NOTICE INVITING TENDER

Sindh Economic Zones Management Company invites eligible contractors/firms for repair and maintenance of the RCC boundary wall and perimeter steel fencing, desilting/cleaning of storm water drainage and sewerage manholes network, and cleaning of the underground wastewater tank / STP, UPVC doors and paint work of admin block at Khairpur Special Economic Zone.

Bidders must be active taxpayers registered with FBR and SRB, and hold valid PEC registration. Procurement will follow the Single Stage One Envelope method under SPP Rules 2010.

Interested Firms / Contractors may download "TENDER DOCUMENTS" free of cost from 27th October 2026 containing Terms & Conditions from following website: www.sezmc.gos.pk , free of cost. The bidder must be registered with E - PAK ACQUISITION & DISPOSAL SYSTEM (EPADS). Interested bidders are requested to submit their bid online through EPADS portal in accordance to the qualification/ eligibility criteria mentioned. The bid security of PKR 470,000/- in the shape of Pay Order shall be submitted in SEZMC office on or before 11:00 am, 12th November 2026. Bids will be opened on the same day at 12:00 noon.

Ref: CTO/SEZMC/KSEZ/O&M/2022-23/158

NOTICE INVITING TENDER

Sindh Economic Zones Management Company invites eligible contractors/firms for repair and maintenance of the RCC boundary wall and perimeter steel fencing, desilting/cleaning of storm water drainage and sewerage manholes network, and cleaning of the underground wastewater tank / STP, UPVC doors & Paint work of Admin Building at Khairpur Special Economic Zone

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Qualification Criteria/Eligibility Criteria

Sr.	Description	Mandatory Requirements
1	BASIC ELIGIBILITY Valid Registration with Pakistan Engineering Council in the relevant Category and Discipline.	Category C5 and above and in Discipline CE-01, CE-9, CE-10
2	Income Tax Returns for the last Three (3) Years	Mandatory
3	Affidavit details pending Litigations/ Arbitration / Disputes with client (if any)	Mandatory
4	Affidavit that the Firm has never been blacklisted	Mandatory
5	NTN & SBR valid registration Certificate	Mandatory
6	Details of Manpower and equipment	Mandatory
7	Net capital of at least PKR 30 million	Mandatory
8	The firm shall have completed at least one project within a Special Economic Zone (SEZ) within last three years	Mandatory

Each page of the bidding document shall be signed and stamped by the bidder. The name of the firm and the name of Bidder shall be clearly typed on the front page.

Description	**Details**
Address and Contact Person of Procuring Agency	Manager Sindh Economic Zone Management Company (SEZMC) 2nd Floor, Bahria Complex-IV, Choudhry Khaliq-Uz-Zaman Road, Gizri, Karachi. Tel: +92 21 99332220
Tender document will be available from:	09:00 am, 27th October, 2026
Issuance Deadline date and time	10:00 am, 12th November, 2026
Submission Deadline date and time	11:00 am, 12th November, 2026
Bid Opening	12:00 noon, 12th November, 2026
Bid Opening Address	2nd Floor, Block A, Bahria Complex IV, Gizri, Karachi.
Bid Security	PKR 470,000/- In the name of Sindh Economic Zones Management Company - NTN:5074375-5
Procurement method	Single stage One envelope – Least cost

Terms & Conditions:

Under following conditions bid will be rejected:

• Bids not submitted with Bid Security of required amount and in the specified shape.

• Bids received after specified date and time.

• Procuring Agency may reject all or any bid as per relevant provisions of Sindh Public Procurement (SPPRA) Rules 2010.

INSTRUCTIONS TO BIDDERS

A. GENERAL

IB.1 Scope of Bid

1.1 The Employer as defined in the Bidding Data hereinafter called "the procuring agency" wishes to receive bids for the construction and completion of works as described in these Bidding Documents, and summarized in the Bidding Data hereinafter referred to as the "Works".

1.2 The successful bidder will be expected to complete the Works within the time specified in Appendix-A to Bid.

IB.2 Source of Funds

2.1 The procuring agency has got approved budget From Sindh Economic Zone Management Company Board Shall be funding the project as indicated in the Bidding Data local currency towards the cost of the project specified in the Bidding Data which is based on Market rates and the funds will be available for payments under the Contract for which these Bidding Documents are issued.

IB.3 Eligible Bidders

3.1 This Invitation for Bids is open to Firms / Contractors / Joint Ventures who are elijable, and under provisions of Sindh Public Procurement Rules as mentioned below and, in the Notice Inviting Tender (NIT)/ Bidding Document.

(c) Bidders: -

(i) Registered with Pakistan Engineering Council in particular category and discipline,

(ii) Registered with relevant tax authorities (income /sales tax, SRB wherever aplicable)

IB.4 One Bid per Bidder

4.1 Each bidder shall submit only one bid either by himself, or as a partner in a joint venture. A bidder who submits or participates in more than one bid (other than alternatives pursuant to Clause IB.16) will be disqualified.

IB.5 Cost of Bidding:

5.1 The bidders shall bear all costs associated with the preparation and submission of their respective bids and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

IB.6 Site Visit

6.1 The bidders are advised to visit and examine the Site of Works and its surroundings and obtain for themselves on their own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. All cost in this respect shall be at the bidder's own expense.

6.2 The bidders and any of their personnel or agents will be granted permission by the Employer to enter upon his premises and lands for the purpose of such inspection, but only upon the express condition that the bidders, their personnel and agents, will release and indemnify the Employer, his personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of such inspection.

B. BIDDING DOCUMENTS

IB.7 Contents of Bidding Documents (SSP RULES 21)

7.1 The Bidding Documents, in addition to invitation for bids, are those stated below and should be read in conjunction with any Addenda issued in accordance with Clause IB.9.

a. Instructions to Bidders.
b. Bidding Data.
c. General Conditions of Contract, Part-I (GCC).
d. Special Condition of Contract, Part-II (SCC).
e. Specifications -.
f. Form of Bid & Appendices to Bid.
g. Bill of Quantities
h. Form of Bid Security.
i. Form of Contract Agreement.
J. Forms of Performance Security and Mobilization Advance Guarantee, Integrity pact and Indenture Bond for secured advance.
k. Drawings.

7.2 The bidders are expected to examine carefully the contents of all the above documents. Failure to comply with the requirements of bid submission will be at the Bidder's own risk. Pursuant to Clause IB.26, bids which are not substantially responsive to the requirements of the Bidding Documents will be rejected.

IB.8 Clarification of Bidding Documents (SSP RULES 21)

8.1 Any prospective bidder requiring any clarification (s) in respect of the Bidding Documents may notify the Employer in writing at the Employer's address indicated in the Invitation for Bids. The Employer will respond to any request for clarification which he receives earlier than 7 days prior to the deadline for submission of bids.

8.2 Copies of the Employer's response will be forwarded to all purchasers of the Bidding Documents, including a description of the enquiry but without identifying its source.

IB.9 Amendment / Modification of Bidding Documents

9.1 At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective bidder, modify the Bidding Documents by issuing addendum.

9.2 Any addendum thus issued shall be part of the Bidding Documents pursuant to Sub–Clause 7.1 hereof and shall be communicated in writing to all purchasers of the Bidding Documents. Prospective bidders shall acknowledge receipt of each addendum in writing to the Employer.

9.3 To afford prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may extend the deadline for submission of bids in accordance with Clause IB.20

C. PREPARATION OF BIDS

IB.10 Language of Bid

10.1 The bid and all correspondence and documents related to the bid exchanged by a bidder and the Employer shall be in the bid language stipulated in the Bidding Data and Particular Conditions of Contract. Supporting documents and printed literature furnished by the bidders may be in any other language provided the same are accompanied by an accurate translation of the relevant parts in the bid language, in which case, for purposes of evaluation of the bid, the translation in bid language shall prevail.

IB.11 Documents Accompanying the Bid

11.1 Each bidder shall:

(a) Submit a written power of attorney authorizing the signatory of the bid to act for and on behalf of the bidder;

(b) Update the information indicated and listed in the Bidding Data and previously submitted with the application for prequalification, and continues to meet the minimum criteria set out in the prequalification documents which as a minimum, would include the following:

(i) Evidence of access to financial resources alongwith average annual Construction turnover;
(ii) Financial predictions for the current year and the two following years including the effect of known commitments;
(iii) Work commitments since prequalification;
(iv) Current litigation information; and
(v) Availability of critical equipment and

(c) Furnish a technical proposal taking into account the various Appendices to Bid specially the following:

Appendix-D to Bid	Proposed Construction Schedule
Appendix-E to Bid	Method of Performing the Work
Appendix-F to Bid	List of Major Equipment

And other pertinent information such as mobilization programme etc;

11.2 Bids submitted by a joint venture of two (2) or more firms shall comply with the following requirements:

(a) one of the joint venture partners shall be nominated as being in charge; and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the joint venture partners;

(b) the bid and in case of a successful bid, the Form of Contract Agreement shall be signed so as to be legally binding on all partners;

(c) the partner-in-charge shall always be duly authorized to deal with the Employer regarding all matters related with and/or incidental to the execution of Works as per the terms and Conditions of Contract and in this regard to incur any and all liabilities, receive instructions, give binding undertakings and receive payments on behalf of the joint venture;

(d) all partners of the joint venture shall at all times and under all circumstances be liable jointly and severally for the execution of the Contract in accordance with the Contract terms and a statement to this effect shall be included in the authorization mentioned under Sub-Para(b) above as well as in the Form of Bid and in the Form of Contract Agreement (in case of a successful bid);

(e) a copy of the agreement entered into by the joint venture partners shall be submitted with the bid stating the conditions under which it will function, its period of duration, the persons authorized to represent and obligate it and which persons will be directly responsible for due performance of the Contract and can give valid receipts on behalf of the joint venture, the proportionate participation of the several firms forming the joint venture, and any other information necessary to permit a full appraisal of its functioning. No amendments / modifications whatsoever in the joint venture agreement shall be agreed to between the joint venture partner without prior written consent of the procuring agency

(f) submission of an alternative letter of Intent to execute a Joint Venture Agreement shall be mandatory

11.3 Bidders shall also submit proposals of work methods and schedule, in sufficient detail to demonstrate the adequacy of the Bidders' proposals to meet the technical specifications and the completion time referred to in Sub-Clause 1.2 hereof.

IB.12 Bid Prices

12.1 Unless stated otherwise in the Bidding Documents, the Contract shall be for the whole of the Works as described in Sub-Clause 1.1 hereof, based on the unit rates and / or prices submitted by the bidder.

12.2 The bidders shall fill in rates and price for all items Works described in the Bill of Quantities. Items against which no rate or price is entered by a bidder will not be paid for by the Employer when executed and shall be deemed covered by rates and prices for other items in the Bill of Quantities.

12.3 The bid price submitted by the contractor shall include all rates and price including the taxes. All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior to the deadline for submission of bids shall be included in the rates and prices and the total Bid Price submitted by a bidder.

Additional / reduced duties, taxes and levies due to subsequent additions or changes in legislation shall be reimbursed / deducted as per Sub-Clause 13.7 of the General Conditions of Contract Part-I.

