not be considered. The request for clarification and the response shall be in writing on EPADS & Email. No change in the price or substance of the Bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids in accordance with Clause IB.28. |
| **25.2** | The following text is added at the end of the sub-clause IB. 25.2:    All such confirmation/submission of missing information shall be made through EPADS & Email. |
| **26.5** | In second line the Sub-Clause No. IB.12.1 (f) is amended to read as  ‘Sub-Clause No. IB.12.1 (A)(e)’ as mentioned in Bidding Data. |
| **7.1 (3), 29.2(e)** | ‘Qualification Updating Forms’ shall be read as ‘Qualification Forms’. |

Evaluation Criteria and Qualification Forms

# EVALUATION CRITERIA AND QUALIFICATION FORMS

**EVALUATION CRITERIA AND QUALIFICATION FORMS**

1. **General**

This Section contains Eligibility and Qualification Criteria that the Employer shall use to evaluate Bids and qualify Bidders in accordance with Clauses IB.26 of Instructions to Bidders. The Bidder shall provide all the information requested in the relevant forms contained in Bidder’s Qualification Forms provided herein.

The information provided in the forms shall be substantiated with valid documentary evidences otherwise the requirement will not be considered as complied.

Wherever a Bidder is required to state a monetary amount, Bidders shall indicate the PKR equivalent using the rate of exchange determined as follows:

- For financial data - Exchange rate prevailing on the last day of the respective calendar year (in which the amounts for that year are to be converted) was originally established.

Exchange rates shall be taken from the publicly available source identified in the SubClause IB.14.2. Any error in determining the exchange rates in the Bid may be corrected by the Employer.

1. **Domestic Preference**

Not Applicable

1. **Evaluation (IB 29.2(e))**

In addition to the criteria listed in IB 29.2 (a) - (d) the following criteria shall apply:

* 1. **Assessment of adequacy of Technical Proposal with Requirements**

* 1. **Multiple Contracts**, if permitted under Sub-Clause 1.1 of Bidding Data, will be evaluated as follows: **[Not Applicable]**

* 1. **Price Adjustments**, if permitted under IB.29.2(d), will be evaluated as follows:

* + 1. Price Adjustment for Completeness in Scope of Work

In case of omission in the scope of work of a quoted item, no price adjustment for the omitted item(s) shall be applied provided that the Bidder has mentioned in his Bid that the same is covered in any other item. Otherwise, the adjustments will be applied for comparison purpose only, taking the average price quoted by other lowest two evaluated substantially responsive Bidders in their original Bids for corresponding item. In case of non-availability of price from other Bidders, the price will be estimated by the Employer from a suitable CSR, adjusted to the date 28 days earlier to the Bid submission date or the Employer shall use its best assessment.

The price adjustment shall not justify any additional payment by the Employer and the price(s) of omitted item(s) shall be deemed covered by other prices of the Bill of Quantities.

* + 1. Price Adjustment for Technical/ Commercial Non-Compliance

The cost of making good any deficiency resulting from technical/commercial non- compliance will be added to the Corrected Total Bid Price for comparison purpose only.

The adjustments will be applied taking the average price quoted by other lowest two evaluated substantially responsive Bidders in their original Bids for corresponding item. In case of non-availability of price from other Bidders, the price will be estimated by the Employer in accordance with sub-para (a) hereof.

1. **Eligibility and Qualification**

Eligibility and Qualification information described here below must be met by the legal entity(ies) comprising the Bidder, and not the Bidder’s/JV partner’s sister or parent companies, subsidiaries or affiliates.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Eligibility and Qualification**  **Criteria** | | | **Compliance Requirements** | | | | **Documentation** |
| **No**  **Subject Requirement**  **.** | | | **Single Entity** | **Joint Venture** | | | **Submission Requirements** |
| **All**  **Partners**  **Combine**  **d** | **Each**  **Membe**  **r** | **Lead**  **Memb er** |
| **1. Eligibility** | | |  | | | |  |
| 1.1 | **PEC**  **Licensing** | Licensing by  Pakistan  Engineering Council (PEC) in accordance with paragraph (b) of Sub-Clause IB.3.1.    Pakistan  Engineering Council (PEC) in the category C-4 or higher (in specialization  code ME-03 and CE-10),  In case of  Joint Venture  (JV) each member shall | Must meet  requirem ent | Must meet  requirem ent | Must meet  require ment | N/A | Provisional/  Standard PEC  License. Foreign Constructor must submit JV  Agreement with  Pakistani  Constructor.    Both JV Partner must have valid\verifiable  PEC Certificate. |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Eligibility and Qualification**  **Criteria** | | | **Compliance Requirements** | | | | **Documentation** |
| **No**  **.** | **Subject** | **Requirement** | **Single Entity** | **Joint Venture** | | | **Submission Requirements** |
| **All**  **Partners**  **Combine**  **d** | **Each**  **Membe**  **r** | **Lead**  **Memb er** |
|  |  | have C-5 or higher category . |  |  |  |  |  |
| 1.2 | **Pakistani**  **Constructor**  **’s Tax**  **Registration** | Requirement of Pakistani Constructor  on Active  Taxpayer  List (ATL) of FBR in accordance  with paragraph (c) of Sub-  Clause IB.3.1. | Must meet  requirem ent | N/A | Must meet  require ment | N/A | Latest extracts of ATL and online verifiable. |
| 1.3 | **Debarment/ Blacklisting** | Not having been debarred/blac  klisted in accordance  with paragraph (d) of Sub-  Clause IB.3.1. | Must meet  requirem ent | N/A | Must meet  require ment | N/A | Undertaking on non-judicial stamp paper is required. |
| **2.** **Pending Litigation** | | | | | | | |
| 2.1 | **Pending Litigation** | Bidder’s financial  position and prospective  long term  profitability  sound according to criteria established in 3.1 below and assuming that all pending litigation will be resolved against the  Bidder . | Must meet  requirem ent | N/A | Must meet  require ment | N/A | Form CON-1 |
|  | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Eligibility and Qualification**  **Criteria** | | | **Compliance Requirements** | | | | **Documentation** |
| **No**  **.** | **Subject** | **Requirement** | **Single Entity** | **Joint Venture** | | | **Submission Requirements** |
| **All**  **Partners**  **Combine**  **d** | **Each**  **Membe**  **r** | **Lead**  **Memb er** |
| **3. Financial Situation and Performance** | | | | | | | |
| 3.1 | **Financial Capability** | The Bidder  shall demonstrate that it has access to, or has available, liquid assets, unencumbere  d real assets, lines of credit, and other  financial  means  (independent  of any  contractual advance payment) sufficient to meet the  construction  cash flow  requirements estimated as Eq. PKR 35 million for the subject contract(s) net of the Bidders other commitments. | Must meet  requirem ent | Must meet  requirem ent | N/A | N/A | Form FIN – 3.1, with attachments (Bank Credit Line  Letter) |
| 3.2 | **Financial Resources** | The Bidders shall also  demonstrate,  to the satisfaction of the Employer, that it has adequate sources of finance to meet the cash flow | Must meet  requirem ent | Must meet  requirem ent | N/A | N/A | Form FIN-3.2, FIN-  3.3, with  attachments |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Eligibility and Qualification**  **Criteria** | | | **Compliance Requirements** | | | | **Documentation** |
| **No**  **.** | **Subject** | **Requirement** | **Single Entity** | **Joint Venture** | | | **Submission Requirements** |
| **All**  **Partners**  **Combine**  **d** | **Each**  **Membe**  **r** | **Lead**  **Memb er** |
|  |  | requirements  on works currently in progress and for future  contract commitments. |  |  |  |  |  |
| 3.3 | **Audited**  **Balance**  **Sheet(s)** | The audited balance sheets or, if not required by the laws of the Bidder’s country, other financial statements acceptable to the Employer, for the last three (03) years shall be submitted and must demonstrate the current soundness of the Bidder’s financial  position and indicate its prospective long-term profitability. | Must meet  requirem ent | N/A | Must meet  require ment | N/A | Audited Balance Sheet Copies |
|  | | |  | | | |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Eligibility and Qualification**  **Criteria** | | | **Compliance Requirements** | | | | **Documentation** |
| **No**  **.** | **Subject** | **Requirement** | **Single Entity** | **Joint Venture** | | | **Submission Requirements** |
| **All**  **Partners**  **Combine**  **d** | **Each**  **Membe**  **r** | **Lead**  **Memb er** |
| **4. Experience** | | | | | | | |
| 4.1 | **Project**  **Experience**  **(Elevator)** | Successful experience of Supply,  Installation,  Testing &  Commissionin g of Elevators during last 07 years:     * At least one project/work   having a minimum cost of PKR 40 million.    OR     * At least two projects/works each having minimum cost PKR 20 million.     OR     * At least five projects/works where two [2] or more   elevators were supplied and installed in each project. | Must meet requirem ent | Must meet requirem ent | N/A | N/A | Provide copies of Contracts  Agreements/ Work Orders along with Scope of Work/  BOQ and  Completion  Certificates. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Eligibility and Qualification**  **Criteria** | | | **Compliance Requirements** | | | | **Documentation** | |
| **No**  **.** | **Subject** | **Requirement** | **Single Entity** | **Joint Venture** | | | **Submission Requirements** | |
| **All**  **Partners**  **Combine**  **d** | **Each**  **Membe**  **r** | **Lead**  **Memb er** |
| 4.2 | **Project**  **Experience**  **(Civil/Steel**  **Structure)** | Successful experience of Supply,  Installation,  Testing &  Commissionin g of Steel  Structure during last 07 years:     * At least one project/work   having a minimum cost of PKR 15 million.    OR     * At least two projects/works each having minimum cost PKR 7.5 million.     OR     * At least three projects/works each having minimum cost PKR 5 million. | Must meet requirem ent | Must meet requirem ent | N/A | N/A | Provide copies of Contracts  Agreements/ Work Orders along with  Scope of  BOQ  Completion Certificates specifically highlighting steel works. | Work/ and    the structure |
| 4.3 | **Operation and Maintenanc e Contracts** | Successful  Operation and  Maintenance (O&M) experience of at least  Fifteen [15] elevators in  Pakistan | Must meet  requirem ent | Must meet  requirem ent | N/A | N/A | Provide copies  Service Contracts/ Work Orders and/ or Completion  Certificates. | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Eligibility and Qualification**  **Criteria** | | | **Compliance Requirements** | | | | **Documentation** |
| **No**  **.** | **Subject** | **Requirement** | **Single Entity** | **Joint Venture** | | | **Submission Requirements** |
| **All**  **Partners**  **Combine**  **d** | **Each**  **Membe**  **r** | **Lead**  **Memb er** |
|  |  | during last 07 years. |  |  |  |  |  |
| 4.4 | **Principal/**  **Manufacture**  **r**  **Experience** | The bidder must have  valid authorization certificate from Principal Manufacturer  of offered equipment for at least last three (03) years; or all equipment  must be  supplied through authorized representative and/or sole distributor of Principal  Manufacturer in Pakistan since at least last three (03) years.    The Principal Manufacturer  of offered  Elevator make shall meet the minimum following criteria:    • International experience of at least 4000 elevators of successful  supply and  installation | Must meet  requirem ent | Must meet  requirem ent | N/A | N/A | Provide company profile, copies Service Contracts/  Work Orders and/or Completion Certificates  against offered brand and online verifiable EU type examination certificate. |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Eligibility and Qualification**  **Criteria** | | | **Compliance Requirements** | | | | **Documentation** |
| **No**  **.** | **Subject** | **Requirement** | **Single Entity** | **Joint Venture** | | | **Submission Requirements** |
| **All**  **Partners**  **Combine**  **d** | **Each**  **Membe**  **r** | **Lead**  **Memb er** |
|  |  | across the world.     * Minimum twenty [20]   years’ international experience of complete elevator manufacturing , fabrication and after  sales services.     * Minimum   experience of thirty [30] successful installation of elevators in Pakistan.     * EU type examination certificates with   Annexures (EN-81 compliance) shall also be provided against complete offered elevator model no. |  |  |  |  |  |
| 5. **Personnel** | | | | | | | |
| 5.1 | **Mechanical**  **Engineer (PEC registered)** | Total Works experience shall be five (05) years or more and three (03) | Must meet  requirem ent | Must meet  requirem ent | N/A | N/A | The nominated person CV, certified last four months’ pay slips and verification through PEC |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Eligibility and Qualification**  **Criteria** | | | **Compliance Requirements** | | | | **Documentation** |
| **No**  **.** | **Subject** | **Requirement** | **Single Entity** | **Joint Venture** | | | **Submission Requirements** |
| **All**  **Partners**  **Combine**  **d** | **Each**  **Membe**  **r** | **Lead**  **Memb er** |
|  |  | years relevant experience  (Elevator  Works) |  |  |  |  | online portal shall be provided to demonstrate its presence in the company. The  Bidder shall also complete the Forms PER-1 and PER-2. |
| 5.2 | **Civil**  **Engineer/**  **Structural**  **Engineer (PEC registered)** | Total Works experience shall be five (05) years or more and three (03) years relevant experience (Steel  Structure  Works) | Must meet  requirem ent | Must meet  requirem ent | N/A | N/A | The nominated person CV, certified last four months’ pay slips and verification through PEC online portal shall be provided to demonstrate its presence in the company. The  Bidder shall also complete the Forms PER-1 and PER-2. |
| 5.3 | **Civil**  **Inspector**  **(DAE, Civil)** | Total Works experience shall be five (05) years or more and three (03) years relevant experience (structure/ civil Works) | Must meet  requirem ent | Must meet  requirem ent | N/A | N/A | The nominated person CV, certified last four months’ pay slips shall be provided to demonstrate its presence in the company. The  Bidder shall also complete the Forms PER-1 and PER-2. |
| 5.4 | **Mechanical**  **Inspector**  **(DAE,**  **MECH)** | Total Works experience shall be five (05) years or more and three (03) years relevant experience (elevator | Must meet  requirem ent | Must meet  requirem ent | N/A | N/A | The nominated person CV, certified last four months’ pay slips shall be provided to demonstrate its presence in the company. The  Bidder shall also |
| **Eligibility and Qualification**  **Criteria** | | | **Compliance Requirements** | | | | **Documentation** |
| **No**  **.** | **Subject** | **Requirement** | **Single Entity** | **Joint Venture** | | | **Submission Requirements** |
| **All**  **Partners**  **Combine**  **d** | **Each**  **Membe**  **r** | **Lead**  **Memb er** |
|  |  | Works) |  |  |  |  | complete the Forms PER-1 and PER-2. |
| 6. **Equipment**  *[These are the minimum requirements. However, the Bidder should have sufficient resources to complete the Project within scheduled time. The Bidder shall provide details of proposed items of equipment using the Forms provided under* ***Schedule-E to Bid****. The Bidder shall also submit an*  *‘Undertaking for access to all these equipment.]* | | | | | | | |
|  | **Equipment/ Tools** | 1. Torque   Wrench   1. Speedome   ter   1. Laser meter 2. Measuring   Tape   1. SPL Meter 2. Multi meter 3. Weight machine 4. Rope   tension measuring device   1. Scaffoldin g 2. Drill   Machine   1. Cutting machine 2. Welding Transform ers 3. Tool Kit | Must meet  requirem ent | Must meet  requirem ent | N/A | N/A |  |

**Bidders Qualification Forms**

To establish its qualifications to perform the contract in accordance with Section (Evaluation Criteria and Qualification Forms) the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder.

**Form ELI -1.1**

**Bidder Information Form**

Date:

Bid Reference No. (if any) and title

Page of pages

|  |
| --- |
| Bidder's name |
| In case of Joint Venture (JV), name of each member: |
| Bidder's country of registration:  *[indicate country of Constitution]* |
| Bidder's year of incorporation: |
| Bidder's legal address [in country of registration]: |
| Bidder's authorized representative information Name:    \_  Address: *\_ \_*  Telephone/Fax numbers:  E-mail address: |
| 1. Attached are copies of original documents, in case of JV, JV agreement, in accordance with Sub-Clause IB 3.1. |

**Form ELI -1.2**

**Bidder's JV Information Form**

**(to be completed for each member of Bidder’s JV)**

Date:

Bid Reference No. (if any) and title

Page of pages

|  |
| --- |
| Bidder’s JV name: |
| JV member’s name: |
| JV member’s country of registration: |
| JV member’s year of constitution: |
| JV member’s legal address in country of constitution: |
| JV member’s authorized representative information Name:  Address:  Telephone/Fax numbers:  E-mail address: |

**Form CON – 1**

**Pending**

**Litigation**

Bidder’s Name: Date:

JV Member’s Name \_\_\_\_\_\_\_\_\_\_\_\_

Bid Reference No. (if any) and title

Page of pages

|  |  |  |  |
| --- | --- | --- | --- |
| Pending Litigation, in accordance with Eligibility and Qualification  Criteria | | | |
| □ No pending litigation in accordance with Eligibility and Qualification Criteria, SubFactor 2.1.  □ Pending litigation in accordance with Eligibility and Qualification Criteria, SubFactor 2.1 as indicated below. | | | |
| **Year of dispute** | **Amount in dispute**  **(currency)** | **Contract Identification** | **Total Contract Amount**  **(currency), Eq.**  **PKR**  **(exchange rate)** |
|  |  | Contract Identification:  Name of Employer:  Address of Employer:  Matter in dispute:  Party who initiated the dispute:  Status of dispute: |  |
|  |  | Contract Identification:  Name of Employer:  Address of Employer:  Matter in dispute: Party who initiated the dispute:  Status of dispute: |  |

**Form FIN – 3.1:**

**Financial Situation and**

**Performance**

Bidder’s Name:

Date:

JV Member’s Name \_\_\_\_\_\_\_\_\_\_\_\_

Bid Reference No. (if any) and title

Page of pages **1. Financial data**

|  |  |
| --- | --- |
| **Type of Financial information in**  **(currency)** | **Historic information for last year***,*  **(amount in currency, currency, exchange rate\*, Eq. PKR)** |
| Statement of Financial Position (Information from Balance Sheet) | |
| Total Assets (TA) |  |
| Total Liabilities (TL) |  |
| Total Equity/Net Worth (NW) |  |
| Current Assets (CA) |  |
| Current Liabilities (CL) |  |
| Working Capital (WC) |  |
| Information from Income Statement | |
| Total Revenue (TR) |  |
| Profits Before Taxes (PBT) |  |
| Cash Flow Information | |
| Cash Flow from  Operating Activities |  |

\*Refer to IB 14.2 for the exchange rate

**2. Financial documents**

The Bidder and its parties shall provide copies of financial statements for last year pursuant to Eligibility and Qualification Criteria, Sub-factor 3.1. The financial statements shall:

1. reflect the financial situation of the Bidder or in case of JV member, and not an affiliated entity (such as parent company or group member).
2. be independently audited or certified in accordance with local legislation.
3. be complete, including all notes to the financial statements.
4. correspond to accounting periods already completed and audited.

 Attached are copies of financial statements1 for the last year required above; and complying with the requirements

1 If the most recent set of financial statements is for a period earlier than 12 months from the date of bid, the reason for this should be justified.

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**Form FIN – 3.2:**

**Financial Resources**

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as specified in Eligibility and Qualification Criteria.

|  |  |  |
| --- | --- | --- |
| **No**  **.** | **Source of financing** | **Amount (Eq. PKR)** |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
|  |  |  |

**Form FIN – 3.3:**

**Current Contract Commitments / Works in Progress**

Bidders and each member to a JV should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | **Current Contract Commitments** | |  | |
| **No.** | **Name of**  **Contract** | **Employer’ s Contact**  **Address,**  **Tel, Fax** | **Value of**  **Outstanding**  **Work**  **[Eq.**  **PKR]** | **Estimated**  **Completion**  **Date** | **Average**  **Monthly**  **Invoicing Over**  **Last Six Months [Eq.**  **PKR**  **/month)]** |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 5 |  |  |  |  |  |
|  |  |  |  |  |  |

**Form EXP – 1: Experience in Contracts of Similar Size and Nature**

Each Bidder or partner of a JV must fill this form.

Fill out one (1) form per contract.

|  |  |  |  |
| --- | --- | --- | --- |
| **Contract of Similar Size and Nature** | | | |
| **Name of Firm:** |  |  | |
| **Contract No** . . . . . .  . | **Contract Identification** | | |
| **Award Date:** |  | **Completion Date:** |  |
| **Total Contract**  **Amount** | **in respective currency \_\_\_\_\_\_\_\_\_\_\_\_:**  **in PKR Equivalent\*:** | | |
| **If partner in a Joint Venture, specify participation of**  **total contract amount** | **Percentage share in Total:**  **Corresponding Amount (in PKR):** | | |
| **Employer’s name**  **Address**  **Telephone number**  **Fax number**  **E-mail** |  | | |
| **Description of the Similarity in Accordance with Eligibility and Qualification Criteria, Sub-factor 4** | | | |

\* Converted to PKR at the rate of exchange at the date of contract.

**Form PER - 1: Proposed Personnel**

The Bidder shall provide the names of suitably qualified personnel to meet the specified requirements stated in Eligibility and Qualification Criteria, Sub-factor 5. The data on their experience should be supplied using the Form below for each candidate.

|  |  |
| --- | --- |
| **1.** | **Title of Position\*** |
|  | **Name** |
| **2.** | **Title of Position\*** |
|  | **Name** |
| **3.** | **Title of Position\*** |
|  | **Name** |
| **4.** | **Title of Position\*** |
|  | **Name** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
| **7.** | **Title of Position\*** |
|  | **Name** |

\*As listed in Eligibility and Qualification Criteria, Sub-factor 5.

**Form PER - 2: Resume of Proposed Personnel**

|  |  |  |
| --- | --- | --- |
| **Position** | | |
| **Personnel Information** | **Name** | **Date of birth** |
| **Professional qualifications along with PEC registration No. (if applicable):** | |
| **Total Work Experience [Years]: Experience in Similar Work [Years]:** | |
| **Present Employme**  **nt** | **Name of Employer** | |
| **Address of Employer** | |
| **Telephone** | **Contact (manager / personnel officer)** |
| **Fax** | **E-mail** |
| **Job title** | **Years with present Employer** |

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

|  |  |  |
| --- | --- | --- |
| **From** | **To** | **Company/Project/Position/Relevant Technical and Management Experience** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# LETTERS OF BID AND SCHEDULES TO BID

**LETTER OF TECHNICAL BID**

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

## SUPPLY, INSTALLATION. TESTING & COMMISSIONING, OPERATION AND MAINTENANCE OF TWO (02) PANORAMIC ELEVATORS ALONGWITH CIVIL/MECHANICAL STRUCTURE AND MISCELLANEOUS WORKS AT STATE LIFE TOWER, ISLAMABAD

To:

**DGM/ In charge (RE)**

State Life Building No. 5 Phase-II (Basement)

Blue Area, Islamabad-44000 Ph.: +92 (051) 9202324

Gentleman,

1. Having examined the Bidding Documents including Instructions to Bidders, Bidding Data, Conditions of Contract, Specifications, Schedules to Bid including Bill of Quantities, Drawings and Addenda Nos. for the execution of the abovenamed Works, we, the undersigned, offer to execute and complete such Works and remedy any defects therein in conformity with the said Bidding Documents and Addenda.

1. We meet the eligibility requirements in accordance with IB.3.

1. We, including any Subcontractors for any part of the Contract, are not debarred/ blacklisted by the Employer, any Government/Semi Government/Public Department in Pakistan or foreign country, international organizations or other foreign institutions.

1. Our subcontractors or suppliers for any part of the Contract, if any, shall have nationalities from eligible countries, in accordance with IB.4.4.

1. We understand that all the Schedules attached hereto form part of this Bid.

1. As security for due performance of the undertakings and obligations of this Bid, we submit herewith a Bid Security in the amount of PKR 2,500,000/-(Pak. Rupees. Two Million Five Hundred Thousand Only) drawn in your favour or made payable to you and valid for a period of 120 days beginning from the date Bids are opened, inclusive of 14 days beyond Bid validity period (as mentioned at Sr. No. 8 above).

1. We 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 Contract Data.

1. We agree to abide by this Bid (Technical Bid and Price Bid) for the period of 120 days, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

1. 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.

1. We do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other Bidder for the Works.

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

1. We undertake that all the information and documents submitted with the Bid are genuine, and in case of incorrect information of fake documents we shall be liable for punitive action under the Applicable Law.

Dated this day of 2025

Signature:

in the capacity of duly authorized to sign Bids for and on behalf of

*(Name of Bidder in Block Capitals)*

*(Seal)*

Address:

Witness:

Signature: Name:

Address: Occupation:

## LETTER OF PRICE BID

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

**SUPPLY, INSTALLATION. TESTING & COMMISSIONING, OPERATION AND**

**MAINTENANCE OF TWO (02) PANORAMIC ELEVATORS ALONGWITH**

**CIVIL/MECHANICAL STRUCTURE AND MISCELLANEOUS WORKS AT STATE LIFE TOWER, ISLAMABAD**

To:

**DGM/ In charge (RE)**

State Life Building No. 5 Phase-II (Basement)

Blue Area, Islamabad-44000

Ph.: +92 (051) 9202324

Gentleman,

1. Having examined the Bidding Documents including Instructions to Bidders, Bidding Data,

Conditions of Contract, Specifications, Schedules to Bid including Bill of Quantities,

Drawings and Addenda Nos. for the execution of the above-named Works, we, the undersigned, offer to execute and complete such Works and remedy any defects therein in conformity with the said Bidding

Documents and Addenda for the sum of PKR (Pak Rupees

) or such other sum as may be ascertained in accordance with the said conditions, excluding any discounts offered in item (2) below.

1. The discounts offered and the methodology for their application are:……………...

1. We understand that all the Schedules attached hereto form part of this Bid.

1. 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.

1. We do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other Bidder for the Works.

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

Dated this day of 2025

Signature:

in the capacity of duly authorized to sign Bids for and on behalf of

*(Name of Bidder in Block Capitals)*

*(Seal)*

Address:

Witness:

Signature:

Name:

Address:

Occupation

**A-1**

**Schedule-A to Bid**

### SCHEDULE OF ADJUSTMENT DATA

**Schedule of Cost Indexation**

**[NOT USED]**

**Table I. Local Currency (LC) For Bill Nos.**

**[NOT USED]**

**Table II. Foreign Currency (FC) For Bill Nos.**

**[NOT USED]**

**Table III. Foreign Currency Requirements**

### [NOT USED]

**Table IV. Summary of Payment Currencies**

### [NOT USED]

**B-1-1**

**Schedule-B to Bid**

**BILL OF QUANTITIES/SCHEDULE OF PRICES**

**A. Preamble**

**:**

1. For scheduled items, the bidder shall quote percentage above or below on the amount put to bid and given in the summery of cost of estimate.

1. For non-scheduled items, the bidder shall quote his rates in Bill of Quantities /Schedule of Prices**.**

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

1. The Quantities given in the Bill of Quantities /Schedule of Prices are estimated and provisional quantities and are given to provide a common basis for bidding. The basis for 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 Contract.

1. The rates and prices quoted in the Bill of Quantities /Schedule of Prices, 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 28 days prior to deadline for submission of Bid, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.

1. A rate or price shall be entered against each Non-Scheduled item in the priced Bill of Quantities /Schedule of Prices, 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.

1. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the Bill of Quantities /Schedule of Prices and where no items are provided, the cost shall be deemed to be distributed among the rates and prices for the other related items of the Works.

1. In case of any discrepancy in description, unit or rate of any Scheduled Item provided in the Bill of Quantities with the description, unit or rate of any Scheduled Item in the Pakistan Public Works Department (Pak-PWD) Schedule of Rates – 2022, the description, unit and rate of item as provided in the in the Pakistan Public Works Department (Pak-PWD) Schedule of Rates – 2022 shall prevail.

1. Complete description of items of works in the Bill of Quantities /Schedule of Prices, general directions, conditions and limitations of works, location and place of works, applicable methods, means to be adopted, type and quality of materials, use of tools, plant, and machinery are not necessarily mentioned in the Bill of Quantities. These shall be referred to in accordance with the Drawings and Technical Specifications.

**B-1-2**

**Schedule-B to Bid**

1. For Scheduled Items, Technical Specifications of Pakistan Public Works Department (Pak-PWD) (relevant to Schedule of Rates – 2022) shall be applicable. Whereas, for Non-Scheduled Items, Technical Specifications enclosed in Volume-II (Technical

Provisions) of the Bidding / Contract Documents shall be applicable. “Ref. Specification Section” indicates the specification section number which as a whole or part (for which the Engineer shall be the sole judge) of these Specifications are to be followed during execution of the item of work in accordance with the applicable drawings.

1. The bidder may ensure himself of the correctness of quantities and application of the individual items of works as per the Drawings, Technical Specifications and Contract Documents.

1. No claim for extra payment will be admissible on account of anticipated profit or variation in overheads expenditure for the works not actually performed nor will any adjustment in the unit rate set forth in the Bill of Quantities be made because of any increase or decrease in the quantities indicated therein.

1. Unless otherwise stated in the text of the Bill of Quantities /Schedule of Prices, the quantities have to be measured and paid in accordance with the Measurement and Payment Clauses given in the relevant Technical Specifications or in accordance with implied meaning of the specifications. Any special method of measurement stated in the text of estimate is limited to the concerned items only.

1. The following abbreviations for the Units have been used in the Bill of Quantities:

**Unit Abbreviations**  Running foot Rft. Square foot Sft.

Cubic feet Cft.

Kilogram Kg.

Metric Ton M. Ton

Per Number Each, Number, No.

Lump Sum Job Job, Lot

Provisional Sum LS

**B-2**

**Schedule-B to Bid**

### BILL OF QUANTITIES/SCHEDULE OF PRICES

**B. Work Items:**

1. The Bill of Quantities contains the following Bills and Schedule

SOP-1-1: CIVIL WORKS-PART-I (SCHEDULE ITEMS)

SOP-1-2: CIVIL WORKS-PART-II (NON-SCHEDULE ITEMS)

SOP-2: MECHANICAL\ELECTRICAL WORKS-PART-III (NON-SCHEDULE ITEMS) SUMMARY OF COST

1. Bidders shall price the Bill of Quantities in Pak. Rupees (PKR) only.

**3**

of

61-13

61-1

**SR. NO.**

**SOP NO.**

**DESCRIPTION**

**1**

**SOP-1-1**

**CIVIL WORKS-PART-I (SCHEDULE ITEMS)**

**TOTAL PRICE (1) = Rs.**

**-**

**2**

**SOP-1-2**

**CIVIL WORKS-PART-II (NON SCHEDULE ITEMS**

**TOTAL PRICE (2) = Rs.**

**-**

**SOP-2**

**MECHANICAL\ELECTRICAL WORKS-PART-III (NON SCHEDULE ITEMS)**

**TOTAL PRICE (3) = Rs.**

**-**

**4**

**DISCOUNT (IF ANY)**

**(4) = Rs.**

**-**

**5**

**TOTAL BID PRICE**

**TOTAL BID PRICE (5) = (1+2+3)-4 = Rs.**

**-**

Initials of Signatory to Bid: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**\*All Taxes and duties shall be included in Bid Price.**

**STATE LIFE INSURANCE CORPORATION PAKISTAN**

**SUPPLY, INSTALLATION. TESTING & COMMISSIONING, OPERATION AND MAINTENANCE OF TWO (02) PANORAMIC ELEVATORS ALONGWITH CIVIL/MECHANICAL**

**STRUCTURE AND MISCELLANEOUS WORKS AT STATE LIFE TOWER, ISLAMABAD**

**SCHEDULE OF PRICES (SOP)**

**SUMMARY OF COST**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **STATE LIFE INSURANCE CORPORATION PAKISTAN**  **SUPPLY, INSTALLATION. TESTING & COMMISSIONING, OPERATION AND MAINTENANCE OF TWO (02)**  **PANORAMIC ELEVATORS ALONGWITH CIVIL/MECHANICAL STRUCTURE AND MISCELLANEOUS WORKS AT**  **STATE LIFE TOWER, ISLAMABAD**  **SCHEDULE OF PRICES (SOP)**  **)**  **. SOP 1-1: CIVIL WORKS-PART-I (SCHEDULE ITEMS**  **1** | |  |  | | --- | --- | | **TOTAL**  **AMOUNT**  **(**  **Rs.)** | **(**  **)**  **g** | | **UNIT**  **RATE**  **(**  **Rs.)** | **(**  **)**  **f** | | **QTY** | **(**  **)**  **e** | | **UNIT** | **(**  **)**  **d** | | **DESCRIPTION** | **(**  **)**  **c** | | **PAK. PWD**  **SCH. 2022 /**  **N.S REF**  **NO.** | **(**  **)**  **b** | | **ITEM NO.** | **(**  **)**  **a** | | **GENERAL NOTE**  Scope:  *(Applicable to all sections)*  Supply,  installation,  testing  and  commissioning  of  the  following  items  of  work,  including  all  labour,  tools,  plant,  accessories,  etc.  required  for  completion  of  each  item  as  per  specifications  and  as approved by the Engineer.  **PART-I (SCHEDULE ITEMS)**  **BRICK MASONRY**  PE-C-  1  a)  (112-25)  +  (112-76)    Providing  and  laying  first  class  solid  burnt  brick  masonry  set  in  cement  mortar  1:5  in  straight  or  curved  walls  9  to  13-1/2  inches  (229  mm  to  343  mm)  thick  including  scaffolding,  raking,  out  joints  and  curing  etc.  complete  in  ground  floor  superstructure .  100    Cft  671.00  41,824.42      280,641.86      b)  (112-25)  +  (112-70)  +    (112-76)  First Floor    100  Cft  71.00  44,165.51      31,357.51      c)  (112-25)  +  (112-70)  +  (112-71)    +  (112-76)    Second Floor    100  Cft  71.00  46,019.01      32,673.50 |

