MUNICIPAL COMMITTEE, KHAIRPUR

NIT No: Engg/MC/Khp/2866 /2022 **Dated: 06/09/2022**

BID DOCUMENT

FOR

ESTABLISHMENT OF THEME PARK AT KHAIRPUR CITY KHAIPRUR TALUKA & DISTRICT KHAIRPUR (REMAINING WORK)

UNDER RULE 46(1) OF SPP RULES-2010

(SINGEL STAGE ONE ENVELOP PROCEDURE)

Summary of Contents

INSTRUCTIONS TO BIDDERS
&
BIDDING DATA

Notes on the Instructions to Bidders

This section of the bidding documents should provide the information necessary for Bidders to prepare responsive bids, in accordance with the requirements of the Procuring Agency. It should also give information on bid submission, opening and evaluation, and on the award of contract. Matters governing the performance of the Contract or payments under the Contract, or matters affecting the risks, rights, and obligations of the parties under the Contract are not nor mally included in this Section, but rather in the appropriate sections of the *Conditions of Contract* and/or *Contract Data.*

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INSTRUCTIONS TO BIDDERS

INSTRUCTIONS TO BIDDERS

(Note: (*These Instructions to Bidders (IB) along with 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

- **Scope of Bid**

The Procuring Agency as defined in the Bidding Data (hereinafter called —the Procuring Agency) 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.

- **Source of Funds**

The Procuring Agency has arranged funds from its own sources or *Federal/ Provincial/Donor agency or any other source,* which may be indicated accordingly in bidding data towards the cost of the project/scheme.

IB.2 Eligible Bidders

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

1. Bidders must be Pakistani Citizen/Company having presence branch office in Sindh Province (Mandatory)

2. Registration with Pakistan Engineering Council in the appropriate category for value of works (C-4 or above) valid for year of 2023. (Mandatory)

3. The bidders must be registered with Income Tax by Pakistan's Federal Board of Revenue (FBR) (Mandatory)

4. Registration with GST by Pakistan's Federal Board of Revenue.

5. The Bidders must be registered with Sindh Revenue Board (Mandatory)

6. The bidders must have EE specialization Codes (EE-04), (EE-06) in their PEC License (Mandatory)

7. The bidders must provide 03 Years financial statement which should not be less than 40.00 Million. (Mandatory)

8. Two (03) years turnover certificate should be not less than 40.00 Million Rupees. In this connection the Bidder is required to obtain a certificate from concerned bank certifying the turnover of Rs. 400 Million & submit with bid. (Mandatory)

9. Undertaking on affidavit on Stamp Paper of Rs. 100/- that the firm is not involved in any litigation or black listed previously by any executing agency of has not abandoned work in the department as well as all documents , particulars information(s) furnished or true and correct. (Mandatory)

10. In case of Firm, furnished list of partners, partnership deed, giving fill particulars of Directors / Proprietors others connected along with power of attorney. In case of being sole Proprietors, such undertaking on affidavit be furnished. (Mandatory)

11. The bidders must provide at least Three (03) Years relevant experience with documentary proof including company profile. (Mandatory)

12. Brief report of at least 05 to 10 similar nature projects/assignments completed or in hand must be accompanied with Bid. (Mandatory)

13. The Bidder is required to authorize any person for participation in bidding process through an authority letter (If needed). (Mandatory)

14. The Bidder is required to submit 5% bid security in shape of Pay Order (ONLY) which must indicate the name of Bidder who's bid is submitted in the pay order of bid security. (In favor of Chief Municipal Officer, Municipal Committee Khairpur). (Mandatory)

NOTE:

1. The bids of the bidder who failed to comply with basic requirements of the bidding documents and do not meet any mandatory eligibility criteria will be disqualified even with lowest offer. The bidders are required are submit documentary evidence to prove their claim/eligibility.

2. No bid Security of 5% in shape of other than pay order will be entertained.

3. Bidders must submit one original plus two copies of bidding documents.

IB.3 Cost of Bidding

3.1 The bidder shall bear all costs associated with the preparation and submission of its bid and the Procuring Agency will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process (SPP Rules 24 & 25).

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, Qualification Information & Schedules to Bid Schedules to Bid comprise the following:
    (i) Schedule A: Schedule of Prices/ Bill of Quantities (BoQ).
    (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 (works costing Rs 10 million and above)

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/Procuring Agency at the Engineer‘s/ Procuring Agency‘s address indicated in the Bidding Data.

5.2 An interested bidder, who has obtained bidding documents, may request for

clarification of contents of bidding documents in writing and procuring agency shall respond to such quarries in writing within three calendar days, provided

they are received at least five calendar days prior to the date of opening of bid (SPP Rule 23-1).

;**IB.6 Amendment of Bidding Documents (SPP Rules 22(2) & 22).**

6.1 At any time prior to the deadline for submission of Bids, the Procuring Agency may, for any reason, whether at his own initiative or in response to a clarification requested by a interested 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 Procuring Agency.

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

C. PREPARATION OF BIDS

IB.7 Language of Bid

7.1 All documents relating to the Bid shall be in the language specified in the Contract Data.

IB.8 Documents Comprising the Bid

8.1 The Bid submitted by the bidder shall comprise the following:

- Offer /Covering Letter
- Form of Bid duly filled, signed and sealed, in accordance with IB.14.3.
- Schedules (A to F) to Bid duly filled and initialed, in accordance with the instructions contained therein & in accordance with IB.14.3.
- Bid Security furnished in accordance with IB.13.
- Power of Attorney in accordance with IB 14.5.
- Documentary evidence in accordance with IB.2(c) & IB.11
- Documentary evidence in accordance with 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 premium on the rates of CSR / rates and prices quoted/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.

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 percentage above or below the Composite Schedule of Rates/unit rates and prices of the Works to be performed under the Contract. Prices in the Schedule of Prices/Bill of Quantities shall be quoted entirely in Pak Rupees 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 or percentage above or below on the composite schedule of rates shall be quoted by the bidder in the currency as stipulated in Bidding Data.

10.4 Items for which no rate or price is entered by the Bidder will not be paid for by the
Procuring Agency when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities.

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 must possess and provide evidence of its capability and the experience as stipulated in Bidding Data and the Qualification Criteria mentioned 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 Procuring Agency 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 as percentage of bid price/estimated cost or in the amount stipulated in Bidding Data in Pak. Rupees in the form of *Deposit at Call/ Payee's Order or a Bank Guarantee* issued by a Scheduled Bank in Pakistan in favour of the Procuring Agency valid for a period up to twenty eight (28) days beyond the bid validity date (*Bid security should not be below 1%.and not exceeding 5% of bid price/estimated cost SPP Rule 37*).

13.2 Any bid not accompanied by an acceptable Bid Security shall be rejected by the Procuring Agency 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, and signed the Contract Agreement (SPP Rule 37).

13.5 The Bid Security may be forfeited:

- if a bidder withdraws his bid during the period of bid validity; or
- if a bidder does not accept the correction of his Bid Price, pursuant to Sub-Clause 16.4 (b) hereof; or
- in the case of a successful bidder, if he fails within the specified time limit to:
- furnish the required Performance Security or
- sign the Contract Agreement.

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 In exceptional circumstances, Procuring Agency may request the bidders to extend the period of validity for a additional period but not exceeding 1/3 of the original period. The request and the bidders' responses shall be made in writing or by cable. A Bidder may refuse the request without forfeiting the Bid Security. A Bidder agreeing to the request will not be required or permitted to otherwise modify the Bid, but will be required to extend the validity of Bid Security for the period of the extension, and in compliance with IB.13 in all respects (SPP Rule 38).

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

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

14.6 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 authorizing 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.

14.7 The Bid shall be delivered in person or sent by registered mail at the address to Procuring Agency 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 Procuring Agency at the address/provided in Bidding Data not later than the time and date stipulated therein.

15.2 The inner and outer envelopes shall

- be addressed to the Procuring Agency at the address provided in the Bidding Data;
- bear the name and identification number of the Contract as defined in the Bidding and Contract Data; and
- provide a warning not to open before the specified time and date for Bid opening as defined in the Bidding Data.
- in addition to the identification required in 15.2, the inner envelopes shall indicate the name and address of the Bidder to enable the Bid to be returned unopened in case it is declared late.
- If the outer envelope is not sealed and marked as above, the Procuring Agency will assume no responsibility for the misplacement or premature opening of the Bid.

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

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

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

15.6 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 IB.13.5 (a).

E. BID OPENING AND EVALUATION

IB.16 Bid Opening, Clarification and Evaluation (SPP Rules 41, 42 & 43)

16.1 The Procuring Agency will open the bids, in the presence of bidders' representatives who choose to attend, at the time, date and in the place specified 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 Procuring Agency at its discretion may consider appropriate, will be announced by the Procuring Agency at the bid opening. The Procuring Agency 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/Procuring Agency 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 (SPP Rule 43).

16.4 (a) Prior to the detailed evaluation, pursuant to IB.16.7 to 16.9, the Engineer/Procuring Agency will determine the substantial responsiveness of each bid to the Bidding Documents. For purpose of these instructions, a substantially responsive bid is one which conforms to all the terms and conditions of the Bidding Documents without material deviations. It will include determining 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 Procuring Agency 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 **(major deviation)** may be waived by Procuring Agency,
provided such waiver does not prejudice or affect the relative ranking of any other bidders.

(A). Major (material) Deviations include:-

- has been not properly signed;
- is not accompanied by the bid security of required amount and manner;
- stipulating price adjustment when fixed price bids were called for;
- failing to respond to specifications;
- failing to comply with Mile-stones/Critical dates provided in Bidding Documents;
- sub-contracting contrary to the Conditions of Contract specified in Bidding Documents;
- refusing to bear important responsibilities and liabilities allocated in the Bidding Documents, such as performance guarantees and insurance coverage;
- taking exception to critical provisions such as applicable law, taxes and duties and dispute resolution procedures;
- a material deviation or reservation is one :
    - which affect in any substantial way the scope, quality or performance of the works;
    - adoption/rectification whereof would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

(B). Minor Deviations

Bids that offer deviations acceptable to the Procuring Agency and which can be assigned a monetary value may be considered substantially responsive at least as to the issue of fairness. This value would however be added as an adjustment for evaluation purposes only during the detailed evaluation process.

16.7 The Engineer/Procuring Agency will evaluate and compare only the bids previously determined to be substantially responsive pursuant to 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 IB.16.8 herein below.

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.

16.8 **Evaluated Bid Price**

In evaluating the bids, the Engineer/Procuring Agency 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:

- making any correction for arithmetic errors pursuant to IB.16.4 hereof.
- discount, if any, offered by the bidders as also read out and recorded at the time of bid opening.
- excluding **provisional sums** and the provisions for **contingencies** in the Bill of Quantities **if any**, but including **Day work,** where priced competitively.

IB.17 Process to be Confidential

17.1 Subject to IB.16.3 heretofore, no bidder shall contact Engineer/Procuring Agency 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 Procuring Agency. The evaluation result shall be announced at least seven (07) days prior to award of Contract (SPP Rule 45). 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/Procuring Agency 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 to Complaint Redressal Committee as per terms and conditions mentioned in SPP Rules 31 & 32. However, mere fact of lodging a complaint shall not warrant suspension of procurement process.

17.3 Bidders may be excluded if involved in **"Corrupt and Fraudulent Practices"** means either one or any combination of the practices given below SPP Rule2(q);

- **Coercive Practice-** means any impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence the actions of a party to achieve a wrongful gain or to cause a wrongful loss to another party;
- **Collusive Practice-** means any arrangement between two or more parties to the procurement process or contract execution, designed to achieve with or without the knowledge of the procuring agency to establish prices at artificial, noncompetitive levels for any wrongful gain;

- **"Corrupt Practice"-** means the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence the acts of another party for wrongful gain;
- **Fraudulent Practice" -**means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
- **"Obstructive Practice"-** means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in a procurement process, or affect the execution of a contract or deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements before investigators in order to materially impede an investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or acts intended to materially impede the exercise of inspection and audit rights provided for under the Rules.

F. AWARD OF CONTRACT

IB.18. Post Qualification

18.1 The Procuring Agency, at any stage of the bid evaluation, having credible reasons for or *prima facie* evidence of any defect in contractor's capacities, may require the 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 therefore 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 B.11, as well as such other information required in the Bidding Documents.

IB.19 Award Criteria & Procuring Agency's Right

19.1 Subject to IB.19.2, the Procuring Agency 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 the IB.18.
19.2 Not withstanding IB.19.1, the Procuring Agency 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 Procuring Agency's action except that the grounds for its rejection 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 (SPP Rule 25).

IB.20 Notification of Award & Signing of Contract Agreement

20.1 Prior to expiration of the period of bid validity prescribed by the Procuring Agency, the Procuring Agency will notify the successful bidder in writing (Letter of Acceptance) that his bid has been accepted (SPP Rule 49).

20.2 Within seven (07) days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Procuring Agency 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 Procuring Agency and the successful bidder duly stamped at rate of ----% of bid price(updated from time to time) stated in Letter of Acceptance shall be executed within seven (07) days of the receipt of Form of Contract Agreement by the successful bidder from the Procuring Agency.

IB.21 Performance Security

21.1 The successful bidder shall furnish to the Procuring Agency 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 (SPP 39).

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.

21.3 Publication of Award of Contract: within seven days of the award of contract, the procuring shall publish on the website of the authority and on its own website, if such a website exists, the results of the bidding process, identifying the bid through procurement identifying Number if any and the following information:

(1) Evaluation Report;
(2) Form of Contract and letter of Award;
(3) Bill of Quantities or Schedule of Requirements. (SPP Rule 50)

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 Sindh Government procurement contracts exceeding Rupees ten (10) million. Failure to provide such Integrity Pact shall make the bid nonresponsive (SPP Rule 89).

BIDDING DATA

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

Instructions to Bidders Clause Reference

(a).	**Name of Procuring Agency**		**CHIEF MUNICIPAL OFFICER, MUNICIPAL COMMITTEE KHAIRPUR**
(b)	**Brief Description of Works**		Establishment of Theme Park at City Khairpur Taluka & District Khairpur (Remaining Work)
©	**Procuring Agency's address:-**		Address: Office of Municipal Committee Khairpur, Behind Phool Bagh, Khairpur Mir's, Sindh Phone No. 9280233-34
d)	**Estimated Cost:-**		**Rs 126.298 Million**
e)	**Amount of Bid Security:- _**		**Rs 6.3149 Million**
f)	**Period of Bid Validity (days):-**		90 Days
g)	**Security Deposit:-(including bid security):- (in % age of bid amount /estimated cost equal to 10%)**		5% Security Deposit
h)	**Percentage, if any, to be deducted from bills :-**		7.00% Income Tax 5.00 % S.R.B Tax
i)	**Deadline for Submission of Bids along with time :-**		26/09/2022 at 2.00 PM
j)	**(j). Venue, Time, and Date of Bid Opening:-**		Office of Municipal Committee Khairpur, Behind Phool Bagh, Khairpur Mir's, Sindh Phone No. 9280233-34
k)	**(k). Time for Completion from written order of commence: -**		24 Months
l)	**(l).Liquidity damages:-**		……..
m)	**Deposit Receipt No: Date: Amount:(in words and figures)**		

10.3 Bid shall be quoted entirely in Pak. Rupees.

The payment shall be made in Pak. Rupees.

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

i. Financial capacity: (must have turnover of Rs 400 Million of last three years);
ii. Technical capacity: Category of registration with PEC C-4 or above (in appropriate category, registered with FBR for income tax and SRB for Services Tax and three years experience in relevant field as well as compliance with instructions mentioned in Bidding Documents).

- **A detailed description of the Works, essential technical and performance characteristics.**
- 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

- Completion period offered is within specified limits,

- Bidder is eligible to Bid and possesses the requisite experience, capability and qualification.
- Bid does not deviate from basic technical requirements and
- Bids are generally in order, etc.

- **Fixed Price contract**: In these contracts no escalation will be provided during currency of the contract and normally period of completion of these works is upto 24 months.

- **Price adjustment contract**: In these contracts escalation will be paid only on those items and in the manner as notified by Finance Department, Government of Sindh, after bid opening during currency of the contract. **(NOT APPLICABLE)**

FORM OF BID
(LETTER OF OFFER)

Bid Reference No. _____
(Name of Works)

To:

CHIEF MUNICIPAL OFFICER
MUNICIPAL COMMITTEE,
KHAIRPUR

Gentlemen,

- 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.

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

- As security for due performance of the undertakings and obligations of this Bid, we submit herewith a Bid Security in the amount of _____ _____ 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.

- 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.

- We agree to abide by this Bid for the period of _____ 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.

- 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.

- 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 _____, 2022

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: _____

SCHEDULES TO BID INCLUDE THE FOLLOWING:

- · Schedule A to Bid: Bill of Quantities
- · Schedule B to Bid: Specific Works Data
- ·Schedule C to Bid: Works to be Performed by Subcontractors
- · Schedule D to Bid: Proposed Program of Works
- · Schedule E to Bid: Method of Performing Works
- · Schedule F to Bid: Integrity Pact

SCHEDULE - A TO BID

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PREAMBLE TO BILL OF QUANTITIES

1. General

1.1 The Schedule of Prices shall be read in conjunction with the Conditions of Contract, Contract Data together with the Specifications and Drawings, if any.

1.2 The Contract shall be for the whole of the works as described in these Bidding Documents. Bids must be for the complete scope of works.

2. Description

2.1 The general directions and descriptions of works and materials are not necessarily repeated nor summarized in the Schedule of Prices. References to the relevant sections of the Bidding Documents shall be made before entering prices against each item in the Schedule of Prices.

3. Units & Abbreviations

3.1 Units of measurement, symbols and abbreviations expressed in the Bidding Documents shall comply with the Systeme Internationale d'Unites (SI Units).

4. Rates and Prices

4.1 Except as otherwise expressly provided under the Conditions of Contract, the rates and amounts entered in the Schedule of Prices shall be the rates at which the Contractor shall be paid and shall be the full inclusive value of the works set forth or implied in the Contract; except for the amounts reimbursable, if any to the Contractor under the Contract.

4.2 Unless otherwise stipulated in the Contract Data, the premium, rates and prices entered by the bidder shall not be subject to adjustment during the performance of the Contract.

4.3 All duties, taxes and other levies payable by the Contractor shall be included in the rates and prices.

4.4 The whole cost of complying with the provisions of the Contract shall be included in the items provided in the Schedule of Prices, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of the Works and no separate payment will be made for those items.

The rates, prices and amounts shall be entered against each item in the Schedule of Prices. Any item against which no rate or price is entered by the bidder will not be paid for by the Procuring Agency when executed and shall be deemed covered by the rates and prices for other items in the Schedule of Prices.

4.5 (a) The bidder shall be deemed to have obtained all information as to and all requirements related thereto which may affect the bid price. (b) The Contractor shall be responsible to make complete arrangements for the transportation of the Plant to the Site.

4.6 The Contractor shall provide for all parts of the Works to be completed in every respect. Notwithstanding that any details, accessories, etc. required for the complete installation and satisfactory operation of the Works, are not specifically mentioned in the Specifications, such details shall be considered as included in the Contract Price.

5. Bid Prices

5.1 Break-up of Bid Prices the various elements of Bid Prices shall be quoted as detailed by the Procuring Agency in the format of Schedule of Prices. The bidder shall recognize such elements of the costs which he expects to incur the performance of the Works and shall include all such costs in the rates and amounts entered in the Schedule of Prices.

5.2 Total Bid Price the total of bid prices in the Schedule of Prices shall be entered in the Summary of Bid Prices.

6. Provisional Sums and Day work

6.1 Provisional Sums included and so designated in the Schedule of Prices if any, shall be expended in whole or in part at the direction and discretion of the Engineer/Procuring Agency. The Contractor will only receive payment in respect of Provisional Sums, if he has been instructed by the Engineer/Procuring Agency to utilize such sums.

6.2 Day work rates in the contractor‘s bid are to be used for small additional amounts of work and only when the Engineer have given written instructions in advance for additional work to be paid for in that way.

SCHEDULE OF PRICES – SUMMARY OF BID PRICES (Sample)

Bill No.	Description	Total Amount (Rs)
	(A) Building Work	
1	Civil works	
2	Internal sanitary and water supply	
3	Electrification	
.4	External Development works	
5	Miscellaneous Items	
	(B) Road Work.	
1	Earthwork	
2	Hard Crust and Surface Treatment	
3	Culverts and Bridges	
4	Miscellaneous Items	
	(**C) Public Health Engineering Works.**	
1	Earthwork	
2	Subsurface Drains	
3	Pipe Laying and Man holes	
4	Tube wells, Pump houses	
5	Compound wall	
6	Miscellaneous Items	
	Total Bid Price (The amount to be entered in Paragraph 1 of the Form of Bid) (In words).	

SCHEDULE - A TO BID

SCHEDULE OF PRICES

Item No.	Description	Quantity	Unit Rate(Rs)	Total Amount (Rs)
	I. (Civil works)			
1				
2				
3				
	II.Internal sanitary and water supply.			
1				
2				
3				
	III. Electrification.			
1				
2				
3				
	IV. External Development works.			
1				
2				
3				
	V. Miscellaneous Items			
1				
2				
3				
	Total (*to be carried to Summary of Bid Price*) *Add/ Deduct the percentage quoted above/below on the prices of items based on Composite Schedule of Rates.*			

BILL OF QUANTITIES

COMMULATIVE SUMMARY OF BID

NAME OF SCHEME: **ESTABLISHMENT OF THEME PARK AT KHAIRPUR TALUKA & DISTRICT KHAIPUR (REMAINING WORK)**

GENERAL ABSTRACT

S.#	Name of Components	Amounts Rs
Part- A	Compound Wall (Remaining Work)	
Part- B	Main Entrance Gates (02 Nos))	
Part- C	Development of Land & Turfing Lawn	
Part-D	Garden Fixtures and Jhoollas	
Part- E	Construction Paths & Walk Ways	
Part- F	Providing Heavy Steel Grill Fencing	
Part- G	Construction of Restaurant & Public Lavatory	
Part I CIVIL WORK		
Part- II	Internal Water Supply, Sanitary Fittings, Sui Gas Gittings , External Water Supply & External Drainage	
Part –III	Internal & External Electrification Work	
Part –H	Construction of Guard Room	
Part-I	External Electrification work (Illumination work)	
Pat –J	Walk through Metal Detector Gates	
Part- K	HIRING CONSULTANT (Consultant Services to be provided by the Contractor for hiring PEC Qualified professional consultant for preparation of Architectural Drawings, Structural Designs and Drawings, External Face Lifting Drawings, Engineering Cost Estimate of all components, and additional shop drawings as per actual site requirements. The payment of consultant will be made through contractor on the basis of services provided and invoice covering all applicable taxes provided by the consultant)	
	GRAND TOTAL AMOUNT	

In Words_____

Contractor Name:_____

Signature:_____

Seal:_____

Contractor

MUNICIPAL ENGINEER
Municipal Committee
KHAIRPUR

FORM OF BID AND BILL OF QUANTITIES

Part "A" Compound Wall (Remaining Work)

S #	Description of Item.	Quantity	Rate	Unit	Amount.
1	Excavation in foundation of buildings, bridges and other structures as per required section, including dag belling, dressing filling around structure with excavated earth watering ramming & compacting etc complete in all respects as per specifications provided and instructions given by the Engineer In charge. **Lead up to 400 ft & lift up to 10 fee**	6830		Cft	
2	Cement Concrete Plain including placing compacting, finishing and curing complete (including screening and washing of crush bajri) without form work . etc complete in all respects as per specifications provided and instructions given by the Engineer Incharge				
	Ratio 1:4:8 (CLASS 'E') (Under Foundation)	1000.00		Cft	
3	Providing and laying plain cement concrete Class "D" (1 : 3 :6) in foundation having minimum works cube crushing strength of 1500 lbs per sq. inch at 28 days for blinding or under floors where required using approved quality 1" maximum size graded crushed stone or gravel with approved quality sand including all all type of form works, rodding, leveling, compacting and curing etc. complete as per specifications, drawings and to the entire satisfaction of Engineer. Ratio 1:3:6 (CLASS 'D')	1950		Cft	
4	Providing & Laying reinforcement concrete using S.R Cement graded screened bajri 3/8" down gauge as fine aggregate, and crushed stone 3/4" down gauge as coarse aggregate with moisture machine concrete including the cost of fixing from work & scaffolding and its removal, vibrating using mechanical vibrator, curing and cylinder testing at 1 & 28 days etc. having min cylindrical strength of 3000 psi after 28 days curing but excluding the cost of reinforcement bars complete as per drawing and as directed by the consultant.				
(i)	**Footings / Rafts**	875.00		Cft	
(ii)	**Padestal Columns**	350.00		Cft	
(iii)	**Plinth Beam**	975.00		Cft	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
5	Providing & Laying reinforcement concrete using O.P.C cement graded screened bajri 3/8" down gauge as fine aggregate, and crushed stone 3/4" down gauge as coarse aggregate with moisture machine concrete including the cost of fixing from work & scaffolding and its removal, vibrating using mechanical vibrator, curing and cylinder testing at 1 & 28 days etc. having min cylindrical strength of 3000 psi after 28 days curing but excluding the cost of reinforcement bars complete as per drawing and as directed by the consultant.				
(i)	**Super Structure Columns**	367.50		Cft	
6	Fabrication of Cold Twisted Deformed Steel Bars, reinforcement for cement concrete work i/c cutting, bending, laying in proper position, making joints & fastenings etc complete. This rate also include cost of binding wire, over lapping ,extra wastage, laboratory testing of steel and removing rust from bars.(Grade 60, Minimum Yield Strength 60000 Lbs / P.S.I)	6.877		Ton	
7	Cement Plaster in Ratio 1:6 (15 mmThick) i/c floating coat of cement in proper design & profile on walls. This rate also i/c providing expanded metal at the joint of R.C.C. members and block masonry where as required etc complete in all respects as per specifications and drawings and approval of Engineer In charge.	3420		Sft	
8	Cement Plaster in Ratio 1:4 (12 mmThick) i/c floating coat of cement in proper design and profile on walls , beams & columns etc complete in all respects as per specifications and drawings and approval of Engineer In charge.	3420		Sft	
9	P/Applying 3 Coats of Weather Shield Paint of superior quality i/c preparing base surface and filling etc complete in all respects as per directives of Engineer In charge (upto 15' -0 height).	3420		Sft	
10	Fair face Pacca brick work on Face Wall and other structure using A Class first quality Fair Face Bricks of approved kiln(Size 225 mm"x 70 mm x 55 mm") with cement mortar in ratio. 1:4. This rate also i/c inducing steel nails of size 4"x 3/16" at end joints with concrete column or beams and making struck cement pointing in ratio 1:3 showing specified design lining of 3/8 thick etc complete in all respects as per directives of Engineer Incharge..	2525		Sft	
	Part "A" Compound Wall (Remaining Work)		**Total Amount**		

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PART "B" MAIN ENTRANCE GATES (02 NOS))