12.4 The rates and prices quoted by the bidders are subject to adjustment during the performance of the Contract in accordance with the provisions of Clause 13.7 of the Conditions of Contract. The bidders shall furnish the prescribed information for the price adjustment formulae in Appendix-C to Bid, and shall submit with their bids such other supporting information as required under the said Clause. Adjustment in prices quoted by bidders shall be allowed as per Sub-Para 4(ii) of section C of Instructions to bidders and bidding data.

IB.13 Currencies of Bid and Payment

13.1 The unit rates and the prices shall be quoted by the bidder entirely in Pak rupees. A bidder expecting to incur expenditures in other currencies for inputs to the Works supplied from outside the Employer's country (referred to as the "Foreign Currency Requirements") shall indicate the same in Appendix-B to Bid. The proportion of the Bid Price (excluding Provisional Sums) needed by him for the payment of such Foreign Currency Requirements either (i) entirely in the currency of the Bidder's home country or, (ii) at the bidder's option, entirely in Pak rupees provided always that a bidder expecting to incur expenditures in a currency or currencies other than those stated in (i) and (ii) above for a portion of the foreign currency requirements, and wishing to be paid accordingly, shall indicate the respective portions in his bid

IB.14 Bid Validity

14.1 Bids shall remain valid for the period stipulated in the Bidding Data after the Date of Bid Opening specified in Clause IB.23.

14.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Employer may request that the bidders extend the period of validity for a specified additional period which shall in no case be more than the original bid

validity period. The request and the responses thereto shall be made in writing. A bidder may refuse the request without forfeiting his Bid Security. A bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his Bid Security for the period of the extension, and in compliance with Clause IB.15 in all respects.

IB.15 Bid Security

15.1 Each bidder shall furnish, as part of his bid, a Bid Security in the amount stipulated in the Bidding Data in Pak Rupees or an equivalent amount in a freely convertible currency.

15.2 The Bid Security shall be, at the option of the bidder, in the form of Deposit at Call or a Bank Guarantee issued by a Scheduled Bank in Pakistan or from a foreign bank duly counter guaranteed by a Scheduled Bank in Pakistan in favour of procuring agency valid for a period 28 days beyond the Bid Validity date.

15.3 The Bid Security shall be submitted to the procuring agency office on or before the last date of the bid submission in the shape / form mentioned in the bidding document. The Bidder shall also upload a scanned copy of the Bid Security on EPADS Portal. Any bid not accompanied by an acceptable Bid Security shall be rejected by the procuring agency as non-responsive.

15.4 Bid securities shall be released to the unsuccessful bidders once the contract has been signed with the successful bidder or the validity period has been expired.

15.5 The Bid Security of the successful bidder will be returned when the bidder has furnished the required Performance Security and signed the Contract Agreement.

15.6 The Bid Security may be forfeited:

(a) If the bidder withdraws his bid except as provided in Sub-Clause 22.1;

(b) If the bidder does not accept the correction of his Bid Price pursuant to Sub-Clause 27.2 hereof; or

(c) In the case of successful bidder, if he fails within the specified time limit to:

(i) Furnish the required Performance Security; or

(ii) Sign the Contract Agreement.

IB.16 Alternate Proposals by Bidder

“This ítem deleted in Totality”

IB.17 Pre-Bid Meeting

17.1 The Procuring agency may, on his own motion or at the request of any prospective bidder(s), hold a pre-bid meeting to clarify issues and to answer any questions on matters related to the Bidding Documents. The date, time and venue of pre-bid meeting, if convened, is as stipulated in the Bidding Data. All prospective bidders or their authorized representatives shall be invited to attend such a pre-bid meeting at their own expense.

17.2 The bidders are requested to submit questions, if any, in writing so as to reach the Employer not later than five (5) days before the proposed pre-bid meeting.

17.3 Minutes of the pre-bid meeting, including the text of the questions raised and the replies given, will be transmitted without delay to all purchasers of the Bidding Documents. Any modification of the Bidding Documents listed in Sub-Clause 7.1 hereof which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause IB.9 and not through the minutes of the pre-bid meeting.

17.4 Absence at the pre-bid meeting will not be a cause for disqualification of a bidder.

IB.18 Format and Signing of Bid

18.1 Bidders are particularly directed that the amount entered on the Form of Bid shall be for performing the Contract strictly in accordance with the Bidding Documents.

18.2 All appendices to Bid are to be properly completed and signed.

18.3 Alteration is not to be made neither in the Form of Bid nor in the Appendices thereto except in filling up the blanks as directed. If any such alterations be made or if these instructions be not fully complied with, the bid may be rejected.

18.4 Each bidder shall prepare by filling out the forms completely and without alterations and shall provide an original along with photocopies as per requirement of procuring agency, specified in the Bidding Data, of the documents comprising the bid as described in Clause IB.7 and clearly mark them “ORIGINAL” and ‘COPY” as appropriate. In the event of discrepancy between them, the original shall prevail.

18.5 The original and all copies of the bid shall be typed or written in indelible ink (in the case of copies, Photostats are also acceptable) and shall be signed by a person or persons duly authorized to sign on behalf of the bidder pursuant to Sub- Clause 11.1(a) hereof. All pages of the bid shall be initialed and stamped by the person or persons signing the bid.

18.6 The bid shall contain no alterations, omissions or additions, except to comply with instructions issued by the Employer, or as are necessary to correct errors made by the bidder, in which case such corrections shall be initialed by the person or persons signing the bid.

18.7 Bidders shall indicate in the space provided in the Form of Bid their full and proper postal addresses at which notices may be legally served on them and to which all correspondence in connection with their bids and the Contract is to be sent.

18.8 Bidders should retain a copy of the Bidding Documents as their file copy.

D. SUBMISSION OF BIDS

IB.19 Sealing and Marking of Bids

19.1 Each bidder shall submit his bid as under:

(a) ORIGINAL Bid shall be submitted on the EPADS Portal mentioned in the bidding document.

IB.20 Deadline for Submission of Bids

20.1 (a) Bids must be received by the procuring agency no later than the time and date stipulated in the Bidding Data.

b) Bids with charges payable will not be accepted, nor will arrangements be undertaken to collect the bids from any delivery point other than that specified above. Bidders shall bear all expenses incurred in the preparation and delivery of bids. No claims will be entertained for refund of such expenses.

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

IB.21 Late Bids

(a) Any bid received by the procuring agency after the deadline for submission of bids prescribed in Clause IB.20 will not be accepted by the procuring agency.

(b) Delays of any kind shall not be accepted as an excuse for failure to upload the bid at the proper time. It shall be the bidder's responsibility to determine to submit the bid in time.

IB.22 Modification, Substitution and Withdrawal of Bids

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

22.2 The modification, substitution, or notice for withdrawal of any bid shall be prepared, sealed, marked and delivered in accordance with the provisions of

Clause IB.19 with the outer and inner envelopes additionally marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" as appropriate.

22.3 No bid may be modified by a bidder after the deadline for submission of bids except in accordance with Sub-Clauses 22.1 and 27.2.

22.4 Withdrawal of a bid during the interval between the deadline for submission of bids and the expiration of the period of bid validity specified in the Form of Bid may result in forfeiture of the Bid Security in pursuance to Clause IB.15.

E. BID OPENING AND EVALUATION

IB.23 Bid Opening

23.1 The procuring agency will open the bids, including withdrawals, substitution and modifications made pursuant to Clause IB.22, in the presence of bidders' representatives who choose to attend, at the time, date and location stipulated in the Bidding Data. The bidders' representatives who are present shall sign a register evidencing their attendance.

23.2 Envelopes marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" shall be opened and read out first. Bids for which an acceptable notice of withdrawal has been submitted pursuant to Clause IB.22 shall not be opened.

23.3 procuring agency shall read aloud the name of the bidder's total Bid Price and price of any Alternate Proposal(s), any discounts, bid modifications**,** substitution and withdrawals, the presence or absence of Bid Security, and such other details as the procuring agency may consider appropriate, total amount of each bid, and of any alternate bid if they have been requested or permitted, shall be read aloud and record when opened.

23.4 procuring agency shall prepare minutes of the bid opening, including the information disclosed to those present in accordance with the Sub-Clause 23.3.

IB.24 Process to be Confidential (SPP Rules 53)

24.1 Information relating to the examination, clarification, evaluation and comparison of bid and recommendations for the award of a contract shall not be disclosed to bidders or any other person not officially concerned with such process before the announcement of bid evaluation report in accordance with the requirements of Rule 45, which states that Procuring agencies shall announce the results of bid evaluation in the form of a report giving reasons for acceptance or rejection of bids. The report shall be hoisted on website of authority and that of procuring agency if it website exists and intimated to all bidders at least three (3) days prior to the award of contract The announcement to all bidders will include table(s) comprising read out prices, discounted prices, price adjustments made, final evaluated prices and recommendations against all the bids evaluated. Any effort by a bidder to influence the procuring agency's processing of bids or award decisions may result in the rejection of such bidder's bid. Whereas, any bidder feeling aggrieved, may lodge a written complaint as per Rule 31; however mere

fact of lodging a complaint shall not warrant suspensión of the procurement process.

IB.25 Clarification of Bids (SPP Rules 43)

25.1 To assist in the examination, evaluation and comparison of bids, the Employer may, at his discretion, ask any bidder for clarification of his bid, including breakdowns of unit rates. The request for clarification and the response shall be in writing but no change in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids in accordance with Clause IB.28.

IB.26 Examination of Bids and Determination of Responsiveness

26.1 Prior to the detailed evaluation of bids, the procuring agency will determine whether the bidder fulfills all codal requirements of eligibility criteria given in the tender notice such as registration with tax authorities, registration with PEC (where applicable), turnover statement, experience statement, and any other condition mentioned in the NIT and bidding document. If the bidder does not fulfill any of these conditions, it shall not be evaluated further.

26.2 Once found to be fulfilling the eligibility criteria, as mentioned in sub- clause 26.1, the bids of eligible bidders will be evaluated for technical responsiveness as per specification and criteria given in the bidding documents. Technical and financial evaluations may be carried out in accordance with single stage-single one envelope, single stage-two envelopes, two stage or two stage-two envelopes bidding procedures, (18) depending on the selection procedure adopted by the procuring agency.

26.3 A bid will be considered technically responsive if it (i) has been properly signed; (ii) is accompanied by the required bid security; and (iii) conforms to all the terms, conditions and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one (i) which affect in any substantial way the scope, quality or performance of the works; (ii) which limits in any substantial way, inconsistent with the bidding documents, the procuring agency's rights or the bidder's obligations under the contract; or (iii) adoption/rectification whereof would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

26.4 If a bid has major deviations to the commercial requirements and technical specifications will be considered technically non responsive. As a general rule, major deviations are those that if accepted, would not fulfil the purposes for which the bid is requested, or would prevent a fair comparison or affect the ranking of the bids that are compliant with the bidding documents.