61-2

61-13

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| |  |  | | --- | --- | | **TOTAL**  **AMOUNT**  **(**  **Rs.)** | **(**  **)**  **g** | | **UNIT**  **RATE**  **(**  **Rs.)** | **(**  **)**  **f** | | **QTY** | **(**  **)**  **e** | | **UNIT** | **(**  **)**  **d** | | **DESCRIPTION** | **(**  **)**  **c** | | **PAK. PWD**  **SCH. 2022 /**  **N.S REF**  **NO.** | **(**  **)**  **b** | | **ITEM NO.** | **(**  **)**  **a** | | 100    Cft  71.00  47,872.51      33,989.48 | 100    Cft  71.00  49,726.01      35,305.47 | 100  Cft  71.00  51,579.51      36,621.45 | 100    Cft  71.00  53,433.01      37,937.44 | 100    Cft  71.00  55,286.51      39,253.42 | 100    Cft  71.00  57,140.01      40,569.41 |
| d)  (112-25)  +  (112-70)  +    (112-71)  +    (112-76)  3  rd Floor  e)  (112-25)  +  (112-70)  +    (112-71)  +    (112-76)  4  th Floor  f)  (112-25)  +  (112-70)  +  (112-71)    +  (112-76)    5  th Floor  g)  (112-25)  +  (112-70)  +    (112-71)  +    (112-76)  6  th Floor  h)  (112-25)  +  (112-70)  +  (112-71)    +    (112-76)  th Floor  7  i)  (112-25)  +  (112-70)  +  (112-71)    +  (112-76)    th Floor  8 | | | | | |

of

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| |  |  | | --- | --- | | **TOTAL**  **AMOUNT**  **(**  **Rs.)** | **(**  **)**  **g** | | **UNIT**  **RATE**  **(**  **Rs.)** | **(**  **)**  **f** | | **QTY** | **(**  **)**  **e** | | **UNIT** | **(**  **)**  **d** | | **DESCRIPTION** | **(**  **)**  **c** | | **PAK. PWD**  **SCH. 2022 /**  **N.S REF**  **NO.** | **(**  **)**  **b** | | **ITEM NO.** | **(**  **)**  **a** | | j)  (112-25)  +  (112-70)  +    (112-71)  +    (112-76)  9  th Floor  100    Cft  71.00  58,993.51      41,885.39      **REINFORCED CONCRETE WORK**  PE-C-  2  a)    (114-55)  +  (114-92)  +  (114-93)  +  (114-137)  Providing  and  laying  reinforced  cement  concrete  using  crush  graded  boulder  3  4  /  inch  (19  mm)  and  down  gauge  having  a  minimum  works  cube  crushing  strength  of  3750  Ibs.  per  sq  inch  at  28  days  with  a  mix  not  leaner  than  1:1-1/2:3  in  **ordinary**  **slab**  **3**  **inches**  **(76**  **mm)**  **to**  **less**  **than**  **5**  **"**  (127  mm)  thick  including  form  work  and  its  removal  compacting  and  curing  etc,  complete  but  excluding the cost of reinforcement, in 2nd floor.    100  Cft  43.00  56,304.37      24,210.88      b)  (114-55)    +  (114-92)  +  (114-93)  +  (114-137)  3  rd Floor  100    Cft  43.00  58,514.96      25,161.43      c)    (114-55)  +  (114-92)  +  (114-93)  +  (114-137)  4  th Floor    100  Cft  43.00  60,725.55      26,111.99      d)  (114-55)    +  (114-92)  +  (114-93)  +  (114-137)  5  th Floor  100    Cft  43.00  62,936.14      27,062.54 |

61-4

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61-13

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| |  |  | | --- | --- | | **TOTAL**  **AMOUNT**  **(**  **Rs.)** | **(**  **)**  **g** | | **UNIT**  **RATE**  **(**  **Rs.)** | **(**  **)**  **f** | | **QTY** | **(**  **)**  **e** | | **UNIT** | **(**  **)**  **d** | | **DESCRIPTION** | **(**  **)**  **c** | | **PAK. PWD**  **SCH. 2022 /**  **N.S REF**  **NO.** | **(**  **)**  **b** | | **ITEM NO.** | **(**  **)**  **a** | | e)  (114-55)    +  (114-92)  +  (114-93)  +  (114-137)  th Floor  6    100  Cft  43.00  65,146.73      28,013.09      f)  (114-55)    +  (114-92)  +  (114-93)  +  (114-137)  7  th Floor  100    Cft  43.00  67,357.32      28,963.65      g)    (114-55)  +  (114-92)  +  (114-93)  +  (114-137)  8  th Floor  100    Cft  43.00  69,567.91      29,914.20      PE-C-  3  a)  (114-166)  +  (114-174)  +  (114-175)  Providing  and  laying  ribbed  deformed  steel  reinforcement  bars  with  guaranteed  minimum  yield  stress  of  60,000  psi  with  and  including  the  cost  of  straightening,  cutting,  bending,  binding,  wastage,  complete  in  all  kinds  of  RCC  work  nd  (2  floor).  Kg  60.00  291.33      17,479.80      b)  (114-166)  +  (114-174)  +  (114-175)  3  rd Floor  Kg  60.00  295.77      17,746.20      c)  (114-166)  +  (114-174)  +  (114-175)  thFloor  4  Kg  60.00  300.21      18,012.60 |

61-13

of

61-5

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| |  |  | | --- | --- | | **TOTAL**  **AMOUNT**  **(**  **Rs.)** | **(**  **)**  **g** | | **UNIT**  **RATE**  **(**  **Rs.)** | **(**  **)**  **f** | | **QTY** | **(**  **)**  **e** | | **UNIT** | **(**  **)**  **d** | | **DESCRIPTION** | **(**  **)**  **c** | | **PAK. PWD**  **SCH. 2022 /**  **N.S REF**  **NO.** | **(**  **)**  **b** | | **ITEM NO.** | **(**  **)**  **a** | |  |

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| |  |  | | --- | --- | | **TOTAL**  **AMOUNT**  **(**  **Rs.)** | **(**  **)**  **g** | | **UNIT**  **RATE**  **(**  **Rs.)** | **(**  **)**  **f** | | **QTY** | **(**  **)**  **e** | | **UNIT** | **(**  **)**  **d** | | **DESCRIPTION** | **(**  **)**  **c** | | **PAK. PWD**  **SCH. 2022 /**  **N.S REF**  **NO.** | **(**  **)**  **b** | | **ITEM NO.** | **(**  **)**  **a** | | c)  (122-4)  +  (122-87)  +  (122-90)  Second Floor    100  Sft  190.00      4,925.59      9,358.62      d)  (122-4)  +  (122-87)  +  (122-90)  rd Floor  3  100    Sft  190.00      5,161.84      9,807.50      e)  (122-4)  +  (122-87)  +  (122-90)  4  th Floor    100  Sft  190.00      5,398.09      10,256.37      f)  (122-4)  +  (122-87)  +  (122-90)  th Floor  5  100    Sft  190.00      5,634.34      10,705.25      g)  (122-4)  +  (122-87)  +  (122-90)  th Floor  6    100  Sft  190.00      5,870.59      11,154.12      h)  (122-4)  +  (122-87)  +  (122-90)  7  th Floor  100    Sft  190.00      6,106.84      11,603.00      i)  (122-4)  +  (122-87)  +  (122-90)  8  th Floor    100  Sft  190.00      6,343.09      12,051.87      PE-C-  6  (122-162)  Painting  with  )  ICI  (  Dulux  Plastic  emulsion  paint  VIP  of  approved  shade  two  coats  over  and  including  the  cost  of  one  priming  coat  complete  over plastered surface at any height in any floor.  100    Sft  895.00      6,737.38      60,299.55 |

61-7

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| |  |  | | --- | --- | | **TOTAL**  **AMOUNT**  **(**  **Rs.)** | **(**  **)**  **g** | | **UNIT**  **RATE**  **(**  **Rs.)** | **(**  **)**  **f** | | **QTY** | **(**  **)**  **e** | | **UNIT** | **(**  **)**  **d** | | **DESCRIPTION** | **(**  **)**  **c** | | **PAK. PWD**  **SCH. 2022 /**  **N.S REF**  **NO.** | **(**  **)**  **b** | | **ITEM NO.** | **(**  **)**  **a** | |  | |  |  |  | | --- | --- | --- | | **1,894,723** |  |  | | **Total Cost of Schedule Items** | **Percentage Above/below on Schedule Items** | **Total Cost of Schedule Items** | |

61-8

61-13

of

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| **STATE LIFE INSURANCE CORPORATION PAKISTAN**  **SUPPLY, INSTALLATION. TESTING & COMMISSIONING, OPERATION AND MAINTENANCE OF TWO (02)**  **PANORAMIC ELEVATORS ALONGWITH CIVIL/MECHANICAL STRUCTURE AND MISCELLANEOUS WORKS AT**  **STATE LIFE TOWER, ISLAMABAD**  **SCHEDULE OF PRICES (SOP)**  **)**  **. SOP 1-2: CIVIL WORKS-PART-II (NON-SCHEDULE ITEMS**  **2** | |  |  | | --- | --- | | **TOTAL**  **AMOUNT**  **(**  **Rs.)** | **(**  **)**  **g** | | **UNIT**  **RATE**  **(**  **Rs.)** | **(**  **)**  **f** | | **QTY** | **(**  **)**  **e** | | **UNIT** | **(**  **)**  **d** | | **DESCRIPTION** | **(**  **)**  **c** | | **PAK. PWD**  **SCH. 2022 /**  **N.S REF**  **NO.** | **(**  **)**  **b** | | **ITEM NO.** | **(**  **)**  **a** | | **GENERAL NOTE**  Scope:  *(Applicable to all sections)*  Supply,  installation,  testing  and  commissioning  of  the  following  items  of  work,  including  all  labour,  tools,  plant,  accessories,  etc.  required  for  completion  of  each  item  as  per  specifications  and  as approved by the Engineer.  **PART-II (NON- SCHEDULE ITEMS)**  **CURTAIN WALL**  **-6171)**  **Ref. Specification Section**  **(**  PE-C-  11  PE-C-NS-  01  Providing,  fabricating,  fixing  and  erecting  in  position  of  Aluminum  Curtain  Wall  (  comprising  Aluminum  Curtain  Wall  Sections  (  anodized  /  powder  coated)  in  approved  colour,  Double  Glazed  hermitically-sealed  mm  24  thick  insulating  Panels  (6  mm  thick  imported  single  Low-e  tinted  and  tempered  glass  on  external  side  +  mm  12  Air  Gap  with  U-insert  +  6  mm  thick  local  clear  tempered  glass  on  internal  side)  and  Aluminium  Curtain  Wall  Openabale  Windows,  including  all  necessary  accessories,  hardware,  imported  structural  &  weather  sealant,  backer  rod,  gasket  seal,  silicon,  supports,  fixing  arrangement,  etc.  complete  in  all  respect  as  per  approved  shop  drawings & technical specifications.  Sft  3,040.00 |

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| |  |  | | --- | --- | | **TOTAL**  **AMOUNT**  **(**  **Rs.)** | **(**  **)**  **g** | | **UNIT**  **RATE**  **(**  **Rs.)** | **(**  **)**  **f** | | **QTY** | **(**  **)**  **e** | | **UNIT** | **(**  **)**  **d** | | **DESCRIPTION** | **(**  **)**  **c** | | **PAK. PWD**  **SCH. 2022 /**  **N.S REF**  **NO.** | **(**  **)**  **b** | | **ITEM NO.** | **(**  **)**  **a** | | **STRUCTURAL STEEL WORKS**  **Ref. Specification Section**  **-3000)**  **(**  PE-C-  12  PE-C-NS-  02  Providing,  fabricating,  fixing  and  erecting  in  position  of  Structural  Steel  Works  comprising  MS  Girders,  MS  Tube  Sections  (  vertical  and  horizontal  members),  Base  &  Side  Plates  with  mechanical  &  chemical  anchors,  MS  Plain  Sheet,  Corrugated  GI  Sheet  for  Composite  Deck  Slab  and  all  required  hardware  etc.  including  cutting,  grinding,  welding,  bolting  and  painting  red  (  oxide  and  enamal)  etc.  complete  in  all  respect  as  per  approved  shop  drawings & technical specifications.  Kg  32,490.00      **FLOOR AND WALL FINISHES**  **Ref. Specification Section-6600,**  **6700)**  **(**  PE-C-  13  PE-C-NS-  03  Providing  and  fixing  Porcelain  Tiles  (  imported),  matching  with  existing  tiles  in  level,  quality,  surface  finish  and  size,  on  any  floors,  laid  with  approved  quality  bond  over  on  1.5  "  thick  cement-  sand  mortar  (1:3)  including  jointing  the  tiles  with  joint  filler  of  approved  quality,  complete  in  all  respect  as  per  drawings  and  technical  specifications and as approved by the Engineer.  Sft  1,265.00      **WALL CLADDING**  **(**  **Ref. Specification Section-6533,**  **3000)** |

61-10

61-13

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| |  |  | | --- | --- | | **TOTAL**  **AMOUNT**  **(**  **Rs.)** | **(**  **)**  **g** | | **UNIT**  **RATE**  **(**  **Rs.)** | **(**  **)**  **f** | | **QTY** | **(**  **)**  **e** | | **UNIT** | **(**  **)**  **d** | | **DESCRIPTION** | **(**  **)**  **c** | | **PAK. PWD**  **SCH. 2022 /**  **N.S REF**  **NO.** | **(**  **)**  **b** | | **ITEM NO.** | **(**  **)**  **a** | |  |

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| **STATE LIFE INSURANCE CORPORATION PAKISTAN**  **SUPPLY, INSTALLATION. TESTING & COMMISSIONING, OPERATION AND MAINTENANCE OF TWO (02) PANORAMIC ELEVATORS ALONGWITH CIVIL/MECHANICAL STRUCTURE AND**  **MISCELLANEOUS WORKS AT STATE LIFE TOWER, ISLAMABAD**  **SCHEDULE OF PRICES (SOP)**  **)**  **. SOP-2: MECHANICAL\ELECTRICAL WORKS-PART-III (NON SCHEDULE ITEMS**  **3** | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Amount**  **(**  **)**  **Rs.** | **Mechanical\Electrical Works**  **PART-III (NON- SCHEDULE ITEMS)** |  |  |  |  |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | **Rate**  **(**  **)**  **Rs.** |  |  |  |  |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | **Quantity** |  |  | 2 | 8 |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | **Unit** |  |  | Each | LOT |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | **Description** | **Elevators Equipment** |  |  | **Supply, Installation & Testing Commissioning of Tube Axial Fans (700 CFM, Static Presuure 0.3) alongwith Supply, Installation, fabrication of GI sheet ducting**  **(24**  **Gauge)**  **approximatly**  **60**  **SFT,**  **Supply,**  **Installation**  **&**  **Testing**  **Commissioning**  **of**  **Air**  **inlet/Outlet**  **One**  **(**  **(01)**  **Diffuser**  **of**  **size**  **15\*15**  **inch**  **and**  **One**  **(01)**  **Grill**  **of**  **size**  **16\*10**  **inches),**  **Supply,**  **Installationall**  **of**  **hanger**  **and**  **supports**  **for**  **fan,**  **ducting**  **and**  **air**  **inlet/outlet,**  **supply**  **installation**  **of**  **electrical**  **work**  **including**  **cabling,**  **conduits, termination complete in all respect as per Engineer/Employers satisafction, all applicable taxes and duties complete in all respect.** | **Supply,**  **Installation**  **&**  **testing**  **commissioning**  **of**  **all**  **electrical**  **works**  **required**  **for**  **elevators**  **as**  **per**  **following**  **detail**  **and**  **standard**  **requiremnets**  **including**  **new**  **distribution**  **board,**  **sockets,**  **cables,**  **conduiting,**  **earthing**  **works**  **and**  **suuply**  **&**  **termination**  **of**  **cables**  **till**  **existing**  **DBs**  **for**  **LED**  **lights**  **at**  **each**  **floor**  **and**  **any**  **other**  **neccessary works to complete the job as per Engineer/Employers satisafction, all applicable taxes and duties complete in all respect;** | Elevator Electrical DB | INCOMING | 01  No. 250 Amps (Adj.) TP MCCB RC=36kA | 06  Nos. 2/25 Amps Protection Fuses | 01  No. VSS (RY-YB-BR-OFF-RN) 7-position | 01  No. 0-250 Volts AC DIGITAL Voltmeter | 03  Nos. 250/5 Amps Current Transformers | 01  No. ASS (R-Y-B-OFF ) 4-position | 01  No. 0-250 Amps AC DIGITAL Ammeter | 06  Nos. RYB and ON OFF TRIP LED indication lights |  | OUTGOING | 02  No. Outgoing 80 Amp (Adj.) MCCB, TP, RC= 25kA | 02  Nos. Outgoing 10 Amp MCB, SP, RC, 10 kA | 01  No. Outgoing 80 Amp (Adj.) MCCB, TP, RC= 25kA (Spare  ) | 14  SWG powder painted 01-cubicle with electrolytic copper bus bar with electrical grade PVC mountings 3 for each, nuts, bolts and washers etc. |  | AC/Fan Electrical DB | INCOMING | 01  No. 32 Amps (Adj.) TP MCCB RC=25kA | 06  Nos. 2/25 Amps Protection Fuses | 01  No. VSS (RY-YB-BR-OFF-RN) 7-position | 01  No. 0-32 Volts AC DIGITAL Voltmeter | 03  Nos. 30/5 Amps Current Transformers | 01  No. ASS (R-Y-B-OFF ) 4-position | 01  No. 0-30 Amps AC DIGITAL Ammeter | | **Item**  **No.** | **1** |  | a) | **2** | **3** | a-1) | | | | | | | | | | | | | | | | | a-2) | | | | | | | | | |

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Outgoing 20 Amp MCB, SP, RC, 10 kA (Spare  ) | 14  SWG powder painted 01-cubicle with electrolytic copper bus bar with electrical grade PVC mountings 3 for each, nuts, bolts and washers etc. |  | 01  No. 250 Amps (Adj.) TP MCCB RC=36kA to be installed in existing Electrical Pannel located at Basement-2 | 01  No. 32 Amps (Adj.) TP MCCB RC=25kA to be installed in existing Electric Pannel located at Basement-2 | Supply,  installation,  testing,  commissioning  and  termination  of  PVC  insulated  600/1000  Voltage  grade  unarmoured  4  core  95  mm2  Copper  cables  of  approximate  length  350  ft laid / pulled in cable tray already laid from basement to 9th floor etc including all accessories as required complete in all respects | Supply,  installation,  testing,  commissioning  and  termination  of  PVC  insulated  450/750  Voltage  grade  unarmoured  1  core  50  mm2  Copper  cables  of  approximate  length  350  ft laid / pulled in cable tray already laid from basement to 9th floor etc including all accessories as required complete in all respects | Supply,  installation,  testing,  commissioning  and  termination  of  600/1000  Voltage  grade  unarmoured  4  core  25  mm2  Copper  cables  of  approximate  length  40  ft  complete  in all respect. | Supply,  installation,  testing,  commissioning  and  termination  of  600/1000  Voltage  grade  unarmoured  4  core  16  mm2  Copper  cables  of  approximate  length  350  ft  complete  in all respect. | Supply,  installation,  testing,  commissioning  and  termination  of  450/750  Voltage  grade  unarmoured  1  core  16  mm2  Copper  cables  of  approximate  length  390  ft  complete  in all respect. | Supply,  installation,  testing,  commissioning  and  termination  of  450/750  Voltage  grade  unarmoured  3  x  1  core  6  mm2  Copper  cables  (  )  PNE  of  approximate  length  30  ft  complete in all respect. | Supply,  installation,  testing,  commissioning  and  termination  of  450/750  Voltage  grade  unarmoured  3  x  1  core  4  mm2  Copper  cables  (  )  PNE  of  approximate  length  30  ft  complete in all respect. | Supply,  installation,  testing,  commissioning  and  termination  of  PVC  conduits  25  mm,  including  hanger,  supports  and  all  relevant  items  where  required  complete  in  all  respect. | Supply,  installation,  testing,  commissioning  and  termination  of  Light  Fixtures  type  LED.  Receessed  mounted  SMD  downlighter,  W,  20  IP-20  Qty.  (  81)  alongwith  connection  cables  of  appropraite  size  termination  till  existing  DB  at  each  floor  complete  in  all  respect  with  allied  accessories.  The  fitting  shall  be  approved  by  the  Engineer/Employer. | **Supply,installation,**  **testing**  **and**  **commissioning**  **of**  **UPS**  **(80**  **KVA**  **&**  **SLA**  **Battery**  **System**  **complete**  **with**  **all**  **required**  **accessories**  **(**  **connection**  **sockets/PDUs)**  **etc.The**  **fitting**  **shall**  **be**  **approved**  **by**  **the**  **Engineer.**  **400**  **Volts,**  **3**  **phase**  **4**  **wire,**  **50**  **Hz,**  **Online**  **double**  **conversion**  **pure**  **sine**  **wave**  **with**  **backfeed**  **protection**  **output**  **Power**  **factor**  **0.9**  **or**  **higher,**  **advance**  **batteries**  **management**  **(**  **backup**  **time**  **One**  **(01)**  **Hour),**  **built**  **in**  **manual**  **maintenance**  **bypass,**  **built**  **in**  **hot**  **sync**  **Brand**  **New**  **UPS including all required accessories. including applicable taxes and duties complete in all respect;** | **Supply,**  **installation,**  **testing**  **&**  **commissionign**  **of**  **heat**  **pump**  **split**  **air**  **conditioner**  **inverter**  **type**  **(**  **Minimum**  **Capacity**  **=**  **24,000**  **BTU/HR)**  **and**  **connection**  **in**  **elevator**  **DB as per Engineer/Employers satisafction, all applicable taxes and duties complete in all respect;** | **Supply,**  **installation,**  **testing**  **&**  **commissioning**  **of**  **propeller**  **type**  **exhaust**  **fans**  **and**  **connection**  **in**  **elevator**  **DB**  **(**  **Size**  **12**  **inches)**  **as**  **per**  **Engineer/Employers**  **satisafction, all applicable taxes and duties complete in all respect;** | **Preshipment Inspection/Third Party inspection of elevators at Manufactureres/Factory Permises as specified in bidding documents.** | **Third party validation for testing & commissioning of elevators in Pakistan.** | **Regular**  **daily**  **operation**  **(24**  **hours/day,**  **7**  **days/week)**  **during**  **Two**  **(02)**  **years**  **of**  **Defects**  **Liability**  **Period,**  **One**  **(01)**  **Operator**  **for**  **each**  **shift)**  **all**  **applicable**  **taxes**  **and duties complete in all respect;** | **Miscellenous**  **works**  **required**  **for**  **completion**  **of**  **above**  **said**  **works**  **like**  **dismentalling**  **and**  **re**  **erection**  **of**  **Fire**  **alarm**  **pannel,**  **ceiling**  **lights**  **etc**  **during**  **execution**  **of**  **the works (If any) or any additional works required in order to execute the project.** | **Provisional Sum** | **Total Amount (Rs.)** | | **Item**  **No.** |  | b-1)  b-2)  c) | | | | | | | | | | d)  e)  f)  g)  h)  i)  j)  k) | | | | | | | | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |  | | **IN WORDS: RUPEES \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

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**C-1**

**Schedule-C Bid**

### CONSTRUCTION SCHEDULE

Pursuant to Sub-Clause 8.3 of the General Conditions, the whole of the Works, and each Section (if any), shall be completed within the Time for Completion for the Works or Section (as the case may be) stated as hereunder and mentioned in Contract Data:

|  |  |
| --- | --- |
| **Description** | **Time for Completion (days)** |
| Whole Works | 210 days |

*[The Bidder shall provide, 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 Sections of the Works may meet Employer’s completion targets in days noted above and counted from the Commencement Date (Attach sheets as required for the specified form of Construction Schedule).*

**D-1**

**Schedule-D 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:

*Shall indicate head office and field office personnel involved in management and supervision, engineering, equipment maintenance and purchasing.*

1. 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.*

1. Method of executing the Works:

*The procedures for installation of equipment and machinery and transportation of equipment and materials to the site.]*

**E-1**

**Bid**

The Bidder will provide on Sheet E-2 of this Schedule 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, Project Completion time and Schedule.

1. Minimum mandatory equipment to be brought/erected at site prior to release of mobilization advance.

Concrete Mixer Machine (Double

* 1. 01 No.

bag)

* 1. Tractor trolley 01 No.
  2. Water Bouzer 01 Nos.
  3. Grader 02 Nos.
  4. Dpzer 01 No.
  5. Scaffolding 30,000 RFT 7. Shuttering 10,000 SFT

8. Vibrators 02 Nos. 9. Compactor 02 Nos. 10. Dump Truck 02 Nos.

* 1. Steel Cutting/Bending Machine 01 No.
  2. Hoist 04 Nos.
  3. Generator Set (50KVA) 01 Nos. 14. Leveling Equipment 02 Nos.
  4. Welding Plant 01 No.
  5. Concrete Pump 01 No.

1. In addition to the above mandatory equipment, the Contractor shall bring and install such other plant and equipment required for successful and timely completion of works.

**Note:**

***The Bidder while preparing his methodology for performing and executing the works and listing out Major Equipment (required to complete the Works in the specified Time Schedule) in this Appendix shall consider the above-mentioned minimum requirement of Construction Equipment to be brought/installed/erected at site***

**E-2**

**Bid**

#### Owned, Purchased or Leased

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

**E-3**

**Bid**

#### Equipment details

|  |  |  |
| --- | --- | --- |
| Item of equipment | | |
| Equipmen  t  informatio n | Name of manufacturer | Model and power rating |
| Capacity | Year of manufacture |
| Current status | Current location |  |
| Details of current commit | ments |
| Source | Indicate source of the equ | ipment |
|  | Owned Rente  manufactured | d Leased Specially |
| The following information shall not be applicab | | le for equipment owned by the Bidder |
| Owner | Name of owner |  |
| Address of owner |  |
| Telephone | Contact name and title |
| Fax | Telex |
| Agreements | Details of rental / lease / manufacture agreements specific to the project | |
|  |  | |
|  |  | |
|  |  | |

*[This Table shall be used for each item of Equipment separately]*

**F-1**

**Schedule-F Bid**

### ORGANIZATION CHART FOR THE SUPERVISORY STAFF AND LABOUR

**MINIMUM MANDATORY STAFF REQUIREMENT:**

The Contractor shall arrange all requisite resources for timely completion of project as per provisions given in the Bidding Documents.

Following is the list of Minimum Mandatory Staff Requirement to be deployed at site immediately by the Contractor upon commencement of Works:

|  |  |  |  |
| --- | --- | --- | --- |
| **Designation** | **Nos.** | **Minimum**  **Qualification** | **Min. Relevant**  **Working**  **Experience** |
| Project Manager | 01 | B.Sc. Mech. Engr.  with valid PEC Regd. | 05 years or above |
| Construction Manager | 01 | B.Sc. Civil Engr. with valid PEC Regd. | 05 years or above |
| Site Supervisor (Civil) | 01 | DAE (Civil) | 05 years |
| Site Supervisor (Mechanical) | 01 | DAE (Mech.) | 05 years |
| Quantity Surveyor | 01 | DAE (Civil) | 05 years |

**G-1**

**Schedule-G 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 and a copy of valid electrical license (if applicable).

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

**H-1**

**Schedule-H Bid**

### ESTIMATED PROGRESS PAYMENTS

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 thousands of PKR:

|  |  |
| --- | --- |
| **Months** | **Amounts**  **(in %age of Bid Price)** |
| **1** | **2** |
| 1st |  |
| 2nd |  |
| 3rd |  |
| 4th |  |
| 5th |  |
| 6th |  |
| 7th |  |
| 8th |  |
| **Bid Price** | **100%** |

**I-1 Schedule-I Bid**

**CONSTRUCTION CAMP AND HOUSING FACILITIES**

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

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.
   * 1. Electrical power (expected power load, etc.).
     2. Water (required amount and system proposed).
     3. Sanitation (sewage disposal system, etc.)
3. Construction of Facilities
   * 1. Contractor’s Office. Workshop and Work Areas (areas required and proposed layout, type of construction of buildings, etc.).
     2. Warehouses and Storage Areas (area required, type of construction and layout).
     3. 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.)

**Note:**

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.

**J-1 Schedule-J Bid**

### INTEGRITY PACT DECLARATION OF FEES, COMMISSION AND BROKERAGE, ETC. PAYABLE BY THE BIDDERS/CONTRACTORS OF GOODS, SERVICES & WORKS IN CONTRACTS WORTH PAK. RS. 10.00 MILLION OR MORE

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

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

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

………………………………… [Name of Bidder/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 Pakistan (GoP) or any administrative subdivision or agency thereof or any other entity owned or controlled by GoP through any corrupt business practice.

Without limiting the generality of the foregoing, [Name of Bidder/ 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 GoP, except that which has been expressly declared pursuant hereto.

[Name of Bidder/Contractor] certifies 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 GoP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

[Name of Bidder/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 GoP under any law, contract or other instrument, be voidable at the option of GoP.

Notwithstanding any rights and remedies exercised by GoP in this regard, [name of Bidder/Contractor] agrees to indemnify GoP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoP in an amount equivalent to ten time the sum of any commission, gratification, bribe, finder’s fee or kickback given by [name of Bidder/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 GoP.

|  |  |
| --- | --- |
| Name of Employer: ……………… | Name of Bidder/Contractor: …………… |
| Signature: …………………..….… | Signature: ………………………………. |
| [Seal] | [Seal] |

**K-1**

**Schedule-K to Bid**

### SPECIFIC WORKS DATA

SPECIFIC WORKS DATA HAS BEEN PRESCRIBED IN

SPECIFIC AND TECHNICAL SPECIFICATIONS OF BIDDING DOCUMENTS

**L-1**

**Schedule-L to Bid**

### LIST OF RECOMMENDED MANUFACTURERS FOR ITEMS/ MATERIALS/EQUIPMENT OF ELEVATOR WORKS

The Bidder should note that Equipment/materials from the following recommended manufacturers or approved equivalent shall be allowed to be used on this Project provided that recommended/approved equivalent manufacturers meet the specified requirements given in the Bidding Documents and in the notes given here under.

**SR. EQUIPMENT/ RECOMMENDED COUNTRY (origin,**

**NO. MATERIAL MANUFACTURER/ manufacturing, assembly,**

**SUPPLIER testing & supply)**

1. Elevators DOPPLER EUROPE

HYUNDAI KOREA, CHINA

KONE EUROPE, CHINA

MITSUBISHI JAPAN/THAILAND

OTIS EUROPE, CHINA

ORONA EUROPE

SIGMA KOREA, CHINA

SCHINDLER EUROPE, CHINA

SHANGHAI MITSUBISHI CHINA

THYSSEN KRUPP EUROPE, CHINA

Or Approved Equivalent**\***

1. Split Air MITSUBISHI As Per Recommended

Conditioner/VRF DAIKIN Manufacturer/Supplier

LG

PEARL

MIDEA

SAMSUNG

GREE

1. UPS ABB As Per Recommended

(With SLA Type APC Manufacturer/Supplier

Batteries) BORRI

GE

LIEBERT

SIEMENS

RIELLO

1. Low Voltage Panel ELECTRECH PAKISTAN

Distribution Board SIEMENS

(DB) PEL

BILAL SWITCHGEAR

MESI

ALSTOM/AREVA

1. LV and Control Cables PAKISTAN CABLES PAKISTAN

|  |  |  |  |
| --- | --- | --- | --- |
| and Wires (600/1000V) | | PIONEER CABLES  NEWAGE CABLES  FAST CABLES |  |
| 6. | PVC Conduit and  Accessories | POPULAR  GALCO | PAKISTAN |
| 7. | Steel Conduit and  Accessories | HILAL INDUSTRIES  ILL  JAMAL  PIONEER  BASHIR | PAKISTAN |
| 8. | MCCBs, MCB | MERLIN GERLIN (MG)  SIEMENS  ABB  LEGRAND  TERASAKI | FRANCE/GERMANY/ ITALY/JAPAN |
| 9. | Magnetic Contactors | ABB  PANASONIC GREEN  POWER  TELEMECANIQUE | ITALY/FRANCE/JAPAN |
| 10. | ACBs, ELCBs | ABB  SIEMENS  MG  TERASAKI | ITALY/GERMANY/ FRANCE/JAPAN |
| 11. | Relays and Timers | FINDER  INTER | ITALY/TURKEY |
| 12. | PFI Relays | NOKIAN  ENTES | FINLAND/JAPAN/ TURKEY |
| 13. | Voltmeters/Ammeters | CIRCULOR  REVALCO  INTER  ENTES | ITALY/TURKEY |
| 14. | Selector | KRAUS & NAIMER | SWEDEN/FRANCE/ ITALY |
| Switches/Push ABB  Button LEGRAND  REVALCO | |
| 15. | Indication Lamps LEGRAND  BRETER  ABB  TELEMECANIQUE | | FRANCE/ITALY |
| 16. | Terminal Blocks LEGRAND  ABB  PHOENIX  CABOUR | | FRANCE/ ITALY/ JAPAN |
|  |  | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 17. | LV Change over  Switch Capacitors | SOCOMEC, ABB, AMBER, NOKIAN, DUCATI | FRANCE/GERMANY/ JAPAN/PAKISTAN |
| 18. | Paint | ICI, MASTER PAINTS,  BERGER | PAKISTAN |
| 19. | Fasteners, Hanging Rods, Rawal Plugs etc. | FISHER, HILTI, SPIT | WEST EUROPE |
| 20. | Propeller/ Tube Axial Fan | GFC  PAKFAN  CLIMAX  ROYAL  LAHORE  SASA  System Air  Aerotech  Sisteven  CASAL  Roesnberg | PAKISTAN/EUROPE/ CHINA |
| 21. | All equipment/ Materials other than stated above | Make and Country of Origin approved by Engineer |  |

**\*NOTES**

1. All components/material shall be supplied through authorized distributors.
2. Manufacturer's authorization certificate shall be provided.
3. In case a Bidder offers an ‘Approved Equivalent’ Brand/Equipment for elevator, it shall be clearly stated in the technical bid and all requisite data/documentation for qualification/evaluation of said brand/equipment shall be provided in the Technical bid in accordance with requirements provided in bidding documents.

* 1. Compliance of equipment parts and their origin as mentioned in Technical Specifications.
  2. Compliance statement of Technical Specification/Standards through the equipment manufacturer.
  3. Full EN81 standards compliance statement for the proposed model from the Manufacturer and EU type examination certificates (As a whole) against proposed elevator model no. from authorized/verifiable companies like TUV, SGS, Lift institute etc.
  4. Successful experience of at least thirty (30) elevators of similar nature and complexity comparable to the works within the last seven (07) years in Pakistan. This experience shall include supply, installation, testing, commissioning, operations & maintenance of elevator works.
  5. Successful experience of proposed brand’s complete elevator manufacturing for minimum twenty (20) years in the international market.
  6. The bidder/supplier must have valid authorization certificate from Principal Manufacturer of offered equipment for at least last three (03) years in Pakistan.

1. In case a Bidder offers an ‘Approved Equivalent’ Brand/Equipment for UPS with SLA Batteries, it shall be clearly stated in the technical bid and all requisite data/documentation for qualification/evaluation of said brand/equipment shall be provided in the technical bid in accordance with requirements provided in bidding

documents.

* 1. Compliance of equipment parts and their origin as mentioned in Technical Specifications.
  2. Compliance statement of Technical Specification/Standards through the equipment manufacturer.
  3. Full standards compliance statement for the proposed model from the Manufacturer and relevant certificates against proposed UPS model no.
  4. Successful experience of proposed brand’s complete manufacturing for minimum ten (10) years in the international market.
  5. The bidder/supplier must have valid authorization certificate from Principal Manufacturer of offered equipment for at least last three (03) years in Pakistan.

**L-2**

**Schedule-L to Bid**

**LIST OF RECOMMENDED MANUFACTURERS FOR ITEMS/ MATERIALS/EQUIPMENT OF CIVIL WORKS**

|  |  |  |
| --- | --- | --- |
| **S.**  **No.** | **Description of Item / Material / Equipment** | **Recommended Manufacturers /**  **Brands** |
| 1 | Curtain Wall (Aluminium Work) | Pakistan Cable  Chawla  Prime  Or any equivalent |
| 2 | Curtain Wall (Glazing Works) | Local Glass  Tariq Glass  Ghani Glass  Imported Glass  Guardian  Pilkington |
| 3 | Porcelain Tiles | Rak (UAE)  Granitto (UAE)  Niro Granite (Malaysia) |
| 4 | Construction Chemicals and Sealants | Sika  Dow Corning  Feb |
| 5 | Anchor for Concrete Works (Mechanical and Chemical) | Hilti  Spit  Sikla  Fischer  Sika |

**M-1**

**SCHEDULE – M TO BID**

**BIDDER’S EQUIPMENT DATA**

### ELEVATORS

**Note:** Data provided hereunder will be assessed for general conformity with requirements of Bidding Document. Acceptance of Bid will not mean acceptance of these data. The Contractor will have to submit detailed equipment submittals for approval of the Engineer in accordance with Special Provisions of Specifications later on after award of the Contract.