S #	Description of Item.	Quantity	Rate	Unit	Amount.
1	Excavation in foundation of buildings, bridges and other structures as per required section, including dag belling, dressing filling around structure with excavated earth watering ramming & compacting etc complete in all respects as per specifications provided and instructions given by the Engineer In charge. Lead up to 400 ft & lift up to 10 feet	192		Cft	
2	Cement Concrete Plain including placing compacting, finishing and curing complete (including screening and washing of crush bajri) without form work . etc complete in all respects as per specifications provided and instructions given by the Engineer Incharge				
	Ratio 1:4:8 (CLASS 'E') (Under Foundation)	32.00		Cft	
	Providing & Laying reinforcement concrete using S.R Cement graded screened bajri 3/8" down gauge as fine aggregate, and crushed stone 3/4" down gauge as coarse aggregate with moisture machine concrete including the cost of fixing from work & scaffolding and its removal, vibrating using mechanical vibrator, curing and cylinder testing at 1 & 28 days etc. having min cylindrical strength of 3000 psi after 28 days curing but excluding the cost of reinforcement bars complete as per drawing and as directed by the consultant.				
(i)	**Footings / Rafts**	36.00		Cft	
(ii)	**Padestal Columns**	32.00		Cft	
4	Providing & Laying reinforcement concrete using O.P.C cement graded screened bajri 3/8" down gauge as fine aggregate, and crushed stone 3/4" down gauge as coarse aggregate with moisture machine concrete including the cost of fixing from work & scaffolding and its removal, vibrating using mechanical vibrator, curing and cylinder testing at 1 & 28 days etc. having min cylindrical strength of 3000 psi after 28 days curing but excluding the cost of reinforcement bars complete as per drawing and as directed by the consultant.				
(i)	**Super Structure Columns**	110.25		Cft	
(ii)	**Structure Beams**	82.00		Cft	
(iii)	**Canopy Roof**	156.00		Cft	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
5	Fabrication of Cold Twisted Deformed Steel Bars, reinforcement for cement concrete work i/c cutting, bending, laying in proper position, making joints & fastenings etc complete. This rate also include cost of binding wire, over lapping ,extra wastage, laboratory testing of steel and removing rust from bars.(Grade 60, Minimum Yield Strength 60000 Lbs / P.S.I)	1.115		Ton	
6	Cement Plaster in Ratio 1:6 (15 mmThick) i/c floating coat of cement in proper design & profile on walls. This rate also i/c providing expanded metal at the joint of R.C.C. members and block masonry where as required etc complete in all respects as per specifications and drawings and approval of Engineer In charge.	160		Sft	
7	Cement Plaster in Ratio 1:4 (12 mmThick) i/c floating coat of cement in proper design and profile on walls , beams & columns etc complete in all respects as per specifications and drawings and approval of Engineer In charge.	160		Sft	
8	P/Applying 3 Coats of Weather Shield Paint of superior quality i/c preparing base surface and filling etc complete in all respects as per directives of Engineer In charge (upto 15' -0 height).	160		Sft	
9	Making and Fixing Ornamental M/S Sheet Door in an angle iron frame of size 2"x 2"x 3/8" with a seperate locking box having size of 12" x 12" of M.Steel sheet and U shape M.S Sheet strips i/c wood carving work and one coat of red oxide paint with two coats of enamel paint etc complete in all respects as per approved make, design and instruction of Engineer Incharge .	224		Sft	
10	Fair face Pacca brick work on Face Wall and other structure using A Class first quality Fair Face Bricks of approved kiln(Size 225 mm"x 70 mm x 55 mm") with cement mortar in ratio. 1:4. This rate also i/c inducing steel nails of size 4"x 3/16" at end joints with concrete column or beams and making struck cement pointing in ratio 1:3 showing specified design lining of 3/8 thick etc complete in all respects as per directives of Engineer Incharge. .	408		Sft	
	Part "B" Main Entrance Gates (02 Nos))		**Total Amount**		

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PART 'C' DEVELOPMENT OF LAND & TURFING LAWN

S #	Description of Item.	Quantity	Rate	Unit	Amount.
1	Turfing slops of banks or lawns with grass sods including ploughing laying, setting and watering turf got from with in a distance of 5 miles and maintenance for 15 days. This rate also i/c cost of filling 3" Thick layer of Bhallu Sand mix where as required and the cost of manure etc complete in all respects i/c one month maintenance charges	25495		P.sft	
2	Providing and Planting mature tree of Date Palm of small age. This rate i/c cost of tree plant, digging the trench up to required depth, erecting plant and refilling excavated soil mixing with manure etc complete in all respect including maintenance for 30 days.	50		Each	
3	S/Planting Mature plant of Babbura Bamboo of small age. This rate i/c cost of tree plant, digging the trench up to required depth, erecting plant and refilling excavated soil mixing with manure etc complete in all respect including maintenance for 30 days.	50		Each	
4	S/Planting Mature plant of Albeeza Labbelete (Sires) small age. This rate i/c cost of tree plant, digging the trench up to required depth, erecting plant and refilling excavated soil mixing with manure etc complete in all respect including maintenance for 30 days.	80		Each	
5	S/Planting Mature plant of Samenea Sanam (Rani Tree) of small age. This rate i/c cost of tree plant, digging the trench up to required depth, erecting plant and refilling excavated soil mixing with manure etc complete in all respect including maintenance for 30 days.	100		Each	
6	S/Planting Mature plant of Poinsimia Regia (Gul-e-Mehar) of small age. This rate i/c cost of tree plant, digging the trench up to required depth, erecting plant and refilling excavated soil mixing with manure etc complete in all respect including maintenance for 30 days.	80		Each	
7	S/Planting Mature plant of Acasia Arbica (Kikra) of small age. This rate i/c cost of tree plant, digging the trench up to required depth, erecting plant and refilling excavated soil mixing with manure etc complete in all respect including maintenance for 30 days.	100		Each	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
8	S/Planting Mature plant of Astonia Scholeris (Alestonia) of small age. This rate i/c cost of tree plant, digging the trench up to required depth, erecting plant and refilling excavated soil mixing with manure etc complete in all respect including maintenance for 30 days.	120		Each	
9	S/Planting Mature plant of Azaddieachte Indica (Neem) of small age. This rate i/c cost of tree plant, digging the trench up to required depth, erecting plant and refilling excavated soil mixing with manure etc complete in all respect including maintenance for 30 days.	120		Each	
10	S/Planting Mature plant of Gasisum Official (Liqnum) of small age. This rate i/c cost of tree plant, digging the trench up to required depth, erecting plant and refilling excavated soil mixing with manure etc complete in all respect including maintenance for 30 days.	200		Each	
11	S/Planting of Mature plant of Plumeri Obtusifloa (Chumpa) of small age. This rate i/c cost of tree plant, digging the trench up to required depth, erecting plant and refilling excavated soil mixing with manure etc complete in all respect including maintenance for 30 days.	120		Each	
12	Providing / planting different type plants of flowers This rate i/c cost of tree plant, clay burn flower box with earth, erecting plant and refilling excavated soil mixing with manure etc complete in all respect including maintenance for 30 days.	450		Each	
			Part A Total		

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PART 'D' GARDEN FXITURES AND JHOOLAS

S #	Description of Item.	Quantity	Rate	Unit	Amount.
1	Providing and fixing Golden Stone Garden Bench size 7'- 0' x 2'- 0" including Stone Pedestals as per approved make and design dully fixed on garden surface in C.C. 1:2:4 etc complete in all respects	180		Nos	
2	Providing and fixing swing two seater with quality cushion in 10' height i/c G.I Pipe posts and chain etc complete in all respects	10		Nos	
3	Providing and fixing G.I Pipe of 1-1/2" Dia pipe Exercise U Shape Hurdle 10' height x 12' length etc complete in all respects	10		Nos	
4	Providing and fixing Fibre Wavy Sliding Saw of std size with steel structure etc complete in all respects	10		Nos	
5	Providing and fixing Trampoline with Safety Net etc complete in all respects	4		Nos	
6	Providing and fixing Happy Hop Castle Bouncer with Slide of std size etc complete in all respects	4		Nos	
7	Making and Fixing **Picnic Hut** made of fibre sheet of 3 mm imported sheet as per approved make and design **(Size 10'-0" x 10'-0" and 9'-0" High)** rest over frame structure of tubular pipe frame consisting of various pipes having sizes 38mm x 18mm, 18mm x 18mm and 25mm x 25mm (16guage) fixed with G.I pipe posts of 60 mm dia painted G.I pipes 10'-0" high above ground and 1'-0" buried under ground . This rate i/c all type of work such as cutting and fixing Fibre Sheet with tubular pipe frame fixing with nuts ,bolts, bitumen washers etc complete in all respects i/c painting one coat of red oxide and two coats of enamel paint over metal iron work as per matching shade etc complete in all respects as per directives of Engineer Incharge	5		Nos	
8	Making and Constructing Water fall Screen Wall made of 6" Thick R.C.C Structural wall (Ratio 1:2:4)with lean concrete in foundation in ratio of 1:4:8 i/c stone and rockery design, colour create picture scenery work with water fall system along with all plumbing and electric lightening work etc complete in all respects as per per approved shop drawing to be pared by the contractor and as per instructions given by the Engineer Incharge (Clear Vision Screen Size 60'-0" x 15'-0" = 900 Sft)	2		Nos	
			Total Rs		

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PART 'E' CONSTRUCTION PATHS & WALK WAYS

S #	Description of Item.	Quantity	Rate	Unit	Amount.
1	Excavation in foundation of buildings, bridges and other structures as per required section, including dag belling, dressing filling around structure with excavated earth watering ramming & compacting etc complete in all respects as per specifications provided and instructions given by the Engineer In charge. Lead up to 400 ft & lift up to 10 feet	16323		Cft	
2	Cement Concrete Plain including placing compacting, finishing and curing complete (including screening and washing of crush bajri) without form work . etc complete in all respects as per specifications provided and instructions given by the Engineer Incharge				
	Ratio 1:4:8 (CLASS 'E') (Under Foundation)	5441.07		Cft	
3	Providing and laying bricks masonary work with cement sand mortar ratio1:6 ratio (Using first class Pucca Bricks of Size 9" x 4-1/2" x 3" or 9 x 6" x 3" in foundation & plinth structure i/c racking out joints, curing and Scafolding wooden prank and its labour also i/c all lead & lifts etc. complete.	14509.52		Cft	
4	Supplying Pit or Cannal Sand from approved outside source within a radius of 8.0 K.M including digging, loading and unloading and filling in foundation trenches, plinth or under floor, etc. including breaking clods, dressing, watering and consolidation by ramming in layers not exceeding 6 inches in depth to full compacting, Lead up to 100 ft& lift up to 5'-0"	91856.16		Cft	
5	Cement Concrete Plain including placing compacting, finishing and curing complete (including screening and washing of crush bajri) without form work . etc complete in all respects as per specifications provided and instructions given by the Engineer Incharge				
	4" Thick Ratio 1:4:8 (CLASS 'E') (Under Floor)	45928.08		Sft	
6	Providing & fixing cement paving blocks flooring having size of 200 x 100 x 60 (mm) of City / Quadra / Cobble shape in a specified pattern and design with the combination of natural colour and coloured blocks, having strength b/w 4000 lbs/sft to 5000 lbs/sft over 3" thick compact bed of crush ash i/c filling the joints with river sand and also i/c proper compaction with compactor machine after laying blocks etc complete in all respect as per specification provided and instructions given by the Engineer Incharge	45928		Sft	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
7	Cement Plaster in Ratio 1:6 (15 mmThick) i/c floating coat of cement in proper design & profile on walls. This rate also i/c providing expanded metal at the joint of R.C.C. members and block masonry where as required etc complete in all respects as per specifications and drawings and approval of Engineer In charge.	21764		Sft	
8	Cement Plaster in Ratio 1:4 (12 mmThick) i/c floating coat of cement in proper design and profile on walls , beams & columns etc complete in all respects as per specifications and drawings and approval of Engineer In charge.	21764		Sft	
9	P/Applying 3 Coats of Weather Shield Paint of superior quality i/c preparing base surface and filling etc complete in all respects as per directives of Engineer In charge (upto 15' -0 height).	10882		Sft	
			Total Amount		

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Khairpur

PART 'F' PROVIDING HEAVY STEEL GRILL FENCING

S #	Description of Item.	Quantity	Rate	Unit	Amount.
1	Making and fixing M.S Square Bars Grating in opening including fixing at site with flat iron 2"*3/8" and 3/4" square bars at 6" center to center and on top 3 curved Arrows with pointed noses as per approved design including cost of erection of steel work, painting one coat of red oxide paint and two coats of enamel paint over steel gate, fixing in masonry wall in cement concrete 1: 2: 4 etc, complete as per instructions of Engineer Incharge	5550		Sft	
			Total Amount		

CONTRACTOR

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Khairpur

PART 'G' CONSTRUCTION OF RESTAURANT & PUBLIC LAVATORY BLOCK

PART- A Civil Work

S #	Description of Item.	Quantity	Rate	Unit	Amount.
1	Excavation in foundation of buildings, bridges and other structures as per required section, including dag belling, dressing filling around structure with excavated earth watering ramming & compacting etc complete in all respects as per specifications provided and instructions given by the Engineer In charge. Lead up to 400 ft & lift up to 10 feet	328	Cft		
2	Cement Concrete Plain including placing compacting, finishing and curing complete (including screening and washing of crush bajri) without form work . etc complete in all respects as per specifications provided and instructions given by the Engineer Incharge				
	Ratio 1:4:8 (CLASS 'E') (Under Foundation)	854.50	Cft		
3a	Providing & Laying reinforcement concrete using S.R Cement graded screened bajri 3/8" down gauge as fine aggregate, and crushed stone 3/4" down gauge as coarse aggregate with moisture machine concrete including the cost of fixing from work & scaffolding and its removal, vibrating using mechanical vibrator, curing and cylinder testing at 1 & 28 days etc. having min cylindrical strength of 3000 psi after 28 days curing but excluding the cost of reinforcement bars complete as per drawing and as directed by the consultant.				
(i)	**Footings / Rafts**	694.50	Cft		
(ii)	**Padestal Columns**	180.00	Cft		
(iii)	**Plinth Beam**	352.13	Cft		

S #	Description of Item.	Quantity	Rate	Unit	Amount.
3b	Providing & Laying reinforcement concrete using O.P.C cement graded screened bajri 3/8" down gauge as fine aggregate, and crushed stone 3/4" down gauge as coarse aggregate with moisture machine concrete including the cost of fixing from work & scaffolding and its removal, vibrating using mechanical vibrator, curing and cylinder testing at 1 & 28 days etc. having min cylindrical strength of 3000 psi after 28 days curing but excluding the cost of reinforcement bars complete as per drawing and as directed by the consultant.				
(i)	**Super Structure Columns**	324.00		Cft	
(ii)	**Stair Case**	196.63		Cft	
(iii)	**Structure Beams**	568.50		Cft	
(iii)	**Main Roof**	1378.63		Cft	
4	Fabrication of Cold Twisted Deformed Steel Bars, reinforcement for cement concrete work i/c cutting, bending, laying in proper position, making joints & fastenings etc complete. This rate also include cost of binding wire, over lapping ,extra wastage, laboratory testing of steel and removing rust from bars.(Grade 60, Minimum Yield Strength 60000 Lbs / P.S.I)	9.896		Ton	
5	Providing and laying plain cement concrete Class "D" (1 : 3 :6) in foundation having minimum works cube crushing strength of 1500 lbs per sq. inch at 28 days for blinding or under floors where required using approved quality 1" maximum size graded crushed stone or gravel with approved quality sand including all all type of form works, rodding, leveling, compacting and curing etc. complete as per specifications, drawings and to the entire satisfaction of Engineer. Ratio 1:3:6 (CLASS 'D')	792.28		Cft	
6	Filling, watering & ramming earth in floor with surplus earth from foundation lead up to 120 ft and lift up to 5 ft:	2934.67		Cft	
7	Earth filling with off site material (brought from out side source) in plinth, depression and where ever required laid in 300mm layer well watered, consolidated and compacted with mechanical means complete as per drawings and as directed by the Consultants.	1843.46		Cft	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
8	Supplying Pit or Cannal Sand from approved outside source within a radius of 8.0 K.M including digging, loading and unloading and filling in foundation trenches, plinth or under floor, etc. including breaking clods, dressing, watering and consolidation by ramming in layers not exceeding 6 inches in depth to full compacting, Lead up to 100 ft& lift up to 5'-0" .	1911.25		Cft	
9	Cement Concrete Plain including placing compacting, finishing and curing complete (including screening and washing of crush bajri) without form work etc complete in all respects as per specifications provided and instructions given by the Engineer Incharge.				
	4" Thick Ratio 1:4:8 (CLASS 'E') (Under Floor)	1,911.25		Sft	
10	Providing and laying bricks masonary work with cement sand mortar ratio1:6 ratio (Using first class Pucca Bricks of Size 9" x 4-1/2" x 3" or 9 x 6" x 3" in foundation & plinth structure i/c racking out joints, curing and Scafolding wooden prank and its labour also i/c all lead & lifts etc. complete.	855.42		Cft	
11	Providing and laying bricks masonary work with cement sand mortar ratio1:6 ratio (Using first class Pucca Bricks of Size 9" x 4-1/2" x 3" or 9" x 6" x 3") in super structure i/c racking out joints, curing and Scafolding wooden prank and its labour also i/c all lead & lifts etc. complete. This Rate also i/c minor reinfiorcement at the end of joints at concrete	1097.10		Cft	
12	Cement Plaster in Ratio 1:4 (15 mmThick) i/c floating coat of cement in proper design and profile on Roof Celings etc complete in all respects as per specifications and drawings and approval of Engineer Incharge	2,013.55		Sft	
13	Cement Plaster in Ratio 1:6 (15 mmThick) i/c floating coat of cement in proper design & profile on walls/beams & columns .This rate also i/c providing expanded metal at the joint of R.C.C.members and block masonary where as reqiured etc complete in all respects as per specifications and drawings and approval of Engineer Incharge	4,737.87		Sft	
14	Cement Plaster in Ratio 1:4 (12 mmThick) i/c floating coat of cement in proper design and profile on walls, beams & columns etc complete in all respects as per specifications and drawings and approval of Engineer Incharge	4,737.87		Sft	
15	Preparing the surface and painting with plastic bound Distemper Paint of approved make I/c rubbing the surface with sand Paper, filling the voids with chalk / plaster of paris and then painting etc. complete.(03 Coats)	4,826.67		Sft	
16	Providing & fixing Colour create on wall surface to provide, durable crust and aesthetics having thickness upto 13 mm with specified colour having water, fire3 and termite resitance over the base of 15mm thick cement plaster ratio (1:4) (up to 15' -0 height).	2,308.25		Sft	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
17	Khaprial (Manglore) Tiles 15" x 8" x 1-1/2" of approved design/shape laid flat in 1:2 grey cement mortar over a bed of 3/4" thick grey cement mortar 1:3 (up to 15' -0 height).	930.25		Sft	
18	Providing and fixing Printed Glazed Ceramic Tiles Flooring (12"x18"x1/4" or above) jointed in white cement and laid over bed of 1/2"thick grey cement send mortar ratio 1:3 i/c washing / filling of joints with white cement etc: complete in all respect (Imported Premium Quality costing Rs 2200 per square meter or above)	197.00		Sft	
19	Providing and fixing Printed Glazed Ceramic Tile Dado/ Skirting (12"x18"x1/4" or above) i/c two layers of Printed Borders (2" to 4"Wide) jointed in white cement and laid over bed of 1/2"thick grey cement send mortar ratio 1:3 i/c washing / filling of joints with white cement etc: complete in all respect. (Imported Premium Quality costing Rs 2200 per square meter or above)	560.00		Sft	
20	Providing and Laying Floor of Verona Marble Tiles 24"x12"x 3/4", fine dressed on the surface without winding set in white cement over a base of 1:2 grey cement mortar 3/4" thick including filling of joints with slurry of white cement and pigment in desired shape with finishing cleaning, curing to proper profile i/c rubbing and chemical polishing etc composite complete in all respect as per detail / drawing and as directed by the Consultants. (Basic cost of Verona Tile Should be Rs.170.00 per Sq ft or above)	1,740.75		Sft	
21	Providing & Fixing 3/8" thick verona marble tiles of approved quality and color shade size 12" x 6" x 3/8" in dado, skirting and facing over 1/2" thick base of cement mrotar 1:3 seting mortar base inclusing filling the joints and washing the tiles with white cement finishing cleaning , rubbing and polishing etc complete in all respects as per detail/ drawing and as directed by the Consultants. (Basic cost of Verona Tile Should be Rs.100..00 per Sq ft or above)	344.75		Sft	
22	Providing and fixing G.I frames /Choukhats for Doors / Windows using 18 gauge G.I sheet I/c welded hinges and fixing at site with necessary hold fasts, filling with cement, sand slurry & zero size crush stone in ratio 1:2:4 , repairing the jambs and painting red oxide anti corrosion paint over exposed surface etc complete in all respects . The cost also i/c all carriage, tools and plants used in making and fixing.				
		51.50		Rft	
		66.00		Rft	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
23	M/ Fixing Russian Wood Door Shutter 1-1/2" thick paneled or partially glazed with frost glass i/c including hold fasts, Brass fittings like hinges, iron tower bolts, handle and cleats with cord etc, complete in all respects as per instructions of Engineer Incharge and as per requirement of Architecture Drawings and specifications etc complete in all respects as per directives of Engineer In charge.	101.50		Sft	
24	M/ Fixing Russian Wood Wire Guaze Door Shutter 1-1/2" thick with 22 standard wire gauze 144 mesh per square inch and Expanded Metal Mesh of 20 guage i/c including hold fasts, Brass fittings like hinges, iron tower bolts, handle and cleats with cord etc, complete in all respects as per instructions of Engineer Incharge and as per requirement of Architecture Drawings and specifications etc complete in all respects as per directives of Engineer In charge.	24.50		Sft	
25	Providing and installation polished Entrance Glass Door with fabricating and fixing standard S.S Channel (using standard section) as approved top & bottom the architect with approved quality bottom rails, brush finish as required, with sand blasting complete with patch fitting, top & bottom locks (from ISEO,Geza or equivalent as approved). Contractor is required to provide joints between the panels with minimum 5mm thick clear silicon from Down corning or other approved, as as per requirement of Architecture Drawings and specifications etc complete in all respects as per directives of Engineer In charge.				
(i)		42.50		Sft	
(ii)		2		Nos	
26	S/F in position Almuniums channels framing or guage 1.2 mm (100mm x 40 mm) for sliding windows & ventilator with collar of Alcop made (of approved make and design) with 5 mm thick tinted glass glazing (Belgium) and almunium fly screen channel including handles stoppers & locking arrangements etc complete in all respects as per directives of Engineer In charge (Delux Model-Bronze with Coating)	238		Sft	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
27	Supplying and fixing Steel grill of 10 mm square bar as per approved design (Weight 1.50 kg / Sq ft:) i/c Painting 2 coats of oil paint with one coat red oxide paint etc: complete in all respects as per specifications and drawings and approval of Engineer In charge.	238		Sft	
26	Providing and Applying French polishing over solid wood work with liqueur base spirit polish and filling material etc complete in all respect.03 Coats	203.00		Sft	
27	Providing and Applying French polishing over wire guaze work with liqueur base spirit polish and filling material etc complete in all respect. 03 Coats	49.00		Sft	
28	Providing and fixing printed glazed porcelain laser cut Semi Granite tile on floor or Wall (600 mm x 600 mm x 18 mm) jointed in white cement and laid over bed of 1" thick grey cement sand mortar ratio 1:3 i/c washing / filling of joints with white cement etc: complete in all respect ((Imported Premium Quality costing Rs 3200 per square meter or above))	1,517		Sft	
29	Providing and fixing Envi-crete Boston Paver Blocks flooring having size of 297mm x 297mm x 40mm of city / qudda /cobble shape (Classic Boston Paver) with pigmented having strength b/w 3000 Lbs/PSI to 4000 Lbs/PSI over bed of 1" thick C.M ` 1:4 i/c filling the joints with Sillary and laying in specified manner / patter and design etc. complete. (Envi-crete /Hub-crete pavers)	1,179		Sft	
30	Providing and fixing Terrace Railing with 38 mm Dia Steel Pipe @ 900 mm c/c vertically up to 600 mm height and on top railing with 4 Nos 16 mm dia pipes horizontally of required design, embedded properly in RCC work by means of iron lugs welded with MS rods, complete as per drawing, specification and satification of the Architect up to any height in any floor etc complete in all respects as per directives of Engineer In charge	189		Sft	
			Total Amount		

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PART 'II' **INTERNAL WATER SUPPLY, SANITARY FITTINGS, SUI GAS FITTINGS , EXTERNAL WATER SUPPLY & EXTERNAL DRAINAGE**

S #	Description of Item.	Quantity	Rate	Unit	Amount.
1	Providing & fixing English Commode with Seat cover including flushing cistern,tee stop cock etc complete in all respects (Imported or Equivalent) (Classic Model)	2		Nos	
2	Providing & fixing Orisa W.C 21" Clear including flushing cistern,tee stop cock etc complete in all respects (Imported or Equivalent) (Classic Model)	6		Nos	
3	Providing & fixing Urinal including flushing cistern, Tee Stop Cock etc complete in all respects (Imported or Equivalent) (Classic Model)	2		Nos	
4	Providing & Fixing Wash Basin size 24" x18" with wash basin mixture and padestal etc complete in all respects (Imported or Equivalent) (Classic Model)	6		Nos	
5	Providing and fixing C.P Brass Double bib cock with Muslim Shower 1/2" dia (Master/ Sonex or equivalent)	8		Nos	
6	Providing and fixing C.P Brass Fancy bib cock with crystal head 1/2" dia (Master / Sonex or equivalent).	8		Nos	
7	Providing and fixing C.P Brass Consealed stop cock with crystal head 1/2" dia (Master / Sonex or equivalent).	2		Nos	
8	Providing and fixing U.P.V.C. Floor Trap 6"x2" or 6"x3" dia i/c Steel floor Jali grade-I (AGM or equivalent) including cutting, fitting with collars, clamps and rubber solvent. This rate also includes making holes in walls, plinth, floor and roof for fixing pipe and making good in c.c. 1:2:4. Testing pressure head 200 feet.	8		Nos	
9	Providing and fixing U.P.V.C. Pipe 4" dia grade-I (AGM or equivalent) including all fittings such bends, tees etc with cutting pipe up to required length, fitting with collars, clamps and rubber solvent. This rate also includes making holes in walls, plinth, floor and roof for fixing pipe and making good in c.c. 1:2:4. Testing pressure head 200 feet.	192		Rft	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
10	Providing & fixing of PPR PN-20 cold water pipes with all required molded fittings PN-20, jointing pipe with heat method, making break through in wall plinth and R.C.C fixing pipe, testing, and making good in C.C 1:2:4 etc complete in all respects as per specifications and instructions provided by the Engineer In charge.				
(i)	**50 mm**	520		Rft	
(ii)	**38mm**	520		Rft	
(iii)	**25 mm**	390		Rft	
(iv)	**20 mm**	520		Rft	
11	Providing & fixing of PPR PN-20 Gate Valve with Brass threads, jointing with already laid pipe by heat method, testing, etc complete in all respects as per specifications and instructions provided by the Engineer In charge.				
(i)	**50 mm**	2		Nos	
(ii)	**38mm**	2		Nos	
(iii)	**25 mm**	4		Nos	
(iv)	**20 mm**	6		Nos	
12	Providing and fixing Stainless Steel Sink Size 40"x20" i/c Sink Mixture ,C.P waste, P.V.C Waste Pipe, Bolt kit etc complete in all respects. (Superior quality and heavy gauge)	1		No	
13	Providing chambers 9" x 12" (inside dimensions) x 12" deep with Glazed Gully Trap for collectin internal sewer and etc. with 6" thick C.C 1:3:6 cast in situ walls, 6" thick C.C 1:4:8 in foundation 1/2" thick cement plaster 1:3 to all inside wall surface and to top 1" thick C.C 1:2:4 flooring complete with hinged cast iron cover and frame 9"x6" (inside) clear opening (wt 1/2" Qr) etc. fixed in cement concrete 1:2:4 including curing excavation back filling & disposal of earth etc. complete.	6		Nos	
14	Supplying & fixing Bath room accessories set (9 Pieces) I/c towel rod, brush holder, Coat Holder & soap tray shelf of approved design i/c cost of screws, nuts etc Complete. (Master Brand or Equivalent).	2		Nos	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
15	Supplying & fixing in position Looking Mirrors (more than 4 Sft or 25 Sq cm) in Aluminium channels framing of 5 mm thick bevelled edge glass glazing (Belgium) fixed with glass soap tray , screws and nails etc. complete in all respects in all respects as per directives of Engineer Incharge	40		Sft	
16	Water Boring by pile drilling method in all type of soils except hard rock etc complete in all respect as shown on drawing provided and as per directives of Engineer In charge.				
(i)	**75 mm**	100		Rft	
17	U- PVC Filter pipe with steel sieve around pipe etc complete in all respect as shown on drawing provided and as per directives of Engineer In charge.				
(i)	**38 mm**	20		Rft	
18	Providing and fixing 1-1/2" Dia C.P Brass Check / Foot Valve i/c brass threads (imported) by approved method, testing etc complete in all respects as per specifications and instructions provided by the Engineer Incharge.	1		Nos	
19	Providing and fixing Mono Block water pumping set size 1"x1-1/4" (Golden or Equivalent) with 1 H.P motor of 2800 RPM having single phase 220 Volts connection including base plate and also making C.C. 1:3:6 plateform of required size and fixing with nuts and bolts complete in all respect.This rate also i/c 2-3/.036 P.V.C insulated power wiring,10 Amp Main Switch for motor etc complete in all respects .	1		Each	
20	Providing and fixing Brass Gas Cock imported by approved method, testing etc complete in all respects as per specifications and instructions provided by the Engineer Incharge				
	(i) 1/4" Dia	3		Each	
	(ii) 1/2" Dia	2		Each	
21	Providing & fixing of Gas Burner (Three Ways Table Top) of approved make and Design with necessary fittings by approved method, testing etc complete in all respects as per specifications and instructions provided by the Engineer Incharge.	1		Each	
22	Providing & fixing of Steel Heavy Duty for Heavy Cooking Twin Stove Burner of approved and Design with necessary fittings by approved method, testing etc complete in all respects as per specifications and instructions provided by the Engineer Incharge	1		Each	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
23	Providing & fixing of Gas Geyser of approved and Design (135 Litres) with imported pilot and other necessary fittings by approved method, testing etc complete in all respects as per specifications and instructions provided by the Engineer Incharge.	2		Each	
24	Providing and laying of U-PVC Pipe of class 'B' suitable for external drainage work buried in ground under roads crossing as per specification with excavating trench for laying of pipe, bricks, warning tape, and back filling with new and fresh sand (4" below pipe and sides with leveling stacks), compaction and plugging of pipe ends etc complete in all respect as shown on drawing provided and as per directives of Engineer In charge				
	(i) 6" or 150 mm dia)	60		Rft	
25	Construction manhole or inspection chamber for the required dia of circular sewer and 3'-0" (900 mm) depth with walls (6" thick) of C.C Plain ratio 1:3:6 cement plastered 1:3 1/2" thick inside of walls and I" (25 mm) thick over benching and hcannel i/c fitting C.I manhole cover with frame of clear opening (1-/2' x 1., 1/2' (457x457 mm) of 1.75 Cwt. (88.9 kg) embedded in plain C.C 1:2:4 and fixing I" (25 mm) C/C duly painted etc. complete as per specification and drawings provided by Engineer Incharge.				
	(i) Circuler Man Hole **(24" Dia i/i with depth of 36")**	6		Nos	
	PART 'II' INTERNAL WATER SUPPLY, SANITARY FITTINGS, SUI GAS FITTINGS , EXTERNAL WATER SUPPLY & EXTERNAL DRAINAGE		**Total Amount**		

