KARACHI PORT TRUST

ENGINEERING DEPARTMENT

TENDER NOTICE

The News

DATED: 21-04-2024

KARACHI PORT TRUST
Gateway to Pakistan
A Great Heritage - A Vibrant Future

Chief Engineer KPT Invited Tender, under PPRA Rule 36 (a) from Bidders registered with Government, Semi Government Department / Organization or with any reputable client for the following work. All interested firms who possess experience in the relevant field may obtain the tender documents available on the downloaded version at KPT, PPRA & MoMA Websites.

Name & Scope of Work	Date, Time of Receipt & Opening of Tender
Maintenance / Repair to Guard Room, Generator Room, Projection of Hut & Allied Repair Work to KPT Hut No. 97 / 98-S at Sandspit Manora. The work mainly comprises of: • Dismantling Damaged Cracked Outlived Cement. • Providing & Applying of Modified Polymer Cement. • Prepare Surface & Apply Water Proofing. • Providing Fabricating & Fixing Executive Quality Stainless Steel Pipe. • Removing the Existing Damaged Lasbela / Silbata Stone. • Prepare Surface & Applying / Spraying 02 Layers of Color.	13-05-2024 Receipt at 10:30 Hrs. 13-05-2024 Opening at 11:00 Hrs. Tender Fee Rs. 3,000/- (Non-Refundable)

1. The intending Bidders must be registered with the Pakistan Engineering Council in Category C-6 and above with Specialized Category CE-10 valid on the date of Opening of Tender.
2. The Prescribed Tender Fees amounting to Rs. 3,000/- (Non- Refundable) and the bid security of the work which is Rs. 140,000/- Fixed (Refundable) will be submitted in separate envelop along with the bid at the time of submission of tender in shape of Pay Orders. In favor of Chief Account Officer KPT.
   The Mandatory Requirement to be full filled as mention from (a to f)
   a. Copy of latest valid NTN, SRB Certificate.
   b. Copy of Online Tax Verification (Fresh Copy of ATL).
   c. Updated Company Profile for those participating first time in KPT.
   d. Copy of Valid PEC Registration Certificate.
   e. Affidavit, that the firm is not defaulter in income tax department nor blacklisted by any Organization.
   f. a. In case of companies and firms, last three years tax returns filed with FBR are to provided showing minimum average turnover of Rs. 05 (M).
   b. In case of individuals / sole proprietors last three years tax returns filed with FBR are to provided showing minimum average turnover of Rs. 05 (M) on average for three years.
3. Only the FBR & SRB Bidders are eligible for bidding, bibbers has to quote their rates inclusive of all Govt. Taxes as applicable as per Standard Format.
4. The bid opening will take place in the committee Room of the Civil Works / Engineering Department at 2nd Floor, KPT Head Office Building, Karachi on given date & time.
5. The KPT may reject all bids or proposals at any time prior to the acceptance of a bid or proposal. The KPT shall upon request communicate to any supplier or contractor who submitted a bid or proposal, the grounds for its rejection of all bids or proposals, but is not required to justify those grounds.
6. The bidder must read the instruction contained in para 1-5 carefully the para 2 in its true letter & sprit.

Chief Engineer
KPT Head Office Building,
Eduljee Dinshaw Road, Karachi – 74000.
UAN: 111-KPT-111 Phone: 99214318 Fax: 99214329-30
Website: www.kpt.gov.pk www.ppra.org.pk

PID (K) No. 2951/2023

DAILY NAI BAAT

DATED: 22-04-2024

KARACHI PORT TRUST
Gateway to Pakistan
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   b. Copy of Online Tax Verification (Fresh Copy of ATL).
   c. Updated Company Profile for those participating first time in KPT.
   d. Copy of Valid PEC Registration Certificate.
   e. Affidavit, that the firm is not defaulter in income tax department nor blacklisted by any Organization.
   f. a. In case of companies and firms, last three years tax returns filed with FBR are to provided showing minimum average turnover of Rs. 05 (M).
   b. In case of individuals / sole proprietors last three years tax returns filed with FBR are to provided showing minimum average turnover of Rs. 05 (M) on average for three years.
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PID(K) 2951/23

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K.P.T

KARACHI PORT TRUST

ENGINEERING DEPARTMENT

DOCUMENTS TO
BE RETURNED

MAINTENANCE/ REPAIR TO GUARD ROOM, GENERATOR ROOM, PROJECTION OF HUT & ALLIED REPAIR WORK TO KPT HUT 97/98-S AT SANDS PIT MANORA

(Civil Works)

Available on PEC website (www.pec.org.pk)
And PPRA website (www.ppra.org.pk)

(Harmonized with PPRA Rules)

SUB:- **MAINTENANCE/ REPAIR TO GUARD ROOM, GENERATOR ROOM, PROJECTION OF HUT & ALLIED REPAIR WORK TO KPT HUT 97/98-S AT SANDS PIT MANORA.**

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INVITATION FOR BIDS

Date: _____

Bid Reference No.: SANC-OT/2024/21/21809 Dated:-06-Feb-2024

The Employer, Karachi Port Trust, invites sealed bids from eligible firms or persons licensed by the Pakistan Engineering Council in the appropriate category and duly qualified with the Employer for the Works, ***MAINTENANCE/ REPAIR TO GUARD ROOM, GENERATOR ROOM, PROJECTION OF HUT & ALLIED REPAIR WORK TO KPT HUT 97/98-S AT SANDS PIT MANORA***, which will be completed in 03 Months.

1. A complete set of Bidding Documents may be purchased by an interested eligible bidder on submission of a written application to the office given below and upon payment of a non-refundable fee of Rupees 3,000.00 Bidders may download the Bidding Documents from KPT, MoMA and PPRA websites or aquire from the Office of the Employer, at Chief Engineer‘s Office 2 nd Floor KPT Head Office, Eduljee Dinshaw Road Karachi.

2. All bids must be accompanied by a Bid Security in the amount of Rs. 140,000.00 Rupees and must be delivered to Chief Engineer ‘s Office 2nd Floor KPT Head Office, Eduljee Dinshaw Road Karachi at or before 10:30 hours, on 13-05-2024. Bids will be opened at 11:00 hours on the same day in the presence of bidders’ representatives who choose to attend, at the same address.

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INSTRUCTIONS TO BIDDERS & BIDDING DATA

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INSTRUCTIONS TO BIDDERS

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INSTRUCTIONS TO BIDDERS

(Note: These Instructions to Bidders (IB) alongwith Bidding Data will not be part of Contract and will cease to have effect once the Contract is signed).

A. GENERAL

IB.1 Scope of Bid & Source of Funds

1.1 Scope of Bid

The Employer as defined in the Bidding Data (hereinafter called "the Employer") wishes to receive Bids for the Works summarized in the Bidding Data (hereinafter referred to as "the Works").

Bidders must quote for the complete scope of work. Any Bid covering partial scope of work will be rejected as non-responsive.

1.2 Source of Funds

The Employer has arranged funds from its own sources.

IB.2 Eligible Bidders

2.1 Bidding is open to all firms and persons meeting the following requirements:

a) Duly licensed by the Pakistan Engineering Council (PEC) in category C-6 or above having specialization in CE-10 category.

b) Valid NTN, SNTN, etc, with active ATL status from FBR.

c) Undertaking /Affidavit that the firm is not defaulter in income Tax Department nor Blacklisted by any Organization over an E-Stamp of RS.500/-in original.

IB.3 Cost of Bidding

3.1 The bidder shall bear all costs associated with the preparation and submission of its bid and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

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B. BIDDING DOCUMENTS

IB.4 Contents of Bidding Documents

4.1 In addition to Invitation for Bids, the Bidding Documents are those stated below, and should be read in conjunction with any Addendum issued in accordance with Sub-Clause IB.6.1.

1. Instructions to Bidders & Bidding Data
2. Form of Bid & Schedules to Bid
   Schedules to Bid comprise the following:

   (i) Schedule A: Schedule of Prices
   (ii) Schedule B: Specific Works Data
   (iii) Schedule C: Works to be Performed by Subcontractors
   (iv) Schedule D: Proposed Programme of Works
   (v) Schedule E: Method of Performing Works
   (vi) Schedule F: Integrity Pact

3. Conditions of Contract & Contract Data

4. Standard Forms:

   (i) Form of Bid Security

   (ii) Form of Performance Security

   (iii) Form of Contract Agreement

   (iv) Form of Bank Guarantee for Advance Payment

5. Specifications

6. Drawings, if any

IB.5 Clarification of Bidding Documents

5.1 A prospective bidder requiring any clarification(s) in respect of the Bidding Documents may notify the Engineer/Employer at the Employer's/Engineer's address indicated in the Bidding Data.

5.2 The Engineer/Employer will respond to any request for clarification which it receives earlier than ten **(**10) days prior to the deadline for the submission of Bids. Copies of the Engineer/Employer's response will be forwarded to all prospective bidders, at least five (5) days prior to dead line for submission of Bids, who have received the Bidding Documents including a description of the enquiry but without identifying its source.

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IB.6 Amendment of Bidding Documents

6.1 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**.

6.2 Any addendum thus issued shall be part of the Bidding Documents pursuant to Sub-Clause 6.1 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.

6.3 To afford prospective bidders reasonable time in which to take an addendum into account in preparing their Bids, **the Employer may at its discretion extend the deadline for submission of Bids.**

C. PREPARATION OF BIDS

IB.7 Language of Bid

7.1 The bid prepared by the bidder and all correspondence and documents relating to the Bid, exchanged by the bidder and the Employer shall be written in the English language, provided that any printed literature furnished by the bidder may be written in another language so long as accompanied by an English translation of its pertinent passages in which case, for purposes of interpretation of the Bid, the English translation shall govern.

IB.8 Documents Comprising the Bid

8.1 The bid prepared by the bidder shall comprise the following components:

(a) Covering Letter

(b) Form of Bid duly filled, signed and sealed, in accordance with Sub-Clause IB.14.3.
(c) Schedules (A to F) to Bid duly filled and initialed, in accordance with the instructions contained therein & in accordance with Sub-Clause IB14.3.

(d) Bid Security furnished in accordance with Clause IB.13.
(e) Power of Attorney in accordance with Sub-Clause IB 14.5.
(f) Documentary evidence in accordance with Clause IB.11
(g) Documentary evidence in accordance with Clause IB.12.

IB.9 Sufficiency of Bid

9.1 Each bidder shall satisfy himself before Bidding as to the correctness and sufficiency of his Bid and of the rates and prices entered in the Schedule of Prices, which rates and prices shall except in so far as it is otherwise expressly provided in the Contract, cover all his obligations under the Contract and all matters and things necessary for the proper completion of the Works.

9.2 The bidder is advised to obtain for himself at his own cost and responsibility all information that may be necessary for preparing the bid and entering into a Contract for execution of the Works.

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IB.10 Bid Prices, Currency of Bid and Payment

10.1 The bidder shall fill up the Schedule of Prices (Schedule A to Bid) indicating the unit rates and prices of the Works to be performed under the Contract. Prices in the Schedule of Prices shall be entered keeping in view the instructions contained in the Preamble to Schedule of Prices.

10.2 Unless otherwise stipulated in the Conditions of Contract, prices quoted by the bidder shall remain fixed during the bidder's performance of the Contract and not subject to variation on any account.

10.3 The unit rates and prices in the Schedule of Prices shall be quoted by the bidder in the currency as stipulated in Bidding Data.

IB.11 Documents Establishing Bidder's Eligibility and Qualifications

11.1 Pursuant to Clause IB.8, the bidder shall furnish, as part of its bid, documents establishing the bidder's eligibility to bid and its qualifications to perform the Contract if its bid is accepted.

11.2 Bidder / Manufacturer must possess and provide evidence of its capability and the experience as stipulated in Bidding Data and the Qualification Criteria stipulated in the Bidding Documents.

IB.12 Documents Establishing Works' Conformity to Bidding Documents

12.1 The documentary evidence of the Works' conformity to the Bidding Documents may be in the form of literature, drawings and data and the bidder shall furnish documentation as set out in Bidding Data.

12.2 The bidder shall note that standards for workmanship, material and equipment, and references to brand names or catalogue numbers, if any, designated by the Employer in the Technical Provisions are intended to be descriptive only and not restrictive.

IB.13 Bid Security

13.1 Each bidder shall furnish, as part of his bid, at the option of the bidder, a Bid Security in the amount stipulated in Bidding Data in Pak. Rupees in the form of Pay Order or a Bank Guarantee issued by a Scheduled Bank in Pakistan or an insurance company having alteast AA rating from PACRA/JCR in favour of the Employer valid for a period up to twenty eight (28) days beyond the bid validity date.

13.2 Any bid not accompanied by an acceptable Bid Security shall be rejected by the Employer as non-responsive.

13.3 The bid securities of unsuccessful bidders will be returned upon award of contract to the successful bidder or on the expiry of validity of Bid Security whichever is earlier.

13.4 The Bid Security of the successful bidder will be returned when the bidder has furnished the required Performance Security, pursuant to Clause IB.21 and signed the Contract Agreement, pursuant to Sub-Clauses IB.20.2 & 20.3.

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13.5 The Bid Security may be forfeited:

(a) if a bidder withdraws his bid during the period of bid validity; or

(b) if a bidder does not accept the correction of his Bid Price, pursuant to Sub-Clause 16.4 (b) hereof; or

(c) In the case of a successful bidder, if he fails to:

(i) Furnish the required Performance Security in accordance with Clause IB.21, or

(ii) Sign the Contract Agreement, in accordance with Sub-Clauses IB.20.2 & 20.3.

IB.14 Validity of Bids, Format, Signing and Submission of Bid

14.1 Bids shall remain valid for the period stipulated in the Bidding Data after the date of bid opening.

14.2 All Schedules to Bid are to be properly completed and signed.

14.3 No alteration is to be made in the Form of Bid except in filling up the blanks as directed. If any alteration be made or if these instructions be not fully complied with, the bid may be rejected.

14.4 Each bidder shall prepare Original and number of copies specified in the Bidding Data of the documents comprising the bid as described in Clause IB.8 and clearly mark them "ORIGINAL" and "COPY" as appropriate. In the event of discrepancy between them, the original shall prevail.

14.5 The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign (in the case of copies, Photostats are also acceptable). This shall be indicated by submitting a written Power of Attorney authorising the signatory of the bidder to act for and on behalf of the bidder. All pages of the bid shall be initialed and official seal be affixed by the person or persons signing the bid.

14.6 The Bid shall be delivered in person or sent by registered mail at the address to Employer as given in Bidding Data

D. SUBMISSION OF BID

IB.15 Deadline for Submission, Modification & Withdrawal of Bids

15.1 Bids must be received by the Employer at the address/provided in Bidding Data not later than the time and date stipulated therein.

15.2 Bids submitted through telegraph, telex, fax or e-mail shall not be considered.

15.3 Any bid received by the Employer after the deadline for submission prescribed in Bidding Data will be returned unopened to such bidder.

15.4 Any bidder may modify or withdraw his bid after bid submission provided that the modification or written notice of withdrawal is received by the Employer prior to the deadline for submission of bids.

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15.5 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 Form of Bid may result in forfeiture of the Bid Security pursuant to Sub-Clause IB.13.5(a).

E. BID OPENING AND EVALUATION

IB.16 Bid Opening, Clarification and Evaluation

16.1 The Employer will open the bids, in the presence of bidders' representatives who choose to attend, at the time, date and location stipulated in the Bidding Data.

16.2 The bidder's name, Bid Prices, any discount, the presence or absence of Bid Security, and such other details as the Employer at its discretion may consider appropriate, will be announced by the Employer at the bid opening. The Employer will record the minutes of the bid opening. Representatives of the bidders who choose to attend shall sign the attendance sheet.

Any Bid Price or discount which is not read out and recorded at bid opening will not be taken into account in the evaluation of bid.

16.3 To assist in the examination, evaluation and comparison of Bids the Engineer/Employer may, at its discretion, ask the bidder for a clarification of its Bid. The request for clarification and the response shall be in writing and no change in the price or substance of the Bid shall be sought, offered or permitted.

16.4 (a) Prior to the detailed evaluation, pursuant to Sub-Clauses IB.16.7 to 16.9, the Engineer/Employer will determine the substantial responsiveness of each bid to the Bidding Documents. For purpose of these Clauses, a substantially responsive bid is one which conforms to all the terms and conditions of the Bidding Documents without material deviations. It will include to determine the requirements listed in Bidding Data.

(b) Arithmetical errors will be rectified on the following basis:

If there is a discrepancy between the unit price and total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected. If there is a discrepancy between the words and figures the amount in words shall prevail. If there is a discrepancy between the Total Bid price entered in Form of Bid and the total shown in Schedule of Prices-Summary, the amount stated in the Form of Bid will be corrected by the Employer in accordance with the Corrected Schedule of Prices.

If the bidder does not accept the corrected amount of Bid, his Bid will be rejected and his Bid Security forfeited.

16.5 A Bid determined as substantially non-responsive will be rejected and will not subsequently be made responsive by the bidder by correction of the non-conformity.

16.6 Any minor informality or non-conformity or irregularity in a Bid which does not constitute a material deviation may be waived by Employer, provided such waiver does not prejudice or affect the relative ranking of any other bidders.

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16.7 The Engineer/Employer will evaluate and compare only the bids previously determined to be substantially responsive pursuant to Sub-Clauses IB.16.4 to 16.6 as per requirements given hereunder. Bids will be evaluated for complete scope of works. The prices will be compared on the basis of the Evaluated Bid Price pursuant to Sub-Clause 16.8 herein below.

(a) Technical Evaluation

It will be examined in detail whether the Works offered by the bidder complies with the Technical Provisions of the Bidding Documents. For this purpose, the bidder's data submitted with the bid in Schedule B to Bid will be compared with technical features/criteria of the Works detailed in the Technical Provisions. Other technical information submitted with the bid regarding the Scope of Work will also be reviewed.

(b) Commercial Evaluation

It will be examined in detail whether the bids comply with the commercial/contractual conditions of the Bidding Documents. It is expected that no material deviation/stipulation shall be taken by the bidders.

16.8 Evaluated Bid Price

In evaluating the bids, the Engineer/Employer will determine for each bid in addition to the Bid Price, the following factors (adjustments) in the manner and to the extent indicated below to determine the Evaluated Bid Price:

(i) making any correction for arithmetic errors pursuant to Sub-Clause 16.4 hereof.
(ii) making an appropriate price adjustment for any other acceptable variation or deviation.
(iii) making an appropriate price adjustment for Deviations in terms of Payments (if any and acceptable to the Employer).
(iv) discount, if any, offered by the bidders as also read out and recorded at the time of bid opening.

16.9 Evaluation Methods

Pursuant to Sub-Clause 16.8, Para (ii), and (iii) following evaluation methods for price adjustments will be followed:

(i) Price Adjustment for Technical Compliance

The cost of making good any deficiency resulting from technical non compliance will be added to the Corrected Total Bid Price for comparison purposes only. The adjustments will be applied taking the highest price quoted by other bidders being evaluated in detail in their original Bids for corresponding item. In case of non availability of price from other bidders, the price will be estimated by the Engineer/Employer.

(ii) Price Adjustment for Commercial Compliance

The cost of making good any deficiency resulting from any quantifiable variations and deviations from the Bid Schedules and Conditions of Contract, as determined by the Engineer/Employer will be added to the Corrected Total Bid Price for comparison purpose only.

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Adjustment for commercial compliance will be added to the Corrected Total Bid Prices.

(iii) Price Adjustment for Deviation in Terms of Payments
Refer to Bidding Data

IB.17 Process to be Confidential

17.1 Subject to Sub-Clause IB.16.3 heretofore, no bidder shall contact Engineer/Employer on any matter relating to its Bid from the time of the Bid opening to the time the bid evaluation result is announced by the Employer. The evaluation result shall be announced at least ten (10) 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.

17.2 Any effort by a bidder to influence Engineer/Employer in the Bid evaluation, Bid comparison or Contract Award decisions may result in the rejection of his Bid. Whereas, any bidder feeling aggrieved may lodge a written complaint not later than fifteen (15) days after the announcement of the bid evaluation result, however, mere fact of lodging a complaint shall not warrant suspension of procurement process.

F. AWARD OF CONTRACT

IB.18. Post Qualification

18.1 The Employer, at any stage of the bid evaluation, having credible reasons for or *prima facie* evidence of any defect in supplier's or contractor's capacities, may require the suppliers or contractors to provide information concerning their professional, technical, financial, legal or managerial competence whether already pre-qualified or not:

Provided that such qualification shall only be laid down after recording reasons therefor in writing. They shall form part of the records of that bid evaluation report.

18.2 The determination will take into account the bidder's financial and technical capabilities. It will be based upon an examination of the documentary evidence of the bidders' qualifications submitted under Clause IB.11, as well as such other information required in the Bidding Documents.

IB.19 Award Criteria & Employer's Right

19.1 Subject to Sub-Clause IB.19.2, the Employer will award the Contract to the bidder whose bid has been determined to be substantially responsive to the Bidding Documents and who has offered the lowest evaluated Bid Price, provided that such bidder has been determined to be qualified to satisfactory perform the Contract in accordance with the provisions of Clause IB.18.

19.2 Not with standing Sub-Clause IB.19.1, the Employer reserves the right to accept or reject any bid, and 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 to inform the affected bidders of the grounds for the Employer's action except that the grounds for its rejection

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of all bids shall upon request be communicated, to any bidder who submitted a bid, without justification of the grounds. Notice of the rejection of all the bids shall be given promptly to all the bidders.

IB.20 Notification of Award & Signing of Contract Agreement

20.1 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.

20.2 Within seven (7) days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Employer will send the successful bidder the Form of Contract Agreement provided in the Bidding Documents, incorporating all agreements between the parties.

20.3 The formal Agreement between the Employer and the successful bidder shall be executed within seven (7) days of the receipt of Form of Contract Agreement by the successful bidder from the Employer.

IB.21 Performance Security

21.1 The successful bidder shall furnish to the Employer a Performance Security in the form and the amount stipulated in the Conditions of Contract within a period of fourteen (14) days after the receipt of Letter of Acceptance.

21.2 Failure of the successful bidder to comply with the requirements of Sub-Clauses IB.20.2 & 20.3 or 21.1 or Clause IB.22 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security.

IB.22 Integrity Pact

The Bidder shall sign and stamp the Form of Integrity Pact provided at Schedule-F to Bid in the Bidding Document for all Federal Government procurement contracts exceeding Rupees ten (10) million. Failure to provide such Integrity Pact shall make the bid non-responsive.

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BIDDING DATA

(This section should be filled in by the Engineer/Employer before issuance of the Bidding Documents. The following specific data for the Works to be tendered shall complement, amend, or supplement the provisions in the Instructions to Bidders. Wherever there is a conflict, the provisions herein shall prevail over those in the Instructions to Bidders.)

Instructions to Bidders
Clause Reference

1.1 **Name of Employer:** Karachi Port Trust (KPT)

Brief Description of Works

The Authority intends to ***MAINTENANCE/ REPAIR TO GUARD ROOM, GENERATOR ROOM, PROJECTION OF HUT & ALLIED REPAIR WORK TO KPT HUT 97/98-S AT SANDS PIT MANORA.*** Includes:

- Dismantling Damaged Cracked Outlived Cement.
- Providing & Applying of Modified Polymer Cement.
- Prepare Surface & Apply Water Proofing.
- Providing Fabricating & Fixing executive Quality Stainless Steel Pipe.
- Removing the Existing Damaged Lasbela / Silbata Stone.
- Prepare Surface & Applying / Spraying 02 layers of Color.

5.1 (a) **Employer's address**:

Karachi Port Trust Head Office Building,

Eduljee Dinshaw Road, M.A Jinnah Road Karachi

Ph#021-99214318

(b) **Engineer's address:**

The Chief Engineer, KPT

2nd Floor KPT Head Office Building,

Eduljee Dinshaw Road, M.A Jinnah Road Karachi.

Ph#:021-99214318

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10.3 Bid shall be quoted entirely in Pak. Rupees. The payment shall be made in Pak. Rupees.

11.2 The bidder/manufacturer has the financial, technical and production capability necessary to perform the Contract as follows:

a) duly licensed by the Pakistan Engineering Council (PEC) in category C-6 or above and having specialization in CE-10 category.

b) Valid NTN, SNTN etc., with active ATL & status from FBR.

c) Undertaking/Affidavit that the firm is not defaulter in income Tax Department nor Blacklisted by any Organization over an E-Stamp of RS.500/-in original.

e) In case of companies and firms, last three years Audited financial Statements are to be provided showing minimum average turnover of Rs. 05 Million.

In case of individuals / Sole Proprietors, last three years tax returns filed with FBR are to be provided showing minimum turnover of Rs. 05 Million. On average for the three years.

12.1 (a) A detailed description of the Works, essential technical and performance characteristics.

(b) Complete set of technical information, description data, literature and drawings as required in accordance with Schedule B to Bid, Specific Works Data. This will include but not be limited to a sufficient number of drawings, photographs, catalogues, illustrations and such other information as is necessary to illustrate clearly the significant characteristics such as general construction dimensions and other relevant information about the works to be performed.

13.1 **Amount of Bid Security**

The clause is deleted in its entity and read as follows:

The bidder must submit a bid security of Rs. 140,000.00 in form of Pay Order, in favour of Cheif Accounts Officer KPT.

14.1 **Period of Bid Validity**

The bid shall remain valid for a period of 180 days only.

14.4 **Number of Copies of the Bid to be Submitted**

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One original / USB & One Copy

14.6 **(a) Employer's Address for the Purpose of Bid Submission**

The Chief Engineer, KPT

2nd Floor KPT Head Office Building,

Eduljee Dinshaw Road, M.A Jinnah Road Karachi.

Ph#:021-99214318

15.1 **Deadline for Submission of Bids**

10:30 AM on 13-05-2024

16.1 **Venue, Time, and Date of Bid Opening**

Venue: Committee Room of Chief Engineer, 2nd Floor KPT Head Office.

Time: 11:00 A.M

Date: 13-05-2024.