Technical catalogues are required only to substantiate the data provided in these forms. Catalogues of equipment not listed in these forms shall not be submitted and if submitted, will be ignored. Acceptance of Bid will not mean the acceptance of information given in those catalogues.

**A. ELEVATORS (MRL – 1275Kg)**

1. Make/Brand: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Country of Manufacture: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Model - Series: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Heavy Duty Passenger Model: (Y/N) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Offered Model is latest and available on the

Manufacture`s Official Website/Catalogue: (Y/N) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Complete elevator parts are being supplied through the

Main Principal Manufacturer: (Y/N) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. All passenger elevator/equipment to be supplied shall be EN 81-20, 50 & 70 Complied:

(Y/N) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. All offered model catalogues, specifications/

Attributes/material are not modified for subject

Project (Y/N) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Note: Confirmation required against Items A (4, 5, 6, 7 & 8) mentioned here above in “Y”. Failure to comply the said data can lead to rejection of Bidder’s Technical Bid.

1. **MAJOR ELEVATOR PARTS COMPLIANCE SHEET**

Following elevator parts shall be supplied by offered elevators manufacturer\brand and supplied from same manufacturing facility location as offered brand. Following Table shall be separately filled for each type of elevators as per project requirements. This shall be filled/complied by all recommended manufacturer or approved equal brands.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sr.**  **No.** | **Description** | **Model No.** | **Manufacturer/**  **Supplier**  **Name**  **Country**  **Origin** | **with of** | **EU Type**  **Examination Certificate No.** | **Supplying**  **Through the main Elevator Brand Factory**  **(Y/N)** |
| 1 | Machine/Motor |  |  |  |  |  |
| 2 | Main Elevator  Controller/  PCB Card |  |  |  |  |  |
| 3 | Over Speed  Governor |  |  |  |  |  |
| 4 | Safety Gear |  |  |  |  |  |
| 5 | Electric Safeties |  |  |  |  |  |
| 6 | Door Operator |  |  |  |  |  |
| 7 | Car Door/  Locking Devices |  |  |  |  |  |
| 8 | Landing Doors/  Locking Devices |  |  |  |  |  |
| 9 | Door Protection Device |  |  |  |  |  |
| 10 | Traction Belt |  |  |  |  |  |
| 11 | Car\Call Operation Panel |  |  |  |  |  |
| 12 | Car cabin |  |  |  |  |  |
| 13 | CWT filler  (50% Cast Iron & 50% Concrete with  Cast Iron Frame) |  |  |  |  |  |
| 14 | Car Guide Rail |  |  |  |  |  |
| 15 | CWT Guide Rail |  |  |  |  |  |
| 16 | Travelling Cable |  |  |  |  |  |
| 17 | Buffers |  |  |  |  |  |
| 18 | Halogen Free  Cables |  |  |  |  |  |
| 19 | Emergency Rescue Device |  |  |  |  |  |
| 20 | Seismic Sensor |  |  |  |  |  |
| 21 | Ropes\Belts |  |  |  |  |  |
| 22 | PCB Card for  Remote Monitoring |  |  | |  |  |

Note: Confirmation and details required against mentioned items here above in “Y” and EU type examination certificates shall be online verifiable. Failure to comply the said data

can lead to rejection of Bidder’s Technical Bid.

1. **UNINTERRUPTIBLE POWER SUPPLY SYSTEMS (UPS)-TECHNICAL DATA REQUIRED**

Brand Name

Country of Manufacture

Model-Series

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| UPS Rating    INPUT  Input phases | | | |  | KVA |
| Nominal voltage | | | |  | V |
| Maximum input tolerance for non-intervention of battery | | | |  | V |
| Nominal frequency  Power factor    BY-PASS | | | |  | Hz |
| Maximum acceptable tolerance for mains switching | | | |  | % |
| Configuration of voltage tolerance (from control panel) % | | | |  |  |
| Maximum frequency tolerance accepted for switching | | | |  | % |
| Configuration of configurable frequency tolerance (from control panel) % | | | |  |  |
| Switching time in Line Interactive mode (by-pass/inverter and vice versa) | | | |  | ms |
| Protection against mains back feed    OVERLOADS ON BY-PASS (xIn)  1s  10ms |  |  |  |
| Efficiency    BATTERY(SLA)  Type of battery  Intervention time (mains failure) |  |  |  | % |  |
| Nominal power supplied |  |  |  | KW |  |
| Compensation of battery voltage with temperature |  |  |  | mV/°C | |
| OUTPUT  Number of phases |  |  |  | per element | |
| Nominal voltage  Field of regulation of the phase/neutral voltage |  |  |  | V | |
| (from control panel)  Wave form |  |  |  | V | |
| Frequency  Operation as frequency converter |  |  |  | Hz | |
| Operation as back-up unit (load powered only if mains absent) Current peak factor (as per standard EN50091-3) | | |  |  | |
| Nominal power (VA) | | |  | KVA | |
| Nominal power (W) | | |  | KW | |

Static variation %

Dynamic variation (with load impact from 0 to 100%) %

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Output frequency variation with mains absent |  |  |  | % |  |
| Output frequency variation with mains present |  |  |  | % |  |
| Output frequency variation (from mimic panel) |  |  |  | % |  |
| Voltage distortion (linear load) |  |  |  | % |  |
| Voltage distortion (non-linear load)    OVERLOAD TIMES (from inverter) |  |  |  | % |  |
| 100%< Load <110% |  |  |  | hrs |  |
| 110%< Load <125% |  |  |  | min |  |
| 125%< Load <150% |  |  |  | min |  |
| Short circuit current (t<0.5 sec.) |  |  |  | % |  |
| Short circuit current (phase/neutral) |  |  |  | In |  |
| Short circuit current (phase/phase) |  |  |  |  | / |
| Inverter efficiency    VARIOUS |  |  |  | % |  |
| AC/AC efficiency (double conversion mode) AC/AC efficiency (Line interactive mode) 98% |  |  |  | % |  |
| Maximum permanent operating temperature |  |  |  | °C |  |
| Humidity    PROTECTIONS |  |  |  | % |  |
| Noise    DIMENSIONS |  |  |  | dB(A) | |
| Mechanical characteristics | Shielded metal cabinet with applied plastic front | | | | |
| Level of protection | IP | | | | |
| Cables input | Front, from the bottom | | | | |
| Cooling | Forced ventilation, with speed variable according | | | | |
|  | to load | | | | |

**N-1**

**SCHEDULE – N TO BID**

### ESSENTIAL AND RECOMMENDED SPARE PARTS

Spare parts are divided into two (02) categories as defined below.

1. Essential Spare Parts

* 1. Essential spare parts category contains spare parts listed in Part-I of this Schedule.

1. Recommended Spare Parts

* 1. Recommended spare parts (Part II of this Schedule) are those considered by the Bidder to be necessary for operation of three (03) years beyond Defects Liability Period.

* 1. Firm price valid for Thirty-six (36) months from the date of completion of Defects Liability Period (DLP).

* 1. Delivery period after receipt of order shall be three (03) months maximum.

(Bidder to complete Description and Pricing in Part-II attached.)

**N-2**

**SCHEDULE – N TO BID**

### PART I: ESSENTIAL SPARE PARTS

Following is a list of essential spare parts to be provided with the supply of equipment. Furthermore all spare parts required during Defects Liability Period of two (02) years shall be provided by the Contractor and their cost shall be included in the Bid.

(Ref: Specifications, Special Provisions, Section-1 of Volume-II)

|  |  |  |  |
| --- | --- | --- | --- |
| Sr.  No. | Spare Parts | Qty | Unit |
| 1 | 2 | 3 | 4 |

**A. Spare Parts to Be Supplied (Not to be Used in DLP)**

1. Guide Shoes 04 Nos (Each Type)
2. PCB Cards 01 No (Each Type)
3. Lubrication Oil 04 Nos (Each Type)
4. Landing Operating Panels 04 Nos (Each Type)
5. Landing Indicators 04 Nos (Each Type)
6. Car & Landing Door Belts 04 Nos (Each Type)
7. Electric Fuses 08 Nos (Each Type)
8. Emergency Lights 08 Nos (Each Type)
9. Electric Safety Switches 08 Nos (Each Type)
10. Door Locks 04 Nos (Each Type)

**B.** Manufacturers Recommended

Spare Parts for Defect Liability Period LOT Nos. (Each Type)

**N-3 SCHEDULE – N TO BID**

### PART-II RECOMMENDED SPARE PARTS

Bidder shall enter item wise price and names of spare parts hereunder which will remain valid for three (03) years beyond Defects liability period. (Ref: Specifications, Special Provisions, Section-1 of Volume-II)

1. **CONSUMABLE SPARE PARTS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sr. No. | Description | For Equipment (Give Equip. Code) | Unit | Qty. | Unit Rate (Rs.) | Amount (Rs.) |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|  |  |  |  |  |  |  |

Total: \_\_\_\_\_\_\_\_\_\_\_\_

1. **NORMAL SPARE PARTS**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sr. No. | Description | For Equipment (Give Equip. Code) | Unit | Qty. | Currency | Unit Rate | Amount (Rs.) |
| 1 | 2 | 3 | 4 | 5 | 6A | 6B | 7 |
|  |  |  |  |  |  |  |  |

Total: \_\_\_\_\_\_\_\_\_\_\_\_

# STANDARD FORMS

**BS-1**

## FORM OF BID SECURITY

Security Executed on

*(Date)*

Expiry on

*(Date)*

Name of Surety with Address:

Name of Principal (Bidder) with Address

Penal Sum of Security PKR (Pak Rupees )

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 'Employer') 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

(*Particulars of Bid*) to the said Employer; and

1. WHEREAS, the Employer has required as a condition for considering said Bid that the Bidder furnishes a Bid Security in the above said sum to the Employer, conditioned as under: that the Bid Security shall remain in force for a period fourteen (14) days beyond the Bid Validity date i.e., upto .
2. that the Bid Securities of the Bidders except the lowest three will be returned by the Employer within twenty eight (28) days from the opening of Bids, provided a Bidder request for the return of its Bid Security, or on the expiry of original validity of Bid Security or as extended, whichever is earlier;
3. that the Bid Security of the lowest three Bidders comprising the successful Bidder will be returned when the successful Bidder has furnished the required Performance Security; and
4. that in the event of failure of the successful Bidder to furnish the required Performance Security, the entire said sum be paid immediately to the said Employer pursuant to IB.16 and IB.35 of the Instructions to Bidders for the successful Bidder's failure to perform.

NOW THEREFORE, if the successful Bidder shall, within the period specified therefor, on the prescribed form presented to him for signature enter into a formal Contract with the said Employer 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 Employer for the faithful performance and proper fulfilment of the said Contract or in the event of nonwithdrawal 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.

**BS-2**

PROVIDED THAT the Surety shall forthwith pay the Employer the said sum upon first written demand of the Employer (without cavil or argument) and without requiring the Employer to prove or to show grounds or reasons for such demand, notice of which shall be sent by the Employer by registered post duly addressed to the Surety at its address given above.

PROVIDED ALSO THAT the Employer shall decide, 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 Employer 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

(Scheduled Bank)

WITNESS: Signature

1. Name

Title

Corporate Secretary (Seal) Corporate Guarantor (Seal)

2.

Name, Title & Address

**PS-1**

**FORM OF PERFORMANCE SECURITY**

Guarantee No. Executed on

Expiry date

[Letter by the Guarantor to the Employer]

Name of Guarantor with address:

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 Employer) in the penal sum of the amount stated above for the payment of which sum well and truly to be made to the said Employer, 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 Employer'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 Employer, 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 Clause11, Defects After Taking Over, 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 defense under the Contract, do hereby irrevocably and independently guarantee to pay to the Employer without delay upon the Employer's first written demand without cavil or arguments and without requiring the Employer to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the Employer'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 Employer’s designated Bank & Account Number.

**PS-2**

PROVIDED ALSO THAT the Employer shall decide, 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 Employer 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

(Scheduled Bank)

WITNESS: Signature

1. Name

Title

Corporate Secretary (Seal) Corporate Guarantor (Seal)

2.

Name, Title & Address

**LOA-1**

**Letter of Acceptance**

*[letter head paper of the Employer]*

NAME OF CONTRACT:

CONTRACT NUMBER:

To :

Date:

Your

Reference:

Our

Reference:

We thank you for your Bid dated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for the execution and completion of the Works comprising the above-named Contract and remedying of defects therein, all in conformity with the terms and conditions contained in the Contract.

We have pleasure in accepting your Bid for the Accepted Contract Amount of:

[currency and amount in figures]

[currency and amount in words]

In consideration of you properly and truly performing the Contract, we agree to pay you the Accepted Contract Amount or such other sums to which you may become entitled under the terms of the Contract, at such times and as prescribed by the Contract.

We acknowledge that this Letter of Acceptance creates a binding Contract between us, and we undertake to fulfil all our obligations and duties in accordance with the terms of this Contract.

Signature:

Signed by:

For and on behalf of:

Date:

**CA-1**

## FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the “Agreement”) made on the day of (month) 2025 between (hereinafter called the “Employer”) of the one part and (hereinafter called the “Contractor”) of the other part.

WHEREAS the Employer 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 witnessed 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.

1. The following documents, in the order of priority, 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:

* 1. This Contract Agreement;
  2. The Letter of Acceptance;
  3. The Letters of Bid (Letter of Technical Bid & Letter of Price Bid);
  4. The Particular Conditions Part A - Contract Data;
  5. The Particular Conditions Part B - Special Provisions;
  6. The General Conditions;
  7. The Specifications Part A - Specific Provisions;
  8. The Specifications Part B - Technical Provisions;
  9. The Drawings;
  10. The Completed Schedules to Bid including Schedule of Prices;
  11. the JV Undertaking (if the Contractor is a JV); and
  12. *[Employer to insert any other documents forming part of the Contract*]

The addenda/corrigenda, if any, (Excluding part relating to Instructions to Bidders alongwith Bidding Data) shall be deemed to have been incorporated at the appropriate places in the “Documents forming the Contract”.

1. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy defects therein in conformity and in all respects with the provisions of the Contract.

1. The Employer 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.

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 Contractor Signature of Employer

(Seal) (Seal)

Signed, Sealed and Delivered in the presence of:

Witness Witness

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

**DAAB-1**

**DAAB Agreement**

[*All italicised text and any text within square brackets (except sub-clause headings) in this form of agreement is for use in preparing the form and should be deleted from the final product*].

Name and details of the Contract

This Agreement made the day of [*month*], [*year*], between

Name and contact details of the Employer (name)

(*address*)

(

*email*

*/*

*other*

*contact*

*details*

;

)

(

*email*

*/*

*other*

*contact*

*details*

)

;

(*telephone*)

Name and contact details of the Contractor (name)

(*address*)

(*telephone*)

Name and contact details of the DAAB

Member (name)

(*address*)

(*telephone*)

(

*email*

*/*

*other*

*contact*

*details*

)

;

(“**DAAB Agreement**”)

Whereas:

1. the Employer and the Contractor have entered (or intend to enter) into the Contract;

1. under the Contract, the “**DAAB**” or “**Dispute Avoidance/Adjudication Board**” means the sole member or three members (as stated in the Contract Data of the Contract) so named in the Contract, or appointed under Sub-Clause 21.1 [*Constitution of the DAAB*] or Sub-Clause 21.2 [*Failure to Appoint DAAB*

*Members*] of the Conditions of Contract;

1. the Employer and the Contractor desire jointly to appoint the above-named DAAB Member to act on the DAAB as:

* 1. the sole member of the DAAB, and where this is the case, all references to the “Other Members” do not apply; or
  2. one of three members / chairman [*delete the one which is not applicable*] of the DAAB and, where this is the case, the other two persons are:

**DAAB-2**

*(name) (name)*

*(address) (address)*

*(telephone) (telephone)*

*(email/ other contact details) (email/ other contact details)*

the “**Other Members**”; and

1. the DAAB Member accepts this appointment.

**The Employer, Contractor and DAAB Member jointly agree as follows:**

1. The conditions of this DAAB Agreement comprise:

* 1. Clause 21 [*Disputes and Arbitration*] of the Conditions of Contract, and any other provisions of the Contract that are applicable to the DAAB’s Activities; and

* 1. the “General Conditions of Dispute Avoidance/Adjudication Agreement”, which is appended to the General Conditions of the “Conditions of Contract for Construction” Second Edition 2017 published by FIDIC (“GCs”), as amended and/or added to by the following provisions.

1. [Details of amendments to the GCs, if any. For example:

In the procedural rules annexed to the GCs, Rule \_ is deleted and replaced by: “ …

“]

1. The DAAB Member shall be paid in accordance with Clause 9 of the GCs. The currency of payment shall be .

In respect of Sub-Clauses 9.1 and 9.2 of the GCs, the amounts of the DAAB Member’s monthly fee and daily fee shall be:

monthly fee per month, and daily fee of per day

(or as otherwise set under Sub-Clause 9.3 of the GCs).

1. In consideration of the above fees, and other payments to be made to the DAAB Member in accordance with the GCs, the DAAB Member undertakes to act as DAAB Member in accordance with the terms of this DAAB Agreement.

1. The Employer and the Contractor shall be jointly and severally liable for the DAAB Member’s fees and other payments to be made to the DAAB Member in accordance with the GCs.

1. This DAAB Agreement shall be governed by the law of (if not stated, the law that governs the Contract under Sub-Clause 1.4 of the Conditions of Contract).

**DAAB-3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| SIGNED by: |  | SIGNED by: |  | SIGNED by: |

Print name: Print name: DAAB Member

Title: Title:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| for and on behalf of  the Employer |  | for and on behalf of the Contractor |  | Title: |
| in the presence of |  | in the presence of |  | in the presence of |
| Witness:  Name:  Address: |  | Witness:  Name:  Address: |  | Witness: Name: Address: |
|  |  |  |  |  |

Date:

Date:

Date:

**MG-1**

## FORM OF MOBILIZATION ADVANCE GUARANTEE

Guarantee No. Date

WHEREAS (hereinafter called the 'Employer')

has entered into a Contract for  *(Particulars of Contract)* with\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hereinafter called the "Contractor').

AND WHEREAS, the Employer has agreed to advance to the Contractor, at the

Contractor's request, an amount of Pak Rupees (PKR ) which amount shall be advanced to the Contractor as per provisions of the Contract.

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

AND WHEREAS,

(hereinafter called the “Guarantor”) at the request of the Contractor and in consideration of the Employer 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 fulfilment of any of his obligations for which the advance payment is made, the Guarantor shall be liable to the Employer for payment not exceeding the aforementioned amount.

Notice in writing of any default, on the part of the Contractor, of which the Employer at his discretion of making decision, shall be given by the Employer 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 PKR \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(Pak Rupees

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_).

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

(*Scheduled Bank*)

WITNESS: Signature

1. Name

Title

Corporate Secretary (Seal) Corporate Guarantor (Seal)

2.

Name, Title & Address

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Conditions of Contract

## CONDITIONS OF CONTRACT

### CONDITIONS OF CONTRACT

The Conditions of Contract comprise two parts:

1. General Conditions
2. Particular Conditions

#### General Conditions

These Conditions are the “General Conditions” which form part of the “FIDIC Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer Second Edition (2017 Red book, Reprinted 2022 with amendments)” published by:

International Federation of Consulting Engineers

(Fédération Internationale des Ingénieurs – Conseils) –

(FIDIC) World Trade Center II - Geneva Airport

P. O. Box 311

CH-1215 Geneva

15 Switzerland

Email: fidic@fidic.org, fidic.pub@fidic.org

Website: https://fidic.org/bookshop

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### Particular Conditions

The Particular Conditions (PC) complement the General Conditions (GC) to specify dates, contractual requirements, and special circumstances related to the Works. The PC consists of two parts, Part A - Contract Data and Part B - Special Provisions. The provisions to be found in the Special Provisions (Particular Conditions - Part B) take precedence over the equivalent provisions found under the same Sub-Clause number(s) in the General Conditions, and the provisions of the Contract Data (Particular Conditions - Part A) take precedence over the Special Provisions (Particular Conditions - Part B).

#### Part A - Contract Data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sub- Claus**  **e** | | **Data to be Given** | | **Data** | |
| 1.1.27 | | Defects Notification Period (DNP): | | 730 days | |
| 1.1.31 | | Employer’s name and address: | | **DGM/ In charge (RE)**  State Life Building No. 5 Phase-II  (Basement)  Blue Area, Islamabad-44000  Ph.: +92 (051) 9202324 | |
| 1.1.35 | | Engineer’s name and address: | | National Engineering Services  Pakistan (Pvt.) Limited (NESPAK) 17-C-1, IEEEP Building, Civic Center, Faisal Town, Lahore. | |
| 1.1.73 | | Sections: | | “None” | |
| 1.1.84 | | Time for Completion: | | 210 days for whole of the Works | |
| 1.3(a)(ii) | | agreed methods of electronic transmission: | | For Notices, electronic transmission is not permitted.    For other communications, SMS, Email, WhatsApp, or any other such means used by the Employer required for supplementing pace of work/decision making for timely completion of the Project. | |
| 1.3(d) | | address of Employer for communications: | | As stated hereof in Sub-Clause  1.1.31 | |
| address of Engineer for communications: | | As stated hereof in Sub-Clause  1.1.35 | |
| address of Contractor for communications: | | [To be filled in at the time of signing of the Contract] | |
| 1.4 | | Contract shall be governed by the law of: | | Islamic Republic of Pakistan | |
| ruling language: | | English | |
| language for communications: | | English | |
| 2.1 | | after receiving the Letter of Acceptance, the Contractor shall be given right of access to all or part of the Site within: | | No later than the Commencement Date | |
| 2.4 | | Employer’s financial arrangements | | The Employer’s financial arrangements are in well in place and payments under the Contract shall be made effectively. | |
| 3.2 (e)(ii) | | Engineer’s Duties and Authority | | Variation resulting in an increase of the Accepted Contract Amount in excess of one percent (1%) subject to accumulative Variations not exceeding five percent (5%) of the Accepted Contract Amount | |
| 4.2 | | Performance Security (as percentage of the Accepted Contract Amount in Currencies) percent: currency: | | Ten percent (10%) denominated in PKR or in a freely convertible currency acceptable to the Employer. | |
| 4.7.2 | | period for notification of errors in the items of reference | | Twenty Eight (28) days | |
| 4.19 | | period of payment for temporary utilities | | None | |
| 4.20 | | number of additional paper copies of progress reports | | Three (03) | |
| 5.1(a) | | maximum allowable accumulated value of work subcontracted (as a percentage of the Accepted Contract  Amount) | | None | |
| 5.1(b) | | parts of the Works for which subcontracting is not permitted | | None | |
| 6.5 | | Normal working hours on the Site | | 12 Hours/Day | |
| 8.3 | | number of additional paper copies of programmes | | Three (03) | |

|  |  |  |
| --- | --- | --- |
| **Sub-**  **Clause** | **Data to be Given** | **Data** |
| 8.8 &  14.15(b) | Delay Damages payable for each day of delay | 0.25% of the Accepted Contract Amount for delay in completion of whole of the Works |
| 8.8 | maximum amount of Delay Damages | Ten percent (10%) of the Accepted Contract Amount |
| 8.14 | Applicability of Incentives for Early Completion | None |
| 12.3 | Percentage profit | None |
| 13.4.(b)(ii) | percentage rate to be applied to Provisional Sums for overhead charges and profit | None |
| 14.2 | Total Advance Payment | Ten percent (10%) of the Accepted Contract Amount excluding  Provisional Sums. |
| 14.2.3 | percentage deductions for the repayment of the Advance  Payment | Deduction shall be made at the amortization rate of 17.5 % of the value of the Works executed of each IPC as provided in paragraph (i) of Sub-Clause GCC 14.3, starting from 2nd IPC provided that the advance payment shall be completely repaid prior to the time when 90% of the Accepted  Contract Amount less Provisional Sums has been certified for payment. It may be more than 17.5% in the last installment to ensure full repayment. |
| 14.3 | period of payment | one month |
| 14.3(b) | number of additional paper copies of Statements | Four (04) |
| 14.3 (iii) | percentage of retention | Five percent (5%) |
| 14.3 (iii) | limit of Retention Money (as a percentage of the Contract  Price) | Five percent (5%) |
| 14.5(b)(i) | Plant and Materials for payment when shipped | Not Used |
| 14.5(c)(i) | Plant and Materials for payment when delivered to the Site | Not Used |

|  |  |  |
| --- | --- | --- |
| **Sub-**  **Clause** | **Data to be Given** | **Data** |
| 14.6.2 | minimum amount of Interim Payment  Certificate (IPC) | 10 Million |
| 14.7(a) | period of payment of Advance Payment to the  Contractor | 14 days |
| 14.7b(i) | period for the Employer to make interim payments to the  Contractor under Sub-Clause  14.6 [Interim Payment] | 28 Days |
| 14.7b(ii) | period for the Employer to make interim payments to the Contractor under Sub-Clause  14.13 (Final Payment) | 28 days |
| 14.7(c) | period for the Employer to make final payment to the  Contractor | 56 days |
| 14.8 | financing charges for delayed payment | Not Used. |
| 14.11.1(b) | number of additional paper copies of draft Final Statements | three (03) |
| 14.15 | currencies of payment of Contract Price | PKR only |
| 14.15(a)(i) | Proportions or amounts of  Local and Foreign currencies | Only local currency, i.e., PKR.  Foreign Currency is not applicable. |
| 14.15(c) | currencies and proportions  for payment of Delay Damages | PKR only |
| 14.15(f) | rates of exchange | Not Applicable |

|  |  |  |
| --- | --- | --- |
| **Sub-**  **Clause** | **Data to be Given** | **Data** |
| 17.2(d) | forces of nature, the risks of which are allocated to the Contractor | Nil |
| 19.1 | permitted deductible limits:   1. insurance required for the Works 2. insurance required for   Goods iii) insurance required for liability for breach of  professional duty   1. insurance required against liability for fitness for purpose (if any is required) 2. insurance required for injury to persons and damage to property 3. insurance required for injury to employees 4. other insurances required by Laws and by local practice | 1. Ten percent (10%) of loss amount on each & every loss 2. Nil iii) Nil        1. Nil        1. Nil vi) Nil   vii) Nil |
| 19.1 | Periods for submission of insurance:   1. evidence of insurance 2. relevant policies | Not later than the  Commencement Date  Within twenty eight (28) days from the Commencement Date |
| 19.2.1(b) | additional amount to be insured  (as a percentage of the  replacement value) | 15% of the replacement value of the Accepted  Contract Amount |
| 19.2.2 | extent of insurance required for Goods    amount of insurance required for Goods | from Ex-Works (i.e., works, factory, warehouse, etc) to delivery at the Site  Full replacement value |
| 19.2.3(a) | amount of insurance required for liability for breach of  professional duty | Full replacement value of the  Works to be designed by the  Contractor |
| 19.2.3(b) | insurance required against liability for fitness for purpose | Yes |
| 19.2.3 | period of insurance required for liability for breach of  professional duty | Until the date of issuance of Performance Certificate |

|  |  |  |
| --- | --- | --- |
| **Sub-**  **Clause** | **Data to be Given** | **Data** |
| 19.2.4 | amount of insurance required for injury to persons and  damage to property | Injury to person and Fatal case: in accordance with  Workmen Compensation  Act    Damage to Property: 2,000,000 without limit to the number of incidents |
| 19.2.6 | other insurances required by Laws and by local practice | All insurances as applicable, to the extent of execution of the project,  under Federal and Provincial laws of Islamic Republic of Pakistan |
| 21.1 | time for appointment of the  DAAB | Appointment of the DAAB shall be made when Dispute arises between the Parties. |
| 21.1 | the DAAB shall comprise | Sole Member |
| 21.1 | List of proposed members of DAAB   * proposed by Employer      * proposed by Contractor | *[to be inserted at the time of*  *signing of the Contract]*  1.  2.    1.  2. |
| 21.2 | Appointing entity (official) for DAAB members | Chairman Pakistan Engineering Council (PEC) from the list of PEC approved arbitrators published at its website |
| 21.6 | Rules of Arbitration | Pakistan Arbitration Act of 1940.  The place of Arbitration shall be: **Islamabad (Pakistan)** |

**Particular Conditions**

##### Part B - Special Provisions

**1.1 Definitions** 1.1.76 “Specification”

Following is added at the end:

“and consists of two parts i.e.,

1. “Part A - Specific Provisions”; and
2. “Part B - Technical Provisions”.”

**1.2 Interpretation** “and” is deleted from the end of sub-paragraph (i) and added at the end of sub-paragraph (j).

Sub-paragraph (k) is added:

“(k) The word “tender” is synonymous with “bid” the word tenderer with “bidder”, the words “tender documents” with “bidding documents” and “Schedule of Prices” with “Bill of Quantities”, as applicable.”

**1.5 Priority of** The documents listed at (a) through (k) of this Sub**Documents** Clause are deleted and substituted with the following:

1. the Contract Agreement;
2. the Letter of Acceptance;
3. the Letter of Bid;
4. the Particular Conditions Part A - Contract Data;
5. the Particular Conditions Part B - Special Provisions;
6. the General Conditions;
7. the Specification Part A - Specific Provisions;
8. the Specification Part B - Technical Provisions;
9. the Drawings;
10. the completed Schedules to Bid including Bill of Quantities;
11. the JV Undertaking (if the Contractor is a JV); and (l) any other documents forming part of the Contract.

The addenda/corrigenda, if any, shall be deemed to have been incorporated at the appropriate places in the documents forming the Contract.

**1.6 Contract** In the last line of the 1st paragraph the text “shall be borne

**Agreement** by the Employer” is substituted by “shall be reimbursed by the Employer to the Contractor”.

**3.1 The Engineer** In sub-paragraph (a) the text “as defined in the Pakistan Engineering Council Act, 1975 (Act No. V of

1976)” are added after the words “professional engineer”.

|  |  |  |
| --- | --- | --- |
| **3.2** | **Engineer’s Duties and Authority** | The Engineer shall obtain the consent in writing of the Employer before taking action under the following Sub-Clauses of these Conditions: |

* + - 1. Consenting to the subcontracting of any part of the Works under Sub-Clause 5.1

[Subcontractors]

* + - 1. Any action under Sub-Clauses 8.9 [Employer’s Suspension] and 8.12 [Prolonged Suspension]

* + - 1. Issuance of “Taking Over Certificate” under Sub-Clause 10.1 [Taking Over the Works and Sections].

(d) Issuing the “Performance Certificate” under Sub-Clause 11.9 [Performance Certificate].

(e) Sub-Clause 13.1 [Right to Vary]: instructing a Variation, except;

* + - * 1. in an emergency situation as determined by the Engineer, or
        2. if such a Variation would increase the Accepted Contract Amount by less than the percentage specified in the Contract Data.

(f) Sub-Clause 13.3 [Variation Procedure]: approving a proposal for Variation submitted by the Contractor in accordance with Sub-Clause

13.3.2 [Variation by Request for Proposal] or

13.2 [Value Engineering].

* + - 1. Certifying release of second half of the

Retention Money under Sub-Clause 14.9 [Release of Retention Money].

* + - 1. Issuing Final Payment Certificate under Sub-

Clause 14.13 [Issue of FPC]

Any such requirement shall not be applied to any action by the Engineer under Sub-Clause 3.7 [Agreement or Determination], as stated in SubClause 3.2 [Engineer’s Duties and Authority] of the General Conditions.

Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Employer.

Following is added after the words “the Employer’s consent is required” in 4th paragraph:

“stating that the Employer’s consent has been obtained for that specified authority”.

**4.2 Performance** 4.2.1 Contractor’s Obligations

**Security**

The entity issuing the Performance Security and its form shall be as under:

The Performance Security shall be, at the option of the Contractor, issued in the prescribed form included in the Bidding Documents, by (a) a Scheduled Bank in Pakistan or (b) a foreign bank duly counterguaranteed by a Scheduled Bank in Pakistan. In case of Joint Venture, the Performance Security shall be in the name of the Joint Venture or in the name of Lead/either firm of the JV or in ratio of shares of the individual JV partners.

Following paragraph is added at the end of this SubClause:

“The amount of Performance Security shall be reduced to 50% following issue of the Taking-Over Certificate for the whole of the Works under Clause

10 of Conditions of Contract.”

**4.3 Contractor’s** In second paragraph the text “professional engineer

**Representative** as defined in the Pakistan Engineering Council Act, 1975 (Act No. V of 1976) (having temporary licence in case of foreign engineer under Section 12 of the

Pakistan Engineering Council Act, 1975 (Act No. V of 1976)” are added after the words “qualified, experienced”.

In the 3rd paragraph the words “28 days” are substituted by “14 days”. In 2nd line of 4th paragraph the text “or appoint a replacement” is substituted by “except appointment of a suitable temporary

replacement is deployed at the Site”

**4.4 Contractor’s** 4.4.2 As-Built Records

**Documents**

First paragraph is deleted and the text in the last

paragraph is substituted with the following:

“The Contractor shall furnish to the Engineer 6 copies, one reproducible and one electronic copy (provided the Engineer has made available to the Contractor editable form of the Drawings) of all Drawings amended to conform to the Works as built.

In case the Engineer does not make available to the Contractor editable form of the Drawings, the Contractor shall furnish to the Engineer as-built data for incorporation in the Drawings. Upon receipt of PDF versions of the as-built drawings prepared by the Engineer, the Contractor shall furnish to the Engineer 6 copies and one reproducible of these Drawings.

The price of such Drawings shall be deemed to be included in the Contract Price.”

Following Sub-Clause is added:

4.4.4 Shop Drawings

The Contractor shall submit to the Engineer for review 3 copies of all shop and erection drawings applicable to this Contract as per provision of relevant Sub-Clause of the Contract.

Review and approval by the Engineer shall not exceed 21 days and be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory and the

Engineer’s review or approval shall not relieve the

Contractor of any of his responsibilities under the Contract.

**4.8 Health and Safety** The following text is added at the end of this Sub-

**Obligations** Clause:

In the event of work being carried out outside the normal working hours and in the event of work being carried out at night, the Contractor shall at his own cost, provide and maintain such good and sufficient light as will enable the work to proceed satisfactorily and without danger. The approaches to the Site and the Works where the night work is being carried out shall be sufficiently lighted. All arrangement adopted for such lighting shall be to the satisfaction of the Engineer.

**4.20 Progress Reports** At the end of sub-paragraph (g) the word “and” is deleted and at the end of sub-paragraph (h) the full stop (.) is replaced with “;”, and the following new sub-paragraphs are added as:

1. planned programme for the execution of the Works for next 56 days to enable the Engineer to determine its programme of inspection and testing;

1. monthly summery of daily job record indicating weather conditions, deployment of Contractor’s Equipment, labour employment, local material procurement and material import, if any; and

1. salient contractual and project information.