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PART 'III' INTERNAL & EXTERNAL ELECTRIFICATION WORK

S #	Description of Item.	Quantity	Rate	Unit	Amount.
1	Wiring for light, fan or plug point with 1.5 sq.mm single core, PVC insulated wire copper conductor wire in 3/4" dia PVC conduct recessed in the wall column, roof etc, including 1 sq.mm single core PVC insulated wire as ECC as required				
(i)	**(From D. B to Switch Board)**	8		Nos	
(ii)	**(From Switch Board to Point)**	12		Nos	
(iii)	**(From Point To Point)**	48		Nos	
2	Wiring for plug point with 1.5 sq.mm single core, PVC insulated wire copper conductor wire in 3/4" dia PVC conduct recessed in the wall column, roof etc, including 1 sq.mm single core PVC insulated wire as ECC as required.(Nearest light plug)	12		Nos	
3	Wiring for call bell point with 1.5 sq.mm single core, PVC insulated wire copper conductor wire in 3/4" dia PVC conduct recessed in the wall column, roof etc, including 1 sq.mm single core PVC insulated wire as ECC as required (When push button outside premises).	1		Nos	
4	Circuit Wiring for distributing circuits with 2-1/1.38(3/.036) PVC insulated wire in 25mm (1") PVC conduit fitted	360.0		Rft	
5	Circuit Wiring for power point with 2-7/0(7/.044) PVC insulated wire with 1-1/36 as ECC in 25mm (1") PVC conduit fitted.	450.0		Rft	
6	Circuit Wiring for power point with3-7/0(7/.064) PVC insulated wire with 1-1/36 as ECC in 38mm (1-1/2") PVC conduit fitted.	390.0		Rft	
7	Providing & fixing 10Amps polycarbonate flame retardant One way switch with fancy gang plate fixed on die fabricated powder coated metal board recessed in wall or column including connection as required. (E31/2/3A Clipsal Make)				
(a)	One Switch Plate	2		Nos	
(b)	Two Switch Plate	2		Nos	
(c)	Four Switch Plate	4		Nos	
(d)	Six Switch Plate	4		Nos	
(e)	Eight Switch Plate	4		Nos	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
8	Providing & fixing 10Amps polycarbonate flame retardant bell push with fancy gang plate fixed on die fabricated powder coated metal board recessed in wall or column including connection as required (E31/MBPR Clipsal Make)	1		Nos	
9	Providing & fixing 10Amps polycarbonate flame retardant 3-pin switch socket unit (Universal) with fancy gang plate fixed on die fabricated powder coated metal board recessed in wall or column including connection as required (Clipsal Make) with back & boxing	8		Nos	
10	Providing & fixing 15-20 Amps polycarbonate flame retardant 3-pin switch socket unit (Universal) with fancy gang plate fixed on die fabricated powder coated metal board recessed in wall or column including connection as required (Clipsal Make) with back & boxing	12		Nos	
11	Providing & fixing A.C/D.C Door Bell (superior quality imported)on die fabricated powder coated metal board recessed in wall or column including connection as required	1		Nos	
12	Providing & fixing 3"x4"x5" size (14SWG) thick recessed type fan clamp box 5/8" dia MS bar fan clamp fixed in roof at casting time as required.	12		Nos	
13	Making hole in the wall for 12" to 16" sweep metallic exhaust fan and fixing of hold fast, dully plaster and making good the damage as required.	2		Nos	
14	Making hole in the wall for 18" to 24" sweep metallic exhaust fan and fixing of hold fast, dully plaster and making good the damage as required.	2		Nos	
15	Providing and fixing 6 Amps plastic ceiling rose on PVC round block /round cover fitted on surface including connection as required.	48		Nos	
16	Providing and installing 13 CM (6") sweep plastic body Exhaust fan complete with blades, motors, etc fixed in existing hole including connection with 14/.0076" flexible wire complete as required (with out regulator) Millat/Pak/Asia/Younus/Climax/ Royal.	6		Nos	
17	Providing and installing 38 Cm (18") sweep Metalic body low noise Turbo Jet Exhaust fan complete with blades, motors, etc fixed in existing hole including connection with 14/.0076" flexible wire complete as required (without regulator) Millat/Pak/Asia/Younus/Climax/Royal.	2		Nos	
18	Providing and installing 60CM (24") Wall Bracket Fancy Fan including connection with 14.0076" flexible wire complete as required (Millat/Pak/Asia/Younus/ Climax / Royal.	4		Nos	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
19	Providing and installing ceiling fan with blades, canopy, standard length of down rod including connection with 14.0076" flexible wire complete as required (without regulator) (Millat/Pak/Asia/ Younus/ Climax/ Royal.)				
	(i) Ceiling Fan 140 CM (56") sweep	4		Nos	
	(ii) Ceiling Fan 120 CM (48") sweep	4		Nos	
20	Providing and fixing Earth set with 2'x2'x1/4" copper plate buried in the ground at a depth of 12 feet or less if water comes out from the ground level (with salt and charcoal, or Earth chemical powder) etc.. Making the pit 12 feet deep by excavation of all type of soil (except soft or hard rock) i/c fixing of 8 SWG copper wire in 1/2" G.I conduit etc complete in all respects as required. appropriate size of upvc conduit for leads , complete as per detail drawing & instruction of consultant. providing as built drawings, test reports documents to Employer / Consultant representative. Complete in all respects	1		No	
21	Providing & Fixing basic batten, surface type, fitting complete with TLD 1x36W white day light lamp starter, electronic ballast as Philips Cat. (TMS015/136 L.E.D)	6		Nos	
22	Providing & Fixing basic batten, surface type, fitting complete with TLD 2x36W white day light lamp starter, electronic ballast as Philips Cat. (TMS015/136 L.E.D)	6		Nos	
23	Providing and fixing L.E.D Energy Saver 12 Watts Phillips i/c wall type or ceiling fancy bracket **(R.A. Attached)**	12		Nos	
24	Providing and fixing L.E.D Energy Saver 18-24 Watts Phillips i/c wall type or ceiling fancy bracket **(R.A. Attached)**	12		Nos	
25	Providing & fixing 15 Amps poly carbonate flame retardant 400 watts fan dimmer with plate fixed on die fabricated powder coated metal board recessed in wall or column including connection as required (E32V400F Clipsal Make) **(R.A. Attached)**	8		Nos	
	(i) Main / Distribution Pannel Boards Work				
26	Supply & Installation of following Main / Distribution Pannel Boards of approved make and design concealed in wall/surface mounted or floor standing. 1.5/2/3 mm sheet steel fabricated powder coated , suitable for 500 volts, 3 phase, 4 wires, 50 Hz, incorporate following components & configuration, complete with all mounting & connecting accessories as per Electrical Drawings attached etc complete in all respect as per specification provided and instructions given by the Engineer Incharge. **(R.A. Attached)**	8		Nos	
01	Shop DB	1		No	
02	Main DB	1		No	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
19	Providing and installing ceiling fan with blades, canopy, standard length of down rod including connection with 14.0076" flexible wire complete as required (without regulator) (Millat/Pak/Asia/ Younus/ Climax/ Royal.)				
	(i) Ceiling Fan 140 CM (56") sweep	4		Nos	
	(ii) Ceiling Fan 120 CM (48") sweep	4		Nos	
27	Providing, installation, testing and commissioning of Flood light fixture (P2 type) with 1-250W SON-T lamp (IP-66) ,as per drawing and specification, complete in all respects.	2		No	
	External Cables Work				
32	Supply, Laying, termination and commissioning of following copper conductor cable in already laid PVC conduit / cable tray / trench as required, as per drawings, specification and instructions given by Engineer Incharge **(Cu /pvc/ pvc cable , 600/1000v, Pak cable/Pioneer/AGE). (R.A.Attached)**				
A	**4 Core - CU/PVC/ PVC Cable (600/1000V)**				
I	4 Core - 10 Sq.mm	90.0		Mtrs	
Ii	4 Core - 25 Sq.mm	80.0		Mtrs	
iii	4 Core - 50 Sq.mm	50.0		Mtrs	
iv	4 Core - 70 Sq.mm	40.0		Mtrs	
c	**1 Core - PVC Cable as ECC (600/1000V)**				
i	1 core -10 Sq.mm	90.0		Mtrs	
ii	1 core - 16 Sq.mm	80.0		Mtrs	
iii	1 core - 25 Sq.mm	50.0		Mtrs	
iv	1 core - 35 Sq.mm	40.0		Mtrs	
		Part "I" Electric Work Total			

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PART 'H CONSTRUCTION OF GUARD ROOM

Part I CIVIL WORK

S #	Description of Item.	Quantity	Rate	Unit	Amount.
1	Excavation in foundation of buildings, bridges and other structures as per required section, including dag belling, dressing filling around structure with excavated earth watering ramming & compacting etc complete in all respects as per specifications provided and instructions given by the Engineer In charge. **Lead up to 400 ft & lift up to 10 feet**	323		Cft	
2	Cement Concrete Plain including placing compacting, finishing and curing complete (including screening and washing of crush bajri) without form work . etc complete in all respects as per specifications provided and instructions given by the Engineer Incharge				
	Ratio 1:4:8 (CLASS 'E') (Under Foundation)	80.63		Cft	
3	Providing and laying plain cement concrete Class "D" (1 : 3 :6) in foundation having minimum works cube crushing strength of 1500 lbs per sq. inch at 28 days for blinding or under floors where required using approved quality 1" maximum size graded crushed stone or gravel with approved quality sand including all all type of form works, rodding, leveling, compacting and curing etc. complete as per specifications, drawings and to the entire satisfaction of Engineer. Ratio 1:3:6 (CLASS 'D')	241.88		Cft	
4a	Providing & Laying reinforcement concrete using S.R Cement graded screened bajri 3/8" down gauge as fine aggregate, and crushed stone 3/4" down gauge as coarse aggregate with moisture machine concrete including the cost of fixing from work & scaffolding and its removal, vibrating using mechanical vibrator, curing and cylinder testing at 1 & 28 days etc. having min cylindrical strength of 3000 psi after 28 days curing but excluding the cost of reinforcement bars complete as per drawing and as directed by the consultant				
(iii)	**Plinth Beam**	21.50		Cft	
4b	Providing & Laying reinforcement concrete using S.R cement graded screened bajri 3/8" down gauge as fine aggregate, and crushed stone 3/4" down gauge as coarse aggregate with moisture machine concrete including the cost of fixing from work & scaffolding and its removal, vibrating using mechanical vibrator, curing and cylinder testing at 1 & 28 days etc. having min cylindrical strength of 3000 psi after 28 days curing but excluding the cost of reinforcement bars complete as per drawing and as directed by the consultant.**(R.A. Attached)**				
(iii)	**Structure Beams**	48.38		Cft	
(iii)	**Main Roof**	105.13		Cft	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
5	Fabrication of Cold Twisted Deformed Steel Bars, reinforcement for cement concrete work i/c cutting, bending, laying in proper position, making joints & fastenings etc complete. This rate also include cost of binding wire, over lapping ,extra wastage, laboratory testing of steel and removing rust from bars.**(Grade 60, Minimum Yield Strength 60000 Lbs / P.S.I)**	0.469		Ton	
6	Filling, watering & ramming earth in floor with surplus earth from foundation lead up to 120 ft and lift up to 5 ft:	107.50		Cft	
7	Earth filling with off site material (brought from out side source) in plinth, depression and where ever required laid in 300mm layer well watered, consolidated and compacted with mechanical means complete as per drawings and as directed by the Consultants.	177.69		Cft	
8	Cement Concrete Plain including placing compacting, finishing and curing complete (including screening and washing of crush bajri) without form work etc complete in all respects as per specifications provided and instructions given by the Engineer Incharge.				
	4" Thick Ratio 1:4:8 (CLASS 'E') (Under Floor)	95.06		Sft	
9	Providing and laying bricks masonary work with cement sand mortar ratio1:6 ratio (Using first class Pucca Bricks of Size 9" x 4-1/2" x 3" or 9 x 6" x 3" in foundation & plinth structure i/c racking out joints, curing and Scafolding wooden prank and its labour also i/c all lead & lifts etc. complete.	36.00		Cft	
10	Providing and laying bricks masonary work with cement sand mortar ratio1:6 ratio (Using first class Pucca Bricks of Size 9" x 4-1/2" x 3" or 9" x 6" x 3") in super structure i/c racking out joints, curing and Scafolding wooden prank and its labour also i/c all lead & lifts etc. complete. This Rate also i/c minor reinfiorcement at the end of joints at concrete	228.01		Cft	
11	Providing and fixing G.I frames /Choukhats for Doors / Windows using 18 gauge G.I sheet I/c welded hinges and fixing at site with necessary hold fasts, filling with cement, sand slurry & zero size crush stone in ratio 1:2:4 , repairing the jambs and painting red oxide anti corrosion paint over exposed surface etc complete in all respects . The cost also i/c all carriage, tools and plants used in making and fixing.	59.93		Rft	
12	M/ Fixing Russian Wood Door Shutter 1-1/2" thick paneled or partially glazed with frost glass i/c including hold fasts, Brass fittings like hinges, iron tower bolts, handle and cleats with cord etc, complete in all respects as per instructions of Engineer Incharge and as per requirement of Architecture Drawings and specifications etc complete in all respects as per directives of Engineer In charge.	45.00		Sft	
13	Supplying and fixing Steel grill of 10 mm square bar as per approved design (Weight 1.50 kg / Sq ft:) i/c Painting 2 coats of oil paint with one coat red oxide paint etc: complete in all respects as per specifications and drawings and approval of Engineer In charge.	24.00		Sft	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
14	Cement Plaster in **Ratio 1:4 (15 mmThick)** i/c floating coat of cement in proper design and profile on Roof Celings etc complete in all respects as per specifications and drawings and approval of Engineer Incharge	225.00		Sft	
15	Cement Plaster in **Ratio 1:6 (15 mmThick)** i/c floating coat of cement in proper design & profile on walls/beams & columns .This rate also i/c providing expanded metal at the joint of R.C.C.members and block masonary where as reqiured etc complete in all respects as per specifications and drawings and approval of Engineer Incharge	935.00		Sft	
16	Cement Plaster in **Ratio 1:4 (12 mmThick)** i/c floating coat of cement in proper design and profile on walls, beams & columns etc complete in all respects as per specifications and drawings and approval of Engineer Incharge	935.00		Sft	
17	Providing and Laying Floor of Verona Marble Tiles 24"x12"x 3/4", fine dressed on the surface without winding set in white cement over a base of 1:2 grey cement mortar 3/4" thick including filling of joints with slurry of white cement and pigment in desired shape with finishing cleaning, curing to proper profile i/c rubbing and chemical polishing etc composite complete in all respect as per detail / drawing and as directed by the Consultants. (Basic cost of Verona Tile Should be Rs.170.00 per Sq ft or above)	124.00		Sft	
18	Providing & Fixing 3/8" thick verona marble tiles of approved quality and color shade size 12" x 6" x 3/8" in dado, skirting and facing over 1/2" thick base of cement mrotar 1:3 seting mortar base inclusing filling the joints and washing the tiles with white cement finishing cleaning , rubbing and polishing etc complete in all respects as per detail/ drawing and as directed by the Consultants. (Basic cost of Verona Tile Should be Rs.100..00 per Sq ft or above)	43.00		Sft	
19	Providing and Applying French polishing over solid wood work with liqueur base spirit polish and filling material etc complete in all respect.03 Coats	90.00		Sft	
20	Preparing the surface and painting with plastic bound Distemper Paint of approved make I/c rubbing the surface with sand Paper, filling the voids with chalk / plaster of paris and then painting etc. complete.(03 Coats)	480.00		Sft	
21	P/Applying 3 Coats of Weather Shield Paint of superior quality i/c preparing base surface and filling etc complete in all respects as per directives of Engineer In charge.	680.00		Sft	
22	Khaprial (Manglore) Tiles 15" x 8" x 1-1/2" of approved design/shape laid flat in 1:2 grey cement mortar over a bed of 3/4" thick grey cement mortar 1:3 (up to 15' -0 height).	210.25		Sft	
			Total Amount		

CONTRACTOR

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PART 'I' EXTERNAL ELECTRICIFACTION WORK (ILLUMINATION WORK)

S #	Description of Item.	Quantity	Rate	Unit	Amount.
1	Providing and fixing Earth set with 2' x 2' x 1/4" copper plate buried in the ground at a depth of 12 feet or less if water comes out from the ground level (with salt and charcoal, or Earth chemical powder) etc.. Making the pit 12 feet deep by excavation of all type of soil (except soft or hard rock) i/c fixing of 8 SWG copper wire in 1/2" G.I conduit etc complete in all respects as required. appropriate size of upvc conduit for leads , complete as per detail drawing & instruction of consultant. providing as built drawings, test reports documents to Employer / Consultant representative. Complete in all respects	1		Each	
2	Providing, installation, testing and commissioning of Flood light fixture (P2 type) with 1-250W SON-T lamp (IP-66) ,as per drawing and specification, complete in all respects.	36		Each	
3	Providing, installation, testing and commissioning of Street Light fixture (P1, P3, P4 type) Philips model SGP 268, Schneider model onyx, Kayos by Oslo lighting, Thorn model Alpha 20000 fixture or equivalent shall be IP 66 rated, non-corrosive die cast aluminum housing, spigot aluminum reflector, toughened glass cover, silicone rubber gasket including 250w SON-T plus lamp control gear, capacitor etc complete in all respect as per specification provided and instructions given by the Engineer In charge.	60		Each	
4	Providing, installation, testing and commissioning of outdoor type IP 65 rated pad mounted Lighting Control Panel (LC P) mounted on concrete pad (including cost of concrete pad) as per drawing and specifications, complete in all respect.				
I	LCP- 1	1		Each	
Ii	LCP- 2	1		Each	
iii	LCP- 3	1		Each	
5	Providing and laying of following sizes of **U-PVC of Class "D" pipe** for L.T power cables, roads crossing. Buried in ground under roads crossing as per specification without excavation for laying of pipe, bricks, warning tape, and back filling with new and fresh sand (4" below pipe with leveling stacks) which will be paid separately and plugging of pipe ends etc complete in all respect as shown on drawing provided and as per directives of Engineer In charge				
iii	50 mm dia Upvc class "D" pipe	1,500		P.RFT	

S #	Description of Item.	Quantity	Rate	Unit	Amount.
7	Providing and construction of main hole of Size1000 x1000 x 1200 mm deep with 6" thick concrete walling and bottom in ratio of 1:2:4 ratio with 600mm round heavy duty cast iron cover, 100% water proof etc complete in all respect as per specification provided and instructions given by the Engineer Incharge. (for incoming cables)	6		Each	
8	Providing, installing, testing and commissioning of lighting pole of 10 m long shaft, 4mm thick round conical, hot dipped galvanized (70 to 85 microns as per BS 729) from inside and outside, including base plate anchor bolt, nuts and washer, self inspection door with special keys including cable connection box and excavation for the pole,as per specification and details shown on the drawings, etc complete in all respect as per specification provided and instructions given by the Engineer In charge. Manufacturer as per specification and drawings, with following shaft sizes and light fixture lanterns (Hitachi/ Phillips or Equivalent Make).				
I	**1x 0.5m long cross arms with 1 lantern**	18		Each	
Ii	**2 x 0.5m long cross arms with 2 lanterns**	36		Each	
iii	**3 x 0.5m long cross arms with 3 lanterns**	18		Each	
9	Construction of pole foundation in concrete class "B", reinforcement as per AASHTO M31, lean concrete etc, and as per specifications and as shown on the drawings, foundation constructed above the drain or any location in project, including excavation & back filling, complete in all respects.	72		Each	
	External Cables Work				
10	Supply, Laying, termination and commissioning of following copper conductor cable in already laid PVC conduit / cable tray / trench as required, as per drawings, specification and instructions given by Engineer Incharge **(Cu /pvc/ pvc cable , 600/1000v, Pak cable/Pioneer/AGE).**				
a	**4 Core - CU/PVC/ PVC Cable (600/1000V)**				
i	4 Core - 10 Sq.mm	1285.0		P.Mtr	
iii	4 Core - 25 Sq.mm	1150.0		P.Mtr	
c	**1 Core - PVC Cable as ECC (600/1000V)**				
i	1 core -10 Sq.mm	1285.0		P.Mtr	
ii	1 core - 16 Sq.mm	1150.0		P.Mtr	
		Part "I" Electric Work Total			

CONTRACTOR

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PART 'J ' WALK THROUGH METAL DETECTOR GATES

S #	Description of Item.	Quantity	Rate	Unit	Amount.
	Providing and fixing Walk Through Metal Dtector Gate imported) having following specifications · 18 Independent Distinct Zones (6 Horizontal Zones & 3 VerticalZones) · Pinpoint Detection Display on Header (Left, Center & Right) · Triple Display (1st Display on Header& 2nd Display on Front Side of The Both Panels & 3rd Display on Back Side of The Both Panels) · Triple Traffic Counter (In Counter, Out Counter & Alarm Counter) · Traffic Pacing Stop & Go Symbols. · Operating Temperature -0C° to 65C° degree Centigrade. · Power Supply Fully Automatic (100to 240 VAC). · HAGC System To Ensure Uniform Detection · Sensitivity Level -99 to +99 · 2-4 Hours Battery Back-up. · IR Sensor For Outside Interference Protection. · Password Protection For Unauthorized Access. · LED display on The Header Panel as well as on The Side Panels. · Integrated Floor Mounting Boots. · Archway Inside: 75cm Wide 200cm Height 50cm Depth · Overall Outside: 87cm Wide 220cm Height 50cm Depth etc complete as per detail drawing & instruction of consultant. providing as built drawings, test reports documents to Employer / Consultant representative. Complete in all respects	**2**		**Each**	
			Total		

CONTRACTOR

MUNICIPAL ENGINEER
Municipal Committee
Khairpur

*SPECIFIC WORKS DATA

(To be prepared and incorporated by the Procuring Agency)

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

Note:

* *The Procuring Agency should decide whether to allow subcontracting or not. In case Procuring Agency decides to allow subcontracting then following conditions shall be complied with:*

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

2. The truthfulness and accuracy of the statement as to the experience of Sub-Contractors is guaranteed by the bidder. The Procuring Agency'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.

SCHEDULE – D TO BID

PROPOSED PROGRAMME OF WORKS

Bidder shall provide a programme in a bar-chart or Program Evaluation and Review Technique (PERT) or Critical Path Method (CPM) showing the sequence of work items by which he proposes to complete the 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 works including the activities like designing, schedule of submittal of drawings, ordering and procurement of materials, manufacturing, delivering, construction of civil works, erection, testing and commissioning of works to be supplied under the Contract.

METHOD OF PERFORMING WORKS

The bidder is required to submit a narrative outlining the method of performing the 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 Works, including the number of shifts per day and hours per shift, he expects to work.

· A list of all major items of construction and plant erection, tools and vehicles proposed to be used in delivering/carrying out the works at site.

· The procedure for installation of equipment and transportation of equipment and materials to the site.

· Organization chart indicating head office & field office personnel involved in management, supervision and engineering of the Works to be done under the Contract.

SCHEDULE – F TO BID

(INTEGRITY PACT)
DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC
PAYABLE BY CONTRACTORS
(FOR CONTRACTS WORTH RS. 10.00 MILLION OR MORE)

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

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

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

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

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

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

[Procuring Agency] [Contractor]

SPECIAL CONDITIONS OF CONTRACT

SPECIAL CONDITIONS OF CONTRACT

(These special conditions of contract shall be integral part of contract once the agreement is made and signed between P/A and contractor)

- Contractor should sign on all the pages of this Tender Document.
- Procuring Agency reserves the right to change any item or specification during execution of the work which will be acceptable to contractor.
- The contractor will have to follow instruction of Procuring Agency .
- The contractor will have to do the work as per specifications of this tender document and in case of any complication he will have to follow the instructions of Procuring Agency.
- The contractor will have to arrange site order book at site of work with technical person.
- The contractor will have to accept the decision of Tender Committee and in case of any conflict he will have to submit before Tender Committee at the time of opening tender after that no claim of contractor will be entertained.
- The contractor will have to arrange his own security staff at site for protection of his material and staff. Procuring Agency will not be responsible for any loss or damage due to security reasons.
- All materials of approved quality will be used. Samples of all material, fixtures will be approved first by Procuring Agency before using them at site.
- Contractor has to arrange water at site on his own. Procuring Agency will not provide any water, electricity etc. Contractor should assess such cost of water, electricity etc and in-built this in his quoted rates.
- The scope of work may increase or decrease depending. In case of reduction in scope of work contractor will not claim any extra charges or compensation.
- The contractor has to complete the work within stipulated time.
- All taxes will be deducted from Bills.
- If work is not completed in stipulated time period then clause of Penalty will be imposed on contractor.
- The contractor has to appoint his permanent engineer at site.
- Cartage shall not be paid separately and that the contractor should in-built any such amount in his quoted rates.
- Any difference on Steel, Cement, Bitumen, Wood and Bricks if notified by Government of Sindh after opening of this bid shall be payable based on actual executed quantities at site.
- If any extra item is required during execution preference will be given to Govt. of Sindh Schedule of rates.

_____

Contractor

GENERAL CONDITIONS OF CONTRACT

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GENERAL CONDITIONS OF CONTRACT

GENERAL 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 Procuring Agency'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 Procuring Agency's drawings of the Works as listed in the Contract Data, and any Variation to such drawings.

Persons

1.1.4 "Procuring Agency" 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 Procuring Agency) any assignee.
1.1.6 "Party" means either the Procuring Agency 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 Works but does not include Materials or Plant intended to form part of the Works.

1.1.12 “Country” means the Islamic Republic of Pakistan.

1.1.13 “Procuring Agency‘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 Works.

1.1.17 “Site” means the places provided by the Procuring Agency 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/Procuring Agency under Sub-Clause 10.1.

1.1.19 “Works” means any or all the works whether Supply, Installation, Construction etc. and design (if any) to be performed by the Contractor including temporary works and any variation thereof.

1.1.20 “Engineer” means the person notified by the Procuring Agency 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 organizations. 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 PROCURING AGENCY

2.1 Provision of Site

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

Site Investigation Reports are those that were included in the bidding documents and are factual and interpretative reports about the surface and subsurface conditions at the Site.

2.2 Permits etc.

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

2.3 Engineer's/Procuring Agency's Instructions

The Contractor shall comply with all instructions given by the Procuring Agency or the Engineer, if notified by the Procuring Agency, 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/Procuring Agency shall affect the Contractor‘s obligations.