16.4 **Responsiveness of Bids**

(i) The Bid is valid till required period,

(ii) The Bid prices are firm during currency of contract (if it is a fixed price bid)

(iii) Completion period offered is within specified limits,

(iv) The Bidder/ Manufacturer is eligible to Bid and possesses the requisite experience, capability and qualification.

(v) The Bid does not deviate from basic technical requirements and

(vi) The Bids are generally in order, etc.

16.3 **Clarification**

The clause is deleted in its entirety.

16.7 The bidders are required to submit their bids in accordance with rule 36 (b) of PPRA i.e. Single Stage Two Envelope Procedure clearly marking Technical and Financial Proposals. The employer will evaluate the technical proposals first and then financial proposals of only technically qualified bidders are to be opened.

16.9 **Price Adjustment:**

The clause is deleted in its entirety.

21.1 **Performance Security:**

The successful bidder shall furnish an amount of 5 % of the Contract Price as the performace security to the Employer a Performance Security in the form within a period of fourteen (14) days after the receipt of Letter of Acceptance.

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FORM OF BID AND SCHEDULES TO BID

CHIEF ENGINEER
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FORM OF BID
(LETTER OF OFFER)

Bid Reference No. _____

_____

_____

(Name of Works)

To:

_____

_____

_____

Gentlemen,

1. Having examined the Bidding Documents including Instructions to Bidders, Bidding Data, Conditions of Contract, Contract Data, Specifications, Drawings, if any, Schedule of Prices and Addenda Nos. _____ for the execution of the above-named Works, we, the undersigned, being a company doing business under the name of and address _____ and being duly incorporated under the laws of Pakistan hereby offer to execute and complete such Works and remedy any defects therein in conformity with the said Documents including Addenda thereto for the Total Bid Price of Rs_____(Rupees_____) or such other sum as may be ascertained in accordance with the said Documents.

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

3. As security for due performance of the undertakings and obligations of this Bid, we submit herewith a Bid Security in the amount of RS. 140,000.00 drawn in your favour or made payable to you and valid for a period of twenty eight (28) days beyond the period of validity of Bid.

4. We undertake, if our Bid is accepted, to commence the Works and to deliver and complete the Works comprised in the Contract within the time(s) stated in Contract Data.

5. We agree to abide by this Bid for the period of 180 days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

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

7. We undertake, if our Bid is accepted, to execute the Performance Security referred to in Conditions of Contract for the due performance of the Contract.

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

9. We do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other person or persons making a bid for the Works.

Dated this_____day of _____, 20

Signature _____

in the capacity of _____duly authorized to sign bid for and on behalf of _____

(Name of Bidder in Block Capitals)

(Seal)

Address

_____

_____

_____

Witness:

(Signature)_____

Name:_____

Address: _____

_____

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[SCHEDULES TO BID INCLUDE THE FOLLOWING:

- Schedule A to Bid: Schedule of Prices
- Schedule B to Bid: Specific Works Data
- Schedule C to Bid: Works to be Performed by Subcontractors
- Schedule D to Bid: Proposed Programme of Works
- Schedule E to Bid: Method of Performing Works
- Schedule F to Bid: Integrity Pact]

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SCHEDULE – A TO BID

BILL OF QUANTITIES

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SCHEDULE - B TO BID

S.No.	Attribute	Criteria
a) Experience		
1.	Having completed/ongoing atleast 02 sizeable Construction Projects of worth 10 (M) related to Civil Works in last 10 years.	Mandatory
b) Personnel Capability		
1.	Site Engineer Minimum BE Civil having an Experience of atleast 10 years	Mandatory
2.	Site Supervisor Minimum DAE Civil having an Experience of atleast 15 years	

NOTE: **JV is Not Allowed.**

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SCHEDULE – C TO BID

WORKS TO BE PERFORMED BY SUBCONTRACTORS

The bidder will do the work with his own forces except the work listed below which he intends to sub-contract.

Items of Works to be Sub-Contracted	Name and address of Sub-Contractors	Statement of similar works previously executed (attach evidence)

Deleted

Note:

1. No change of Sub-Contractors shall be made by the bidder without prior approval of the Employer.

2. The truthfulness and accuracy of the statement as to the experience of Sub-Contractors is guaranteed by the bidder. The Employer's judgment shall be final as to the evaluation of the experience of Sub-Contractors submitted by the bidder.

3. Statement of similar works shall include description, location & value of works, year completed and name & address of the clients.

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SCHEDULE – D TO BID

PROPOSED PROGRAMME OF WORKS

Bidder shall provide a programme in a bar-chart showing the sequence of work items by which he proposes to complete the civil Works of the entire Contract. The programme should indicate the sequence of work items and the period of time during which he proposes to complete the civil Works including the activities like methodology / sequence of civil works to be carried out, arrangement of skilled manpower, Mechanical equipments and their useage, procurement of materials, manufacturing, delivering, construction of civil works, erection, testing and commissioning of works to be performed under the contract.

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SCHEDULE – E TO BID

METHOD OF PERFORMING WORKS

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

- The sequence and methods in which he proposes to carry out the civil Works, including the number of shifts per day and hours per shift, he expects to work.
- A list of all major items of machinery, tools and plants, floating barges and vehicles proposed to be used in delivering/carrying out the civil Works at Site
- The procedure for installation of equipment and transportation of equipment and materials to the site.
- Organisation chart indicating head office & field office personnel involved in management, supervision and engineering of the civil Works to be done under the Contract.

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SCHEDULE – F TO BID

(INTEGRITY PACT)

DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC. PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES & WORKS IN CONTRACTS WORTH RS. 10.00 MILLION OR MORE

Contract No._____ Dated _____
Contract Value: _____
Contract Title: _____

…… [name of Supplier] 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 Supplier] 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 Supplier] 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 and will not take any action to circumvent the above declaration, representation or warranty.

[name of Supplier] 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 Supplier] 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 Supplier] 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 Buyer: …… Name of Seller/Supplier: ……

Signature: …… Signature: ……

[Seal] [Seal]

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CONDITIONS OF CONTRACT

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CONDITIONS OF CONTRACT

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CONDITIONS OF CONTRACT

1. GENERAL PROVISIONS

1.1 Definitions

In the Contract as defined below, the words and expressions defined shall have the following meanings assigned to them, except where the context requires otherwise:

The Contract

1.1.1 "Contract" means the Contract Agreement and the other documents listed in the Contract Data.

1.1.2 "Specifications" means the document as listed in the Contract Data, including Employer's requirements in respect of design to be carried out by the Contractor (if any), and any Variation to such document.

1.1.3 "Drawings" means the Employer's drawings of the Works as listed in the Contract Data, and any Variation to such drawings.

Persons

1.1.4 "Employer" means the person named in the Contract Data and the legal successors in title to this person, but not (except with the consent of the Contractor) any assignee.

1.1.5 "Contractor" means the person named in the Contract Data and the legal successors in title to this person, but not (except with the consent of the Employer) any assignee.

1.1.6 "Party" means either the Employer or the Contractor.

Dates, Times and Periods

1.1.7 "Commencement Date" means the date fourteen (14) days after the date the Contract comes into effect or any other date named in the Contract Data.

1.1.8 "Day" means a calendar day

1.1.9 "Time for Completion" means the time for completing the Works as stated in the Contract Data (or as extended under Sub-Clause 7.3), calculated from the Commencement Date.

Money and Payments

1.1.10 "Cost" means all expenditure properly incurred (or to be incurred) by the Contractor, whether on or off the Site, including overheads and similar charges but does not include any allowance for profit.

Other Definitions

1.1.11 "Contractor's Equipment" means all machinery, apparatus and other things required for the execution of the civil of Piot Per but does not include Materials or Plant intended to form part of the civil Works.

1.1.12 "Country" means the Islamic Republic of Pakistan.

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1.1.13 "Employer's Risks" means those matters listed in Sub-Clause 6.1.

1.1.14 "Force Majeure" means an event or circumstance which makes performance of a Party's obligations illegal or impracticable and which is beyond that Party's reasonable control.

1.1.15 'Materials" means things of all kinds (other than Plant) to be supplied and incorporated in the Works by the Contractor.

1.1.16 "Plant" means the machinery and apparatus intended to form or forming part of the civil Works.

1.1.17 "Site" means the places provided by the Employer where the Works are to be executed, and any other places specified in the Contract as forming part of the Site.

1.1.18 "Variation" means a change which is instructed by the Engineer/Employer under Sub-Clause 10.1.

1.1.19 'Works" means the works for construction of Maintenance / Repair To Guard Room Generator Room Projection of Hut & Allied Repair Work To KPT Hut 97/98-S at Sandspit Manora be performed by the Contractor including any temporary works thereof.

1.1.20 "Engineer" means the person notified by the Employer to act as Engineer for the purpose of the Contract and named as such in Contract Data.

1.2 **Interpretation**

Words importing persons or parties shall include firms and organisations. Words importing singular or one gender shall include plural or the other gender where the context requires.

1.3 **Priority of Documents**

The documents forming the Contract are to be taken as mutually explanatory of one another. If an ambiguity or discrepancy is found in the documents, the priority of the documents shall be in accordance with the order as listed in the Contract Data.

1.4 **Law**

The law of the Contract is the relevant Law of Islamic Republic of Pakistan.

1.5 **Communications**

All Communications related to the Contract shall be in English language.

1.6 **Statutory Obligations**

The Contractor shall comply with the Laws of Islamic Republic of Pakistan and shall give all notices and pay all fees and other charges in respect of the Works.

2. THE EMPLOYER

2.1 **Provision of Site**

The Employer shall provide the Site and right of access thereto at the times stated in the Contract Data.

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2.2 **Permits etc.**

The Employer shall, if requested by the Contractor, assist him in applying for permits, licences or approvals which are required for the Works.

2.3 **Engineer's/Employer's Instructions**

The Contractor shall comply with all instructions given by the Employer or the Engineer, if notified by the Employer, in respect of the Works including the suspension of all or part of the Works.

2.4 **Approvals**

No approval or consent or absence of comment by the Engineer/Employer shall affect the Contractor's obligations.

3. ENGINEER'S/EMPLOYER'S REPRESENTATIVES

3.1 **Authorised Person**

The Employer shall appoint a duly authorized person to act for him and on his behalf for the purposes of this Contract. Such authorized person shall be duly identified in the Contract Data or otherwise notified in writing to the Contractor as soon as he is so appointed. In either case the Employer shall notify the Contractor, in writing, the precise scope of the authority of such authorized person at the time of his appointment.

3.2 **Engineer's/Employer's Representative**

The name and address of Engineer's/Employer's Representative is given in Contract Data. However the Contractor shall be notified by the Engineer/Employer, the delegated duties and authority before the Commencement of Works.

4. THE CONTRACTOR

4.1 **General Obligations**

The Contractor shall carry out the Works properly and in accordance with the Contract. The Contractor shall provide all supervision, labour, Materials, Plant and Contractor's Equipment which may be required.

4.2 **Contractor's Representative**

The Contractor shall appoint a representative at site on full time basis to supervise the execution of work and to receive instructions on behalf of the Contractor but only after obtaining the consent of the Employer for such appointment which consent shall not be unreasonable withheld by the Employer. Such authorized representative may be substituted/replaced by the Contractor at any time during the Contract Period but only after obtaining the consent of the Employer as aforesaid.

4.3 **Subcontracting**

The Contractor shall not subcontract the whole of the Works. The Contractor shall not subcontract any part of the Works without the consent of the Employer.

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4.4 **Performance Security**

The Contractor shall furnish to the Employer within fourteen (14) days after receipt of Letter of Acceptance a Performance Security at the option of the bidder, in the form of Bank Draft or Bank Guarantee or an insurance company having alteast AA rating from PACRA/JCR for the amount and validity specified in Contract Data.

5. DESIGN BY CONTRACTOR

5.1 **Contractor's Design**

The Contractor shall carry out design to the extent specified, as referred to in the Contract Data. The Contractor shall promptly submit to the Engineer/Employer all designs prepared by him. Within fourteen (14) days of receipt the Engineer/Employer shall notify any comments or, if the design submitted is not in accordance with the Contract, shall reject it stating the reasons. The Contractor shall not construct any element of the Works designed by him within fourteen (14) days after the design has been submitted to the Engineer/Employer or which has been rejected. Design that has been rejected shall be promptly amended and resubmitted. The Contractor shall resubmit all designs commented on taking these comments into account as necessary.

5.2 **Responsibility for Design**

The Contractor shall remain responsible for his bided design and the design under this Clause, both of which shall be fit for the intended purposes defined in the Contract and he shall also remain responsible for any infringement of any patent or copyright in respect of the same. The Engineer/Employer shall be responsible for the Specifications and Drawings.

6. EMPLOYER'S RISKS

6.1 **The Employer's Risks**

The Employer's Risks are:-

a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies, within the Country**;**
b) rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war, within the Country**;**
c) riot, commotion or disorder by persons other than the Contractor's personnel and other employees including the personnel and employees of Sub-Contractors, affecting the Site and/or the Works**;**
d) ionising radiations, or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive nuclear assembly or nuclear component of such an assembly, except to the extent to which the Contractor/Sub-Contractors may be responsible for the use of any radio-active material**;**
e) Pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds**;**
f) use or occupation by the Employer of any part of the Works, except as may be specified in the Contract**;**
g) late handing over of sites, anomalies in drawings, late delivery of designs and drawings of any part of the Works by the Employer's personnel or by others for whom the Employer is responsible;
h) a suspension under Sub-Clause 2.3 unless it is attributable to the Contractor's failure; and
i) physical obstructions or physical conditions other than climatic conditions, encountered on the Site during the performance of the Works, for which the Contractor immediately notified to the Employer and accepted by the Employer.

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7. TIME FOR COMPLETION

7.1 Execution of the Works

The Contractor shall commence the Works on the Commencement Date and shall proceed expeditiously and without delay and shall complete the Works, subject to Sub-Clause 7.3 below, within the Time for Completion.

7.2 Programme

Within the time stated in the Contract Data, the Contractor shall submit to the Engineer/Employer a programme for the Works in the form stated in the Contract Data.

7.3 Extension of Time

The Contractor shall, within such time as may be reasonable under the circumstances, notify the Employer/Engineer of any event(s) falling within the scope of Sub-Clause 6.1 or 10.3 of these Conditions of Contract and request the Employer/Engineer for a reasonable extension in the time for the completion of Works. Subject to the aforesaid, the Employer/Engineer shall determine such reasonable extension in the time for the completion of Works as may be justified in the light of the details/particulars supplied by the Contractor in connection with the such determination by the Employer/Engineer within such period as may be prescribed by the Employer/Engineer for the same; and the Employer shall extend the Time for Completion as determined.

7.4 Late Completion

If the Contractor fails to complete the Works within the Time for Completion, the Contractor's only liability to the Employer for such failure shall be to pay the amount stated in the Contract Data for each day for which he fails to complete the Works.

8. TAKING-OVER

8.1 Completion

The Contractor may notify the Engineer/Employer when he considers that the Works are complete.

8.2 Taking-Over Notice

Within fourteen (14) days of the receipt of the said notice of completion from the Contractor the Employer/Engineer shall either takeover the completed Works and issue a Certificate of Completion to that effect or shall notify the Contractor his reasons for not taking-over the Works. While issuing the Certificate of Completion as aforesaid, the Employer/Engineer may identify any outstanding items of work which the Contractor shall undertake before submitting his final invoice.

9. REMEDYING DEFECTS

9.1 Remedying Defects

The Contractor shall for a period stated in the Contract Data from the date of issue of the Certificate of Completion carry out, at no cost to the Employer, repair and rectification work which is necessitated by the earlier execution of poor quality of work or use of below specifications material in the execution of Works and which is so identified by the Employer/Engineer in writing within the said period. Upon expiry of the said period, and subject to the Contractor's faithfully performing his aforesaid obligations, the Employer/Engineer shall issue a Maintenance Certificate whereupon all obligations of the Contractor under this Contract shall come to an end.

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Failure to remedy any such defects or complete outstanding work within a reasonable time shall entitle the Employer to carry out all necessary works at the Contractor's cost. However, the cost of remedying defects not attributable to the Contractor shall be valued as a Variation.

9.2 **Uncovering and Testing**

The Engineer/Employer may give instruction as to the uncovering and/or testing of any work. Unless as a result of an uncovering and/or testing it is established that the Contractor's design, Materials, Plant or workmanship are not in accordance with the Contract, the Contractor shall be paid for such uncovering and/or testing as a Variation in accordance with Sub-Clause 10.2.

10. VARIATIONS AND CLAIMS

10.1 **Right to Vary**

The Employer/Engineer may issue Variation Order(s) in writing. Where for any reason it has not been possible for the Employer/Engineer to issue such Variations Order(s), the Contractor may confirm any verbal orders given by the Employer/Engineer in writing and if the same are not refuted/denied by the Employer/Engineer within seven (7) days of the receipt of such confirmation the same shall be deemed to be a Variation Orders for the purposes of this Sub-Clause.

10.2 **Valuation of Variations**

Variations shall be valued as follows:

a) at a lump sum price agreed between the Parties, or

b) where appropriate, at rates in the Contract, or

c) in the absence of appropriate rates, the rates in the Contract shall be used as the basis for valuation, or failing which

d) at appropriate new rates, as may be agreed or which the Engineer/Employer considers appropriate, or

e) if the Engineer/Employer so instructs, at day work rates set out in the Contract Data for which the Contractor shall keep records of hours of labour and Contractor's Equipment, and of Materials, used.

10.3 **Early Warning**

The Contractor shall notify the Engineer/Employer in writing as soon as he is aware of any circumstance which may delay or disrupt the Works, or which may give rise to a claim for additional payment.

To the extent of the Contractor's failure to notify, which results to the Engineer/Employer being unable to keep all relevant records or not taking steps to minimise any delay, disruption, or Cost, or the value of any Variation, the Contractor's entitlement to extension of the Time for Completion or additional payment shall be reduced/rejected.

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10.4. **Valuation of Claims**

If the Contractor incurs Cost as a result of any of the Employer's Risks, the Contractor shall be entitled to the amount of such Cost. If as a result of any Employer's Risk, it is necessary to change the Works, this shall be dealt with as a Variation subject to Contractor's notification for intention of claim to the Engineer/Employer within fourteen (14) days of the occurrence of cause.

10.5 **Variation and Claim Procedure**

The Contractor shall submit to the Engineer/Employer an itemised make-up of the value of variations and claims within twenty eight (28) days of the instruction or of the event giving rise to the claim. The Engineer/Employer shall check and if possible agree the value. In the absence of agreement, the Employer shall determine the value.

11. CONTRACT PRICE AND PAYMENT

11.1 (a) **Terms of Payments**

The amount due to the Contractor under any Interim Payment Certificate issued by the Engineer pursuant to this Clause, or to any other terms of the Contract, shall , subject to Clause 47, be paid by the Employer to the Contractor within 30 days after such Interim Payment Certificate has been jointly verified by Employer and Contractor, or, in the case of the Final Certificate referred to in Sub Clause 60.8, within 60 days after such Final Payment Certificate has been jointly verified by Employer and Contractor; Provided that the Interim Payment shall be caused in 42 days and Final Payment in 60 days in case of foreign funded project. In the event of the failure of the Employer to make payment within the times stated, the Employer shall pay to the Contractor compensation at the 28 days rate of KIBOR+2% per annum in local currency and LIBOR+1% for foreign currency, upon all sums unpaid from the date by which the same should have been paid. The provisions of this Sub-Clause are without prejudice to the Contractor's entitlement under Clause 69.

(b) **Valuation of the Works**

The Works shall be valued as provided for in the Contract Data, subject to Clause 10.

11.2 **Monthly Statements**

The Contractor shall be entitled to be paid at monthly intervals:

a) The value of the Works executed; and

b) The percentage of the value of Materials and Plant reasonably delivered to the Site, as stated in the Contract Data, subject to any additions or deductions which may be due.

The Contractor shall submit each month to the Engineer/Employer a statement showing the amounts to which he considers himself entitled.

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11.3 **Interim Payments**

Within a period not exceeding seven (7) days from the date of submission of a statement for interim payment by the Contractor, the Engineer shall verify the same and within a period not exceeding thirty (30) days from the said date of submission by the Contractor, the Employer shall pay to the Contractor the sum verified by the Engineer less retention money at the rate stated in the Contract Data.

11.4 **Retention**

Retention money shall be paid by the Employer to the Contractor within fourteen (14) days after either the expiry of the period stated in the Contract Data, or the remedying of notified defects, or the completion of outstanding work, all as referred to in Sub-Clause 9.1, which ever is the later.

11.5 **Final Payment**

Within twenty one (21) days from the date of issuance of the Maintenance Certificate the Contractor shall submit a final account to the Engineer to verify and the Engineer shall verify the same within fourteen (14) days from the date of submission and forward the same to the Employer together with any documentation reasonably required to enable the Employer to ascertain the final contract value.

Within sixty (60) days from the date of receipt of the verified final account from the Engineer, the Employer shall pay to the Contractor any amount due to the Contractor. While making such payment the Employer may, for reasons to be given to the Contractor in writing, withhold any part or parts of the verified amount.

11.6 **Currency**

Payment shall be in the currency stated in the Contract Data.

12. DEFAULT

12.1 **Default by Contractor**

If the Contractor abandons the Works, refuses or fails to comply with a valid instruction of the Engineer/Employer or fails to proceed expeditiously and without delay, or is, despite a written complaint, in breach of the Contract, the Employer may give notice referring to this Sub-Clause and stating the default.

If the Contractor has not taken all practicable steps to remedy the default within fourteen (14) days after receipt of the Employer's notice, the Employer may by a second notice given within a further twenty one (21) days, terminate the Contract. The Contractor shall then demobilise from the Site leaving behind any Contractor's Equipment which the Employer instructs, in the second notice, to be used for the completion of the Works at the risk and cost of the Contractor.

12.2 **Default by Employer**

If the Employer fails to pay in accordance with the Contract, or is, despite a written complaint, in breach of the Contract, the Contractor may give notice referring to this Sub-Clause and stating the default. If the default is not remedied within fourteen (14) days after the Employer's receipt of this notice, the Contractor may suspend the execution of all or parts of the Works.

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If the default is not remedied within twenty eight (28) days after the Employer's receipt of the Contractor's notice, the Contractor may by a second notice given within a further twenty one (21) days, terminate the Contract. The Contractor shall then demobilise from the Site.

12.3 **Insolvency**

If a Party is declared insolvent under any applicable law, the other Party may by notice terminate the Contract immediately. The Contractor shall then demobilise from the Site leaving behind, in the case of the Contractor's insolvency, any Contractor's Equipment which the Employer instructs in the notice is to be used for the completion of the Works.

12.4 **Payment upon Termination**

After termination, the Contractor shall be entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and Plant reasonably delivered to the Site, adjusted by the following:

a) any sums to which the Contractor is entitled under Sub-Clause 10.4,

b) any sums to which the Employer is entitled,

c) if the Employer has terminated under Sub-Clause 12.1 or 12.3, the Employer shall be entitled to a sum equivalent to twenty percent (20%) of the value of parts of the Works not executed at the date of the termination, and

d) if the Contractor has terminated under Sub-Clause 12.2 or 12.3, the Contractor shall be entitled to the cost of his demobilisation together with a sum equivalent to ten percent (10%) of the value of parts of the Works not executed at the date of termination.

The net balance due shall be paid or repaid within twenty eight (28) days of the notice of termination.

13. RISKS AND RESPONSIBILITIES

13.1 **Contractor's Care of the Works**

Subject to Sub-Clause 9.1, the Contractor shall take full responsibility for the care of the Works from the Commencement Date until the date of the Employer's/Engineer's issuance of Certificate of Completion under Sub-Clause 8.2. Responsibility shall then pass to the Employer. If any loss or damage happens to the Works during the above period, the Contractor shall rectify such loss or damage so that the Works conform with the Contract.

Unless the loss or damage happens as a result of any of the Employer's Risks, the Contractor shall indemnify the Employer, or his agents against all claims loss, damage and expense arising out of the Works.

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13.2 **Force Majeure**

If Force Majeure occurs, the Contractor shall notify the Engineer/Employer immediately. If necessary, the Contractor may suspend the execution of the Works and, to the extent agreed with the Employer demobilise the Contractor's Equipment.

If the event continues for a period of eighty four (84) days, either Party may then give notice of termination which shall take effect twenty eight (28) days after the giving of the notice.

After termination, the Contractor shall be entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and Plant reasonably delivered to the Site, adjusted by the following:

a) any sums to which the Contractor is entitled under Sub-Clause 10.4,

b) the cost of his demobilization, and

c) less any sums to which the Employer is entitled.

The net balance due shall be paid or repaid within thirty five (35) days of the notice of termination.

14. INSURANCE

14.1 **Arrangements**

The Contractor shall, prior to commencing the Works, effect insurances of the types, in the amounts and naming as insured the persons stipulated in the Contract Data except for items (a) to (e) and (i) of the Employer's Risks under Sub-Clause 6.1. The policies shall be issued by insurers and in terms approved by the Employer. The Contractor shall provide the Engineer/Employer with evidence that any required policy is in force and that the premiums have been paid.

14.2 **Default**

If the Contractor fails to effect or keep in force any of the insurances referred to in the previous Sub-Clause, or fails to provide satisfactory evidence, policies or receipts, the Employer may, without prejudice to any other right or remedy, effect insurance for the cover relevant to such as a default and pay the premiums due and recover the same plus a sum in percentage given in Contractor Data from any other amounts due to the Contractor.

15. RESOLUTION OF DISPUTES

15.1 **Engineer's Decision**

If a dispute of any kind whatsoever arises between the Employer and the Contractor in connection with the Works, the matter in dispute shall, in the first place, be referred in writing to the Engineer, with a copy to the other party. Such reference shall state that it is made pursuant to this Clause. No later than the twenty eight (28) days after the day on which he received such reference, the Engineer shall give notice of his decision to the Employer and the Contractor.