**5.1 Subcontractors** Add the following text at the end of paragraph (ii):

“under Schedule to Bid”

The following is added at the end of the last paragraph of Sub- Clause 5.1:

“All subcontracts relating to the Works shall include provisions which entitle the Employer to require the subcontract to be assigned to the Employer under sub-paragraph (a) of Sub- Clause 15.2.3 [*After Termination*].

The Contractor shall give reasonable opportunity to contractors from Islamic Republic of Pakistan for subcontracts for the Works, and endeavor to employ such contractors as Subcontractors.”

**5.2 Nominated** 5.2.2 Objection to Nomination

**Subcontractors**

In sub-paragraph (c), “and” is deleted from the end of (i); “.” at the end of (ii) is replaced with: “, and”.

The following is then added as (iii):

“(iii) be paid only if and when the Contractor has received from the Employer payments for sums due under the Subcontract referred to under

Sub-Clause 5.2.3 [*Payment to nominated*

*Subcontractors*].”

**6.1 Engagement of** The following paragraph is added at the end of the **Staff and Labour** Sub-Clause:

“The Contractor shall, to the extent practicable and reasonable, employ staff (not less than 50%) and labour (not less than 85%) with appropriate qualifications and experience from sources within the Islamic Republic of Pakistan.”

**6.7 Health and Safety** The existing text is substituted with the following: **of Personnel**

“In order to provide for the safety, health and welfare of persons, and for prevention of damage of any kind,

all operations for the purposes of or in connection with the Contract shall be carried out in compliance with the Safety Requirements of the Government of Pakistan with such modifications thereto as the Engineer may authorize or direct and the Contractor shall take or cause to be taken such further measures and comply with such further requirements as the Engineer may determine to be reasonably necessary for such purpose. The Contractor shall also provide all other medical services and appoint a health and safety officer at Site if stated in the Specifications. In case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer immediately by the quickest available means.”

**6.8 Contractor’s** Insert at the end of sub-paragraph (a) of this Sub-Clause:

**Superintendence**

"or, if not, the Contractor shall make competent interpreters available during all working hours, in a number sufficient for those persons to properly

perform their superintendence duties"

The following text is added at the end of this Sub-Clause:

“The Contractor’s authorized representative and his other engineers working at site shall possess valid registration with the Pakistan Engineering Council.

The Contractor’s authorized representative at Site shall be authorized to exercise adequate administrative and financial powers on behalf of the Contractor so as to achieve completion of the Works as per the Contract.”

**6.12 Key Personnel** The following is inserted at the end of the last paragraph:

“If any of the Key Personnel are not fluent in this language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer.”

The following Sub-Clauses 6.13 to 6.26 are added at the end of Sub-Clause 6.12:

**6.13 Foreign Personnel** The Contractor may bring in to the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, if requested by the Contractor, use all reasonable endeavor in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national, or government permission required for bringing in the

Contractor’s personnel.

The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.

**6.14 Supply of** The Contractor shall arrange for the provision of a **Foodstuffs** sufficient

supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor’s Personnel for the purposes of or in connection with the Contract.

**6.15 Supply of Water** The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor’s Personnel.

**6.16 Measures against** The Contractor shall at all times take the necessary **Insect and Pest** precautions to protect the Contractor’s Personnel **Nuisance** employed on the Site from insect and pest nuisance, and to reduce the danger to their health. The

Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

**6.17 Alcoholic Liquor** The Contractor shall not, otherwise than in **or Drugs** accordance with the Laws of the Country, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal thereto by Contractor’s Personnel.

**6.18 Arms and** The Contractor shall not give, barter, or otherwise

**Ammunition** dispose of, to any person, any arms or ammunition of any kind, or allow Contractor’s Personnel to do so.

**6.19 Festivals and** The Contractor shall respect the Country’s

**Religious** recognized festivals, days of rest and religious or

**Customs** other customs.

**6.20 Funeral** The Contractor shall be responsible, to the extent

**Arrangements** required by local regulations, for making any funeral arrangements for any of its local

employees who may die while engaged upon the Works

**6.21 Forced Labour** The Contractor, including its Subcontractors, shall not employ or engage forced labour which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labourcontracting arrangements.

**6.22 Child Labour** The Contractor, including its Subcontractors, shall not employ or engage child labour in accordance with relevant law(s) in force in Islamic Republic of Pakistan.

**6.23 Employment** The Contractor shall keep complete and accurate **Records of** records of the employment of labour at the Site. The **Workers** records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the Engineer. These records shall be included in the details to be submitted by the

Contractor under Sub-Clause 6.10 [*Contractor’s Records*].

**6.24 Workers’** The Contractor shall comply with the relevant labour **Organizations** laws of Pakistan which recognize workers’ rights to form and to join workers’ organizations/Trade Union of their choosing and to bargain collectively without interference.

**6.25 Non-** The Contractor shall not make decisions relating to

**Discrimination and** the employment or treatment of Contractor’s

**Equal Opportunity** Personnel on the basis of personal characteristics unrelated to inherent job requirements. The

Contractor shall base the employment of Contractor’s Personnel on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to any aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices.

Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination. The Contractor shall provide protection and assistance as necessary to ensure nondiscrimination and equal opportunity, including for specific groups such as women, persons with disabilities, migrant workers and children (of working age in accordance with SubClause 6.22).

|  |  |  |  |
| --- | --- | --- | --- |
| **6.26** | **Epidemics** |  | In the event of any out-break of illness of epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government or the local medical or sanitary authorities for the purpose of overcoming the same. |
| **7.7** | **Ownership** | **of** | The following is added before the first paragraph: “Except as otherwise provided in the Contract,” |
| **Plant and Materials** | |

The following is added at the end of the Sub-Clause:

"No Plant and/or Materials that is the property of the Employer shall be removed from the Site. If it becomes necessary to:

1. remove any item of such Plant from the Site for the purposes of repair, the Contractor shall give a Notice, with reasons, to the Engineer requesting consent to remove the defective or damaged item off the Site. This Notice shall clearly identify the item of defective or damaged Plant, and shall give details of: the defect or damage to be repaired; the place to which defective or damaged item of Plant is to be taken for repair; the transportation to be used (and insurance cover for such transportation); the proposed inspections and testing off the Site; and the planned duration required before the repaired item of Plant shall be returned to the Site. The Contractor shall also provide any further details that the Employer may

reasonably require; or

1. replace any item(s) of such Plant and/or Materials, the Contractor shall give a Notice, with reasons, to the Engineer clearly identifying the item(s) of Plant and/or Materials to be replaced, and giving details of the due date of delivery to the Site of the replacement item(s).

Where any item of Plant and/or Materials has become the property of the Employer under this Sub-Clause before it has been delivered to the Site, the Contractor shall ensure that such an item is not moved except for its delivery to the Site.

The Contractor shall indemnify and hold the Employer harmless against and from the consequences of any defect in title or encumbrance or charge (except any reasonable restriction arising from the intellectual property rights of the manufacturer or producer) on any item of Plant and/or Materials that has become the property of the Employer under this Sub-Clause."

**7.9 Use of Pakistani** The Contractor shall, so far as may be consistent **Materials and** with the Contract, make the maximum use of **Services** 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** The following is added before the first paragraph:

**Works**

“After signing of the Contract Agreement by both Parties,” and thereafter the word “The” is replaced with the word “the”.

**8.5 Extension of Time** The following is added after paragraph (c):

**for Completion** “for last five years”.

The following Sub-Clause 8.14 is added after Sub-Clause 8.13:

**8.14 Incentives For** If Contract Data does not state applicability of

**Early Completion** incentives for early completion, this Sub-Clause shall not apply.

The Contractor shall be entitled subject to SubClause 20.2 [*Claims for Payment and/or EOT*] to bonus payment if the Works and/or each Section is completed earlier than the Time for Completion for the Works or Section (as the case may be). The amount of bonus for early completion of the Works and/or each Section shall be upto a limit and at a rate to 50% of the relevant limit and rate of delay damages prescribed in Contract Data and shall be paid for every day which shall elapse between the relevant Date of Completion of the Works or Section and the relevant Time for Completion.

For the purposes of calculating any bonus payment, the applicable Time for Completion stated in the Contract Data is fixed and no adjustments of this time by reason of granting an EOT will be allowed.

The following Sub-Clause 11.12 is added after Sub-Clause 11.11:

**11.12 Supervisory** If provided under the Schedule of Prices, the **Assistance During** Contractor shall provide supervisory assistance to

**DNP** the Employer during the DNP for the Works. Such supervisory assistance shall be as described in the Specification for the purpose of supporting the Employer's operation and maintenance of the Plant for the period specified in the Schedule of Prices after the Date of Completion.

**12.2 Method of** The following paragraph is added at the end of the **Measurement** Sub-Clause:

“Summary of measured quantity for payment shall be delineated item-wise under four heads namely; “Schedule of Prices Quantity”, “Quantity Executed To-date”, “Quantity Certified Previously” and “Net Quantity Executed under this Certificate”.

**12.3 Valuation of the** The following text is added at the end of fifth **Works** paragraph of the Sub-Clause:

“Sum of overhead charges and profit for subparagraph (a) shall be Twenty percent (20%)”.

**13.4 Provisional Sums** The following paragraph is inserted as

the penultimate paragraph:

“The Provisional Sum shall be used to cover the Employer’s share of the DAAB members’ fees and expenses, in accordance with Clause 21. No prior instruction of the Engineer shall be required with respect to the work of the DAAB. The Contractor shall submit the DAAB members’ invoices and the satisfactory evidence of having paid 100% of such invoices as part of the substantiation of those Statements submitted under Sub-Clause 14.3.

**13.6 Adjustments for** The following paragraph is added at the end of the **Changes in Laws** Sub-Clause:

“Notwithstanding the foregoing, the Contractor shall not be entitled to an extension of time if the relevant delay has already been taken into account in the determination of a previous extension of time and such Cost shall not be separately paid if the same shall already have been taken into account in the indexing of any inputs to the Table of Adjustment Data in accordance with the provisions of Sub-Clause 13.7

[*Adjustments for Changes in Cost*].”

**14.2 Advance** 14.2.1 Advance Payment Guarantee

**Payment**

The entity issuing the Advance Payment Guarantee and its form shall be as under:

The Advance Payment Guarantee shall be in the form of Guarantee issued by (a) a Scheduled Bank in Pakistan or (b) a foreign bank duly counterguaranteed by a Scheduled Bank in Pakistan.

In case of Joint Venture, the Advance Payment Guarantee(s) shall be in the name of the Joint Venture or in the name of Lead/either firm of the JV or in ratio of shares of the individual JV partners. 14.2.1 Advance Payment Guarantee.

**14.4 Schedule of** The Contract Price shall be paid according to the **Payments** following Schedule of Payments:

A) Payment against Supply, Installation, Testing and Commissioning of Plant and Materials imported from abroad (Elevator) shall be made in the

following manner: (SOP-2 (1))

1. Ten percent (10%) recoverable advance shall be paid against the submission of acceptable bank guarantee. The bank Guarantee shall be released after recovery of advance from IPC’s.

1. Twenty Five percent (25%) of the Contract value shall be paid after approval of its technical submittals by the Engineer and upon submission of Letter of Credit (L/C) (in original) established by the Contractor for payment to the Manufacturer. The charges for the establishment of such L/C (i.e., opening and retirement) and subsequent charges for modifications and extension shall be borne by the Contractor.

1. Twenty Five percent (25%) of the Contract value shall be paid upon submission of the following documents:

* + Notice to deliver, issued by the Engineer after pre-shipment\Third party inspection at Manufacturer’s Premises, up to satisfaction of the Engineer.

* + Shipping Documents comprising:
    1. Payment/Commercial Invoice duly certified by the Engineer;
    2. Clean on board Bill of Landing or airway

Bill issued by freight forwarder; iii. Warranty Certificate issued by the

Manufacturer; iv. Certificate or Policy of Marine Insurance covering transit insurance from Ex-works to the Project Site of the portion of the Plant and Materials for which Certificate of

Payment is requested;

* + 1. Packing List;
    2. Certificate of Origin (in original), issued by the Manufacturer;
    3. Pre-shipment Inspection Report (if applicable), issued by the Engineer or any third party approved by the Employer; and
    4. Any other document as necessary due to statutory requirement.

1. Twenty percent (10%) of the Contract value shall be paid upon arrival at Karachi port and upon issuance of Inspection Certificate by the Engineer after inspection of imported Plant at Karachi port upto his satisfaction.

1. Fifteen percent (15%) of the Contract value shall be paid on its delivery & verification by the Engineer at Site and upon issuance of Good Receipt Note (GRN) by the Employer.

1. Ten percent (10%) of the Contract value shall be paid on completion of installation up to the satisfaction of the Engineer and submission of invoice for the same amount duly certified by the Engineer.

1. Fifteen percent (15%) of the Contract value shall be paid on completion of Testing and

Commissioning of all Works up to the satisfaction of the Engineer and after issuance of Taking Over Certificate and submission of invoice for the same amount duly certified by the Engineer.

All above payments shall be made after deduction of applicable taxes, Advance repayments and Retention Money under the provisions of the Contract.

B) Payment against Supply, Installation, Testing and Commissioning of locally manufactured and imported Plant and Materials procured from local market: (SOP-2

(2 to 7 & 10))

1. Ten percent (10%) recoverable advance shall be paid against the submission of acceptable bank guarantee. The bank Guarantee shall be released after recovery of advance from IPC’s.

1. Sixty (60%) of the Contract Value of Local Plant and Imported Plant procured from local market shall be paid on pro-rata basis upon delivery at Site, submission of invoice and after issuance of Inspection Certificate by the Engineer or Engineer’s Representative following inspection of such Plant up to his satisfaction.

1. Twenty percent (20%) of the Contract value shall be paid on completion of installation upto the satisfaction of the Engineer and submission of invoice duly certified by the Engineer.

1. Twenty percent (20%) of the Contract value shall be paid on completion of testing and commissioning of all Works upto the satisfaction of the Engineer and after issuance of Taking Over Certificate and submission of invoice duly certified by the Engineer.

All above payments shall be made after deduction of applicable taxes, Advance repayments and Retention Money under the provisions of the Contract.

Note: The payment of Third Party Validation in Pakistan shall be done once the report is submitted to Engineer. The payment of O&M shall be made on monthly basis during defect liability period after deduction of applicable taxes.

C) Payment for SOP-1

* + - 1. Ten percent (10%) recoverable advance shall be paid against the submission of acceptable bank guarantee. The bank Guarantee shall be released after recovery of advance from IPC’s.

* + - 1. The payments shall be made against items of this SOP shall be made as mentioned in the Schedule B to Bid (Sr. No. 13.).

All above payments shall be made after deduction of applicable taxes, Advance repayments and Retention Money under the provisions of the Contract.

* 1. **Plant and** This Sub-Clause shall not apply. **Materials intended for the works**

* 1. **Issue of IPC** 14.6.1 The IPC

In the first line of the 1st paragraph the words “28 days” are substituted by “14 days”.

* 1. **Payment** The words “or through crossed cheque in favour of the Contractor or JV partners. The Payment to JV partners shall be made at the request of the Joint Ventures in the ratio of their shares specified by them” are added at the end of the Sub-Clause.

* 1. **Delayed Payment** In the first paragraph, third line, the words

“compounded monthly” are deleted.

The text of 2nd paragraph is deleted and substituted with the following:

“The Employer shall pay to the Contractor compensation at the rate stated in the Contract Data.”

**15.2 Termination for** Notice

**Contractor’s**

**Default** Following text is added at the end of sub-paragraph

(h) of this Sub-Clause:

“For the purposes of this Contract, corrupt and fraudulent practices have been defined in Public Procurement Rules 2004.”

15.2.3 After Termination

The word “and” at the end of sub-paragraph (ii) of paragraph (b) is deleted the following paragraph is added after sub-paragraph (iii):

“(iv) all Employer-Supplied Materials and/or

Employer's Equipment made available to the

Contractor in accordance with Sub-Clause 2.6

*[Employer-Supplied Materials and Employer's Equipment],* and”

**15.4 Payment after** The following text is added at the end of this Sub-Clause:

**Termination**

“The Employer shall be entitled to sell any of the Contractor’s Equipment, Temporary Works and unused materials and apply the proceeds of sale towards payment of any debt due from the Contractor to the Employer under this Clause including any outstanding payments to the Subcontractors.

* 1. **Termination by** 16.2.1 Notice

**Contractor**

The sub-paragraph (j) is deleted in its entirety.

At the end of sub-paragraph (i) “; or” is replaced with “.” and at the end of sub-paragraph (h) “;” is replaced with “; or”.

In sub-paragraph (f) “84 days” are replaced with “180 days” and text “for reasons not attributable to the Contractor” is added at the end.

* 1. **Contractor’s** Sub-paragraph (c) is deleted and replaced with:

**Obligations After**

**Termination** "(c) deliver to the Engineer all Employer-Supplied

Materials and/or Employer's Equipment made available to the Contractor in accordance with

Sub-Clause 2.6 *[Employer- Supplied*

*Materials and Employer's Equipment];* and

(d) remove all other Goods from the Site, except as necessary for safety, and leave the Site."

**17.1 Responsibility for** After the two instances of “Goods” in the last

**Care of the Works** paragraph, the words “Employer-Supplied Materials and/or Employer's Equipment” are added.

The following Sub-Clause 17.7 is added after Sub-Clause 17.6:

**17.7 Use of Employer’s** The Contractor shall take full responsibility for the

**Accommodation/** care of the items of the Employer’s facilities and/or

**Facilities** accommodation, if any, as detailed in the

Specification, from the date of use and/or occupation by the Contractor until the date on which such use and/or occupation is re-vested in the Employer.

If any loss or damage happens to any of the above items during a time while the Contractor is responsible for its care, arising from any cause other than a cause for which the Employer is responsible or liable, the Contractor shall promptly rectify the loss or damage at the Contractor’s risk and cost.

**18.1 Exceptional** The words “or disorder” are replaced with

**Events** “disorder or sabotage” in sub-paragraph (c) of the

Clause.

**18.4 Consequences of** The following is added at the end of sub-paragraph **an Exceptional** (b) after deleting the “.”:

**Event**

“, including the costs of rectifying or replacing the Works and/or Goods damaged or destroyed by Exceptional Events, to the extent they are not indemnified through the insurance policy referred to in Sub-Clause 19.2 [*Insurance to be provided by the*

*Contractor*].”

**18.5 Optional** In sub-paragraph (c), the words “and necessarily” are **Termination** added after the words “was reasonably”.

**19.1 General** Following text is added at the end of first paragraph:

**Requirements**

“The Contractor shall immediately after the date of the Letter of Acceptance submit the draft of insurance policies for the Employer’s consent.”

Following text is added at the end of third paragraph:

“The Contractor shall, within the respective periods stated in the Contract Data submit to the Engineer and the Employer a) evidence that the insurances described in this Clause have been effected, and b) copies of policies of the insurances described in SubClauses 19.2.1, 19.2.4 and 19.2.5.”

**19.2 Insurance to be** 19.2.5 Injury to employees **provided by the**

**Contractor** The words “sickness, disease” are deleted in the third line of first paragraph.

The following Sub-Clause is added after Sub-Clause

19.2.6:

19.2.7 Insurance Company

“The Contractor shall be obliged to place all insurances described in this Clause with insurers listed in the Contract Data and rated by PACRA/VIS

of rating as provided in Table below:

|  |  |
| --- | --- |
| Accepted Contract  Amount  (In Eq. million PKR) | Minimum Rating of Insurance Companies |
| Up to 1000 | A  (+) |
| 1001 to no limit | AA |

**21.6 Arbitration** The word “international” is deleted in the sixth line of

first paragraph. The text of sub-paragraph (a) is substituted with the following:

“the Dispute shall be finally settled under the Rules of Arbitration, specified in the Contract Data;”

The following Clauses are added after Clause 21

|  |  |  |
| --- | --- | --- |
| **22** | **Custom Duty** | The Employer shall assist the Contractor in obtaining clearance through the customs of the Goods. The customs, import duties and other fees/levies in respect of importation of Goods required for the Works shall be paid by the Contractor. |
| **23** | **Taxes** | The Contractor, Subcontractors and their employees shall be liable to pay income tax, withholding tax, super tax, sales tax and other taxes on income arising out of the Contract. The rates and prices as stated in the contract shall be deemed to cover all such taxes. |
| **24** | **Integrity Part** | If it is found and established at any stage that the Contractor or any of his Subcontractors, agents or servants have violated or involved in violation of the Integrity Pact signed by the Contractor then the Employer shall be entitled to : |

* 1. recover from the Contractor an amount equivalent to ten times the sum of any commission, gratification, bribe, finder’s fee or kickback given by the Contractor or any of his

Subcontractors, agent or servants;

* 1. terminate the Contract; and

* 1. recover from the Contractor any loss or damage to the Employer as a result of such termination or of any other corrupt business practices of the

Contractor or any of his Subcontractors, agent or

servants.

The termination under sub-paragraph (b) of this SubClause shall proceed in the manner prescribed under Sub-Clause 15.1 to 15.4 and the payment under Sub-Clause 15.4 shall be made after having deducted the amounts due to the Employer under sub- paragraph (a) and (c) of this Sub-Clause.

**25 Facilities to be** The Contractor shall provide the following facilities to the **provided at Site** Engineer, immediately after the Notice to Commence. The cost of these facilities shall be deemed to have been included in the Contract Price.

1. One (01) car 1300 CC for the site staff and RE during execution of works including running and maintenance charges.
2. One 1-1/2 ton split A.C installed in the office.
3. One (01) office table (5’ x 3’ size) as selected by the Engineer.
4. One (01) revolving executive chair.
5. Three (03) no. of visitor chairs.
6. One (01) side table.
7. One (01) Laptop (Core i7) with Wifi Internet connection.
8. One (01) Laser printer/Copier/Fax.
9. Telephone/Mobile in the office. All charges/bills shall be borne by the Contractor for the duration of the Project.
10. One (01) Drawing rack.
11. Filing rack.

All the above facilities from item (b to k) shall be property of the Employer during and after completion of Works under this Contract.

# SPECIFICATIONS PART A – SPECIFIC PROVISIONS

Drawings

# DRAWINGS



## STATE LIFE INSURANCE CORPORATION PAKISTAN

**SUPPLY, INSTALLATION. TESTING & COMMISSIONING, OPERATION**

**AND MAINTENANCE OF TWO (02) PANORAMIC ELEVATORS**

**ALONGWITH CIVIL/MECHANICAL STRUCTURE AND**

**MISCELLANEOUS WORKS AT STATE LIFE TOWER, ISLAMABAD**



**VOLUME-II**

## JUNE 2025

National Engineering Services Pakistan (Pvt) Limited

New Ventures Division

IEEEP Building, 17-C-1, Faisal Town, Lahore 54700, Pakistan

[Phone:](https://www.google.com/search?safe=strict&client=firefox-b&q=punjab+mass+transit+authority+phone&ludocid=15923822371896249155&sa=X&ved=2ahUKEwiux7Pow-TdAhUGQRoKHfZjD3EQ6BMwF3oECAgQRQ) +92-42-99232261-74 Ext 112 Fax: +92-42-99232275 Email: nvd@nespak.com.pk, hvac\_bsd@hotmail.com

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**SECTION-I**

**SPECIAL PROVISIONS**

**1.1. SCOPE OF WORK**

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

1. Preparation of all relevant installation/ erection drawings, coordinated shop drawings, obtaining Government and/ or Employer approvals and/ or certificates, fabrication, transportation to site, storage, installation, testing, commissioning, operation and maintenance thereafter for the stipulated period of equipment including training of Employer's staff.
2. All structure steel works as per BOQ/ SOP and tender drawings including fabrication, supply, erection installation, testing, stacking, painting and all other items incidental to steel work for a complete job of steel structure shall be responsibility of the Contractor up to Engineer/Employers satisfaction.
3. All architectural works as per BOQ/ SOP and tender drawings including fabrication, supply, erection installation, testing, stacking, painting and all other items incidental to Curtain walls and all architectural finishing work for complete job shall be responsibility of the Contractor up to Engineer/Employers satisfaction.
4. All civil works as per BOQ/ SOP, RCC Slab Cutting, dismantling, patching, stacking, and repairing of damaged civil works required during installation of new equipment. Repairing of damaged civil works and architectural finishes are also included in the scope of work.
5. All electrical works including supply, installation, testing of UPS with SLA batteries, Electrical Distribution Board (DB), cables, earthing, labour and control cables including necessary material and accessories from the power supply point for complete job shall be responsibility of the Contractor up to Engineer/Employers satisfaction.
6. Hard wired control connectivity of Elevator controller with building’s Fire alarm system.
7. All other miscellaneous equipment and/ or work required to render the equipment ready for continuous, safe and efficient operation.
8. Contractor is responsible to follow all Health and Safety Executive (HSE) requirements as per applicable by laws and submit the execution plan accordingly.
9. Inspection of site immediately after award of work and confirmation of its suitability for the equipment and allied works. Furthermore, Contractor is also responsible to coordinate all mechanical, steel structure, curtain wall, civil works and prepare\submit a coordinated shop drawing for Engineer/Employers approval.
10. Regular operation (24 hours/ day, 7 days/ week and 365 days/ year) & Maintenance and periodic servicing of equipment during defects liability period (i.e.; 730 days) including greasing, oiling, cleaning etc. of parts as recommended by the manufacturer. Full time operational staff (trained experienced operator cum technician) is required for each shift.
11. Provide all required installation, operation and maintenance manuals, spares lists, drawings and diagrams, inspection test certificates and submission of miscellaneous requisite documentation.
12. Providing training to Employer’s Staff at site regarding operation and maintenance of the equipment.

**1.2. CODES AND STANDARDS**

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

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

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

* AISE American Institute of Steel Construction
* ACI Akaike information criterion
* ANSI American National Standard Institute, USA
* ASCE American Society of Civil Engineers
* ASME American Society of Mechanical Engineers, USA
* ASTM American Society for Testing and Materials, USA
* AWS American Welding Society
* EN European Norms
* IEE Institute of Electrical Engineers, London
* ISO International Organization for Standardization
* NEMA National Electrical Manufacturer's Association
* NFPA National Fire Protection Association
  1. **MAKE/ORIGIN OF ELEVATOR**

Elevators to be supplied under the Contract, shall be of imported origin and can be provided by any one of the manufacturers mentioned in Schedule/Appendix to Bid “List of Recommended Manufacturers” or approved equivalent subject to meeting the specification requirement (models fully complied and certified with latest EN 81 Standards only).

* 1. **QUALITY STANDARD**

To guarantee a high-quality standard in the field of designing, fabricating, installing and maintaining the said equipment, only manufacturers with a proven record of similar experience will be considered in Bid Evaluation. To verify the manufacturer’s experience, a reference list with completed projects should, therefore, accompany the Bidding documents.

* 1. **PRODUCT HANDLING AND STORAGE**

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

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

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

* 1. **INSPECTION AND CONTROL** 
     1. **General**

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

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

* + 1. **Pre-shipment Inspection/Third Party Inspection at Manufacturers Premises**

All equipment to be supplied under this Contract shall be subject to inspection and testing by a well-known and pre-approved third party (TUV, Moody, SGS, Lift institute etc.) at its point of original manufacture or final shop assembly before its dispatch to site. The Contractor shall make necessary arrangements and provide all the facilities required for conducting such inspection, at Contractor’s cost.

The Contractor shall submit tests procedures for approval of Engineer well in advance to the set date of third-party inspection. The Contractor shall give at least one (01) weeks’ notice to the Employer/ Engineer for such inspections/ tests/approval.

In case of absence of such inspection for any reason, Engineer reserves the right to deduct suitable amount from Contractor’s payment on pro rata basis/as per actual prevailing market rates and all responsibility to cover any discrepancies (If found) shall be responsibility of Contractor.

* + 1. **Inspection at Karachi Port/ Dry Port**

All major imported equipment will be inspected at Karachi port/ Dry port The Contractor shall make necessary arrangements and provide all the facilities required for such inspection. The cost of travel, boarding and lodging of Employer, his authorized representative and the Engineer shall be the responsibility of the Contractor. In case of non-availability of such inspection, Engineer reserves the right to deduct suitable amount from Contractor’s payment and subsequent inspection at dry port will be additional responsibility of the Contractor up to Engineer’s satisfaction.

* + 1. **Inspection at Site Works**

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

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

* + 1. **Damages, During Transportation, Storage & Installation**

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

**1.7. DRAWINGS AND SUBMITTALS**

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

**1.7.1. Technical Data Sheets/Technical Submittal**

Technical data/ submittal of proposed Elevator shall comprise of the following at the minimum, which shall be submitted along with Bid/technical submittal approval stage as desired by the Engineer:

1. Manufacturer’s authorization certificate for the proposed brand regarding the subject project.
2. Manufacturer’s technical data & selection sheets clearly depicting all specified safety features as per the Contract Specifications.
3. Original Catalogues/brochures highlighting the proposed model.
4. Paragraph wise compliance statement from the equipment Manufacturer/Bidder for Technical Provisions (Volume - II).
5. Outline design drawings, structural drawings and installation shop drawings from the Manufacturer as per existing/proposed shaft sizes.
6. Full EN81 standards compliance statement for the proposed model and all components from the Manufacturer and EU type examination certificate against proposed complete elevator model no. from authorized/verifiable companies like TUV, SGS, Liftinstituut etc.
7. List of major essential parts of the equipment specifying country of origin and model duly certified by the Manufacturer.
8. Warranty statement duly certified by the Manufacturer.
9. Manufacturer’s duly certified list of essential spare parts included with supply of equipment to be used during defects liability period.
10. Catalogue for aesthetic finishes with different options to be submitted.
11. One (01) original Installation manual provided by manufacturer for the equipment shall be submitted by the Contractor.

**1.7.2. Design Drawings**

The Contractor shall submit Design Drawings along with the Bid for Review/ Acceptance.

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

i. Final arrangement of equipment keeping in view the dimensions provided in architectural drawings for civil\mechanical structure construction of the Equipment. ii. Maximum dynamic and static loads imposed on civil\mechanical structure.

1. Dimensions and locations of all services, openings in floors and walls, location of embedded parts and location of Employer’s furnished electrical connection.
2. The Contractor shall review the civil\mechanical structure construction drawings related to the equipment and identify any major shortcomings/ rectifications essentially required for equipment installation within above stipulated time period. all civil\mechanical structure rectification and adjustment works are included in Contractor’s Scope of Work.
3. Wiring and control logic diagrams.
4. All other relevant information required by the Engineer.

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

**1.7.3. As-Built Drawings**

The Contractor will furnish As-Built Drawings separately. Such drawings, diagrams and schedules as well, in the opinion of the Engineer, provide an adequate record of the work "as installed" shall be submitted to the Engineer for approval before the issuance of Taking-Over Certificate.

The drawings shall include particulars of all items of equipment, including wiring diagrams, etc. As-installed drawings shall be submitted to the Engineer at least thirty (30) days before issuance of Taking-Over Certificate.

The size of the drawings shall be minimum A2 size. Every item and dimensions in drawings must be legible.

**1.7.4. Installation, Operation and Maintenance Manuals**

Two (02) sets of installation manual for the equipment shall be supplied by the Contractor prior to commencement of installation of equipment.

At least thirty (30) days prior to the scheduled date of practical completion, the Contractor shall supply a complete set of operating and maintenance manuals to the Engineer for approval. Once approved, the Contractor shall proceed to prepare and hand to the Engineer three (03) sets of the approved operating and maintenance manuals.

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

i. Index ii. General description of the complete facility. iii. Operating instructions of the complete facility. iv. Emergency directions of the complete facility.

1. Safety control adjustment and settings of all safety protection equipment.
2. List of equipment giving manufacturers and agents' name, and name plate data together with all data sheets published by the equipment manufacturer.
3. Installation, operating and maintenance instructions for each item of equipment (including lubricating charts). viii. Proforma for Operational log of equipment as per manufacturer recommendation or Engineer’s approval.
4. List of spare parts for each item of equipment as recommended by the manufacturer for at least three (03) years operation.
5. List of essential tools recommended by the manufacturer for Operation and Maintenance.
6. As-built drawings.

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

* 1. **QUALITY ASSURANCE**

The Contractor shall submit with this Bid a written assurance that the materials and workmanship of the equipment installed will be according to recognized international standards and will conform to all contractual requirements of this specification.

* 1. **OPERATION AND MAINTENANCE**

**1.9.1. Operation and Maintenance during Defects Liability Period**

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

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

Continuous service operators shall be provided on a routine daily basis for 24 hours/day, 7 days/ week and 365 days/ year for two (02) years.

Services shall be performed by skilled personnel (operator cum technician) under the supervision of experienced supervisors.

The operation & maintenance shall include operators for continuous operation, provision of spare parts by the Contractor during Defects Liability Period, inspection of all equipment, lubrication of all bearings, the supply of all necessary oil and grease, cotton waste, running adjustments and keeping the installation and equipment in a clean condition unless otherwise specified/ required by the Engineer.

**1.9.2. Register of Service, Operation and Maintenance**

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

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

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

**1.9.3. Operation and Maintenance Staff during Defects Liability Period**

The Contractor shall provide operators in elevators in different shifts to operate the system continuously for 24 hours, 7 days/ week and 365 days/ year during Defects Liability Period of two (02) years. Operating personnel for complete system shall have at least five (05) years’ experience in operation and maintenance of similar works. The remaining staff list shall be provided to the Engineer for approval. The staff Nos, skills and experience shall be as per approval of Engineer. The Contractor shall also arrange to provide proper training to Employer staff to operate the system to complete satisfaction of the Employer. All cost incidental to provide operating staff including staff salaries shall be deemed to be included in relevant item of Schedule of Prices. No separate payment shall be made to the Contractor for fulfillment of his obligations under this Clause.

**1.10. TOOLS & INSTRUMENTS FOR TESTING, SERVICING, OPERATION AND MAINTENANCE**

The Contractor shall supply and deliver to site a complete set of essential tools, test equipment, and other instruments necessary for proper testing, servicing, operation and maintenance of the equipment. Tools shall include special tools and instruments, which are necessary for maintenance repair and overhauls of the equipment. The Contractor will not use these tools for erection purpose, etc.

**1.10.1. Spare Parts**

A list of essential spare parts to be provided with the supply of equipment is attached in

Appendix-III. Furthermore, all spare parts during Defects Liability Period (DLP) of two

(02) years shall be provided by the Contractor, costs of essential and required spare parts during DLP shall be included in the Bid.

Also, the recommended (Consumable & Normal) spare parts list shall be provided along with prices which remain valid for three (03) years beyond Defects Liability Period.

The Bidder shall also confirm in Bid his ability to provide a full range of spare parts and major components for the offered equipment. The Bidder shall provide a guarantee period of at least 25 years for the serviceability of equipment and supply of spare parts and indicate the same in his Bid.

Furthermore, all spare parts essential/recommended shall be provided by Principal Manufacturer or its authorized distributor and shall be from same country of origin as per supplied elevator.