3. ENGINEER'S/PROCURING AGENCY'S REPRESENTATIVES

3.1 **Authorized Person**

The Procuring Agency 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 Procuring Agency 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/Procuring Agency's Representative**

The name and address of Engineer's/Procuring Agency's Representative is given in Contract Data. However the Contractor shall be notified by the Engineer/Procuring Agency, 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 Procuring Agency for such appointment which consent shall not be withheld without plausible reason(s) by the Procuring Agency. 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 Procuring Agency 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 Procuring Agency.

4.4 **Performance Security**

The Contractor shall furnish to the Procuring Agency within fourteen (14) days after receipt of Letter of Acceptance a Performance Security for validity specified in Contract Data, in the form of unconditional/ irrevocable Bank Guarantee of amount equal to 10% of the contract price from any scheduled bank/banks of Pakistan or Pay Order/Demand Draft in favor of Procuring Agency.

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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/Procuring Agency all designs prepared by him, within fourteen (14) days of receipt the Engineer/Procuring Agency 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/Procuring Agency 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/Procuring Agency shall be responsible for the Specifications and Drawings.

6. PROCURING AGENCY'S RISKS

6.1 **The Procuring Agency's Risks**

The Procuring Agency's Risks are:-

- war, hostilities (whether war be declared or not), invasion, act of foreign enemies, within the Country**;**
- rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war, within the Country**;**
- 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**;**
- 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**;**
- Pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds**;**
- use or occupation by the Procuring Agency of any part of the Works, except as may be specified in the Contract**;**

- late handing over of sites, anomalies in drawings, late delivery of designs and drawings of any part of the Works by the Procuring Agency‘s personnel or by others for whom the Procuring Agency is responsible;
- a suspension under Sub-Clause 2.3 unless it is attributable to the Contractor‘s failure; and
- 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 Procuring Agency and accepted by the Procuring Agency.

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/Procuring Agency 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 Procuring Agency/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 Procuring Agency/Engineer for a reasonable extension in the time for the completion of works. Subject to the aforesaid, the Procuring Agency/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 Procuring Agency/Engineer within such period as may be prescribed by the Procuring Agency/Engineer for the same; and the Procuring Agency may 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 Procuring Agency for such failure shall be to pay the amount as **liquidity damages** 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/Procuring Agency 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 Procuring Agency/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 Procuring Agency/Engineer may identify any outstanding items of work which the Contractor shall undertake during the Maintenances Period.

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 Procuring Agency, 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 Procuring Agency/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 Procuring Agency/Engineer shall issue a Maintenance Certificate whereupon all obligations of the Contractor under this Contract shall come to an end.
Failure to remedy any such defects or complete outstanding work within a reasonable time shall entitle the Procuring Agency 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/Procuring Agency 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 Procuring Agency**/**Engineer may issue Variation Order(s) in writing. Where for any reason it has not been possible for the Procuring Agency/Engineer to issue such Variations Order(s), the Contractor may confirm any verbal orders given by the Procuring Agency/Engineer in writing and if the same are not refuted/denied by the Procuring Agency/Engineer within ten (10) 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:

- at a lump sum price agreed between the Parties, or
- where appropriate, at rates in the Contract, or
- in the absence of appropriate rates, the rates in the Contract shall be used as the basis for valuation, or failing which
- at appropriate new rates, as may be agreed or which the Engineer/Procuring Agency considers appropriate, or
- if the Engineer/Procuring Agency 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 Changes in the Quantities.

- If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 15 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Procuring Agency/Engineer shall adjust the rate to allow for the change and will be valued as per sub clause 10.2.

- The Engineer shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Procuring Agency.

- If requested by the Engineer, the contractor shall provide the Engineer with a detailed cost breakdown of any rate in the Bill of Quantities.

10.4 Early Warning

The Contractor shall notify the Engineer/Procuring Agency 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/Procuring Agency 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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10.5 **Valuation of Claims**

If the Contractor incurs Cost as a result of any of the Procuring Agency‘s Risks, the Contractor shall be entitled to the amount of such Cost. If as a result of any

Procuring Agency‘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/Procuring Agency within fourteen (14) days of the occurrence of cause.

10.6 **Variation and Claim Procedure**

The Contractor shall submit to the Engineer/Procuring Agency an itemized detailed breakdown 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/Procuring Agency shall check and if possible agree the value. In the absence of agreement, the Procuring Agency 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 authorized by the Procuring Agency pursuant to this Clause, or to any other terms of the Contract, shall , subject to Clause 11.3, be paid by the Procuring Agency to the Contractor within 30 days after such Interim Payment Certificate has been jointly verified by Procuring Agency and Contractor, or, in the case of the Final Certificate referred to in Sub Clause 11.5, within 60days after such Final Payment Certificate has been jointly verified by Procuring Agency and Contractor; Provided that the Interim Payment shall be caused in thirty (30) days and Final Payment in 60 days in case of foreign funded project. In the event of the failure of the Procuring Agency to make payment within 90 days then Procuring Agency 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.

(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 less to the cumulative amount paid previously; and

- value of secured advance on the materials and valuation of variations (if any).

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

11.3 **Interim Payments**

Within a period not exceeding 14 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 Procuring Agency shall pay to the Contractor the sum subject to adjustment for deduction of the advance payments and retention money.

11.4 **Retention**

Retention money shall be paid by the Procuring Agency 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, whichever 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 Procuring Agency together with any documentation reasonably required to enable the Procuring Agency to ascertain the final contract value.

Within sixty (60) days from the date of receipt of the verified final account from the Engineer, the Procuring Agency shall pay to the Contractor any amount due to the Contractor. While making such payment the Procuring Agency 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 Defaults by Contractor

If the Contractor abandons the Works, refuses or fails to comply with a valid instruction of the Engineer/Procuring Agency or fails to proceed expeditiously and without delay, or is, despite a written complaint, in breach of the Contract, the Procuring Agency 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 Procuring Agency‘s notice, the Procuring Agency may by a second notice given within a further twenty one (21) days, terminate the Contract. The Contractor shall then demobilize from the Site leaving behind any Contractor‘s Equipment which the Procuring Agency instructs, in the second notice, to be used for the completion of the Works at the risk and cost of the Contractor.

12.2 Defaults by Procuring Agency

If the Procuring Agency 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 Procuring Agency‘s receipt of this notice, the Contractor may suspend the execution of all or parts of the Works.

If the default is not remedied within twenty eight (28) days after the Procuring Agency‘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 demobilize from the site leaving behind, in the case of the Contractor‘s insolvency, any Contractor‘s Equipment which the Procuring Agency 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:

- any sums to which the Contractor is entitled under Sub-Clause 10.4,
- any sums to which the Procuring Agency is entitled,

- if the Procuring Agency has terminated under Sub-Clause 12.1 or 12.3, the Procuring Agency 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
- 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 Procuring Agency's/Engineer's issuance of Certificate of Completion under Sub-Clause 8.2. Responsibility shall then pass to the Procuring Agency. 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 Procuring Agency's Risks, the Contractor shall indemnify the Procuring Agency, or his agents against all claims loss, damage and expense arising out of the Works.

13.2 Force Majeure

If Force Majeure occurs, the Contractor shall notify the Engineer/Procuring Agency immediately. If necessary, the Contractor may suspend the execution of the Works and, to the extent agreed with the Procuring Agency demobilize 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:
7
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 Procuring Agency 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 Procuring Agency's Risks under Sub- Clause 6.1. The policies shall be issued by insurers and in terms approved by the Procuring Agency. The Contractor shall provide the Engineer/Procuring Agency 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 Procuring Agency 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 Decision on Dispute

If a dispute of any kind whatsoever arises between the Procuring Agency and the Contractor in connection with the works, the matter in dispute shall, in the first place, be referred in writing to the Chief Municipal Officer, 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 Chief Municipal Officer shall give notice of his decision to the Procuring Agency (Chairman-Municipal Committee) and the Contractor.

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 Procuring Agency (Chairman-Municipal Committee)shall give effect forthwith to every such decision of the Chief Municipal Officer 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 of consultant or if no decision is given within the time set out in Sub-Clause 15.1 here above, 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 Chief Municipal Officer is revised by an arbitrator.

If a contractor is dissatisfied with the decision of the Chief Municipal Officer of the department or decision is not given in time then he can approach Chairman-Municipal Committee within 14 days, in case of dissatisfaction with decision of Chairman-Municipal Committee or not decided within 28 days, then arbitration process would be adopted as per clause 15.3.

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 there under 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 Procuring Agency 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 Procuring Agency 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 Procuring Agency 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 Procuring Agency under Sub-Para (a) and (c) of this Sub-Clause.

CONTRACT DATA

Sub-Clauses of
Conditions of Contract

1.1.3 Procuring Agency's Drawings: A complete set of tender drawings is attached with this document.

1.1.4 The Procuring Agency means — the person or entity 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. Here P/A is **Chief Municipal Officer**, Municipal Committee Khairpur.

1.1.5 The Contractor means a person or firm whose tender has been accepted by the Procuring Agency for providing all of the material, labor, equipment and services necessary for the construction and completion of the project.

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

1.1.9 Time for Completion 24 months

1.1.20 Engineer **Authorized by P/A**

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) Special Conditions of Contract
(f) Conditions of Contract
(g) The completed Schedules to Bid including Bill of Quantities
(h) The Drawings
(i) The Specifications

2.1 Provision of Site: On the Commencement Date
3.1 Authorized person: Chief Municipal Officer, Municipal Committee Khairpur

3.2 Name and address of Procuring Agency's representative:
Chief Municipal Officer, Municipal Committee Khairpur, Behind Phool Baagh, Khairpur Mir's, Sindh.

4.4 Performance Security:
Amount Bank Guarantee – 10% of Contract Price or

Validity 3 years

5.1 Requirements for Contractor's design (if any): Nil

7.2 Programme:
Time for submission: Within fourteen (14) days of the Commencement Date.
Form of programme: *Bar Char t / CPM/PERT*

7.4 Amount payable due to failure to complete shall be 0.10% per day up to a maximum of (10%) of sum stated in the Letter of Acceptance

7.5 Early Completion (NOT APPLICABLE)
In case of earlier completion of the Work, the Contractor is entitled to be paid bonus
up-to limit and at a rate equivalent to 50% of the relevant limit and rate of liquidated
damages stated in the contract data.

9.1 Period for remedying defects (Defects Liability Period): 6 months

10.2 (e) Variation procedures: (NOT APPLICABLE)
Day work rates_____
_____(details)

11.1 Terms of Payments

a) Mobilization Advance (NOT APPLICABLE)

(1) Mobilization Advance up to 10 % of the Contract Price stated in the Letter of Acceptance shall be paid by the Procuring Agency to the Contractor on the works costing Rs.4.00 million or above on following conditions:

(i) on submission by the Contractor of a Mobilization Advance Guarantee for the full amount of the Advance in the specified form from a Scheduled Bank in Pakistan to the Procuring Agency;

(ii) Contractor will pay interest on the mobilization advance at the rate of 10% per annum on the advance; and

(iii) This Advance including the interest shall be recovered in 5 equal installments from the five (05) R.A bills and in case the number of bills is less than five (05) then 1/5th of the advance **inclusive of the interest** thereon shall be recovered from each bill and the balance together with interest be recovered from the final bill. It may be insured that there is sufficient amount in the final bill to enable recovery of the Mobilization Advance.

2) **Secured Advance on Materials**

(a) The Contractor shall be entitled to receive from the Procuring Agency Secured Advance against an INDENTURE BOND in P W Account Form No. 31(Fin.R. Form No. 2 acceptable to the Procuring Agency of such sum as the Procuring Agency may consider proper in respect of non-perishable materials brought at the Site but not yet incorporated in the Permanent Works provided that:

(i) The materials are in accordance with the Specifications for the Permanent Works;

(ii) Such materials have been delivered to the Site and are properly stored and protected against loss or damage or deterioration to the satisfaction and verification of the P/A for inspection by the P/A;

(iv) The Contractor shall submit with his monthly statement the estimated value of the materials on Site together with such documents as may be required by the P/A for the purpose of valuation of materials and providing evidence of ownership and payment therefore;

(v) Ownership of such materials shall be deemed to vest in the Procuring Agency and these materials shall not be removed from the Site or

otherwise disposed of without written permission of the Procuring Agency;

(vi) The sum payable for such materials on Site shall not exceed 75 % of the (i) landed cost of imported materials, or (ii) ex-factory / ex-warehouse price of locally manufactured or produced materials, or (iii) market price of stands other materials.

(vii) Secured Advance should not be allowed unless &until the previous advance, if an, fully recovered;

(viii) Detailed account of advances must be kept in part II of running account bill; and

(ix) Secured Advance may be permitted only against materials/quantities anticipated to be consumed / utilized on the work within a period of 3 months from the date of issue of secured advance and definitely not for full quantities of materials for the entire work/contract

- Recovery of Secured Advance:
  - Secured Advance paid to the Contractor under the above provisions shall be effected from the monthly payments on actual consumption basis, but not later than period specified in the rules not more than three months (even if unutilized); other conditions.

(ii) As recoveries are made the outstanding accounts of the items concerned in Part II should be reduced b making deduction entries in the column; —deduct quantity utilized in work measured since previous bill, ‖ equivalent to the quantities of materials used by the contractor on items of work shown as executed in part I of the bill.

(c) Interim payments: The Contractor shall submit to the P/A monthly statements of the estimated value of the work completed less the cumulative amount certified previously.

(i) The value of work completed comprises the value of the quantities of the items in the Bill of Quantities completed.

(ii) Value of secured advance on the materials and valuation of variations (if any).

(iii) P/A may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

(v) Retention money and other advances are to be recovered from the bill submitted by contractor.

11.2 *****(a) **Valuation of the Works:**

Measurement of executed quantities at quoted rates.

11.3 Percentage of retention: Ten percent (10%)

11.6 Currency of payment: Pak Rupees

14.1 Insurances: (Not Applicable)

Type of cover
The works

Amount of cover

The sum stated in the letter of acceptance plus fifteen percent

Type of cover
Contractor's equipment

Amount of cover
Full replacement cost

Type of cover
Third party injury to persons and damage to property

Workers:

Other cover:

14.2 Amount to be recovered (not applicable)

Premium plus_____ percent (%)

15.3 Arbitration

Person & Place of Arbitration: Chief Municipal Officer, Municipal Committee Khairpur, Behind Phool Baagh, Khairpur Mir's, Sindh.

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).

FORM OF BID SECURITY

(Bank Guarantee)

Guarantee No._____

Executed on _____
(Letter by the Guarantor to the Procuring Agency)

Name of Guarantor (Scheduled Bank in Pakistan) with address_____
_____
Name of Principal (Bidder) with address:
_____
_____

Sum of Security (express in words and figures): _____
_____
_____
Bid Reference No._____
Date of Bid _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at the request of the said Principal, we the Guarantor above-named are held and firmly bound unto the _____, (hereinafter called The "Procuring Agency") in the sum stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.
THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying Bid numbered and dated as above for _____ (Particulars of Bid) to the said Procuring Agency; and
WHEREAS, the Procuring Agency has required as a condition for considering the said Bid that the Principal furnishes a Bid Security in the above said sum to the Procuring Agency, conditioned as under:

(1) that the Bid Security shall remain valid for a period of twenty eight (28) days beyond the period of validity of the bid;

(2) that in the event of;

(a) the Principal withdraws his Bid during the period of validity of Bid, or
(b) the Principal does not accept the correction of his Bid Price, pursuant to Sub-Clause 16.4 (b) of Instructions to Bidders, or
(c) failure of the successful bidder to

(i) furnish the required Performance Security, in accordance with Sub- Clause IB-21.1 of Instructions to Bidders, or
(ii) sign the proposed Contract Agreement, in accordance with Sub- Clauses IB-20.2 & 20.3 of Instructions to Bidders, the entire sum be paid immediately to the said Procuring Agency for delayed completion and not as penalty for the successful bidder's failure to perform.

NOW THEREFORE, if the successful bidder shall, within the period specified therefore, on the prescribed form presented to him for signature enter into a formal Contract Agreement with the said Procuring Agency 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 Procuring Agency for the faithful performance and proper fulfillment of the said Contract or in the event of non-withdrawal of the said Bid within the time specified then this obligation shall be void and of no effect, but otherwise to remain in full force and effect. PROVIDED THAT the Guarantor shall forthwith pay to the Procuring Agency the said sum stated above upon first written demand of the Procuring Agency without cavil or argument and without requiring the Procuring Agency to prove or to show grounds or reasons for such demand, notice of which shall be sent by the Procuring Agency by registered post duly addressed to the Guarantor at its address given above.

PROVIDED ALSO THAT the Procuring Agency 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 above, or has defaulted in fulfilling said requirements and the Guarantor shall pay without objection the sum stated above upon first written demand from the Procuring Agency forthwith and without any reference to the Principal or any other person.

IN WITNESS WHEREOF, the above 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. _____

1.Signature:_____
2. Name _____
3. Title _____

_____
Corporate Secretary (Seal)

2._____
_____
(Name, Title & Address)

Corporate Guarantor (Seal)

FORM OF PERFORMANCE SECURITY
(Bank Guarantee)

Guarantee No._____
Executed on _____
Expiry Date
(Letter by the Guarantor to the Procuring Agency)

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

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has accepted the Procuring Agency's above said Letter of Acceptance for _____ _____ (Name of Contract) for the_____ (Name of Project).

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the Procuring Agency, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract and of any and all modifications of 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. We,

_____ (the Guarantor), waiving all objections and defenses under the Contract, do hereby irrevocably and independently guarantee to pay to the Procuring Agency without delay upon the Procuring Agency's first written demand without cavil or arguments and without requiring the Procuring Agency to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the Procuring Agency's written declaration that the Principal has refused or failed to perform the obligations under the Contract, for which payment will be effected by the Guarantor to Procuring Agency‘s designated Bank & Account Number.

PROVIDED ALSO THAT the Procuring Agency shall be the sole and final judge for deciding whether the Principal (Contractor) has duly performed his obligations under the Contract or has defaulted in fulfilling said obligations and the Guarantor shall pay without objection any sum or sums up to the amount stated above upon first written demand from the Procuring Agency forthwith and without any reference to the Principal or any other person. IN WITNESS WHEREOF, the above bounded Guarantor has executed this Instrument under its seal on the date indicated above, the name and corporate seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____
Guarantor (Bank)

Witness: 1.
Signature:_____
1. _____ 2. Name _____
3. Title _____

Corporate Secretary (Seal)
2._____
(Name, Title & Address) Corporate Guarantor
(Seal)

FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the —Agreement ‖) made on the day of _____ 200 _____ between _____(hereinafter called the “Procuring Agency”) of the one part and _____ (hereinafter called the “Contractor”) of the other part.

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

NOW this Agreement witnesseth as follows:

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

2. The following documents after incorporating addenda, if any except those parts relating to Instructions to Bidders, shall be deemed to form and be read and construed as part of this Agreement, viz:
(a) The Letter of Acceptance;
(b) The completed Form of Bid along with Schedules to Bid;
(c) Conditions of Contract & Contract Data;
(d) The priced Schedule of Prices/Bill of quantities (BoQ);
(e) The Specifications; and
(f) The Drawings

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

4. The Procuring Agency hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of the Contract, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

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

_____
(Seal)

Signature of the Procuring Agency

_____
(Seal)

Signed, Sealed and Delivered in the presence of:

Witness:

_____
(Name, Title and Address)

Witness:

_____
(Name, Title and Address)

MOBILIZATION ADVANCE GUARANTEE

Guarantee No._____
Executed on_____
(Letter by the Guarantor to the Procuring Agency)

WHEREAS the _____ (hereinafter called the Procuring Agency) has entered into a Contract for _____ _____ (Particulars of Contract), with _____ _____ (hereinafter called the Contractor).

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

AND WHEREAS the Procuring Agency has asked the Contractor to furnish Guarantee to secure the 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 Procuring Agency agreeing to make the above advance to the Contractor, has agreed to furnish the said Guarantee.

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

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

This Guarantee shall 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 (Bank)

Witness:
1. _____

_____
Corporate Secretary (Seal)

2._____

_____
(Name, Title & Address)

1. Signature:_____
2. Name _____
3. Title _____

_____
Corporate Guarantor (Seal)

INDENTURE FOR SECURED ADVANCES

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

This INDENTURE made the .... day of ..... ---- - ..... ---------- ..... -197--"- BETWEEN (hereinafter called "the Contractor" which expression shall where the context so admits or implied be deemed to include his heirs, executors, administrators and assigns) of the one part and THE GOVERNOR OF SINDH (hereinafter called "the Government" of the other part).
WHEREAS by an agreement, dated (hereinafter called the said agreement, the contractor has agreed to perform the under-mentioned works (hereinafter referred to as the said work):-

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

AND WHEREAS the contractor has applied to the .... — ..... ----- for an advance to him of Rupees ---------- ------ .(Rs. .....) on the security of materials absolutely belonging to him and brought by him to the site of the said works the subject of the said agreement for use in the construction of such of the said works as he has undertaken to execute at rates fixed for the finished work (inclusive of the cost of materials and labour and other charge) AND

WHEREAS the Government has agreed to advance to the Contractor the sum of Rupees, (Rs. .....) on the security of materials the quantities and other particulars of which are detailed in Part II of Running Account Bill (E). the said works signed by the contractor Fin R.Form.l7.A on ---------- ..... — and on such covenants and conditions as are hereinafter contained and the Government has reserved to itself the option of marking any further advance or advances on the security of other materials brought by the Contractor to the site of the said works.

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

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

(2) That the materials detailed in the said Running Account Bill (B) which have been Fin R Form No. 17-A Offered to and accepted by (he Government as security for the said amount are absolutely by the Contractors own property free from encumbrances of any kind and the Contractor will not make any application for or receive a further advance on the security of materials which are not absolutely his own property and free from encumbrances of any kind and the contractor hereby agrees, at all times, to indemnify and save harmless the Government against all claims whatsoever to any materials in respect of which an advance has been made to him as aforesaid.

(3) That the said materials detailed in the said Running Account Bill (B) and all other

Fin. R. Form No. 17-A Materials on the security of which any further advance or advances may hereafter be made as aforesaid (hereinafter called the said materials) shall be used by the Contractor solely in *the* execution of the said works in accordance with the directions of the Divisional Officer ----------(hereinafter called the Divisional Officer) and in the terms of the said agreement.

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

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

(7) That if the Contractor shall at any time make any default in the performance or observation in any respect of any of the terms and provisions of the said agreement or of these presents the total amount of the advance or advances that may still be owing to the Government shall immediately on the happening of such default be repayable by the Contractor to the Government together with interest

thereon at twelve percent per annum from the date or respective dates of such advance or advances to the date or repayment and with all costs, charges, damages and expenses incurred by the Government in or for the recovery thereof or the enforcement of this security or otherwise by reason of (he default of the Contractor and any moneys so becoming due and payable shall constitute a debt due from the Contractor to the Government and the Contractor hereby covenants and agrees with the Government to repay and the same respectively to it accordingly.

(8) That the Contractor hereby charges all the said materials with the repayment to the Government of the said sum of Rupees ..... - .....(Rs. .....) and any further sum or sums which may be advanced as aforesaid and

al l costs charges damages and expenses payable under these present PROVIDED ALWAYS and it is hereby agreed and declared that notwithstanding anything in the said agreement and without prejudice to the powers contained therein if and whether the covenant for payment and repayment hereinbefore contained shall become enforceable and the money owing shall not be paid to accordingly. Once there with the Government may at any time thereafter adopt all or any of following courses as it may deem best ;-

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

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

(c) Deduct all or any part of the moneys owing out of the security deposit or any sum due to the Contractor under the said agreement. (9) That except as is expressly provided by the presents interest on the aid advance shall not be payable.

(10) That in the event of any conflict between the provisions of these presents and the said agreement the provisions of these presents shall prevail and in the event of any dispute or difference arising over the construction or effect of these presents the settlement of which has not been hereinbefore expressly provided for the same shall be

referred to the Superintending Engineer ..... Circle whose……. decision shall be final and the provisions of the Indian Arbitration Act for the time being in force so far as they are applicable shall apply to any such reference.

In witnesses whereof the* ----- -—__..... on behalf of the Governor of Sindh and the said ..... — ..... - ..... --have hereunto set their respective hands and seals the day and first above written.

Signed, sealed and delivered by* In the presence of

Seal
1st witness 2nd witness

Signed, sealed and delivered by* In the presence of

Seal
1st Witness 2nd witness

LIST OF APPROVED MANUFACTURERS

LIST OF APPROVED MANUFACTURERS

(Samples subject to physical approval by PA/Engineer Incharge)
Note: This project may not require some of following materials

S/No	Description	Company
1.	Reinforcement Steel	Amreli, Mughal, Razzaq, Metropolitan, & Itehad
2.	Cement (OPC/SR)	DG Cement, Lucky Cement, and Falcon cement
3.	Concrete Floor tiles, Kerb Stone, Paving Block, Pavers and Edging Stone	Envicrete, (Banu Mukhtar) Bincrete, Magnacrete, Hubcrete, AHS Crete, Pak Tuff Pavers Pvt Limited, Innovate Concrete Products Pvt Limited

TENDER DRAWINGS

SPECIFICATIONS

Specifications

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SECTION-1 GENERAL

The Contractor is responsible for the proper execution of all works under this contract. The construction site shall be provided sufficiently at all times with adequate staff/personnel and equipment.

The Contractor shall at his own expenses provide on the sites, water, electricity, communication facilities and all other services required to execute the works. When main supplies are not available on site, he shall provide a generator with suitable capacity, and tank of suitable sizes for diesel, potable water, gas etc. as required.

The Contractor shall drain flood water and excess water or storm water by pumping to prevent damage on the site and to prevent any damage to a third party.

The Contractor shall keep a special record (daily diary), registering the construction activities and works carried out, number of personnel and plant on site, problems encountered, climatic conditions, incl. maximum/minimum temperatures, humidity, the daily rainfall in millimeters and the number of hours of rainfall, for each day. The format of the daily diary has to be approved by the Engineer.

The Contractor shall give due attention to the following matters:

General Obligations

The Contractor shall preserve trees, planted fields and fences in a suitable manner, and shall replant those that were damaged or removed, and re-erect fences to their original condition, in accordance to the Employer's Representative's instructions.

In case of repair works, the Contractor shall tabulate the requirements and methodology thereof, and ask the Employer's Representative for approval before starting any repair. After completion or repaired work, such work shall be re-inspected by the Engineer.

In case of a need to erect scaffolding on any private property the Contractor shall contact the owner of the property and arrange for the proper execution, and for the removal of the scaffolding. He shall carry out all repairs and re-instatement prior to the contractual completion date.

Before starting any construction activity in public or private roads, the Contractor has to submit a method statement presenting the intended signposting, signaling, erection of barriers or guard rails, diversion of traffic, protection measures for the public, railings around construction pits etc. He has to obtain approval from the local authorities and the police before starting any construction work.

Contractor's Supervision

In case of joint-ventures and sub-contracting, the lead contractor has the full responsibility of the performance and execution of all works. The Lead Contractor's Representatives and his staff shall, in compliance with his quality management system, supervise, check and control permanently the staff of the joint-venture partner(s) and / or subcontractors during their part of the construction and shall take full responsibility for their performance and execution of the works.

The Contractor's Representative shall supervise all design and construction works from the commencement of the works until completion and commissioning. All documents

during the completion of all works issued by the Contractor shall be only in force and accepted by the Employer and the Employer's Representative, if these documents are issued by the Contractor's Representative in accordance with the requirements of the Contract.

With the commencement of the Works, the Contractor shall hand over a list of all names, titles, addresses and telephone/fax/mobile phone/e-mail of his managerial and supervising staff on site indicating those responsible who may be reached outside of normal working hours in emergency cases.

First Aid Outfits

The Contractor shall, at his own cost, provide and maintain for the duration of the Contract adequate first aid outfits at all construction sites.

Cleanliness on Site

The Contractor shall make every effort to keep the site tidy and in orderly manner and to take at any time every possible precaution against the contamination of subsoil and groundwater. The Contractor shall be responsible for making all arrangements for the disposal of solid and liquid wastes from the site at his own expenses. Furthermore, he shall give strict instructions to all persons employed by him to use the sanitary accommodation provided at site. If the Contractor fails to keep the site clean, the Engineer will instruct a third party to carry out the work at the cost of the Contractor.

Site guard

The Contractor shall provide sufficient number of watchmen for guarding the site and the works, day and night. Each Contractor has to safe his stocks at the site.

Protection of water quality

The Contractor shall make every effort to not contaminate the drinking water in the area surrounding the site. The Contractor has to keep in mind that drinking water is an essential food for human beings which requires careful hygienic handling. Whenever the risk of contamination may arise the Contractor shall interrupt the supply (with the consent of the Employer) and shall then disinfect the works in contact with drinking water.