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

(i) has been not properly signed;
(ii) is not accompanied by the bid security of required amount and manner;

(iii) stipulating price adjustment when fixed price bids were called for;

(iv) failing to respond to specifications;

(v) failing to comply with Mile-stones/Critical dates provided in Bidding Documents;

(vi) sub-contracting contrary to the Conditions of Contract specified in Bidding Documents;

(vii) refusing to bear important responsibilities and liabilities allocated in the Bidding Documents, such as performance guarantees and insurance coverage;

(viii) taking exception to critical provisions such as applicable law, taxes and duties and dispute resolution procedures;

(ix) a material deviation or reservation is one:

(a) which affect in any substantial way the scope, quality or performance of the works;

(b) 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.

26.5 If a bid is not substantially responsive, it will be rejected by the procuring agency, and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

IB.27 Correction of Errors

27.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:

(a) Where there is a discrepancy between the amounts in figures and in words, the amount in words will govern; and

(b) Where there is a discrepancy between the unit rate and the line-item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer there is an obviously gross misplacement of the decimal point in the unit rate, in which case the line-item total as quoted will govern and the unit rate will be corrected.

27.2 The amount stated in the Form of Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and with the concurrence of the bidder, shall be considered as binding upon the bidder. If the

bidder does not accept the corrected Bid Price, his Bid will be rejected, and the Bid Security shall be forfeited in accordance with Sub- Clause 15.6(b) hereof.

IB.28 Financial Evaluation and Comparison of Bids

28.1 The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Clause IB.26.

28.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:

(a) Making any correction for errors pursuant to Clause IB.27;
(b) excluding Provisional Sums if any, for contingencies in the Summary Bill of Quantities, but including competitively priced Day work; and
(c) Making an appropriate adjustment for any other acceptable variation or deviation.

28.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in Bid evaluation.

28.4 If the Bid of the successful bidder is seriously unbalanced in relation to the Employer's estimate of the cost of work to be performed under the Contract, the procure agency may require the bidder to produce detailed price analyses for any or all items of the Bill of Quantities to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, the Employer may require that the amount of the Performance Security set forth in Clause IB.32 be increased at the expense of the successful bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful bidder under the Contract.

28.5 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);

(i) "**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;
(ii) "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;
(iii) "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;
(iv) "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;

(v) "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.

28.6 Evaluation Report (SPP Rule 45)

After the completion of evaluation process, as described in clauses IB 27 and IB 28, the procuring agency shall announce the results of bid evaluation in the form of report (available on the website of the authority) giving reasons for acceptance and rejection of bid. The report shall be hoisted on website of the authority and that of procuring agencies if its website exists and intimated to all bidders at least three (3) days prior to the award of contract.

F. AWARD OF CONTRACT

IB.29 Award (SPP 49)

29.1 Subject to Clauses IB.30 and IB.34 and provision of rules: the Employer will award the Contract to the bidder whose bid has been determined to be substantially responsive to the Bidding Documents and who has offered the lowest evaluated Bid Price but not necessarily the lowest submitted price**,** within the original or extended period of bid validity. Provided that such bidder has been determined to be eligible in accordance with the provisions of Clause IB.3 and qualify pursuant to Sub-Clause IB 29.2.

29.2 The Employer, 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 for the said project:

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

IB.30 Procuring Agency's Right to reject all Bids or Annul/Cancellation the Bidding Process (SPP Rule 25)

Notwithstanding clause IB 29 and provision of the rule: (1) A procuring agency reserves may cancel the bidding process at any time prior to the acceptance of a bid or proposal; (2) The procuring agency shall incur no liability towards bidders solely by virtue of its invoking sub–rule (1); (3) Intimation of the cancellation of

bidding process shall be given promptly to all bidders and bid security shall be returned along with such intimation; (4) The procuring agency shall, upon request by any of the bidders, communicate to such bidder, grounds for cancellation of the bidding process, but is not required to justify such grounds.

IB.31 Notification /Publication of the Award of Contract (SSP Rules)

31.1 Prior to expiry of the period of bid validity, including extension, prescribed by the procuring agency, the procuring agency shall notify the successful bidder in writing ("Letter of Acceptance") that his bid has been accepted. This letter shall mention the sum which the procuring agency will pay to the contractor in consideration of the execution and completion of the works by the contractor as prescribed by the contract (hereinafter and in the conditions of contract called the "Contract Price").

31.2 No negotiation with the bidder having evaluated as lowest responsive or any other bidder shall be permitted, however, procuring agency may hold meetings to clarify any item in the bid evaluation report.

31.3 The notification of award and its acceptance by the bidder will constitute the formation of the contract, binding the procuring agency and the bidder till signing of the formal Contract Agreement.

31.4 Upon furnishing by the successful bidder of a Performance Security and signing of the contract, the procuring agency will promptly notify the name of the successful bidder to all bidders and return their bid securities accordingly.

31.5 Within seven days of the award of contract, procuring agency shall publish on the website of the Authority and on its own website, if such a website exists, the results of the bidding process, identify the bid through procurement identifying numbers, and the following information:

(1) Evaluation Report;
(2) Form of Contract and letter of Award;
(3) Bill of Quantities or Schedule of Requirement.

31.6 De briefing (SPP Rule 51).

(a) A bidder may ask the procuring agency for reasons for non acceptance of his bid and may request for a debriefing meeting and procuring agency shall give him the reasons for such non acceptance, either in writing or by holding a debriefing meeting with such a bidder.

(b) The requesting bidder shall bear all the costs of attending such a debriefing.

IB.32 Performance Security (SPP Rule 39)

32.1 The successful bidder shall furnish to the Employer a Performance Security in the form of pay order or demand draft or bank guarantee, and the amount stipulated

in the Bidding Data and the Conditions of Contract within a period of 07 days after the receipt of Letter of Acceptance.

32.2 Failure of the successful bidder to comply with the requirements of Sub-Clause IB.32.1 or Clauses IB.33 or IB.35 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security.

32.3 Validity of performance security shall extend at least ninety days beyond the date of completion of contract, or as mentioned in the bidding data to cover defects liability period or maintenance period subject to final acceptance by the procuring agency.

IB.33 Signing of Contract Agreement

33.1 Within 07 days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Employer will send the successful bidder the Contract Agreement in the form provided in the Bidding Documents, incorporating all agreements between the parties.

33.2 The formal Agreement between the Employer and the successful bidder shall be executed within 07 days of the receipt of the Contract Agreement by the successful bidder from the Employer.

33.4 Stamp Duty.

The formal agreement between the Employer and the successful bidder shall be duly stamped at the rate of 0.35% paisa for every hundred rupees or part of the contract / bid Price (updated from time to time) stated in letter of acceptance.

IB.34 General Performance of the Bidders

Procuring agency may in case of consistent poor performance of the contractor and his failure to remedy the underperforming contract may take such action as may be deemed appropriate under the circumstances of the case including the rescinding the contract and/or black listing of such contractor and debarring him from participation in future bidding process.

IB.35 Integrity Pact (SPP Rule 89)

The bidder shall sign and stamp the Integrity Pact provided at Appendix-L to the bidding documents for all Provincial/Local Government procurement contracts exceeding Rupees ten million. Failure to provide such Integrity Pact shall make the bidder non-responsive.

IB.36 Instructions not Part of Contract

Bids shall be prepared and submitted in accordance with these Instructions which are provided to assist bidders in preparing their bids and do not constitute part of the bid or the Contract Documents.

IB.37 Arbitration (SPP Rule 34)

Any dispute that not amicably resolved shall be finally settled, unless otherwise specified in the Contract, under the Arbitration Act 1940 updated from time to time and would be held anywhere in the Province of Sindh at the discretion of procuring agency.

Repair and Maintenance of RCC Boundary Wall and Perimeter steel Fencing, Desilting and Cleaning of Storm Water Drainage, Sewerage Manholes/Network, and Cleaning of Underground Wastewater Tank / STP Tank, UPVC doors & Paint work of Admin Building at Khairpur Special Economic Zone

BIDDING DATA

The following specific data for the works to be bided 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.

Data Sheet

	Project Name	Repair and Maintenance of RCC Boundary Wall and Perimeter steel Fencing, Desilting and Cleaning of Storm Water Drainage, Sewerage Manholes/Network, and Cleaning of Underground Wastewater Tank / STP Tank, UPVC doors & Paint work of Admin Building at Khairpur Special Economic Zone (KSEZ).
	Project Duration	45 Days
1	**Address and Contact Person of Procuring Agency**	Manager, Sindh Economic Zone Management Company (SEZMC) 2nd Floor, Bahria Complex-IV, Choudhry Khaliq-Uz-Zaman Road, Gizri, Karachi. Tel: +92 21 99332220
2	**Issuance date and time**	09:00 am, 27th October, 2026
4	**Issuance Deadline date and time**	10:00 am, 12th November, 2026
5	**Submission Deadline date and time**	11:00 am, 12th November, 2026
6	**Bid Opening**	12:00 noon, 12th November, 2026
8	**Language of Bid and correspondence**	English
9	**Bid Validity Period**	90 days from the Submission Deadline.
10	**Evaluation Criteria**	Minimum 70 points for Proposal qualification.
11	**Scoring System**	Refer Section 6B
12	**Method of Selection**	Most Advantageous bidder
13	**Procurement Procedure**	Single Stage One envelope

13	**Bid Security**	The Bidder shall submit a bid security of PKR 470,000/-in the form of Pay Order/ Bank Guarantee/ Bank Draft in original Proposal. Requirements of valid Bid Security as mentioned in 2.17
14	**Performance Security**	5% of Bid Price in the form of Pay Order / Bank Guarantee/ Bank Draft, shall remain valid for period of 90 days beyond

		the completion of assignment or two years, whichever comes earlier
16	**Tax Liability**	The procuring agency shall only deduct all applicable Taxes. Bidder has to assess all other applicable taxes while quoting the Bid Price in the Proposal.
17	**Mobilization Advance**	Not Applicable
18	**Engineer`s Estimate**	Based on Market rates

Repair and Maintenance of RCC Boundary Wall and Perimeter steel Fencing, Desilting and Cleaning of Storm Water Drainage, Sewerage Manholes/Network, and Cleaning of Underground Wastewater Tank / STP Tank, UPVC doors & Paint work of Admin Building at Khairpur Special Economic Zone (KSEZ).

PREAMBLE

1. The Bill of Quantities shall be read in conjunction with Instructions to Bidders. Form of Tender with Appendices Conditions of Contract, Technical Specifications, drawings and other related documents.

2. In making this Tender and pricing the items in this Bill, the Contractor must cover himself and shall be deemed to have covered himself for

   2.1 All services and materials which according to the true intent and meaning of the Specifications, Drawings and Conditions may be inferred as necessary for the carrying out in a good and workman like manner of the works shown on the Drawings and described in the Specifications whether expressly mentioned therein or not, and

   2.2 All the duties, obligations liabilities and responsibilities which any of the Contract Documents places upon the Contractor in connection with or in relation to the Contract.

3. The Quantities given in the Bill of Quantities are estimates only and is not to be taken as sufficiently precise for ordering materials and the Contractor in placing orders should be guided by the actual requirements of the work and in pricing them the Contractor must allow for any increase in quantity and for any additional material and for the use of materials and plant which may be required in the actual construction of the works to meet the requirements of Specifications and Drawings.