**1.11. PAINTING & FINISHES**

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

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

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

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

**1.12. TESTING AND COMMISSIONING**

On the completion of the Work substantially in accordance with the Contract, the Contractor shall give the Engineer notice in writing thereof and before making the

“Testing and Commissioning" shall give the Engineer and the local authority seven (07) days’ notice in writing of the date on which he will make the said tests of the work in accordance with relevant codes and in the manner prescribed by the Specification.

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

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

If the "Testing and Commissioning" is not successfully made by the Contractor within one (01) week after the date fixed by the Contractor for the completion for operational use or for the testing of the works, the Engineer may in writing call upon the Contractor under seven days’ notice to make such tests, and on the expiry of such notice such tests shall forthwith be made by some other agency appointed by the Engineer at the expense of Contractor.

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

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

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

Should any failure occur due to, or arising from, faulty materials or workmanship or otherwise, sufficient to prevent the operational use of the installation, the reliability test period of two (02) years shall recommence after the Contractor has remedied the cause of failure to the satisfaction of the Engineer.

**1.13. TEST CERTIFICATES AND REPORTS**

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

1. Test Certificates of critical materials
2. Complete EU type examination certificate against offered\supplied elevator model no.
3. Factory test reports
4. Pre-shipment inspection\test report
5. Onsite equipment verification report vi. Third party inspection report in Pakistan vii. Report of testing & commissioning of equipment
   1. **TRAINING**

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

* 1. **MANUFACTURER WARRANTEE**

The Contractor shall submit two (02) copies of written warrantee from the manufacturer under his cover warrantee that the material and workmanship of the equipment installed is according to recognized international standards and conform to all contractual requirements of this specification that he will make good without extra cost any defects not due to ordinary wear and tear or improper use, which may develop within two (02) years from date of the installation being handed over to the Employer.

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

The manufacturer warrantee period shall be two (02) years after final commissioning and installation being handed over to the Employer.

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

**1.16. MEASUREMENT AND PAYMENT**

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

**SECTION-II**

**TECHNICAL PROVISIONS**

**2.1 GENERAL**

This section shall cover Elevators indicated on the drawings and specified herein. Any conflicts between the requirements in this specification and the codes, drawings, standards and specifications referred to herein shall be brought immediately to the attention of the Engineer for resolution. The Bidder shall submit technical data sheets, outline drawing and printed technical literature to fully elaborate offered equipment. The Bidder is advised to visit the site to check the available elevator shaft**,** pit depth and machine room etc. to ensure that offered equipment will suit to existing conditions.

**2.2 SCOPE OF WORK**

Following elevator works are required for State Life Insurance Corporation (SLIC), State

Life Tower building, located at blue area Islamabad, Pakistan;

1. Supply of Two (02) No. Brand new 1275 kg (17 Persons) Passenger Elevator, fully-EN certified heavy duty MRL (Machine Room Less) Type with destination control & duplex control system serving Ground and Eight (08) upper floors. Design to operate 24 hours/ day, 7 days/ week and 365 days/ year.
2. All associated civil, architectural, mechanical steel structural and electrical works necessarily required for installation of elevator at the proposed\available location.
3. Making good any damage done to the civil works including supply and installation of matching paint, floor tiles, granite / marble wall finish etc., whichever is applicable as per site conditions and/ or as directed by Engineer.
4. Supply and installation of exhaust fan propeller type of size 12” Dia (SP 0.2 inch of WG) is required for each Machine Room/shaft respectively including complete electrical work.
5. Supply and installation of UPS with SLA Batteries, Electric Distribution Board and related electrical works at elevator control panel on last floor and cables for elevator power supply and other electrical accessories required for proper installation of the elevator.
6. Supply and installation of split air conditioner with Hydrophilic blue/black fin having cooling capacity of 2 tons of refrigeration (TR) heavy duty (10 hours operation), high ambient (0~45ºC compatible) for Machine rooms/Shaft (for MRL) of elevator.

The scope of work shall cover design, supply, installation, testing, commissioning, operations and maintenance of entire civil\mechanical structure, tempered glass, elevator equipment including hoisting machinery, sheaves and girders, controller, car, ropes, counterweights, supports, brackets, guide rails, car doors, landing doors, door operator, switches, control, safety devices, signals, governor, safety gears, buffers, pit screens, well trimming girders, trap door, hard wired control connectivity of Elevator controller with building’s Fire alarm system and such related accessories complete in all respects as specified herein. The Contractor shall also provide all the labor, erection equipment, (i.e., winches, scaffolding etc.), erection tools, appurtenances, embedded parts and materials, etc. necessary to supply, install, test and commission the elevator all in perfect operating conditions in accordance with these specifications and drawings.

The Contractor shall submit design drawings/ shop drawings within two weeks after award of work for approval of Engineer. The drawings must show final arrangement of equipment, dynamic & static loads imposed on the building, openings, location of embedded parts etc. wiring and control logic diagrams.

The Contractor shall be responsible to make good any damage done to the civil works for erection or other purposes without cost to the Employer.

The Contractor shall also provide and install, from designated electrical power supply point, all required cabling, distribution boards and accessories without cost to the Employer.

The Contractor shall maintain the works during Defects Liability Period. In addition to routine periodic maintenance, the Contractor shall execute all such work of repair, rectification, parts replacement and making good defects occurring during this period. Design of equipment to be supplied by the Contractor shall also be the responsibility of the Contractor and/ or his suppliers.

The Contractor shall also provide training to the staff of Employer regarding operation and maintenance of the equipment.

Prior to completion date, the Contractor shall submit Three (03) copies of Operating and Maintenance Manuals to the Employer/ Engineer.

**2.3 DESIGN REQUIREMENTS**

**2.3.1 Elevator System General Requirements**

1. Elevators shall be designed specifically for the operation; loading and environmental conditions encountered in specialized building and shall have a minimum design life of 25 years.
2. The final assembly of all components shall not pose hazardous conditions to the public or maintenance personnel. Surface irregularities, sharp edges, or protrusions in public or maintenance areas shall not be permitted.
3. Provide convenient and safe equipment access for inspection, cleaning, maintenance, repair, and replacement.
4. All gaps and running openings within regulatory tolerances shall be properly closed by the use of appropriate sealant or another approved means installed in accordance with the manufacturer’s instructions.
5. For parts and equipment subject to wear and requiring periodic replacement, the Contractor shall furnish key and seat, nut, screws, or other removable and replaceable type mechanical fasteners. Such replacements shall not diminish original structural integrity. Use of rivets or similar type fasteners requiring physical deformation during field positioning will not be permitted.
6. The elevator equipment shall be quiet and smooth running and shall not exceed the following maximum noise output levels during all phases of operation:
   * 70 dBA measured in the elevator car
   * 70 dBA measured at the elevator hoist way entrances
7. Fire Protection: Contractor shall provide non-combustible materials for components including Halogen-free cables.
8. Fire Elevator: In case of Fire elevator Contractor shall provide non-combustible materials for components including Fire Rated Cables as per EN 81-72 standards.

**2.3.2 Seismic Criteria**

1. Installation and equipment designed for static and for seismic conditions shall be provided in accordance with regulatory requirements.
2. Provide hardware necessary to protect motors, drives, and door operators
3. Seismic design shall be based on the assumption that structures and equipment will be subjected to a maximum horizontal ground acceleration of 0.7g (70 percent of gravity).

**2.3.3 Power**

The main elevator power shall be 400 V, three phase, 50 Hertz.

**2.3.4 Elevator Controller**

1. The controller for Elevators shall be a field programmable microprocessor based, collective selective control, automatic operation with open loop, variable voltage, and variable frequency control.
2. Elevator operation shall be by means of Push Buttons in the car, numbered to correspond to landings served, by push buttons Call at terminal landings, and by UP and DOWN Push buttons at intermediate landings.
3. All options or parameters shall be field programmable without the need for external devices. Programmable settings shall be stored in non-volatile memory.

**2.3.5 Elevator Door and Hoist way Door Operation**

2.3.5.1 Hoist way doors and car doors shall

1. Open automatically and simultaneously when the car arrives at the destination landing.
2. Be equipped for readily and independently adjustable door hold open times when car stops for a car or hall call. Main floor door hold times shall be adjustable independently of other floors.
3. Close after hold open time interval has elapsed and no obstruction has been detected, or when the car is called or dispatched to another landing, or when either the car door close button or a car call is pushed.

2.3.5.2 Activation of the door close button in the car shall cancel door timer and close the doors provided there is no obstruction

2.3.5.3 All closing times shall be adjustable from 5 seconds to 30 seconds without exceeding closing force specified herein.

**2.4 MATERIALS & WORKMANSHIP**

* + 1. **Materials**

All materials shall be of the highest grade, free from defects and imperfections, of recent manufacture and unused, and of the classification and grades designated, conforming to the requirements of the latest issue of the appropriate specifications and standards. All materials, supplies, and articles not fabricated by the Manufacturer shall be the products of recognized reputable manufacturers.

All materials including electrical wirings shall be weather proof.

* + 1. **Workmanship**

All work shall be performed and completed in a thorough workmanlike manner and shall follow the best modern practice in the manufacture of high-grade machinery, notwithstanding any omissions from the Bid Documents. All work shall be performed by mechanics skilled in their various trades. All parts shall be made accurately to American/British Standard or other approved gage, where possible, so as to facilitate replacement and repairs. All bolts, nuts, screws, rivets, threads, pipes, gages and gears shall conform to applicable American or other approved standards.

* + 1. **Structural Metal Work**

The fabrication of the Structural Steel shall be performed strictly in accordance with specifications as mentioned in Section 3000.

**2.5 PRODUCT DESCRIPTION**

**2.5.1 General**

Elevators shall be installed by the Contractor in the elevator shaft at location shown on the drawing. The dimensions of respective elevator wells and pits are also shown on the drawings.

The Contractor is recommended to visit the site to examine the existing structures and details to verify, confirm suitability of the existing structure and review design drawings for modifications required in design of civil\mechanical structure shafts (columns\beams etc.) for the installation of the equipment.

Any changes in the above planned elevators shaft and pit floor structure or other design details due to particular equipment requirement shall be submitted by the Contractor to the Employer/Engineer for approval within fifteen (15) days from the date of Award of the Contract. All such approved amendments shall be made by the Contractor without any additional cost to the Employer. Similarly, the elevator contractor must coordinate the installation with the other trades.

The elevator contractor shall also provide opening in Elevator well for suitable ventilation and for escape of gases and smoke in case of fire.

The control cabinet/ panel of MR type elevator shall be located in machine room and control cabinet/ panel of MRL elevator shall be located at the last serving floor. The dimensions/ location shall be given by the elevator Manufacturer.

The location of drive machinery and control cabinet shall suit the elevator orientation to allow easy access and sufficient space for maintenance work and to provide a goodlooking architectural outlook.

The Contractor shall acoustically insulate the elevator shaft and shall appropriately isolate the equipment to prevent disturbances in the surroundings area due to operating machinery.

1. Sound reducing materials to isolate motor set from civil structure, balance rotating parts to eliminate vibrations and flexible electrical conduits shall be provided. The operation of elevator car and doors shall be completely free from all abnormal jerks, vibrations and sound. The maximum sound level within the car must be within comfortable limits defined in relevant standards/codes.
2. The elevator Contractor must schedule his installation work in accordance with civil\mechanical construction schedule.

The characteristic details of the elevator to be supplied under this contract are listed under para 2.6. The construction and functional details are given hereunder:

**2.5.2 Civil Construction**

**2.5.2.1 Elevator Well**

The elevator shall be installed in the completed elevator wells of dimensions as available on site.

The top of the well shall be enclosed and watertight.

The Contractor shall be responsible to carry out correction for the purpose of installation of guides in perfect plumb and other equipment to ensure perfect installation and operation of the elevators without any cost to the Employer.

**2.5.2.2 Pit Access Ladder**

A rugged steel ladder for easy access to the pit shall be provided by the elevator Contractor. The pit access ladder shall be attached with a safety switch inside the pit as per standard\code requirements.

**2.5.2.3 Pit Screen**

A suitable rigid screen shall be provided and fixed by the Elevator Contractor at the bottom of the elevator well where the counterweight comes down to its buffers and between elevators if required. The screen shall have a minimum height of 7 ft. as per code requirements.

**2.5.3 Elevator Car**

**2.5.3.1 Car Frame & Platform**

The car frame, consisting of upper yoke with cross yoke side braces and bottom frame shall be made of welded or bolted steel channel sections, sufficiently rigid to withstand the operation of the safety-gear without permanent deformation of the car frame. The elevator car, platform, door operating mechanism, safety doors, etc. shall be mounted on car frame.

The deflection of the members carrying the platform shall not exceed 1/1000 of their span under static conditions with the contract load evenly distributed over the platform.

Roller/sliding guides as specified, mounted on car frame, shall have individual suspension to cushion jolts and minimize noise and vibration.

The platform shall be of fabricated frame of formed and structural steel shapes gusseted and rigidly welded, with provision for a floor covering as specified with the car body work. Rubber pads of sufficient size shall be provided between the car frame and the platform to provide sound and vibration isolation. The underside of the platform will be covered with sheet steel to provide adequate fire resistance.

An aluminum sill grooved to suit door spuds shall be fitted to the platform together with a toe-guard.

The car bodywork shall be carried on the platform with the top fixing to the car frame being suitably isolated.

All auxiliary equipment shall be mounted and supported from the car frame.

**2.5.3.2 Car Body Work**

The car bodywork shall be of steel construction with provision for interchangeability of décor finishes and ceiling designs. The roof shall be constructed to withstand the weight of three men without deformation.

One side wall of the car shall be made of see through laminated tempered glass minimum 12mm thickness as mentioned in Technical Data Clause 2.6 as approved by the Client/Employer.

One side of the car shall have vision panel. Vision Panels shall be installed in such a way that vision panels on car and hoist way shall be aligned.

The car top shall have provision for emergency communication and roof trap door with micro-switch. A3 pin socket outlet shall be fitted on top of the Elevator car, besides two outdoor protected type lights one each at the bottom and top of the car operated through an MCB.

**2.5.3.3 Finish**

The car enclosure and floor shall be as mentioned in Technical Data Clause 2.6 or approved by the Client/Employer.

Ceiling shall be of removable type with modular LED light fittings.

Handrails on two side walls shall be provided with satin finish standard stainless steel hollow section. Fixing brackets shall also be in stainless steel.

The design and finish of car interior together with suspended ceiling, light fittings, floor covering and other fittings shall be to the Engineer’s approval. The Contractor shall offer various options of car finish with his bid.

**2.5.3.4 Telephone**

A telephone compartment shall be provided in each car in the front return panel above the car operating buttons. The compartment shall be provided with hinged door flush with the panel. The entire compartment and door shall be of stainless steel.

The Contractor shall also provide a telephone set in the compartment which shall be connected to the central control center. The intercom connection work with the Central Control Center included in elevator contractor scope of work.

**2.5.3.5 Recessed Motion Sensing Unit**

The motion sensor unit shall be recessed into the ceiling. Provide a mounting bracket flush to the ceiling for the motion detector unit. The motion detector shall be located and adjusted so that movement of the doors does not generate a false occupancy. Provide the 120 Vac-power supply to the power pack unit of the motion detector.

**Programmed Operation:** If after a programmable length of time, an elevator car call has not been activated and the sensor detects elevator car occupancy, the car shall be programmable to proceed with either one of two courses of action. The choice of action shall be selectable by the motion detector switch in the service panel on the Car Operating Panel. The logic and circuitry of this alarm shall be incorporated into the controller circuit. Any auxiliary relay contact required to accomplish this feature shall be provided. This circuit shall be depicted in the schematic diagram of the controller. All occupancies, regardless of operation, shall be reported to the Communication Room.

**Automatic Car Call Mode:** Upon occupancy detection, the elevator shall automatically generate a car call to the opposite floor if a car call is not activated within an adjustable time of 5 to 30 seconds.

**Nuisance Occupancy Mode:** If occupancy is detected without a car call for an adjustable time of 5 to 30 seconds, then the doors shall reopen and remain open with audible alarm until a car call or hall call is generated or the car is vacated.

**2.5.3.6 Camera**

A 360° camera shall be mounted in the ceiling corner on the front wall opposite of the side of the Car Operating Panel. The camera shall be adjusted to observe patrons inside the Car. The camera shall be housed in a vandal resistant enclosure. The display of the camera shall be available in the control room. All necessary hardware till control room and software shall be provided by the Contractor. The connection work with the central control room included in elevator contractor scope of work.

**2.5.4 Doors**

**2.5.4.1 Landing Doors**

Each landing shall be provided with center/side opening doors as shown on drawings. The doors, frames and architrave shall be made of stainless steel in satin finish. The door panels shall have a fire resistance rating of at least one hour. The panels shall be interconnected by maintenance - free self-tensioning synchronizing wire rope.

Each landing shall be equipped with a toe-guard apron at the hoist way entrance side.

The toe-guard apron shall be of sheet steel not less than 16 gauge thick, and shall

extend not less than 50mm beyond the entrance jamb at each side. Toe-guard apron shall be approximately 2 feet deep, adequately fastened and braced; the lower edge turned inward.

The frames shall be of 14 SWG (min.) and panel’s fascia, toe-guards, dust and hanger covers shall be of 16 SWG. All other features not covered above shall be similar to that specified under Car Doors.

Each landing entrance shall be equipped with an approved type factory tested interlock as required by the code. The interlock shall be designed to prevent moving of the car away from the landing until the doors are locked in the closed position as defined by code and shall prevent opening of the doors at any landing from the corridor side unless the car is at rest at that landing or is in the leveling zone and stopping at that landing.

Landing door unlocking device as specified by the ASME A17.l or EN 81 Code shall be provided to permit authorized persons to gain access to hoist way when Elevator car is away from the landing.

Each Landing door or door panel shall be furnished with sheave type two-point suspension hangers and tracks complete in all respects. The sheaves shall have polyurethane tires with ball bearings sealed and lubricated for life. Hangers shall be provided with an adjustable slide to take the up-thrust of the doors. Tracks shall be of cold drawn steel shapes with smooth surface and shaped to conform to the hanger sheaves. Tracks shall be removable for replacement.

**2.5.4.2 Car Doors**

The car doors shall be center/side-opening type as shown on drawings. The door-gear shall operate by a fractional kilowatt AC motor with VF drive. The door gear shall be built-in unit with the car door top track support, mounted on the car entrance column extensions.

A retractable car door coupling shall be provided to connect the car and landing doors to eliminate any backlash and ensure complete door synchronization.

The car doors, frame and front shall be of stainless steel (brush finish) with panel construction and other features such as fire rating, etc. similar to the Landing Doors.

The door panels shall be suspended from sheave hangers with polyurethane tires and sheaves running on a polished steel track, and guided at the bottom by non-metallic shoes sliding in an extruded aluminum threshold groove.

If the car is stationary at floor level with the doors closed, it shall be possible to open the car doors from inside the car by pushing the car door in the opening direction. To open the doors from the landings, the triangular key must be used.

**2.5.4.3 Door Safety Devices**

**2.5.4.3.1 Full Width Light Curtain**

The car doors shall be fitted with light barrier system extending from 25mm above floor level up to a height of 2000 mm, operating between car and landing doors. The barrier system shall comprise of a transmitter and a receiver strip containing several pairs of transmitters & receivers generating a large number of invisible light rays. In case if any one of these rays is interrupted, the control unit immediately reverses the door motion. The light curtain shall recalibrate itself at regular interval to update its scanning cycle.

In addition to above, the car doors shall be provided with an additional safety such as Door closing force limiting device or photoelectric beam etc. to maintain operational safety in case of failure of the main light barrier system.

**2.5.4.3.2 Door Open Timing Feature**

The door operation shall also have door open timing feature operation in conjunction with light rays to provide adjustable, reduced, hold open time once rays are broken and re-established. In the event rays are broken beyond an adjustable time, a buzzer shall sound and doors to close at reduced speed.

**2.5.4.4 Door Operator**

A variable frequency controlled variable speed door operating unit capable of opening and closing car and landing doors simultaneously shall be mounted on the car frame independent of the car bodywork. The mechanism shall be designed to achieve smooth acceleration and retardation of doors without the use of dashpots. All pivot and bearing points shall be of steel and nylon or bronze bushed pins, ball or roller bearings suitably lubricated shall be fitted.

The driving mechanism shall be designed such that:

The closing force applied to the doors shall meet the requirements of EN81 standards.

The car doors can be opened by hand in the event of a mains failure.

The motion of the doors will be reversed if they meet an obstruction. An AC motor with VF drive to provide variable speed shall be provided to obtain the performance required by the control system.

Mechanical Control Station, carrying controls and equipment as specified in EN81 standards shall be fitted on the top of the operator.

**2.5.5 Hoisting Equipment**

**2.5.5.1 General**

The elevator shall be MRL (Machine Room Less) or MR (Machine Room) type as specified in para 2.6. The complete drive machinery and convertor shall be installed in the overhead of the shaft for MRL type and in machine rooms for MR type or as indicated in drawings. The Contractor shall provide exact location of Drive Machinery and other equipment so as to allow sufficient access and space for maintenance work within fifteen (15) days after award of the contract.

Anchor bolts, templates, inserts, signal boxes, and sleeves for installation shall be furnished by the Contractor. Additional structural members such as steel angle, steel beam supports for governors, motors, controller, and rope guards shall also be supplied by the Contractor.

Each hoisting machine and corresponding controller shall be numbered with 100mm high numerals giving elevator numbers.

Sound reducing buffers of elastic material shall be provided under the base of the hoisting machines to isolate sound and vibrations from the building structure. The rotating parts shall be dynamically balanced to eliminate vibration.

**2.5.5.2 Hoisting Machines**

**2.5.5.2.1 Gearless Traction Type**

The hoisting machine shall be of the permanent magnet gearless drive with motor, brake and other integral parts mounted as one assembly on steel bed plates so that proper alignment of these parts is maintained under all conditions.

Means shall be provided on all elevator machines to enable the elevator cars to be raised or lowered in an emergency by manual operation. The direction of winding corresponding to the raising and lowering of the elevator car shall be clearly indicated.

Manual operation shall be by a smooth-rimmed detachable, spoke less wheel fitted to the shaft.

**2.5.5.2.2 Brakes**

The brake shall be spring actuated, electrically released and of adequate proportions for the duty involved and fitted with two self-aligning shoes actuated by compression springs.

The brake shall be instantly and automatically applied in the event of interruption of the power supply.

The brake shall be capable of bringing the car to rest smoothly, under maximum conditions of load and speed, and capable of sustaining static load of 150% of the contract load.

**2.5.5.2.3 Motor**

The variable voltage variable frequency (VVVF), motor specially designed to meet all elevator duty requirements shall have a duty cycle rating of a minimum of 240 starts per hour. The motor speed shall have controls to allow smooth transition between acceleration and deceleration phase. The motor shall be capable of stable operation at all speeds up to the stated maximum and no abrupt speed change shall be permitted. It shall have a drip proof enclosure and may be force ventilated.

The drive motor shall be rated to provide sufficient power to accelerate the elevator to full speed in the shortest period while maintaining passenger comfort.

The power system shall incorporate solid state equipment controlling the speed of the elevator motor. Smooth performance with steeples acceleration and deceleration is to be provided with a leveling accuracy of ± 0.25” and the final stop at floor level is to be achieved dynamically after which the machine brake shall be applied to hold the elevator car stationary.

**2.5.6 Hoist-way Equipment**

**2.5.6.1 Suspension Ropes/Belts**

Suspension ropes of high-grade steel specially designed for elevator duty shall be provided in conformity with the requirements of ISO 4344. The material of the rope shall conform to ISO 4344. It shall be free from loose wires, distorted strands or other irregularities. All rope terminals shall comply with ISO 4344. Independent adjustment shall be provided for each rope. All suspension ropes material and strength shall comply the requirements of latest ISO, EN 81-20, EN 81-50 & ASME 17.1 standards.

The length of each rope shall be so adjusted that it loses traction with sheave when the counterweight touches its buffers.

An automatic device shall be provided for equalizing the tensions of suspension ropes at least at one of their ends.

Suspension belts as per International Standards may be provided as an alternative to suspension ropes. However, Contractor will ensure trouble/ jerk free operation in suspension belt due to power break down problem.

All necessary equipment/ material shall be provided for trouble free operation. Manufacturer certificate on letter head for the same is required with use of suspension belts.

**2.5.6.2 Guides, Fixings and Inserts**

The guides shall consist of high quality 'T' section steel of adequate strength and dimensions suitable for travel, car weight, speed and capacity of elevator. Guiding surfaces shall be accurately machined. The joints shall be spigotted and joined by machined steel finish plates.

Guides shall be of sufficient length to prevent any of the car or counterweight shoes from running off the guides.

All guides are to be securely fixed to the walls of the elevator well by steel brackets bolted to metal inserts or by other approved means. Rag bolts shall not be permitted. All metal inserts, fixings, guide rails, anchor bolts etc. shall be provided by the elevator Contractor.

Guides shall be so jointed and fixed to their brackets that they do not deflect by more than 3mm under normal operation.

Guides and their fixing shall withstand the application of the safety-gear without permanent deformation when stopping a fully laden car or the counterweight.

**2.5.6.3 Guide Shoes**

The sliding/roller guide shoe as per EN81 standards shall comprise three slide elements, wherein each slide elements form a respective. The arrangement shall be suitable for an oil-free mode of operation. Three fastening grooves each for preferably (with respect to the direction of insertion or longitudinal direction) mechanically positive reception of a respective slide element shall be provided in the support element. Support element shall comprise at least one bearing pin formed, preferably monolithically, at the support element. The guide shoe housing shall have a cut-out, which is complementary with the bearing pin.

The sliding/roller guide shoe shall comprise a preferably separate protective element for protecting the slide surfaces from contaminations. The protective element in that case be positioned at the holding element on an inner side facing at least one slide element. In completely assembled position the protective element shall bear against the slide element or slide elements shall seal protects these.

**2.5.6.4 Counterweight**

A counterweight equal in weight to the car plus 40% to 50% of the specified load shall be provided to each elevator. Structural Steel frame shall support requisite number of cast iron weights. It shall be fitted with guide shoes and suspension arrangements and accessories suitable for specified elevator capacity.

**2.5.6.5 Safety Gear and Governor**

A friction type progressive safety gear actuated by centrifugal over speed governor shall be securely bolted to the car frame under the car platform.

The governor wire rope operating the safety gear mechanism shall not be less than 8mm diameter and shall complied with EN 12385-5 standards.

The tension weight fitted with an electrical safety device shall be provided to cause the hoist motor to stop should the governor rope break or slacken.

The governor shall be fitted with a direct driven unit to relay to the control system both the speed and position of the elevator in shaft.

The governor shall be equipped with two electrical switches, preset to operate progressively in case of over speeding to reduce the elevator speed in the first stage and if the elevator speed is not brought under control, operate to cut of power supply to the hoist machine and apply brakes.

If the car continues to travel downwards at excessive over speed, the mechanical trip shall operate causing the governor jaws to grip the rope to bring the safety gear mechanism into operation causing the jaws to grip the guide rails equally through selfaligning friction shoes thus bringing the car to rest gradually and smoothly. The governor and safety gear shall be released by raising the car.

In case of elevator pit have another floor under it or access to public there must be second Safety Governor with safety gears attached with counter weight frame and operation will be same as stated above for Safety Governor attached with the Car.

The governor and safety gear shall be adjusted to operate as specified by EN 81 standards.

**2.5.6.6 Buffers**

Oil buffers of spring-return type or as mentioned in EN standards shall be supplied and installed in pit under car and counterweight for each Elevator. The minimum total stroke of the buffer shall be based on the retardation of 32 feet/sec2 based on 115% contract speed. The maximum rate of retardation of the oil buffers based on 115% contract speed shall be 80.5 feet/sec2 excluding any transient declarations having duration not exceeding 0.04 sec.

The buffers shall be mounted on continuous channels securely anchored to the pit floor and fastened to the guide rails. The channels, anchors and any additional supports required for buffers shall be provided by the Contractor.

The buffers shall be fitted with means of ascertaining the correct amount of oil in the buffers.

Each buffer shall be permanently and legibly marked to indicate the type and quantity of oil to be used within the buffer.

The buffers shall be self-setting type fitted with safety device to ensure its return to their normal position after operation.

**2.5.6.7 Final Limit Switches**

The elevators shall be equipped with an automatic device arranged to bring the car to a stop at the terminal landings independent of the regular operating devices in the car. Final limit switches should stop the car and prevent normal operation should it travel beyond the normal stopping device.

Separate control devices for normal stopping and final limit switches shall conform to the requirements of EN 81 standards.

**2.5.7 Controller & Control System**

**2.5.7.1 Controller**

The controller shall be floor\Wall mounted, upright type enclosed in enamel finish steel cabinet with either hinged doors at the front and removable panels at back or hinged door both at front and back.

The control system shall be microprocessor based and fitted with all safety devices to protect equipment and motors from damage in the event of overload or other malfunction. Protection against phase reversal and overheat shall provide as per code.

The driving unit control module, comprising of power and command module, shall control drive performance parameters. The controller unit shall control acceleration & deceleration, speed and the jerk rates during change in acceleration or deceleration to provide steeples speed variation for maximum passenger comfort. The jerk rates shall be individually adjustable to user’s satisfaction. Upon receiving signal to perform journey, the command module shall evolve optimum speed profile for each journey and trigger power module for AC/DC and DC/AC conversion for necessary drive current and voltage to obtain desired motor torque.

The controller shall control car motion on feedback from motor-mounted tachometer and operate the brakes of hoisting motor through the signals received from micro switches and load weighing devices.

The controller shall be arranged to cut off the power supply, apply the brake and bring the car to rest upon failure of operation of any of the electrical safety devices.

**2.5.7.2 Control System**

**2.5.7.2.1 General**

The design of control system shall be based on functionally arranged section modules featuring high degree of efficiency, economy of operation, adaptability to changing operating conditions, safety and reliability in operation through maintenance free electronic circuitry.

The control equipment shall be microprocessor based electronic solid state. The total system shall be designed to operate in normal machine room ambience and incorporate full protection against noise and electrical interference generated within the power section, controller and switchgear. The system design shall allow the control algorithm to be reprogrammed by software changes.

The Controller shall be state-of-art microprocessor-based controller capable of high- speed data transmission and analysis for optimization of traffic control.

All modules shall be tested at the manufacturer's works prior to installation. System component shall be subjected to environmental endurance, thermal shocks and salt spray in test chambers.

**2.5.7.2.2 Monitoring of Elevator through IBMS (If Required):**

The Contractor shall supply controller along with communication interface card/software, based on BACnet over IP protocol for real time monitoring and error reporting to the Integrated Building Management System (IBMS) or work as standalone system.

The built-in controller/communication interface shall be supplied by the elevator’s Manufacturer for Remote Monitoring and Integration with Integrated Building Management System (IBMS) of the Building or work as standalone system. Any Software, if required, for integrating Elevators with IBMS or work as standalone system shall also be provided by Elevator Manufacturer.

The following is a list of parameters which shall be monitored and recorded for each Elevator. The list is indicative only and shall be finalized according to Client/Project requirements:

1. Operations Status of Elevator (Running, Out of Service, or Maintenance mode).
2. Elevator Running Up/Down
3. Elevator Error/Fault Detail
4. Emergency Stop
5. Main Power Supply Failure
6. Elevator logs with Down Time Calculations

**2.5.7.2.3 Supervisory Operational Mode**

The operational mode of the Elevator shall be automatic control as specified in para 2.6.

With special operation features, viz emergency operation and fireman switch.

The control system shall be provided with a parking feature, which returns the car to the main floor when there are no calls in the system. Also, the elevator controller shall have provision to bypass the landing calls in case of full load and continue travelling to the destination floors registered from inside Call operating panel.

The elevator shall be provided with individual landing station and operated from interconnected landing buttons including two operating devices in the car. Single touch buttons shall be mounted at each terminal landing.

On touching car or landing buttons, (other than those for landing at which car is standing) shall start the car provided interlock circuits are established and causes car to start traveling in the direction of registered call. Car shall stop at the designated landings for which calls are registered with stops made in order in which landings are reached, irrespective of sequence in which calls are registered, provided call for a given landing is registered sufficiently in advance of arrival of car at that landing to permit stop to be made.

If there are no car calls and car start up in response to outside landing calls, car shall proceed first to the highest down call and then reverses to collect other down calls. Up landing calls shall be collected similarly when car starts down in response to such calls. If car stops for a landing call and a car call is registered within a predetermined interval after stop for a landing corresponding to direction car was travelling, car shall proceed in the same direction regardless of other landing calls registered.

If DOWN landing buttons are touched while car is travelling up, car shall not stop at these landings, but calls remain registered. After highest car and landing calls have been answered and door interlock circuit is established, car shall reverse automatically and respond to down car and landing calls. When travelling down, car shall not respond to up landing calls, but calls shall remain registered and answered on next up trip. No double door operation shall be permitted.

**2.5.7.2.4 Load weighing**

Means shall be provided for weighing passenger load. Control system shall be designed to provide dispatching in advance of normal intervals and to provide landing call bypass when the car is filled to approximately 90% of full capacity load.

Settings shall be individually adjustable. A buzzer shall be provided to indicate overload in elevator.

**2.5.7.2.5 Door Operation**

Doors shall open automatically when a car arrives at a terminal to permit egress of passengers. When another car is at the terminal and is loading for departure or upon expiration of a timed interval, the doors shall close until car is designated for loading. In the event a passenger has entered the elevator, the doors shall reopen upon registration of call on the car button or by pressing the door open button. If no other car is at the terminal, an arriving car shall have its doors open until the car is dispatched or expiration of a timed interval with no demand.

**2.5.7.2.6 Automatic leveling**

An automatic 2-way leveling device shall be provided, designed to govern the leveling of the car to within 6mm above or below the landing sill. The leveling operation shall avoid over-travel, under-travel, of the car and maintain the leveling accuracy regardless of the load in the car, direction of travel, rope slippage or stretch in ropes.

**2.5.7.2.7 Independent Operation**

Controls shall be provided for operation of the elevator from car buttons only. A key operated switch shall be provided in each car for special/VIP service.

**2.5.7.2.8 Emergency Features**

1. Emergency operation: The Elevator shall be equipped with control system to operate and recall the cars in fire or other emergency conditions and to allow the elevator to run on emergency power supply.
2. Hard wired control connectivity of Elevator controller with building’s Fire alarm system and operate automatically when received signal through Building Fire alarm system.
3. The operation of elevator on emergency service shall be as follows:
   * The Elevator shall be operable only by a person in the car.
   * Elevator shall not respond to Elevator corridor calls.
   * The Elevator will stop at the designated egress floor level.
4. The opening of power operated doors shall be controlled only by buttons or switches. If the switch or button is released prior to the doors reaching the fully open position, the doors shall automatically re-close. Open doors shall be closed by either the registration of a car call or by "door close" switch or button.
5. Elevators shall be removed from emergency service by moving the emergency service key-operated switch in the car to the 'off' position with the car at the main floor.
6. Emergency Lighting and Emergency alarm unit: An emergency light shall be included for each elevator car. An automatic change over switch shall be provided in the controller so that upon normal supply failure Emergency power supply shall be available for the light fixture, exhaust fan, and alarm unit.
7. The Contractor shall supply a suitable button in the car control wired to a terminal box fixed in the elevator shaft near the bottom floor served. A suitable alarm bell shall be provided and fixed including all necessary wiring connecting up to the terminal box.
8. The power for the emergency lighting, exhaust fan and alarm bell shall be from the same emergency supply consisting of rechargeable nickel cadmium battery unit with trickle charger and 10 years minimum life expectancy.
9. Emergency power transfer: In the event of normal power failure, adequate power will be supplied through Employer furnished stand-by generator to run the Elevator.
10. Operation under Standby Power: A control signal from the generator shall be provided to the elevator controller or elevator group to place the elevator or group

of elevators in emergency power mode, which will cause the elevators to return to the designated floor and remain there with the doors open. If there are a group of elevators, power shall be provided to only one elevator at a time and automatically switch to the remaining elevators until all elevators have returned to the designated floor with the doors open.