Protection of environment

The Contractor shall make every effort to not contaminate the environment within or adjacent to the WWTP area , especially the beaches and concerned Black Sea section. The Contractor has to keep in mind that during summer month the nearby beaches will be frequented by visitors and the impact on the near shore sea and beaches shall be kept at a minimum. Works leading to notable turbidity in the Black Sea shall be undertaken when currents condition are such that beaches used for recreation are not affected or even better in low season (autumn – spring).

Whenever the risk of contamination may arise the Contractor shall immediately stop the works and inform the Engineer to jointly decide on the next steps and who to mitigate the danger.

SECTION-2 SITE CLEARANCE

All trees, shrubs, vegetation, rubbish etc., within the limits of the Site and elsewhere as directed by the Engineer shall be cleared down to ground level and removed from the Site. The trees and shrubs etc., which have to be removed shall either be cut or burnt down to ground level, and where directed grubbed up by the roots and removed from the Site. All trees shall remain the property of the Employer, and the Contractor shall collect these trees and store them until required by the Employer. All trees near to and about the Works, except such as are to be removed, shall be carefully protected from damage by the Contractor during the construction of the Works and during the period of maintenance and no trees shall be removed without the prior consent of the Engineer.

2.1 Clearing

Clearing shall consist of cutting, or trimming of trees, if any, and the satisfactory disposal of tree and other vegetation designated for removal, together with the timber snags, bushes, and rubbish occurring within the area. Trees, other vegetation stumps, roots, and bushes in area to be cleared shall be cut off flush with or below the original ground surface except such individual trees, group of trees and vegetation as may be indicated on the drawing or designated by Consultant's Representative to be left standing. Individual trees and other vegetation, to be left standing shall be thoroughly protected from damage during construction operation, by erection of barriers or by such other means as the circumstances require and as approved by the Consultant's Representative. Clearing operation shall be conducted in a manner that existing structures, and installations under construction, employees and others remain safe.

2.2 Grubbing

Grubbing shall consist of the removal and disposal of the stumps, roots larger that 25 mm, 12.7 mm in and matted roots in the designated grubbing areas. Stumps, roots, logs and timbre and other debris, shall be excavated and removed to a depth not less than 0.6 m below any sub-grade level. In areas where the cut is over 1 m grubbing shall not be necessary.

2.3 Disposal Of Debris

Timber and other refuse to be disposed off by burning shall be burned at location, approved by the Consultant's representative, in manner that will avoid all hazard such as damage to existing structures, construction in progress, trees and vegetation. The contractor shall be responsible for compliance with all pertinent laws and regulations pertaining to the burin of fire. Disposal by burning shall be kept under constant attendance, and residual, until materials will not be permitted to be pushed or placed on the adjacent areas without written approval of the owner/owners. The stones and concrete shall be broken and removed from the site for receiving the structure/flooring where required. No separate payment will be made for the work covered in this section of the specification and all costs of site clearing and setting out shall be concerned in the unit rates of the Contractor for items

2.4 Setting out of Works

The contractor shall set out the works and shall be responsible for true and perfect setting out of the same and for correctness of the direction, levels, dimension and alignment of all parts thereof. He shall give 24 hours notice to the Engineer of his request for the setting out to be checked and shall provide all instruments, tapes, etc. and assistance to the Engineer in the checking thereof. If at any time any error in this

respect shall appear during the progress of the works, the Contractor shall, at his own expense, rectify the error to the satisfaction the Consulting Representative. The Contractor shall construct accurate bench marks so that the lines and levels can easily be checked by the Consulting Representative.

SECTION-3 EXCAVATION, FILLING, BACK-FILING AND DISPOSAL

3.1 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 excavating, filling, backfilling and disposal for building construction, 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.

a) Classification:- Excavation shall include the removal of all materials of every category and nature. If rock is encountered it shall be removed carefully and without excessive noise and vibration. Blasting shall not be resorted to without specific permission in writing from the Consultants.

b) The excavation shall conform to the dimensions and elevation as indicated on the Drawings. Foundations on made up ground shall be taken down to natural bottom soil as per direction and approval of the Consultants. Excavation shall extend a sufficient distance from walls and footings to allow for placing and removal of forms installation of services and for inspection but the same shall not be paid.

c) In the event of any excavations being carried out wider or deeper than authorized. The same shall be filled in by the Contractor at his own cost the required levels with lean concrete if below footing or with properly compacted local river sand if beneath slabs or as directed by the Engineer.

d) Shoring and Breaching: - The Contractor shall provide at his own cost where required all shoring walls, 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.

e) De-watering and Drainage: - The Contractor shall control 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 dry all pits and trenches during construction and all de-watering and pumping out whether due to ground water seepage or otherwise, shall be included in the rates as quoted by the Contractor. The method employed in all cases shall be approved and agreed by the Consultants or his Representative.

f) Protection of utility lines: - When any existing utility lines whether to be retained or be removed are enchanted within the area of operations the Contractor shall notify the Consultants and his Representative, and shall not protection or removal of the lines and instructions are obtained from the Consultants.

g) Excess and undesirable material form excavation not required for fill or backfill of the building site, shall be disposed off, removed and/or deposited as for filling and

leveled anywhere on the work site as directed by the Engineer. Earth suitable and meant for backfill shall be stored at site in a manner not to interfere with the progress of construction works.

3.2 Excavation

Everything contained in this clause with regard to the execution of excavations, disposal of excavated material etc. shall apply to all material, unless otherwise stated.

All excavations shall be carried out to the lines and limits shown on the excavation plan and other drawings, or defined in the Specification. Said lines and limits may be amended by the Engineer to suit soil and other conditions encountered during actual excavation and field inspection. When excavating in any material other than rock for formation levels under any structure, the last 15cm of excavation shall be taken out not more than 24 hours before placing of foundations or fill. The bottoms of excavations shall be levelled and trimmed to full width to required lines and levels and where under foundations shall be well watered and rammed before placing of concrete.

The Contractor shall well and effectively hold up the sides and ends of all trenches and excavations wherever necessary with strong, close timbering, and shall prevent any fall or run of earth or sand from any portion of the ground outside of the trench or excavation. If, despite such precautions, or by reason of their neglect, any portions of the bottoms sides or ends of any trenches or excavations shall give way or be excavated without instructions from the Engineer, the Contractor shall at his own expense excavate and remove all the ground thereby disturbed both within and without the limits of the trench or excavation. Should the Contractor exceed in depth or extend the excavation of the formations or be ordered to take out extra excavation for the reasons given above, no payment will be made for such extra excavation, and he shall, if ordered by the Engineer, make it good with well rammed fill or in such class of concrete as may be ordered by the Engineer and at the Contractor's expense. Should any existing subsoil or field drains be uncovered during any excavation, the Contractor shall carefully replace them when backfilling or, if this is impossible, he shall divert them to new drains or ditches, otherwise relay them as the Engineer may direct. Payment for this work shall be by Daywork and will be met from the Contingencies

Before commencing any pipelaying, building or earthfilling work, all shattered and loose material must be removed by hand, the excavation being performed in such a manner as the Engineer shall direct so as to ensure that the work sits on an absolutely solid and clean foundation or abuts tightly against solid ground In no case must pipes, concrete or earthfill be placed in an excavation until the surface onto which such pipes, concrete and earthfill are to be placed has been approved by the Engineer.

3.3 Preparation of Foundation

The Contractor shall prepare the areas of excavations against which concrete is to be placed or on which pipes are to be laid, in a manner suitable for forming a foundation. Foundations in earth upon which concrete is to be placed shall be finished accurately to the dimensions shown on the Drawings or prescribed by the Engineer, brought to proper moisture content by sprinkling as required, and thoroughly compacted with suitable tools. No boulders shall be left projecting within the minimum excavation lines shown on the Drawing.

Foundations for concrete on bedrock shall be trimmed to the prescribed lines, thoroughly cleaned of mud and debris, and moistened in advance of placing concrete. All foundation surfaces shall be free from pools of water at the time of placing concrete. Wherever any excavation in earth has been made below grade without the Engineer's instructions, it shall be refilled as specified in Clause 1.4 hereof at the Contractor's expense.

3.4 Back-filing

All excavations shall be backfilled to the level of the original ground surfaces, unless otherwise shown on the Drawings or ordered by the Engineer, and in accordance with the requirements of the Specification. The material used for backfill, the amount thereof, and the manner of depositing and compacting shall be subject to the approval of the Engineer, but the Contractor will be held responsible for any displacement of pipe or other structures, any damage to their surfaces, or any instability of pipes and structures caused by the improper depositing of backfill materials.

Pipe surround and structures of concrete shall be backfilled as soon as the concrete has attained sufficient strength, as determined by the Engineer, to sustain the load imposed.

Where concrete slabs are to be placed on the ground, any loam, organic and other unsuitable material shall be removed. Fill where required to raise the sub-grade for concrete slabs shall be clean, undulated local river sand or gravel and shall be free from wood, stones and others debris. Excavated material shall only be used for fill if approved by the Consultants in writing. All the Backfill behind the sub-grade walls shall be done with clean local river sand or approved excavated soil. Fill shall be compacted up to 95% modified AASHTO Density by a Power vibratory roller, mechanical hammer, or other approved equipment, in layers not more than 150mm thick. Each layer shall be uniformly spread, watered to the extent of optimum moisture requirement for the required degree of compaction and then compacted. Contractor shall arrange at his own cost the testing of the filling where required by the Consultants or his Representative, after completion of foundation footings, walls, slabs and other construction below the elevation of the final grades and prior to backfilling. Backfill shall be placed in horizontal layers not more than 150mm thick and shall have a proper moisture content for the required degree of compaction of 95% . Each layer shall be compacted by mechanical tampers or by other suitable equipment suitable elevation above grade to provide for anticipated settlement and shrinkage thereof checked.

Backfill shall not be placed against foundation walls etc., prior to the damp proofing treatment as specified elsewhere in these specifications and approval by the Consultants or his Representative. Backfill shall be brought up evenly on each side walls as far as practicable. Heavy equipment for spreading and compacting backfill shall not be operated closer to the wall than distance equal to the height of the backfill above the top of footing. Fill and/or backfill within the building or structures and for a distance of 6 ft. outside structures shall be compacted to a density of not less than 95% maximum density at optimum moisture content

3.5 BASE COURSE

Aggregate Base is used as the base course under asphalt concrete pavement roadways, under Portland cement concrete slabs and structural foundations, and as backfill material for underground pipelines and other underground utilities within a roadway.

Provide base course material consisting of fine and coarse aggregate, the combination of materials conforming to the requirements of ASTM D2940.

Base course shall have a resistance value (R-value) not less than 76 as determined by ASTM D2844. It shall be well graded and broken stone metal of properly graded to maximum size of 1-1/2" in hard stone obtained from an approved quarry.

The Base Course shall be laid and packed to even grades and well rolled using vibratory roller to a consolidated thickness as shown on the drawings.

The whole of the surface of the compacted Base Course/Stone Metal shall be blended with 15 Cft screenings and non plastic quarry fines. After the interstices have been filled with smaller size stones so as to effectively fill in the voids and crevices, the soling area may be watered, if necessary and again thoroughly rolled with the roller or rammed manually to produce a smooth and even surface from irregularities and true to line and level.

Care shall be taken to prevent any damage to existing structures, mains or pipes while rolling operation is in progress. Places inaccessible for a roller, compaction shall be done by hand tampers weighing not less than 9 kg or power rammers as directed by the Engineer.

3.6 Measurement & Payment

All excavation shall be measured net and perpendicular and no allowance shall be made for any increase in bulk of the excavate material after excavation or for sloping side or widened trenches to accommodate.

Excavation, filling and Disposal shall include all leads and lifts as specified elsewhere in these specifications. Payment for all items under this section shall be made at the rate entered in BOQ appended to the contract and in accordance with the applicable conditions of the contract.

SECTION-4 CONCRETE

- **GENERAL**

Concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, water and admixtures as specified, all well mixed and brought to the proper consistency. All concrete and its constituent materials and all methods and procedures shall conform to applicable standards of the British Standards Institution otherwise specified. The costs of all tests of concrete and/or its components shall be deemed to be included in the dispatching to the Project.

- **CEMENT**

Unless otherwise specified the cement used in the Works shall be sulphate resisting Portland Cement (SRPC) complying with BS 402. Where specified or ordered by the Engineer, Ordinary Portland Cement (OPC) complying with BS 12 7 standard current at the time shall be used.

The cement to be used in the works shall be obtained from an approved manufacturer. For each delivery of Cement the Contractor shall furnish, free of cost, test certificates as directed by the Engineer, relating to the cement to be used on the work. Analyses of the cement shall be shown. The Contractor shall maintain a record available for inspection by the Engineer of the locations of cement from each consignment. The Contractor shall supply samples of cement, when requested by the Engineer from any store on Site and the place of manufacture.

- **AGGREGATE**

Aggregate for concrete shall comply with BS 882 current edition.

Fine aggregate shall consist of natural sand and shall comply with requirements of Table 4 of BS 882. The Engineer will permit the addition of suitable crushed rock fine aggregate, as necessary, to the sand where in his opinion it is impracticable to obtain the specified grading of the combined aggregate otherwise than by such addition. The maximum quantities of particles smaller than 75mm shall, in any event, not exceed 3% by weight when the sample is tested to BS 812; Section 103.1. Coarse aggregate shall comply with the requirements in Table 3 of BS 882 for single sized aggregate to the nominal maximum size specified for the appropriate class of concrete and shall be made up of the following grading:-

a) 40mm single sized
b) 20mm single sized
c) 10mm single sized

The shape of the aggregate shall be rounded, or irregular as defined in BS 812; Part 1. The flakiness index, as determined in accordance BS 812; Section 105.1, shall not exceed 3% when measured in accordance with BS 812; Part 2. The soundness of the aggregate, as determined in accordance with ASTM C 88-83 using magnesium sulphate with 5 cycles, shall not show a loss of greater than 15% for find aggregate and 18% for coarse aggregate.

Immediately after commencement of the Works, the Contractor shall supply samples of proposed aggregates for preliminary tests of compliance with Specification to the satisfaction of the Engineer before the Engineer will give approval to the source aggregate proposed by Contractor. Alternatively and subject to the approval of the circumstances by the Engineer, the Contractor may submit a Certificate from an independent laboratory. Where 40mm nominal maximum size coarse aggregate is specified it shall consist of a mix of 40mm single sized aggregate, 20mm single sized aggregated and 10mm single sized aggregate.

During the performance of the Contract, the Contractor shall supply samples of aggregates when required by the Engineer for testing (the samples shall be taken in accordance with BS 812). Testing of all specified requirements will be performed by the Contractor at intervals as directed by the Engineer for each source at each grading approved by the Engineer, unless otherwise instructed by the Engineer. Any rejected aggregate shall be promptly removed from Site. The Contractor shall demonstrate that no part of the aggregates contain any mineral known to have a potential to cause alkali silica, alkali silicate, alkali carbonate or any other damaging chemical reaction between alkalis and aggregates. Testing of aggregates shall be accordance with ASTM C 1260-94 and ASTM C586 as appropriate.

Should the results of the test prove unsatisfactory the Contractor shall make provision for the employment of a low alkali content cement to the approval of the Engineer.

- **WATER**

The water used for making and curing concrete, grout and mortar shall be from a source approved by the Engineer and at the time of use shall be free from polluting matter in any quantity which:-

a) Affects the initial setting time of the cement by more than 30 minutes or reduces the compressive strength of test cylinders by more than 20% when tested in accordance with BS 3148.

b) Prevents the achievement of the specified test cylinder strengths at 28 days for the appropriate class of concrete.

c) Produce discoloration or efflorescence on the surface of the hardened concrete.

The water shall be free from hydrocarbons and from suspended organic matter. Inorganic matter in solution shall not exceed 500mg/1 by weight and in suspension shall not exceed 50mg/1 by weight.

No salty water shall be used.

The water which the Contractor proposes shall be tested by the Contractor to the approval of the Engineer before use in the Permanent Works. Regular tests of the water shall be made by the Contractor during construction of the Works. The water shall be sampled at the point of discharge into the mix and the frequency of sampling shall be as approved by the Engineer. The Contractor shall supply two copies of each test result to the Engineer.

- **ADMIXTURES**

Admixtures in general shall comply with BS 1014, BS 3892 or BS 5075 as appropriate. Concrete shall be made from cement, aggregates and water as specified. No other ingredient shall be mixed with the concrete or mortar without the Engineer's approval.

If the Contractor proposes to use retarding or workability agents then the manufacturer's literature must be supplied giving typical dosage, effects of incorrect dosage, the amount of air entertainment associated with its use, and the chloride ion content by weight of the admixture. The Engineer's approval to the use of admixtures shall be subject to the following conditions.

a) No reduction of target mean strength compared with additive-free concrete of the same class.
b) No change in specified cement content or effective water cement ratio.
c) No corrosive effect on reinforcement steel.
d) Dosage and admixture must be strictly in accordance with the manufacturer's instructions in respect of the specific conditions pertaining. Dosage to be by an approved dispenser, to within 5% of the required amount.

If air entertainment is approved the air content shall be 4% for concrete with a maximum aggregate size of 20mm, with an allowable tolerance of 1.5%.
The method of determining the air content shall be in accordance with BS 1881: Part 106 and the Contractor shall supply the necessary apparatus so that the Engineer may check the air content. If the average air content is greater or less than that specified or the range is greater than 2%, before any further concrete is used in the Works the Contractor shall take such steps as may be agreed with the Engineer to adjust the air content of the concrete or improve its uniformity. Any rejected air entertained concrete must be removed.

- **CHEMICAL CONCRETE MATERIALS**

The total sulphate content, whether as gypsum or more soluble salts, of concrete ingredients when measured as sulphur trioxide shall together not exceed 4.-0% of the weight of cement in the concrete. The chloride content of concrete ingredients when measures as CI shall together not exceed 0.3% of the weight of cement in concrete using SRPC.

The sulphate and chloride contents shall be established using the following tests:-

	Sulphate	**Chloride**
Aggregate	BS 1377: Part 3	BS 812: Part 117
Cement	BS 4550: Part 1 Clause 12	BS 4550: Part 2 Clause 17
Water	BS 1377: Part 3	BS 812: Part 117

The contribution of any admixture must also be included. Testing will be weekly, or as directed by the Engineer. When the acid soluble alkali content of the cement is greater than 0.6% (calculated as Na2 0+0.658K20) the Contractor must demonstrate that adverse alkali-silica reaction is likely. This may done by determining the alkali content of the cement, in accordance with BS 4450; Part 2 and establishing the alkali content of the concrete. Any concrete containing less than 3.0 Kg/m³ may be considered not at risk. In the event of higher alkali contents a sample of aggregate from each source must be

tested in accordance with ASTM C 227-87. Any aggregate source showing an expansion greater than 0.05% at 3 months shall not be approved.

- **WATER STOPS**

The Contractor shall supply and fix water stops in all contraction and expansion joints in members which are to be liquid retaining and where shown on the Drawings. They shall be obtained from manufacturers approved by the Engineer and shall be stored and fixed in accordance with the manufactures instructions. PVC water stops shall comply with information and Guidance Note 4-31-02 of the UK Water Research Centre. The number of joints made on Site shall be kept to minimum. Any jointing of PVC water stops on Site shall be by the process of head fusion using an appropriate jig and heating blade all in accordance with the manufactures instructions. PVC water stops shall comply with information and Guidance Note 4-31-02 of the UK Water Research Centre. The number of joints made on Site shall be kept to a minimum. Any jointing of PVC water stops on Site shall be by the process of head fusion using an appropriate jig and heating blade all in accordance with the manufacturer's recommendations. The minimum dimensions of water-stops shall be as tabulated below (all dimensions in mm):

Width	**Web Thickness**	**Edge Bulb* diameter**	**Centre Bulb* Int. diameter**	**Edge Bulb* height**
140	4.5	12.5	8	-
190	4.5	12.5	8	-
240	4.5	19.0	10	22

Notes: * Internal water stops only

** External water stops only

Unless otherwise shown on the Drawings, the width of the water stops shall be at least equal to the thickness of the concrete member in which it is embedded, up to a maximum width of 250 mm. The edge bulb section of internal water stops shall be circular or semicircular. The centre bulb should be hollow. The water stops shall be carefully maintained in the position shown on the Drawings and properly protected from damage and the harmful effects of light and heat during all stages of construction. The stop-boards on each side of the water stops. The concrete shall be carefully compacted under and around the water stops so as to leave no cavities.

The PVC Water stops shall be laid in continuous lengths. Splices in the continuity or at the intersections of runs of PVC water stops shall be performed by heat sealing the adjacent surfaces in accor-dance with the manufacturer's recommendations or as directed by the Engineer. A thermostatically controlled electric source of heat shall be used to make all splices. The correct temperature at which splices should be made will differ with the material used but should be sufficient to melt but not char the plastic. After splicing, a remolding iron with ribs and corrugations to match the pattern of the waterstop shall be used to reform the ribs at the splice. The continuity of the characteristic components of the cross section of the waterstop design (ribs, tubular center axis, protrusions, and the like) shall be maintained across the splice.

The Contractor shall supply the manufacturer's test certificates for each consignment of water stops delivered to Site and shall if requested to supply to the Engineer sufficient samples of each type and consignments for conformity tests to be carried out in accordance with the appropriate standard test procedure. The PVC for PVC water stops

shall be high grade virgin polyvinyl chloride containing no filter, reclaimed or scrap material. It shall comply with the requirements of BS 2571 for type A3 of Class 1 but shall have improved tensile qualities. The minimum tensile strength shall be 12.5 N/mm² and the minimum elongation at break shall be 28.5%.

- **JOINT FILLER**

The Contractor shall supply and fix pre-moulded joint filler in all expansion joints and where shown on the Drawings. Unless otherwise specified the joint filler shall be of resin or bitumen bonded cork or impregnated fibreboard. Impregnated fibreboard shall not be used in water retaining structures. Materials shall be obtained form manufacturers approved by the Engineer and shall be stored and fixed in accordance with the manufacturer's instructions. The joint filler of the material and thickness specified shall be cut to shape and fixed to fill the whole space between the concrete faces to the joint not otherwise filled by water stop and joint sealer. Abutting places shall be placed in close contract and the joints covered on each side to prevent the passage of cement grout.

The Contractor shall supply the manufacturer's test certificate for each supply to the Engineer sufficient samples of each type and consignment for confirmatory tests to be carried out in accordance with the appropriate standard test procedure.

The filler shall comply with the following American Society for Testing and Materials Specifications.

a)	Resin Bonded Cork	ASTM D 1752-84 Type II
b)	Bitumen Bonded Cork and Impregnated Fiberboard.	ASTM D 1751-83

- **JOINT SEALERS**

All joints of concrete member shall be sealed with mastic as specified and/or as directed by the Engineer.

The Contractor shall select permanent elastic, synthetic mastic sealing compound, which has a high degree of extensibility, optimum elastic force and good adhesion to concrete. Products consisting of one or two components, one the basis of poly sulphide liquid polymer, silicone rubber and polyurethane of others may be used; however, only proprietary materials (made by fully recognised manufacturers), which are resistant to aging, oxygen, irradiation with ultra-violet light, water, oil, grease, chemicals and biodegradation and which have been approved by the Engineer may be used. Areas not exposed to the eye may be filled with dark coloured mastic.

The mastic shall be stored in sealed containers in a dry and cool place prior to use, strictly in accordance with manufacturer's instructions.

Mastic sealing compound used for expansion joints in water tanks shall be:

- Physiologically absolutely safe, i.e it shall not contain any substances which may be considered a substrate for water bacteria;
- Resistant to any detergents used in water tanks;

- Complying with the health requirements for potable water.

The Contractor shall construct recesses at all joints and on both faces of accurately formed to the lines and dimensions shown on the Drawings or as agreed with the Engineer. The Contractor shall prepare the surfaces of the recess and shall supply a joint sealer and fill or caulk the recess completely with it. Joint sealing shall not be commenced without the approval of the Engineer. In reservoir joints the sealer shall be poured after the construction of the reservoir roof.

All joint sealers shall be from an approved manufacturer. The Contractor shall supply the manufacturer's test certificates for each consignment of each type of joint sealant delivered to the Site and shall if requested to supply to the Engineer sufficient samples of each type and consignment for conformity tests to be carried out in accordance with the appropriate test procedure.

Sealants shall be installed in strict accordance with the manufacturer's instructions. Debonding strip shall be used in conjunction with the sealers as indicated on the Drawings. The debonding strip shall be compatible with the joint sealer and shall be resistant to attack from the primer used to bond the sealer to the concrete.

Polysulphide and polyurethane sealers shall not abut bituminous sealers. Surfaces to receive polysulhpide and polyurethane sealers shall be kept free from bituminous paints.

All sealers shall be appropriate for the prevailing climatic conditions.

Bituminous sealers shall comply with BS 2499 for Type Al.

Polysulphide Sealers shall comply with BS 4254

• BOND BREAKING COMPOUND

Bond breaking compound shall consist of 66% of 200 pen bitumen blended hot with 14% light creosote oil and when cold brought to the consistency of paid by the addition of 20% solvent naphtha or other approved compound meeting the following requirement.

a) It shall not retard or in any other way affect the settling of concrete.

b) The average bond stress on bars coated with the compound with half their length cast into concrete specimens and subjected to pull out tests at 7 days shall not exceed 0.13 N/mm² and the total movement of the dowel bar relative to the concrete specimens shall be not less than 0.15mm at the stress. The concrete specimens shall be 150mmx150mm in section and 450mm long and made with the same mix proportions as used in the works.

• CLASSES OF CONCRETE – GENERAL

The class of concrete is defined by the characteristic cylinder crushing strength and the nominal maximum aggregate size, with additional suffix defining any additional requirements. The requirements for each class of concrete are give in Table 14.1 below.

The specified slump values are a guide only and may be varied subject to the approval of the Engineer.

The Concrete grads is defined as the 28 day cylinder crushing strength (MPa) below which no more than 5% of results are expected to fail.

TABEL: 14. 1

Concrete Classes

Concrete Class	Grade (MPa)	Maximum Aggregate Size (mm)	Cement * Type	Workability**
35/20S	35	20	SRPC	High
28/40	28	40	OPC	Medium
28/20	28	20	OPC	High
28/10	28	10	OPC	High
24/40S	28	40	SRPC	Medium
28/20S	28	20	SRPC	High
21/20	21	20	OPC	-
21/20S	21	20	SRPC	-
C15/40	15	40	OPC	-

Notes: * SRPC shall be used where specified in Clauses 2.19 and 2.21

** High workability; slump 65 to 135 mm

Medium workability: slump 50 to 100mm

- **CLASSES OF CONCRETE – PARTICULAR**

The classes of concrete to be used are as noted on the Drawings. In addition, the following shall apply unless specified otherwise:

35/20 S	-	Reinforced Concrete in Piles
28/20 S	-	Reinforced concrete in foundation and plinth, reservoirs and chambers (if required).
28/20	-	Reinforced concrete in foundation and plinth, reservoirs and chambers.
21/20	-	Reinforced concrete in super structure above plinth.
	-	Precast concrete.
21/20	-	Benching to manholes and chambers.
	-	Carriageways and footpaths.
21/20S	-	Pipe bedding and pipe anchor
	-	Support blocks & filling with mass concrete.
15/20	-	Binding/Lean Concrete
	-	Non-structural concrete around manholes & chambers.
	-	Haunching to kerbs.

All concrete or mortar used in sewerage manholes, chambers or tanks shall be made with SRPC.

- ## WATER-RETAINING CONCRETE

Where water proof concrete is required, the Contractor shall take full responsibility for ensuring that such construction is completely water proof (crack-free). Any leaks appearing during the construction and maintenance period of the Contract shall be completely repaired by the Contractor at his own expense. The method proposed by the Contractor for dealing with shrinkage cracks, leaks, or other defective work shall have no adverse effect on the finished structure. Treatments of internal and external concrete surfaces of water retaining structures, etc. (coating or toppings) provided in the Bill of Quantities, does not relieve the Contractor of this obligations under the Contract. These treatments shall be considered as an additional step for waterproofing and / or resistance to chemical attack.

- ## CONCRETE MIX DESIGN

The Contractor shall determine to the approval of the Engineer the actual proportions of ingredients for each class of concrete to be used in the permanent works.

The concrete shall meet the requirements given in Table below.

Before commencing any concerning on the Site the Contractor shall conduct tests to the satisfaction of the Engineer to determine the concentration of sulphate in the soil and the ground water in order to determine the concrete exposure class as detailed in Table 4.14. The Contractor shall ensure that all concrete susceptible to sulphate attack from the soil and ground water shall be designed to satisfy the additional requirements given in Table 4.13 for the particular Site exposure class.