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Unless the Contract has already been repudiated or terminated, the Contractor shall, in every case, continue to proceed with the Work with all due diligence, and the Contractor and the Employer shall give effect forthwith to every such decision of the Engineer unless and until the same shall be revised, as hereinafter provided in an arbitral award.

15.2 **Notice of Dissatisfaction**

If a Party is dissatisfied with the decision of the Engineer or if no decision is given within the time set out in Sub-Clause 15.1 hereabove, the Party may give notice of dissatisfaction referring to this Sub-Clause within fourteen (14) days of receipt of the decision or the expiry of the time for the decision. If no notice of dissatisfaction is given within the specified time, the decision shall be final and binding on the Parties. If notice of dissatisfaction is given within the specified time, the decision shall be binding on the Parties who shall give effect to it without delay unless and until the decision of the Engineer is revised by an arbitrator.

15.3 **Arbitration**

A dispute which has been the subject of a notice of dissatisfaction shall be finally settled as per provisions of Arbitration Act 1940 (Act No. X of 1940) and Rules made thereunder and any statutory modifications thereto. Any hearing shall be held at the place specified in the Contract Data and in the language referred to in Sub-Clause 1.5.

16 INTEGRITY PACT

16.1 If the Contractor, or any of his Sub-Contractors, agents or servants is found to have violated or involved in violation of the Integrity Pact signed by the Contractor as Schedule-F to his Bid, then the Employer shall be entitled to:

(a) 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 Sub-Contractors, agents or servants;

(b) terminate the Contract; and

(c) 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 Sub-Contractors, agents or servants.

On termination of the Contract under Sub-Para (b) of this Sub-Clause, the Contractor shall demobilize from the Site leaving behind Contractor's Equipment which the Employer instructs, in the termination notice, to be used for the completion of the Works at the risk and cost of the Contractor. Payment upon such termination shall be made under Sub-Clause 12.4, in accordance with Sub-Para (c) thereof, after having deducted the amounts due to the Employer under Sub-Para (a) and (c) of this Sub-Clause.

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CONTRACT DATA

Sub-Clauses of

Conditions of Contract

1.1.3 Employer's Drawings, if any

(To be listed by the Employer)

1.1.4 **The Employer** means

Karachi Port Trust

1.1.5 **The Contractor** means

Bidder

1.1.7 **Commencement Date** means the date of issue of Engineer's Notice to Commence which shall be issued within fourteen (14) days of the signing of the Contract Agreement.

1.1.20 **Engineer**

The Chief Engineer,

Karachi Port Trust.

1.3 **Documents forming the Contract listed in the order of priority:**

(a) The Contract Agreement
(b) Letter of Acceptance
(c) The completed Form of Bid
(d) Contract Data
(e) Conditions of Contract
(f) The completed Schedules to Bid including Schedule of Prices
(g) The Drawings, if any
(h) The Specifications

2.1 **Provision of Site:** On the Commencement Date

3.1 **Authorised person :** Executive Engineer (S), KPT

3.2 **Name and address of Engineer's/Employer's representative**

The Chief Engineer, KPT

2nd Floor KPT Head Office Building,

Eduljee Dinshaw Road, M.A Jinnah Road Karachi.

Ph#021-99214318

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4.2 This Clause Is Deleted In It Entirty.

4.4 **Performance Security:**

The clause is deleted and substituted as following:

"The Contractor shall furnish performance security of 5% of the contract price to the Employer within fourteen (14) days after receipt of Letter of Acceptance a Performance Security in the form of Bank Draft / Pay Order only.

- Validity 12 Months.

7.2 **Programme:**

Time for submission: Within fourteen (14) days* of the Commencement Date.

Form of programme: Bar Chart/CPM/PERT using MS Project / Primavera.

7.4 **Late Completion:**

Amount payable due to failure to complete shall be of Rs. 4,795/- PKR per day of delay upto a maximum cap of 10% of the contract price.

8. Taking Over

The performance security shall remain valid beyond 60 days after the issuance of Completion / Taking Over Certificate. This security shall be released upon successful issuance of the Completion Certificate.

9.1 Deleted in its entirity.

9.2 Deleted in its entirity.

11.1 ***(a) Terms of Payments**

The clause is deleted and substituted as following:

Payment of Contract Price shall be made in the following manners**:**

The amount due to the Contractor under any Interim Payment Certificate issued by the Engineer pursuant to this Clause, or to any other terms of the Contract, shall , subject to Clause 47, be paid by the Employer to the Contractor within 60 days after such Interim Payment Certificate has been jointly verified by Employer and Contractor, or, in the case of the Final Certificate referred to in Sub Clause 60.8, within 90 days after such Final Payment Certificate has been jointly verified by Employer and Contractor.

11.2 Deleted in its entireity.

11.3 The clause is deleted and substituted as following:

Within a period not exceeding seven (7) days from the date of submission of a statement for interim payment by the Contractor, the Engineer shall verify the same and within

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a period not exceeding thirty (30) days from the said date of submission by the Contractor, the Employer shall pay to the Contractor the sum verified by the Engineer less retention money at the rate stated in the Contract Data.

The Price adjustment should be given as perfollowing formula:

Adjustment Formula

The adjustment to the monthly statements in respect of changes in cost shall be determined from the following formula:-

$$Pn = A + b\frac{Ln}{Lo} + c\frac{Mn}{Mo} + d\frac{En}{Eo} + \ldots\ldots\ldots\ldots\ldots$$

Where:

Pn is a price adjustment factor to be applied to the amount for the payment of the work carried out in the subject month.

A is a constant, specified in (f) weightages, representing the nonadjustable portion in contractual payments;

b, c, d, etc., are weightages or coefficients representing the estimated proportion of each cost element (labour, cement and reinforcing steel etc.) in the Works or Sections thereof, net of Provisional Sums and Prime Cost; the sum of A, b, c, d, etc., shall be one;

Ln, Mn, En, etc., are the current cost indices or reference prices of the cost elements for month "n", determined pursuant to Sub-Clause (d), applicable to each cost element; and

Lo, Mo, Eo, etc., are the base cost indices or reference prices corresponding to the above cost elements at the date specified in Sub-Clause (d).

(c) Sources of Indices and Weightages

The sources of indices shall be those listed in (f), as approved by the Engineer. As the proposed basis for price adjustment, the Contractor shall have submitted with his bid the tabulation of Weightages and Source of Indices if different than those given in (f), which shall be subject to approval by the Engineer.

(d) Base, Current, and Provisional Indices

The base cost indices or prices shall be those prevailing on the day 28 days prior to the latest date for submission of bids. Current indices or prices shall be those prevailing on the day 28 days prior to the last day of the period to which a particular monthly statement is related. If at any time the current indices are not available, provisional indices as determined by the Engineer will be used, subject to subsequent correction of the amounts paid to the Contractor when the current indices become available.

(e) Adjustment after Completion

No Adjustment will be applicable after completion of the project.

(f) Weightages

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PRICE ADJUSTMENT UNDER CLAUSE 70 OF CONDITIONS OF CONTRACT

The source of indices and the weightages or coefficients for use in the adjustment formula under Clause 70 shall be as follows:

(To be filled by the Employer)

Cost	Description	Weightages	Applicable index
1	2	3	4
(i)	Fixed Portion	0.30	
(ii)	Local Labour	0.10	Government of Pakistan (GP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin.
(iii)	Cement – in bags	0.20	" " "
(iv)	Steel	0.20	" " "
(v)	High Speed Diesel (HSD)	0.00	" " "
(vi)	Bricks/Blocks	0.10	" " "
(vii)	Bitumen	0.00	" " "
(viii)	Aggregates	0.10	
	Total	1.000	

Notes:

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

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

3) Fixed portion shown here is for subject project, Employer to determine the weightage of Fixed Portion considering only those cost elements having cost impact of seven (7) percent or more on his specific project.

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11.4 **Retention**

Rentention Money will be an amount equal to 5% of bid price / Contract value.

The Defects liability period will be 365 days.

11.6 **Currency of payment:** Pak. Rupees

12.4 The clause is deleted in its entirety

14.1 **Insurances:**

All sort of insuarance pertaining to health and safety of workers and workplace on the site along with equipments shall be borne by the contractor himself.

15.3 **Arbitration**

Place of Arbitration: Karachi

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STANDARD FORMS

(Note: Standard Forms provided in this document for securities are to be issued by a bank. In case the bidder chooses to issue a bond for accompanying his bid or performance of contract or receipt of advance, the relevant format shall be tailored accordingly without changing the spirit of the Forms of securities).

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FORM OF PERFORMANCE SECURITY

(Bank Guarantee)

Guarantee No._____
Executed on _____

(Letter by the Guarantor to the Employer)

Name of Guarantor (Scheduled Bank in Pakistan) 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, by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has accepted the Employer's above said Letter of Acceptance dated _____ (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 the said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause 9, Remedying Defects, 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.

Deleted

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NOW THEREFORE, if the successful bidder shall, within the period specified therefore, on the prescribed form presented to him for signature enter into a formal Contract Agreement with the said Employer in accordance with his Bid as accepted and furnish within fourteen (14) days of receipt of Letter of Acceptance, 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 withdrawal of the said Bid within the time specified then this obligation shall be void and of no effect but otherwise to remain in full force and effect.

Deleted

PROVIDED THAT the Guarantor shall forthwith pay to the Employer the said sum stated above upon first written demand of the Employer without caviling and demur and without requiring the Employer to prove or to show grounds or reasons for such demand or otherwise and shall be sent by the Employer by registered post duly addressed to the Guarantor at the address given above.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal has duly performed his obligations to sign the Contract Agreement and to furnish the requisite Performance Security within the time stated or has defaulted in fulfilling said requirements and the Guarantor shall pay without objection the sum 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 bounded Guarantor has executed the instrument under its seal on the date indicated above, the name and seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

_____

Guarantor (Bank)

Witness:

1. _____

_____

Corporate Secretary (Seal)

2. _____

_____

(Name, Title & Address)

1. Signature _____

2. Name _____

3. Title _____

Corporate Guarantor (Seal)

Note:

Bid security fixed Rs 140,000.00 in shape of Pay order of Scheduled banks in favor of Chief Accounts officer, KPT at the time of submission of Bid

Remaining amount will be deducted through the interim payment certificates.

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FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the _____ day of _____ 202 _____ 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 witnesseth as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents after incorporating addenda, if any except those parts relating to Instructions to Bidders, shall be deemed to form and be read and construed as part of this Agreement, viz:
   (a) The Letter of Acceptance;
   (b) The completed Form of Bid alongwith Schedules to Bid;
   (c) Conditions of Contract & Contract Data;
   (d) The priced Schedule of Prices;
   (e) The Specifications; and
   (f) The Drawings

3. 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 within the provisions of the Contract.

4. 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 Contract Agreement to be executed on the day, month and year first before written in accordance with their respective laws.

Signature of the Contactor	Signature of the Employer
_____	_____
(Seal)	(Seal)

Signed, Sealed and Delivered in the presence of:

Witness:	Witness:
_____	_____
(Name, Title and Address)	(Name, Title and Address)

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FORM OF BANK GUARANTEE FOR ADVANCE PAYMENT

Guarantee No._____

Executed on_____

(Letter by the Guarantor to the Employer)

WHEREAS the _____ (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 Rs._____ Rupees _____) which amount shall be advanced to the Contractor as per provisions of the Contract.

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

AND WHEREAS _____ (Scheduled Bank) (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.

Deleted

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

Notice in writing of any default, of which the Employer shall be the sole and final judge, as aforesaid, on the part of the Contractor, 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.

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This Guarantee shall come into force as soon as the advance payment has been credited to the account of the Contractor.

This Guarantee shall expire not later than _____

by which date we must have received any claims by registered letter, telegram, telex or telefax.

It is understood that you will return this Guarantee to us on expiry or after settlement of the total amount to be claimed hereunder.

_____

Guarantor (Scheduled Bank)

Witness:

1. _____ 1. Signature _____

_____ 2. Name _____

Corporate Secretary (Seal)

3. Title _____

2. _____

_____ _____

(Name, Title & Address) Corporate Guarantor (Seal)

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*DRAWINGS

* (Note: The Engineer/Employer may incorporate specific Drawings for bidding purposes only or may include the detailed drawings in a separate volume, if necessary).

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SPECIAL PROVISIONS

1. Proper following of EHS standards during the execution is to be ensured by the Contract.
2. The Contractor is liable to ensure all the insurances from worker safety / health to insurance of equipments.
3. All the services and setting up of Contractor Office facility on site shall be borne by the Contractor Himself (inclusive of Electricity required at site).

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SPECIFICATIONS
CIVIL WORKS

ITEM – 1 GENERAL

1.1 COMPONENT PARTS

The component parts of this contract i.e. Drawings, the Specifications, and Description of items/Bill of Quantities shall be read together, in accordance with assigned precedence as given elsewhere in the contract.

1.2 CLARIFICATION

Description of items of work in the Bills of Quantities are in the nature of specification and are deemed to be the part of these specification. In case the Contractor finds any conflict between the description of items and the detailed text in the volume of specifications the same shall be got clarified by him before submission of the bids whereupon an addendum might be issued to all the bidders. After award of work the discretion of interpretation and applicability shall rest with the Engineer whose decision shall be final and binding without any increase either in cost or completion time.

Any item for which no specifications have been laid down, but shown on drawings or added in future, shall be done in a workmanlike manner according to the pertinent standards as per ASTM/BSS (where ASTM not available). The engineer may supplement such specification during the progress of work. All materials and processes used for such an item shall be subjected to standard testing and, if found below the pertinent ASTM/British (where ASTM not available) Standards, shall be removed from the site immediately at Contractor's expenses.

ITEM – 2 SUBSOIL INVESTIGATION

The Contractor shall be deemed to have acquainted himself with the subsoil conditions on site and his rates shall fully cover all the works involved for excavation, dewatering and other factors affecting the works.

Where directed by the Engineer the Contractor shall hire a soil specialist as a Sub-contractor to drill 2 Nos. bore holes at the proposed site in natural soil 40 feet deep and at least 4 No. test pits, including mobilizing/demobilizing, carrying out standard penetration test at 3 ft intervals, collection, Grain size Analysis, Specific gravity, Bulk density, Unconfined Compression Direct Shear, Consolidation, Sulphate content & PH of Soil, Total Soluble salts & chlorides, compaction modified AASHTO and soaked CBR, all complete including submission of soil report etc. as per instruction/direction of the Engineer.

2.1 MEASUREMENT AND PAYMENT

No separate measurement or payment shall be made for above section. All costs and charges shall be deemed to have been included in the rates for related items of works.

ITEM - 3 CLEARING, GRUBBING & DISPOSAL

3.1 SCOPE OF WORK

The work covered by this section of Specifications consists of furnishing all labour, materials, necessary equipment, services, miscellaneous and necessary items required to satisfactorily complete the clearing, grubbing and setting out of the Works, as indicated on Drawings, specified herein or both, until and unless directed otherwise by the Engineer.

3.2 CLEARING

Clearing shall consist in the felling and cutting up, or trimming of trees if any and the satisfactory disposal of tree and other vegetation designated for removal, together with the down timber, snags, bushes, and rubbish occurring within the areas to be cleared. Trees, other vegetation, stumps, roots, and bushes in areas to be cleared shall be cut-off below the original ground to extract the roots except such individual trees, groups of trees and vegetation as may be indicated on the drawings or designated by the Engineer to be left standing. Individual trees, groups of trees, and other vegetation, to be standing, shall be thoroughly protected from damage incident to construction operations, by the erection of barriers or by such other means as the circumstances required, and as approved by the Engineer. Clearing operation shall be conducted so as not to cause any damage or harm to existing structures and installations and to those under construction, and so as to provide for the safety of employees and others.

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3.3 **GRUBBING**

Grubbing shall consist of the removal and disposal of all occurring stumps, roots larger than 1" in diameter, and matted roots in the designated grubbing areas, stumps, roots, logs or other timber more than 1 1/2" in diameter, matted roots and other debris, shall be excavated and removed to a depth not less than 18" below any subgrade, shoulder or slope. In areas where the cut is over 1m, grubbing shall not be necessary. In areas to be paved, or in areas indicated on the drawings as future paved areas, excess excavation from grading operations in places, or in areas designated by the Engineer as future paved areas where excess excavation from grading operations is placed, grubbing will be necessary.

3.4 **DISPOSAL**

Unless directed otherwise, timber and other refuse shall be disposed off by burning at locations approved by the Engineer in a manner that will avoid all hazards such as damage to existing structures, construction in progress, trees and vegetations. The Contractor shall be responsible for compliance with all pertinent laws and regulations pertaining to the burning of fires and observance of any security regulations applicable thereto, including envirmental laws under specific ordinance or rules.

Disposal by burning shall be kept under constant attendance until the fires have burned out or have been extinguished. No materials will be permitted to be pushed or placed on adjacent property without prior written approval of the owner of such property.

3.5 MEASUREMENT AND PAYMENT

No separate measurement or payment shall be made for above section. All costs and charges shall be deemed to have been included in the rates for related items of works.

ITEM - 4 SETTING OUT OF WORKS/DRAINAGE

4.1 **SETTING OUT OF WORKS**

The Contractor shall set out the Works and shall be responsible for true and perfect levels and setting out of the same and for correctness of the direction, levels, dimensions, and alignments of all parts thereof. If any error in this respect shall appear during the progress of the work, the Contractor shall at his own expense rectify such error to the satisfaction of the Engineer. Any checking by the Engineer shall not relieve the contractor from his complete unshared responsibility for correct setting out of works. The Contractor shall construct and maintain accurate bench marks so that the lines and levels could be easily checked by the Engineer.

4.2 **DRAINAGE DITCHES/DEWATERING**

The Contractor shall construct and maintain such ditches/drains, in addition to those shown on drawings or as may be ordered by the Engineer to adequately drain the areas under construction of the water from any source including sub-soil water in foundations. If due to any negligence the area is flooded the same shall be drained with adequate measures by the contractor at his own cost.

4.3 **MEASUREMENT AND PAYMENTS**

No direct payment for the above item will be made and will be treated as incidental to other items of work.

ITEM - 5 EXCAVATION, FILLING, BACKFILLING & DISPOSAL

5.1 **SCOPE OF WORK**

The work covered by this section of the Specifications consists of furnishing all plant, labour, equipment, appliances and materials & in performing all operations in connection with excavating, dewatering, filling, backfilling and disposal for all construction works and other foundations complete in strict accordance with this section of the specifications and the applicable drawings and subject to the terms and conditions of the Contract, notwithstanding any caving in of the trenches or filling in, etc.

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5.2 SUB-SOIL CONDITIONS

The Contractor shall be deemed to have acquainted himself, with the sub-soil conditions on site and his bid shall be fully covering the work involved.

The Contractor shall make his own deductions for sub-surface conditions which may affect methods or cost of constructions of the work and he shall make no claim whatsoever for damages or compensation, should he find conditions during the progress of the work, different from those as calculated and/or anticipated by him.

5.3 EXCAVATION

Excavation shall include the removal of all material of every name and nature. If rock is encountered it should be removed carefully and without excessive noise and vibration. Blasting shall only be undertaken with the permission of Engineer. In case the Engineer does not allow blasting it will not be a ground for extra rates or any payment in such a case to the Contractor.

The excavation shall conform to the dimensions and elevations as indicated on the drawings or as directed by the Engineer. Foundations on made up ground shall have to be taken down to natural bottom soil as per drawings, and direction and approval of the Engineer.

Excavation shall extend to a sufficient distance from wall and footings to allow for placing and removal of forms, installation of services and for inspection but the same shall not be paid separately in the event of any excavations being carried out wider or deeper than authorised, the same shall be filled in by the Contractor at his own cost to the required levels with lean concrete (1:4:8 mix) if below footing or beneath the slabs and with properly compacted well graded sand free from any deleterious matter as directed by the Engineer, if the excavation is wider than authorised.

In case any excavation is carried out and after the levels have been checked by the Engineer, the pits and trenches, thereafter, are filled with accumulated sand or debris from blowing windstorm, duststorms, moving sand dunes or by any other reasons thereof, the excavation or levelling shall have to be carried out again in the same manner as before unless and until concreting is done in the foundation/trenches. No separate payment shall be made on any such account.

Shoring and Bracing

The Contractor shall provide at his own cost, where required, all shoring, wall supports etc. to the sides of the excavation to prevent sliding or any movement. Where necessary, excavated sides shall be sloped as directed by the Engineer with no extra cost to the Employer.

Dewatering and Drainage

The Contractor shall control at his own cost all the grading in the vicinity of site of work in order to prevent any water from running into the excavated areas.

He shall at his own cost keep drop dry all pits and trenches during construction and all dewatering and pumping out whether due to ground water seepage or otherwise shall be included in the bid price. The method employed in all cases shall be approved and agreed by the Engineer.

Protection of Utility Lines

When any existing utility line, whether to be retained or to be removed, are encountered within the area of operation the Contractor shall notify the Employer/Engineer and shall not proceed until necessary measures are taken for protection or removal of the lines and instructions are obtained from the Engineer/Employer. This will be done at no extra cost to the Employer.

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5.4 FILL AND BACKFILL

Where concrete slabs, floors and pavements are to be placed on the ground any and all loam,organic and other unsuitable material shall be removed.

Fill where required to raise the subgrade for concrete slabs shall be clean, unadulterated, free from deleterious and organic substance and shall be free from wood, stones and other debris. In case sand shall be provided for filling, the same shall be clean and free from harmful substances.

All materials, where used in fill shall be compacted upto 95% modified AASHTO Density by power roller, mechanical rammer, or other approved equipment, in layers not more than 150 mm thick. In sand filling each layer shall be uniformly spread, saturated with water or dried and then compacted. Contractor shall arrange at his own cost the testing of the compaction.

After completion of foundation, footings, walls, slabs and other construction below the elevation of the final grades and prior to backfilling, forms shall be removed and excavation shall be cleaned of trash and debris. No backfilling shall be done until the entire foundations and footings etc. have been cured, inspected and approved by the Engineer. Backfill shall be placed in horizontal layers not more than 150 mm thick and shall have a proper moisture content for the required degree of compaction upto 95%. Each layer shall be compacted by mechanical tampers or by other suitable equipment approved by the Engineer. Backfill shall be brought to a suitable elevation above grade to provide for anticipated settlement and shrinkage thereof.

Backfill shall not be placed against foundation walls etc. prior to the damp proofing treatment if specified elsewhere in these documents or ordered later and after approval by the Engineer. Backfills shall be brought up evenly on each side of structures as far as practicable. Heavy equipment for spreading and compacting backfill shall not be operated closer to the structures less than distance equal to the height of the backfill above the top of footing.

The filling material shall be subject to the approval of the Engineer.

5.5 COMPACTION

Fill and/or backfill within the building or wherever required within the premises shall be compacted to a density of not less than 95% of the maximum density at optimum moisture content.

5.6 ROUGH GRADING

Necessary rough grading shall be carried out by the Contractor to establish the finish grade or construction requirements of the site, grades not otherwise indicated shall be uniform levels or slopes between points on existing and finished grades. Abrupt changes in slopes shall be rounded. Additional fill required to complete rough grading shall be provided as directed by the Engineer.

Where paving or slabs are specified, all rough grading shall be done to the sub-grade of the base course, removing all large stones and debris and shall be compacted uniformly to the correct lines and levels ready to receive the paving or slab. Refilling, where required shall be executed with suitable selected materials in layers not exceeding 150 mm in thickness and thoroughly compacted to the required density.

5.7 MEASUREMENT AND PAYMENT

Accepted quantities measured shall be paid at the contract unit price of net volume of excavation including backfill for the items listed below, and shown in bill of quantities which price and payment will constitute full compensation for all cost involved in proper completion of work.

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ITEM - 6 PLAIN AND REINFORCED CONCRETE

6.1 SCOPE OF WORK

The work covered by this section of the Specifications consists of furnishing all materials, formwork, plant, labour, equipment, appliances and in performing all operations in connection with plain and/or reinforced concrete work whether cast-in-situ or precast, complete in strict accordance with the applicable Drawings, and the Specifications and descriptions in Bills of quantities of the contract and as approved by the Engineer. Adequate arrangements and skilled manpower shall be provided to produce homogenous concrete without honeycomb and to correct levels, grades, alignment and plumb. Until and unless specified or directed otherwise by the Engineer all materials and workmanship shall be based on the latest versions of applicable ASTM Standard. Any defective work shall be removed and reconstructed without undue delay to the approval of the Engineer. Any previous checks by the Engineer shall not in any way relieve the Contractor of his responsibility in respect of quality and accuracy of work.

Full care shall be taken to install embedded items, and form ducts and openings etc. Embedded items shall have been inspected and check tests for concrete and other materials or for mechanical operations shall have been completed and approved before concrete is placed. The Contractor shall submit and shall be solely responsible for the accuracy of the bar bending schedules of reinforcement to be approved by the Engineer for guidance only prior to the cutting of reinforcement. All concrete work including reinforcement etc. shall be carried out in accordance with the applicable requirements of ACI-318-89 and the instructions of the Engineer.

Prior to the commencement of work on the Site, the Contractor shall prepare, for approval by the Engineer, a plan showing the proposed locations of the aggregate and sand stock piles, cement storage area, steel yard, shuttering yard, batching and mixing plant etc., and a schedule of equipment to be used for mixing, transporting and placing of the concrete. He shall also detail all sources of materials that he intends to incorporate in, and use for, the making of concrete, which sources shall be similarly, subject to the Engineer's approval.

6.2 MATERIALS

Cement

Grey portland cement shall be normal setting cement of approved make and source and of the specific gravity fineness and chemical composition fully conforming to British Standard Specifications B.S. No.12 and shall be capable of satisfying all tests such as the tensile strength tests contained therein. Standard test briquettes prepared with 1:3 cement-sand mortar shall give the following tensile strength:

At 3 days not less than 21 kg/sq.cm (2.1 N/sq.mm)

At 7 days not less than 28 kg/sq.mm (2.8 N/sq.mm)

Sulphate resistant cement where required shall be sulphate resistant portland cement of approved make fully conforming to British Standard Specification No. 4027 and satisfying the requirements for fineness, chemical composition, strength, setting time soundness, etc.ss

The supply of cement must be so programmed by the Contractor such that at no time the quantity of cement stock shall be less than that required for an average consumption of four weeks. Lorry or truck or other means of transportation, for the conveyance of cement to the site of work, shall be clean, dry, metal-lined and covered from top with water proof sheets, so that cement is sufficiently protected from any deterioration during transit.