4. The prices or rates and total amount are for everything set in place in the work and include the expenses of the plant, machinery, tools, sheet piling, timbering, dewatering and all other materials, things and labour necessary to be used during the execution of the work and for the proper and sound completion and maintenance thereof for the period of maintenance.

5. Where no price is inserted against any item in the Bill of Quantities, the cost shall be deemed to have been included and spread over all other priced items.

6. No measurement shall be made for the following, the cost of which shall be deemed to be included in the various rates:

   6.1 Supply of water for all construction works including concrete, mains or pipes, site offices for cleansing or other purposes, including arranging and paying for the supply of water, providing mains and fittings, carting, storing, etc. and including subsequent, disposal of surplus or used water.

6.2 Providing, maintaining and keeping clean sanitary accommodation for staff office and residence if provided.

6.3 Protecting works from weather including adopting appropriate procedures for concreting in cold or rainy weather.

6.4 Maintaining existing works in operation.

6.5 Taking any precautions necessary for the abatement of nuisance from noise, dust, etc.

6.6 Keeping public, private and access roads free from mud, dirt, debris and dust.

6.7 Complying with any requirements specified in the Contract.

6.8 Clearing and cleaning the whole of the works on completion including the removal of the surplus materials, plant, equipment, rubbish, etc., and leaving all in a clean and tidy state.

6.9 Providing and testing samples of materials before placing orders to ensure compliance with the specification.

6.10 Collecting from the Employers store any articles if provided as free-issue by the Employer including any inspection and testing deemed necessary by the Contractor to ensure issue items are un-damaged before he removes them from store.

6.11 Working in the vicinity of and coordinating and liasing with other Contractors including providing for any inconvenience, delay, lack of working space, changes in programming or methods of working and all other costs incurred due to the presence of other Contractors.

6.12 Construction of approach road for access for the labour materials, construction machinery and equipment to the site of construction where required in connection with execution of work under this Contract.

6.13 Dewatering encountered during excavation or foundations or in trenches for laying pipelines etc.

7. All items or groups of items, which are designated "Provisional" shall be used only at the direction of the Engineer, and if not used either wholly or in part, the amount not used shall be deducted from the Contract Price without any further adjustments to the Contract Price. Provisional sum has been provided in the Bill of Quantities for such items of work, which cannot be assessed at the time of preparation of tender documents. In case the necessity of such items arises, the Contractor shall carry out such works only after the approval of the rates and quantities for such works has been issued by the competent authority.

8. **EARTHWORK**

8.1 The respective rates for excavations shall include removing and setting aside all or any surface materials and their subsequent replacement or disposal, immediate removal and disposal of any material not deemed by the Engineer suitable for subsequent refilling work in all types of soils of whatsoever nature including compacted fill except rock, working adjacent to the excavation or pipe-laying; working without machinery where deemed necessary by the Engineer; shoring and timbering in the trenches and excavations and driving steel sheeting or sheet piling; rectification and making good all slips, falls, adjoining subsidence, weakening or damaging of roads, structures and the like provision of temporary fencing, preparation of formations and foundations, provision of a concrete 1:4:8 bed or any other work that may be required if a suitable bottom to an excavation is needlessly, damaged by exposure or from other causes, provision and operation of any necessary pumping or dewatering plant including dealing with water arising from sub-soil, or rain water or water from any other source and its disposal; refilling excavations, reinstatement of all surfaces other than those in carriage ways and footways of public and private roads and public footpaths; maintenance and control of traffic; reinstating surfaces damaged due to lack of proper traffic control) moving plant and equipment or other operations of the Contractor, removal and return of excavated material where ordered working under, alongside, across or near existing services pipes, cables, nullahs, drains and refilled ground or similar difficult locations maintaining existing services.

8.2 The cost of the removal of surplus excavated material of any kind shall be included in the rates of the work, material or structures. All surplus shall be removed from the site or sites as it arises.

8.3 Under no circumstances shall a measurement for bulk excavation be made.

8.4 Any the limits shown in the drawings shall be treated as excess and shall not be paid for.

8.5 The Contractor shall make allowance for the additional excavation required for excavation of sump well, valve chambers, Jointing of pipes etc. in the price tendered for trench excavation. These shall not be separately measured or paid.

8.6 The quantities of excavation for all other work except pipe laying shall be measured as the product of the horizontal area of the bottom of the wall or other structure, shown on the drawings multiplied by the mean depth and the Contractor will be paid in accordance with the quantities thus ascertained, irrespective of the gross volume of excavation which the Contractor may carry out.

8.7 The Contractor shall include in his rates for excavation *for* carrying out excavation and handling of any materials,' including disposal of surplus, excavated earth, any additional excavation required either to accommodate steel sheeting or timbering or to provide *working* space for the construction of the work.

8.8 The rate for trial holes shall be inclusive of breaking open existing surfaces, excavation in all types of ground or other substances, other than rock, timber or other supports to the excavation, pumping, keeping open for the inspection of the Engineer, refilling, and reinstatement other than in paving of roads and footways.

9. CONCRETE WORK

9.1 The rates for concreting shall include for preliminary samples and testing for establishing mix design and for storing cement and aggregate; providing and testing samples, screening or washing aggregates where ordered, provision and handling of materials, manufacture of test cubes and any expense incurred in proportioning or varying the concrete mixes or delay incurred due to awaiting test results, proportioning, gauging and mixing, site testing, forming construction Joints, placing in Position, proper compaction with vibrators or tampers as specified, screening, the surface to the line and level ordered by the Engineer, formwork where used, protecting concrete finishing surfaces, reconstructing faulty work and testing for ensuring water tightness. The rates for concrete shall include for formwork and curing with water for required period.

9.2 The rate shall include for forming holes for concreting, grouting and making good, to pipes, fittings, and fixing bolts etc. to be supplied by the Contractor for a complete installation.

9.3 No payment will be made for costs incurred in alteration or cutting out of sub-standard concrete because of inaccuracies in any site testing or measuring equipment, or for any other reasons and no payment will be made for reconstructing the faulty work.

9.4 The rates for concrete shall cover all costs involved in making finished concrete of required specifications including curing work.

9.5 No deduction in the measurement of concrete is made for chamfers, bolt holes, rails, joists or reinforcement for pipes and holes with an area of less than 2 sft. (0.186 Cu m) except for concrete surround to pipes.

9.6 The rates for pre-cast concrete items shall include the provision of samples for testing.

9.7 The concrete rates shall include for all materials and labor in erecting formwork and moulds for all necessary strutting, supports, props, cleats and bearings, cleaning holes and cleaning for easing, striking around pipes, steelwork and cleaning fittings; ends & intersections. Their proper design and the calculations shall be made available to the Engineer upon request.

9.8 The rates for steel reinforcement shall include for providing reinforcement fixed in place in accordance with the drawings including all reinforcing bars, wire or other material for binding or supporting the bending, hooking, wire brushing and all other work in providing, and fixing the reinforcement. The rates also include for displacing and cutting reinforcing bars at all openings for pipe work, providing block out in concrete walls for installation of pipes.

9.9 The weights of steel reinforcement given in the Bill of Quantities are net and no extra weight will be allowed for mill tolerance, which shall be allowed for by the Contractor in his prices.

9.10 The rates for concrete blinding shall be fully inclusive of screening the surface to the lines and levels ordered by the Engineer for providing all formwork etc.

10. CONSTRUCTION WORKS

10.1 The rates for masonry work shall include for building to the specified bond, building in wall ties, cutting, forming Joints as the work proceeds, scaffolding, protection and cleaning and forming openings and building in all pipes, fixtures and the like.

10.2 The Contractor in his price shall include for all necessary temporary wood and other screeds, stops. dressing around installation already completed etc., and making good cracks, blow holes or other defects.

11. SITE WORK AND BUNDS

The rate for construction of bunds and embankments shall include.

11.1 Transportation of earth from excavation / temporary dumps any where on the site of works and approved borrow areas.

11.2 Forming the embankment in layers to regular slopes or shops specified on the drawing up to required level.

11.3 Compaction of each layer including water, scarifying.

11.4 Control of moisture content including dewatering in borrow areas to achieve the required degree of compaction and rolling.

11.5 Pumping or dewatering the sub-soil or any other water met with during excavation or making embankment.

12. **AS BUILT DRAWINGS**

After completion of the Contract Works, the Contractor, at no extra cost, shall provide two copies of all drawings, correctly modified as final as-built drawings. These shall be submitted to the Engineer for approval before taking over of entire Contract Works and shall be a complete record of work, carried out by the Contractor. After approval the Contractor shall submit one complete set of drawings on tracing paper and five set of all record drawings along with a set of drawings on CD.

The rate of surface excavation shall include all works described in the Section-1 of specification under excavation including fully stripping and setting a side separately top soil.

No separate payment shall be made for construction of access approach if required for transport of earth or any other material.

Evaluation/Qualification Criteria.

1. Evaluation/Qualification Criteria:

a) The bidders must meet all the mandatory criteria

b) Weightages/Marks

i.	Financial Soundness	40
ii.	Work Experience	30
iii.	Work program	10
iv.	Work Methodology	05
v.	Key Personnel	10
vi.	Plant & Equipment	05
	Total Marks	**100**

For Technical Qualification, Passing Mark = 70%

(i) Registration with PEC:

Bidders must possess valid registration certificate of PEC in the category C5 and above in discipline (CE01, CE09, CE10)

(Attach PEC registration certificate valid for current year) Single

Entity: Mandatory

(ii) Registration with Income Tax Department:

Bidders must possess valid registration certificate from income tax authority (NTN). (Attach NTN & SRB valid registration certificate).

Single Entity: Mandatory

(iii) Conflict of Interest / Litigation History:

Bidder shall not have the Conflict of Interest. The "Conflict of Interest means:

(a) where a contractor, supplier or consultant provides, or could provide, or could be perceived as providing biased professional advice to a procuring agency to obtain an undue benefit for himself or those affiliated with him.

(b) receiving or giving any remuneration directly or indirectly in connection with the assignment except as provided in the contract.any engagement in consulting or other procurement activities of a contractor, consultant or service provider that conflicts with his role or relationship with the procuring agency under the contract.

(c) where an official of the procuring agency engaged in the procurement process has a financial or economic interest in the outcome of the process of procurement, in a direct or an indirect manner;"

(d) All pending litigation shall in total not represent more than fifty (50) % of the Bidder's net worth and shall be treated as resolved against the Bidder.

(Attach Affidavit on Rs. 200 Stamp paper attested by Notary Public)

Single Entity: Mandatory

(iv) **Blacklisting**:

A) Bidder is not blacklisted, Blacklisting means:

"Barring a bidder, contractor, consultant or supplier from participating in any future procurement proceedings by the Pakistan Engineering Council/SPPRA/any government, semi government, and autonomous bodies" (Attach Affidavit on Rs. 200 Stamp paper attested by Notary Public, while foreign bidder's Affidavit should be attested by Consulate of their country)

B) The Procuring Agency shall, in accordance with the applicable procurement rules & procedures, duly verify the status of all participating firms against the list of blacklisted/ debarred firms published on the official website of the Sindh Public Procurement Regulatory Authority (SPPRA**)**, and shall record the outcome of such verification for the purpose of technical evaluation and further processing of the procurement.