TABLE 4.13

Requirements of Classes of Concrete

Class	**Cement Content kg/m³**		**Maximum W/C ratio**
	Minimum	**Maximum**	
35/20S	295	550	0.65
28/40	245	550	0.65
28/20	275	550	0.65
28/10	315	550	0.65
28/40S	250	550	0.65
28/20S	285	550	0.65
21/20	270	550	0.65
21/20S	280	550	0.65
15/20	220	550	0.60

Notes: 1 Water cement ration is the ratio of free water to cement in the mix based on aggregates being in a saturated surface dry condition.

2 Characteristic compressive strength compliance requirements shall be to BS 5328 Clause 3.16.2 and Table 1.

TABLE: 4.14

Requirement of Classes of Concrete

Exposed to Sulphate Attack

Class	Concentration of Sulphate expressed as SO			Type of Cement	Dense fully compacted concrete made with 20 nominal size aggregate complying with BS 882 or BS 1047	
	In Soil		In Groundwater (g/litre)			
	Total SO3	SO3 2:1 Water soil Extract (g/litre)			Cement* Content not less than	Free water Cement* ratio not More than
1	Less than 0.2	Less than 1.0	Less than 0.3	All cement listed in Clause 6.1, 2.1** BS 12 cements combined with pfa* BS 12 cements Combined with ggbfs+	No additional requirements	
2	0.2 to 0.4	1.0 to 1.5	0.3 to 0.7	All cements listed in Clause 6.1, 2.1** BS 12 cements combined with pfa* Bs 12 cements Combined with ggbfs+	330	0.50
				BS 12 cements Combined with min 25% or max 40% pfa++	310	0.55
				BS 12 cements Combined with min 70% or max 90% ggbfs		
				BS 4027 cements (SRPC)	280	0.55
				BS 4248 cements (SSC)		
3.	0.4 to 0.7	1.5 to 2.1	0.7 to 1.4	BS 12 cements Combined with min 25% or max 40% pfa+, BS 12 cements Combined with min 70% or max 90% ggbfs	3850	0.45
				BS 4027 cements (SRPC) BS 4248 cements (SSC)	330	0.50
4	0.7 to 1.0	2.1 to 3.1	1.4 to 2.5	BS 4027 cements (SRPC) BS 4248 cements (SSC)	370	0.45
5	Over 1	Over 3.1	Over 2.5	BS 4027 cements (SRPC) and BS 4248 cements (SSC) with adequate Protective coating. Refer Clause 6.2.3.3**		

Notes: * Inclusive of pfa and ggbfs content.

** All clause numbers refer to BS 8110.

\+ Refer to BS 8110, Clause 3.3.5

++ Values expressed as percentages by mass of total contents of cement, Pfs and.

1. Mix proportions shall be adjusted in accordance with BS 8110, Clause 6.2.4.3.
2. Reference should be made to the notes give with Table 6.1 in BS 8110 retaining to use of sulphate-resisting Portland Cement (SRPC) and the method analysis of soil water extracts.

3. SSC – Super sulphated Cement.

Unless otherwise specified or agreed by the Engineer for concrete Grade 30 and above the proportions of coarse and the aggregates shall be selected to achieve one of the grading curves defined in Table 4.15, within an allowable tolerance of generally 5%. A change from a maximum positive tolerance to a maximum negative tolerance in consecutive sieve sizes should be avoided. Classes 20/40P and 20/40SP shall have a find aggregate content of 15% of the coarse aggregates.

TABLE 4.15

Combined Aggregate Gradings

40mm maximum aggregate size grading curves

Sieve size (mm)	**1**	**2**	**3**	**4**
50	100	100	100	100
37.5	95	97	99	100
20	50	59	67	75
10	36	44	52	60
5	24	32	40	47
2.36	18	25	31	38
1.18	12	18	24	30
0.60	7	12	17	15
0.30	3	7	11	15
0.15	0	0	2	5

20mm maximum aggregate size grading curves

Sieve size (mm)	**1**	**2**	**3**	**4**
37.5	100	100	100	100
20	95	97	99	100
10	45	55	65	75
5	30	35	42	48
2.36	23	28	35	42
1.18	16	21	28	34
0.60	9	14	21	27
0.30	2	3	5	12
0.15	0	0	0	1.5

10mm maximum aggregate size grading curves

Sieve size (mm)	**1**	**2**	**3**	**4**
10	95	97	99	100
5	30	45	60	75
2.36	20	33	46	60
1.18	16	26	37	46
0.60	12	19	28	34
0.30	4	8	14	20
0.15	0	1	3	6

The Contractor shall submit details of the source of all material and the proposed quantities of each ingredient per cubic meter of fully compacted concrete. The Contractor shall then make trial mixes for each class of concrete using the same type of Constructional Plant and the same

materials as are proposed for the Permanent Works. The Contractor shall give 24 hours notice of such trials to enable the Engineer to attend. For each trial mix, three separate batches of concrete shall be made by the Contractor and will be tested at 28 days all in accordance with BS 1881: Part 116. Such trial mixes shall not be the first batch through the plant in any one sequence of concrete production.

The Contractor shall not commence concerning in the Permanent Works until details of trial mixes and test results for each class of concrete have been submitted to, and approved by, the Engineer.

A trial mix design will be approved by the Engineer with respect to strength if the average compressive strength of the nine cylinders so tested is more than the target mean strength.

The Contractor shall not alter the approved mix proportions nor the approved source of supply of any of the ingredients without having previously obtained the approval of the P/A

During the production the Engineer may require trial mixes to be made before a substantial change is made in the materials or in the proportions of the materials to be used.

- ## DELIVERY AND STORAGE OF MATERIALS

All materials for concrete delivered shall be approved and contain following identification marks both in English and Urdu and Stacked as per instruction of the P/A.

- Type of cement/steel
- Number and date of standard conforming to
- Net weight of cement contained in bags
- Name, trade name of manufacturer
- Country of origin
- Date of manufacturer

- ## CONTROL AND MIXING OF INGREDIENTS

The Contractor shall measure the moisture content in the aggregates and so determine the amount of water to be added to each batch of fresh concrete. Such determinations shall be to the approval of the Engineer and the results and calculations shall be available for inspection by him. The frequency of such determinations shall be as directed by the Engineer and shall depend on the quality of control of storage and handling, weather conditions and variability of aggregated supplied.

The Contractor shall proportion the ingredients of each batch of concrete by weight. The measuring equipment should give an accuracy of $\pm$ 3% for each ingredient. The water shall be added to the aggregates and cement in a mechanical batch mixer; it shall not exceed the maximum ratio with regards to cement give in Table 14.2 (A0 hereof, and shall otherwise be the minimum amount necessary consistent with complete compaction. The device for measuring the water shall show accurately the weight required with given moisture content of the aggregate and shall be so designed that the water supply will be automatically stopped when the correct quantity has been discharged into the mix. The concrete ingredient shall then be thoroughly mixed.

The minimum mixing time shall be:

1) For mixes of 1.5m³ capacity or less 1-1/2 minutes.

2) For mixes of larger capacity that 1.5m³ the time shall be increased by 15 seconds for each additional 0.75m³ capacity. For intermediate sizes the time shall be assessed by proportion.

3) IN special circumstances, and at the sole discretion of the Engineer, the proportioning of materials by volume may be approved. In such circumstances the cement content of the concrete shall be increased by 10% over the amount in the approved mix. The boxes used for proportioning shall be deep and narrow to the approval of the Engineer, and shall be separately constructed for each class of concrete to be proportioned by volume.

• CONCRETE SAMPLING AND TESTING

The temperature of concrete, concrete constituents, reinforcement form work and the atmosphere shall be monitored continuously for every concrete pour. All sampling and testing of fresh and of hardened concrete shall be carried out in accordance with the provision of BS 1881 unless such provision is at variance with the Specification.

Table 14.5 gives the program for sampling and testing of concrete for each class of concrete from each batching centre in each active day.

TABLE 14.5

Program for Works Sampling and Testing

Grade	**30 & above**	**Less than 30**
Workability (slump test)	1	0
Workability (compacting factory test)	2	0
Compressive Strength	3	0

Where: *0- No testing required.*
1- Every batch at point of deposit
2- One sample from every 10 batches, one sample per 20m³ of concrete or one sample from each day's concrete, whichever involves the greatest number of samples.
3- One sample from every 50 batches, one sample per 50m³ of concrete or one sample from every three days concrete, whichever involves the greatest number of sample.

The Contractor shall establish a plan for sampling and testing to the approval of the Engineer. Samples shall be taken at the place of deposition from each class of concrete at random. The frequency of sampling shall in general be in accordance with Table 14.5 but the actual rate of sampling may vary with the approval of the Engineer and shall be increased when ordered by the Engineer in appropriate circumstances, From each such sample six 150mm concrete cylinders shall be prepared, each cylinder shall be marked indelibly for identification when it is in the mould. After retention at the site for 24 hours the cylinders shall be delivered to the testing laboratory for curing and testing.

• COMPLIANCE WITH SPECIFIED CONCRETE REQUIREMENTS

Of the six cylinders made from each sample of fresh concrete in accordance with the Specifications, three will be crushed at 7 days and the other three at 28 days. The average of the three 28 days strengths will be taken as the test result. Compliance with the specified strength requirements shall always be judged on the 28 days test results.

Concrete shall be considered to have failed to comply with the Specification.

(a) If a test result is less than the minimum specified in BS 5328 for that class of concrete, in which case the concrete which it represents shall be broken out and disposed of away from the site by the Contractor unless at his sole discretion the Engineer approves

(b) If the average of four consecutive test results for that class of concrete shall have failed to exceed the minimum mean of 4 as specified in BS 5328 in which case no further concrete of that class shall be placed in the Permanent Works until the Contractor shall have discovered the cause of such failure and rectified it to the satisfaction of the Engineer.

If a mix fails to achieve the requirements for fresh concrete the batch shall be rejected and no further concrete of that class shall be placed in the Permanent Works until the cause of failure has been rectified.

If test results for strength of concrete of any class are consistently and significantly in excess of the target strength the Engineer may on the application of the Contractor agree to a reduction in the cement content in the mix for that class, provided the cement content is not lowered below the minimum specified for that class, nor the maximum water/cement ratio exceeded.

- **FURTHER TESTING**

When the P/A agrees to or requires testing of the hardened concrete in a structure of pre cast element all such testing shall be carried out in accordance with BS 1881 or BS 8110. The results of such tests shall be interpreted in accordance with BS 6089. Any test on hardened concrete required by the P/A shall be completed within 28 days of the Procuring Agency's order for the test.

In assessing the results of compressive tests on cores the concrete represented by the core shall be deemed not to comply with the Specification if the strength of the core when adjusted for length; diameter ratio and converted to estimated cylinder strength in accordance with BS 1881 is less than 85% of the specified characteristics strength. Cores shall not be tested for strength at ages less than 28 days and no adjustment shall be made to the measured strength in respect of the age of the core when tested.

- **TRANSPORTING, PLACING AND COMPACTING CONCRETE**

The concrete shall be handled so that at the point of deposition it is of the specified quality and approved consistency, nothing having been added to it or lost from it since leaving the mixer. Any free water shall have been removed from the section to be concreted before concrete is deposited.

The Contractor shall obtain the approval of the Engineer to the arrangements he proposes to use for concreting before commencing concrete work.

The Contractor shall regard the compaction of the concrete as work of fundamental importance and shall produce a watertight concrete of maximum density compatible with the approved mix. Compaction shall be assisted by the use of mechanical vibrators of the immersion type, but shall not involve the vibration of reinforcement or shutters except that vibration of shutters may be allowed in precast concrete, with the approval of the P/A. Vibrators shall be inserted at least to the full depth of the newly deposited concrete, kept in position for about a quarter of a minute and then slowly withdrawn to prevent the formation of voids. The procedure shall be continuous with points of insertion 150 to 225 mm apart. The number and type of vibrators available for use during each period of concerting shall be to the approval of the PA, which will not be given if sufficient stand by vibrators in good working order are not readily available. If concerting is in the dark, ample lighting shall be provided at the mixing stations and at every place where concrete is being deposited.

Lean concrete for binding course may be compacted by tamping.

Concrete without a retarded which is not deposited in the work within 30 minutes after the start of mixing shall not be used unless the Engineer approves otherwise.

Concrete may be pumped provided the mix design and the nature of pumping comply with the recommendations give in the Guide to Concrete Pumping as published by the Building Research Establishment (UK) and are not in conflict with any specified requirements. The first batch of concrete to be made every time work is commenced shall contain 10% more cement than the normal amount.

Concrete shall be placed continuously up to positions of joints prepared prior to commencement of concreting. No concrete shall be dropped or chuted into the shuttering in such a manner as to cause segregation of the ingredients. The deposited layers of concrete shall not exceed 600 mm in thickness. Shallow beams may be concreted to full height in one operation as directed by the PA. Care shall be taken to ensure that reinforcement projecting from concrete recently placed is not shaken or disturbed.

Where steps, splays and kickers occur these shall be cast in one with the slab and additional case shall be taken in the vibration and finishing techniques and procedures to ensure that thorough compaction is achieved and the unset concrete is not subjected to tension and no cracks are formed. The techniques and procedures to be adopted shall be discussed with the PA and his approval received before any such concreting is commenced.

- **TRUCK MIXED CONCRETE**

Truck mixers can be used if authorized by the PA. They shall be of the revolving type, watertight and so constructed that the concrete can be mixed to ensure a uniform distribution. When truck mixers are approved to supply concrete to a distant location, the Contractor shall ensure that the following information is supplied on an approved delivery from:

- Type of concrete and ingredients used;
- Water/cement ratio;
- Type and quantity of approved additives to the concrete mix;
- Time of departure from batching plant;
- Slump;
- Signature of Plant manager

Water shall be added to the mix either at site or at the batching plant. In no circumstances shall water be added in transit.

No concrete shall remain in a revolving truck mixer more than 1 ½ hours.

- **CONCRETING IN UNFAVOURABLE CONDITIONS**

The Contractor shall not place concrete in the Permanent Works:-

a) During heavy rains or dust storms.

b) When the air temperature is more than 40°C.

c) When the air temperature is les than 2°C.

d) If the temperature of the concrete on discharge from the mixer is less than 4°C or more that 32°C.

e) When the air temperature exceeds 25°C without taking precautions and demonstrating to the approval of the Engineer that the maximum internal temperature of the concrete within 24 hours after casting in place is

unlikely to be more than 30°C in excess of the ambient temperature or more than 60°C.

f) Without the approval of the Engineer if the temperature of the shutters or reinforcement exceeds 30°C.

To keep within these limits the Contractor may, among other means, spray aggregates with water, and use chilled mixing water, or add ice direct to the mixer provided that no ice is present in the mix when discharged form the mixer. When concreting in hot weather all material used shall be kept in the shade. Water tanks, mixers and chutes should be shaded, but where this is not possible they shall be painted white and kept white.

- **CONCRETING RECORDS**

A written record of the concrete works shall be made each day by the Contractor and kept available for inspection by the Procuring Agency. The diary shall contain notes and records of;

a) The names of the Contractor's engineers who are responsible for the different phases of the concrete work, and also the names of their assistants.

b) The temperatures of air, water, cement, aggregates and concrete, together with the air humidity and type of weather.

c) Deliveries to the site of concrete materials (quantity, brand of cement, etc).

d) Inspections carried out, tests performed, etc and their results.

f) Quantity of cement, fine and coarse aggregate and admixture used for each section of work, and the number and kind of test samples taken on these ingredients and water.

- **SHUTTERING**

The terms shuttering and form work shall be interpreted as meaning one hand the same thing, namely temporary works set up to obtain the required profiles and surface textures of the concrete. Shuttering shall be such that it remains rigid during the placing and setting of the concrete and prevents the loss of any concrete ingredients.

The shuttering shall be fixed in correct alignment and to the true shape and dimensions of the Permanent Works and shall be designed so that it can easily be removed for curing of concrete to commence as soon as practicable. Where necessary, shuttering should be so arranged that the soffit form, properly supported on props only, can be retained in position for such periods as may be required to allow the concrete to mature as specified in Clause 2.44. A method of support which would involve holes or tie wires extending the whole width from face of work to be concreted will not be permitted, unless authorised by the PA in writing. No plugs, bolts, wire ties, holdfasts or any other appliance whatsoever for the purpose of supporting the shuttering or reinforcement shall be fixed permanently into the structure so that they have less cover than that specified for the reinforcement or in any way impair the strength or appearance of the work, nor shall they be placed in such a manner that damage to the work would result in the removal of the same at the time of striking the shuttering.

Before the concrete is placed the retaining surfaces shall be cleaned of sawdust and shavings, dir, other debris and standing water.

The inside of shuttering shall be coated with a release agent of non-staining mineral oil, mould cream emulsion or with other approved material. Adjacent concrete or reinforcement shall not be contaminated. The release agent must be compatible with any applied finish.

Temporary openings for cleaning and inspection before concreting shall be provided at the base of column and wall shuttering and where necessary. Shuttering for walls or other thin sections may have openings where approved by the Engineer for the placing and compacting of the concrete. No concreting shall be started before the shuttering has been inspected by the PA. Unless otherwise approved, top shuttering shall be provided to concrete faces where the slope exceeds one vertical to three horizontal. Exposed arises shall be formed with a chamber measuring 20mmx20mm.

The rates for concreting shall include shuttering and for all types of cutting and waste, forming chambers or as otherwise indicated on the Drawings.

- ## SURFACE FINISHES

The faces of all concrete shall be left sound, solid, free from voids and to the class of finish specified.

No treatment to the finished concrete other than that specified in the class of finish shall be carried out unless approval to do so has been given by the Engineer.

Bolt bobbin holes shall be filled with cement and suitable fine aggregate mortar to match the colour of the concrete. The mortar shall be well worked in and thoroughly cured.

Classes for formed surfaces.

Class F-1: This finish requires no special treatment and is for surfaces which will remain hidden in the Permanent Works.

Class F 2S: This finish is for all exposed surfaces that shall not be rendered.

The finish shall be obtained from forms designed to produce a hard smooth surface with true, clean arises. Only very minor surface blemishes shall be permitted and these shall be no staining or discoloration. The formwork shall be faced with plywood or equivalent material in large sheets rigidly supported so as to prevent distortion under load. The sheets shall be arranged to coincide with architectural features, or changes in direction of the surface. All joints between panel shall be straight and either vertical or horizontal unless otherwise directed and the joints between panels to slab soffits shall be parallel to the supports. Suitable joints shall be provided between sheets to minimize joint marks and to maintain accurate alignment in the plane of the sheets.

Class F2R: This finish is for all exposed surfaces that are to be rendered or plastered. The formwork shall be face with plywood or equivalent material in large sheets rigidly supported to as to prevent distortion under load. All joints between panels shall be straightened either vertical or horizontal unless otherwise directed. Suitable joints shall be provided between sheets to minimise joint marks and to maintain accurate alignment in the plane of the sheets. The surface of the formwork shall be unplanned so as to produce a rough concrete finish to provide a good key for the render or plaster.

Class F3: This finish identical to Class F2 finish except that the permitted deviations for irregularities are more stringent as given in Table 14.6.

Profited Surface Finish – This finish is used where indicated on the Drawings. The quality of the surface finish and the permitted deviations shall be as for a Class F2S finish.

Where a surface is partly below sand partly above the final ground level the finish for exposed surfaces shall extend for 500mm below the final ground level.

Classes for unformed surfaces:

Type U1: This finish is for surfaces where a superior finish is not required. It is also the first stage for finishes U2 and U3. The finishing operations shall consist of grading, tamping and screeding the concrete to produce a uniform, plain or ridged surface.

Type U2: This is a smooth matt finish such as may be achieved by a wood trowel, as required, inter alia, to receive mastic pavings, block of tile pavings bedded in mastic or screeds. Smoothing shall be done only after the concrete has hardened sufficiently, and may be hand produce a uniform surface free from marks.

Type U3: This a smooth steel-trowelled finish for surfaces of concrete pavings, tops of walls, coping's and other members exposed to weathering or water, surfaces to receive thin flexible sheet, tile pavings bedded in adhesive, and seatings for bearing plates and the like where the metal is in direct contact with the concrete. Trowelling shall not commence until the moisture firm has disappeared and the concrete hardened sufficiently to prevent excess laitance from being worked to the surface. The surfaces shall be trowelled by hand or machine under firm pressure and left free trowel marks.

Type U4: This is power trowelled finish for surfaces to receive epoxy resin floor finish. Trowelling shall not commence until the moisture film has disappeared and the concrete hardened sufficiently to take the weight of the machine and operator.

- ## FINISHES FOR FORMED SURFACES – PARTICULAR

Class F1 is for surfaces which will remain hidden in the Permanent Works.

Unless otherwise stated on the Drawings all exposed surfaces shall be Class F2R, subject to the following exceptions:-

The internal faces of all liquid retaining structures shall be Class F2S.

The exposed faces of all concrete walls shall be Class F2S.

- ## PERMITTED DEVIATIONS IN FINISHED WORK

The irregularities in formed and unformed surfaces for the various classes of finish shall be within the target limits shown in Table 14.6. If irregularities exceed the target the Contractor shall take the necessary steps to bring subsequent work within the target. If, however, the irregularities exceed the maximum allowable shown in the table it shall be sufficient cause for the structure, member or section of a member of the structure to be removed and properly reconstructed.

In Table 14.6 the type of irregularity is defined as follows:-

i) Departure from alignment and grad and dimension shown on the Drawings.

ii) The cross sectional dimensions of structural members less than 600 mm, such as walls, columns, beams etc where for structural reasons, it is desirable to keep the tolerances within closer limits than those for alignment and grade.

iii) Gradual irregularities measured from a 3m long template placed against the concrete.

iv) Abrupt irregularities such as those resulting from defective or displaced facing or movement of supports.

TABLE 14.6

Permitted Deviations for Irregularities of Concrete Surfaces

Tolerances in mm Formed finish

Type Irregularity	**Target**			**Maximum allowed**		
	F1	F2	F3	F1	F2	F3
1	± 20	± 5	± 1	± 40	± 10	± 2
2	± 07	± 5	± 1	± 15	± 10	± 2
3	7	5	± 1	15	10	± 2
4	7	3	± 1	10	5	± 2

Tolerances in mm Unformed finish

Type Irregularity	**Target**			**Maximum allowed**		
	U1	U2	U3	U1	U2	U3
1	± 20	±10	± 3	± 35	± 20	± 6
2	± 07	± 5	± 3	± 15	± 10	± 6
3	10	5	3	20	10	6

- ## REMEDIAL WORK

A concrete surface with in the opinion of the Engineer fails to achieve the required standard shall render that section of concrete, the member of which it is a part, or in extreme cases the whole structure, liable to be rejected by the Engineer.

No remedial work shall be started before the defective section has been inspected by the Engineer. IF the Engineer permits remedial work as an alternative to reconstruction, the Contractor shall submit his proposals in respect of the repair to the Engineer for his approval.

Bolt bobbin holes shall be filled with cement and suitable fine aggregate mortar to match the colour of the concrete. The mortar shall be well worked in and thoroughly cured.

- ## FIXING REINFORCEMENT

Steel reinforcement shall be cut from straight bars free from kinks and bends or other damages, and cold bent by experience competent workmen. Bars shall be bent in a bending machine approved by the Engineer. Cutting, bending and marking shall be to the tolerances and format give in BS 4466 unless otherwise specified or ordered by the Engineer.

The Contractor shall place and fix steel reinforcement accurately in the positions shown on the Drawings and shall ensure that it remains rigidly in that position during the placing of concrete. Tack welding shall not normally be permitted, however in particular cases it may be allowed with the prior approval of the Engineer. Supports, spacers, including PVC spacers, and tie shall be subject to the approval of the Engineer. Concrete spacers shall be made of the same quality concrete as that for the work in which they will be embedded with any tying wires galvanized and located to give a minimum cover of at least half that specified for the reinforcement. Metallic spacers, fixing clips and tying wire shall be computable with the material of the reinforcement and the specified cover shall be maintained.

Spacers should be of such materials and designs as will be durable, not lead to corrosion of the reinforcement and not cause spelling of the concrete.

Reinforcement projecting form previously cast concrete shall not be bent so as to require rebending without the prior approval of the Engineer.

The main wires of adjacent sheets of steel fabric reinforcement shall be lapped at least 300 mm and the transverse wires at least 150mm.

The Contractor shall not place concrete around reinforcement until the reinforcement has been inspected by the Engineer.

- ## COVER TO REINFORCEMENT

Except where otherwise shown on the Drawings the nominal concrete cover the nearest reinforcement (exclusive of concrete blinding and rendering) shall be 40mm.

- ## CONSTRUCTION JOINTS

Where construction joints are shown on the Drawings the Contractor will not be permitted to after these joints or their positions or to increase their number without the prior approval of the Engineer.

Where not shown on the Drawings, the details and position of construction joints shall be submitted to the Engineer for approval before any concerting takes place. They shall be located so that, when considered with sequence of concreting, the effects of shrinkage and temperature are minimized.

Construction Joints shall be formed in straight lines with rigid shuttering perpendicular to the principal line of stress and as far practicable at points of least shear. They shall be the plain type unless otherwise specified or approved.

As soon as the exposed concrete has sufficiently hardened surface of the joint shall be brushed with a stiff brush to expose the larger aggregate without it being disturbed. Roughening of the surface by chipping or hacking will not generally be approved. Before Placing fresh concrete against a construction joint all loose material shall be removed and the surface sluiced with water until it is perfectly clean, thereafter all ponded water should be removed.

A period of at least 3 days and not more than 14 days, except under special circumstances and with the approval of the Engineer, shall elapse between the casting of successive lifts of concrete.

In the case of water retaining structures no more than 7 days will be permitted to elapse between casting of the base or footing to a wall panel and the casting of the stem of the wall on the base or footing.

The cost of construction joints shall be deemed to be included in the rates for concrete.

- ## MOVEMENT JOINTS

Movement joints (Expansion & Partial Contraction Joint) shall be constructed in the positions as shown on the Drawings or as directed or approved by the Engineer.

Movement joints are measured separately and items are included in the Bill of Quantities for the various joints in each of the structures.

Where indicated on the Drawings, dowel bars shall be positioned across the joint. They shall be placed with the midpoint of the longitudinal axes intersecting the plane of joint at right angles, half the length of the bars being suitably coated to prevent bonding. Fitted over the coated length shall be pipe sleeve, closed and packed with compressible filler for a depth of 25mm at the end of the bar remote from the joint.

Where shown on the Drawings or as directed by the Engineer, joints shall be sealed on one of both faces as required. On the face or faces requiring, a groove of the shape and dimensions shown in the standard joint details shall be formed. Not earlier than fourteen days after the placing of the concrete, or when otherwise directed by the Engineer, the groove shall compound to the underside of the chamfers. The sealer shall be prepared and applied strictly in accordance with the manufacturer's instructions.

The joints shall be made by forming the concrete on one side of the joint and allowing it to set before concrete is placed on the other side of the joint. The surface of the concrete first placed at contraction joints shall be coated with band breaking compound before the concrete on the other side of the joint is placed.

• PROTECTION AND CURING OF CONCRETE

The Contractor shall take measures to the approval of the Engineer for the protection of concrete from the harmful effects of wind, sun, high and low temperatures, rapid temperature changes, premature loading, deflection, impact and aggressive ground water. Such measure shall continue from the time that the concrete is placed for a minimum of 14 days.

All exposed concrete surfaces shall be kept moist, for not less that 14 days after casting by methods to be approved by the Engineer in writing before use.

Concrete surfaces shall be protected and cured in the following manner.

a) The concrete shall be kept moist for a continuous period of at lease 14 days after placing by covering it with moist sane, wet sacks, canvass, fibre mats or other satisfactory material capable of retaining the moisture, or by providing a sprinkler system.

b) Utilizing of an approved non-bituminous pigmented liquid curing compound of an adequate type. The compound shall be applied strictly in accordance with the recommendations of the manufacturer. This compound shall not be applied on concrete surfaces of movement or construction joints.

• REMOVAL OF SHUTTERING

Shuttering shall be removed in accordance with Table 14.7. In certain circumstances reductions may be made to these times in accordance with the principles of BS 8110: Part 1: Clause 6.9.3 with prior written approval of the Engineer. Unless the soffit shuttering to beams and slabs has been designed so that it can be struck without disturbing the props, it shall be retained in position for the minimum period given in Table 14.7 for the retention of the props. Great care shall be exercised during the removal to avoid shocks to, ore reversal stress in and the concrete.