The Contractor shall provide at his own cost on the site all necessary sheds which shall be perfectly dry and water tight for the storage of cement to be delivered to the work, to ensure adequate supplies being available for the work.

If any time the Engineer considers that any batch of cement may have deteriorated on site during storage for any reason, he will direct that tests shall be made and the batch of cement on the site which may be in question shall not be used until it has been shown by test at a laboratory, approved or appointed by the Engineer to be satisfactory. Contractor shall bear all costs of such testing. Any rejected cement shall be removed from the site by the Contractor without delay. Cement reclaimed from cleaning bags or leaking containers shall not be used.

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Cement shall be consumed in the sequence of receipt of shipments unless otherwise directed by the Engineer.

Aggregates

All fine and coarse aggregates to be used shall be supplied from approved sources which shall not be changed without permission in writing from the Engineer. Aggregate shall conform to the requirements of applicable ASTM C-33-82.

Fine Aggregate

Fine aggregates, shall be from an approved source of supply of a uniform quality conforming to ASTM C-33-82 and shall be clean and sharp and free from clay, earth vegetable and organic matters, alkaline or acid reactions or other deleterious salts or such harmful matters ad impurities and shall have dry specific gravity not less than 2.6 and %age absorption not greater than 2%.

Fine aggregates shall conform to the requirements of the relevant ASTM C-33-82 Specifications, and shall be graded as follows:

Sieve Number/Size	**%age (by weight) passing**
9.50 mm (3/8")	100
4.75 mm (No.4) 3/16"	95 - 100
2.36 mm (No.8) 3/32"	80 - 100
1.18 mm (No.16)3/64"	50 - 85
1.18 mm (No.30)	25 - 60
0.30 mm (No.50)	10 - 30
0.15 mm (No.100)	2 - 10

Fineness modulus of fine aggregate (sand) shall be not less than 2.3 and not more than 3.1.

Limits for deleterious substances of total sample shall be:

- Clay lumps and friable particles — Maximum 3.0% by weight
- Material passing No.200 sieve — Maximum 3.0% by weight
- Coal and lignite — Maximum 0.5% by weight

Weight loss of sand subjected to 5 cycles of soundness test when sodium sulphate is used shall not be greater than 10%.

Coarse Aggregate

Coarse aggregate shall be approved hard crushed stone from a source approved by the Engineer and shall be clean insert, hard, non-porous and free from laminated particles, sand, dust, salt, lime, chalk, clay organic impurities or other deleterious matter and shall have dry specific gravity not less than 2.6 and %age absorption not more than 2%.

Coarse aggregate shall also conform to gradation the requirements of ASTM C-33 and shall be graded as follows:

(Nominal Size of Graded Aggregates shall be 19mm down)

Sieve Number/Size	**%age (by weight) passing**
19.00 mm	90 - 100
12.50 mm	-
9.50 mm	20 - 55
4.75 mm	0 - 10
2.36 mm	0 - 5

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Weight loss of coarse aggregate when subjected to 5 cycles of soundness test using sodium sulphate shall not exceed 12% and %age loss for Los Angles Abrasion (500 revolutions) not greater than 50.

All aggregates shall be stored on properly constructed paving and in bins and there shall be a physical partition between the stock piles of coarse and fine aggregates. No mixed up aggregates shall be used in any concrete Under no circumstances aggregates shall be allowed to be in contact with ground.

Aggregates shall be screened and washed if required, to the satisfaction of the Engineer, before use by proper screening and washing plant. Adequate time is to be allowed, therefore, for the moisture content to become substantially uniform before use in works.

Water

Water to be used in the work shall be potable water and shall be free from all impurities whether suspended or dissolved. Further, the water shall not contain any chemical impurities, salts etc. of any kind. Water shall be tested for its fitness in works in accordance with AASHTO Method T26-51.

6.3 CLASSIFICATION OF CONCRETE

Classes of concrete to be used in various parts of the works shall be as indicated on the drawings and mentioned in the bill of quantities. The concrete of various grades shall be proportioned as set out in Table-1 below:

TABLE – 4

Type of Concrete	Max. Size of coarse aggregate	28 day compressive strength (cylinders)		Minimum Nos. of Cement Bags /100/Cft	Consistency (Range in Slump inches
		Laboratory	Field Cured		
		Kg/cm^2 (psi)	Kg/cm^2 (psi)		
Class A	21	330 (4680)	210 (3000)	24	2-3
Class B	20	204 (2900)	170 (2400)	17	2-3
Lean Concrete	51	120 (1700)	100 (1400)	13	-

6.4 PROPORTIONING OF CONCRETE MIXES

All concrete shall be proportioned by weight for design of concrete mixes, unless specifically agreed by the Engineer to proportion them by volume, which permission shall be given only if the arrangements made at site are satisfactory. The Contractor shall submit to the Engineer proposed mix designs for concrete to be used, based on preliminary laboratory test to determine proportion of cement, aggregates and water in the concrete conforming to the quality and strength requirements specified herein. Quantity of cement so arrived at shall be increased but not decreased from the minimum quantity of cement stated in Table-1 above. Preliminary test results of at least three different mixes of each class of concrete with varied water-cement ratios shall be submitted. The results of 7 days and 28 days cylinders tests shall be used to establish the ratio between 7 days and 28 days strengths of used concrete. The Engineer may order adjustments in the ratio of fine to coarse aggregate in the mix for a certain work which shall be done without additional cost. Preliminary design of mixes and testing shall be the responsibility of the Contractor at his own cost. The proportion of

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voids in the coarse aggregate shall be controlled and if it exceeds 45%, sand and consequently the cement shall be increased by the Contractor without any charge. If the proportion is less than 45%, sand shall be decreased but not the cement.

Maximum Allowable Water Content

All concrete specimens shall be made, cured and tested in accordance with ASTM Standard. A curve representing the relation between the water content and the average 28 days compressive strength or earlier strength at which the concrete is to receive its full working loading shall be established for a range of values including all the compressive strengths shown in the Drawings or in BOQ. The curve shall be established by at least four points, each point representing average values for at least four points, each point representing average values content for atleast four specimens. The maximum allowable water content for the concrete shall be as determined from this curve and shall correspond to a strength 15% greater than that required. However water cement ratio of 0.50 shall not be exceeded.

Slump Test

The slump for concrete, determined in accordance with ASTM C-143 Test for Concrete, shall be minimum of 25 mm and a maximum of 75 mm (normally 50 mm to be adopted) provided the requisite strength is obtained. Corrective additions to remedy deficiencies in aggregate gradations shall be used only with the written approval of the Engineer. When such additions are permitted, the material shall be measured separately for each batch of concrete.

6.5 MIXING WITH CONCRETE MIXERS (ELECTRIC/MECHANICAL OPERATED)

No hand mixing under any circumstances even with extra cement shall be permitted. If during concreting, the mixing plant fails, the concrete already poured shall be removed, unless directed otherwise by the Engineer. Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned before any further concrete is mixed.

The capacity and number of mixers provided by the Contractor shall be such as to meet requirements but without producing an appreciable excess concrete at any time. Special attention shall be devoted to this point in hot weather when the setting of concrete is considerably accelerated.

The volume of the mixed material per batch shall not exceed the manufacturer's rated capacity of the mixer.

To ensure that the concrete materials can be mixed most readily into a homogeneous mass, wherever possible the cement, aggregates and water should be fed into the drum simultaneously.

Each batch of materials including water shall be mixed in the drum of the mixer until the concrete is of uniform colour and consistency. The minimum time of mixing shall be three minutes for drum mixers. The mixing time shall be measured from the time all materials required for the batch, including water, are in the drum of the mixer.

The drum shall be completely emptied before recharging and any water retained in the mixing drum be completely discharged.

The mixing water shall be regularly sampled and tested for salt content and contamination.

On completion of each working period, the drum of the mixer shall be thoroughly cleaned and all adhering concrete shall be removed.

Concrete shall be discharged from the mixers and conveyed to the work in such a manner that no segregation or leakage of the constituent materials takes place. The method and equipment used for transporting concrete shall be subjected to the approval of the Engineer. The means of transportation shall ensure that the concrete is of the required quality at the point and time of placing.

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6.6 TRANSPORTING AND PLACING CONCRETE

Concrete shall be conveyed and deposited as quickly as possible after mixing and shall proceed so that, as far as possible, a complete section of the work is done in one operation. The concrete may be distributed in barrows, skips, chutes and by any other method such as pumps, conveyor belts etc. all to the approval of the Engineer.

Transport of concrete shall be in a manner approved by the Engineer and shall be so as to avoid segregation or loss of ingredients of concrete.

All foundations, superstructure and roofs and other portions of work to be concreted shall be approved by the Engineer in writing before concrete is poured. For this purpose a standard format shall be provided by the Engineer (called Pour Slip).

All forms and reinforcement shall be completed, cleaned, to be inspected and approved before pouring of concrete. No concrete is to be deposited till the Engineer has inspected and approved in writing all aggregates, cement, reinforcement, forms, details, positioning of all fixture and materials to be embedded in concrete, control levels and screeds, etc. and is satisfied with the arrangements the Contractor has made to efficiently proceed with the work such as sufficient labour, materials, plants etc. Such an approval will not relieve the Contractor from any of his obligations under the Contract. No concrete shall be deposited without the written permission from the Engineer (Pour slip to be signed) who shall have no authority to waive off this condition. Any concrete without such written authorization shall be liable to be rejected.

Placing of concrete shall not be permitted when, in the opinion of the Engineer the sun, heat, wind, cold, snow, or limitations or facilities furnished by the Contractor prevent proper preparation, placing, finishing and curing of concrete.

All concrete shall be thoroughly compacted and consolidated by means of pneumatic or mechanical immersion type vibrators of suitable size having minimum frequency of 8000 RPM. Care shall be taken to avoid segregation due to excessive vibration. The Contactor shall maintain on site at all times one or more standby vibrators. Tapping or other external vibration of forms shall not be allowed, unless so directed by the Engineer in that case form work shall be adequate to withstand vibrations. Compaction shall be done until the whole mass assumes a jelly like appearance and consistency with water just appearing on the surface. Concrete shall be sufficiently tamped and consolidated around the steel rods, care shall be taken that the vibrator does not touch steel or formwork, and is worked into all parts of the moulds in order that no voids or cavities are left. Steel shall not be disturbed during operation of concreting. Concrete shall be brought up in even layers not more than 200 mm thickness and worked against side of forms to give a smooth and uniform surface. No surplus water shall be allowed to come out and lie on the surface of concrete. The concrete must be of such a consistency that after ramming, consolidating and tamping is completed, a thin film of water is just appearing on the surface. In vibrating, care shall be taken to avoid displacing the reinforcement.

Hardened concrete, debris and foreign materials shall be removed from interior of forms and form inner surface of mixing and conveying equipments.

Runways and gangways shall be provided for wheeled concrete handling equipment and workmen, and such equipment shall not be wheeled over reinforcement, nor shall runways be supported on reinforcement.

Concrete shall not be dropped freely from a height of more than 3 metres. In cases where an excessive drop is inevitable the Contractor shall provide spouts, down pipes, chutes, or side ports to forms with pockets which will let concrete stop and flow easily into the form without any risk of segregation. The discharge of the spouts, down pipes or chutes shall be controlled so that the concrete may be effectively compacted into horizontal layers not more than 200 mm thick.

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Concrete is to be deposited as quickly as possible after mixing and to proceed continuously. Concrete which has attained its initial set or has contained its mixing water for more than 30 minutes shall not be allowed to be placed in the work.

When concrete is laid on hard core, such as subgrade for floor slabs, or other absorbent material, the surface is to be watered, consolidated and, blinded before the concrete is deposited.

Fresh concrete shall not be placed on previously laid concrete or on old concrete surfaces until the latter has been cleaned of all dirt, scum and laitence by wire brushes. The clean surface shall then be thoroughly wetted and grouted with cement slurry as approved by the Engineer.

Care shall be taken not to disturb newly placed concrete by vibrator, indirect loading or otherwise. No traffic or loading shall be allowed on the concrete until it has thoroughly set and hardened.

Construction joints in concrete shall only be given at locations indicated on the drawings or as approved by the Engineer. If approved by the Engineer, the concrete at the end of the day's work shall be finished off against a temporary shutter stop which shall be vertical and securely fixed. Such stops shall be removed within 24 hours of placing of concrete. Construction joints not shown on the drawings shall be reinforced with steel bars or dowels if deemed necessary by the Engineer and to be furnished by the Contractor without any additional payment.

No concrete shall be placed during rains or inclement weather and all fresh concrete shall be suitably protected from rain fall and excessive heat or cold.

Should any part of the exposed surface present a rough, uneven or imperfect appearance, when the shuttering is removed, it shall be picked out to such depth and refilled and properly re-surfaced and entirely redone, at the cost of the Contractor, as per directions and approval of the Engineer.

On removal of the forms and before the concrete skin has had time to harden all faces of the concrete inside and outside, to be kept exposed (i.e. unplastered) shall be rubbed over with carborundum stone, and washed with cement to remove all marks, projections, hollows, or any other defect. No extra payment shall be made for this work.

All exposed surfaces and lines of the concrete work are to be true and fair without cracks, bends, windings and distortions of all kinds, without any extra charges by the Contractor. All concrete work to remain exposed and unplastered is to be fair face smooth, pleasing in appearance and to the entire satisfaction of the Engineer.

A float or screed is to be worked over the exposed surfaces of all concrete work on the flat or curve, so as to render the surfaces perfectly smooth, clear and to the necessary slopes or falls or as required to receive the floor or roof finishes according to the drawings and as directed by the Engineer without any extra charge by the Contractor.

6.7 PROTECTION AND CURING

All exposed concrete shall be cured. Curing shall be accomplished by preventing loss of moisture, rapid temperature change and mechanical injury from rain or flowing water for a period of at least twenty eight (28) days. Curing shall be started as soon as the concrete has hardened sufficiently for the surface not to be marked. Curing shall be done either by continuous sprinkling of water on the surface or by covering with sand, hessian, canvas or other approved fabric mats which shall be kept continually wet and shall be continued at least for a period of fourteen (14) days with watering atleast thrice a day in the next fourteen (14) days. If required and so directed by the Engineer, formed surface with forms in position shall also be cured by keeping all forms continually wet. As an alternative, curing of concrete on all exposed surfaces which could not be kept covered, such as sides of the beams, under side of the slabs, may also be done by sealing concrete surfaces with liquid membrane forming curing compounds white pigment type conforming to ASTM C-309 or equal so as to arrest loss of moisture from concrete, with the approval of the Engineer. Care should be taken so as to spray the compound/chemicals on all the exposed faces of concrete so that no loss of moisture takes place. The Contractor shall take special care that curing of concrete is satisfactorily carried out and in accordance with methods specified herein and /or as instructed by the Engineer.

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Any negligence in this regard may result in total rejection of such concrete works which in the opinion of the Engineer have not been adequately cured. Period of curing for any concrete shall be as stated above or as directed by the Engineer. All concrete pours and concreted structures shall be clearly marked with non-washable paints to indicate the date of placing concrete. During hot weather, curing shall be done even at night. It shall be obligatory on the part of the Contractor to obtain a certificate from the Engineer that the curing has been properly done. A suitable format shall be printed and kept on site to be signed by the Engineer for every part of the work.

6.8 SAMPLE AND TESTING

Testing of Concrete

All test cylinders shall be of 150 mm dia x 300 mm long size cast in steel moulds. Set of 6 cylinders shall be prepared numbered and initialed by Engineer each for foundations, plinth, band, columns, door level band and roof.

Three cylinders of the set shall be tested at 7 days and shall be tested at 28 days.

All test specimens shall be made, cured & tested in accordance with ASTM or applicable British standard.

If the strength tests of the specimens for any portion of the work falls below the minimum required compressive strength at 28 days for the class of concrete used in the portion, the Engineer shall have the right to order dismantling & replacement of the affected work.

Water

Water to be used in the work shall be potable water.

Cement

Cement shall be tested as prescribed in BS-12.

Aggregate

Aggregates shall be tested as prescribed in ASTM C-33. In addition, fine aggregates shall be tested for organic impurities in conformity with ASTM C-40.

Reinforcement

Reinforcement bars shall be tested as prescribed in BS-4461 (for Ribbed Tor Steel), ASTM A-615-82(S1) (for Mild Steel Plain Bars). Refer Item 6.12 of this Section for minimum yield strength and other requirements.

6.9 PRECAST CONCRETE UNITS

Precast concrete units shall be cast to the sizes and dimensions as indicated on the drawings. Separate precasting platform of the size and at the location approved by the Engineer shall be made. All the concrete used for precast units shall conform to the specifications laid down for cast in situ reinforced concrete unless otherwise required. Special vibrating tables shall be employed for thin sections.

All concrete for precast units shall be cast against formica lined formwork to finish smoothly to the required lines, angles and all the units shall be adequately cured in water tanks and shall be properly stacked on the platform to prevent damage or cracks. All precast units shall be transported and erected into position in the manner as approve by the Engineer.

6.10 WATERPROOF CONCRETE

Wherever specified on the drawings and all liquid or water retaining structures and those subject to water pressure shall be executed with approved waterproofing compound such as PUDLO or approved equivalent. The waterproofing compound shall be mixed with the concrete in strict accordance with the manufacturer's directions and/or as directed by the Engineer.

Special care will be observed to make the shuttering waterproof. The shuttering joint shall be well made to make them leakproof. Tin strips to join the shuttering planks will not be used as they result in leakage. New timber or plywood shuttering shall be used for work under this section.

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6.11 REINFORCEMENT STEEL

General

The work covered by this sub-section of the Specifications consists of furnishing all materials, tools, labours and in performing all operations in connection with the providing, straightening, cutting, bending, fixing, binding including binding wire, chairs, pins, spacer blocks complete in strict accordance with this sub-section of the Specifications, the applicable drawings and approved bar bending schedule.

Materials

Reinforcing steel to be new billet stock of mild steel (plain bar) and ribbed to steel bar as specified hereunder and on the drawings and shall conform to relevant British Standard Specifications for Ribbed Tor Steel and ASTM for Mild Steel. It should be free from loose mill scale, loose rust, oil, grease, dirt or other harmful substance.

The Contractor shall furnish from the agency supplying the steel, the manufacturer's mills certificates to guarantee that supplied steel is from new billets and the steel meets all the requirements of the relevant specifications and further meets the minimum certified requirements as follows:

i) Mild steel plain and deformed bars grade 40 conforming to ASTM 615-82 (S).
   a) Minimum Ultimate tensile strength 4,922 kg/sq.cm
   b) Minimum Yield Strength 2,812 kg/sq.cm
   c) Minimum Elongation 8% to 12%

ii) High yield steel bars: These are Ribbed tor steel conforming to BS 4461-1978.
   a) Minimum Ultimate tensile strength upto 16 mm 5,104 kg/sq.cm
over 16 mm 4,781 kg/sq.cm
   b) Minimum Yield strength upto 16 mm 4,711 kg/sq.cm
over 16 mm 4,360 kg/sq.cm
   c) Minimum Elongation upto 16 mm 12%
over 16 mm 14%

Bendability

All Mild Steel bars shall be capable of being bent cold through 180 degree round a bar of two times its own dia without fracture or injury of any kind.

All Tor Steel bars shall be capable of being bent cold through 180 degree round a bar of two times its own dia without fracture or injury of any kind.

18 gauge galvanized wire shall be used for binding the steel reinforcement.

Samples shall be tested for above requirements in an approved laboratory before starting the cutting of the bars and when so required by the Engineer; and all cost of such tests shall be borne by the Contractor.

Storage

Reinforcing bars shall be stored on platform sufficiently above ground surface and be free from scales, oil, structural defects prior to placement in works. Rusted or dirty steel bars shall not be used in the works unless brushed and cleaned by proper steel wire brushes and after being approved for use by the Engineer.

Reinforcement Cutting and Placing

All reinforcement steel shall be cut and bent cold in strict accordance with the drawings and bar bending schedules approved by the Engineer. In case any bars, cut, bent or even fixed in position are found incorrect in dimensions, size, and shape and are not according to the requirements of the drawings or instructions of the Engineer, notwithstanding any previous approval of the Engineer, the Contractor shall replace such steel bars, cut, bent or fixed in position, by correct sizes bars at his own cost and no extra payment shall be made to the Contractor on such account. Suitable spacers, chairs as approved by the Engineer shall be used for supporting and spacing purposes of bars. In case any bars are bent or displaced they shall be straightened or replaced prior to pouring. All reinforcement bars within the limit of a days pour shall be in place and firmly tied with 18 gauge G.I. wires. Bars with kinks or bends not shown on the drawings shall not be used. Reinforcement bars shall not be used for supporting the workman and concreting work. Separate supporting system shall be used for this purpose.

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Laps and Splices

No. splicing of bars shall be allowed at position other than shown on the drawings. All lap lengths shall be of the minimum sizes as indicated on the drawings and in no case shall lap length be less than 40 times the diameter of bigger bar in tension and 35 times the diameter of bigger bar in compression for nominal M.S. bars. High yield (tor steel) bars shall have laps of 50 times the bigger diameter of lapping bars in tension and 40 times for compression. Splices of adjacent bars shall be staggered, unless approved otherwise by the Engineer. All reinforcing steel fixed in position shall be inspected by the Engineer and no concrete shall be poured until steel placement has been approved in writing by the Engineer. For inspection purposes the Contractor shall give to the Engineer reasonable notice before the scheduled pouring time. Clear concrete cover to reinforcement steel shall be as specified or indicated on the drawings or as directed by the Engineer.

6.12 FORMWORK

General

The Contractor shall provide all materials and labour, necessary for a good and speedy making and erection of form work such as scaffolding, shuttering, planks, struts, bolts, stays, gangways, boards, fillets etc. and shall do all that is essential in executing the job in a workman like manner to the satisfaction of the Engineer.

The formwork for columns, beams, slabs, walls and all other works whether to be precast or cast-in-situ shall conform to ACI-347 and shall be made of sound and properly seasoned timber or other approved material and shall be rigidly formed and designed by the Contractor to the required shapes and forms, so as to be able to withstand, without displacement, deflection or deformation or movements of any kind, the pressure of the moist concrete and all other loads.

Contractor shall remain solely responsible for any damage or injury caused to the work and people, due to improper formwork resulting in dislocation or collapse when loaded or early striking of formwork.

Materials

Forms

Forms shall be constructed of wood or metal, and shall conform to ACI 347.

Form Oil

Form oil shall be non-staining colorless mineral oil, free from kerosene; the flash point shall be not lower than 149 degrees C, determined in accordance with ASTM D92.

Form Sealer

Shall be best of its kind and shall be as approved by the Engineer.

Form Accessories

Form ties, anchors and hangers shall be of sufficient strength to completely resist displacement of forms due to construction loads and the depositing of concrete. Provide tie and spreader type form ties designed to that no metal will be within 25 millimeters of any surface when forms are removed. Where concrete surfaces are exposed to view, do not use form ties which, when removed, will leave a depression larger than 25 millimeters in diameter. Use water seal ties in concrete exposed to hydrostatic pressure. Conform to ACI 301 and 347.

Design of Formwork

All formwork and supports thereto shall be designed by the Contractor for the type and quantum of loads and forces to be supported and relevant drawings shall be submitted, if so directed, to the Engineer for approval before the work is taken in hand. Such an approval shall not relieve the Contractor from all or any of his obligations under the contract.

Formwork: Fabrication and Erection

Forms shall be fabricated and erected in position, perfect in alignment, levels and true to plumb and shape and securely braced so as to enable it to stand all weights, dead and live, to be endured during placing of concrete and its subsequent hardening till the form work is struck. It shall be sufficiently rigid as not to loose its shape and shall be made to

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compensate for bulging, and deflection to give the finished concrete the required lines, plumb, size and shape.

The form work shall be so designed and arranged as not to unduly interfere with concrete during its placing, and easy to be removed without injuring the finished concrete. Wedges, clamps, bolts and rods shall be used, when permitted and where practicable, in making the form work rigid and in holding it to true position.

The joints in the form work for all concrete surfaces shall be close jointed and treated smooth so as not to allow any leakage of mortar form the concrete and show any appearance of leaking mortar on concrete surface.

Formwork for Fairfaced Concrete

In addition to the provision made elsewhere, for all the concrete work covered in this contract which are to remain exposed in the finished work and left unplastered, the formwork shall be smoothly faced by using plywood sheets or lining the shuttering with smooth G.I. sheet or non-absorbent material like formica sheets or in any manner as approved by the Engineer so as to make a perfectly smooth surface of the finished concrete.

Temporary Openings in Formwork

Wherever concreting is required to be carried out within forms of depth exceeding 2 metres, temporary openings in the side of the form shall be provided to facilitate the pouring and consolidation of the concrete. Small temporary openings may be provided at the bottom of all forms to permit the removal of rubbish etc; but the same shall be suitably closed before pouring of concrete.

Openings and Other Details

Provision shall be kept in the form work such as openings, recesses, holes, pockets,fillets, etc. for housing services and other details in the finished concrete or on its surface and edges as shown on the drawings or as directed by the Engineer and to fix all necessary inserts, dowels, pipes, holdfast etc. in concrete as shown on the drawings or as directed.

Treatment and Inspection of Forms

All rubbish particularly chippings, shavings and sawdust shall be removed from the interior of the forms, before placing concrete. Forms shall be coated with approved shuttering oil before reinforcement is placed. Surplus oil on forms and any oil on reinforcement steel shall be removed. If the forms are not used within 24 hours, a fresh coat of oil shall be given before placing of concrete if so directed by the Engineer.