1. Intercom: The Contractor shall install for each elevator, an intercom facility with control room or at location designated by Employer for 24 hours communication. All necessary cabling and conduiting is included in contractor’s scope of works.
2. Earthquake control: In the event of an earthquake, the elevator facility shall be provided with a seismic detector which will bring all cars to stop at the next floor and open the doors.
3. Emergency Rescue Device (ERD): In the event of a power break down, the elevator shall be provided with ERD which will bring all cars to stop at the next floor till the power is resumed.
4. Manual Brake Release Lever: In case of a power break down and fault in ERD, the elevator shall also be provided with a manual brake release lever to manually evacuate the passengers. And it shall be fixed inside the control panel to be used only by the designated person.

**2.5.8 Signals & Fixtures**

Contractor shall provide fixtures and signals as follows, test complete system, correct any deficiencies in wiring and function and make complete system fully functional. Location and arrangement of fixtures and signs shall comply with the ADA and other code requirements.

* + - 1. **Integrated Hall Indicator**

An integrated hall indicator consisting of digital TFT/LED type car position indicator (revealing floor position of car) and illuminated arrows indicating the arrival and departing direction, as determined by the control system shall be installed above each individual elevator and at each landing. A two-tone electronic gong shall also be provided for audible announcement of the arrival of the elevator car.

The digital car position indicator shall be of TFT/LED type with character height of 3540mm.

The integrated hall indicator shall be of horizontal configuration. The stainless-steel face plate, min. 2mm thick, of satin finish containing the digital car position indicator and direction arrows as specified in para 2.6. The hall indicator shall operate on 24 V D.C. supplies.

* + - 1. **Landing Call Station**

Landing call station fitted with push button Panels shall be installed at each landing. It shall be designed for mounting on the landing door frame or on adjacent side wall, subject to Engineers' approval.

The push button Call Panels shall be of flush type, constructed of stainless-steel panel suitable for long arduous duty. The translucent surround of the push button Call Panels shall illuminate to indicate acceptance of call signal.

The push button Call Panels of each landing station shall be inter-linked such that with the pressing of call button of any elevator, call buttons of elevators in the same direction shall light up and record the call.

* + - 1. **Car Station/Car Operating Panel (COP)**

The car station shall be integrated/aligned with the front return of the car and constructed from stainless-steel push-button panels with TFT/LED display.

The hinged full height front panel of the car station shall carry the controls and indicators. The panel shall be fitted with a secret release, which can only be opened from the back of the trough. When the hinged panel is opened an isolate/ normal switch shall be available. The car operating panel shall be recessed in the wall of lift cabin and edges of car operating panel shall be flushed with the wall of lift cabin.

The car-operating panel shall contain at least the following controls with push button Call Panels:

1. Alarm button
2. One floor button for each floor served iii. Open door button/hold on button iv. Key operated car independent service switch
3. Key operated fan switch
4. Digital TFT/LED type car position indicator, direction arrows and when required showing safety signs like overload, fire mode etc.
5. Intercom viii. Speaker for position announcement

All push button Panels shall be set flush with the panel surface for maximum resistance against abuse. When operated, a LED illuminated halo shall highlight the screen thereby informing that the call has been registered. The push button Panels shall be made of stainless steel with the appropriate floor marking.

The digital car position indicator and direction arrows of TFT/LED type shall be positioned above the floor marking.

Separate Car Operating Panel for wheel chairs user shall be provided in the car lift with all necessary features as per EN 81-70 standards.

**2.5.9 Power Supply & Electrical Installations**

**2.5.9.1 General**

The power supply at load break switch will be available in the Elevator machine room. All further wiring, controls and providing proper distribution boards, along with necessary material and accessories beyond the power supply points shall be supplied and installed by the Contractor. The electrical installation and appliances shall comply with relevant prevailing International Standards.

**2.5.9.2 Wiring Installation**

All wiring shall be carried out in accordance with the IEE regulation, NEC standard and B.S. wherever applicable.

All cables shall be halogen free, and if required additionally sheathed also, single or multi core having tinned copper conductors. Cables for different voltage circuits which are run together must have the insulation rating, suitable for the highest voltage present. Wherever cables are subjected to high temperature such as termination to car light, it shall be protected by suitable heat-resistant sleeve. At all terminations, cable ends shall have numbered ferrule to match with the mark on respective component and control drawings. All wiring shall be continuous between terminations.

Travelling cables between the elevators well and elevator car terminal boxes shall be suspended by looping over reels or by suitable clamps. The connections in the terminal boxes shall be marked for identification purposes.

Travelling flexible cables shall be fire resistant and shall comply with B.S.

In case of Fire elevators all wiring\cables shall be Fire rated as per standards applied.

**2.5.9.3 Trunking and Conduits**

All wiring from machine room to motor controls at each floor and to other circuits shall either be run in 16 SWG galvanized steel conduit or trunking, the selection and route of which shall depend on the number of cables and ease of installation and maintenance. If trunking is installed it shall have removable covers, and the trunking finished in dark grey enamel as per B.S. 4800. Fixing arrangements of conduit of trunking shall be vibration proof suitable for the existing conditions. All connections from trunking or conduits to motors or other equipment subjected to vibration shall be with flexible galvanized steel conduit. All trunking and conduit shall be continuous throughout the length to ensure good earth continuity.

In case of Fire elevators all conduits shall be Fire rated as per standards applied.

**2.5.9.4 Earthing**

Earthing of all equipment and metal work which can be subjected to dangerous voltage under normal operating and fault conditions shall be earthed in accordance with NEC Standard. One halogen free insulated earth conductor of suitable size having yellow colour with green tracer shall be run along the trunking or conduit as main earth. All branch circuits in conduit or trunking and other metal work shall have branch earthing cable connected to main earth. All length of trunking shall also be bonded to main earth.

**2.5.9.5 Testing**

Testing of electrical installations shall be carried out to the satisfaction of the Engineer in accordance with standard practice and recognized international standards/codes.

**2.5.10 Fire Protection**

All precautions will be taken to eliminate the potential sources of fire and smoke sources and prevent flame propagation. In particular:

i. Halogen-free cables will be used, ii. Oil, grease and dust will be collected, iii. No plastic materials shall be used in these systems.

Each elevator will be equipped with a fire and smoke detection unit and linked to the fire detection system.

Hard wired control connectivity of Elevator controller with building’s Fire alarm system and operate automatically when received signal through Building Fire alarm system.

**2.5.11 Local Materials**

**2.5.11.1 Pit Screen**

A suitable rigid steel screen shall be provided and fixed by the Elevator Contractor at the bottom of the elevator well where the counter-weight comes down on its buffers and between elevators. The screen shall have a minimum height of 7 ft. as per code requirements.

**2.5.11.2 Separator Beams & Well Trimming Girders**

Properly designed separator beams and trimming girders shall be supplied and installed at proper location in Elevator well by the elevator contractor to suit fixing requirement of offered elevator. The separator beams and trimming girders installed in elevator shall be of at least 200mm rolled I-beams of prime quality structural steel (ASTM A-36 or equivalent).

**2.5.11.3 Trap Door**

The Contractor shall provide and install the trap doors of rugged construction in the machine rooms at location shown on relevant drawing to enable access of the hoisting machinery into the machine rooms. The trap door shall be strong enough to temporarily withstand/support heavy machinery. It shall be installed flush with the finished floor when closed and be lockable only from inside the machine room.

The Contractor shall include the above items in his bid price for the elevators.

**2.6 TECHNICAL DATA**

**2.6.1 Passenger Elevator Schedule-Quantity Two (02) Nos.**

|  |  |  |
| --- | --- | --- |
| **Sr.**  **No.** | **Description** | **Minimum Requirement** |
| 01 | Type | Machine Room Less Type (MRL) heavy duty VVVF Passenger Elevator fully complied with EN 81-20, EN 81-50 and EN 81-70 standards. |
| 02 | Capacity | 1275 Kg |
| 03 | Elevator Speed | 2.0 m/sec |
| 04 | Travel Height | As per BOQ/SOP |
| 05 | No of Stops/Openings | Ground and Eight (08) upper floors (09 stops/09 openings) |
| 06 | Internal Car Sizes (w x d) x h | (2000 mm x 1400 mm) x 2400 mm  (Will be finalized at Technical Submittal Review Stage) |
| 07 | Machine Type | VVVF AC gearless drive |
| 08 | Car & Counterweight Guide Shoes | Roller guide shoes as per EN81 standards |
| 09 | Drive Location | Machine Room Less (MRL Type) |
| 10 | Control System | Duplex & Destination Control System |
| 11 | Architraves | Full width of Stainless-Steel satin finish at all floors as approved by the Client/Employer at all floors. |
| 12 | Elevator Shaft Size (w x d) | As per layout drawing attached |
| 13 | Pit Depth | As per layout drawing attached |
| 14 | Head Room | As per layout drawing attached |
| 15 | Buffers | Oil buffers of spring return type (Energy Dissipation type) or as recommended by EN 81 Standards |
| 16 | Door Size | 1100mm x 2100mm |
| 17 | Door Operation & Type | VVVF control, Power operated, 2-Panel Side opening stainless steel panel construction and fire rating of 1 hr. |
| 18 | Indicators | * Digital TFT/LED type car position indicator on each landing with directional arrows as approved by the Client/Employer/Engineer. * Digital TFT/LED type position indicator inside the car with directional arrows as approved by the Client/Employer/Engineer. * Two tone electronic voice announcing for arrival of car etc. |
| 19 | Landing Call Station | Push buttons type with stainless steel frame or as approved by the engineer with call acceptance illuminated indication |

|  |  |  |
| --- | --- | --- |
| 20 | Car Operating Panel  (COP)  (02 Nos each elevator  –  One (01) for wheelchair users as per EN 81-70) | * Integral with the front return of the car and constructed of Stainless Steel/glass and recessed/flushed with wall. Including separate handicapped car operating panel push button type or as approved by the engineer * It shall include TFT/LED type display, alarm buttons, floor call buttons, door open/hold button, keyoperated attendant switch, fan switch, intercom, all buttons shall be of push button type or as approved by the engineer (connection with building safety/security system is included in Contractor’s scope). |
| 21 | Car Design | * One side wall of laminated tempered Glass of minimum 12mm thickness and Three walls of Stainless-Steel Hairline as approved by the Client/Employer/Engineer. * Front return and car door of stainless steel (hairline finish) construction or as approved by the client/employer. * Full width Full height mirror on rear wall or as per manufacturer design. * Ceiling removable type full extended poly carbonate diffuser with modular light fittings as approved by engineer * Ventilation Blower (Pre-Installed) * Handrails on two side * Granite Floor * Inter Telecommunication system * Emergency exit/Trap Door * Load measuring device with overload buzzer and inter-lock till overload is removed. * LED Lighting * Seismic Sensor |
| 22 | Door Safety Devices | * Full height Light curtain protection (2D) * Door opening timing feature |
| 23 | Special Features | * Premium Motor * Attendant Control * Emergency Operation & Fireman Switch * Hard wired control connectivity of Elevator controller with building’s Fire alarm system and operate automatically when received signal through Building Fire alarm system. * Emergency Lighting & Alarm Unit * Earthquake Control System * Voice Guidance System * Connected with Building Control system * Suitable 0 ~ 45°C Ambient Temperature * Phase Reversal Failure Indication & Interlock * Energy Regeneration Drive System * Unintended Car Movement Protection (UCMP) * Ascending Car Movement Protection (ACOP) * Manufacturer Security Cameras for Surveillance (Connection with Building’s Safety/Security is |

|  |  |  |
| --- | --- | --- |
|  |  | included in the scope of the Contractor)   * ERD Device (Emergency Rescue Device Battery Backup) * Manual Brake Release Lever * Halogen Free Cables (All cables) * Destination Control System (Provision to Connect with existing Elevators Destination Control system) * RFID interface provision in elevator’s controller capable to control the system for selection of floors by the passengers. * Access Control System (Biometric & Barcode Scanner) |
| 24 | Interior Finish | Superior/Highest/Executive quality as per approval of engineer on submitted samples. |
| 25 | Minimum Functions | * Energy Regeneration Drive System * Direct Leveling * Optimum travel curve * Re-running automatically when elevator is re-powered * Car location adjusted automatically * Load compensating * Travel Counter * Over/Under voltage protection * Phase trip protection * Over current protection * Over heat protection * Encoder trip protection * Contact adhered protection * Bi-directional over speed protection * Additional Overspeed Governor attached with Safety Gear for counterweight * Final terminal protection * Over load protection * Anti-door lock bridge * Automatic by-pass hall calls while full load * Travel to next floor when open door trip * Emergency illumination in car * Emergency alarm * Automatic car fan with minimum 1000CFM * Automatic car lighting * Settable landing number * Automatic parking, parking floor * Parking key switch, landing * Fire return (Phase I), Main landing * Hoist way lighting * Car door button\key pads |
| 26 | Trips/hour | 240 minimum |
| 27 | Power Supply | * 3 Phase / 400V / 50 Hz. * 1Phase/230V/50 Hz. (for lighting) |
| 28 | Monitoring/Integration with BMS/ Building Controls (If required) | Communication module/Controller based on BACNet over IP for each Elevator to be provided for integration with Building Management system (BMS)/Work as Standalone System. Any Manufacturers Software & hardware (Computer, LED |
|  |  | other accessories), if needed for integration with IBMS or work as standalone system, shall also be provided by the Contractor. |
| 29 | Ambient Condition for Motor/control safeties for shafts etc. | 0°C to 40°C |
| 30 | Inspection & Test Language | English |
| 31 | Elevator Mode | Two Mode:   * Normal Mode: From the car or from the landing. * Maintenance Mode: Low speed (inspection running). |
| 32 | Design Life | 25 Years |

**NOTES:**

1. Bidder is advised to visit the site to check as built\newly built\proposed dimensions of elevator shafts, overhead and pit and confirm in his bid that offered elevators will suit to as built dimensions.
2. All leaflets properly signed/stamped in original to be submitted with the bids for the equipment including drive, controls, car design, doors & architrave, indicators landing and car station, safety devices etc. being offered.
3. Any variation in the technical aspects of the offered model by the Bidder, against the data provided along with Bid, due to manufacturer’s standards will be subject to Engineer’s approval.

**2.7 INSTALLATION**

**2.7.1 General**

The installation of elevator equipment including its electrical installations shall comply with applicable standards, manufacturers' instructions and recommendations. Electrical work required during installation shall comply with NFPA 70 or approved equivalent.

The scope of installation and civil works shall include the following:

* + - 1. Providing and/or cutting all necessary holes, chases and openings and making good after installation of equipment.
      2. Supplying and fixing all supports, beams, ladders etc. necessary for the installation of the machinery, guide brackets, doors, buffers etc.
      3. Furnishing all necessary cement and/or concrete for 'grouting-in' brackets, bolts, etc.
      4. Providing and fixing suitable scaffolding and protection of work in progress.
    1. **Welded Construction**

Welded construction shall be provided for installation of Elevators wherever bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, or replacement of worn parts. Welding workmanship and qualification of welding operators shall comply with American Welding Society (AWS) standards or approved equivalent.

* + 1. **Sound Isolation**

Rotating and vibrating Elevator equipment and components shall be mounted on vibration - absorption mounts designed to effectively prevent the transmission of vibrations of the structure, and thereby eliminate the sources of structure - borne noise.

* + 1. **Lubrication**

Operating parts of the system including ropes (if required), guides, etc., shall be lubricated as per manufacturer's recommendation.

* + 1. **Alignment**

Proper co-ordination of installation of hoist way entrances with the installation of elevators' guide rails shall be done for accurate alignment of entrances. Wherever possible the final adjustment of sills and doors shall be delayed until the car is operable in the shaft. The clearance shall be reduced to minimum, safe, workable dimensions at each landing.

* + 1. **Sills**

Sill unit shall be set at each floor landing accurately aligned, slightly above structural floor, to suit level of scheduled floor finish.

* + 1. **Painting, Retouching & Re-finishing**

After completion of installation and testing to the satisfaction of the Engineer-in-Charge, the Contractor shall carryout all finishing, retouching and refinishing operation on the entire equipment accessories and installation matching the original finish in an approved way. All auxiliary works carried out by the Contractor as the finished installation shall also be painted in the approved standard after applying anticorrosive base.

**2.8 TESTING AND INSPECTION REQUIREMENTS**

The Contractor shall submit separate list of shop tests, to be conducted prior to shipment and field tests after installation prior to commissioning.

The Contractor shall arrange pre-shipment inspection of the equipment as per requirements given in Bidding Documents.

Testing after installation shall be carried out for each elevator before it is put into normal service in accordance with EN-81 standards and appropriate certificate shall be completed. The tests shall include but be not limited to the following:

i. Functioning of all system and devices ii. Operational test of all safeties iii. Protection against false signals

1. Earth fault test on cable/controller & switch gears
2. Insulation resistance test for cables

A thorough inspection of all equipment shall also be undertaken at this stage and appropriate certificate shall be completed.

Elevator shall be periodically re-examined during defect liability period and at the end of guarantee/defect liability period appropriate certificate shall be completed to assess operational performance.

All equipment and personnel required to complete testing and inspection shall be provided by the Contractor. All erection work and tests shall be performed by the Contractor's erectors who shall be suitably qualified and experienced persons to the satisfaction of the Engineer.

**SECTION – 3000**

**STRUCTURAL STEEL WORKS**

**1.0 SCOPE**

**2.0 APPLICABLE CODES AND STANDARDS**

**3.0 SUBMITTALS**

**4.0 MATERIALS**

**5.0 CONNECTIONS**

**6.0 SHOP DRAWINGS**

**7.0 FABRICATION**

**8.0 WELDER QUALIFICATIONS**

**9.0 WELDERS IDENTIFICATION**

**10.0 TEST ASSEMBLY**

**11.0 SURFACE PREPARATION AND PAINTING**

**12.0 INSPECTION AND TESTS**

**13.0 ERECTION**

**14.0 MISCELLANEOUS STEEL WORKS**

**15.0 MEASUREMENT AND PAYMENT**

**1.0 SCOPE**

The work under this section consists of furnishing all material, labour, plant, equipment and appliances, fabricating, erecting, installing, testing, painting and all other items incidental to steel work for a complete job as shown on the drawings, specified herein and/or as directed by the Engineer.

**2.0** **APPLICABLE CODES AND STANDARDS**

Latest edition of the following codes and standards are applicable to the work of this section:

AISC Specifications for the design, fabrication and erection of structural steel for buildings.

ANSI / Manual of steel construction, LRFD & ASD. AISC 360

AISC 303 Code of Standard Practice, for Steel Buildings and Bridges.

ASTM A6 Standard specifications for general requirements for rolled steel plates, shapes, sheets, piling and bars for structural use.

ASTM A36 Standard Specifications for Carbon Structural Steel.

ASTM A53 Standard Specifications for Pipe, Steel, Black & Hot Dipped, Zinc Coated, Welded and Seamless

ASTM A307 Carbon steel externally and internally threaded standard fasteners.

ASTM A325 High strength bolts for structural steel joints including suitable nuts and plain hardened washers.

ASTM A446 Specifications for steel sheet zinc coated (galvanized) by the hot dipped process.

ASTM A490 Quenched and tempered alloy steel bolts for structural steel joints.

ASTM A501 Hot formed welded and seamless carbon steel structural tubing.

ASTM A563 Carbon and alloy steel nuts.

ASTM A572 Standard Specifications for High - Strength Low - Alloy

Columbium – Vanadium Structural Steel

ASTM E109 Dry powder magnetic particle inspection.

AWS D1.1 Specifications for welding of steel structures.

ANSI

B 18.2.2.1 Plain Washers.

SSPC – SP6 Steel structures painting council – surface preparation specifications.

**3.0 SUBMITTALS**

Design drawings shall be prepared by the Engineer and supplied to the Contractor. These shall contain main dimensions, sizes of members, typical details of joints.

Workshop drawings shall then be prepared by the Contractor from the design drawings supplied and submitted to the Engineer for approval.

**4.0 MATERIALS**

Except otherwise stated on the drawings, the material specifications shall conform to the following. Wherever necessary the Contractor may use equivalent alternative material subject to approval of the Engineer.

4.1 **Structural Steel**

* + Structural steel shall conform to the requirements of ASTM A-36, or ASTM A-572.

* + Steel pipes shall conform to the requirements of ASTM A 53 Class B, ASTM A501 or shall be made of plates spirally welded.

* + All material shall be supplied chirpy V-Notch testing in accordance with ASTM A6, Supplementary Requirement S5.

* + Grating shall conform to ANSI / NAAMM MBG 531.

4.2 **Steel Forging**

Steel forging shall conform to the requirements of ASTM A235.

4.3 **Steel Casting**

Steel casting shall conform to the requirements of ASTM A27.

4.4 **Welding**

Welding Electrodes for manual shielded metal arc welding shall conform to AWS A 5.1 latest edition or the A 5.5 latest edition. Equivalent locally manufactured electrodes may be used subject to the approval of the Engineer.

4.5 **Common Bolts, Anchor Bolts, Nuts and Washers**

Common Bolts, Anchor Bolts, Nuts and Washers Bolts and Nuts shall conform to the requirements of ASTM A307.

4.6 **High Strength Bolts**

High strength bolts, heavy hexagonal nuts and hardened washers shall conform to the requirements of ASTM A325. All field connections, except noted, shall be made with high strength bolts in friction type connection.

4.7 **Washers**

Washers shall conform to the requirements of ANSI B18.2.2.1 and shall be of structural grade steel appropriate for the type of bolts for which they are used. For oversized holes, the washers shall be large enough to cover the entire hole by at least 6mm (1/4 in.) or as directed by the Engineer.

4.8 **Cast Iron**

Shall conform to the requirements of latest edition of ASTM A 48.

**5.0 CONNECTIONS**

5.1 **Design of Connection**

All connections shall be designed and detailed for 75% of the effective capacity of the member. A minimum of two bolts or equivalent welding shall be used per connection.

Shop connection may be welded or bolted. Field connections shall be bolted unless noted otherwise on design drawings or approved by the engineer.

Allowable design stresses for structural steel members and their connections, including temporary bracings and shorings shall be in accordance with AISC Specifications.

5.2 **Installation of Bolts**

High strength bolts shall be installed in accordance with AISC

“Specifications for Structural Joints using ASTM A 325 or A 490 bolts”.

5.3 **Minimum Spacing of Bolts**

The distance between center of bolt holes shall not be less than 3d, where d is the diameter of the bolt in inches.

5.4 **Minimum Edge Distance**

The minimum edge distance i.e. center of standard hole to edge of connected part shall be as given in the table below:

|  |  |  |
| --- | --- | --- |
| **Normal Bolt Diameter (Inches)** | **At Sheared Edges (Inches)** | **At Rolled Edges or**  **Plates, Shapes or**  **Gas Cut Edges**  **(Inches)** |
| 1 / 2 | 1.5 times the Bolt Diameter | 3 / 4 |
| 5 / 8 | 7 / 8 |
| 3 / 4 | 1 |
| 7 / 8 | 1 -1 / 8 |
| 1 | 1 – 1 / 4 |

**6.0** **SHOP DRAWINGS**

6.1 Shop drawings shall be submitted by the Contractor, for structural steel works, for acceptance in accordance with the requirements or the Contract Documents.

6.2 Shop drawings furnished for this section shall conform to the best standards of the construction industry. Shop drawings shall be prepared by and under the supervision of competent engineering personnel. Prior to submittal, the Contractor shall check each shop drawing for compliance with the requirements of the Contract Documents.

6.3 Shop drawings shall include plans, elevations, sections and complete details to describe clearly, at an ample scale, all work to be provided. Drawings shall be accurately dimensioned and shall be noted clearly.

6.4 All connections shall be designed and detailed as, per sub-section 4 above, by the contractor on the shop drawings. Design calculations for connections shall be made as per AISC specifications and shall be submitted along with the shop drawings after checking and signing by the Contractor for approval of the Engineer.

6.5 The shop drawings shall include

1. An erection scheme, in suitable size, having the following information:

* + - * + Location of erection elements in respect of axis and Marks as well as picking points of these elements with respect to each other or with the existing steel or reinforced concrete structures.

* + - * + Joints showing erection welding sizes and lengths, bolts diameter and numbers.

* + - * + Chart showing list of assembling marks having columns such as Mark, Description, Quantity, Weight of each Mark, total weight and Remarks with grand total in the end.

* + - * + Chart showing List of Erection Bolts, Nuts and Washers in tabulated form, detailing information such as size, quantity, weight and their grand totals.

* + - * + Quality of materials.

* + - * + Quality and type of welding electrodes.

* + - * + Measures to be adopted against unscrewing of bolts.

* + - * + Painting instructions.

* + - * + Erection sequence.

* + - * + References to relevant drawings.

* + - * + Except in special cases all scheme drawings shall be made in single fairly thick lines.

* + - * + The recommended scale of erection scheme is 1:50,

1:100, 1:200, for joints 1:5, 1:10 or 1:20.

1. Fabrication drawings in suitable size shall contain the following information:

Each Shop Assembly (Mark) shall be drawn separately showing necessary lines, elevations, sections with reference to axis, center lines, location of holes, cleats, plates, lugs etc. fully dimensioned with part numbers.

Bolts and holes sizes.

Welding symbols and welded joints requirements, in accordance with AISC manual of steel construction and AWS specifications.

Geometrical Setting out dimensions necessary for the assembly of an element. Location and details of joints as calculated by the Contractor.

Instruction for welding, dimensions of weld, edge preparations methods of welding, and methods for control of distortions.

List of symbols for bolts and holes uses.

List of symbols for welds used.

Edge distance (general).

Welding sizes and lengths (general).

Standards and quality of materials.

Type and quality of welding electrodes.

Tests for welding.

Reference to related erection scheme drawings.

Reference to design and working drawings.

Part list.

Instructions for surface preparation, painting, primer and finish coats.

Recommended scales for fabrication drawings are preferably 1:10 or 1:20, and for joints and details 1:1, 1:2, or 1:5.

* 1. **FABRICATION**

The Contractor shall notify the Engineer about any problems or doubts/errors, if any, in the drawings for clarifications/rectification well in time to prevent any fabrication errors. Fabrication shall not be commenced until approval has been obtained from the Engineer.

* 1. **Straightening of Material**

Rolled material, before being worked upon shall be straightened within tolerances as per ASTM specifications A6. Straightening, necessarily shall be done by mechanical means or by the application of a limited amount of localized heat. The temperature of heated areas, as measured by approved methods, shall not exceed 1200 0 F.

* 1. **Cutting**

As far as practicable cutting shall be done by shearing. Oxygen cutting shall be done where shear cutting is not practicable and shall preferably be done by Machine. All edges shall be free from notches or burs. If necessary, the same shall be removed by grinding.

* 1. **Holes Punching/Drilling**

Holes shall be punched where thickness of the material is not greater than the diameter of bolt +1/8 in. Where the thickness of the material is greater the holes shall either be drilled or sub-punched and reamed to size. The die for all sub-punched holes and the drill for all sub-drilled holes shall be at least 1/16” smaller than the nominal diameter of the rivet or bolt. Holes for A514 steel plates over 1/2" thick shall be drilled.

* 1. **Welding**

* + 1. All execution and inspection of welding shall be done in accordance with the provisions of the American Welding Society Specifications. No welding for piping/electrical supports shall be made transversely to any tension flanges or beams or columns.

* + 1. Maximum and minimum size and lengths of fillet welds shall be in accordance with AISC specifications, or as mentions on drawing.

* + 1. Surface to be welded shall be free from loose scale, slag, rust, grease, paint or any other foreign matter.

* + 1. Butt welds shall be full penetration welds, unless otherwise specified and permitted.

* + 1. Avoid the use of temporary welded attachments during fabrication as much as possible. After fabrication is completed, remove flush with the base material without encroaching on the minimum required base material thickness. After the surface has been restored, examine all areas from which temporary attachments have been removed by the same methods required for permanent fillet welds.

* + 1. Do not begin structural welding until joint elements are tacked in intimate contact and adjusted to dimensions shown with allowance for any weld shrinkage that is expected. Weld heavy sections and those having a high degree of restraint with low hydrogen type electrodes. No member shall be spliced without approval.

* + 1. For notch-toughness specified material, all weld metal, processes and preheat requirements shall be compatible to assure notchtough composite weld metal.

* + 1. Shop splices of webs and flanges in built-up girder shall be made before the webs and flanges are joined to each other.

* + 1. For all built-up members, i.e. sections fabricated from plates and flat bars or compound rolled sections, plate and box girders, where long continuous, welding is to be done, should be executed by Automatic submerged Arc Welding process in accordance with relevant AWS specifications.

7.5 **Tolerances**

Tolerances for Structural Steel shall be as per AISC Specifications unless noted otherwise.

A variation of 1mm is permissible in the overall length of members with both ends finished for contact bearing. The bearing surfaces prepared to a common plane by milling.

Members without end finished for contact bearing which are to be framed to other steel parts of the structure shall have a variation from detailed length not greater than 1/8" for length over 30 feet and not greater than 1/16” for length.

Members with ends finished for contact bearing shall have a variation 1/32” in the overall length.

* 1. **WELDER QUALIFICATIONS**

* 1. All welders contracted to perform work shall be required to show written evidence that they have been properly tested in compliance with the approved welding procedures.

* 1. Welders shall have been qualified in the proposed procedure by an established laboratory acceptable to the Engineer within the preceding 90 days.

* 1. All welders shall be qualified for the type of welding, grade of steel, thickness of steel, welding process and welding position that they are employed to weld. Welders and welding operators that have not been performance qualified, for all material and thickness ranges used on the job, shall be restricted to welding only that portion of the work for which they are qualified.

* 1. Engineer reserves the right to have welders or welding operators prequalified or removed from the job as he deems necessary during the progress of work. Engineer’s decision regarding the qualifications of any welder shall be final.

* 1. **WELDERS IDENTIFICATION**

* 1. Each welder shall be assigned a unique identifying number or symbol that he shall use to identify all welding resulting from his skills.

* 1. Stenciled markings shall be applied within 40mm (1-5/8 in.) of the weld using low stress concentration dies. Written symbols are also acceptable.

* 1. A record shall be kept of these symbols by the Contractor. The records shall show welder’s name, symbol assigned, procedures to which qualified, employment and test dates. This record shall be available to the Engineer’s Representative at all times.

* 1. **TEST ASSEMBLY**

* 1. After fabrication and before galvanization or painting, test assembly of complete Structural Components shall be done on the shop floor as directed by the Engineer.

* 1. Test assembly work and procedure should be planned during fabrication process.

* 1. Each test assembly shall be got inspected from the Engineer and shall be dismantled only after his approval in writing.

* 1. **SURFACE PREPARATION AND PAINTING**

Surface preparation and painting shall be in accordance with the provisions of the Code of Standard Practice of the American Institute of Steel Construction, Inc.

* 1. **Surface Preparation**

* + - * 1. All steel shall be cleaned free from loose scale, rust, burrs slag, etc. by means of sand blasting and/or other approved means as recommended by the manufacturer of paint.
        2. The sand used for this purpose shall conform to the type as specified in SSPC-SP.6. It should be free from earth, dust, clay and moisture. For this, the Contractor shall submit the gradation (no less than that passing through a 16-mesh screen U.S. sieve series) and source of sand along with the sample for approval by the Engineer prior to commencing the sand blasting operation.

* + - * 1. The size of sand particles, air pressure and size of the hose nozzle shall be correlated to give proper and acceptable surface.

* + - * 1. Material which is to be used for fabrication of components to be galvanized later on shall not be cleaned.

11.2 **Painting**

* + - * 1. Immediately after surface preparation all materials shall be given one prime coat of rust preventive paint in the fabrication shop.

* + - * 1. After fabrication one shop coat of primer paint and then one coat of enamel paint shall be applied.

* + - * 1. One final coat of enamel paint shall be applied after erection of all components.

* + - * 1. The thickness of each coat of paint shall be in accordance with the paint manufacturer’s recommendation.

* + - * 1. All other requirements for the specified paint system shall be in accordance with the paint manufacturer’s specifications/ recommendations.

* + - * 1. The Contractor shall use the best quality of the type of paint specified and shall get the same approved by the Engineer.

* + - * 1. Steel work/Surfaces not to be painted:

Steel work to be encases/embedded in concrete or surface in contact with concrete or grout shall not be painted, but shall be given a cement wash after surface preparation.

Machined finished surfaces shall not be painted but shall be coated with rust preventive compound, approved by the Engineer immediately after finishing. Such surfaces shall also be protected with wooden pads or other suitable means for transportation. Unassembled pins, keys, and bolt thread shall be greased and wrapped with moisture resistant paper.

Contact surfaces of connections using high strength bolts in friction type connections shall not be painted. Such surfaces of all components after fabrication shall be cleaned free of paint. No coating whatsoever then shall be applied to such surface. The surface roughness for high strength friction grip holts is a very important factor therefore components shall not be erected unless approved by the Engineer.

11.2.1 Primer and Paint

11.2.1.1Primer

Primer shall be of proven quality. The type of primer to be used shall be approved by the Engineer.

11.2.1.2 Paint

Paint shall be enamel paint of a proven quality. The type of paint to be used shall be approved by the Engineer.

11.3 **Galvanizing (Zinc Coating)**

Galvanizing, wherever specified, shall be applied in a manner and of a thickness and quality conforming to the requirements of ASTM A123 standard specifications for zinc (Hot galvanized) coating on products fabricated from rolled, pressed and forged steel shapes, plates, bars and strips.

Components shall be galvanized i.e. zinc coated after complete fabrication i.e. welding, drilling etc. the process shall consist of removal of rust and mill scale by pickling in hydrochloric acid or sulphuric acid followed by water wash and prefluxing in tanks containing zinc ammonium chloride and then fluxing with ammonium chloride. The fluxed components shall then be passed through a drying oven prior to immersion in a bath of virtually pure molten zinc.

* 1. **INSPECTION AND TESTS**

* 1. Manufacturer’s Test Certificate for all material used shall be furnished by the Contractor for Engineer’s scrutiny and approval.

* 1. Rolling tolerance of all shapes and profile according to AISC shall be in accordance with the provisions of ASTM A6 specifications. These shall be checked by the Contractor before commencing work and shall be rejected if found not within limits.

* 1. Materials shall be tested for conformance with the specified standards at an approved testing laboratory as and when directed by Engineer.

* 1. Contract surfaces of connections using high strength bolts in friction type connections shall be got inspected and approved from the Engineer before bolting.

* 1. All bolted connections shall be got inspected and approved from the Engineer for types, size, number of bolts and installation including tightening.