Single Entity: Mandatory

(v) The firm shall have completed at least one project within SEZ

The bidder shall have successfully completed at least one (01) project within a Special Economic Zone (SEZ) during the last three (03) years preceding the bid submission deadline. The bidder shall submit documentary evidence in the form of a copy of the Letter of Award (LoA) and/or Completion Certificate, duly issued by the concerned client, in support of compliance with this eligibility criterion. Failure to furnish the requisite documentary evidence shall render the bidder non-responsive.

Single Entity: Mandatory

(VI) Failure to Sign Contracts:

Not being under execution of a Bid Securing Declaration for last 5 years. (Provide details or attach Affidavit in case of not applicable on attested by Notary Public, while foreign bidder's Affidavit should be attested by Consulate of their country)

Single Entity: Mandatory

***Note that If any bidder fails in any of the Mandatory Provision/Eligibility Criteria, its bid will not be considered for further evaluation.**

1.2 Financial Soundness — 40 Marks (max)

Firm shall be awarded on the basis of following criteria.

Financials	Marks
1) Average Annual Turnover (For last 3 years) **a) 30 million and above** **b) 20 million to 23.0** **c) Less than 20 million**	**15** **10** **05**
2) Average Net worth (For last 3 years) **a) 30 million and above** **b) 20 to 30.0 million** **c) Less than 20 million**	**15** **10** **05**
3) Net working capital (Last Financial Year) **a) 30 million and above** **b) 20 to 30.0 million** **c) Less than 20 million**	**10** **08** **04**

*(Indexation of 7% per annum will be applied)

1.3 Work experience — 30 Marks (Max)

Similar assignments with cost and complexity, under-taken over in the past five (05) years, participation as contractor or subcontractor, with a value of the largest work of at least amount as mentioned below, that have been successfully and substantially completed and that are similar to the proposed works. The similarity shall be based on the physical size, complexity, methods / technology or other characteristics.

Category	Each Project of Value PKR 30 (Million) and above	Marks (30)
A	**5 Projects or more** **4 Projects** **3 Projects** **2 Projects** **1 Projects**	30 24 18 12 06
B	**Each Project of Value PKR 20 (million) to 29.9 (million)**	
	06 Projects or more **05 Projects** **04 Projects** **03Projects** **02Projects** **01Projects**	30 25 20 15 10 05

C	**Each Project of Value PKR 05 (million) to 19.9 (million)**	
	10 Projects or more **Each project**	30 03
D	**Each Project in SEZ of Value PKR 30 (million)**	
	Each project	15

1.4 Work Program **10 Marks (max.)**

Project Schedule	**Marks**
Detailed Project Schedule (Up to Level 4/Gant Chart)	10

1.5 Work Methodology **05 Marks (max.)**

Project Methodology	**Marks**
Detailed & Project related methodology to car out works	05

1.6 Key Personnel (Qualification & Experience) 10 Marks (max.)

(All engineers must be registered with PEC)

	Designation	Marks
Key Professional Staff	**Project Manager** Qualification: BE in Civil Engineering from HEC Recognized University (15%/25%) (PEC Registration is mandatory) Relevant Experience Experience in relevant field/projects More than 10 years 75% 8-10 years 60% 5-7 years 40% Less than 5 years 15%	5
	Site Supervisor Qualification: Diploma/BE in Civil Engineering from HEC Recognized University (15%/25%) (PEC Registration is mandatory – If applicable) Relevant Experience Experience in relevant field/projects More than 8 years 75% 3-8 years 60% Less than 5 years 40%	2
	Site Surveyor Diploma in Civil Engineering from HEC Recognized Institute More than 5 years 100% 3-8 years 60% Less than 5 years 40%	2
	Support Staff **a) Survey Helper** **b) Document Controller** **c) Draughtmen/Cad Operators** More than 3 years 100%	1

	Less than 3 years 50%	

*(For all Engineers, submit PEC registration certificate and Brief CVs of personnel as per form provided hereunder).

1.7 Plant & Equipment 05 Marks (Max.)

The Bidder must demonstrate that it has the key equipment listed hereafter

Sr. No.	Description of Equipment	Capacity & Horse Power	Minimum Requirement (Qty. in No.)	Marks
1	Concrete Transit Mixer	6 Cum	1	1
2	Concrete Vibrator	3/5 HP	1	1
3	Mechanical compactor		1	1
4	Marine ply Shuttering		500 Sqft	1
5	Survey equipment Dumpy Level machine		1	1
Total				**5**

FORMS OF TECHNICAL QUALIFICATIONS

Form 1: Bidder Information Form

Company Profile

All individual firms and each partner of a joint venture submitting bid are requested to complete the information in this form.

1.	Name of firm (legal): (In case of Joint Venture (JV), legal name of each member	
2.	Nature of Business: (Whether the firm is a Corporation, Partnership, Trust etc.) (In case of Consortium; whether the Lead Consortium Member is a Corporation, Partnership, Trust etc.)	
3.	Head Office address:	
4.	Telephone: Fax Number: E-mail address:	
5.	Place of Incorporation/Registration: Year of Incorporation/Registration:	
6.	Applicant's authorized representative: Telephone Fax numbers: E-mail address:	
7.	NATIONALITY OF OWNERS	
	Name:	Country:

Form 2: Historical Contract Non-Performance

Each Bidder or each member of a JV must fill in this form

Non-Performing Contracts
❑ **Contract non-performance did not occur** within the last **two (02)** years prior to the deadline for bid submission based on all information on fully settled disputes or litigation **(Affidavit to be provided on Rs. 100 Stamp paper attested by Notary Public)** ❑ **Contract non-performance during the stipulated period,**

Year	**Outcome as Percent of Total Assets**	**Contract Identification**	**Total Contract Amount (Current value, PKR)**
		Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	

Bid Security Declaration
☐ **Bidder shall not be under execution of a Bid–Securing Declaration (Affidavit to be provided on Rs. 100 Stamp paper attested by Notary Public)**

Black Listing
❑ **Bidder shall not be black listed by government/semi government /autonomous /private organizations (Affidavit to be provided on Rs. 100 Stamp paper attested by Notary Public)**

Pending Litigation

- ❑ **No pending litigation (**A fully settled dispute or litigation is one that has been resolved in accordance with the Dispute Resolution Mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted) **(Affidavit to be provided on Rs. 100 Stamp paper attested by Notary Public)**

- ❑ **Pending litigation (**All pending litigation shall in total not represent more than **50%** of the Bidder's net worth and shall be treated as resolved against the Bidder)

Year	**Outcome as Percent of Total Assets**	**Outcome as Percent of Total Assets**	**Total Contract Amount (PKR)**
		Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	

Form 3: Financial Situation

Each Bidder or each member of a JV must fill in this form

Financial Data for Previous 3 Years

Information from Balance Sheet

	Year 2022-2023	Year 2023-2024	Year 2024-2025
Total Assets			
Total Liabilities			
Current Assets			
Current Liabilities			

Information from Income Statement

Total Revenues of Construction			
Profits Before Taxes			
Profits After Taxes			

☐ Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last three years, as indicated above, complying with the following conditions.

- All such documents reflect the financial situation of the Bidder or partner to a JV, and not sister or parent companies.
- Historic financial statements must be audited by a certified accountant.
- Historic financial statements must be complete, including all notes to the financial statements.
- Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted). ☐NTN certificate must be attached
- Foreign firms if participating in the bidding process should submit NTN Certificate of their country duly attested by Consulate of their country

Form 4: Average Annual Construction Turnover

Each Bidder or each member of a JV must fill in this form

Annual Turnover Data for the Last 3 Years (Construction only)	
Year	**Amount (PKR)**
2020	
2021	
2022	
Average Annual Construction Turnover	

The information supplied should be the Annual Turnover (Construction only) of the Bidder or each member of a JV in terms of the amounts billed to clients for each year for work in progress or completed.

Form 5: Financial Resources

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

Financial Resources		
No.	**Source of financing**	**Amount (PKR)**
1		
2		
3		

Form 6: Current Contract Commitments / Works in Progress

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

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

Form 7: Details of Contracts of Similar Nature and Complexity completed over the last 05 years

Sr. No.	1	2	3	4	5
Name of Contractor:					
Country:					
Name of Procuring Agency with Address, Tele, Fax.					
Nature of works and special features relevant to the contract for which applied:					
Contract Role (Mention: Sole, Sub Contactor or Partner in a Joint Venture).					
Value of the total contract in Pak/Rs:					
Date of Award:					
Date of Completion:					
Cost per day Index					

Form 8: Personnel Capabilities

Bidder should provide the names of suitably qualified personnel to meet the specified requirements stated in Evaluation and Qualification Criteria

Sr. No.	Title of Position	Name
1		
2		
3		
4		
5		

Form 9: Curriculum Vitae (CV) for Proposed Experts

1. Proposed Position: _____

2. Name of Expert & PEC Registration No: _____

3. Name of Firm: _____

4. Current Residential address: _____

5. Telephone No: _____ **Fax No:** _____

6. Mail Address: _____

7. Date of Birth: _____ **Citizenship:** _____

8. Address: _____

9. Qualification: _____

10. Work Experience: Summarize professional experience in reverse chronological order.

Indicate particular technical and managerial experience relevant to the project.

From	To	Company/Project/Position/Relevant technical and management Experience

Form 10: Plant & Equipment

Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment whether owned/ leased/ rented listed Evaluation and Qualification Criteria.

A. **Equipment Capabilities (owned by the contractor/firm)**

Sr. No	Name of Equipment	Name of Manufacturer	Model and power rating	Capacity	Year of Manufacture	Current Location
1						
2						
3						
4						
5						
6						
7						
8						
9						

B. **Equipment Capabilities (leased/rented by the contractor/firm)**

Sr. No	Name of Equipment	Mention whether leased or rented	Name of Owner	Address of owner	Contact name and title with Telephone Fax & Email of the owner	Agreements Details of rental/ lease/ manufacture agreements specific to the project
1						
2						
3						
4						
5						
6						
7						

8						
9						

Repair and Maintenance of RCC Boundary Wall and Perimeter steel Fencing, Desilting and Cleaning of Storm Water Drainage, Sewerage Manholes/Network, and Cleaning of Underground Wastewater Tank and STP Tank & UPVC doors & Paint work of Admin Building at Khairpur Special Economic Zone (KSEZ).

PEC STANDARD BIDDING / CONTRACT DOCUMENTS FOR CIVIL WORKS

CONDITIONS OF CONTRACT

CONDITIONS OF CONTRACT

1. GENERAL PROVISIONS

1.1 Definitions

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

The Contract

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

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

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

Persons

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

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

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

Dates, Times and Periods

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

1.1.8 "Day" means a calendar day

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

Money and Payments

1.1.10 "Cost" means all expenditure properly incurred (or to be incurred) by the Contractor, whether on or off the Site, including overheads and similar

charges but does not include any allowance for profit.