Striking Shuttering

Forms shall be removed in such a way as to permit the concrete to take the stress uniformly and gradually. Any method of form removal likely to cause overstress of the concrete shall not be used.

No struts or timbering which serve the purpose of supporting the shuttering or centering shall be struck and removed without permission from the Engineer in writing and the work of striking and removal after the receipt of such permission shall be conducted under the personal supervision of the competent foreman in the employment of the Contractor; and the Contractor even after the permission from the Engineer shall hold himself fully responsible for any consequence whatsoever. In all cases the Engineer will direct and control the minimum period of time for which the forms, shuttering or centering the minimum period of time for which the forms, shuttering or centering shall remain in place before being struck; but, for the general guidance of the Contractor, the following are to be considered as the desired periods for the main classes of work:

Removal of Shuttering	Cold Weather	Normal Weather
	No. of days	No. of days
Beams sides, walls and Columns (unloaded)	4	2
Slabs soffits	18	14
Beams soffits	21	15

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The Engineer may require, however, that any wallings, solders, struts or other timbers or supports, the removal of which may cause the transference of load to the finished work, to be kept in place for three weeks after the placing of the concrete.

The Contractor shall be responsible for any injury to the work and any consequential damages caused by or arising from the removal and striking of forms, centering and supports, due to striking too soon, and any advise, permission or approval given by the Engineer relative to the removal and striking of forms, centering and supports shall not relieve the Contractor from his responsibilities under the Contract.

Treatment after Removal of Forms

Any minor surface blemishes or other irregularities are to be properly made good immediately upon the removal of the form work and the surface made good to the satisfaction of the Engineer. Any small voids shall be neatly grouted with cement mortar consisting of one part of cement to two parts of sand and the whole surface rubbed over with carborundum stone and cement wash and bring the whole to a smooth and pleasing finish and uniform colour.

6.13 CONSTRUCTION JOINTS

Construction joints shall be located as indicated on the drawings and/or as approved or directed by the Engineer. For slab and beams, construction joints shall be located at mid point of the span unless a secondary beam intersects a main beam at the centre in which case the joints in the main beam shall be off-set a distance equal to thrice the width of the beam and provision for shear shall be made by the use of inclined reinforcement at the cost of the Contractor. Joints in columns shall be made at the under side of the deepest beam framing thereto. Beam stems and slabs shall be poured monolithically unless allowed otherwise by the Engineer in writing. Joints not specified or shown on the drawings if so required and approved by the Engineer, shall be so located as to least impair the strength and appearance of the work. Except and where indicated on the drawings, no jointing shall be made in footings or foundations without written approval of the Engineer.

Construction joints shall be at right angles to the member and shall be formed against firm stop boards. The stop board shall be removed as soon as possible after placing the concrete but without the risk of movement of the concrete and the concrete surface shall be well brushed with a hard brush and washed off with a spray of water, two to four hours after castings, to expose the aggregate and provide a key for the next pour. In all liquid retaining structures and other sub-structure pits and trenches P.V.C, stopper sheets or any other approved water stops shall be provided at the construction joints in the manner shown on the drawings and/or approved by the Engineer.

Whenever a section of concrete is left unfinished, for any reasons with the prior approval of the Engineer, leaving surface which will be hard-set before additional concrete can be joined to it, additional measures such as dovetails, grooves or other bonds shall be provided as may be necessary to ensure a good bond with the new work, at the cost of the Contractor. Before depositing fresh concrete upon or against any concrete which is already set, the surface of the set concrete shall be roughened with a cutting tool, any laitance removed, thoroughly cleaned from all foreign matter, well watered and covered with approved bonding compound, and special care shall be taken to ram the fresh concrete thoroughly up and against the set concrete; and, if deemed necessary by the Engineer, the joints shall be reinforced with steel bars or dowels to be all furnished and done by the Contractor without any additional payment.

6.14 ANCHOR BOLTS, INSERTS, SLEEVES, CHASES, RECESSES, STEEL FRAMES

The Contractor shall furnish and place in position accurately, as shown on the drawings, all inserts, sleeves, chases, recesses, etc., supplied by himself or other sub-contractor or Contractors, as directed and full cooperation and coordination shall be maintained with other contractors, sub-contractors in this regard.

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6.15 MEASUREMENT AND PAYMENT

Concrete

Payment shall be made for the net volume of Concrete as per drawings or as actually executed whichever is less (provided that the Engineer has agreed and allowed the reduction in sizes whenever occurred, which however shall not be a usual case).

Steel Reinforcement

Payment for steel reinforcement shall be made for the actual length of steel bars incorporated in the work multiplied by the standard weight without consideration of over-rolling etc. Wastage, laps not shown in drawings, spacer bars, chairs, binding wire etc. shall not be paid and the Contractor shall be deemed to have made provision for such matters in his rates for steel reinforcement in the Bill of Quantities.

Formwork and Construction Joints

No separate measurement or payment shall be made for Formwork and Construction Joints and all costs and charges shall be deemed to have been included in the rates for related items of concrete in the Bill of Quantities.

ITEM - 7 BRICK MASONRY WORK

7.1 SCOPE

The work covered by this section of the Specifications consists of furnishing all plant, equipment, appliances, and materials, and in performing all the operations in connection with brick masonry work complete in strict accordance with the specifications herein and the applicable drawings and subject to the terms and conditions of the contract.

7.2 MATERIALS

Cement

The cement shall be normal setting portland cement of approved make complying all respects with BS-12.

Sand

Sand shall be sharp, cubical, hard, dense, durable and shall pass through 3/16 sieve and 2 to 10% through sieve No.100. It should free from organic impurities and lumps and salts of any nature and kind.

Water

Water shall be as specified under Item - 6 on page SPC-13 for Concrete and shall be free from salts of any nature and kind.

Bricks

Bricks shall be hand moulded or machine made of the best kind conforming to relevant BS 3921 having a size not less than 220 mm x 105 mm x 67 mm. They shall be hard, sound, well burnt, regular in shape and colour, uniform in size, and free from nodules of lime. When the bricks are struck together they shall give a ringing sound.

Samples shall be approved by the Engineer at intervals and consignments rejected shall be immediately removed from the site. Colour of the bricks shall be as approved by the Engineer.

Minimum crushing strength shall be 85 kg/sq.cm. The bricks shall not absorb more than 15 percent water (of their dry weight) when immersed in water for 24 hours.

The finished brick work shall not show any sign of efflorescence as the same will pass through the plaster and spoil internal finish e.g. distemper, plastic paint.

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7.3 CEMENT MORTAR FOR MASONRY

Mortar shall be composed of one part cement and four parts of sand or as described in the relevant B.O.Q. Mortar shall be machine mixed and hand mixing shall not be allowed in any case.

Mixing Time

Mortar shall be mixed in the mechanical mixer for 2 minutes. Mortar shall be used within half an hour of mixing. Mortar standing for more than half an hour shall not be used.

The ingredients for mortar shall be measured in boxes. No retempering of mortar shall be allowed nor mixing of any antifreezing ingredients in mortar shall be permitted.

The mortar shall be subject to compressive strength test and the average compression strength of three Nos. 50 mm cubes of mortar shall be not less than 126 kg per sq. cm (1800 psi) at 28 days.

7.4 MASONRY AND JOINTING

All bricks for laying in cement mortar directed by the Engineer shall be thoroughly soaked in water for 24 hours before use.

All masonry shall be laid in plumb, true to line and level in accurately spaced course with each breaking joints with the course below, corners and reveals shall be plumb and true, chases, grooves, reglet bricks and raked out joints shall be kept free from mortar and other debris.

The thickness and length of various walls shall be as indicated on the drawings.

Unless otherwise shown on the drawings or specified, the spaces around frames and other build-in-items shall be solidly filled with mortar except those joints which are to be caulked shall be raked out 20 mm deep.

Bricks for brick work which shall not be covered with plaster will remain exposed, shall be pre-selected and the face, or faces, of the brick which will remain exposed shall be ground smooth prior to installation to give a even, uniform and smooth texture. Samples of which will have to be approved by the Engineer.

Work required to be build in with masonry including anchors, wall plugs and accessories shall be build in as the work progresses. Wood plugs and blocking shall not be built into masonry.

All horizontal and vertical joints shall be completely and solidly filled with mortar as the bricks are laid.

The thickness of joints shall not exceed 10 mm and the joints shall be pressed 12 mm deep when the mortar is still fresh so as to provide for proper bond for the plaster and pointing.

No masonry to be erected when temperature of outside air is below 40 degree F, unless suitable means, as approved by the Engineer are provided to heat materials, protected from cold and frost and ensure that material will harden without freezing.

Where masonry work abuts columns, it shall be anchored there, by means of dovetail 10 mm dia M.S. bar at every 4th course of masonry unless otherwise directed by the Engineer.

The top course of partitions under slabs and beams shall not be laid until the forms have been removed and the roof slab placed.

All bricks to be thoroughly soaked in water before being laid in cement.

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All joints to be well flushed up at every course. The walls shall be carried up regularly, not leaving any part more than 1 m lower than another, unless special circumstances render this impracticable and are so approved by the Engineer.

Any walls left at different levels to be racked back, courses to be properly levelled, perpends, quoins, jambs and other angles plumbed, as the work proceeds.

All brick work shall gauge four courses to 300 mm in height including four joints.

All brick work to be build in English Bond unless otherwise directed by the Engineer, no half bricks or bats being used except where necessary to complete the bond.

When the masonry is to receive plaster on one side and pointing on the other, the brick shall be placed in such a way that the better face shall be on the side of pointing.

7.5 COORDINATION

Provide chases, and openings required under other sections to sizes and location shown in the drawings.

Cooperate with other trades in setting build in items, take special care in cutting, fitting, setting units so that built in members are in their true, respective positions, flush voids full.

For items provided in other sections such as door frames, hold fasts, miscellaneous metal work occurring in the masonry, sleeves, anchors, supports, nailing strips, braces, jambs, are to be built-in the masonry.

Special care shall be taken in building walls of door frames, Contractor shall see that frames are square and in plumb. Check frames before building work around or against them. The Contractor shall see that full electric conduits are not housed into frames, so as to prevent extension of frame anchors.

The Contractor shall be responsible for any damage to his own work and also to the work of other sections.

7.6 PROTECTION AND CLEANING

Surface of masonry not being worked or shall be properly protected to all times during the construction operations. When rain and/or snow is expected and the work is discontinued.

Exposed masonry surfaces shall be cleaned with water and fibre brushes or as directed by the Engineer.

Protect adjacent work during cleaning operations, make good damage from neglect of this precaution.

7.7 SAMPLES

Samples of all kind of materials to be used on the job shall be submitted to the Engineer and to be approved by him before bulk quantities are procured. Source of supply or quality of materials not to be changed unless authorised in writing by the Engineer.

7.8 TESTING

All the materials and samples shall be subject to standard testing and if found below the recognized standard specifications such as BSS, ASTM or equal shall be rejected. Rejected materials shall be removed from the site immediately. All testing shall be done at contractor's cost.

7.9 CURING

Curing shall be done as specified in Item - 6.

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7.10 **MEASUREMENT AND PAYMENT**

Masonry work below plinth shall be measured in cubic measure and above plinth measurement shall be made in square measure. Payment shall be made for the square measurement of walls area actually constructed. No separate measurement or payment shall be made for wall ties, or holding clips etc.

ITEM - 8 FLOORING

8.1 **SCOPE OF WORK**

The work covered under this section shall include furnishing of all materials, labour, equipment and appliances and performing all operations required in connection with flooring work as described hereinafter, shown on the drawings, stated in the description of items of work in the Bills of Quantities and as directed and approved by the Engineer.

8.2 **MATERIAL**

The material of fill shall be obtained from approved sources. Suitable material obtained from excavation shall also be used. Quality of fill material shall be governed by the relevant specifications.

Stone Soling (Hard core)

Course aggregates shall be crushed or uncrushed stone, angular or rounded in shape and shall have granular, crystalline or smooth surface free from friable, flaky and laminated pieces, mica and shale, all coarse aggregate shall conform to BSS 882. Aggregate shall be thoroughly rolled and compacted mechanically to achieve a compaction of 95% modified AASHTO.

Lean Concrete Sub-floor

Lean concrete sub-floor shall conform to the relevant specifications for Concrete.

Class-B Concrete Base

Class-B concrete base shall conform to the relevant specification for Concrete.

Ceramic Tiles

150mm x 150mm 200 x 300 size 1st quality Ceramic Tiles manufactured by M/s. "EMCO" Tiles Ltd or approved equivalent shall be used.

The relevant information regarding the quality, finish and origin as to the surface finishes have been stipulated on the drawings and described in B.O.Q which shall be provided.

8.3 **WORKMANSHIP**

Sandfill

Fill shall be placed in layers not exceeding 150 mm thickness and shall be thoroughly rolled and compacted mechanically by the addition of controlled amounts of water required to achieve a compaction of 95% AASHTO density. Compaction test at different places shall be submitted for approval of the Engineer. The Engineer shall have complete freedom in rejecting any work in full which is not properly compacted to the required degree. The top surface shall be finished smooth as to elevation or falls shown on the drawings or directed. This surface shall be made over to receive subfloor wherever required.

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Ceramic Tiles Work

Materials

Cement

Cement shall be white cement as per ASTM or British Standard.

Sand

Approved sand shall be used which shall be clean, washed, uncoated aggregate, free from deleterious substance, uniformly graded with 100 percent passing No. 4 screen, not more than 5% passing No.100 screen and shall conform to ASTM C-144.

Tiles

Ceramic tiles shall be 1st quality "EMCO" brand or approved equal of 150 mm x 150 mm size. Tiles for floor work shall be non-skid type.

Workmanship

Ceramic tiles shall be installed as indicated on drawings and finishing schedules. The colour and samples of ceramic tiles shall be selected and approved by the Engineer.

Cutting of tiles shall be done in a neat manner to make tiles fit, to conform properly to adjoining works and to suit conditions, without marring the tile surfaces.

Ceramic Tiles on Floor

The work consists of laying ceramic tiles with 1:1 cement sand mortar slurry to achieve good bonding on levelling base of Class-B concrete and Lean concrete subfloor over hard core & sand fill laid to slope as required towards floor drains. The joints in the tiles shall then be filled neatly with grout of cement and integral colouring to match colour of ceramic tiles. The tiles shall then finally be cleaned and protected against abrasion and damage.

Ceramic Tiles on Walls

The work consists of laying ceramic tiles with 1:1 cement sand slurry to achieve good bonding. The joints in the tiles shall then be filled, finished and protected as per direction of Engineer.

8.4 **INSITU MOSAIC FLOOR**

12 mm thick insitu Mosaic floor shall be laid with one part by weight of cement to two parts by weight of approved marble chips size No. 3 of approved colour and quality. Addition of marble powder will not be allowed. The insitu mosaic shall be done in panels of maximum 10 sft using 1/4" (5 mm) thick glass divider strips. The insitu mosaic shall be cured, ground smooth to obtain an even texture and exposure of marble chips. The surface shall then be cleaned and finally wax polished.

INSITU MOSAIC SKIRTING.

Insitu mosaic skirting be done by using one part by weight of cement to two parts by weight of marble chip of size No. 3 to a thickness of 3/8" and shall be same colour and quality as sued for flooring. Addition of marble powder will not be allowed. The skirting should be either flush with the plaster or slightly recessed, skirting standing proved of the plaster surface shall not be accepted except where shown in the drawings. The skirting shall be ground smooth to obtain an even texture and exposure of the marble chips. The surface shall then be cleaned and finally wax polishes.

8.5 **CURING, GRINDING AND POLISHING:**

Floor should be kept continuously wet for seven days before grinding and no one shall be allowed to walk on floor during that period.

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After seven days the terrazzo floor shall be machine ground to a true even surface using various grades of abrasive stones as required. After the first grinding, the floor shall be thoroughly grouted with the same cement and colour composition as used for tiles manufactured. The grout shall be of the consistency of thick cream ad shall be brushed over the floor to eliminate all imprisoned air and thoroughly fill the surface for final grinding.

The floor shall be kept continuously wet after grouting for atleast 7 days and then the grouting coat shall be removed by grinding. The final finished surface should have very smooth finish. Small areas, in accessible portions and corners and the skirting which cannot be reached by the grinding machine shall be ground and rubbed by hand.

After final grinding is complete the floor shall be washed and left for 7 days for drying. During this drying period, the floor shall be kept covered such that no dust is allowed to settle on the floor. After the floor is perfectly dry, the surface shall be thoroughly cleaned but without the use of water. Wax polishing shall then be applied to provide smooth glossy finish. The surface, then shall be covered with sawdust and all movements over the floor prevented. The final gloss shall be given by final coat of polishing to the satisfaction of the Engineer.

8.6 **SAMPLES**

Samples of all kinds of materials to be used on the job, shall be submitted to the Engineer and to be approved by him.

8.7 **MEASUREMENT AND PAYMENT**

Payment shall be made for the actual area covered in square measure and shall include all under base i.e earth filling, concrete subfloor, concrete base course, slurry base etc. for which no separate measurement or payment shall be made.

ITEM - 9 PLASTERING

9.1 **GENERAL**

The work covered by this Section of the Specification consists of furnishing all plant, labour, appliances and materials and in performing all operations in connection with lathing and plastering, complete in strict accordance with this section of the Specifications and the applicable drawings and subject to the approval of the Engineer.

Except as may be otherwise shown or specified, all plaster shall be cement plaster. Plastered walls shall include partitions, columns, pilasters, plastered jambs and other returns, reveals, and backs of recesses and alcoves, and jambs and heads of windows and doors, unless otherwise specified or shown on the drawings. Plaster on walls, shall be carried down to dado, skirting and projected bases.

9.2 **MATERIALS**

Portland cement shall be normal setting cement of approved make complying in respects with ASTM.

Sand shall comply with the requirements of ASTM C-35.

Water shall be clean and free from oils, acids, alkalies salts and organic or other injurious matter.

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9.3 **MIXING OF MORTAR FOR PLASTER**

Mechanical mixers of an approved type shall be used for the mixing of mortar for plaster. Frozen, caked, or lumped materials shall not be used. Mechanical mixers, mixing boxes, and tools shall be cleaned after mixing each batch and kept free of mortar from pervious mixes. Mortar shall be thoroughly mixed with the proper amount of water until uniform in colour and consistency. Retempering will not be permitted, and all mortar which has begun to stiffen or where 30 minutes have passed since mixing of water shall not be used.

9.4 **PROPORTIONING OF PLASTER**

All plaster shall be portland cement plaster, all coats of which shall be mixed in the proportions of one part of cement and four parts of sand by volume unless shown otherwise in the relevant items of work in the Bill of Quantities.

All coats of plaster in water retaining structures shall be waterproofed by addition of an approved compound like PUDLO in liquid form or solid used at the rate of 3% by weight of cement. The water proofing compound shall be commercially pure with no clods or oils or other ingredients detrimental to the cement.

9.5 **APPLICATION OF PLASTER**

All the holes and blocking for the installation of electrical and mechanical fixtures and wiring, conduits and pipe sleeves, metal anchors of all types, openings for installation of equipments etc. shall be installed and approved before plastering. Cutting and drilling in finished plaster shall not be permitted.

Masonry joints shall be raked and concrete surface to receive plaster shall be thoroughly hacked to provide a rough surface for proper key to the plaster. The surface shall be properly wetted and a spray coat of cement slurry shall be applied before laying the plaster.

Two (2) coats of plaster shall be used on masonry and concrete surface where thickness is more than 13 mm. Plaster work shall be carried out only when the temperature is not less than 5^{o}C. Plaster shall not be applied when the surface contains frost.

In case of 2 coats the first coat shall be full and thick and shall be applied with sufficient force to form good keys. The scratch coat shall be cross-scratched upon attaining its initial set and shall be kept damp with a fog spray.

Finish coat shall not be applied until the first coat has seasoned for 2 days. Just before application of the finish coat, the first coat shall again be wetted evenly with a fog spray. Finish coat shall be smooth finished. The finish coat shall be kept moist with a fog spray for at least 2 days and thereafter shall be protected against rapid drying until properly and thoroughly cured.

All plaster shall be finished true in line, levels and plumb. The surface shall be even and smooth without travel marks, kinks, bulges or deformities of any sort.

9.6 **SAMPLING OF PLASTER**

Samples may be taken by the Engineer at any time from plaster work in place. Areas represented by samples which show over sanding will be rejected.

9.7 **PATCHING**

Plaster containing cracks, blisters, pits, checks, or discolouration will not be accepted. Such plaster shall be removed and replaced with plaster conforming to this Specification and approved by the Engineer. Patching shall match with existing work in texture and colour.

9.8 **CONCRETE/MASONRY JOINTS**

All joints of concrete and masonry walls shall be specially treated. A 200 mm wide approved G.I. wire mesh of 24 gauge weighing 1.5 kg/sq.m shall be securely fixed at the joint and then plaster shall be applied. The item for plaster shall include this wire mesh and no separate payment shall be made for the same.

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Plaster shall be kept continuously wet atleast for 10 days and thereafter wetted atleast at the interval of 4 hours (or less if directed by the Engineer) for the next 10 days.

9.9 MEASUREMENT AND PAYMENTS

Payment against the item of plaster shall be made in square metres as per actual area plastered including jams without separate measurement of payment being made for providing wire mesh on concrete/masonry joints which shall be deemed to have been included in the rate of plaster the price & payment shall constitute full compensation for all costs involved in proper completion of work.

ITEM – 10 CARPENTRY, JOINERY AND HARDWARE

10.1 SCOPE OF WORK

The work covered by this section of the Specifications consists in furnishing all plant, labour, equipment, appliances and materials and in performing all operations in connection with supply and installation of wooden doors, frames, panels, shutters, in size, thickness and dimensions shown on the drawings or as required, complete in strict accordance with this section of the Specifications and the applicable approved shop drawings (to be prepared by the Contractor) and subject to the terms and conditions of the Contract with materials and workmanship best of their kinds as used in Pakistan.

10.2 MATERIALS

The entire timber shall be from the heart of sound and full grown trees, it shall be uniform in substances, properly seasoned, straight in fibre, free from large, loose or dead knots, twists, cracks, incipient decay. The scantlings of all timber shall be bright sound and square edged. The colour of the timber shall be uniform throughout. The timber shall be tested before use to evaluate its suitability. The moisture content shall not exceed 10%. The Contractor shall pay for such tests. All timber before use shall be subject to the approval of the Engineer.

Hardware and Fittings

Brass fittings are to be furnished and oxidized on exposed surfaces. Aluminium fittings are to be anodized on exposed surfaces. Chromium plated fittings are to be the best quality of their respective kind and shall have a base coat of brass or copper all as approved. Brass oxidized fittings are to be fixed with brass screws.

Locks, handles/heavy handles, door stoppers, shall be as specified and approved by the Engineer.

Lock and latch furniture (doors) shall conform to relevant ASTM or BS 4951: (Builder's Hardware).

The whole of the iron, oxidized brass must be of the best possible quality and workmanship. The Contractor shall submit samples for the approval of the Engineer and all such iron, brass and bronze mongery shall conform to these approved samples.

Glue shall conform to the requirement of BS 745 for cake or powder glue.

Nails and Screws

Nails shall comply with requirements of relevant ASTM or BS 1202. Screws with the requirements of relevant ASTM or BS 1210.

Hold-fasts shall consist of 125 mm screws at 300 mm centre to centre in plastic plug countersunk and wood plugged.

Hinges

Heavy duty brass hinges and brass screws as per table given below and approved by the Engineer and as specified on the drawings:

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WEIGHTS FOR TEN NOS. ARTICLES IN KG

(including weight of necessary screws)

SIZE IN MILLIMETERS

	50 Brass	75 Brass	100 Brass	125 Brass
Hinges Butt	0.39	0.85	1.42	2.27

Tolerance in weight 10%

All other fittings shall be best available of its kind as required and approved by the Engineer. Samples shall be submitted to the Engineer free of cost for his approval. All fittings such as hold-fasts, hinges, tower bolts, locks, door stoppers, door closers shall be included in the rates of items for doors and joinery and no separate payment shall be made on this account.

10.3 **FABRICATION**

The Contractor shall perform all necessary morticing, tenoning, grooving, notching, tonguing, housing, revetting, hard wood pinning on joints and all other work necessary for the correct jointing. The Contractor shall also provide all metal plates, screws, nails and other fixing that may be instructed by the Engineer or which may be necessary for the proper execution of the joinery work specified. The Contractor shall also be required to carry out all works necessary for the proper construction of all framings, and for their support and fixing in the building. All shop drawings to be prepared by the Contractor for the wood work shall be approved and initialled by the Engineer before being fabricated and fixed in position.

Any joinery which may show signs of defects arising from the unsound materials or defective workmanship before the expiry of the maintenance period shall be cut out and replaced at Contractor's own expense.

Solid well seasoned deodar wood frames as per Bill of Quantities or as shown on the drawings are to be prepared with posts tenoned with the heads. The shutters will be fixed to the frames with approved quality fittings. The frames will be fixed to the wall with 80 mm screws at 300 mm centre to centre in plastic plug countersunk and wood plugged.

Flush Doors shall be complying with BS 3444 (Sterling Plywood Industries Karachi or approved equivalent).

Flush doors shall be constructed of 3 mm commercial plywood. The thickness of shutter shall be 40 mm with 40 mm x 15 mm sheesham wood lipping.

The solid core shall consist of well seasoned soft wood battens.

Flush doors shall be manufactured by pressing under a specific pressure of 13 kg/sq.cm.

Bonding shall be done under pressure between the veneers and the core with synthetic resins under heat of water proof and water resistant qualities respectively.

Urea Formaldehyde for water resistant and melamine urea formaldehyde for water proof bonding types shall be used as these are highly resistant to micro-organism attacks.

The finished doors shall have a moisture content of 8 to 12% which is within the tolerance limit of twist and warp under BS 3444.

Each door shall be suitable to receive hinges and locks in the position shown.

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Glazing wherever shown on the drawings or given in Bill of Quantities shall be Hasanabdal Glass or equivalent.