* 1. **Inspection and Testing - Welding**

12.6.1 General

Welding shall be inspected and tested by an approved testing laboratory during fabrication and erection of structural steel as follows:

The testing laboratory shall be responsible for conducting and interpreting the tests. It shall state in each report whether or not the test specimens conform to all requirements of the Contract Document and shall specifically note any deviations therefrom.

Certify all welders and make 100 percent visual inspections and tests as follows:

* + - * + Record types and locations of all defects found in the welding work.
        + The measures required and performed to correct such defects.

In addition to the requirements of AWS D 1.1, paragraph 8.15, each weld shall be visually free of slag, inclusions and porosity.

In addition to visual inspection of all welds magnetic particle, ultrasonic and radiographic inspection shall be made of all welds as specified below. Magnetic particle tests shall be made on the root pass and finished weld.

The method of magnetic particle test shall be in accordance with ASTM E109. Any type of crack or zone of in-complete fusion or penetration shall not be acceptable.

Radiographic testing technique and standards of acceptance shall be in accordance with AWS D 1.1.

Ultra-sonic testing shall be performed in accordance with AWS D 1.1.

Welding inspection and test report showing evidence of the quality of welding shall be submitted by the Contractor. For each section of weld inspected and tested, furnish a report which clearly identifies the work, the welder’s identification, the areas of inspections and test, the acceptability of the welds, and signature of the inspector or laboratory incharge. Each report shall be completed at the time of inspection or test. For radiographic examination, furnish a complete set of radiographs in addition to the reports. All inspection and testing shall be carried out in presence of the Engineer or his representative.

12.6.2 Test Methods

Use the following test methods as specified. The following list is in descending order. When a particular test method is specified for a joint and the method is impractical to use, use the next highest method practicable. The alternative method will be subject to approval, NDT procedures and techniques shall be in accordance with AWS D 1.1, section 6.7.

1. Radiographic Method: In addition to the requirements of AWS D 1.1, comply with ASTM E94.

1. Ultrasonic method.

1. Magnetic particle method.

1. Liquid Penetration Method: Visible-dye, solvent removable method only.

12.6.3 Members Designated for Tests

1. Built – up Members

Examine 100 percent of flange-to-flange and web-to-web welding by the radiographic method. For all web-to-flange and pipe column seam welding, examine ten percent of each welder’s work as follows:

* + Full penetration groove welds by the ultrasonic.

* + fillet welds and partial penetration groove welds by the magnetic particle method.

1. Moment Connection Joints

* + Examine 100 percent of all flange-to-flange and web-to-web welding as follows:

Full penetration groove welds by the ultrasonic method or other method as designated by the Engineer.

Fillet welds and partial penetration groove welds by the magnetic particle method.

* + For all web-to-flange welding, examine ten percent of each welder’s work as follows:

Full penetration groove welds by the ultrasonic method or radiographic method as approved by the Engineer.

Fillet welds and partial penetration groove welds by the magnetic particle method.

1. Column Base Plates.

Examine 100% of all welding for connection of base plate to column.

1. Bracing Connections: Examine 100 percent of all welding for connection of diagonal bracing as follows:

* + Groove welds by the ultrasonic method.

* + Fillet welds by the magnetic particle method.

12.6.4 Requirement for ten percent Examination

1. Examine a 300mm (12 in.) section of weld in each 3m (10 ft.) increment of each welder’s work as directed by the Engineer. If the examination meets the acceptance standards of AWS D 1.1, the 3m (10 ft.) of weld represented will be accepted.

1. if the examination fails to meet the acceptance standards, examine two additional 300mm (12 in.) sections in the 3m (10 ft.) increment as directed by the Engineer. If both of these examinations meet the acceptance a standards, the 3m of weld represented will be accepted. Repair the defects detected in the first examination and re-examine.

1. If one or both of the examinations fails to meet the acceptance standards, examine the remaining weld of the 3m (10 ft.) increment. Repair the areas that do not meet the acceptance standards and re-examine.

12.6.5 Repair and Re-Testing of Welds

Repair defective welds in accordance with AWS D 1.1, or replace the weld, and Re-test repaired and replaced welds by the same method and acceptance standard used to examine the original weld. In addition, when defective welds are found, the testing laboratory shall determine the cause of the defective welding and institute immediate corrective action.

All defective welding shall be repaired or replaced at the

Contractor’s expense.

12.7 **Rejection**

Neither the fact that the materials have been tested nor that the manufacturers test certificates have been furnished shall affect the liberty of the Engineer to reject material found not according to these specifications.

Materials or workmanship not in conformance with the provisions of these specifications shall be rejected at any time, after delivery or during the progress of the work or the completion and erection at site.

* 1. **ERECTION**

* 1. **Bracing**

All steel structures shall be carried up true and plumb within the limits defined in the AISC code of standard practice, and temporary bracing shall be introduced wherever necessary to take care or all construction loads to which the structure may be subjected including the equipment and the operation of the same. Such bracing shall be left in place as long as required for safety.

Wherever piles of materials, erection equipment and other loads are carried during erection, proper provision shall be made by the Contractor to take care of the stresses resulting from such loads.

* 1. **Alignment**

No permanent bolting or welding shall be done at site during erection until as much of the structure as will be stiffened thereby has been properly aligned and approved by the Engineer.

* 1. **Joints Using High Strength Bolts**

All structural joints using high strength bolts shall be executed and inspected in accordance with “AISC Specification for structural joints using ASTM A325 or A490 bolts”. High strength bolts and nuts, loosened after tightening, shall be discarded and replaced with unused bolts and nuts.

* 1. **Stubs**

Stubs of trusses before being embedded in concrete shall be erected in position timely aligned using stub setting templates.

**14.0 MISCELLANEOUS STEEL WORKS**

The work covered shall include furnishing, fabricating, installing and painting miscellaneous steel work including the following:

1. Structural Steel Works for Elevator Shaft, comprising MS Girders, MS Tube Sections (vertical and horizontal members), Base & Side Plates with mechanical & chemical anchors, MS Plain Sheet, Corrugated GI Sheet for Composite Deck Slab including all required hardware.

1. Steel Supporting System for Granite Cladding, comprising MS vertical & horizontal tubes/angles, GI clamps / connections, mechanical anchors / bolts etc.

1. G.I. Expanded metal edge bead for Walls / RCC corners fixed with nails.

1. G.I. Expended Metal Lathe for Concrete and Masonry Joints, to be fixed using Stainless Steel Nails with G.I. Washers etc.

Drawing, material, fabrication, surface preparation shall conform to the applicable requirements of relevant clauses of these specifications. Any proposed deviation due to field conditions and availability of local material shall be submitted to the Engineer for approval.

* 1. **MEASUREMENT AND PAYMENT**

* 1. **General**

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost there of shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of Quantities. The rates quoted by the Contractor in the Bill of Quantities shall include works to be executed under this specification in any floor and at any height.

* + - 1. Structural design calculations, preparation of fabrication / shop drawings etc.

* + - 1. All hardware including but not limited to Nuts, bolts, screws, washers, weld metal and welding rods etc.

* + - 1. Testing of materials and welds, and repair of defects.

* + - 1. Surface preparation including cleaning with sand blasting.

* + - 1. Painting system including primer coats.

* + - 1. Galvanizing

* + - 1. Fabrication

* + - 1. Erection

* + - 1. Steel Supporting System for Granite Cladding

15.2 **Structural Steel Works for Elevator Shaft**

* + 1. Measurement

Measurement of acceptably completed works of the items will be made on the basis of actual weight of the used material (in kg as specified in the Bill of Quantities and according to approved shop drawings) after verification at site to the satisfaction of the Engineer that the items fabricated, supplied and erected in position conform with the contract and approved shop drawings.

* + 1. Payment

Payment will be made for acceptable measured quantity of the items on the basis of unit rate quoted in kg and shall constitute full compensation for all the works related to the item.

15.3 **G.I. Expanded Metal Edge Bead for Walls / RCC corners**

* + 1. Measurement

Measurement of acceptably completed works of the items will be made on the basis of actual covered length in running feet (as specified in the Bill of Quantities) after verification at site to the satisfaction of the Engineer that the items fabricated, supplied and erected in position conform with the contract.

* + 1. Payment

Payment will be made for acceptable measured quantity of the items on the basis of unit rate quoted in running feet (Rft.) and shall constitute full compensation for all the works related to the item.

15.4 **G.I. Expended Metal Lathe for Concrete and Masonry Joints**

* + 1. Measurement

Measurement of acceptably completed works of the items will be made on the basis of actual covered area length in square feet (as specified in the Bill of Quantities) after verification at site to the satisfaction of the Engineer that the items fabricated, supplied and erected in position conform with the contract.

* + 1. Payment

Payment will be made for acceptable measured quantity of the items on the basis of unit rate quoted in square feet (Sft.) and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 3000 \*\*\*

**SECTION – 6171**

**CURTAIN WALLS**

**1.0 SCOPE**

**2.0 QUALIFICATIONS**

**3.0 MATERIALS AND CONSTRUCTION**

**4.0 PERFORMANCE REQUIREMENTS**

**5.0 DELIVERY, STORAGE AND HANDLING**

**6.0 EXECUTION**

**7.0 TESTING UPON COMPLETION**

**8.0 INSERTS, ANCHORS ETC**

**9.0 PACKING**

**10.0 WARRANTY**

**11.0 MEASUREMENT & PAYMENT**

* 1. **SCOPE**

The work covered under this section of the specifications, consists of providing all material, labour, plant, equipment, appliances, scaffolding and performing all operations required for designing, providing and installation of glazed aluminium curtain wall system complete in accordance with this section of the specifications and the applicable drawings.

* 1. **System Description**

The Contractor shall design, test, fabricate, deliver, install, take up all construction necessary to provide a complete Glazed Aluminium Curtain Wall System and guarantee the design, stability, performance, including any measures that may be required to that end, notwithstanding any omissions or inadequacies of drawings and/or specifications.

Without limiting the foregoing, the Curtain Wall system shall include:

* + - 1. All main and secondary runners and runners support system, for fourway structural glazing, all anchors, attachments, reinforcements, mullions, transoms, panels, doors, openable/fixed windows, frames, Aluminium Fins at Facade and glazing required for complete installation. All necessary hardware and operable mechanism, sealing and flashing. The system shall be suitable to accommodate double glass with overall thickness of 24mm (6mm+12mm+6mm) to be supported as shown on drawings.

* + - 1. Finishes, protective coatings and treatments, internal gutter and other water drainage system.

* + - 1. All internal insulation including supports, backing and reinforcements. All gaskets, sealants, electrometric and metal flashing, including sealing at junctions with roofing waterproofing.

* + - 1. Electrical bonding and earthing of all curtain wall components.

The scope of work includes but not limited to the:

* + - 1. Production of shop drawings, structural design and calculations of the Glazed Aluminium Curtain Wall system frame-work and glass, coordination with other disciplines.

* + - 1. Preparation of samples, mock-ups and test units.

* + - 1. Performance test for the Glazed Aluminium Curtain Wall System Assembly and arranging inspection of the test.

* + - 1. Co-ordination of work with other trades/contractors
      2. Protections, Guarantees and Warrantees.

* + - 1. All final exterior and interior cleaning of Curtain Wall system.

* + - 1. Maintenance and cleaning for six months after installation.

It shall be the prime responsibility of the Contractor to ensure the water tightness of the whole Curtain Wall system installations and its structural stability. The Contractor shall investigate and satisfy himself with all local conditions to which the system will be exposed.

All scaffoldings arrangements and means required for erection and lifting shall be provided by the Contractor at his cost. The approval of the Engineer will be obtained prior to making such arrangements.

* 1. **Building Regulations**

Design of the Curtain Wall type system shall comply with applicable international Codes and Regulations, Building Regulations, Fire Regulations, Safety Regulations and any others applicable to the installation. Structure is designed for currently applicable seismic zone regulations in accordance with Pakistan Building Code / Uniform Building Code.

* 1. **Architectural Drawings**

This specification shall be read in conjunction with the relevant drawings.

The drawings indicate profile and general configuration of the Curtain Wall.

The drawings are diagrammatic only, and suggest directions for major design requirements and the Contractor shall use these and develop accordingly.

Specifications are performance based and include the minimum requirements of the Curtain Wall type system, without limiting the Contractor to the method of achieving such performance.

* 1. **Submittals**

* + 1. The detailed design, scaled drawings and elevations must be submitted by the Contractor for approval of the Engineer. The Contractor may propose alternatives, provided basic functional and architectural requirements are fulfilled. Works shall be coordinated with other trades & disciplines.

* + 1. The detailed design/drawings shall show all items of works at full scale as far as practicable: metal thickness, dimensions, profiles, panels, fins, arrangements of components, jointing, reinforcements, water proofing, insulation, earthing, provision for thermal movement, sealants and glazing methods, metal finishes, windows operable mechanism and all pertinent information.

* + 1. Structural Calculations

The Contractor shall submit structural design calculations for approval of the Engineer.

The calculations must necessarily consist of design load assumptions, pressure equalization, detailed engineering of mullions, moment of inertia of mullions and detailed engineering of anchorage hardware, clip angles, washers, anchor bolts, welds and torque pressure. The calculations shall bear contractor’s stamp and designer’s stamp if different from contractor.

The approval of design shall in no way absolve the Contractor for the design, structural stability, soundness, and water tightness of the Curtain Wall or of any other defect.

* + 1. Mock-up

After approval of design and drawings, the Contractor shall at his own cost, fabricate, in his shop one system mock-up sample comprising of two bays with all fixings, showing full size sections, details of components, assembly method and all required fittings prior to the actual fabrication of the bulk.

* + 1. Glazing & Sealant Material

The Contractor shall submit, for Engineer's approval, samples of all glazing and sealant materials proposed for the Curtain Wall construction and installation. The Contractor shall be responsible for stability and durability of all such materials.

* + 1. Performance Test Report

The Contractor shall submit copies of reports of performance tests of the system as described in these specifications.

* + 1. Programme

The Contractor shall submit a programme for the total system construction including the performance test phase.

* + 1. Planning of the Test

The Contractor shall submit a preliminary planning report of the performance test with detailed description of the procedure.

* + 1. Planning of Erection

The Contractor shall submit a preliminary planning report of the whole stage of delivery from factory to the site. The report shall include methods of protection packaging, transportation system loading and off-loading and site storage requirements.

* 1. **QUALIFICATIONS**

* 1. The contractor’s Engineer and Curtain Wall sub-contractor shall have adequate experience in designing, manufacturing and installation of engineering works of the kind specified and as covered in specifications and have successfully completed projects of similar nature and quantum.

* 1. Manufacturer and supplier of all materials and components of the Curtain wall system are subject to the approval of the Engineer.

* 1. **MATERIALS & CONSTRUCTION**

* 1. **Materials & Finishes**

* + 1. Aluminium

All extrusion sheets and plates should be made from Aluminium Alloy that conforms to B.S. 1474/1972, HE 9 Alcan Ref.GB50s suitable for Anolock anodizing process. Powder Coated Aluminium sections to be provided to accommodate the glazing as specified. BS 8118: The structural use of Aluminium.

* + 1. Powder Coating

All Aluminium sections shall be powder coated in accordance with the standards of Aluminium Association of USA. The anodization shall not be less than 70-90 microns.

For powder coated finish aluminium sections to be coated shall be mill finish. The sections shall be firstly degreased with degreasing chemical to remove all/any stains. The sections will then be given a chromating coating and lector static powder coating in the desired colour with powder-coating machine. After colour coating, the sections will be baked at baking temperature of 220 degree Centigrade for 25 minutes.

All exposed metal, snap-on, nuts, fixtures etc. shall match with the contour of the Curtain Wall frame which shall be as selected by the Engineer.

* + 1. Glass

Standards: BS 952, BS 1288, BS 6206, BS6375, ASTM C1036

All labels on the glass are to be removed before glazing. Glass shall be of overall 24 mm thickness best quality, approved imported, double glazed comprising:

* + - * 6mm thick clear tempered inner pane
      * 6mm thick reflective tempered outer pane (Green or as approved by the Engineer)
      * 12mm sealed air cavity

The glass shall have shading coefficient of 0.25 and U-Value of 2.84 W/m2-K (0.5 Btu/hr-ft2 F°).

* + 1. Glazing Material

Dense neoprene gaskets or pressure type glazing shall be used. The gasket to be integral, four sided and with vulcanized welded corners. The neoprene shall conform to B.S.4255/Part-1/1967 and shall have a class-D shore hardness of 75 degrees +0.50.

Section tolerances on the gaskets shall to class 'E/1' as defined in B.S. 3743/9.3. The glazing method must incorporate a drainage system for all cavities around the perimeter of the glass. The Contractor shall fully satisfy himself with the quality of the glazing material and shall take full responsibility for glazing.

* + 1. Sealant Material

All joints shall be sealed with the materials approved by the Engineer and all requirements of sealant manufacturer for specific sealant selection shall be met. The sealant shall be high quality European Origin and shall meet the relevant ASTM & British Standard.

* + 1. Fixing

Any sheet steel, cleats, angles etc used for the fixing basketry shall comply with B.S. 4360, and rolled sections shall be used are to be hot-dip galvanized to the requirements of B.S.729, Part-2, 1971 after all cutting, welding, holding has been completed. Surfaces in contact with concrete are to be painted with approved protection paint.

Bolts, screen and nuts used for assembly and fixing shall be of adequate strength for design purpose and shall be stainless steel. Locking arrangement and limit hinges shall be provided for all opening windows.

The Contractor will build-in any 'Unistruts' or other fixing devices, for fixing of the Curtain Wall frame to the Concrete. However, the Contractor shall submit drawings and specifications of the 'Unistrusts' for incorporation in the structure to the Engineer for approval.

* + 1. Weather Stripping

Weather stripping must be capable of meeting all performance requirements.

* + 1. General

The method of assembly, construction, and fixing of the Curtain Wall system shall be the Contractor’s responsibility, and he shall design the assembly, construction and fixing to suit each specified condition in an acceptable manner complying with the requirements of the specifications.

All parts shall be secured by concealed means unless specific approval to the contrary is given by the Engineer.

All components shall be assembled, fixed, reinforced and sealed in a manner not restricting thermal, wind and seismic movements of the Curtain Wall.

Free and noiseless movement of all components of the Curtain Wall system due to thermal, structural, seismic, wind load, erection or dead loads, is to be achieved without strain to glass, without buckling of any component and without excessive stress to any member or assemblies. All dissimilar metals shall be adequately separated from contact with each other in an approved manner.

**4.0 PERFORMANCE REQUIREMENT**

The Contractor shall design the installation to meet or excel but not limited to the following requirements and as per ASTM E330.

**4.1 Performance Standard**

The Curtain Wall Type system shall be designed to withstand maximum wind pressure and seismic forces applicable to the building location and height. The design data would be provided by the contractor with his design.

4.2 **Performance Test**

4.2.1 General

After approval of structural calculations and shop drawings for the Curtain Wall system installations, which approval shall not absolve the Contractor of his responsibilities, the Contractor shall submit manufacturer’s tests certificates of performance on the basis of minimum criteria given hereunder and/or as per the relevant American/British Standards.

4.2.2 Test Requirements

Air infiltration shall be no more than 0.06 CEM per sq. ft of fixed area at 6.24 PSF pressure differential per ASTM E283-84 as per drawings, specifications and/or as directed by the Engineer.

System shall meet a water test with no leakage at 15 psf pressure differential with a water rate of 5 gallons/hr/sq ft. when tested in accordance with ASTM E331-86

The system shall withstand the effects of a wind load of 50 psf acting inward and outward, normal to the plane of wall when tested in accordance with ASTM E 330, with no failure or permanent deformation of structural members.

Structural test pressure shall be equal to 150 percent of the inward and outward acting design wind pressure.

The curtain wall system shall be capable of withstanding building movements including wind loading and performing within following limitations.

1. Deflection of framing members perpendicular to the plane of wall shall not exceed L/175 of its clear span.

1. Deflection of member parallel to the plane of wall when carrying its full dead load shall not exceed an amount that will reduce glass bite by less than 75 percent of the design dimension and shall not reduce edge clearance between itself and the panel, glass, or other fixed members immediately below to less than on inch.

1. The glazed curtain wall system shall be capable of withstanding expansion and contraction of components caused by an ambient air temperature range from 0 C to 50

C without buckling, stress on glass, edge seal failure, excess

stress on curtain wall structure, anchors and fasteners or reduction in performance.

1. Condensation Resistance Factor (CRF) will be determined in accordance with AAMA Specification 1503.1-1998 procedure.

1. Sealant performance requirements as per relevant ASTM/BSI Standards.

4.3 **Structural Tolerances**

* + 1. Deflection of Cantilevered Floor Slabs

The Contractor shall make suitable allowances in the design of the Curtain Wall for the deflection of the cantilevered floor slabs. The allowance shall be based on an 8mm deflection over a period of two to three years after completion and taking over the Curtain Wall. The Contractor may seek further advice from the Architect/ Consultant. The Curtain Wall system shall have built-in provision to absorb a movement of 8mm without causing any damage whatsoever to the Curtain Wall members or glass.

* + 1. Tolerances

The Contractor shall be responsible for agreeing to all dimensions with the Engineer before proceeding with the manufacture and for making provision to allow for building tolerances required by the Engineer. Contractor shall also take site measurements of the structure completed before manufacturing his Curtain Wall members.

4.4 **Thermal & Seismic Movements**

The window and glazing assemblies are to be constructed and installed in the openings with sufficient tolerance and, where necessary, expansion joints incorporated in the couplings, to provide for expansion and construction as will be caused by the local seismic and climatic conditions and temperature changes, winter to summer - day to night without buckling, distortion of joints, or other harmful effects.

Allowance is to be made in the design for eliminating any noise caused, not only by seismic and thermal expansion and contraction of metal parts, but also by deflection and settlement of the building structure.

* 1. **DELIVERY STORAGE AND HANDLING**

* 1. Contractor shall deliver materials in manufacturer’s original, unopened containers clearly labeled with manufacture’s name and address, material brand, type, class and rating as applicable.

* 1. Contractor shall store the materials in original unopened containers with labels intact/protected from ground contact and from elements which may damage the materials.

* 1. Contractor shall handle the materials in a manner to prevent and damage to surfaces of materials.

* 1. **EXECUTION**

* 1. **Erection**

* + 1. General

The Curtain Wall assembly shall be installed according to the approved shop drawings, set plumb, erected square and at proper elevations and located in proper alignment with all adjoining work. All members shall be securely fixed in accordance with approved details.

* + 1. Workmanship

The Contractor shall be responsible for the protection and installation of all items furnished. All items shall be installed plumb and square and shall be solidly anchored in a good workman like manner in accordance with the manufacturer's instruction and as specified herein. The Contractor shall be responsible for the protection of installed items from damage by other trades. All items shall be left in operating, neat and clean condition, free from dirt, finger marks, etc. The Contractor shall be responsible for final cleaning before the final acceptance.

The glass panes shall firmly be secured in the rebates with the rubber gasket. Ensure that the beads and grooves are clean, dry and unobstructed at the time of glazing. The complete unit shall be airtight and watertight on completion.

No work shall be considered complete until and unless the

fingerprints and other stains and marks have been removed from the surface of glass and aluminium.

Should any scale or scratch appear on any surface of the Works, the Contractor shall at his own expense and at the Engineer's direction have all exposed surfaces cleaned to bare bright specified colour.

All works shall be installed strictly in accordance with the manufacturer's printed instructions.

6.1.3 Scaffolding

The Contractor shall provide safe scaffolding of adequate strength for use of workmen at all levels and heights. Cost of scaffolding shall not be separately payable. Scaffolding which is unsafe in the opinion of the Engineer shall not be used until it has been strengthened and made safe for use of workmen. The contractor shall be responsible to repair the damages to any works from scaffolding or any other objects.

6.1.4 Protection and Cleaning

1. Temporary protection shall be achieved by applying water soluble protective coating capable of withstanding the action of lime mortar.

1. Apply coating in the manufacturer's plant to the exposed surfaces of all components.

1. Before application of coating, remove all fabrication compounds, moisture and dirt accumulations.

6.1.5 Defective Work

In the event of non-conformance to specifications and drawings the work shall be rejected by the Engineer and the Contractor shall remove and replace the rejected works by new work of same specifications.

* 1. **Glazing**

General - The glazing operation must comply with British Standard Code of Practice CP: 52:1972.

Curtain Wall system shall be designed for glazing from inside the building. All glazing work must be quality controlled and monitored on a full-time basis by experienced quality control supervisory panel, suitable qualified and approved by the Engineer.

* 1. **Sealants**

* + 1. Sealant material should be high quality European origin fulfilling the relevant ASTM and British Standards. The sealants used must be supported by suitable polyethylene foam backing around the periphery of the doors and windows.
    2. The Contractor shall be responsible for determining the depth of the sealant in relation to the width of the joints and for their adequacy.

* + 1. Window bedding materials where adjacent to or likely to be in contact with the sealant should be a type which is acceptable to the sealant manufacturer.

* + 1. All surfaces are to be clean, dry and free from grease and any surface dust or friable material before sealants are applied.

* + 1. Sealant pointing must not be carried out during rain or when moisture/dampness is on the windows, panels, or adjacent surfaces.

* + 1. Colours of sealants to be approved by the Engineer.

6.4 **Maintenance Manual**

The Contractor shall submit manuals which shall be developed in paralled with the design and shall include but not limited to the following information:

* + 1. the name, address and contact number of each company, manufacturer, supplier and sub-contractor involved in the supply or installation of materials, components assemblies and finishes.

* + 1. concise description of construction used to form various areas of installation

* + 1. recommendation for routine maintenance, cleaning, suitable cleaning agents and details of any lubricants and adjustments required for working parts.

* + 1. two sets of as-built drawings and two copies of all guarantees, including details of their terms and conditions.

**7.0 TESTING UPON COMPLETION**

Upon completion of the installations, the Contractor shall perform field test for checking water penetration. This test shall be conducted in the presence of the Engineer/Employer. The Contractor shall make all arrangements and furnish all personnel required for testing.

The Contractor shall record and submit the test results duly initialed by the Engineer / Employer and rectify all defects to their entire satisfaction before the issue of the completion certificate.

**8.0 INSERTS, ANCHORS ETC**

The Contractor shall submit type and complete details and locations of the Unistruts/Inserts/Anchors or other fixings to be provided and embedded in concrete.

**9.0 PACKING**

All exposed surfaces are provided with a protective membrane which shall be removed by the Contractor immediately prior to handling over the installation to the Employer.

* 1. **WARRANTY**

* 1. **General Warranty**

The Contractor shall provide agreement to indemnify the Owner against any defects in the design, workmanship and quality of materials, water tightness or performance of the Works included in this part and to repair or replace defective design, workmanship or materials of the Curtain Wall System during the Warranty Period. Defective materials and workmanship include:

1. Structural failure of any component resulting from exposure pressure and forces within specified limits.

1. Abnormal deterioration, ageing and weathering of the system

1. Leakage of water or air exceeding specified limits.

1. Failure of operable parts to function normally.

1. Glass breakage due to defective design, manufacture or installation or exposure to pressure and forces within specified limits.

1. Deterioration or discoloration of finishes in excess of normal weathering and ageing.

1. Failure of Curtain Wall System to meet any other specified performance requirements.

* 1. The Warranty shall not include damage caused by vandalism or natural conditions exceeding the performance requirements.

* 1. The warranty shall be for the period of 10 years after handing over of the works.

* 1. **MEASUREMENT AND PAYMENT**

* 1. **General**

Except otherwise specified herein or elsewhere in the Contract Document, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities.

1. Preparation / submission of detailed design, detailed drawings, shop drawings, structural calculations, glazing and sealant material, factory test, performance test at site.

1. Glass and glazing material, sealant material, installation / fixing, accessories including sheet steel, cleats and angles, locks, handles, operable mechanism etc; weather stripping, earthing etc.

1. Aluminium extrusions, members, frames, anchors etc. as per approved design. Anodizing / Powder coating of Aluminium works.

1. All anchoring system, brackets, stays, hinges, plugs, bolts etc.

1. All hardware fittings as recommended by the manufacturer.

1. Aluminium Fins at Façade.

1. Testing upon completion.

1. Removal of membrane and cleaning immediately prior to handing over to the Employer.

1. All samples and mock ups, guarantees and warranties.

1. Providing, installing and removing all scaffolding and ramping.

11.2 **Curtain Wall**

* + 1. Measurement

Measurement of acceptably completed works of Curtain Wall will be made on the basis of net actual area in square meter / square foot provided and installed in position as shown on the Drawings or as directed by the Engineer.

* + 1. Payment

Payment will be made for acceptable measured quantity of Curtain Wall type on the basis of unit rate per square meter / square foot quoted in the Bill of Quantities, verified by the Engineer as per respective Clauses of bidding documents and approved by the Engineer and shall constitute full compensation for all the works related to the items.

\*\*\* End of Section 6171 \*\*\*

**SECTION – 6533**

**MARBLE & GRANITE CLADDING**

**1.0 SCOPE**

**2.0 APPLICABLE CODES AND STANDARDS**

**3.0 SUBMITTALS**

**4.0 MATERIALS**

**5.0 PRODUCT DELIVERY, STORAGE AND HANDLING**

**6.0 JOB CONDITIONS**

**7.0 FABRICATION**

**8.0 FABRICATION TOLERANCES**

**9.0 EXECUTION**

**10.0 MEASUREMENT AND PAYMENT**

**1.0 SCOPE**

The work under this section of specifications, consists of providing all material, labour, plant, equipment, appliances in any floor and at any height and performing all operations required for providing and installing marble natural stone slab for toilet counters, where shown on the drawings, complete in strict accordance with this section of the specification and the applicable Drawings.

**2.0 APPLICABLE CODES AND STANDRADS**

The codes and standards applicable to only a portion of the work specified in this section are referenced in the relevant paragraphs.

**3.0 SUBMITTALS**

The following submittals as defined in the Supplement to the Standard Specifications are required:

1. Assembly, Erection and Installation Drawings and Manuals

1. Detail Drawings and/or Shop Drawings

1. Samples

Submit three sets of samples not less than 300mm x 300mm in size of each different colour, grade and finish of marble or granite required. Include in each set the full range of exposed colour and texture, including material blemishes which may be characteristic of the stone selected and to be expected in the complete work. Review will be for colour and texture only.

* 1. **MATERIALS**

* 1. **General**

All marble stones shall comply with the requirements of the Marble Institute of America (MIA) for type, finish and attachment. Obtain marble or granite of one type form one quarry, with consistent colour range and texture throughout the work.

* 1. **Marble and Granite Tiles**

Colour to match samples to be submitted to the Employer for approval. Any sound strong variety for backing as recommended by fabricator.

* + 1. Quarry Location:

Local or imported as per approval of the Employer/Engineer.

* + 1. Condition:

Sound and free from defects affecting strength, durability, and appearance. No piece of stone will be accepted showing flaws, imperfections, crystallization or damage before setting or during the project warranty period after acceptance. Natural variations in colour and marking characteristic with stone and quarry will be accepted.

* + 1. Fissures in Marble:

Dimensions of spots shall not be more than 25 mm., in any one dimension. There should not be more than three such spots on any one panel. In no case should any two spots be less than 10 cm. Apart, nor should the third spot (if any) on the same panel be less than 30 cm away from either of the other two spots. There should be no clouding on any panel.

* + 1. Finish:

Polished on exposed faces after filling as required.

* 1. **Dowels and Anchors**

Stainless Steel, ASTM A 167 Type 3.2 or 304

* 1. **Connection Material : Anchorage**

Provide necessary loose steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other miscellaneous steel shapes for securing marble or granite units to other supporting and adjacent members. Provide at least two anchors for each piece.

* 1. **Adhesives, Grouts and Sealants**

Proprietary adhesives, joint grouts and sealants of approved type as required and recommended by the manufacturer for specific application shall be used. The colour of the joint grout and the sealants shall match with the colour of stone.

* 1. **Water**

Treated water (utility water quality)

* 1. **Setting Shims or Buttons**

Lead buttons of the thickness required for the joint size shown or specified, and of the size required to maintain uniform joint width.

1. **DELIVERY, STORAGE AND HANDLING**

* 1. **Protection**

Materials shall be protected from damage during loading, shipment, delivery and storage. Non-staining materials for blocking and packing shall be used.

Stacking of the marble and granite tiles at site shall be done in accordance with manufacturer's recommendations and as required to prevent staining, scratching, etching or breakage.

Protect accessories from weather, moisture and contamination with earth and other foreign materials.

* 1. **Handling**

Handle marble or granite to prevent chipping, breakage, soiling or other damage. Do not use pinch or wrenching bars without protecting edges of the stone with wood or other rigid materials. Do not use wire ropes containing tar or other substances which might cause staining. If required, use wood rollers and provide cushions at end of wood slides.

* 1. **Storage**

Store marble or granite on wood skids or pallets, covered with non-staining, waterproof membrane. Place and stack skids and stone to distribute weight evenly and to prevent breakage and cracking. Protect stored stone from weather with waterproof, non-staining covers or enclosures, but allow air to circulate around pieces.

* 1. **Transportation**

Handle marble or granite units during transportation in positions consistent with their shape and design. Adequately protect edges of the units by padding or other means to prevent staining and chipping.

* 1. **Marking**

Clearly mark units to identify the final position in the structure as indicated on the shop drawings.

* 1. **Delivery**

Marble or granite units shall be delivered finished unless otherwise approved. **6 EXAMINATION OF JOB CONDITIONS**

Contractor shall examine all parts of the supporting structure and the conditions under which the work is to be installed. Do not proceed with the installation of marble or granite until unsatisfactory conditions have been corrected.

* 1. **FABRICATION**

* 1. **General**

Fabricate as shown and as detailed on final shop drawings and in compliance with the recommendations of the applicable marble or granite association. Provide holes and sink-ages cut or drilled for anchors, fasteners and supports as shown and as necessary to secure the stone in place. Cut and back-check as required for proper fit and clearance. Shape beds to fit supports. Provide reinforcing backing as required for adequate strength, firmly adhered in place.

* 1. **Contagious Work**

Provide chases, reveals, openings and similar spaces and features as required for contiguous work. Coordinate with drawings and final shop drawings showing contiguous work.

Cut openings for lavatories, plumbing fittings and similar items indicated on drawings and final shop drawings, as specified in other sections and as required.

* 1. **Cutting**

Cut to shape and dimensions shown on final shop drawings, maintaining fabrication tolerances specified.

* + 1. Dress joints (bed and vertical) straight and at 90-degree angle to face, unless otherwise shown or specified.

* + 1. Joint Width: Cut to provide joint widths 2.0 mm or as shown on final shop drawings.

7.4 **Thickness**

Provide stone of the thickness shown. Back surfaces concealed in the finished work shall be as required for proper fit and adhesion of sealants and adhesives.

**8 FABRICATION TOLERANCES**

Fabricate marble or granite units in accordance with the following dimensional tolerances, unless otherwise shown.

|  |  |  |  |
| --- | --- | --- | --- |
| - | Length or width |  | + 1 mm |
| - | Thickness (depth) |  | + 1 mm (where visible) |
|  |  |  | + 6 mm (where not visible) |
| - | Horizontal and vertical |  | + 1 mm |
|  | alignment (deviation from |  |  |
|  | straight lines parallel to |  |  |
|  | center line) |  |  |
| - | Out of square (differences |  | + 2 mm |
|  | in length of two diagonal |  |  |
|  | measurements): |  |  |

**9.0 EXECUTION**

9.1 **Inspection and Preparation**

Do not use marble or granite units with chips, cracks, stains or other defects which might be visible in the finished work, Preparation.