Other Definitions

1.1.11 "Contractor's Equipment" means all machinery, apparatus and other things required for the execution of the 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 "Employer's Risks" means those matters listed in Sub-Clause 6.1.

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

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

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

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

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

1.1.19 'Works" means 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 Employer to act as Engineer for the purpose of the Contract and named as such in Contract Data.

1.2 **Interpretation**

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

1.3 **Priority of Documents**

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

1.4 **Law**

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

1.5 **Communications**

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

1.6 **Statutory Obligations**

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

2. THE EMPLOYER

2.1 **Provision of Site**

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

2.2 **Permits etc.**

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

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

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

2.4 **Approvals**

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

3. ENGINEER'S/EMPLOYER'S REPRESENTATIVES

3.1 **Authorised Person**

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

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

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

Engineer/Employer, the delegated duties and authority before the Commencement of Works.

4. THE CONTRACTOR

4.1 General Obligations

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

4.2 Contractor's Representative

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

4.3 Subcontracting

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

4.4 Performance Security

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

5. DESIGN BY CONTRACTOR

5.1 Contractor's Design

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

5.2 **Responsibility for Design**

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

6. EMPLOYER'S RISKS

6.1 **The Employer's Risks**

The Employer's Risks are:-

a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies, within the Country**;**

b) rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war, within the Country**;**

c) riot, commotion or disorder by persons other than the Contractor's personnel and other employees including the personnel and employees of Sub-Contractors, affecting the Site and/or the Works**;**

d) ionising radiations, or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive nuclear assembly or nuclear component of such an assembly, except to the extent to which the Contractor/Sub-Contractors may be responsible for the use of any radio-active material**;**

e) Pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds**;**

f) use or occupation by the Employer of any part of the Works, except as may be specified in the Contract**;**

g) late handing over of sites, anomalies in drawings, late delivery of designs and drawings of any part of the Works by the Employer's personnel or by others for whom the Employer is responsible;

h) a suspension under Sub-Clause 2.3 unless it is attributable to the Contractor's failure; and

i) physical obstructions or physical conditions other than climatic conditions, encountered on the Site during the performance of the Works, for which the Contractor immediately notified to the Employer and accepted by the Employer.

7. TIME FOR COMPLETION

7.1 Execution of the Works

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

7.2 Programme

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

7.3 Extension of Time

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

the Employer shall extend the Time for Completion as determined.

7.4 Late Completion

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

8. TAKING-OVER

8.1 Completion

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

8.2 Taking-Over Notice

Within fourteen (14) days of the receipt of the said notice of completion from the Contractor the Employer/Engineer shall either takeover the completed Works and issue a Certificate of Completion to that effect or shall notify the Contractor his reasons for not taking-over the Works. While issuing the Certificate of Completion as aforesaid, the Employer/Engineer may identify any outstanding items of work which the Contractor shall undertake 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 Employer, repair and rectification work which is necessitated by the earlier execution of poor quality of work or use of below specifications material in the execution of Works and which is so identified by the Employer/Engineer in writing within the said period. Upon expiry of the said period, and subject to the Contractor's faithfully performing his aforesaid obligations, the Employer/Engineer shall issue a Maintenance Certificate whereupon all obligations of the Contractor under this Contract shall come to an end.

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

9.2 Uncovering and Testing

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

10. VARIATIONS AND CLAIMS

10.1 Right to Vary

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

10.2 Valuation of Variations

Variations shall be valued as follows:

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

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

c) in the absence of appropriate rates, the rates in the Contract shall

be used as the basis for valuation, or failing which

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

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

10.3 **Early Warning**

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

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

10.4. **Valuation of Claims**

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

10.5 **Variation and Claim Procedure**

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

11. CONTRACT PRICE AND PAYMENT

11.1 (a) **Terms of Payments**

The amount due to the Contractor under any Interim Payment Certificate issued by the Engineer pursuant to this Clause, or to any other terms of the Contract, shall , subject to Clause 47, be paid by the Employer to the Contractor within 15 days after such Interim Payment Certificate has been jointly verified by Employer and Contractor, or, in the case of the Final Certificate referred to in Sub Clause 60.8, within 60 days after such Final Payment Certificate has been jointly verified by Employer and Contractor; Provided that the Interim Payment shall be caused in 42 days and Final Payment in 60 days in case of foreign funded project. In the event of the

failure of the Employer to make payment within the times stated, the Employer shall pay to the Contractor compensation at the 28 days rate of KIBOR+2% per annum in local currency, upon all sums unpaid from the date by which the same should have been paid. The provisions of this Sub-Clause are without prejudice to the Contractor's entitlement under Clause 69.

(b) **Valuation of the Works**

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

11.2 **Monthly Statements**

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

a) the value of the Works executed; and

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

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

11.3 **Interim Payments**

Within a period not exceeding seven (7) days from the date of submission of a statement for interim payment by the Contractor, the Engineer shall verify the same and within a period not exceeding fifteen (15) days from the said date of submission by the Contractor, the Employer shall pay to the Contractor the sum verified by the Engineer less retention money at the rate stated in the Contract Data.

11.4 **Retention**

Not Applicable

11.5 **Final Payment**

Within Fourteen (14) 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 Seven (7) days from the date of submission and forward the same to the Employer together with any documentation reasonably required to enable the Employer to ascertain the final contract value.
Within sixty (60) days from the date of receipt of the verified final account from the Engineer, the Employer shall pay to the Contractor any amount due to the Contractor. While making such payment the Employer may, for

reasons to be given to the Contractor in writing, withhold any part or parts of the verified amount.

11.6 **Currency**

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

12. DEFAULT

12.1 **Default by Contractor**

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

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

12.2 **Default by Employer**

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

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

12.3 **Insolvency**

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

12.4 **Payment upon Termination**

After termination, the Contractor shall be entitled to payment of the unpaid

balance of the value of the Works executed and of the Materials and Plant reasonably delivered to the Site, adjusted by the following:

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

b) any sums to which the Employer is entitled,

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

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

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

13. RISKS AND RESPONSIBILITIES

13.1 Contractor's Care of the Works

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

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

13.2 Force Majeure

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

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

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

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

b) the cost of his demobilization, and

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

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

14. INSURANCE

14.1 Arrangements

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

14.2 Default

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

15. RESOLUTION OF DISPUTES

15.1 Engineer's Decision

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

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

15.2 **Notice of Dissatisfaction**

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

15.3 **Arbitration**

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

16 INTEGRITY PACT

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

(a) recover from the Contractor an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by the Contractor or any of his Sub-Contractors, agents or servants;

(b) terminate the Contract; and

(b) recover from the Contractor any loss or damage to the Employer as a result of such termination or of any other corrupt business practices of the Contractor or any of his Sub-Contractors, agents or servants.

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

CONTRACT DATA

(Note: Except where otherwise indicated, all Contract Data should be filled in by the Employer prior to issuance of the Bidding Documents.)

Sub-Clauses of Conditions of Contract

1.1.3 Employer's Drawings, if any (To be listed by the Employer)

1.1.4 **The Employer** means

Sindh Economic Zones Management Company (SEZMC)
Address: Office of Sindh Economic Zones Management Company (SEZMC)**,** 2nd Floor, Bahria Complex IV, Choudhry Khaliq Uz Zaman Road, Gizri Karachi. 74000 Karachi.
Mobile: 0092-21-99332220, Fax:0092-21-99332202
Email: info@sezmc.gos.pk, Website: https://www.sezmc.gos.pk/

1.1.5 **The Contractor** means

1.1.7 **Commencement Date** means the date of issue of Engineer's Notice to Commence which shall be issued within seven (07) days of the signing of the Contract Agreement.

1.1.9 **Time for Completion** _____days

(The time for completion of the whole of the Works should be assessed by the Employer)

1.1.20 **Engineer**
Employer representative / Engineer

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

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

(The Employer may add, in order of priority, such other documents as form part of the Contract. Delete the document, if not applicable)

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

3.1 **Authorised person :**_____

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

_____

4.4 **Performance Security:** Amount_

Validity_____

(Form: As provided under Standard Forms* of these Documents)

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

Specification Clause No's_____

7.2 **Programme:**

Time for submission: Within Seven (07) days* of the Commencement Date.

Form of programme: _____(Bar Chart/CPM/PERT or other)

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

(Usually the liquidated damages are set between 0.05 percent and 0.10 percent per day.)

9.1 **Period for remedying defects**

_____

_____

10.2 (e) **Variation procedure:**

Daywork rates_____

_____(details)

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

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

i) Payment will be made as per the issuance of Interim Payment Certificate

_____

* (Employer to amend as appropriate)

11.1 *(b) **Valuation of the Works*:**

i) Lump sum price_____(details), or

ii) Lump sum price with schedules of rates _____ (details), or

iii) Lump sum price with bill of quantities_____(details), or

iv) Remeasurement with estimated/bid quantities in the Schedule of Prices_____(details), or/and

v) Cost reimbursable_____(details)

11.2 (b) **Percentage of value of Materials and Plant:**

Plant Materials	Eighty (80%)*
Civil works	Twenty (20%)*

11.3 **Percentage of retention:** NA

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

14.1 **Insurances:**

Type of cover The

Works **Amount of**

cover

The sum stated in the Letter of Acceptance plus fifteen percent (15%)

Type of cover

Contractor's Equipment:

Amount of cover

Full replacement cost

---

* (Employer to amend as appropriate)

Type of cover

Third Party-injury to persons and damage to property

_____

(The minimum amount of third party insurance should be assessed by the Employer and entered).

Workers:

_____

_____

Other cover*:

_____

(In each case name of insured is Contractor and Employer)

14.2 **Amount to be recovered**

Premium plus _____percent (_____%).