Anti-termite treatment of approved quality shall be applied to frames on the surface in contact with earth, or wall.

Three (3) coats of approved quality enamel paint over a coat of red oxide as primer coat approved quality wax or french polish shall be applied to the doors including door frames as per directions of the Engineer or as described in the description of items or in drawings. No additional payment shall be made against this item.

10.4 **SAMPLES**

Samples of corner section of each type of door, window and panel of each kind of wood and fitting e.g. locks, bolts, hinges, screws, holdfast shall be delivered to the Engineer for approval and ordering necessary tests to be arranged by the Contractor without cost.

10.5 **MEASUREMENT AND PAYMENT**

All doors, cabinets and wardrobes shall be measured in square measure of elevation measured between outer edges of the frames and shall include all the wood work/chip boards, formica etc., fittings and hardware, anti-termite treatment and painting/polishing etc. and no separate measurement or payment shall be made for any of such component items.

ITEM – 11 STEEL DOORS / WINDOWS

(A) STEEL DOORS

11.1. **SCOPE OF WORK**

The work covered by this section of the specifications consists of furnishing all plant, labour, equipment, appliances and materials and in performing all operations in connection with the furnishing and installing of steel doors with painting complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

11.2. **MATERIALS**

All materials shall be best quality and type used for the purpose. Material shall be free from all defects and imperfections that might affect the serviceability of the finished product and shall conform to relevant British Standard Specifications.

11.3. **MANUFACTURE**

Doors shall be constructed as indicated on the drawings, consisting of stiles, rails and other members of the frames and shutters. The drawings and details shown profiles and design of doors and pressed steel frames and these specifications describe minimum requirements. Stock fabricated items complying with these profiles, designs and requirements may be used subject to approval of the Engineer and provided the quality is at least equal to that specified. The work required under this, shall be made by an approved manufacturer regularly engaged in the production of the kind of work shown and specified. All door frames shall be constructed of steel single profiles as shown on the drawings and shall be provided with strip steel anchor 1/4" x 3/4" x 12" split at the end, 30" c/c.

11.3.1 **Construction**

Construction joints of steel work shall be continuously welded full depth and width or equivalent splice plates where so directed shall be welded on unexposed faces of frames. Exposed surfaces of welded joints shall be mitred and butt

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welded and shall be dressed and flat finished to produce invisible connections, spot welding may be used where practicable and if approved by the engineer.

11.3.2 **The Finished Work**

The work shall be strong and rigid, neat in appearance and free from defects. Plain surfaces shall be smooth and free from warp or buckle. Moulded members shall be cleaned out straight and true. Miters shall be well formed and in true alignment. Fastenings shall be concealed where practicable. All doors and door frames shall be cleaned by a hot dip phosphate or a cold phosphate chromate treatment. Immediately after drying these shall be applied with two shop coats of approved rust-inhibitive paint such as red oxide which will produce a hard tough film of good appearance, flexibility and rust resistance and then painted with 3 coats of approved enamel paints.

11.4. **CUT-OUTS**

Cut-outs where so required shall be accurately located and made to fit the hardware. Cut-outs shall have dust covers of galvanised sheet welded in place to prevent mortar and plaster from contact where the reinforcing plates and lock strikes.

11.5. **CLEARANCE**

Unless directed otherwise, doors shall have not more than 1/8" clearance at jambs and heads and not more than 3/8" clearance from floor or from threshold at the bottom, and shall have the proper level on lock stiles rails to operate without bending. They shall be made strong and reinforced at corners sufficiently to prevent sagging or twisting.

11.6. **BASE ANGLE AND SPREADERS**

Where required the base angle for fastening to floor shall be welded to each jamb section. Provide removable angle spreaders securely fastened to bottom of each jamb.

11.7. **INSTALL FRAMES AND DOORS**

Install frames plumb, grout, rigid and in true alignment and braced to retain position and clearance during construction of walls and partitions. Doors shall be installed in accordance with the working drawings and the instructions of the Engineer.

The doors shall be provided with all hardware, necessary for an efficient operation, such as hinges, lock sets, latchsets, cylinders, levers, lifting and sliding accessories. The final selection of the hardware, which shall all be the best of its kinds, shall be done during the execution of the contract, by the Engineer.

11.8. **PAINTING**

For painting and its application the specification given painting and finishing Chapter of the Specifications shall be followed.

(B) STEEL WINDOWS

11.9. **SCOPE:**

The work covered by this section consists of furnishing all labour, equipment, supplies and materials and in performing all operations in connection with the fabrication, construction and installation of metal windows, complete, in strict accordance with this section of the Specifications and the applicable Drawings, and subject to the terms and conditions of the Contract. Insect screens shall be provided in the locations where required by the Drawings.

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11.10. **LOCATIONS AND QUANTITIES:**

It is the intent of the Specifications to indicate the quality, character and type of the items. All locations and quantities of the various items shall be obtained from the drawings.

11.11. **STANDARD MANUFACTURED ITEMS:**

The Specifications describing the individual items indicate the type, construction, size or style, but substantially meeting the requirements specified, may be acceptable provided the quality is at least equal to the specified, and provided approval is obtained from the Engineer prior to purchase. The contractor shall clearly describe any deviation from the Drawings and Specifications for the items he proposes to furnish.

11.12. **CONSTRUCTION:**

Steel windows shall conform to relevant ASTM or BS 990 Part 2. All metal windows and screens shall be the products of a reputable manufacturer of metal windows approved by the Engineer. Windows shall be of the type indicated on the drawings and shall conform to the requirements herein specified for the respective types:-

Each window and screen shall be complete including all anchors, clips, bolts, mullions, and hardware and all attachments required for the installation of window screens.

Drips and weep holes, where required for satisfactory drainage shall be in accordance with manufacturer's standard practice for windows of the various types.

All metal window mullions shall be standard sections.

Where indicated on the drawings, provide openable sections of windows conforming to requirements hereinafter specified.

All windows shall be left in satisfactory operating condition and shall be water-tight.

11.13. **STORAGE:**

Windows and screens shall be stored in a vertical position at the site to prevent distortion or injury to hardware or finish.

11.14. **VERTICAL MULLIONS:**

Unless otherwise detailed on the drawings, vertical mullions required to combine two or more windows in a single opening shall be the manufacturer's standard mullion complete with bolts for attaching, and with inside and outside covers.

11.15. **ANCHORS:**

The windows shall be provided with all necessary clips and anchors required for attaching windows to steel, concrete, and/or masonry as required by the drawings.

11.16. **ERECTION:**

Windows shall be erected in prepared opening in accordance with the relevant drawings/details. They shall be set plumb and true, properly aligned and securely anchored as shown on detail drawings, with all ventilators correctly adjusted before glazing, joints at mullions between connecting windows and contact of windows with masonry sills shall e bedded in mastic. There shall be one (1) anchor at the top and bottom of each jamb and at not over 3'-0' intervals between jambs.

Anchor, clips and belts shall be furnished.

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11.17. **CAULKING:**

All fixed joints between various parts of the windows assemblies shall be buttered with caulking compound before the windows are assembled. All joints between windows and surrounding masonry construction shall be caulked with gray caulking compound of standard make.

11.18. **GLAZING:**

All windows shall be provided with best quality sheet glass 1/4" (5 mm) thick fixed with putty and deodar wood beading. Also refer relevant Chapter of the Specifications.

11.19. **MEASUREMENT AND PAYMENT:**

Doors and windows shall be measured in square measure between outer edges of the frames and top edges of the frame to floor level in case of doors. No separate measurement or payment shall be made for component items, such as hardware, glazing chaulking, painting etc.

ITEM - 12 GLAZING

12.1 **SCOPE OF WORK**

The work covered by this section of the Specifications consists of furnishing all plant, labour, equipment, appliances and materials, and in performing all operations in connection with this Section of the Specifications and the applicable drawings subject to the terms and conditions of the contract.

12.2 **MATERIALS**

All glass shall be from an approved local manufacturers and of approved best quality free from specks, bubbles and other defects and give clear undistorted vision. It shall be 5 mm or 6 mm thick or as shown on drawings/described in Bid Schedules or directed. All glass to generally comply with relevant ASTM or BS 952.

Putty

Putty shall be made as follows:
930 gm fine powder whiting
58 gm white lead (dry)
350 gm raw linseed oil
30 gm litharge
for glazing in metal ashes, 5% red lead should be added.

Glazing Compound

It shall be a standard product of manufacture; and a composition approved by the Engineer.

12.3 **INSTALLATION**

Materials installed under this section shall be certified to be as specified hereinbefore in quality, colour, performance and pattern.

All glass shall be cut accurately to the required sizes and all the edges shall be cleaned out.

Glass cut incorrectly, damaged or not meeting minimum requirement specified above shall be removed from position immediately and replaced.

Glazing shall be done in weather proof and water proof conditions. If the work schedule requires glazing work to be done at temperature below 5 degree C, proper grade of glazing compound (sealant) as certified by the manufacturer shall be applied according to manufacturer's direction with work full guaranteed.

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Glazing beads shall be removed while performing glazing operation. Beads to be set back in correct locations.

Glass shall be set in with equal bearings on entire perimeter with the help of clip and putty. Glazing surface shall be clean, dry, completely dust free before commencing application of glazing material.

Excess sealant compound shall be removed immediately from glass and other adjacent surface to prevent permanent stains or other damages to said surfaces.

12.4 **ACCEPTANCE AND CLEANING**

Labels showing glass manufacturer's identity, type of glass, thickness and quality will be required on each piece of glass. Labels must remain on glass until it has been set and inspected.

The Contractor shall clean all work on completion. Clean up all stains, marks, spots and disfigurements from all work, touch up as required, clean all window panes, remove all rubbish and debris from building and site and leave premises clean and tidy and fit for occupation in all respects and to the entire satisfaction of the Engineer.

Glass shall be protected against damage. After inspection any label, paint, smears, stains, dirt, shall be removed from the glass, and the glass shall be washed clean on both sides taking care not to scratch or damage the glass. Damaged or broken glass shall be removed and replaced with new glass of same kind before acceptance.

12.5 **GUARANTEE**

Contractor shall, and does hereby guarantee as part of the Contract, that all glazing joints in exterior openings shall remain water tight for a period of at least two years after the final acceptance of the buildings. The Contractor shall also guarantee that during the above period, caulking compound shall not crack, dry out, crumble or fall away from sash on glass.

12.6 **SAMPLES**

Samples of all kinds of materials to be used on the job shall be submitted to the Engineer for approval before the same are procured.

12.7 **TESTING**

All materials shall be subject to standard testing and specifications such as ASTM Standard C-797, if found below the standard the same shall be rejected and removed from the site immediately.

12.8 **MEASUREMENT AND PAYMENT**

No separate payment for the work described in this section of the specifications or incidental thereto shall be made to the contractor and his quoted price for doors, windows, ventilators fixed panel etc. shall be deemed to be inclusive of glass and glazing where the same is to be fixed.

ITEM - 13 EXTERNAL FINISHES/ PAINTING

13.1 **SCOPE**

The work covered by this section of the Specifications consists of furnishing all plant, labour, equipment, appliances and materials and in performing all operations in connection with protective and general painting steel, wood, plaster work, concrete surfaces etc. all as directed and finishing complete in strict accordance with this section of the Specifications and the applicable drawings, Description of Items and subject to the terms and conditions of the contract.

13.2 **GENERAL**

The term "Paint" as used herein includes, emulsions, enamels, paints, distempers, stains, varnishes, sealers, primers, colour washes etc. All colours shall be subject to the approval of the Engineer.

13.3 **MATERIALS**

Paints shall be well ground, shall not settle badly, cake or thicken in the container, shall be readily broken up with a paddle to a smooth consistency and shall show easy brushing properties. The paint shall be suitable for spraying when thinned with not more than 12 percent by volume of mineral spirits. All paint materials shall be delivered to the job in original unbroken containers with labels and tags intact.

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All paints shall be the best of their kind as used in Pakistan and a first class quality product made by an approved manufacturer of good standing and repute and shall conform to the requirements of current British Standard Specifications or ASTM Standards.

All colours shall be pure tint colours ground in linseed oil and guaranteed non-fading.

Colour shall be lime proof where used on cement block, concrete, or plaster.

All colours and shades shall be as directed by the Engineer. The colour of each coat of paint shall be a different shade from that following.

Until and unless specified or directed otherwise, paints shall be of Berger Pakistan Ltd's paint or equivalent. Colour wash shall mean coloured chalk applied with glue at the rate of 2.25 kg per bag of 30 kg chalk. Chalk wash shall mean white chalk with glue at the rate of 2.25 kg per bag of 30 kg.

13.4 PROTECTIVE PAINTS

Unless otherwise specified all exterior and interior ferrous metal surfaces, except reinforcing steel, bolts, rough hardware and metals with non ferrous coatings shall be given a shop coat of protective paint (zinc compound). Paint shall conform to the requirements of ASTM D-80. Surface to be painted shall be thoroughly cleaned of scale, dirt, and rust by the use of steel scrapers, wire brushes, sand blast or other equally suitable tools or methods. Oil and grease shall be removed with benzene or other suitable solvent. Paint shall be kept well stirred while it is being applied. No paint shall be used after it has caked or hardened. Paint shall be well worked into all joints and corners. Paint shall not be applied to damp surfaces nor when the temperature is below 5 degree centigrade.

13.5 GRAFFITO

This textured finish is based on quartz powder around 300 mesh and silica sand averaging 70 mesh. Split up mesh sizes are used for improving the conglomeration. A round stone of desired mesh size is used to create the radial or linear effects.

Graffito shall be applied as external finish on external plastered surfaces (13mm thick, 1:4 plaster).

13.6 SAMPLES AND TESTS

Samples of each type of paint and each colour proposed for use shall be submitted to the Engineer and approval thereof received before the material, represented by the sample, is used on the project. Samples shall consist of 1 pint and 3 displays of each type and colour of paint applied to material strips 50 mm by 150 mm. Back material used for display stains, shall be the same kind as that on which the stain is ultimately to be applied. In addition to the submission of samples, the Contractor shall submit authenticated report of tests of the materials proposed for use, as directed by the Engineer.

13.7 PREPARATION OF SURFACES

General

Hardware, accessories, plates, lighting fixtures, and similar items in place shall be removed prior to painting operations and completion of the painting in each space, or shall be otherwise protected. All surfaces to be painted shall be clean, smooth, dry and free from dust, grit and other objectionable materials.

Concrete and Plaster Work

Concrete and plastered masonry surfaces to be painted shall be prepared by removing all dirt, dust, oil and grease for good adhesion for the paint. The method of surface preparation shall be left to the discretion of the Contractor, provided the results are satisfactory to the Engineer. Nails and similar exposed metal occurring in concrete or plaster surfaces shall be

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coated with shellac or oil paint before the cement-water paint is applied. All surfaces required to be painted with oil-base paints shall be free from alkali and shall be thoroughly dry before paint is applied.

Plaster shall be sufficiently old and shall be thoroughly dry, clean and free from grit, loose plaster, and surface irregularities before paint is applied. Cracks and holes shall be repaired with patching plaster with approved additive such as "Thorite" and properly keyed to the existing plaster. All plaster surfaces shall be tested for the presence of alkali, which if present, shall be removed with a solution of zinc sulphate mixed in the proportion of 1 kg to 1.5 kg of compound to 4 litres of water. After drying, the precipitate shall be removed by brushing. Plaster patches shall be worked to match the appearance of the adjoining plaster.

Before the application of the cement-water paint, all holes in joints or masonry plaster surface shall be filled with mortar and suitably tooled and caulking installed around wood or metal frames built into masonry, shall be thoroughly checked. Plaster surface shall be cleaned and free from dust, dirt, grease, or any other material which might affect the proper adhesion of paint. Surfaces shall be thoroughly dampened with a fine spray of water before application of paint.

Internal Painting of Concrete and Plastered Surfaces (Distemper)

All the surfaces shall be prepared as stated in sub item 15.7 hereinbefore.

Irregularities in the surfaces shall be made smooth by applying coat of proper putty such as Berger Robbialac plastron putty or approved equivalent.

Finished surfaces shall then be treated with one coat of Berger Robbialac plastron wall primer sealer or approved equivalent.

3 coat of Synthetic Polyvinyl Distemper of Berger Robbialac make or approved equivalent shall then be applied.

Application of primer and paint in coats shall be done strictly in accordance with the manufacturer's instructions.

External Painting of Concrete and Plastered Surfaces (Weather Shield Paint)

All the surfaces shall be prepared as stated in sub item 15.7 hereinbefore.

Irregularities in the surfaces shall be made smooth by applying coat of proper putty such as Berger Robbialac plastron putty or approved equivalent.

3 coat of Berger Robbialac Chlorinated Rubber Base Paint or 3 coat of "Weather Fighter" brand paint of Buxly Paint Ltd. Pakistan or approved equivalent shall be applied.

Application of primer and paint in coats shall be done strictly in accordance with the manufacturer's instructions.

External Painting of Concrete nd Plastered Surfaces (Snowcem/Durocem)

Before the application of the cement-water paint, all plastered surfaces shall be clean and free from dust, dirt, grease, or any other material which might affect the proper adhesion of paint. After application of paint the surface shall be water cured as per manufacturer's instructions.

Mix the paint in accordance with the manufacturers' directions and allow it to stand 30 to 45 minutes. Before application mix to uniform consistency and stir frequently during application. Dampen, but do not saturate, the surface uniformly by spraying for several minutes and let the moisture penetrate through. Apply the paint with a brush having relatively short, stiff, fibre bristles by scrubbing the paint into the surface voids. Cure the first coat by keeping the surface damp for at least 24 hours; spray the surface as soon as the paint has hardened sufficiently to resist injury and repeat the spraying as often as necessary to keep the surface damp before applying second coat. Apply the second coat in such a manner as to completely cover the first and cure as specified above, except that curing shall be continued as long as practicable, and for not less than 48 hours. Apply the paint in the shade rather than in bright sunlight, specially avoiding

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painting during warm windy weather. In applying the finish coat, layout the work so that an entire wall surface may be completed in one operation; if this is impracticable, carry the painting to some natural stopping point.

Metal Work

Shop-primed metal work shall be kept clean and free from corrosion following installation. Abraded surfaces shall be retouched prior to finish painting, using the same type of paint as the priming coat (zinc compound).

Wood Work

Small, dry, seasoned knots shall be thoroughly cleaned and scraped, and shall be given a thin coat of orange shellac varnish before the priming coat is applied. Large, open, unseasoned knots and all beads or streaks of pitch, shall be heated by a blowtorch and then scrapped off, or, if the pitch is still soft, it shall be removed with mineral or denatured alcohol. Resulting voids, if any, shall be filled with putty. Nails shall be set. Painting shall proceed only when, in the opinion of the Engineer, the wood is satisfactorily dry.

13.8 APPLICATION OF PAINTS

All the work shall be done in a workmanlike manner, leaving the finished surfaces free from drips, ridges, waves, laps, and brush marks. Except as specified or required for, cement-water paints shall be applied under dry and dust-free conditions and unless otherwise approved by the Engineer shall not be applied when the temperature is below 5 degree centigrade nor when a temperature drop of 11 degree centigrade or more is in forecast. All primer and intermediate coats of paint shall be unscarred and completely integral at the time of application of each succeeding coat. Each coat of paint shall have slight variations of colour to distinguish it from the preceding coat. Sufficient time shall be allowed between coats to ensure proper drying. Paints shall be thoroughly stirred and kept at a uniform consistency during the application and shall not be opened until required for use. Except as otherwise, paint may be applied by the spray method except during cold weather or when, in the opinion of the Engineer, spraying in any particular application would produce unsatisfactory result. Floors, roofs and other adjacent work shall be properly protected by drop cloths or other covering.

Polishing/Painting of Wood Work

Wood work (and including also the inside face of exterior doors and frames) shall be stained to match an approved sample prepared by the Contractor and given three (3) coats of spar varnish. Top and bottom edges of doors shall be given three (3) coats of spar varnish.

Wherever indicated otherwise on the drawings, the wooden doors and partitions shall be painted with three (3) coats of enamel paint. All wood work specified to be painted shall be primed in all sides in the shop before delivery to the job. After the priming coat has been applied, nail holes, cracks, and other depressions shall be filled flush with putty, coloured to match the finish coat and sand-papered smooth. Putty shall be dry before subsequent painting. Glazing rabbets and beads in exterior glazed doors shall be given 1 coat of exterior primer before glazing. All exposed putty shall be painted.

Ferrous Metal Work (Enamel Paint)

Exterior ferrous metal surfaces shall be painted three (3) coats of exterior oil enamel paint after the protection coat of zinc compound.

Protective Coating

All structural steel should be given a shop coat of anti-rust protective paint (zinc compound) of standard manufacturer. Paint shall conform to the requirements of B.S. 2523, type "A" or equivalent ASTM standard. Surface to be painted shall be thoroughly cleaned of scales, dirt and rust by the use of steel scrapers, wire brushes, sand blast or other equally suitable tools. Oil or grease shall be removed with benzene or other suitable solvent. Paint shall not be applied to damp surface nor when temperature is below 5 degree centigrade.

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Surface Treatment and Painting

After each item of metal work has been fabricated, the Contractor shall clean and prime paint and/or protect it in the manner specified herein. All exposed surface of structural steel members, shall have all oil and grease removed by washing with a suitable solvent. The surfaces shall then be thoroughly cleaned to expose clean metal.

Following the above surface treatment and on the same day and before any visible rusting takes place, apply 0.05 mm dry film thickness of an approved red oxide/zinc chromate primer. The primer shall be of a high quality.

This shall be followed by at least two (2) coats of approved first quality enamel paint. The first coat or under coat shall be of the specified colour in flat base paint and shall fully mask the prime coat. The second coat or finish shall be of an approved alkaloid resin pigmented enamel paint. Each coat to have a minimum dry film thickness of 0.05 mm. Primer and paint shall be of I.C.I. Pakistan or Berger Paints or approved equivalent.

Where mating machine ferrous surfaces are required to remain in contact after shop assembly, each together with the shanks and threads of bolts used, shall immediately before assembly, be uniformly coated with a thin mixture of white lead and graphite in oil.

All exposed bright and/or ferrous surface not intended to be painted, including exposed screw threads, shall be cleaned and given a heavy uniform coating of petroleum soluble rust preventative compound. Such protection shall be adequate to prevent corrosion during transport and/or storage in the open.

Where mating unmachined ferrous surfaces will be in permanent contact after strop assembly, each surface shall receive the surface treatment as specified above followed by one coat of red oxide/zinc chromate and the surfaces shall be brought together whilst the paint is still wet. All coatings shall be applied by qualified trades men painters. Painting shall not be carried out in unsuitable weather when humidity is less than 80% and the temperature is above 40^{o}F or higher temperatures if recommended by the manufacturer. Spray painting shall be adopted wherever possible. All paints shall be used and mixed according to the manufacturer's instructions, including thinning, if necessary. Finishes shall be smooth and free from brush marks. Minimum drying and curing times recommended by the manufacturers shall be strictly observed before recoating.

Application of all coating systems shall be carried out in accordance with the instruction of the manufacturer. Colour scheme and paint shades shall be approved by the Engineer.

Buried Piping

All steel piping and all exposed threads of galvanized piping, where run in or through concrete or masonry, or buried underground, shall be given one (1) coat of approved asphalt varnish.

13.9 **CLEARING**

All cloth and cotton waste, which might constitute a fire hazard, shall be placed in metal containers or destroyed at the end of each work day. Upon completion of all work, all staging, scaffolding and containers shall be removed from the site or destroyed in a manner satisfactory to the Engineer. Paint spots, oils, or stains upon adjacent surfaces shall be removed and the entire job left clean and acceptable to the Engineer.

13.10 **MEASUREMENT AND PAYMENT**

Measurement of painting work of distemper, emulsion and snowcem/durocem on concrete/plastered surfaces, application of graffito on plastered surfaces shall be made for actual area painted/treated and paid for as per rates of pay items in B.O.Q.

Enamel painting of steel and wooden surfaces of doors, windows, cabinets, wardrobes etc. shall not be measured or paid and the same shall be deemed to be included in the rates of these items of wood and metal work in the Bill of Quantities.

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ITEM - 14 CAULKING (SEALANT OR MASTIC)

14.1 SCOPE

The work covered by this section of the Specifications consists of furnishing all plant, labour, equipment, appliances, and materials, and in performing all operations in connection with the application of caulking complete, subject to the terms and conditions of the Contract, and in strict accordance with this section of the Specifications, applicable Drawings and Descriptions of items.

The Contractor shall caulk at the sills, jambs, and heads of all windows and louvers and at the jambs and heads of all doors in walls. He shall also caulk the joints and intermediate joints of windows sills and around the perimeters of concrete framing members such as columns, masonry, and beams. Caulking noted on the Drawings as "Mastic" shall be included under this section.

Caulking occurring in connection with joints in concrete floors, in walls, and roofing and sheet metal work is also included in this section.

14.2 MATERIALS

Materials shall conform to the following requirements:

Caulking Compound

Caulking compound shall be elastic waterproof and non-corrosive, firm when set, but not hard or brittle and shall have "Elastomeric" properties. Oils shall not leave the body of the materials to such an extent as to extend beyond the periphery of the material when it is applied to any type of masonry. It shall be of such composition that a thin tough skin will form an exposed surface while underneath remains plastic indefinitely. It shall have no tar or asphalt content, but shall be composed of specially prepared porous pigments so treated that they will absorb and retain sufficient oil to provide long life, elasticity, and complete and permanent adhesion to wood, iron glass, concrete, concrete blocks, and masonry. It shall show no sagging puckering, cracking, or shrinking under any weather conditions after application. The colour of the caulking compound shall match the colour of the adjacent surfaces. Delivery of the caulking compound to the project site shall be in the manufacturer's original sealed package, bearing the name of the manufacturer.

Sealer

The sealer for the joint grooves in masonry shall be a quick-dry liquid, and of a type and consistency recommended by the manufacturer of the caulking compound.

Rope Yarn

Rope yarn shall be the beveled strands of rope fiber, free from oil or other staining element.