TABLE 14.7

Minimum Period before Striking Formwork

Temperature of Concrete Type of formwork	16°C	7°C
Vertical formwork of columns Wall and Large beams	18 hours	24 hours
Soffit formwork to slabs (props left under)	4 days	7 days
Props to slabs	11 days	14 days
Soffit formwork to beams (props left under)	8 days	14 days
Props to beams	15 days	21 days

Notwithstanding the foregoing the Contractor shall be held responsible for any damage arising from removal f formwork before the structure is capable of carrying its own weight and any incidental loading.

- ## CEMENT MORTAR

Mortar shall comply with BS 5628.

Sand shall be to BS 1200, Table 1, for general purpose mortars. Cement shall be as specified in Clause 2.2

Plasticizers shall comply with BS 4887 and be used only as recommended by the manufacturer.

The dry ingredients of cement mortar shall be thoroughly mixed with just sufficient water to make to workable to the correct degree. With the approval of the Engineer anon-shrink admixture may be used subject to the provisions of Clause 2.6.

Cement mortar which has begun to set shall not be used or reworked for use in the works.

Mortar shall be mixed in batcher mixer of a type approved by the Engineer or mixed by hand as instructed by the Engineer.

The proportions of mortar shall be:

a) Type M1.
Mortar for block work and building in ancillary components such as sills, copings, lintels.
Cement: Sand
The proportion of sand may be increased to give a maximum cement; sand ration of 1:5 provided that the workability of the mortar is maintained by the addition of an approved Plasticizer.

b) Type M2
Mortar for:-

- Bedding steel flooring system support angles;
- Packing cavities between pipe work or embedded plant and the surface of structural concrete or block work;
- Packing under horizontal surfaces such as stanchions and machine base plates;
- Grouting of steel channels or support frames for switch board and electrical equipment.

Cement: Sand 1:1

Levelling of the equipment before mortar packing, and checking of alignment before and after the grouting will be carried out by others.

Immediately before mortar packing, the space between the concrete and base plate shall be cleaned and thoroughly wetted. Al excess water shall then be blown away by means of a compressed air jet.

- ## CEMENT GROUT

Cement ground shall be mixed in the relevant proportions indicated in the following table using the minimum quantity of water to ensure the necessary fluidity and to render it capable of penetrating the work.

Class	Nominate mix by mass	
	Cement	Sand
G1	1	-

The Contractor shall carry out the following grouting work as and when instructed by the Engineer, using the specified grout type:

i. filling of pockets containing holding-down bolt anchorages or rag bolts: G1

ii. Grouting of bolt tubes: G1.

Levelling of the equipment before grouting, and checking of arrangement before and after the grouting will be carried out by others. Grout shall be mixed in batcher mixer of a type approved by the Engineer or mixed by hand as instructed by the Engineer.

Immediately before grouting, the grout pockets shall be cleaned and thoroughly wetted. All excess water shall then be blown away by means of a compressed air jet.

The grout shall be transported from the mixer to the placing point quickly and in such a way that the materials do not segregate. Grout shall be placed within 30 minutes of being mixed. Grout shall be worked into position with roads or other suitable instruments until the whole of the space is completely filled with the ground. Mechanical vibrators shall not be used. The main grouting and the grouting of bolt sleeves and pockets should normally be carried out at the same time. If separate operations are advisable bolt sleeves and pockets shall be grouted up to approximately 50mm below the level of the concrete foundation before the main grouting.

- ## PRECAST CONCRETE

Unless otherwise specified or described all precast concrete work shall be Class 28/20. Moulds for precast units shall be so constructed as to provide a Class F3 finish to the units unless otherwise specified.

Each mould for concrete work which is specified or approved by the Engineer to be precast shall have a different embossed or recessed identification mark in a position to the approval of the Engineer. Each precast unit shall be indelibly marked with the date of casting and after the mould is removed shall not be disturbed for 28 days.

Each precast unit shall, where required be provided with lifting eyes and holes located to avoid excess stress during handling to the satisfaction of the Engineer. Units requiring removal at a later date for inspection/maintenance shall be provided with permanent lifting points where indicated on the Drawings. These shall be proprietary fixings allowing easy removal of the units and shall have suitable protection against corrosion. They shall not protrude above the finished surface of the concrete. Temporary lifting point shall be removed or covered up and any holes or recesses shall be filled after installation of the precast units. Precast units must be of a sufficient age and handled with sufficient cast to avoid permanent damage. The Contractor shall take steps to ensure the even seating of all pre-cast members on their bearings to the satisfaction of the Engineer.

- ## FILTER UNDERDRAINS

Filter under drains will be dual parallel under drain filters for drinking water applications. The low profile blocks design will have a method of gripping the grout, which helps to alleviate the

buoyancy inherent in plastic under drain installation with wide, low-profile design requiring that fewer blocks be installed to cover a filter floor.

The blocks are formed covering the floor of the gravity filters, supporting the filter media. Air is distributed evenly across the entire filter bottom area to scour the media and to provide an air lift which, with the water, removes the released solids from the filter. This dual backwash action provides intense washing energy throughout the filter. The TETRA (or similar) blocks can be cut in half lengthwise to avoid filling the remaining space with grout that will not accommodate a full width block

- ## MEASUREMENT AND PAYMENT

- ### Measurement

Measurement, for payment, of concrete required to be placed directly upon or against surfaces of excavation will be made to the lines for which payment for excavation is made. Measurement, for payment, of all other concrete will be neat lines of the structures an shown on the Drawings unless otherwise prescribed in this Specification.

In measuring concrete for payment, deductions will be made for the volume of all ducts, embedded pipes, surface conduits and drains, recesses for rails and gate guides in firs stage concrete, embedded metalwork and other blockouts having a cross-sectional area larger than 0.10m² as measured at right angles to their longitudinal axis. Deductions will also be made for all openings, recesses and blockouts with cross-sectional area less than 0.10m² but which have an individual volume larger than 0.5 m³.

Measurement, for payment, for concrete required for treatment of defects outside the excavation pay lines other than in excavation for underground works will be made for the actual volume of concrete directed to be placed in these locations. Measurement, for payment, of backfill/dental concrete will be made of the actual volume of concrete placed as directed by the Engineer. Measurement of precast concrete shall be made as per dimension shown on drawings.

- ### Payment

Payment for concrete in the various parts of the Works will be made at the applicable rates per cubic meter tendered in the priced Bill of Quantities. These rates shall be include the cost of all labour, constructional plant, formwork and materials including cement required in the construction, except that payment for providing and placing or installing reinforcing bars. Payment will not be made for concrete required to be places outside specified or approved excavation pay lines due to over-breakage, excess excavation or wasted concrete, or for any other reason. Direct payment will not be made for cement used in concrete, mortar, shotcrete, dry-pack or grout for filling the cavities. The cost of producing or providing aggregates required under this Specification shall be included in the rate tendered in the priced Bill of Quantities for the various grades of concrete construction in which the aggregate is used. The Contractor will not be entitled to any additional payment for materials wasted from deposits, including crusher fines, excess material of any of the sizes into which the aggregates are required to be separated by the Contractor and material which have been discarded by reason of being above the maximum sizes specified for use.

The cost of contraction joints shall be included in the rate tendered in the priced Bill of Quantities for the concrete in which the joints are required. The cost of expansion joints shall be included in the rate tendered in the priced Bill of Quantities for the concrete in which the joints are required. The cost of all labour and materials for forms and for any necessary treatment or coating of forms shall be included in the rate tendered in the priced Bill of Quantities for concrete for which the forms are used. All materials, labour and construction plant required for the repair of concrete shall be provided at the expenses of the Contractor.

No payment will be made for the backfill/dental concrete to fill the over excavation due to negligence and fault of Contractor

The cost of placing concrete in blockouts, and dry pack and grout under base plates of equipment and machinery supplied and installed by the Contractor shall be deemed to be included in the rates tendered in the priced Bill of Quantities for items of work for which the concrete and grout is required. No separate payment will be made for injection of cement grout or epoxy grout for filling the gap or cavity within hardened concrete.

SECTION-5 REINFORCEMENT STEEL

- **SCOPE OF WORK**

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

- **MATERIALS**

  - Reinforcing steel to be new billet stock of mild steel (plain bar), hard grade (deformed bar) and Ribbed Tor steel as specified on the drawings and shall conform to British Standard Specifications or equivalent ASTM or Pakistan Standard.
  - The contractor shall purchase the steel from ay reputable source of steel manufacturing company/factory. The contractor shall furnish to consultants manufacturer's mills certificate to guarantee that steel meets the standard, specifications requirement and medium certified yield stresses as follows;
    - Mild Steel Plain Bars conforming BSS 15 or BSS 4449 or PS-231-1962

      a. Tensile Strength 438 to 517 N/sq.mm (28 to 33 tons/sq.in)
      b. Yield Strength 250 N/sq.mm (16 tons/sq.in)
      c. Elongation 16% to 26% (avg. 20%)

    - Hard grade deformed bars conforming to ASTM, A-15-85 T. or PS-605-1962 Tensile Strength-560 N/sq.mm (35.7 tons/sq.in)

      a. Yield Strength 350 N/sq.mm
      b. Elongation Max. 7%

    - Ribbed Tor Steel conforming to BS 4461

a.	Tensile Strength	490 N/sq.mm
b.	Yield Strength	420 N/sq.mm
c.	Elongation	14.5%

- All steel to be true to the Standard Specifications with regard to bend-ability specially the hard grade deformed bars under 19mm dia shall be capable of being bent cold through 90˚ round a bar of four times its own diameter without fractures or injury of any kind. In case of deformed bars over 19mm dia and under 28mm dia round a bar of 6 times its own diameter.
- 20 gauge galvanized wire shall be used for binding the steel reinforcement.

- **TESTING**

Samples shall be tested for above specification in an approved laboratory when required by the Consultants of his representative and all costs of such tests shall be borne by the contractor.

- **STORAGE**

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

- **CUTTING AND PLACING OF REINFORCEMENT**

All reinforcement steel shall be cut and bent cold in strict accordance with bar bending schedule approved and drawings supplied by the consultants. The contractor shall prepare bar bending schedule form approved structural working drawings and instructions to be provided to him by the consultants. The bending schedules shall be drawn on approved forms and submitted to the consultants or his representative for checking and approval, the steel reinforcement shall be cut and bent to sizes as per drawings and approved bending schedules. In case any bar(s), cut, bent or even fixed in position are found incorrect in dimensions size or shape according to the requirements of the drawings and instructions of the consultants, the contractor shall replace such steel bars cut bent or fixed in position by correct sized bars at his own cost and no extra payment shall be made to the contractor on such account. These systems of holding bars in place shall ensure that all steel in top section will support weight of workmen without displacement or distortion. Suitable spacers chairs as approved by the consultants representative shall be used for supporting and spacing purposed bars. In case any bar(s) are bent or displaced they shall be straightened or the limit if a days pour shall be in place and firmly tied with 20 gauge G.T Wire, bars with kinks or bends not shown on drawings shall not be used.

Where indicated in the drawings, mesh shall be of the sizes as shown on drawings and conform to British Standard BS 785. Mesh reinforcement when used in slabs shall be supported at proper elevations by standard accessories. In slabs on ground, precuts concrete blocks may be substituted for chairs.

All reinforcement shall be secured in place by use of metal or concrete supports, spacers, or ties, as approved by the consultants. Such supports shall be of sufficient strength to maintain the reinforcement in place throughout the concreting operation. The supports shall be used in such a manner that they will discoloration or deterioration of the concrete. Concrete supports shall be manufactured of the same concrete mix as used in the structure to be concreted.

All reinforcing steel fixed in position shall be inspected by the consultants' representative and no concrete shall be poured until steel placement has been approved by the consultants' representative ad no concrete shall be poured until steel placement has been approved by the consultants representative. For inspection purposes the contract shall give to the consultants' representative reasonable notice before the scheduled pouring time.

- **LAPS AND SPLICES**

Except otherwise shown on the drawings or specified herein, all splices, lengths of laps, splice location placement and embedment of reinforcement shall conform to the applicable requirements of ACI 318-77, Building Code Requirements for Reinforced Concrete. All splices and locations of laps in reinforcement shall be as shown in drawings or directed by the consultants. Lapped ends of bars may be placed in contact and securely wired or may be separated sufficiently to permit the embedment of the entire surface of each bars by butt-welding or by approved mechanical methods such as the Cadweld splice or the other type splice using positive connectors shall be adopted where indicated or directed by the consultants. But welding of the reinforcing bars, where indicated or directed shall conform to the requirement of American Welding Society's Recommended practice for welding reinforcing steel, metal inserts and connections, D. 12.1 Concrete shall be protected from heat during welding operations.

- **MEASUREMENT AND PAYMENT**

The quantity to be paid for shall be the calculated in theoretical number of metric ton or reinforcement steel bars or mesh as determined from the approved bar bending diagrams and incorporated in the concrete and accepted, except when reinforcement is paid for under other items.

- The weight of plain or deformed bars will be computed from the theoretical weight of plain round bars of the same nominal size as shown in the following tabulation;

Size (mm)	Weight per unit length (kg/m)
10	0.561
13	0.996
16	1.556
19	2.24
22	3.049
25	3.982
29	5.071
32	6.418
36	7.924
40	9.619
43	11.41
57	20.284

- Clips, ties, separators and other material used for positioning and fastening the reinforcement in place, and structural steel shall not be included in the weight calculated for payment under this item. If bars are substituted upon consultant's request and as a result more steel is used than specified only the amount specified shall be included.
- When laps are made for splices, other than those shown on the drawings or required by the Engineer and for the convenience of the contractor, the extra steel shall not be measured nor paid for.
- When continuous bars are shown on the drawings, without the splices being shown the necessary steel in the splices will be paid for on the basis of individual bars not being shorter than 40 ft.

The accepted quantity measured as provided above shall be paid for at the contract unit price for items listed in the bill of quantities which price and payment shall be full compensation for furnishing materials, labour, equipment and incidentals necessary to complete the item.

SECTION-6 BRICK MASONRY

- **6.1 SCOPE**

The work covered by this section of the specifications consists of furnishing all plant, labour, equipment, appliances, and materials and in performing all 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.

- **6.2 MATERIALS**

a) Cement: Shall be Portland cement meeting the requirements specified under clause of section-2 “CONCRETE”.

b) Aggregates: Aggregates used shall meet the requirements specified under clause of section-2 “CONCRETE”.

c) Water: Shall be as specified under clauses of the section-2 “CONCRETE”.

d) Concrete Masonry Units:

The bricks shall be solid as required and shall be carefully made so that they are true in line and face with square corners and free from all defects.

The bricks are to be exposed to view they shall have clean, cut straight and true edges, smooth dense faces of uniform appearance without voids honey combs, projections or variation in texture and shall be free from cracks, spells ships, ragged edges or other defects detrimental to their appearance.

Where bricks are to be plastered the exposed surfaces shall have a coarse texture suitable for bonding the plaster as approved by the consultants.

The bricks used shall be of standard size (228 mmx114 mmx76 mm) first class well burnt, uniform in shape, size, texture, colour and should produce a ringing sound when struck. The bricks shall be free from flaws, cracks, chips, stone nodules of lime or kan-kar or any other blemishes. The brick shall not absorb more than one sixth of its weight when soaked in water for one hour. Compressive strength shall not be less than of 984,297 kg/m2. Bricks over burnt, under burnt vitrified and irregular shall not be used. Bricks of uniform size shall be used throughout the work and source of supply shall not be diversified.

The average moisture content of all concrete masonry units shall not exceed 30 percent of the total absorption of the units.

- **6.3 MORTAR FOR MASONRY AND BRICKWORK**

- Cement shall be Portland as specified under clause of the section-2 “CONCRETE”.
- Fine aggregate shall be clean, hard, durable particles free from laminated material well graded from No.4 to 100 sieve.
- Water shall be clean and free from injurious acids, alkalis and organic impurities.

- All mortar for masonry shall be in proportion one (1) cement and four (4) sand (fine aggregate) and the ingredients shall be mixed by volume.

- Mortar shall be mixed thoroughly in a drum type batch mixer for a period of not less than three minutes, using the quantity of water required to obtain the desired workability. Hand mixing shall be subject to approval by the Engineer and if he allows the mortar materials shall be mixed in a light mortar mixing box. In no case the mixing of mortar shall be done on open platform.

- The mortar shall be subject to compressive strength test and the average compressive strength of three numbers 50mm cubes of mortar shall be not less than 1265525 kilogram/meter3 at 28 days.

- Mortar shall be used in the masonry within half an hour form addition of water into the mortar. The mortar which haw already set shall not be used in the masonry.

- **6.4 MASONRY & JOINTING**

a) All masonry shall be laid plumb, true to line and level and accurately spaced coursed and with each course breaking joints with the coursed and with each course breaking joints with the course below. Bond shall be kept plumb; corners and reveals shall be plumb and true. Chases, grooves, reglet blocks and raked out joints shall be kept free form mortar and other debris.

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

c) Unless otherwise shown on the drawings or specified the spaces around from and other built in items shall be solidly filled with mortar except those joints that are to be caulked shall be raked out 19 mm.

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

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

f) The thickness of joints shall not exceed 9.5 mm and the joints shall be raked 12.7 mm deep when the mortar is still fresh so as to give proper bond to the plaster.

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

(I) Masonry walls shall be cured for at least ten (10) days from the day it is installed.

- **6.5 BRICKWORK**

    - Before use all bricks shall be soaked in clean water in tanks or pits for at-least two hours.

    - All brickwork shall be skilfully laid with level courses, uniform joints, square corners, plumb verticals and true surfaces except when otherwise shown on the Drawings or directed by the Engineer. Brickwork will be of best standard of workmanship obtainable and objectionable offsets in the brickwork shall be avoided. Smoothest practicable finished surface of the brickwork shall be ensured. Unless otherwise specified bricks shall be laid in English Bond with frogs (Manufacturer's marks) upward.

    - All horizontal joints shall be parallel and truly level. Vertical joints in alternate coarses shall come directly over one another. Thickness of joints unless otherwise specified shall not be less than 635 mm and not more than 9.5 mm. The height of 4 coarses and 3 joints as laid shall not exceed by more than 25 mm the height of 4 bricks as piled one upon the other

    - All brick work involving use of cement shall be cured by water curing or other acceptable methods. The Engineer shall approve all methods and operations of the Contractor in curing different portions of work.

    - When curing by water brickwork shall be kept wet for at least 14 days by covering with water saturated materials or by a system of perforated pipes, mechanical sprinklers, porous hose, ponding or by any other approved method which will keep all surfaces to be cured continuously wet. Water used for curing shall meet the requirements given in Clause 2.2 of these specifications

- **6.6 MEASUREMENT AND PAYMENT**

- **Measurement:**

Measurement of acceptably completed works of Brick masonry will be made on basis of number of cubic meters provided and installed in position as shown on the drawing or as directed by the engineer in charge.

- **Payment**

Payment shall be made for acceptable measured quantity of Brick masonry on the basis of unit rate per Cubic meter quoted in the Bill of Quantities and shall constitute full compensation for all the works related to the item.

SECTION-7 DEMOLITION AND DISMANTLING WORKS

- **7.1 SCOPE**

The work covered by this Section of the Specifications consists of furnishing all plant, labour, equipment, appliances and performing all operations in connection with demolition and removal of existing, brick masonry work and concrete structures including disposal of demolished material to designated places. Demolition work shall be done in accordance with these specifications and as directed by the Engineer.

- **7.2 Demolition Procedures**

The Engineer will define the limits where demolition is to be done and shall approve the procedures/methods of demolition to be adopted by the contractor.

Demolition shall be performed in an orderly manner and the Contractor shall take all necessary precautions and expedients to prevent damages to the adjunct structures, installed equipment/machinery, pipes, conduits etc. Any damage caused to the structures and installations due to negligence of the Contractor during demolition operations shall be repaired/replaced by the Contractor at his cost and to the satisfaction of the Engineer.

- **7.3 DEMOLITION OF MASONRY WORKS AND CONCRETE WORKS**

The Contractor shall demolish, masonry and concrete works to the line and depth as shown on the drawing or as directed by the Engineer. Explosives shall not be used to remove the plain and reinforced cement concrete or any other material whatsoever. Mechanically operated brakers, concrete saws, chipping hammers or other approved methods shall be employed for cutting. Care shall be taken that existing services, structures are not damaged. It shall be the responsibility of the contractor to replace at his cost any services, structures damaged by the contractor due to his negligence during cutting operations or thereafter until the whole of cut parts/arrears are restored to original condition to the satisfaction of the Engineer.

- **7.4 DISPOSAL**

All debris materials resulting from demolition work shall be disposed off to places designated by the Engineer with in free haulage limit of 10 km from the place of work and in the manner of disposition required and directed by the Engineer. All useable materials resulting from demolition and removal shall remain the property of the Employer.

SECTION-8 PLASTERING

- **8.1 GENERAL REQUIREMENTS**

a) Contractor shall examine all other sections of the specifications for requirements with affect work of this section whether or not such work is specifically mentioned in this section.

b) Contractor shall coordinate work with that of all other trades affecting, or affected by work of this section especially all embedded items in walls.

- **8.2 SCOPE**

a) The scope of work consists of the installation of all materials to be furnished under this section and without limiting the generality thereof, includes all equipments, labour and services required for all latching and cement plastering, including all items incidental thereto as specified herein and as shown on the Drawings.

b) Includes as part of the work herein, the installation of scratch coat plaster base and cement mortar setting bed for ceramic tile at walls.

c) See drawings and schedules for location and details.

- **8.3 SAMPLES**

Contractor shall submit samples as requested by the consultant of all material specified herein and before ordering material, obtain approval from the consultant.

- **8.4 PLASTERING MATERIALS**

a) Materials shall be approved by the consultant.

b) Portland cement shall conform to British Standard specifications as specified for Plain & Reinforced concrete Work.

c) Sand shall conform to British Standard Specifications except that the gradation shall meet further requirements for cement plaster work as directed by the consultant.

d) Water shall be clean, fresh and suitable for domestic consumption.

- **8.5 WORKMANSHIP**

a) All work shall be done in the best possible manner by skilled workmen of the plastering trade, contractor will be responsible for results of the highest quality. Unsound and unsightly work shall be removed and replaced by work satisfactory to the consultant at no additional cost.

b) All finished surfaces shall be even and properly trawled. Finished surfaces shall be even in colour, free from stains, marks or defects. Finished surfaces shall be straight-edged and plumb or level in every direction, angles shall be straight, true and perfect.

c) Test and examine all work related to the work under this section. Work shall be plumb and straight, special care being taken at intersections.

d) All work shall be prepaid drying. Exterior openings shall be kept properly adjusted to regulate the drying and curing of cement plaster.

- **8.6 PLASTER SAMPLE PANELS**

A plaster sample application shall be made in finished area for consultant approval of the finished appearance, which shall be uniform in finish, free of swirls or float marks. Un-approved plaster sample shall be removed and additional plaster applications made, until approval is obtained. Samples for ach different types of plaster shall be made for

consultant's approval. No plastering work shall be done without the approval of plaster samples.

- **8.7 CEMENT PLASTER APPLICATION**

- **Inserts And Embedded Items.**

Plastering shall not commence until all metal lath, electric conduits, drainage and sanitary pipes, inlets to tanks, brackets, clamps, doors and window frames and all sorts of inserts are fixed in position. It shall be the responsibility of the contractor to make sure that all such work is carried out by other contractors before starting of plaster work. Chiseling and repairing of cement plaster shall not be permitted without the approval of the Engineer. Before commencing plaster work contractor shall check with the specialist and other service contractors to ensure that all embedded and other items are in place.

- **Preparation of Masonry Surface to be Plastered.**

All masonry surfaces to be plastered shall be cleaned to remove all matter which will otherwise adversely affect the adhesion of plaster to the surface concerned. All the adhesion of plaster to the surface concerned. All masonry joints and concrete surfaces shall be properly roughened before plaster work is commenced. The surface thus prepared shall be treated uniformly with cement and sand slurry. The slurry to be used shall be one part cement to one part sieved sand by volume with water added with a stiff brush on surface which shall be applied with a stiff brush on surface which shall be well wetted before the application of the slurry.

- **8.8 METAL LATH OVER RCC - MASONRY JOINT.**

Expanded metal strips of 152 mm width shall be installed over all joints of masonry and RCC members. It shall be heavy duty expanded metal with6 mm to 19 mm approx. openings and shall be firmly fixed to both RCC and masonry @ 228 mm spacing of both sides before start of plastering work.

- **Preparation of Cement Mortar for Plaster**

a) The mortar shall be mixed form ordinary Portland cement mixed with clean sieved sand in the volumetric ratio of one part cement to four parts of sand (1:4) or as specified. The mixtures shall be turned over and over till the ingredients are thoroughly mixed.

b) Only limited water shall be added for proper workability and such quantity of the mortar shall be prepared that will be consumed in thirty minutes after preparation. Preparation of mortar in bulk quantity for use during the entire day or for any other time more than that stipulated above is expressly prohibited.

- **8.9 APPLICATION OF PLASTER.**

The minimum thickness of plaster shall be 12.7 mm. If the plaster is to be more than 16 mm thick it shall be done in two layers. The surface of first layer shall be made rough after the initial set. The second layer shall be applied after a period of three (3) days of application of the first layer. The plaster shall not have wavy surfaces and shall be perfectly in line level and Plumb. The edges and corners shall represent straight lines.

The plaster shall be kept wet continuously for at least 10 (ten) days. Plaster shall be carried in jambs, junctions, corners, edges, round surfaces. The plaster work is to cover all conduits, pipes etc. fixed in the walls and ceiling. Before start of plastering, 152 mm wide continuous strip of heavy duty panded metal lath (4.25 kg. per sq.m) shall be nailed to all joints of RCC and brick to prevent plaster cracks at such joints. No extra payment shall be made for thicker plaster due to defective masonry.

8.9.1 Patching

Plaster containing cracks, blisters, pits, discoloration or any defects shall not be acceptable. Any such plaster or loose plaster shall be removed and replaced with plaster in conformity with these specifications and as additionally directed by the consultants. Contractor shall remove completely and provide plaster in lieu of all defective work in patches as directed, at no additional expense to the employer.

8.9.2 Drips and Grooves

The contractor shall make drips for rainwater protection and grooves as per details shown on drawings.

8.9.3 Alignment and Smoothness

All cement plaster shall be uniformly true in line level and plumb, smooth trowel finished, free of waves and blemishes etc. to the full satisfaction of the consultant.

8.9.4 Cleaning and Protection.

Rubbish and debris shall be removed as necessary to make way for work of other trades and as directed by the consultant. As each room or space is completed all rubbish debris, scaffolding and tools should be removed to leave the room clean. Protect finished plaster from injury by the any source. Prior to plastering all Aluminum windows doors and finished metal shall be covered by plastic adhesive tape or any other approved system to completely protect it from damage and defacement. Contractor shall also protect walls, floors and work of other trades from plaster materials.

- ## 8.10 TYROLENE PLASTER (ROUGH CAST PLASTER)

a) Tyrolene plaster shall be applied on exterior/interior wall wherever specified and shown on drawings. Prepare plaster surface to receive tyrolene treatment. Mortar for tyrolene treatment shall be one part of ordinary Portland cement and two part of sand as approved by the consultant (1:2) and shall be applied to wall by machine over 12.7 mm rough plaster base (1:4). The thickness of tyrolene shall be a minimum of 6 mm. The texture of tyrolene plaster shall meet with consultant's approval. Where required 6 mm thick tyrolene plaster (1:2) shall be applied in white cement and colour pigment added as instructed by the consultant. Also 152 mm wide heavy duty metal lath share be installed over all joints of masonry and R.C.C. members.

b) The contractor shall prepare samples for consultant's approval before commencement of work. The work shall be carried out by experienced workmen only to ensure uniformity of colour and texture and shall match with the approved sample.

- **8.11 WATER PROOF PLASTER**

- **Water Tanks & Other Structures**

a) Where specified elsewhere in the drawings or bills of quantities and in accordance with Engineer's requirements, water retaining storage tanks, and other structures shall be given a waterproofing treatment on the inside. Waterproofing treatment shall be given to the bottom slabs and vertical walls of the tanks. The plaster shall be made by mixing waterproofing compound in the cement sand mix of 1:4 by volume according to the manufacturer's instructions for treatment of water tanks and applied in one layer of 19mm on all inner surfaces. Waterproofing compound in sealed containers only shall be allowed. Only water proofing compound duly approved by the consultant shall be allowed for use. In water tanks all corners, vertical as well as horizontal shall have triangular cant strips 152 mmx152 mm size in mortar 1:6. The internal surfaces of tanks to receive waterproofing treatment shall be made rough for bonding. After the surface has been made rough, metal lath (diamond mesh) shall be nailed to the entire wall and the bottom of the tanks in an approved manner. The layer of waterproofing plaster 19mm thick shall be then applied and its surface shall be made smooth by the use of a trowel or other suitable instrument. The layer shall be allowed to cure for a minimum of 14 days.

b) Waterproof plaster work shall not be started till all pipes have been installed by the plumbing contractor. Any damage or leak discovered in the tank shall be repaired by the contractor at his own cost.