Clean stone before setting by thoroughly scrubbing with fibre brushes followed by a thorough drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh fillers or abrasives.

9.2 **Installation**

* + 1. Setting Stone:

Employ skilled stone setters at the site to do necessary field cutting as marble or granite is set.

* + 1. Contiguous Work:

Provide chases, reveals, openings and other spaces as shown or required for contiguous work.

* + 1. Setting:

Set marble or granite in accordance with drawings and final shop drawings. Provide anchors, supports, fasteners and other attachments shown or necessary to secure the stone in place. Shim

and adjust accessories as required from proper setting of marbles or granite.

9.3 **Erection Tolerances**

* + 1. General:

Installation shall be in accordance with reviewed shop drawings. Each unit, piece, or panel shall be set in position assigned on the reviewed shop drawings, carefully plumbed and aligned and securely anchored to the structural backing as detailed.

For items penetrating stone units that cannot be located accurately before panel fabrication, drill stone in the field with a diamond core drill and cover the opening with an escutcheon of approved material and finish.

* + 1. Erection Process:

All units shall be erected level, plumb, square and true within the allowable tolerances. They shall be positioned so that cumulative dimensional error is not allowed. Horizontal and vertical joints shall be correctly aligned to maintain a uniform joint width. Each unit shall be securely fastened in place as indicated on the shop drawings.

Adjustments or changes in connections, which could involve additional stresses in the products or connections, will not be permitted without approval. Units shall be erected in a sequence indicated on the shop drawings.

* + 1. Installation Tolerances:

Install stone without exceeding the following tolerance limits:

* + - * Variations from plumb: 1/500 in any run.
      * Variations from level or elevations: 1/500 in any unit.
      * Offsets in alignment of adjacent unit members at any joints: 2 mm maximum.

d) Regardless of the above tolerances, placement of erected units shall be visually accurate. Marble or granite units shall not be perceptibly out of alignment at vertical or horizontal joints. Any face which shows an undulating or irregular surface, even though it may within the limit given, will not be accepted.

9.4 **Adjustment & Cleaning**

* + - * 1. Replacement:

Remove and replace marble or granite units which are broken, or stained. Where directed, remove and replace units which do not match adjoining work. Provide new matching units, install as specified, provide a neat, uniform appearance.

* + - * 1. Cleaning:

Clean marble or granite work not less than six days after completion of work, using clean water and stiff-bristle brushes. Do not use wire brushes, acid type cleaning agents or other cleaning agents or other cleaning compounds with caustic or harsh fillers. Remove sealant and adhesive smears as recommended by their manufacturers in a manner to avoid damage to stone.

* + - * 1. Protection:

Take precautions as required to protect the stone work from collapse, deterioration, discoloration and damage during construction and until acceptance of the work.

**10.0 MEASUREMENT AND PAYMENT**

10.1 **General**

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of Quantities.

The rates quoted by the Contractor in the Bill of Quantities shall include work to be executed under these specifications in any floor and at any height except where otherwise specifically stated in the relevant item of Bill of Quantities and the Contractor shall not be entitled to any claim or claim any compensation on this account.

Finishing, washing, polishing, repair cleaning and protection of marble stone/tiles in position.

Proprietary adhesives, joint grouts and sealants for fixing marble stone where specified on the Drawings or directed by the Engineer.

Chemical polishing on marble / granite surfaces.

Dowels, anchorages, fasteners, adhesives, shims and buttons as well as mechanical anchoring etc.

10.2 **Marble / Granite Cladding**

10.2.1 Measurement

Measurement of acceptably completed works of marble or Granite cladding will be made on the basis of net actual area in square feet of marble/granite provided and installed in position as shown on the Drawings or as directed by the Engineer.

10.2.2 Payment

Payment will be made for acceptable measured quantity of marble or granite cladding on the basis of unit rate per square feet quoted against respective item in the Bills of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\*End of Section 6533\*\*\*

**SECTION – 6600**

**FLOOR AND WALL FINISHES**

**1.0 SCOPE**

**2.0 MATERIALS**

**3.0 SUBMITTALS**

**4.0 EXECUTION**

**5.0 MEASUREMENT AND PAYMENT**

**1.0 SCOPE**

The work under this section of the Specification consists of furnishing all plant, labour, equipment, appliances and materials and performing all operations in any floor and at any height in connection with the installation of cement concrete floors and floor finishes including bases, skirting and external surface treatments, complete in strict accordance with this section of the specifications and the applicable drawings and subject to the terms and conditions of the Contract.

**2.0 MATERIALS**

2.1 **Cement**

Cement shall be ordinary Portland cement conforming to BS 12 or PS 232.

2.2 **Sand**

All fine sand shall be obtained from sources approved by the Engineer. The grading shall conform to BS 882 Grading Zone 1 and 2 of which the gradation limits are as follows:

|  |  |  |
| --- | --- | --- |
| **BS Sieve No.** | **Percentage Passing (By Weight)** | |
| **Grading Zone-1** | **Grading Zone-2** |
| 3/8” (9.53 mm) | 100 | 100 |
| 3/16” (4.765 mm) | 90-100 | 90-100 |
| No. 7 | 60-95 | 75-100 |
| No. 14 | 30-70 | 55-90 |
| No. 25 | 15-34 | 35-59 |
| No. 52 | 5-20 | 8-30 |
| No. 100 | 0-10 | 0-10 |

2.3 **Coarse Aggregate**

Coarse aggregate shall be crushed or uncrushed gravel or crushed stone, angular or rounded in shape and shall have granular, crystalline or smooth surface free from friable, flaky and laminated pieces, mica and shale. It shall not contain matters injurious to concrete. All coarse aggregate shall conform to BSS NO.882 and shall be graded as follows:

|  |  |
| --- | --- |
| **BS Sieve No.** | **Percentage Passing (By Weight)** |
| 1” (25.40 mm) | 100 |
| 3/4” (19.05 mm) | 90-100 |
| 3/8” (9.53 mm) | 20-55 |
| 3/16” (4.765 mm) | 0-10 |

The aggregate shall be stored on properly constructed paving or as directed by the Engineer.

There shall be a physical partition between the stockpiles of coarse and fine aggregate. If required, aggregates shall be washed and screened to the satisfaction of the Engineer. Sieve analysis of all the aggregates to be used in the works shall be carried out as and when required by the Engineer. All aggregate shall be subject to the approval of the Engineer.

Any aggregates not found to be of the specified/approved standard shall be rejected by the Engineer and all such rejected material shall be removed from site with-out delay.

Floors, sub-base or base constructed with rejected aggregates shall be dismantled and rebuilt at the expense of the Contractor.

2.4 **Stone Ballast**

50 mm (2 in.) and down gauge graded Stone ballast shall be used under flooring.

2.5 **Water**

Water used for mixing concrete, curing or any other operation of the works specified herein shall be fresh, clean and free from organic or inorganic matters in solutions or in suspension. Only water of the approved quality shall be used for all constructional purposes.

2.6 **Cleaning Compound**

The compound used for all cleaning of terrazzo shall be an approved neutral chemical cleaner free from acid and alkali or any other material that will affect the colour or otherwise damage the terrazzo and shall not affect the conductivity of terrazzo floors.

2.7 **Division Strips**

Glass Division strips shall be as approved by the Engineer. Standard division strips for floor finishes shall be not less than 5mm in thickness and shall not be less than 1-3/4” (37.5mm) in depth.

2.8 **Marble Chips**

Marble chips shall have an abrasive hardness of not less than 16, as determined by the test of wear resistance in National Bureau of Standards Reports MBS 98. Size shall vary from No. 0 to 8.

2.9 **Preservative Material**

Preservative treatment for terrazzo floor shall produce a water-proof finish which will not be impaired by immersion in water at room temperature for a

period of 2-1/2 hours, approximately 18 hours after the floor is finished by buffing, as specified. The preservative material shall not discolour the terrazzo nor leave a tacky or sticky finished film on the surface after buffing.

2.10 **Porcelain Tiles**

Porcelain tiles shall be imported, best quality, plain coloured / textured from one of the approved manufacturer of sizes as specified on the drawings.

2.11 **Granite Tiles**

All Granite stone types are to be selected and approved by the Engineer for quality, colour and texture. All approved granite for tile work shall be obtained from a single quarry and the Contractor shall ensure consistency in colour range and texture throughout the work. All granite tiles to be installed / laid shall be factory polished.

2.12 **Marble Tiles / Slabs**

Tiles and slabs of selected marble types shall be of best quality, plain coloured / textured from one of the approved sources / manufacturer of sizes as specified on the drawings.

2.13 **PVC Vinyl Tiles**

PVC vinyl tiles / sheet shall be of best quality (imported tiles), available in the Country. Size, colour and shade shall be as per sample to be submitted by the Contractor and approved by the Engineer.

2.14 **Cement Concrete Tiles / Pavers**

Cement Concrete tiles shall be of approved shade, shape and size, checkered, mechanically vibrated and compressed type conforming to

PS-531, as shown on the drawings and approved by the Engineer. Manufacturer of concrete tiles and pavers shall be subject to the approval of the Engineer.

**3.0 SUBMITTALS**

3.1 Contractor shall submit at least 3 range samples of all the items/each type of stone/tile to be provided under this section showing colour, grade, finishing and texture to the Engineer for approval.

3.2 Contractor shall provide samples from each specified manufacturer and in sufficient variation for each type of item.

3.3 The Engineer shall make his selection only when all related samples have been submitted and he is satisfied that the samples submitted are the maximum range available against any item.

**4.0 EXECUTION**

4.1 **Installation of Tile Flooring**

When setting out the tiles, care shall be taken to establish the correct elevation for the floor. A gauge rod shall be used, indicating the overall measurement of a given number of tiles with specified joint width to reduce cutting.

After the floor has been machine finished, it should be covered with white, non-staining sand or rags to protect it while other work is being done. After removal, the floor shall be thoroughly scrubbed.

4.1.1 General

The base shall be prepared by laying cement concrete of specified grade and of thickness as shown on the drawings, or specified in the Bill of Quantities.

The curing period of the setting bed shall be as directed by the Engineer. As large an area of setting bed shall be spread at one time as can be covered with tiles before the mortar has set. Surplus mortar shall be removed. The thickness of setting bed in any space shall not be less than 13mm (1/2").

Floor and wall surfaces to receive the tiles shall be thoroughly cleaned of all dirt, dust, oil and other objectionable matters. Tiles shall be laid out from the centre line of each space in an outward direction and the pattern should be made symmetrical with a minimum number of cut tiles as directed by the engineer.

Joints between the tiles shall be of uniform width. Tiles shall be cut with a suitable cutting tool and rough edges shall be rubbed smooth. Tiles shall be laid to the straight edges.

4.1.2 Porcelain / Granite Tiles

The tiles shall be laid to the required lines, levels and grades over a setting bed of cement sand mortar comprising of one part of cement and 4 parts of sand by volume and the joints filled with neat white / pigmented cement including vertical and horizontal covers. The tile floor shall be kept wet for at least 72 hours and no traffic should be allowed on the tiles during curing period.

4.1.3 Cement Concrete Tiles

The cement concrete tiles shall be laid to the required lines, levels and grades over a setting bed of cement sand mortar comprising of 1 part of cement and 4 parts of sand by volume.

The sides shall be buttered with cement mortar and adjacent tiles laid in the same manner in the required pattern, with a thin joint in proper level and line. The joints shall then be thoroughly cleaned with wire brush and pointed with neat cement of the same colour as the tile.

Care shall be taken to see that full tiles are used as far as possible. Where this is not possible, the edge tiles shall be neatly cut with an electric saw and the edges rubbed smooth. In case of patterned tiles, the tiles shall be laid in such a way that the pattern ends symmetrically on two sides.

Cement concrete tiles shall be cured for 7 days with water and then thoroughly cleaned and dried. Notwithstanding anything written above, the manufacturer's printed instructions regarding laying shall be strictly followed.

4.1.4 Concrete Pavers

Concrete pavers shall be laid in-accordance with the instructions of the manufacturer over a sand cushion as shown on the drawings. The pavers will be laid as per the instructions of the Engineer.

4.1.5 PVC Vinyl Tiles

The base shall be prepared as per thickness shown on drawings keeping the margin of tile thickness. After the base is cured, any irregularities found on the base shall be filled in and leveled before the application of tiles. Surface to receive tiles shall be thoroughly cleaned of all dirt, dust, oil and other objectionable matter. Approved manufacturer’s recommended adhesive shall be applied as per specifications and in quantities recommended by him. Tiles shall be laid starting from one side of the room or as per the instructions of the Engineer and shall be so pressed that complete adhesion takes place.

Tiles shall be cut where required with suitable cutting tool and rough edges shall be rubbed smooth. Tiles shall be laid to straight edges as per approved pattern.

**5.0 MEASUREMENT AND PAYMENT**

5.1 **General**

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities.

The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of Quantities.

1. Loss and wastage of material due to consolidation, erosion and settlement.

1. All type of joints (expansion, contraction and construction joint etc.).

1. Class 'C' cement concrete screed base and 1:4 cement sand mortar under floor.

1. Rough plaster base under skirting / dado.

1. Finishing/grinding, washing & polishing works.

1. 1:2 and 1:4 cement sand rough cast plaster.

1. Pigmented grouting.

1. Cleaning of tiles after installation.

1. Bull-nozing, chamfering of edges of marble tops including base mortar and making holes for wash basin including all necessary fixing accessories.

1. Liquid water proofing, if required.

5.2 **Porcelain / Granite / Marble / PVC Tile Floor**

* + 1. Measurement

Measurement of acceptably completed works of tile in floor will be made on the basis of net actual area in square foot of floor laid in position as shown on the drawing or as directed by the Engineer.

* + 1. Payment

Payment will be made for acceptable measured quantity of tile floor on the basis of unit rate per square foot quoted in the respective

items of Bills of Quantities and shall constitute full compensation for all the works related to the item.

5.3 **Porcelain / Granite / Marble / PVC Tile Dado / Skirting**

* + 1. Measurement

Measurement of acceptably completed works of tile in dado / skirting will be made on the basis of net actual area in square foot of dado/skirting laid in position as shown on the Drawing or as directed by the Engineer.

* + 1. Payment

Payment will be made for acceptable measured quantity of tile in dado / skirting on the basis of unit rate per square foot quoted in the respective items of Bills of Quantities and shall constitute full compensation for all the works related to the item.

5.4 **Cement Concrete Tiles / Pavers**

* + 1. Measurement

Measurement of acceptably completed works of cement concrete tiles / pavers will be made on the basis of net actual area in square foot of tiles / pavers laid in position as shown on the Drawing or as directed by the Engineer.

* + 1. Payment

Payment will be made for acceptable measured quantity of cement concrete tiles / pavers on the basis of unit rate per square foot quoted in the respective items of Bills of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 6600 \*\*\*

**SECTION – 6700**

**PAINTING**

**1.0 SCOPE**

**2.0 APPLICABLE STANDARDS**

**3.0 GENERAL**

**4.0 MATERIALS**

**5.0 DELIVERY, STORAGE AND CONTAINER SIZES**

**6.0 SURFACE PREPARATION**

**7.0 APPLICATION**

**8.0 JOB CONDITIONS**

**9.0 QUALITY ASSURANCE**

**10.0 SCHEDULE OF MEASUREMENT OF PAINT AREA**

**11.0 MEASUREMENT AND PAYMENT**

**1.0 SCOPE**

The work under this section of the Specifications consists of furnishing all materials, plant, labour, equipment, appliances and performing all operations in any floor and at any height in connection with surface preparation, mixing, painting concrete works, gates, frames, walls, ceilings and all such surfaces as shown on the Drawings and/or as directed by the Engineer. The scope of this section of specification is covered with detailed specifications as laid down herein.

* 1. **APPLICABLE STANDARDS**

Latest editions of following British Standards are relevant to these specifications wherever applicable.

* 1. **BSI (British Standards Institution**)

245 Specification for mineral solvents (white spirits and related hydrocarbon solvents) for paints and other purposes.

2521 Lead-based priming paint for wood work.

2523 Lead based priming paint for iron and steel.

2569 Sprayed metal coatings.

4800 Paint colours for building purposes.

CP.231 Painting of building.

CP.3012 Cleaning and preparation of metal surfaces.

**3.0 GENERAL**

3.1 Except as otherwise specified, all painting shall be applied in conformity with BS CP 231 "Painting of Building" as applicable to the work.

3.2 The Contractor shall repair at his own expense all damaged or defective areas of shop-painted metal work and structural steel work. Metal surfaces against which concrete is to be placed will be furnished shop-painted and shall be cleaned prior to being embedded in concrete.

3.3 Except as otherwise specified all concrete and plastered surfaces are to be painted.

3.4 The Engineer will furnish a schedule of colours for each area and surface. All colours shall be mixed in accordance with the manufacturer's instructions.

3.5 Colours of priming coat (and body coat) where specified, shall be lighter than those of finish coat. The Engineer shall have unlimited choice of colours.

3.6 Samples of all colours, and finishes shall be prepared in advance of requirement so as not to delay work and shall be submitted to the Engineer for approval before any work is commenced. Any work done without such approval shall be redone to the Engineer's satisfaction, without additional expense to the Employer. Samples of each type of paint shall be on separate 12" x 12" x 1/8" tempered hard board panels. Manufacturer's colour chart shall be submitted for colour specifications and selection.

**4.0 MATERIALS**

4.1 All materials shall be acceptable, proven, first grade products and shall meet or exceed the minimum standards of reputable manufacturers as approved by the Engineer.

4.2 Colours shall be pure, non-fading pigments, mildew-proof sun-proof, finely ground in approved medium. Colours used on-plaster and concrete surfaces shall be lime-proof. All materials shall be subject to the Engineer's approval.

4.3 All synthetic enamel paints and primers for structural steel works, metal work and wood works will be the best available of its type and shall be approved by the Engineer prior to its procurement.

4.4 The plastic emulsion paint, vinyl emulsion paint or similar as approved by the Engineer shall be used for interior surfaces.

4.5 Approved quality paint shall be used for painting the exteriors of the structures or other surfaces where specified on the drawings as directed by the Engineer.

4.5 Texture coating wherever specified shall be acrylic resin-based coating composed of acrylic copolymers, natural quartz, natural marble chips, metallic oxides, antibacterial and antifungal additives, and expanders, foaming and setting agents and shall be applied in-accordance with approved manufacturer’s recommendations.

4.6 All material shall be delivered to site in their original unbroken containers or packages & bear the manufacturer's name, label, brand & formula & will be mixed and applied in accordance with his directions.

**5.0 DELIVERY STORAGE AND CONTAINER SIZES**

Paints shall be delivered to the site in sealed containers, which plainly show the type of paint, colour (formula or specifications number) batch number, quantity,

date of manufacture, name of manufacturer and instructions for use. Pigmented paints shall be supplied in containers not larger than 20 liters. All materials shall be stored under cover in a clean storage space, which should be accessible at all times to the Engineer. If storage is allowed inside the building, floors shall be kept clean and free from paint spillage.

**6.0 SURFACE PREPARATION**

6.1 All oil, grease, dirt, dust, loose mill scale and any other foreign substance shall be removed from the surface to be painted, polished and white washed by the use of a solvent and clean wiping material. Following the solvent cleaning, the surfaces shall be cleaned by scrapping, chipping, blasting, wire brushing or other effective means as approved by the Engineer.

6.2 In the event the surfaces become otherwise contaminated in the interval between cleaning and painting, re-cleaning will be done by the Contractor at no additional cost.

6.3 Surfaces of stainless steel, aluminum, bronze, and machined surfaces adjacent to metal work being cleaned or painted shall be protected by effective masking or other suitable means, during the cleaning and painting operations.

6.4 All the surfaces to be painted with approved quality paint shall be free from dust, dirt, fungus, lichen, algae etc. Oil paint, varnish and lime wash should always be removed by scraping and washing.

6.5 All surfaces to be bitumen painted shall be thoroughly cleaned of any accretion, dust, dirt etc. by scraping, wire-brushing or as directed by the Engineer. The surface shall be primed with a coat of asphalt oil used at the rate of not less than 0.50 pound per square foot.

No work in this section shall be allowed until all surfaces or conditions have been inspected and approved by the Engineer.

**7.0 APPLICATION**

7.1 All paint and coating materials shall be in a thoroughly mixed condition at the time of application. All work shall be done in a workman like manner, leaving the finished surface free from drips, ridges, waves, laps, and brush marks. All paints shall be applied under dry and dust free conditions. Unless approved by the Engineer paint shall not be applied when the temperature of the metal or of the surrounding air is below 7 degrees Centigrade. Surfaces shall be free from moisture at the time of painting.

All primary paint shall be applied by brushing. The first coat of paint shall be applied immediately after cleaning. When paint is applied by spraying, suitable measures shall be taken to prevent segregation of the paint in the container during painting operation.

Effective means shall be adopted for removing all free oil and moisture from the air supply lines of the spraying equipment. Each coat of paint shall be allowed to dry or harden thoroughly before the succeeding coat is applied. Surfaces to be painted that will be inaccessible after installation shall be completely painted prior to installation.

Coats of Weather Shield/Weather Coat paint shall be applied in accordance with the manufacturer's instructions or as directed by the Engineer.

Only as much material should be mixed as can be used up in one hour. Over-thinning will not be permitted. After the first coat the surfaces will be soaked evenly four or five times and the second coat shall be applied after leaving for at least overnight.

7.2 Where shown on drawings all exterior finishes shall be painted with acrylic based textured coating as shown on drawings in approved colours as per manufacturer's specifications. The number of coats shall be as shown on the drawings or as directed by the Engineer.

7.3 Plastic emulsion paint, vinyl emulsion paint or matt enamel paint of the approved make and shade shall be applied to surfaces as shown on Drawings as per manufacturer's instructions. The number of coat shall be as indicated on the Drawings or as directed by the Engineer.

8.0 **JOB CONDITIONS**

8.1 Observe manufacturer's recommended minimum and maximum temperature but do not apply paint or finish to any surface unless ambient temperature is 10 degree C or above and less than 43 degree C. No painting shall be done above 90% relative humidity.

8.2 Place drop cloths to adequately protect all finished work.

8.3 Remove and replace all items of finish hardware, device plates,

accessories, lighting fixtures or other removable items.

8.4 In no case shall any finish hardware or other finished item that is already fitted into place be painted, unless otherwise specified.

**9.0 QUALITY ASSURANCE**

All paint for any one surface shall be top quality, of one manufacturer and approved by the Engineer. Deep tone accent colours shall be used and the unavailability of final coat colours may be the basis for rejecting materials for any one surface.

**10.0 SCHEDULE OF MEASUREMENT OF PAINT AREA**

Irrespective of prime coats and number of paint coats applied to exposed painting surface area of column, walls, projections, ceilings, false ceilings and other surfaces (Except gates, doors windows and ventilators) shall be measured as per actual paint surface area for single time only and paid in accordance with quoted rate of Bill of Quantities.

**11.0 MEASUREMENT AND PAYMENT**

11.1 **General**

Except otherwise specified herein or elsewhere in Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of Bill of Quantities.

The rates quoted by the Contractor in the Bill of Quantities shall include work to be executed under this specification in any floor and at any height except where otherwise specifically stated in the relevant item of Bill of Quantities and the Contractor shall not be entitled to any claim or claim any compensation on this account.

1. Preparatory works, including preparatory materials, scraping, scratching, sand blasting, cleaning, prime coating, priming, protection of finished works etc.

1. Polishing works, including preparatory materials, scraping, cleaning, sanding etc.

1. Before application of paint on existing surface the old paint surface shall be removed existing paint, filling of cracks, surface preparation and application of primer coat, if any.

11.2 **Painting of All Types / Acrylic based textured Coating**

* + 1. Measurement

Measurement of acceptably completed respective type of painting works / Acrylic based textured coating will be made on the basis of net actual area in square foot of the surface painted / coated as shown on the Drawings or as directed by the Engineer.

* + 1. Payment

Payment will be made for acceptable measured quantity of respective type of painting / acrylic based textured coating on the basis of unit rate per square foot quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 6700 \*\*\*

**SECTION 8112**

**UNINTERRUPTIBLE POWER SUPPLY SYSTEMS**

**1.0 SCOPE**

**2.0 APPLICABLE STANDARDS & CODES**

**3.0 MATERIAL**

**4.0 TESTING**

**5.0 MANUFACTURER WARRANTEE**

**6.0 MEASUREMENT AND PAYMENT**

**1.0 SCOPE**

The present specification indicates the characteristics required for the supply of uninterruptible power systems.

The product supplied must be compatible with the specification requirements. Any departure from the specification must be indicated in the bid phase.

* 1. **APPLICABLE STANDARDS & CODES**

The following Standards are referred to in this Part:

IEC 60647 Low Voltage Switchgear and Control gear

IEC 60948 Low Voltage Control gear

* 1. **SUBMISSIONS**

Submit in accordance with General Specification for electrical works

**2.1.1 Shop Drawings**

Submit dimensional drawings of the main switchboard, including sections and elevations, showing the following:

i) Sizes and positions of components ii) Positions and method of fixing cable and boxes iii) Location of terminal boards

iv) Other pertinent data

**2.1.2 Project Data**

**a) Submit**

1. Full specifications of the enclosure and the components of the equipment with relevant sheets of manufacturer’s catalogues
2. Confirmation that the equipment complies with the relevant

specifications

**2.1.3 Technical Data Sheets/Technical Submittal**

Technical data/ submittal of proposed UPS shall comprise of the following at the minimum, which shall be submitted along with Bid/technical submittal approval stage as desired by the Engineer:

1. Manufacturer’s authorization certificate for the proposed brand regarding the subject project.
2. Manufacturer’s technical data & selection sheets clearly depicting all specified features as per the Contract Specifications.
3. Original Catalogues/brochures highlighting the proposed model.
4. Outline design drawings and installation shop drawings from the Manufacturer.
5. Compliance statement of relevant standards for the proposed model from the Manufacturer and test certificate against proposed UPS with SLA batteries model no. from authorized/verifiable companies.
6. Warranty statement duly certified by the Manufacturer.
7. Manufacturer’s duly certified list of essential spare parts included with supply of equipment to be used during defects liability period.
8. One (01) original Installation manual provided by manufacturer for the equipment shall be submitted by the Contractor.

* 1. **MATERIAL**

* 1. **DESCRIPTION OF THE REQUIRED SYSTEM**

The UPS system shall be comprised of single rectifier, battery charger and inverter modules:

1. The UPS system shall be designed in such a way that any spare part, printed circuit boards, sub-assembly or component, can be replaced without any adjustment

1. It shall supply clean, uninterrupted power to the critical loads and meet the specifications

1. Transformers shall be manufactured using vacuum pressure impregnated insulation.

The system required is an uninterruptible power system (UPS) with rating mentioned in BOQ with On Line double conversion technology: the load is always powered by the inverter, which supplies a sinusoidal voltage that is filtered and stabilized in voltage, form and frequency. Moreover, the input and output filters significantly increase the immunity of the load against mains interference and lightning.

CHARACTERISTICS

* The system has to provide a power supply that is filtered, stabilized and reliable (On Line double conversion technology in accordance with standard EN50091-3) with filters for the suppression of atmospheric noise.
* The on-line technology guarantees maximum protection for the connected loads. A double conversion stage is also required to filter and stabilize the input voltage, by regenerating it and removing mains interference (over voltages, frequency and voltage fluctuations)

**The UPS must provide the following features:**

* Total microprocessor control
* Distributed parallel configuration
* Automatic battery test
* Ups can be connected in parallel and redundant up to 8 units even different power rating
* Protection against battery deep discharge
* Automatic shutdown function when load is absent - LCD and LEDs display - Low consumption:
* The UPS must provide various operating modes to reduce consumption. The user must be able to select from the following modes:

* 1. **“on line”** operation (in compliance with standard EN50091): to guarantee maximum protection for the load
  2. **“line interactive”** operation (in compliance with standard

EN50091): to guarantee minimum consumption

* 1. **“automatic line interactive”** operation: the UPS automatically selects line interactive operation, after checking the quality of the mains power supply and running load and mains interference diagnostics
  2. **“back-up”** operation: for the supply of power to emergency lighting.
* Automatic restart when mains power returns
* Frequency auto-sensing
* Manual by-pass
* Monitoring and shut down software included:
* Network management through TCP/IP protocol:

The system must be provided with the software to guarantee the efficient and intuitive management of the UPS, displaying by means of bar graphs the most important information such as input voltage, applied load, battery capacity, etc.

* External manual by-Pass:

It must be possible to connect the UPS to an external manual by-pass system. Manual bypass switch system of full UPS shall be integrated into the UPS so that load can be transferred to mains supply WITHOUT break for maintenance of UPS. Procedure for transfer to maintenance bypass and back to UPS shall be controlled by the bypass menu of the UPS, thus eliminating possibility of causing disturbance of load by operator who is unaware of correct procedures (it must also be possible to read on the UPS display the signals on the status of the external by-pass).

* Interfacing

Connectors for remote signals and controls

The UPS must provide the following connectors:

connectors for EPO, emergency remote shutdown control, female DB15 (input/output contacts for remote signalling); male DB9 (RS232-1); female

DB9 (RS232-2 for modem connection);

Slot for SNMP card

The contractor shall assess the electrical load capacity of the UPS taking into account derating for non-linear and worst case ambient temperature conditions.

The UPS cabinet shall be designed such that all components are removable from the front and cable entry by floor mounted gland plates.

**3.2 RECTIFIER/CHARGER**

The rectifier/charger shall be solid-state type with fully controlled 6-pulse thyristor bridge and anti-harmonic chokes. It shall have 10 sec walk-in ramp for input current, adjustable battery current and voltage. It shall recharge a fully discharge battery in 24 hours. A boost charge facility shall be provided. A normally open contact rated at 220 Vac, 2A, close on boost charge, shall be provided for remote monitoring. Input voltage ratings are as follows:

1. Mains 1 (input to rectifier/charger)

Voltage : 400 volts AC  10% / 220 volts AC  10%

Wiring : 3-phase, 4 wire + Earth / 1-phase, 2 wire + Earth

Frequency : 50 Hz

1. Mains 2 (input to static switch)

Voltage : 400 volts AC  15% / 220 volts AC  15%

Wiring : 3-Phase, 4 wire + Earth / 1-Phase, 2 wire + Earth

Frequency : 50 Hz

1. Synchronization Range:  0.75 Hz

* 1. **BATTERY**

Unless otherwise specified in the Project Documentation, the battery shall be of sealed lead acid maintenance free type and sized for the pre-selected time with the UPS operating at rated load. The battery set shall be installed in similar cabinet finish as the UPS unit.

**The battery system shall be sized to maintain full load for a period of One (01) Hour.**

* 1. **INVERTER**

The inverter shall be of transistorized PWM type, for the specified UPS rated power at 0.9 p.f. Output rating shall be as follows:

**Wiring : 3-phase, 4 wire and earth /**

**1-phase, 2 wire and earth**

**Voltage : 400/220 volts (** **1%), 50 Hz**

**Transient voltage Regulation : Voltage transients shall not**

**exceed** 5% for a 100% load step change and the return to steady state value shall be in less than 20 milliseconds.

**Harmonic distortion : Less than 4% THD**

**Efficiency : For 100% load 92%**

**: For 50% load 91%**

**Audible noise : < 65 dBA @ 1.5m**

Output synchronized in amplitude, phase & frequency to mains 2 when mains 2 is within tolerance limits. Phase difference between inverter output and mains 2 held below 3 (electrical) in such condition so that the maximum gap while transfer to UPS from Mains 2 and vice versa occurs shall be less than 167 micro seconds.

**3.5 OVERLOAD CAPABILITIES**

a) Inverter shall sustain 125% overload for at least 10 minutes and 150% overloads for 1 minute. After delay, if overload persists, the load shall be transferred to bypass supply without break if Main voltage is within tolerance limits. The UPS shall check the load and if the load is below overload threshold, inverter shall restart automatically and load shall be transferred back to inverter. Facility to inhibit automatic re-transfer shall be provided.

**3.6 MONITORING AND CONTROL**

**Monitors**

1. The following status information shall be monitored by indicating lights on the front panels of the UPS:

i) rectifier/charger on ii) load on inverter

* + 1. load on Mains 2 bypass
    2. alarm
    3. inverter shutdown imminent vi) boost charge

1. an audible alarm shall warn the user of faults or operating problems. The system shall be equipped with an alarm off button. Metering values displayed on an alpha-numeric display.

1. The following measurements shall be available:

i) inverter output voltage (L-L) ii) Inverter output frequency iii) inverter output currents iv) voltage across battery terminals

v) battery current (charge) input voltages vi) mains 1 rectifier/charger) input voltages (L-L) vii) rectifier/charger input currents.

* 1. **REMOTE CONTROL AND MONITORING**

On request, the supplier must be able to guarantee 24-hour remote supervision of the equipment. The products provided must therefore be able to dialogue via modem and to communicate with the authorized support centers that will be able to interrogate the system periodically and verify the present and past operating parameters, and send a report to the user, in fully automatic mode.

The UPS must be able to call the support centers to signal alarms or faults automatically so that the support center may intervene immediately. Remote transmission shall be possible for all controls, monitors and measurement indication on the UPS unit.

* 1. **PROTECTIVE DEVICES, CONTROLS AND MONITORS**

The UPS shall be built on modular basis.

The UPS shall include protection against input over voltage, load short – circuits, external or internal over-temperature, vibration and impacts during transport, etc. The UPS shall stop automatically if the DC voltage drops below a pre-set minimum value.

Signaling on the operating status of the UPS is to be provided by means of a liquid crystal display (LCD) with contrast control and having two(min) rows of at least 30 characters.

Controls shall be microprocessor based and the following main controls shall be possible:

* four luminous report signals: power supply and by-pass lines input inverter output by-pass line output battery input
* rectifier/charger on/off
* inverter on/off
* forced shutdown
* forced transfer upon forced shutdown of inverter when the bypass power supply is outside tolerances
* self-test

- an acoustic alarm device.

**4.0 TESTING**

The Ups manufacturer shall provide proof of a stringent Quality Assurance Program. In particular the main equipment manufacturing stages sanctioned by appropriate tests such as: incoming components inspection, discrete sub-assembly tests and complete functional checks on the final product. Equipment shall undergo on-load burn-in laving the factory. Final inspection and calibration operations shall be documented in a report drawn up by the supplier’s Quality Inspection department.

**5.0 MANUFACTURER WARRANTEE**

The Contractor shall submit two (02) copies of written warrantee from the manufacturer under his cover warrantee that the material and workmanship of the equipment installed is according to recognized international standards and conform to all contractual requirements of this specification that he will make good without extra cost any defects not due to ordinary wear and tear or improper use, which may develop within two (02) years from date of the installation being handed over to the Employer.

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

The manufacturer warrantee period shall be two (02) years after final commissioning and installation being handed over to the Employer.

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

**6.0 MEASUREMENT AND PAYMENT**

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





















