14.3 SAMPLES

Before the work of application is started, samples of all materials proposed for use shall be submitted to the Engineer for approval.

14.4 APPLICATION

Caulking compound shall be applied by the gun method using nozzles of proper sizes to fit the several widths of the joints. The type of gun shall be subject to approval by the Engineer.

Preparation

Caulking in joints shall be a minimum of 20 mm in depth and 4 mm in width, unless otherwise indicated on the Drawings. Where adequate grooves for caulking have not been provided, grooves shall be prepared by cutting and cleaning out the mortar to the minimum depth and by grinding to the minimum width, taking care that adjoining metal work is not reduced in section. All particles of mortar, dust, and other foreign matter shall be brushed out and just prior to caulking, the joint grooves shall be treated with an application of sealer, where a suitable mortar backs top has not been provided, the back of joint grooves shall be packed tightly with rope yarn.

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Caulking

The compound shall be driven into the joint grooves with sufficient pressure to force out all air and to fill the joints grooves solidly. Caulking joint where exposed, shall be free of wrinkles and shall be filled slightly convex to obtain a flush joint when dry. Upon completion of the caulking any caulked joints not entirely filled shall be roughened and filled as specified and the exposed surface tooled smooth.

Cleaning

The surfaces of all materials adjoining caulked joints shall be cleaned of any smears of compound or other soiling due to the caulking application.

14.5 **GUARANTEE**

The Contractor shall, and as part of his contract does, guarantee that for a period of three (3) years after acceptance of the Contractor's work, the caulking will be weather tight and the caulking compound will not become brittle, sag, run, or crumble or fall out of place.

14.6 **MEASUREMENT AND PAYMENT**

No separate measurement or payment shall be made for caulking work described in this section.

The cost of caulking work shall be deemed to be included in the rates/prices of related items of work in the Bill of Quantities.

ITEM - 15 WATERPROOFING

15.1 **SCOPE OF WORK**

The work covered by this section of the Specifications consists of furnishing all plant, labour, equipment, appliances and materials and in performing all operations in connection with the application of Water Proofing as specified hereunder complete, in strict accordance with this section of the Specifications and the applicable Drawings, Description of items and subject to the terms and conditions of the Contract to the entire satisfaction of the Engineer.

15.2 **GENERAL**

All materials shall be delivered to the site in containers with labels, comments and seals unbroken and shall not be opened until inspected by the Engineer. Work required under this Section of Specifications shall not be performed when ambient temperature is lower than $5^{o}C$ or during rain or snow or where surfaces are damp.

15.3 **MATERIALS**

Bitumen for Roofing shall be an asphalt with the following characteristics and shall be a standard manufacture of National Petrocarbon Ltd. or equivalent as approved by the Engineer.

		Max.	Min.
i)	Specific Gravity at $25^{o}C$	1.06	1.01
ii)	Softening Point (Ring & Ball Method)	$93^{o}C$	$80^{o}C$
iii)	Penetration at $25^{o}C$, 0.1 mm	35	20
iv)	Ductility at $25^{o}C$, Min. cm	-	3
v)	Loss on heating (ASTM), Max.% wt.	0.05	-
vi)	Solubility in CCL4, Min.% wt.	-	99
vii)	Pouring temperature ^{o}C	$180^{o}C$	170^{oC}
viii)	Flash Point	-	200^{oC}

Precast stools

Precast stool shall be concrete class-E of size 300x300x100 mm high.

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15.4 SAMPLES AND TESTS

Samples of all materials prepared or ordered for use in works under this section of the Specifications and a written statement indicating exact proportions, method of mixing, constant weight per cubic metre and method of application etc., as per manufacturer's instructions shall be submitted to the Engineer. Necessary tests as required by the Engineer shall be carried out by the Contractor at his own cost to establish their suitability and ascertain the quality claimed.

15.5 PREPARATION OF SURFACES

Construction of the roof slab and related work shall be completed prior to start of application of roofing materials. The surfaces shall be thoroughly clean, free of dirt and foreign materials and shall be dry, firm and smooth. Vents and other projections shall be properly flashed and secured in position. No damp proofing or roofing materials shall be applied prior to approval of the condition of the roof surface by the Engineer.

15.6 APPLICATION OF MATERIALS

All applications shall be in strict accordance with ASTM D-1327 and the manufacturer's specifications as approved.

No material shall be applied when temperature is below 5^{o}C or during rain or snow or where surfaces are damp.

Asphalt shall not be applied when its temperature exceeds 180^{o}C. Heating of asphalt shall be rigidly controlled by means of an approved type thermometer suitably suspended over the kettle while heating is in progress and it shall not be heated above 245^{o}C.

15.7 ROOF WATER PROOFING

Scope

The work covered by this section of the Specifications consists of furnishing all plant, labour, equipment, appliances and materials and in performing all operations in connection with the application of insulated roofing including felt water proofing, flashing and concrete protective stools and roofing screed, complete in strict accordance with this section of the Specifications and the applicable Drawings, and subject to the terms and conditions of the Contract.

The work under this section of the Specifications comprises the following:

Installation of Roofing

a) One prime coat and two flood coat of SIB 10/20 hot bitumen at the rate of 15 kg. Per 100 sq.ft. each over RCC slab.

b) Apply one layer of polythene sheet 0.20 mm laid 75 side laps and 100 mm end laps staggered with layers bonded together with bitumen, broom sheet to ensure that it is free of wrinkles.

c) Earth shall be laid to desired slopes and tiles shall be laid on a mortar bed (average thickness 75 mm) to the required slopes as shown on plans. The preparation of mud plaster shall be as follows:-

The clay containing sand not more than 5% shall be laid out in stakes not exceeding 12" height and saturated with water and allowed to stand for not less than 3 days, water being added during this period to ensure complete saturation. The binding material (Bhoosa) shall then be added and the mixture well puddle and left 2 days or so. It will then be thoroughly mixed to the required consistency of mortar and laid to slope.

d) Brick tiles of specified size and first class quality shall be laid wet, grouted and pointed flush in cement sand mortar (1:2). The top surface shall be smooth and accurately level in accordance with the specified slopes. No brick or cracked tile to be used. Special Tiles for sloped roof shall be laid as per details shown on the drawings

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15.8. **CURING**

Tiles, after laying, grouting and flush pointing is completed, shall be kept wet throughout for at least seven days.

15.9. **PROTECTION**

The Contractor shall take each and every care to maintain the slopes levels and shall protect the work from any damage. The Contractor shall have to remove, replace and rectify such damaged work at his own cost.

Screeding

Laying of Class-B cement concrete plain screeding of average thickness of 50 mm shall be started using approved quality 10 mm & down graded crush stone & approved quality sand. All concrete to be machine mixed, laid in required slope compacted & properly cured.

Bitumen/Sand Water Proofing (where shown on drawings)

After thoroughly cleaning the concrete surface and removing all dirt and dust, Hycarb A-20 shall be applied at the rate of 2 kg/sq.m while sufficiently hot, coarse sand shall be spread evenly and pressed into the Bitumen Coat such that entire surface is fully covered.

15.10 **MEASUREMENT AND PAYMENT**

Measurement and payment shall be made for the composite work for the roof area covered and measured in square measure. No separate measurement or payment to be made for component items of screed, waterproofing layers, stools, etc.

ITEM – 16 DAMP PROOFING

16.1. **DESCRIPTION**

The Damp Proof Course shall be horizontal and vertical as shown on the drawings and specified in the Bill of Quantities.

16.2. **HORIZONTAL**

16.2.1 In Walls

The horizontal D.P.C. shall consist of 50 thick, Class-B cement concrete with two (2) sand blinded coats of Hycrab-A-20

16.2.2 Under Floors

Same as in walls except bitumen layers to be laid on 12/20 mm blinding screed (1:6) to even out surface of lean concrete hard core.

16.3. **VERTICAL**

The vertical D.P.C. shall consist of 20 thick 1:3 cement sand mortar with 5% pudlo and two (2) sand blinded coats of hot Hycrab-A-20

16.4. **MATERIAL REQUIREMENTS**

All material i.e. cement, sand aggregate, water polythene sheet and bitumen shall conform to the specification given in respective section.

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16.5. **CONSTRUCTION REQUIREMENTS**

The Contractor shall lay the D.P.C. only when the level, quality of masonry work, etc. is approved.

The concrete work of D.P.C. shall conform to the relevant specifications given in this section for the execution of these items.

Horizontal D.P.C. shall extend to the full width of the wall i.e. upto the external faces. No portion of doors opening, etc. shall be left while laying D.P.C. The period of curing of concrete shall be not less than 72 hours. Every care should be taken that concrete is not left dry during this period. The work of laying Damp Proof Course shall be carried out as follows unless otherwise described in BOQ:-

a. Placing 2" layer of Class-B cement concrete.
b. Laying 2 Coats of hot bitumen Hycrab-A-20 grade @ 20 lbs. per % sq.ft. (each coat) over entire width and lengths of concrete after the concrete has been properly cured for at least 72 hours, and sand blinding where specified.
The application of bitumen coating in case of vertical D.P.C. shall be same as mentioned above.

16.6. **MEASUREMENT AND PAYMENT**

The measurement shall be made in per sq.ft./M by measuring length and breadth/height of actual work done and as shown on the drawings.

ITEM - 17 TERMITE CONTROL

17.1 **SCOPE OF WORK**

The work covered by this section of Specification consists of furnishing all labour, materials, equipments, services, miscellaneous and necessary items required to complete Termite Control Work, related works as indicated on Drawings specified herein or described in description of items.

17.2 **MATERIALS**

Pesticides shall be solution of an approved chlorinated hydrocarbon such as 0.5% Dieldrin or 0.5% Aldrin mixed in clean water for application in earth, and mixed with pure turpentine for application to wood.

Pesticides (Dieldrin and Aldrin) shall be obtained under permission of the department controlling their sale in Pakistan, in sealed drums at rate in force at the time of their acquisition and only in the quantity necessary for work of this Project. All mixing shall be done at site and the amount of pesticides used shall be verified by the Engineer.

17.3 **METHOD OF APPLICATION**

Pesticides solution shall be applied with approved pressure spraying equipment maintaining a pressure of $1N/mm^2$ ($10kg/cm^2$) to all applications to, on or in earth. Spraying to wood shall be done by hand compression sprayers with an approximate pressure of $0.15\ N/mm^2$

17.4 **EXTENT OF APPLICATION**

All excavation, all walls and bottoms of all pits or trenches for footings or foundations are to be sprayed. Pesticide shall penetrate to a depth of 12" minimum in porous earth at bottom and 3" minimum at sides of excavations.

Stockpiled excavated material to be used as back fill is to be spray treated as above. After backfilling to plinth level, area of the whole building upto 10'-0" outside the building line is again to be sprayed penetrating a minimum of 12" into soil.

After grading, compaction and levelling and before formation of hard core/soling under floor slabs all areas to receive slabs shall be sprayed with pesticides, penetrating a minimum of 12" into soil.

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All rough wood work for the entire project shall be pesticide treated (before application of solignum in the case of material to receive both treatments). Pesticide shall be sprayed on all surfaces of blocking, furring planks, scantlings, boards etc. before installations. Spraying shall be once again done at the site, after delivery and before installation. All spraying will be done within one week of working of the material.

17.5 **LOCATION AND SCHEDULING**

Saturation of earth is to be done by adequate personnel and in such a manner as to in no way disrupt the progress of work.

Spraying of rough wood work will be done on or near the site at location and in such enclosures as proposed by the Contractor and approved by the Engineer. Such work is to be scheduled and done by sufficient skilled personnel as to in no way impede the progress of the work.

Care shall be exercised to ensure that no marks or damage occurs to the finished building as a result of the work under this Section, and Contractor shall verify and ensure that no material used herein will impede the growth of grass or plants at areas where spraying is done.

17.6 **STANDARD**

All methods of termite protections used herein shall be in accordance with best standard practices of National Pest Control Association, U.S.A. and the British Wood Preserving Association.

17.7 **GUARANTEE**

The Contractor is to guarantee that the building shall be free from termite (white ants), wood bores and other pests or rodents which cause damage to wood or other organic material for 10 years from the date of acceptance of the building and that.

In the event of any damage caused within the guarantee period, the Contractor shall replace at his own cost such damaged material, finishes and affected portion thereof and suitably preserve and treat the entire premises with the best method known to the trade to prevent the spreading of termites.

17.8 **TESTING**

All materials and samples shall be subject to standard testing in accordance with the standards specified herein and shall be rejected if found below these standards. Rejected materials shall be removed from the site immediately.

17.9 **MEASUREMENT AND PAYMENT**

The item of work of termite proofing is given in BOQ on the basis of plinth area of the Buildings while it shall cover application of termite proofing to all bottoms and sides of pits, fill material, floor sub-grade and all the works requiring termite proofing in an area extending upto 3 metres outside the building line as elaborated in para 4 "Extent of Application" of these specifications.

ITEM - 18 TREES AND PLANTER AREAS

18.1 **SCOPE OF WORK**

The work covered under this section of specifications consists of preparation of ground, pits and trenches and providing and planting trees, shrubs and planter areas such that these are well grown at the time of completion of the project works.

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18.2 **TYPES**

Shrubs and planters shall be of type that are well grown and blossoming in a short time but well suited to the area. Trees to be planted shall be of type suitable for growth in the area, capable of growing in a shorter time and to provide shades.

18.3 **TOP SOIL**

Top soil furnished from one source shall be typical sterile, soil obtained from well-drained area and possessing characteristics of representative soils in the project vicinity that produce vigorous plant growth. The top soil shall be free of sub-soil, brush, organic litter, objectionable weeds, clods, shale, large stones stumps, roots or other material 13mm in diameter or more, or any substance which might be harmful to plant growth or be a hindrance to grading, planting and maintenance operations.

18.4 **FERTILIZER**

The fertilizer shall be well decomposed organic manure which shall be subject to approval by the Engineer.

18.5 **PLANTING PITS FOR TREES AND SHRUBS**

Excavation for planting shall include plant pits and planting beds. The minimum depth of plant pits or beds shall be measured from finished grade.

Plant beds and pits shall be tested for drainage before planting by filling with water twice in succession. Conditions permitting the retention of water in planting beds or pits for more than 24 hours shall be brought to the attention of the Engineer.

If rock, underground construction obstruction, tree roots or other obstruction are encountered in the excavation of plant pits, alternate locations may be selected by the Engineer.

The Contractor shall review the applicable architectural or engineering drawings and shall be familiar with the alignment of utility lines, ducts and buried cables existing in the area. The Contractor shall field check the location of utilities shown on the drawings before any installation of material or plants. The Contractor shall be responsible for all damage resulting from any neglect or failure to comply with this requirements.

Following excavation of the planting pits, the pits shall be back filled with the sweet soil mixture as specified. Three days prior to planting, the pit shall then be filled with water for consolidation of the soil.

The dimension of the planting pits are as follows, unless specifically directed otherwise by the Engineer.

a) Trees 1m x 1m x 1m

b) Shrubs 600mm x 600mm x 600mm

c) Hedges Trenching 600 x 600 mm deep of required length.

d) Edges and flower beds: Fill the flower box with sweet soil as per drawings. For seasonal flowers, the beds are to have a minimum of 300 mm sweet soil and 150mm manure.

18.6 **SHRUBS AND PLANTER AREAS**

Should the existing grades be at the proposed elevations, the soil must be "trenched or plowed" 300mm deep over the entire surface. Should the soil be unsuitable, it must be removed and replaced with sweet soil.

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Sweet soil shall be placed in the planter areas as shown on the drawings and raked. All stones in excess of 25mm in diameter and all rubbish shall be removed. Sweet soil not be spread in muddy state.

Sweet soil shall have minimum thickness of 300mm after natural settlement and light rolling, and shall conform to the finish grades and elevations shown in the plans. The finish grades shall be refined under the supervision of the Engineer.

Cover the sweet soil with 100mm of well decomposed organic manure and mix into the top 100mm of the top soil.

The prepared surface shall be free from all rivulets, crusting and caking. The sub-grade soil shall be scarified to a 300mm minimum depth and brought to a true and uniform grade before dumping and spreading of sweet soil.

18.7 **MAINTENANCE AND PROTECTION**

Maintenance by the Contractor shall begin immediately after the planting operation is completed and shall continue until acceptance. All replacement, adjustment and maintenance shall be done at no additional cost.

18.8 **CLEAN UP**

After completion of all work, all debris, rubbish and surplus material shall be removed from the site at the Contractor's expense. The site shall be left clean, presentable and to the satisfaction of the Engineer.

18.9 **MEASUREMENT AND PAYMENT**

Planter area shall be measured in square measure of the plan area covered and paid the rate per sq.meter in the B.O.Q.

Trees shall be measured in number and paid at the rate per number in the B.O.Q.

ITEM – 19 FOOT PATH AND PAVEMENT

Footpath and pavement shall be constructed with component parts as under:

Compacted fill to 95% compaction to required grades

150 mm thick compacted sand filling.

100 mm thick Lean concrete.

300 x 300 x 25 thick class-B concrete tiles laid with 2” inches joints which is to be filled either by sweet soil or shall be grouted with pebbles in approved patterns.

19.1 **MEASUREMENT AND PAYMENT**

Walkways to be measured in square measure between outer edges of pavement no separate measurement or payment to be made for component parts.

ITEM - 20 ALUMINIUM DOORS AND WINDOWS

20.1SCOPE

This section of the technical specifications comprises the provision of all labour, materials and plant and performing all construction operations in connection with the erection and installation of all aluminum doors, windows, ventilators, fixed panels, with grills and glazing, etc, complete in every respect, including all related items required by the drawings and as specified herein or as directed. Materials and workmanship shall be the best of their kind and always above the minimum requirements of relevant British and/or American Standards. The standard of manufacture shall be ALCOP/KRUDDSON or equal as approved by the Engineer.

20.2SHOP DRAWINGS

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Before any work in connection with the windows and doors commences, the Contractor shall prepare shop drawings and specifications for all the windows and doors with all detail drawings showing fixings, details for materials and workmanship, etc,. necessary for their complete manufacture and installation. The Contractor after consulting the manufacturer shall submit the shop drawings and specifications to the Engineer for approval within a period of 20 days (minimum) prior to any commencing of work on the window or door lugs and fittings.

Shop drawings shall indicate elevations of windows and doors, full size sections, thickness and gauges of metal, proposed method of anchoring, the size and spacing of anchors, details of construction, method of glazing, method and materials for weather stripping when specifically required, and details of installation.

20.3SITE MEASUREMENTS

Measurements in the knowledge of the Engineer shall be taken on the site as necessary to verify and supplement dimensions shown on the contract drawings.

20.4SAMPLES

The Contractor shall submit samples of metal and materials of Engineer and his Representative for approval of finish and shall also submit manufacturer's literature describing all manufactured items. All materials used in the works shall be the best of its kind and at least equal in all respects to the samples approved.

20.5MATERIALS

Extruded Sections

All extrusions are to be in accordance with B.S.1476 alloy HE9 with the mechanical properties of the WP condition unless required otherwise.

Sheet (Aluminium)

All aluminium sheet shall be to B.S.1470 alloy NS ¼ hard condition, unless required otherwise.

Anodising

All aluminium sections exposed to atmosphere shall be anodised in accordance with B.S. 3987 with a satin surface finish or other as required and approved. The average thickness of the anodic coating o a significant surface at the time of delivery shall not be less than 25 microns and at no point on the significant surface shall the measured thickness be less than 23 microns, or more than 30 microns. The method of testing shall be that described in Appendices, A,B and C of British Standard 3987.

Lacquer Finish to Anodised Aluminium

Unless directed otherwise all anodised aluminium shall be dipped one coat of methacrylate lacquer and stoved on at the works to a required temperature for a period of 20 minutes, the dry film thickness must be 12 microns minimum. Air drying sprayed coatings of lacquer or wax coatings and other removable protected methods will not be acceptable.

Steel

All steel fixing cleats, structural sections and steel cores which if required to be used to reinforce the aluminium windows or used in conjunction with the fixing, shall be hot dip galvanized in accordance with B.S.729: Part 1. Electro-galvanizing or metal spraying is not acceptable.

Neoprene Gaskets

The glazing shall be manufactured from neoprene to B.S.4255: Part 1, which covers performed rubber gaskets for weather exclusion from building, as approved by the Engineer.

Polystyrene Foam

The external aluminium windows and doors where required shall have expanded polystyrene foam (thermopore) picked into the hollow perimeter frame section to form a base for the mastic perimeter sealing.

Glazing

The glazing work shall be carried out according to the section "GLASS & GLAZING" and adhere to the recommended procedure of the window manufacture, to assure proper water tightness of the glazing and in any position where aluminium opening windows are used. They must be set strictly as the window manufacturer's instructions and British Standard Code of Practice C.P.152.

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Fastening and fixing

All opening windows and doors are to be fitted with suitable opening, bolting at locking devices, catches and stays from the inside as necessary, with the best of their kinds as approved by the Engineer.

Grills

All grills shall be of approved material, shape and design as shown on the drawings or as directed, where required.

Aluminium Wire Net

Aluminium wire net shall be provided for mosquito proofing as approved on all openable windows and elsewhere, unless not required, as shown on the drawings.

20.6DESIGN

All the external windows and doors must be designed always subjected to the approval of the Engineer to meet the following conditions:

i) The wind load for design purposes to be a maximum of 100 kg per square metre.

ii) The provision for expansion and contraction for the temperature range of 50^{o}C to 0^{o}C.

iii) The design must accept single thickness of tinted or float glass or alternatively,

iv) All glazing is to be neoprene channel gaskets with vulcanized corners and fixed with spring beads.

v) Mastic perimeter sealing and at joints between adjacent frames shall be with polysulphide in accordance with B.S.4254.

vi) The finished doors and windows shall be free from all sharp edges, burrs and the like that might be a hazard to the user.

vii) It shall not be possible for a panel or leaf to become accidentally disengaged from the outer frame.

viii) On all finished doors and windows means shall be provided to prevent injury to the user's hand where the end grip may meet or pass close to another panel during operation.

20.7DELIVERY AND PROTECTION

Delivery

Windows and doors are to be delivered to the site complete with fittings and fixings. The Contractor shall install, clean down and protect the windows and doors against further building work under the direction and supervision of the Engineer and to his complete satisfaction.

Protection of Aluminium from Dissimilar Materials

Where aluminium windows and doors come into contact with block work, steelwork, concrete or plaster, they shall be coated with an insulating lacquer, paint or tape, to ensure that electro-chemical corrosion is avoided.

20.8INSTALLATION OF WINDOWS AND DOORS

General

Doors and windows shall be installed and adjusted by experienced workmen. They shall be installed, without forcing, into prepared opening unless detailed or specified otherwise in accordance with manufacturer's instructions and the approved shop drawings and set at the proper elevation and location in level and in alignment with properly braced frames to prevent distortion and misalignment.

Anchors and Fastenings

Anchor all the units to masonry, or to other or adjacent construction as shown on details and the approved shop drawings. Where windows are set in prepared openings, place the necessary anchorage during progress of wall construction. Anchors and fastenings shall be built into anchored, or bolted to the jambs of openings, and shall be fastened securely to the windows or frames and to the adjoining construction. Unless otherwise detailed, anchors shall be spaced not more than 45 cm apart on heads, jambs and sills. All anchors shall have sufficient strength to hold the member firmly in position.

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Protection

Care shall be taken in handling windows and doors during transportation and at site. Doors and windows shall be stored upright on pieces of timber in a dry location, and under cover. After installation, protect windows and doors frame damage during subsequent construction activities.

Cleaning

Surfaces of windows and doors shall be cleaned on both the inside and outside of all mortar, plaster, paint and other foreign matter to present a neat appearance and prevent fouling of weathering surfaces and weather-stripping. In addition, windows shall be washed off with a stiff-fibre brush, soap and water, and thoroughly rinsed with clean water.

Where windows and doors have become stained or discoloured they shall be cleaned or have finish restored in accordance with recommendations of the manufacturers. Stained, discoloured, or abraded windows that cannot be satisfactorily repaired shall be replaced with new windows at the Contractor's expense.

20.9FIXED GLAZED PANELS

Wherever required fixed glazing shall be installed. This shall contain ventilator grills on area, capable of being opened, and being integrated within the anodized aluminium frame work in which the glazing will be fixed. The Contractor shall submit shop drawings obtained from the manufacturers (marked in English) and submit these to the Engineer for approval of the design.

20.10 SPECIAL DOORS

Glazed double swing self-closing doors wherever required or as shown in the drawings shall be of a type and design and for which prior approval of the Engineer shall be obtained by the Contractor.

20.11 MEASUREMENT AND PAYMENT

The doors, windows and ventilators shall be measured net between the outer edges of the aluminium frames and paid for at the unit rates entered in the Bill of Quantities and in accordance with the Conditions of Contract. Unit rates for doors, windows, ventilators shall be inclusive of all materials, labour, etc including anodizing, netting, fittings, fixtures and glazing, etc complete covering any other items incidental thereto.

CHIEF ENGINEER
K.P.T

04 May 2018

DOCUMENTS TO
BE RETURNED

KARACHI PORT TRUST
ENGINEERING DEPARTMENT

NAME OF WORK: **MAINTENANCE/ REPAIR TO GUARD ROOM, GENERATOR ROOM, PROJECTION OF HUT & ALLIED REPAIR WORK TO KPT HUT 97/98-S AT SANDS PIT MANORA.**

S.No	Description of Work	Unit	Rate	Quantity	Amount(Rs.)