- **8.12 CUTTING AND PATCHING**

When so directed and prior to painting and finishing of cement plastered surfaces, contractor shall check all cement plastering throughout the work, doing any and all cutting, patching and refinishing required in a manner satisfactory to the consultant.

- **8.13 PROTECTION AND CLEANING**

a) During the operation of cement plastering, protect the work of other trades against undue spoilage and damage by the exercise of reasonable care and precautions. Repair, replace, or both, any work so damaged, and soiled.

b) Upon completion of all work remove all rubbish, scaffolding and tools from the work and leave the premises clean and to the consultant's satisfaction.

- **8.14 MEASUREMENT AND PAYMENT**

Plaster work will be measured and paid for the net area over which it is laid. All openings shall be deducted. The cost for drips and architectural grooves jambs and sills shall be included in the unit rate of plaster and no separate payment shall be made for these. The cost of providing, expanded metal lath at junction of RCC and Masonry shall be included in the unit rate of the contractor. All unit rates shall include cost of all materials,

labour, scaffolding and curing. No extra payment shall be made to the contractor for thicker plaster required due to unevenness in the masonry or defective masonry.

• SECTION-9 WATER AND SANITARY INSTALLATIONS GENERAL

• 9.1 GENERAL

The water and sanitary installations include:

Supply and installation of water meters and stop cocks and the supply and installation of service pipes. Supply and installation of internal water supply pipes, water pipes and sanitary appliances including connections to external water supply and sewerage systems.

• 9.2 SANITARY FIXTURES

Sanitary appliances supplied and fixed should comply with the descriptions of commercial pamphlets submitted with the Tender and approved by the Engineer. They shall answer the following requirements:

• 9.2.1 EUROPEAN WATER CLOSET

- The European water closet shall consist of :
- A) Approved washdown closet in white glazed or coloured earthenware with integral "p" or
- "s" trap as specified.
- B) Rubber joints for inlet connection.
- C) Black or any other colour of solid plastic seat and cover with chromium-plated hinges and
- Rubber buffers as specified.

D) Low level flushing cistern of 15 litres capacity Fordham or equivalent make, porcelain Enamelled with all fittings and accessories with 32mm flush chromium plated flush bend.

E) Porcelain enamelled supporting brackets for cistern.

F) 15mm p.v.c. Connector and 15mm C.P brass stop cock easy clean type.

G) All the necessary work required for satisfactory working

9.2.2 PAN TYPE WATER CLOSET

This shall consist of :

a) Best make Water Closet pan of Orissa pattern 580 x 440 mm with "P" or "S" trap in white glazed or other colour earthenware.

b) Low level flushing cistern of 15 litres ccapacity ‘Fordham’ or equivalent make, porcelain enamelled with all fittings and accessories with 32 mm flush chromium plates flush bend.

c) 32mm C.I. flush pipe of appropriate length with necessary brass and wiped soldered joints bend to proper shape & fixed in position in chasses and the chasses shall then be fixed smooth to match.

d) The brickbat lime or cement concrete required to be filled around the entire space of the W.C. pan properly rammed and consolidated without damaging the pan.

e) C.I. soil waste pipe bend with cleaning cap extending upto Gulley Trap Chamber beyond the "P" trap.

f) The work shall include all the primary works such as cutting, excavating pits in ground floor for fixing closet pan and similar other work necessary for satisfactory working of the closet.

9.2.3 WASH BASIN

This shall be the best available type of wash basin of approved Manufacturer and shall consist of the following approved accessories :

a) Wash basins of size as specified in the material schedule and shall be in prime quality ICL Ifo wash basin with pedestal in glazed earthen ware in approved colour with tap holes, overflow split.

b) Supporting Cast Iron Brackets with premier & 20r more finishing coats.

c) 12mm chromium plated tap with appropriate marks for cold or hot water.

d) 32 mm chromium plated brass waste coupling with rubber plug and chain.

e) 12mm p.v.c. connector with wiped joints & 15mm chromium plated brass stop cock.

f) All the accessories wherever necessary shall be painted in 2 coats or more with approved enamel paint.

g) The wash basin shall have glazed pedestal whenever so specified in the material schedule.

h) All the necessary work that will be necessary for its satisfactory working.

9.2.4 MIRROR

The mirrors shall be of size specified in the Drawings with bevelled edges. The mirrors glass shall be free from all defects & shall give clean undisturbed image at any distance & angle. This shall be of " Belgium mirror" with Aluminum Frame. The mirror shall be fixed with c.p. screws with washers and detachable G.P.caps.

9.2.5 SOAP DISPENSER

This shall be either clear glass or chinaware type or as specified in the material schedule and shall be of approved type. This shall include all the necessary accessories such as fixing bracket with easy rotatory moment of the dispenser.

9.2.6 TOWEL RAILS

The towel rails shall be of chromium plate brass tube with a pair of C.P. brackets. Material shall be of approved type and the size shall be 750mm long, 20mm dia as indicated in the Bill of Quantities. The towel rails shall be fixed to wall by Rawl plugs and C.P. brass counter sunk screws.

9.2.7 STOP COCKS & BIB TAPS

These shall be chromium plated brass heavy quality, and shall be easy type with capston head. The size shall be as specified in the Bill of Quantities.

9.2.8 VALVES

The all types of valves shall be of gunmetal heavy type of approved quality and shall have hand wheels. The work shall include testing & making good leakages. No attempt shall be made to align valves or accessories by tightening bolts forcibly by hammer blows or by any other method likely to cause damage or give rise to internal stresses in the valve body or flanges

9.3 MISCELLANEOUS FIXTURES

9.3.1 GULLY TRAP CHAMBERS

The Gully Trap Chambers shall consist of brick masonry chambers suitable for the specified size of the Gully Traps. The traps shall be glazed stoneware of approved make.

Construction of Gully Trap Chambers shall consist of the following :

a) Excavation and refilling after construction of chamber.

b) 1:3:6 PCC bed concrete required for embedding the Trap.

c) 230mm thick Brick Masonry in C.M. 1:6.

d) 20mm thick W.P plaster from inside and smooth from outside in C.M. 1:6 trowell smooth by cement floating on all surfaces.

e) PCC 1:3:6 coping 100mm thick for having cast iron cover frame. (Dimensions shall suit the brickwork).

f) Cast iron frame and cover size fixed in coping & painted in 3 coats of anti-corrosive bitumastic paint.

g) All the work necessary for satisfactory working of the same.

9.3.2 CAST IRON COVERS

The Cast Iron cover for manholes, Inspection Chambers, Valve Chambers, Gully Traps, Pits shall be of the size & duty as specified in the BOQ or Drawings. The Cast Iron cover

shall not have weight less than 30kg including angle iron frame. The rate shall include painting with three coats of anti-corrosive bitumastic paint.

9.3.3 G.I. PIPE WORK

The galvanized iron pipework shall include cutting to required lengths, threading, jointing, fixing, testing, and commissioning the water lines. Any leakages found during testing, or after commissioning the lines shall be removed and replaced. The pipes when fixed to walls shall be fixed with wooden packing and G.I. clamps and screws. They shall be kept at least 12mm away from the walls and/or concealed in walls as necessary depending upon the site conditions and directions of Engineer Incharge. The piping as done shall be tested for water pressure of 10Kg / Sqm, maintained for 12 hours. The measurement of the pipings shall be done along the longitudinal axis of the pipeline. The rate of the pipeline shall include the following items :

a) Providing pipe & specials other materials as required.

b) Cutting to required lengths, threading, jointing, fixing, testing & commissioning the line as required.

c) Including all Tees, Bends, elbows, reducers, flanges Couplings, Unions and all other accessories.

d) Providing wooden battens, clamps, screws, rubber insertions, bushes etc.

e) Where specified pipes shall be Painted with two coats after cleaning the pipe etc. with white Zink paint with pigment to match colour of the building.

- ### 9.3.4 uPVC Pipes

The pipe shall be positioned in the trench so as to avoid any induced stress due to deflection. Any deviation required shall be obtained by using preformed pipe bends or by the use of joints which are designed to allow deflection (e.g. certain types of rubber ring joint). Manufacturer's guidance should be sought before using joints for this purpose.

Pipes may, however, be joined at the trench side and then placed in the trench, and/or if vertically installed they shalled be jointed together firmly before clipping them to the walls and utmost care must be exercised during this operation to avoid straining pipes or joints. Where solvent welded joints are used, the final connection at any fixed point shall be deferred until the majority of the line has been covered with backfill, to minimize stresses due to temperature change. Care should be taken to ensure that movement does not exceed the maximum telescopic movement afforded by the joint. Where rubber ring joints are used, the temperature movement of each pipe length is absorbed within that length.

9.3.5 P.E Pipes

PE pipe or fittings are joined to each other by heat fusion or with mechanical fittings. PE pipe may be joined to other pipe materials by means of compression fittings, flanges, or other qualified types of manufactured transition fittings. There are many types and styles of fittings available from which the user may choose. Each offers its particular advantages and limitations for each joining situation the user may encounter. Contact with the various manufacturers is advisable for guidance in proper applications and styles available for joining as described in this document. The joining methods discussed in this chapter cover both large and small diameter pipe. Large diameter PE pipe is considered to be sizes 76 mm IPS (89mm OD, Iron Pipe Size) and larger. All individuals involved in the joining PE pipe systems, whether it be using the typical heat fusion methods or employing mechanical connections, should be fully trained and qualified in accordance with applicable codes and standards and/or as recommended by the pipe or fitting manufacturer. Those assigned to making joints in PE pipe for gas applications must meet the additional requirement of compliance with U.S. Department of Transportation Pipeline Safety Regulations (10). The equipment used in the process of making heat fused joints must be designed to operate for the selected pipe and fusion procedures. Additionally, the equipment should be well maintained and capable of operating to specification.

- **9.4 PIPE LAYING**

- **9.4.1 LOWERING OF PIPES AND ACCESSORIES INTO TRENCH**

Pipes and accessories shall be inspected for defects prior to their being lowered into the trench and any defective, damaged or unsound pipe or coating shall be replaced or repaired to the satisfaction of the Engineer. All foreign matter or dirt shall be removed from the interior of the pipe and accessories before they are lowered into the trench.

Coated pipes shall not be allowed to come in contact with any metal tools or heavy equipment neither shall they be walked on by workmen wearing boots with leather or metallic soles and heels.

Implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and efficient execution of his work. All pipes, fittings, and accessories shall be carefully lowered into the trench in a manner that will prevent damage to the pipes, fittings and accessories. Any damage to protective lining and/or coating from any cause whatsoever shall be repaired by the Contractor at his own expense.

Under no circumstance shall pipes or accessories be dropped or dumped into the trench or on to other pipes already in the trench, and no pipe shall be rolled into position for

lowering into the trench unless rolling is effected on timber planking and controlled with ropes or other approved tackle.

- **9.4.2 LAYING OF PIPES GENERAL REQUIREMENT**

The Contractor shall provide and fix properly painted sight rails on the alignment of the pipeline. There shall not be less than three sight rails in position of any length of pipes to be laid to a common gradient at any one time. The distance between adjacent sight rails shall not exceed 6Om. Properly cut wooden or iron pegs shall be driven to the bottom of the pipe trenches at intervals of 6Ocm. less than the length of the pipes to be laid. A boning rod shall be placed on the top of each peg and held truly vertical and then shall be driven down until the top of the boning rod is in perfect alignment with the top of the sight rails. Levels measured from a string run between profile boards is not an acceptable way of measuring the required height as the string will sag. The profile boards should be securely fixed at locations that are not likely to be disturbed during excavation.

The top of each peg so boned shall be the invert of the pipe at that point and the bottoming up of the trench shall be carried to a depth equal to the thickness of the pipe below the top of the peg and throughout the length between two consecutive pegs. Square mouthed shovels shall be employed in the final bottoming of the invert of the trench. The pegs shall be removed as the pipes are laid.

The pipes shall be laid in straight lines in plan where possible, but where curves or changes in direction are shown on the Drawing or indicated by site conditions they shall be effected in accordance with Clause 18.6.

Before pipes are jointed they shall be thoroughly cleaned of all earth lumps, stone, or any other objects that may have entered the interior of the pipes.

At the end of each working day, or whenever work is interrupted for any period of time, the free ends of laid pipes shall be protected by suitable covers against the entry of dirt or other foreign matter by means of approved plugs.

When pipelaying is not in progress, the open ends of installed pipe shall be closed by approved means to prevent entrance of trench water into the line. Whenever water is excluded from the interior of the pipe, enough backfill shall be placed on the pipe to prevent floating. Any pipes that have floated shall be removed from the trench and relaid as directed by the Engineer.

No pipe shall be laid in wet trench conditions that precludes proper bedding, or when in the opinion of the Engineer, the trench conditions or the weather are unsuitable for proper installation.

For the pipe laying the lifting forces of empty pipes in ground water must be considered. If there is the danger of lifting the pipe special measures must take place to prevent the uplift. These are e.g. concrete cover along the pipe, concrete blocks placed with a

certain distance along the pipe, anchors. These measures are subject to the approval of the Engineer.

9.4.3 LOWERING AND LAYING OF PIPES

The trench shall be checked for proper level, gradient and alignment before lowering the pipes.

Lowering

The pipes shall be lowered cautiously to prevent disturbance of the bed and sides of the trench. The heavy pipes shall be lowered by means of proper shear legs, chain pulley blocks or as directed by Engineer in charge. Great care should be taken to prevent sand and other foreign material etc. from entering the pipes.

Laying

Laying of pipes shall proceed up grade of slopes. The error of grade shall not be rectified by packing up earth underneath the pipes. If required, concrete shall be used for packing. The ends of the pipes shall be kept closed to keep dirt, mud and foreign materials, out. Adequate provision shall be made to prevent floating of pipe in the event of flooding of trenches. The body of the pipe for its entire length shall rest on an even bed in the trench and places shall be excavated to receive the collar for the purpose of jointing.

9.5 TESTING FOR WATER SUPPLY SYSTEM

When the service is complete, it shall be slowly and carefully charged with water, allowing all air to escape and avoiding all shock or water hammer. The services shall then be inspected under working conditions of pressure. When all draw of points are closed, the service pipe shall be absolutely water tight. All piping, fittings and appliances will be checked over for satisfactory support, and protection from damage and corrosion. Because of the possibility of damage in transits, cisterns shall be retested for water tightness on arrival at the site, before fixing.

9.6 TESTING FOR SEWER SYSTEM

Comprehensive tests of all appliances shall be made by simulating conditions of use before the final approval. Over flow shall also be examined for obstruction.

• SECTION-10 PAINTING, WATERPROOFING AND GLAZING

• 10.1 PAINTING GENERAL

All paints, wood preservatives, stains, etc., shall be approved makes and application and shall conform implicitly with the manufacturer's instruction.

Where more than one undercoat is specified they shall be of distinctive tints, and finishing colours are to be approved by the Engineer. No coat shall be applied until at least 24 hours drying time for the previous coat has elapsed, nor hsall any paint be applied to a surface that is damp.

All paint work on metal and wood shall be rubbed down with glass paper between coats. Plaster surfaces shall be cored with coarse glass paper before work proceeds. Final painting shall be left till after substantial completion of the Contract, unless otherwise ordered. Except where otherwise specified, all painting and polishing shall be applied in conformity with CP 231"Painting" as applicable to the work shown on the drawings and in the Bill of Quantities.

Materials of painting and polishing shall be high grade products of known manufactures approved by the Engineer and shall be delivered to the site in original unbroken packages bearing the maker's name and brand.

• 10.2 PAINTING WOODWORK

All woodwork except where otherwise specified shall be properly rubbed down, knotted, stopped and primed and painted three coats of approved classes of ail paints and finished to approved tints. Each coat shall be rubbed down to the final coat which shall be a hard glass coat. When priming, the grates care shall be taken to see that priming is thoroughly brushed into every part of the surface in particular at end grains, joints and notches.

Joinery shall be primed before assembly and all timber to be inserted in concrete or brickwork and all faces of timber to remain in contact with concrete or brickwork shall be stained with two coats of solignum or other preservative as specified. All hardwood unless otherwise painted or protected shall be treated with wo coats of boiled linseed oil after erection.

• 10.3 PAINTING PLASTER ETC.

Plaster work shall be carefully rubbed down smooth and any cracks, blisters or other imperfections cut out carefully, stopped and made good with Parian cement. Before painting is commenced, all plaster shall have dried out to the satisfaction of the Engineer, and any efflorescence on the surface shall have been removed by dry brushing.

All plaster and internal concrete to be painted shall be given three coats of "Plastic Emulsion Coating" unless otherwise specified, in accordance with the manufacturer's instructions and finished to be approved tints.

- **10.4 WORKMANSHIP**

a) All surfaces shall be clean, dry and free from dust at the time any coating is applied.

b) Wood work shall be smooth and free from raised grains or other surface imperfections. Knots and piles streaks nails, holes, cracks and similar blemishes, shall be neatly puttied and sanded smooth.

c) Plastered surfaces shall be allowed to dry for a minimum of 15 days prior to painting and cleaned until free of all loose and foreign materials and excess mortar, using metal scrapers and wire brushes if necessary. Grades and oil spots shall be removed by suitable cleaning compound and then rinsed with clean water to remove all traces of alkali efflorescence (alkali salts). Interior concrete surfaces shall be washed with zinc sulphate solution mixes in proportion of 2 ½ to 3 pints to a gallon of water. Treated surfaces shall be allowed to dry thoroughly before any paint is applied. Plaster patches shall be worked to match the appearance of the adjoining plaster.

d) Ferrous surfaces that have not been shop painted shall be kept clean and free from corrosion before installation. All rust shall be removed before priming. Abraded or corroded spots on shop-coated surface shall be wire brushed and touched up with the same material as the top coat. Dents, hollow places, open joints and any other irregularities in metal work shall be filled in with approved metal body filter suitable for the purpose and sanded to smooth and hard finish.

e) **Plastic Emulsion/Enamel Painting**

1) Two coats (except where otherwise provided) of plastic emulsion/enamel paint over a coat of priming shall be applied on the approved prepared surface faces in accordance with manufacturer's general instructions and / or directions of the Engineer.

2) Each coat of paint shall be evenly worked and allowed to dry before any subsequent coat is applied or any rubbing is done. The primary coat shall be thinner than the subsequent coats to assist penetration and adhesion.

3) Finish coat shall be of the exact shade approved by the Engineer. It shall be very carefully crossed and laid off so that brush marks are not visible. The finished work shall be free from runs and sags, defective coverage and clogging or liens or angles. Edges of pain adjoining other material or other colour shall be full and cleaned out without overlapping.

4) Spray painting shall not be employed for joinery work which must be done by brush to obtain proper penetration into joints and cracks etc.

5) When painting is applied by brushes, the brushes shall be in conformity to the applicable requirements of BS 2992. All coats shall be spread as evenly and smooth as possible by crossing and laying off. Brushes shall be reversed at frequent intervals so that they wear down evenly. A free easy stroke shall be cultivated, avoiding short and jerky strokes and stretching the strokes too far.

f) **Touching Up**

At the completion of other items of work, all finished work shall be touched up and restored where damaged or defaced and the entire work left free from blemishes, sports etc.

• 10.5 GLAZING MATERIALS

All sheet glass shall comply with the requirement of standards for external installation in warm climates depending on the use of the windows and doors the type of glass must be used as specified. All glaziers work shall be carried out in the best approved manner and in accordance with international accepted standards. Putty for glazing to wood shall be linseed oil putty of a suitable quality. Putty for glazing to metal shall be an approved putty fur use with metal frames as recommended by the manufacturer.

Instead of putty also approved synthetic materials maybe used. Care must be taken that the synthetic materials are well tolerated by the paint of the windows or doors.

• 10.6 FIXING OF GLASS

Unless specified to the contrary all glass is to be neatly splayed to the sight line externally. All glazing rebates are to be primed before glazing and all putty shall be painted within seven days of being applied.

Glazing shall be fixed in metal windows by proprietary PVC or neoprene molded soling strips as provided by the manufacturers of the windows, or as may be directed by the Engineer. All windows shall be glazed with 5 mm thick glass.

The contractor shall be responsible for protecting and maintaining all glazing in its prime condition. On completion all glass shall be cleaned inside and out and all cracked and broken glass shall be replaced, all to the satisfaction of the Engineer.

• SECTION-11 SITEWORKS, PATHS, ROADS AND PAVED AREAS

• 11.1 GENERAL

Work under this Section comprises site formation and the construction of paths, roads, paved areas, rainwater ditches and culverts.

The paths, roads and paved areas shall be correctly set out in accordance with the lines and levels shown on the Drawings or as directed by the Engineer.

The width and traversal slopes of the roads and pave areas are shown on the Drawings. All roadwork included in this contract shall be constructed in accordance with this Specification and the requirements of the Highway authority of Pakistan.

The roads with the base course and prime coats completed may be used as access and construction road. The seal coat, where directed, shall not be placed until all construction works have been completed. Site formation shall be carried out in accordance with the Drawings and as directed by the Engineer. Rainwater ditches shall be excavated where shown on the Drawings and ordered to protect the Site against flooding by surface water.

• 11.2 CONSTRUCTION OF ROADS-PREPARATION OF SUB-GRADES

The ground shall be shaped by excavation and fill, as the case may be, to obtain the required sub-grade for roads or parking areas. Where, in the opinion of the engineer, the ground at formation level is not capable of carrying traffic, an additional excavation shall take place to the required depth, where stable foundation conditions are available and the surface made up to the required level with hard broken bolders or other approved material.

The subgrade shall be thoroughly consolidated and rolled to the cross falls shown on the Drawing. all materials outside the prescribed lines shall be removed and all depressions shall be filled with compacted material approved by the Engineer. The sub grade shall be thoroughly consolidated and rolled to the crossfall as shown on the drawings. All materials outside the prescribed lines shall be removed and all depressions shall be filled with compacted material approved by the Engineer. Where material on the sub-grade is loose or otherwise unsuitable to receive the base course, such material shall be consolidated of the satisfaction of the Engineer, or it shall be removed and the resulting depressions shall be filled as aforesaid. The surface of the sub-grade and verges shall be accurately finished to the required lines.

• 11.3 MATERIAL FOR GRAVEL BASE

The grading which might be used for the base shall be as follows:

As example is shown material usable for the base with a maximum grain size of 56mm.

Sieve Size in mm	Percentage Passing lower limit	upper limit
56	100	90
45	90	70
31.5	81	61
16	68	44
8	57	33
4	47	24
2	40	18
1	35	11
0,5	30	5
0,25	25	2
0,063	7	0

The minimum thickness allowed to build in is 20cm below the bituminous layers. The allowable deviation from the position according to profiles is smaller than +/- 2cm. The deviation from the evenness shall be smaller than 2cm over a length of 4m.

Any base course material delivered to Site which does not meet the requirements of these Clause or the approval of the Engineer shall be removed from the Site and replaced by material which conforms to specification requirements.

- **11.4 MATERIAL FOR BITUMINOUS BASE**

The bituminous base shall have a thickness depending on the traffic load. For a low traffic load the bituminous base shall have a thickness of 10cm. This base will consist of mineral material of the required grading (0/32mm) and of bitumen used for road construction. The grading as well as the bituminous material must comply with Pakistan standards and are subject to the approval of the engineer.

- **11.5 MATERIAL FOR BITUMINOUS SEALING**

This layer is placed on the top of the bituminous base. The thickness depends on the traffic load. For a low traffic load the bituminous sealing will have a thickness of 4cm. The grading of the aggregates shall be 0/16mm. The detailed grading and the bitumen used shall comply with Pakistan standards and are subject to the approval of the engineer.

- **11.6 GABBION WALLS**

Wire for Stone Gabions: high galvanized low carbon steel wire, the quality and technique as following: A, Gabion Box is made of high galvanized low carbon steel wire or intertwisted wire by double intertwist with machine or forming hexagonal structure. The quality conforms to BS443, BS1052.B, resin film (PVC,PE) conforms to ASTM D412,ASTM D719C, Gabion Box material is supported by ISO9001:2000D, Base on international standard of EN 10223

Carbon steel wire shall be coated (95% Zinc 5% Aluminium) for welded mesh Gabion baskets wire as per EN 10218-2. All mesh panels used to conform to EN10244-2 with a tensile range of 540-770N/mm2, steel grade 0.10% Carbon max, Weld sheer strength minimum 75% of the tensile strength of the wire.

Required minimum 4mm dia wire with mesh according to stone size

• SECTION-12 FLOOR AND WALL TILING

• 12.1 FLOOR AND WALL TILES

The laying of the tiles shall not commence until the work of all other trades has been completed. The tiles shall be laid flush with adjacent surfaces. The wall tiles shall have dimensions shown on drawings or as in the bills of quantities, alternatively as agreed with the Engineer. The colour shade of the tiles will be subject to the approval of the engineer.

The wall tiles should be fixed in continuous, true horizontal and vertical joints to the indicated heights. The fixing should be done by mastic adhesives and bedded according to the instructions of the manufacturers of the adhesive. Joints shall be of a minimum of 2mm and the surface of the finished tiling should not vary from the general plane by more than 2mm in any distance of 3m. Pointing of the joints shall be done by grouting. The colour and type of grouting is subject to the approval of the engineer.

Tile fittings and cushion edges shall be included where necessary. Rounded edges shall fit neatly to the adjacent plaster. The above mentioned is corresponding valid for floor tiles. The laying of the floor tiles shall start at the centre of the floor and shall be worked toward the walls and so adjusted as too avoid the use of fractional tiles. The joint shall be continuous. The surface where the tiles are laid shall be level, even and cracks, holes or bad patches have to be filled with a non-shrinking mortar. Before laying starts, the surface shall be swept clean and shall be free from paint, oil, grease etc.

12.2 MARBLE WORK

These shall be of the sizes specified in the relevant drawings or Bill of Quantities and shall be machine cut and pre-polished from one side with rounded bull nose front edges and (if necessary) corners. The marble tops shall be 25mm thick and free from all defects hair cracks etc.This shall be fixed in the brickwork and or concrete with 1:2 cement sand mortar base and appropriate groove made good to match after fixing. Where indicated in the drawings the marble tops shall be provided with the wash basin/ kitchen sink holes in required size before fixing the marble in place. The Marble steps for staircase tread shall be of specified size and 25mm thickness in approved pattern and color. These shall be pre-polished from one side with rounded bull nose front edges. This riser shall also be pre-polished in required size as per drawings and 10mm thick.

• 12.3 CLEANING UP AND PROTECTION

All floor and finishes are to be left in a clean and perfect condition, and all dirt, grease, extrusions of vedding and other adhesive materials are to be carefully removed without damaging the floor finish. The contractor must protect also floors and skirting from damage after laying, using the most suitable and approved means for the type of floor concerned. Any faulty sections, cracked, broken or chipped tiles, etc must be replaced and made good, as must any other damage resulting from the floors not being properly protected.

• **12.4 CONCRETE FLOORING** The floor finish shall comprise of cement concrete of required Class (as specified in drawings or BOQ) and shall be laid in panels to the required thickness as shown on the Drawing of as directed by the Engineer. The panels shall be made by provision of fixing glass strips 4mm thick and 1" deep. The pouring of concrete shall be carried out in alternate panels. The concrete after laying will be thoroughly rammed and mortar worked up to the top and smoothed with a steel towel. The edge of each section into which the floor is divided (if free at ends) should be defined by wooden strips of the approved width and of a depth equal to the depth of the floor concrete. Freshly placed concrete floor and completed floor portions as finished shall be protected to prevent loss of water by curing through ponding method or prevent

the loss of water by applying approved water trapping material with consent and approval of Engineer, and shall be kept constantly damp for a period of seven days minimum or longer after concreting as directed by the Engineer. The concrete shall be allowed to dry out slowly over a period of the days after wet curing is completed.

NOTE:

- This is a standard bid document and contains 157 pages, the Bidders are required to sign and stamp each page, in case of failure it will not be entertained.
- The Bidder who failed to comply the instructions will not be entertained for evaluation.
- The evaluation of the bids will be carried out by the procurement Committee as defined in the SPPRA Regulations.