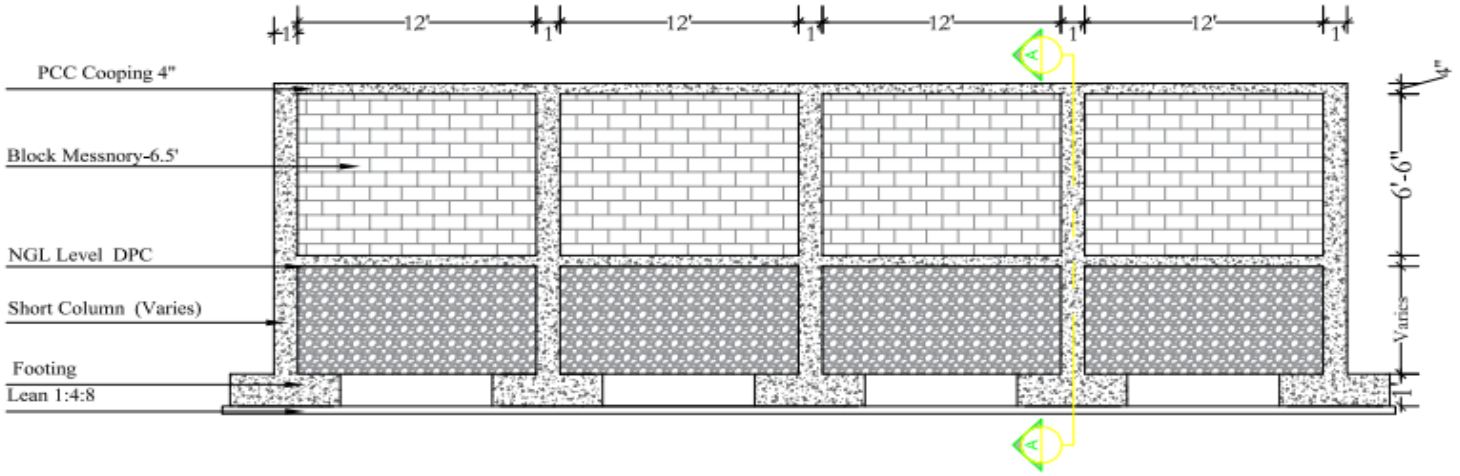
15.3 **Arbitration**

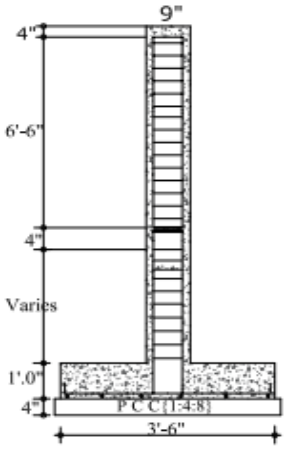
Place of Arbitration:_____

***** (Employer to specify as appropriate)

BOUNDARY WALL

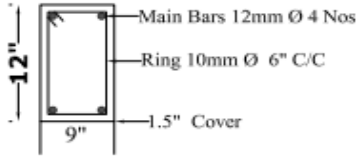
ISSUED FOR TENDER



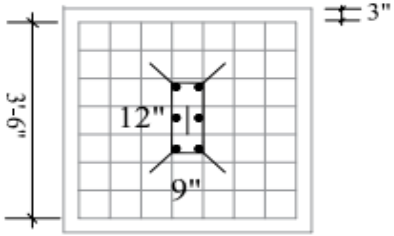


Stone pitching in bed as per BOQ

Detail Of Column



footing



Section A-A

Shedule of Continue footing

Loong Bar top & bottom	Ø 12mm 8" c/c
Short Bar top & bottom	Ø 10mm 8" c/c

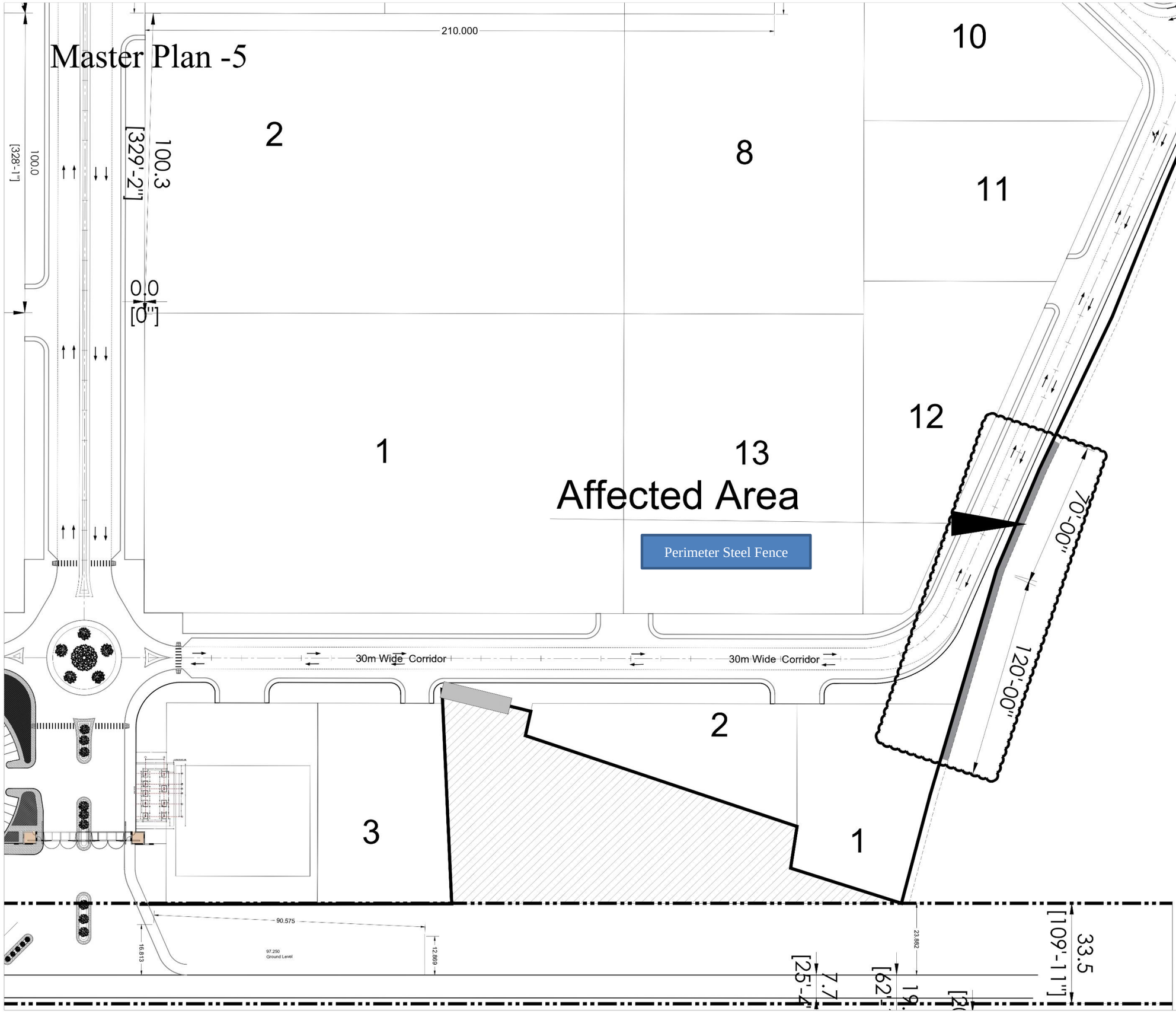
Shedule of Column

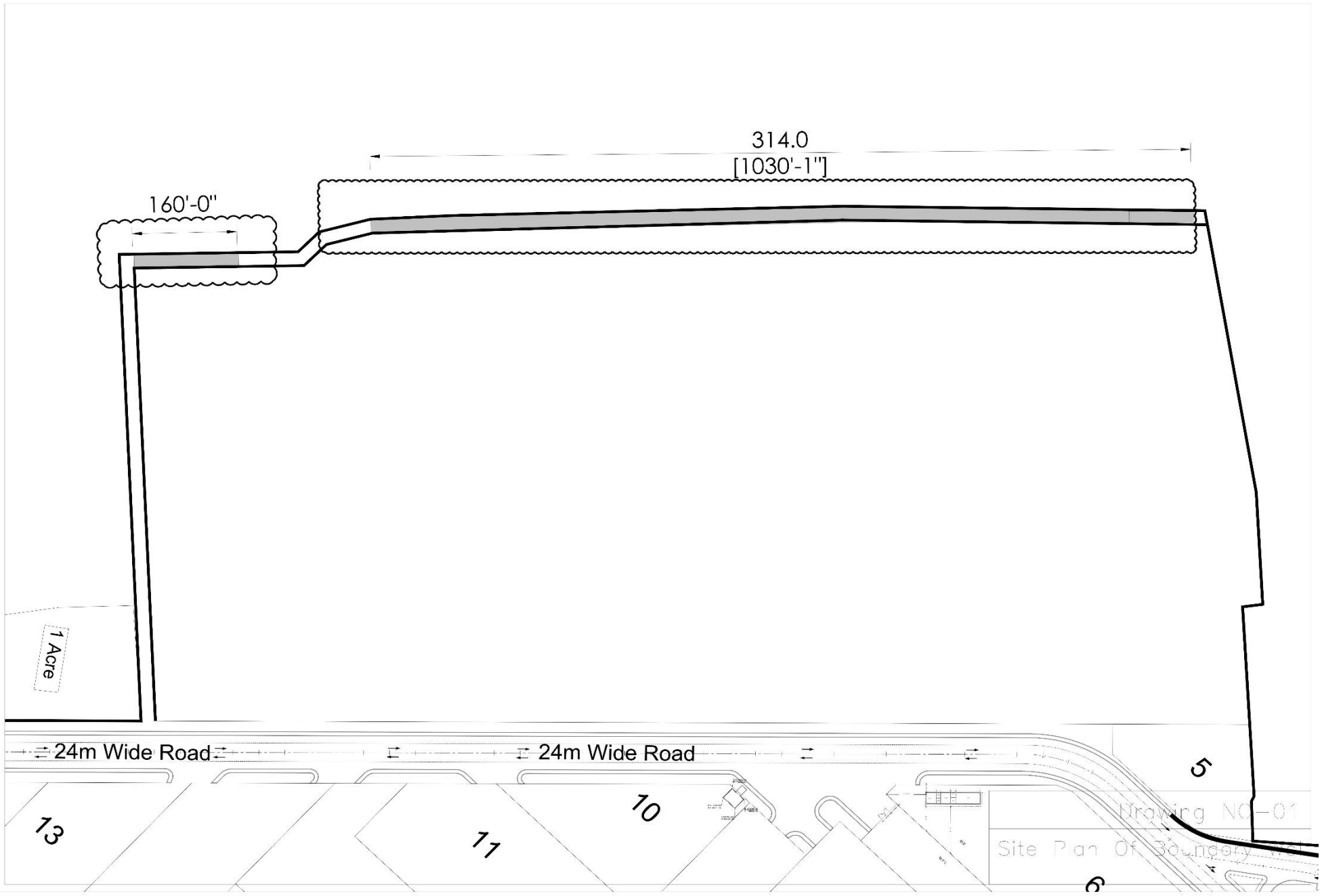
Main Bars	12mm Ø 4 Nos
Ring	10mm Ø 6" C/C

Drawing NO–02

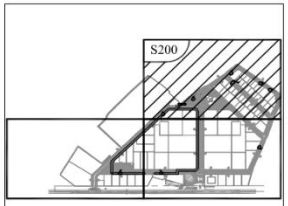
Boundary Wall Detail

Master Plan -5

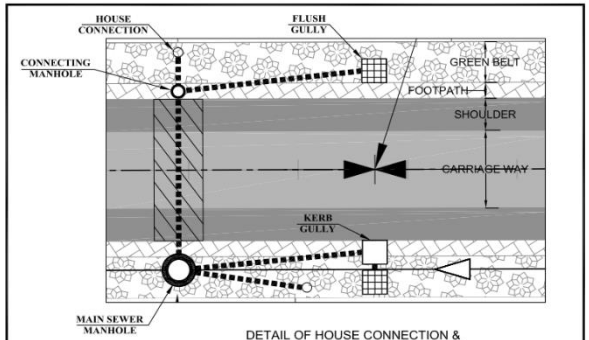



314.0
[1030'-1"]
160'-0"
1 Acre
24m Wide Road
24m Wide Road
13
11
10
5
6
Drawing NO-01
Site Plan Of Boundary