Notes:-

a) After the completion of the work the contractor is required to clear away and remove from the site all construction plants, surplus material, rubbish, debris and temporary works of every kind etc. to the entire satisfaction of the Engineer. It may be noted that Contractors' account will not be finalized till such time a certificate to this effect is obtained from Executive Engineer and submitted to the Chief Engineer for his information

b) The Contractor must ensure that the dismantled materials should be disposed is accordance with safety standards fixed by the civic agencies and specified environmental protection rules

c) Debris dismantled materials, rubbish etc. should be disposed in such a way that it should not cause any pollution and shall not be source of harm to public.

d) The tenderer must fill all the pages of Performa “A" & A-1" of tender documents, and ensure enclosing of the pay order for Bid **Security Amount Rs. 140,000.00 Fixed.**

e) The tenderers are advised to avoid cutting / over writing in B.O.Q. In case any cutting / over writing it should be properly re-write, sign and stamp otherwise, the tenders may not be considered.

f) The Bidders are requested to collect the drawing & specifications form the office of chief engineer on given date & time as per advertisement.

g) ***“Only the FBR & SRB Registered Contractors are eligible for bidding, Contractor has to quote their rates inclusive of all Govt. Taxes”***.

CHIEF ENGINEER
K.P.T

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MAINTENANCE/ REPAIR TO GUARD ROOM, GENERATOR ROOM, PROJECTION OF HUT & ALLIED REPAIR WORK TO KPT HUT 97/98-S AT SANDS PIT MANORA

Plan #

Dated :

S.No.	Ref.	Item description	Unit	Rate	Rate in Words	Quantity	Amount
1		ARRANGING/ HIRING, TRANSPORTATION & INSTALLATION OF SCAFFOLDING BAMBOO OR PIPE TYPE AS WORKING PLATFORM REQUIRED FOR PROJECTION REPAIR WORK UPTO 35 TO 40 FEET HEIGHT, FOLLOWING ALL EHS SAFETY MEASURES USE PROPER PPE'SCOMPLETE JOB AS REQUIRED AT SITE AND AS PER ENGINEER DIRECTION,	*LUMP/SUM*			1.00	
2		DISMANTLING RCC / CC WORK AT ANY HEIGHT AND PLACE INCLUDINGSTACKING SERVICEABLE MATERIAL AND DISPOSING OFF RUBBISH OUT SIDE KPT LIMITS AS PER DIRECTIONS OF THE ENGINEER INCHARGE.	*PER CUM*			35.00	
3		PROVIDING AND LAYING REINFORCED CEMENT CONCRETE USING SCREENED GRADED BAJRI 20 MM (3/4") AND DOWN GAUGE HAVING A MINIMUM WORKING CUBE CRUSHING STRENGTH OF 3000 LBS. PER SQ. INCH I/C ADMIXTURE OF APPROVED MAKR & BRAND FOR ENHANCING STRENGTH & WORKABILITY AFTER 28 DAYS WITH A MIX NOT LEANER THAN 1:2:4 IN COLUMN, BEAMS,FOUNDATION, LINTELS, ROOF SLAB, CHAJJA, WALLS STAIRCASE, ETC., OF REQUIRED SHAPE AND DESIGN INCLUDING FORM WORK AND ITS REMOVAL, COMPACTING AND CURING ETC. COMPLETE.	*PER CUM*			20.00	
4		PREPARE SURFACE AND APPLYING 1/2" TO 3/4" AVG. THICK CEMENT SAND PLASTER AT ANY HEIGHT OF RATIO 1:3, INCLUDING THE ADMIXTURE OF APPROVED BRAND FOR ENHANCED WORKABILITY & STRENGTH FINISHED SMOOTH INCLUDING CURING, SCAFFOLDING, CORNICES, EDGES ALL AS SPECIFIED AND DIRECTED	*PER SQM*			130.00	
5		PROVIDING AND LAYING DEFORMED STEEL (MINIMUM STRENGTH 60,000 PSI) REINFORCEMENT BARS WITH AND INCLUDING THE COST OF STRAIGHTENING, CUTTING, BENDING, BINDING, WASTAGE AND SUCH OVERLAPS AS ARE SHOWN ON THE DRAWING PLACING IN POSITION IN CEMENT CONCRETE 1:2:4 PRECAST OR M.S. CHAIRS, TYING WITH BINDING WIRE, INCLUDING COST OF CHAIRS AND WIRES DRILLING, INJECTING ETC. IN ALL KIND OF RCC WORK IN FOUNDATION, BASEMENT, PLINTH AND SUPER STRUCTURE.	*PER KG*			1,750.00	
6		PROVIDING AND FIXING OF M.S WIRE MASH OF NOT LESS THEN 1" SIZE ATTACHING IN EXISTING CC OR RCC THROUGH STEEL NAILS WITH BINDING WIRES INCLUDING DRILLING IF REQUIRED	*PER SQM*			130.00	

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MAINTENANCE/ REPAIR TO GUARD ROOM, GENERATOR ROOM, PROJECTION OF HUT & ALLIED REPAIR WORK TO KPT HUT 97/98-S AT SANDS PIT MANORA

Plan #

Dated :

S.No.	Ref.	Item description	Unit	Rate	Quantity	Amount
7		PREPARE SURFACE AND APPLYING 2" AVG THICK CEMENT SAND PLASTER IN 2 LAYERS (CONSISTING 1"+1" ROUGH & FAIR FACE) AT ANY HEIGHT OF RATIO 1:4, INCLUDING THE APPROVED ADMIXTURE (SBR ETC.) FINISHED SMOOTH INCLUDING CURING, SCAFFOLDING, CORNICES, EDGES ALL AS SPECIFIED AND DIRECTED	*PER SQM*		95.00	
8		PROVIDING AND LAYING 50 MM (2") THICK PLAIN CEMENT CONCRETE OF RATIO 1:2:4 CEMENT CONCRETE USING GRADED CRUSH 20MM (3/4") AND DOWN GAUGE IN PANELS AS LAID IN FLOOR, SCREED, UNDER FLOOR OR LIKE INCLUDING LEVELING, COMPACTING AND CURING ETC., COMPLETE.	*PER SQM*		95.00	
9		PROVIDING AND FIXING OF 4" DIA UPVC PIPE AND FITTINGS INCLUDING EXCAVATION / CUTTING OF WALL, GROUND ETC AND FIX WITH ALL ACCESSORIES LIKE ,T, BENDS, SOCKETS, ELBOWS, ¿Y¿, UNIONS ETC COMPLETE AND USE OF BOND ADHESIVE ALL OF BEST APPROVED QUALITY AND MAKE INCLUDING COST OF MAKING GOOD THE DISTURB SURFACES ON LIKE TO LIKE BASIS, FIXED AT ANY HEIGHT ANY SURFACE	*PER RMT*		30.00	
10		PROVIDING AND FIXING OF ¾" DIA CPVC PIPE AND FITTINGS INCLUDING EXCAVATION / CUTTING OF WALL, GROUND ETC AND FIX WITH ALL ACCESSORIES LIKE "T", BENDS, SOCKETS, ELBOWS, "Y", UNIONS ETC COMPLETE AND USE OF BOND ADHESIVE ALL OF BEST APPROVED QUALITY AND MAKE INCLUDING COST OF MAKING GOOD THE DISTURB SURFACES ON LIKE TO LIKE BASIS, FIXED AT ANY HEIGHT ANY SURFACE.	*PER RMT*		20.00	
11		PROVIDING AND FIXING P OR S TYPE FLOOR TRAP 4 DIA INLET AND OUTLET OF UPVC MAKE EMBEDDED IN CC 1:2:4 CONCRETE BED INCLUDING STAINLESS / PLASTIC GRATING 6 X 6 OF 6 DIA MAKING CONNECTION WITH SEWERAGE MAIN ETC ALL AS SPECIFIED AND DIRECTED	*EACH*		1.00	
12		PROVIDING AND FIXING EASTERN TYPE WHITE / LIGHT COLOR GLAZED WARE WC INCLUDING 13 LITER FLUSHING CISTERN LOW DOWN PLASTIC INCLUDING THE COST OF 4" DIA BRASS THIMBLE, MAKING CONNECTION WITH THE WATER AND SEWERAGE MAIN ETC ALL AS SPECIFIED AND DIRECTED. (I/C THE COST OF T-STOP COCK, STOP COCK, MUSLIM SHOWER, ETC..	*EACH*		1.00	

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Plan #

Dated :

S.No.	Ref.	Item description	Unit	Rate	Quantity	Amount
13		PROVIDING AND FIXING WASH HAND BASIN 25 X 18 INCLUDING PEDESTAL WHITE / LIGHT COLOR GLAZED WARE INCLUDING THE COST OF ALL NECESSARY FITTINGS LIKE WASTE COUPLING, WASTE PIPE, CONNECTIONS, KIT SCREWS/ WROUGHT IRON BRACKETS & MAKING CONNECTION WITH THE WATER AND SEWERAGE MAIN ETC ALL AS SPECIFIED AND DIRECTED	*EACH*		1.00	
14		PROVIDING AND FIXING FIXTURE SET OF (MASTER OR APPROVED EQUIVALENT BRAND) I/C SHOWER MIXTURE ,SHOWER AND ITS ROD, BASIN MIXTURE T.STOP COCKS, SINGLE COCK DOUBLE COCKS BIBCOCK AND MUSLIM SHOWER COMPLETE IN ALL RESPECT AS PER REQUIRED ON SITE.	*EACH*		1.00	
15		PROVIDING AND FIXING BATHROOM ACCESSORIES SET OF APPROVED QUALITY & COLOUR MASTER MAKE OR EQUIVALENT CONSISTING OF 7 PIECES SUCH AS (MIRROR GLASS 24" X 24" WITH FRAME, TRAY SHELF, TOWEL RAIL, SOAP CASE, TISSUE PAPER HOLDER, CLOTH HANGER, ETC. COMPLETE FIXING IN PROPER POSITION WITH BRASS SCREW. COMPLETE AS DIRECTED	*EACH*		1.00	
16		PROVIDING AND FIXING OF 500 GALLON FIBER GLASS WATER TANK OF BEST QUALITY IN REQUIRED SHAPE AND DESIGN ON 7X 6X 6THICK 1:2:4 CONCERT PLATE FORM COMPLETE AS PER SATISFACTION OF ENGINEER INCHARGE.	*EACH*		1.00	
17		CLEANING THE MANHOLES / PITS OF ANY SIZES AND DEPTH BY REMOVING EACH THE ENTIRE SLUDGE, GARBAGE, DEBRIS AND STONES ETC I/ C REMOVING COVER AND REFIXING THE SAME VERY CAREFULLY AFTER COMPLETION DISPOSAL OF REMOVED SLUDGE, GARBAGE ETC OUTSIDE KPT LIMITS COMPLETE AS PER DIRECTED.	*EACH*		4.00	
18		PROVIDING AND LAYING ¼" THICK WHITE / COLORED OF APPROVED SIZE & MAKE SINATRY GLAZED TILES GLOSSY / MATT FINE DRESSED ON THE SURFACE WITHOUT SANDING LAID OVER 1" THICK CEMENT MORTAR OF RATIO 1:2, AND IN DADOS & SKIRTING LAID OVER ½" THICK BASE OF CEMENT MORTAR 1:3 SETTING TILES IN SLURRY OF GREY CEMENT, JOINTING AND WASHING THE TILES WITH WHITE / COLORED CEMENT SLURRY ALL AS SPECIFIED OR USE OF BOND MORTAR INSTEAD OF CEMENT MORTAR WHICH EVER REQUIRED.	*PER SQM*		20.00	

CHIEF ENGINEER
K.P.T

MAINTENANCE/ REPAIR TO GUARD ROOM, GENERATOR ROOM, PROJECTION OF HUT & ALLIED REPAIR WORK TO KPT HUT 97/98-S AT SANDS PIT MANORA

Plan #

Dated :

S.No.	Ref.	Item description	Unit	Rate	Quantity	Amount
19		PROVIDING FABRICATING AND FIXING EXECUTIVE QUALITY STAINLESS STEEL PIPE RAILING 16 GAUGE (TAIWAN MAKE) PER DESIGN AND ELEVATION, WITH ALL ACCESSORIES LIKE SPHERICAL "GOLA" ON POST & JOINT COLLARS ETC I/C COMPLETE FIXING IN ALL RESPECT BY CUTTING, JOINTING, DRILLING, WELDING, COUPLING, U/L BENDS, FIXING/ EMBEDDED IN C.C/ R.CC COMPLETE AS MANUFACTURER SPECIFICATION. COST OF EXISTING WOODEN RAILING REMOVAL AND SUBMISSION OF SERVICEABLE MATERIAL TO MANORA STORE INCLUDED BY ALL MEAN COMPLETE AS PER DIRECTION OF ENGINEER INCHARGE. COMPRISING 2"~2.5" DIA PIPE AS TOP HORIZONTAL RAIL, 1"DIA PIPE AS CONNECTING HORIZONTAL PARALLEL PIPES IN 3 NOS, 2" DIA PIPE AS VERTICAL POST 36" C/C APART AND UPTO 36" HEIGHT OR 8MM GLASS TYPE FILLING AS REQUIRED AT SITE & AS PER DIRECTION OF ENGINEER INCHARGE	*PER RMT*		15.00	
20	N/S	PROVIDING & FIXING WOODEN RAILING ON THE SEA FACING BALCONY WITH CYLINDRICAL DESIGN WOODEN VERTICAL PILLARS & PROPERLY FIXING THEM IN CONCRETE BASE/ WOODEN BASE WITH PROPER FITTINGS & FIXTURE INCLUDING RIVETING, DRILLING, CUTTING, JOINTING, WITH BONDING SOLUTION AND WOODEN RAILING ON TOP OF THE PILLARS OF APPROVED DESIGN COMPLETE FIXED POSITION AS DIRECTED BY ENGINEER INCHARGE.	*PER SQM*		20.00	
21	N/S	APPLYING FRENCH/ SPRIT POLISHING WITH MATT FINISH OF APPROVED SHAD MINIMUM TWO COATS TO WOODEN RAILING / FURNITURE, ETC BY APPROVED MEANS I/C SCRAPPING, SAND PAPERING ETC COMPLETE SMOOTH FINISH AS PER DIRECTIONS OF THE ENGINEER INCHARGE.	*PER SQM*		80.00	
22	N/S	PREPARE SURFACE, PROVIDING & APPLYING WATER PROOFING MEMBRANE OF POLYMER BASE COVERED WITH 10 OZ PER SFT CANVAS CLOTH COMPLETE OR ANY LATEST TECHNOLOGY COATING, ALL OVERLAPS, COVERS, CORNER, TAPPERS, 6" VERTICAL ON PARAPET WALL ETC I/C REMOVING, CLEANING,WASHING OF EXISTING WATER PROOFING LAYERS WITH REPAIR TO SURFACE CRACKS AND SPOTS WITH CEMENT MORTAR TAKE OUT LEVELED SURFACE ALL AS DIRECTED AND SPECIFIED	*PER SQM*		360.00	
23	N/S	PROVIDING AND LAYING SOLID STONE MASONRY USING 4" TO 6" SIZE STONES / BOLDERS LAID OVER 1" THICK CEMENT MORTAR OF RATIO 1:2 AT ANY HEIGHT AND CEMENT JOINTING WITH 1:3 CEMENT MORTAR USING OPC CEMENT I/C CURING ,NEATLY POINTED COMPLETE AS PER DIRECTION OF ENGINEER INCHARGE.	*PER CUM*		15.00	

CHIEF ENGINEER
K.P.T

MAINTENANCE/ REPAIR TO GUARD ROOM, GENERATOR ROOM, PROJECTION OF HUT & ALLIED REPAIR WORK TO KPT HUT 97/98-S AT SANDS PIT MANORA

Plan #

Dated :

S.No.	Ref.	Item description	Unit	Rate	Quantity	Amount
24		PROVIDING/ FIXING & REPALCMENT UPVC SOLID COMPOSITE DOORS, WINDOWS IN APPROVED COLOUR, COMPRISING OF UPVC FRAME, SHUTTER AND ARCHITRAVES, ALPINE OR EQUIVALENT MAKE/ BRAND AND QUALITY AS SPECIFIED, CONTAINING PARTIALLY SOLID AND PARTIALLY FILLED WITH 5MM PLAIN/ FROSTED/ TENTED BELGIUM GLASS, WITH APPROVED HARDWARE FITTINGS I.E STAINLESS STEEL/ BRASS HINGES, HANDLE LOCK, TOWER BOLT ETC. COMPLETE IN ALL RESPECT AS PER THE MANUFACTURE'S SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER INCHARGE	*PER SQM*		4.00	
25		PROVIDING AND FIXING 1 ½" THICK BEST QUALITY PARTAL WOOD SOLID PANELED DOORS, WINDOWS AND VENTILATORS DOUBLE LEAF, FULLY / PARTIALLY PANELED & PARTIALLY PLAIN GLAZED WITH APPROVED BRASS FITTINGS (MONGERY) AND REQUIRED OAKWOOD FRAME OF SIZE I.E (2" X7") INCLUDING WOODEN CLEATS & STOPPERS, BEADING ETC COMPLETE, FRAME HANGING IN POSITION, FIXED ON WALLS WITH HOLD FASTS ETC OR AS DIRECTED.	*PER SQM*		8.00	
26		REPARING ONLY OF WOODEN DOOR/ WINDOW SHUTTER INCULDING REPARING OF DAMAGE PORTION BY USING WOOD / GLASS IN LIKE TO LIKE BASIS AND WITH REPLACEMENT OF NECESSARY IRON/ BRASS/ SELVER FITTINGS WHICH INCLUDE, HINGES, HANDLE, HOOKS, TOWER BOLTS ETC COMPLETE BY MAKE ALL SHUTTERS IN WORKING CONDITION AS DIRECTED	*EACH*		3.00	
27		REPARING ONLY OF ALUMINUM/ UPVC DOOR/ WINDOW SHUTTER INCULDING REPARING OF DAMAGE PORTION BY USING ALUMINUM/ FIBER SECTION / GLASS IN LIKE TO LIKE BASIS AND WITH REPLACEMENT OF NECESSARY IRON/ BRASS/ SELVER FITTINGS WHICH INCLUDE, HINGES, HANDLE, HOOKS, TOWER BOLTS ETC COMPLETE BY MAKE ALL SHUTTERS IN WORKING CONDITION AS DIRECTED	*EACH*		8.00	
28		REMOVING THE EXISTING DAMAGED LASBELA/ SILBATA STONE TILES AND PROVIDING AND LAYING THE SAME OF SIZE (8"X16") 1" THICKNESS OR AS PER EXISTING IN REQUIRED PATTERN OVER AN BASE OF 13MM CEMENT MORTAR 1:3 OR AS RECOMMENDED AR ANY HEIGHT COMPLETE AS DIRECTION.	*PER SQM*		75.00	
29		CLEARING, CHIPPING, WIRE BRUSHING OF CEMENT SPOTS FROM EXISTING LASBILA /SILBATA STONE TILES CAREFULLY COMPLETE WASHOUT SURFACE FROM ANY KIND DEPOSITORIES, MUD ,STAINS ETC TAKEN OUT STONE SURFACE CLEAR & LEVELED WHAT SO EVER REQUIRED IN THE PROCESS COMPLETE MANUAL OR MECHANICAL MEAN AT ANY HEIGHT AS DIRECTED	*PER SQM*		40.00	

CHIEF ENGINEER
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MAINTENANCE/ REPAIR TO GUARD ROOM, GENERATOR ROOM, PROJECTION OF HUT & ALLIED REPAIR WORK TO KPT HUT 97/98-S AT SANDS PIT MANORA

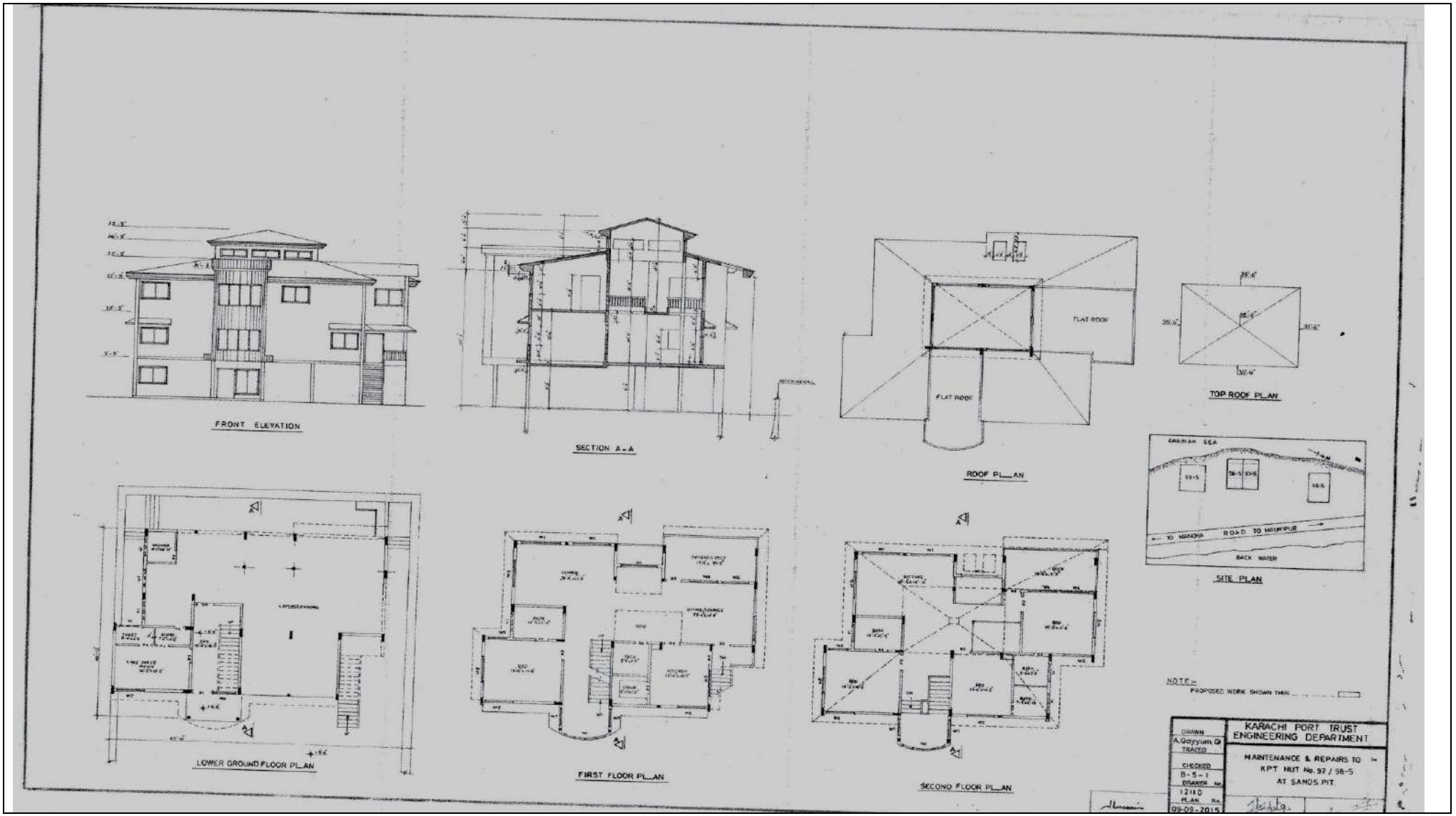
Plan #

Dated :

S.No.Ref.	Item description	Unit	Rate	Quantity	Amount
30	PREPARE SURFACE PROVDING AND APPLYING 2 X COATS OF METORI WASH ON STONE SURFACE APPROVED SHADE INCLUDING SCRAPING SAND PAPERING DUSTING AND FILLING THE HOLES,CRACKS AND INEQUALITIES IF ANY AT ANY HEIGHT AND IN ANY FLOOR I/C. REMOVING RUBBISH ETC., OUTSIDE K.P.T. LIMIT COMPLETE WITH FINISHD SURFACE.	*PER SQM*		620.00	
31	PREPARE SURFACE PROVDING COLOR AND APPLYING 2 X COATS OF OIL BOUND DISTEMPER APPROVED MAKE AND SHADE AND 1 COAT OF PRIMER INCLUDING SCRAPING SAND PAPERING DUSTING AND FILLING THE HOLES,CRACKS AND INEQUALITIES IF ANY AT ANY HEIGHT AND IN ANY FLOOR I/C. REMOVING RUBBISH ETC., OUTSIDE K.P.T. LIMIT COMPLETE WITH FINISHD SURFACE.	*PER SQM*		230.00	
32	PREPARE SURFACE PROVDING COLOR AND APPLYING 2 X COATS OF SYNTHETIC ENAMEL PAINT APPROVED MAKE AND SHADE AND 1 COAT OF PRIMER INCLUDING SCRAPING SAND PAPERING DUSTING AND FILLING THE HOLES,CRACKS AND INEQUALITIES IF ANY AT ANY HEIGHT AND IN ANY FLOOR I/C. REMOVING RUBBISH ETC., OUTSIDE K.P.T. LIMIT COMPLETE WITH FINISHD SURFACE.	*PER SQM*		70.00	
33	PREPARE SURFACE PROVDING COLOR AND APPLYING 2 X COATS OF WEATHER SHIELD PAINT APPROVED MAKE AND SHADE AND 1 COAT OF PRIMER INCLUDING SCRAPING SAND PAPERING DUSTING AND FILLING THE HOLES,CRACKS AND INEQUALITIES IF ANY AT ANY HEIGHT AND IN ANY FLOOR I/C. REMOVING RUBBISH ETC., OUTSIDE K.P.T. LIMIT COMPLETE WITH FINISHD SURFACE.	*PER SQM*		190.00	
34	PREPARE SURFACE AND APPLYING/ SPRAYING 2 LAYERS OF COLOUR CREATE WITH MECHANICAL MEAN MIXED IN (1:3) WHITE CEMENT, FINE SAND WITH APPROVED SHADE/ COLOUR INCLUDING PREPARING SURFACE BY SCRAPING, SAND PAPERING, DUSTING AND FILLING THE HOLES, CRACKS AND INEQUALITIES IF ANY AT ANY HEIGHT AND IN ANY FLOOR I/C. REMOVING RUBBISH ETC., OUTSIDE K.P.T. LIMIT	*PER SQM*		210.00	

TOTAL :	
ADD 5% CONTINGENCIES	**0**
NET TOTAL	
ADD 13% S.R.B	
GRAND TOTAL	**0**

CHIEF ENGINEER
K.P.T



CHIEF ENGINEER
K.P.T