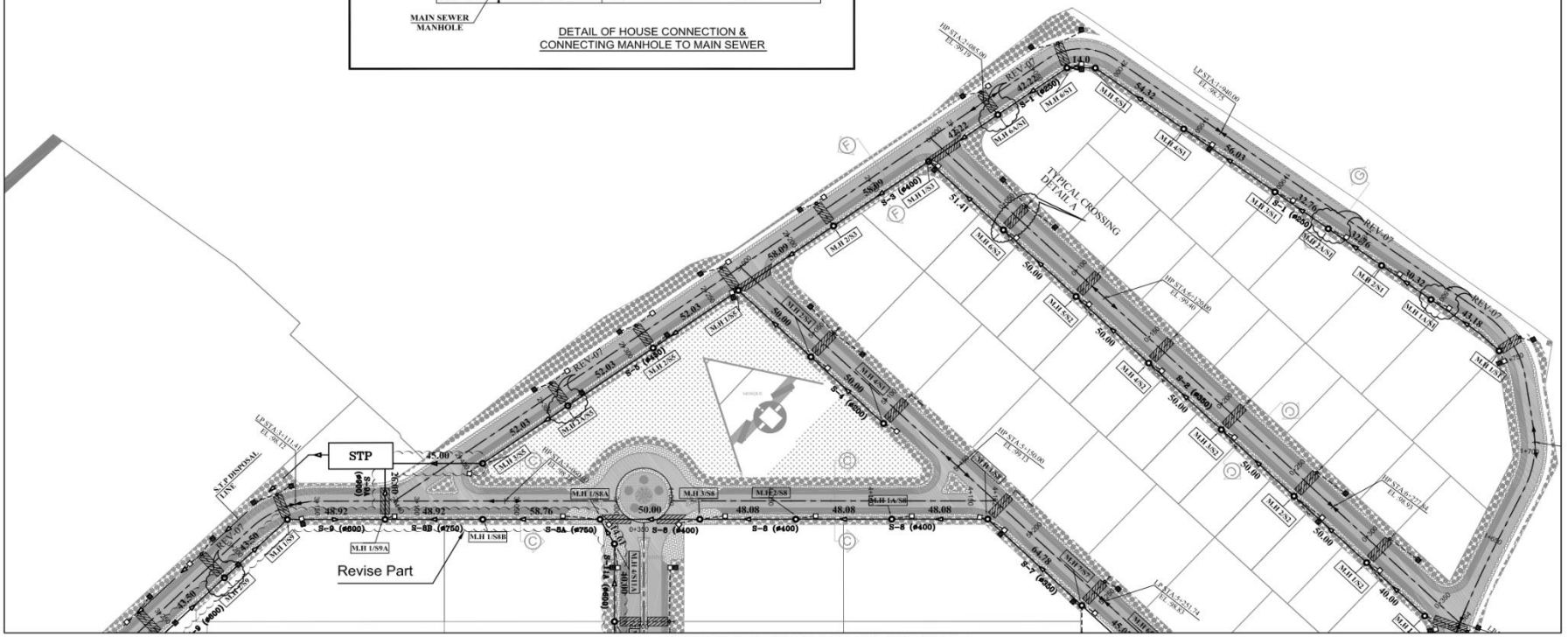
DESILTING OF MAIN HOLE



SHEET INDEX AND LOCATION PLAN



DETAIL OF HOUSE CONNECTION & CONNECTING MANHOLE TO MAIN SEWER



MATCH LINE DWG NO. EA-660-KHP-U-S201

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. 200 mm DIA TO 400 mm DIA PIPE ARE uP.V.C CLASS B AND ABOVE 400mm DIA PIPES ARE R.C.C ASTM C-76/BS 5911
3. ALL HOUSE CONNECTION PIPES ARE 150mm DIA
4.MINIMUM PIPE DIA SHALL BE 200mm
5. FOR DETAILS OF MANHOLE AND TRENCH REFER DWG NO.EA-660-KHP-U-S500
6.FOR SEWERAGE LEVEL SHEET REFER DWG NO.EA-766-KHP-U-SH01
7.FOR HOUSE CONNECTION DETAIL REFER DWG NO. EA-660-KHP-U-S502
8.FOR ROAD CROSS SECTION REFER DWG. NO. EA-660-KHP-U-CS01
9.AT EVERY ROAD CROSSING CONCRETE PROTECTION WILL BE PROVIDED.
10.TYPICAL CROSSING DETAIL FOR HOUSE CONNECTION SEWER & WATER. REFER DWG NO.EA-660-KHP-U-S502
11.KERB AND FLUSH GULLY CHAMBERS SHALL BE PROVIDED IN FOOTPATH AND GREEN BELT RESPECTIVELY AS PER SITE CONDITION FOR DETAIL REFER DWG NO.EA-660-KHP-U-S503 TO S505
12. FOR DETAIL OF R.C.C PIPE CULVERT REFER DWG. NO. EA-660-KHP-U-S506

LEGEND:
1 PROPOSED SEWER LINE
2 FLOW DIRECTION OF SEWERAGE
3 PROPOSED SEWERAGE MANHOLE
4 S.T.P DISPOSAL LINE
5 AT EVERY ROAD CROSSING CONCRETE PROTECTION WILL BE PROVIDED.
6 FRL FINISH ROAD LEVEL
7 IL INVERT LEVEL
8 KERB INLET
9 FLUSH GULLY
10 150mm Ø uPVC PIPE

ED.NO	DATE	DESCRIPTION	BY	CKD	APPRO
8	MAY,14	CHANGE OF STP LOCATION	S.A	W.A.F	A.A
7	MAR,14	SEWER LENGTH REVISED AS PER SITE	A.M	N.B	A.A
6	NOV,13	COMMENTS INCORPORATED	A.M	N.B	A.A
5	OCT,13	REVISION IN MASTER PLAN NEAR TRUCK STAND	S.A	N.B	A.A
4	SEP,13	COMBINED SYSTEM	A.M	N.B	A.A
3	JUL,13	COMMENTS INCORPORATED	H.S	N.B	A.A
2	FEB,13	ISSUED FOR CONSTRUCTION	S.A	N.B	A.A
1	NOV,12	ISSUED FOR REVIEW/COMMENTS	S.A	N.B	A.A

CLIENT:-
CITY DISTRICT GOVERNMENT KHAIRPUR

CONSULTANT:-
EA Consulting (Pvt.) Limited
(Formerly Engineering Associates)
CONSULTING ENGINEERS, ARCHITECTS, ECONOMISTS & PLANNING EXPERTS

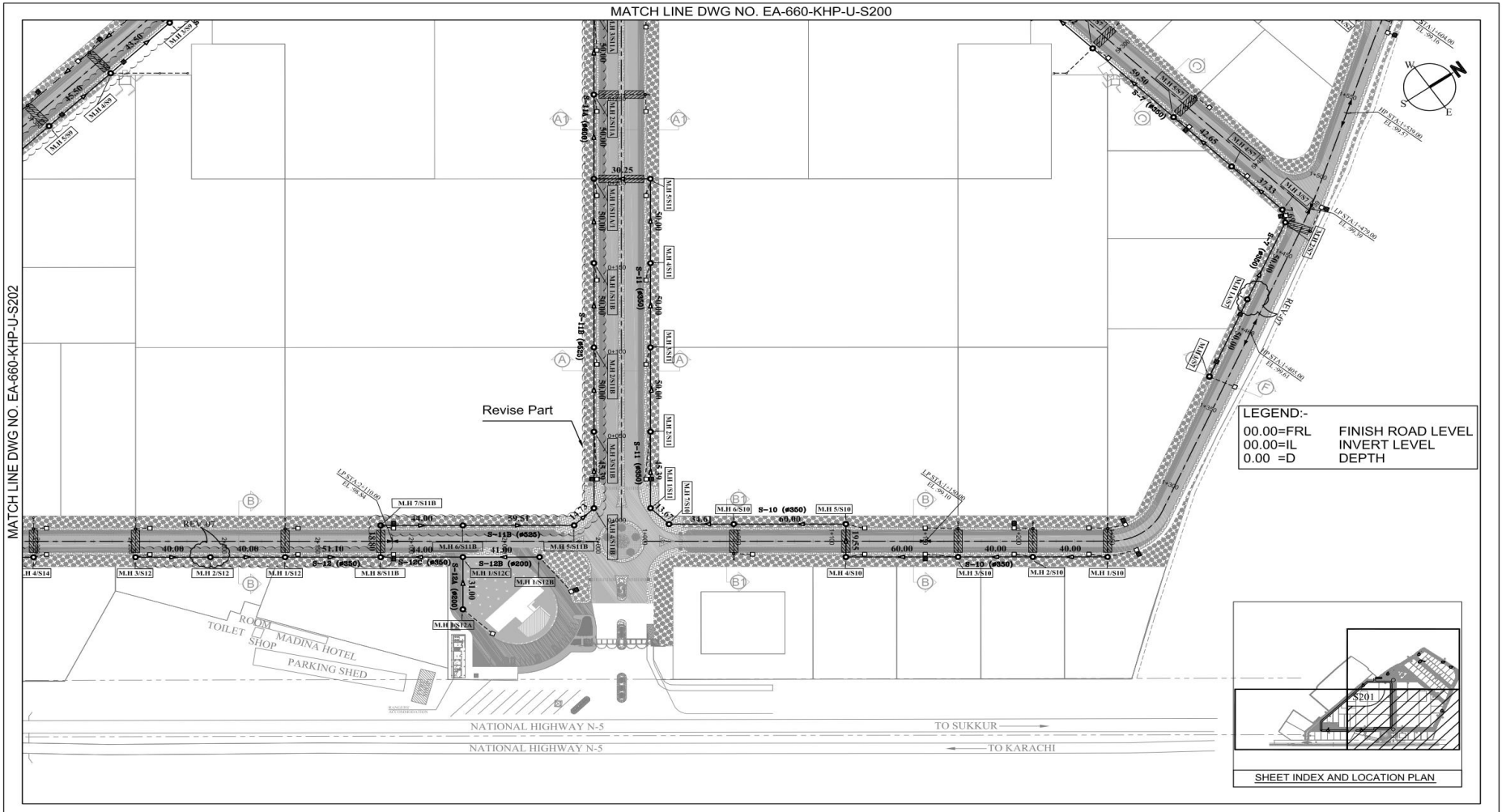
PROJECT:
SPECIAL ECONOMIC ZONE KHAIRPUR

DRAWN BY	S.A.A
DESIGNED BY	S.A
CHECKED BY	N.B
APPROVED BY	A.A

TITLE: LAYOUT PLAN OF COMBINED SEWERAGE & DRAINAGE SYSTEM

SCALE: 1:1000

DWG.NO. EA-660-KHP-U-S200



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7. FOR HOUSE CONNECTION DETAIL REFER DWG NO. EA-660-KHP-U-S502
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4		S.T.P DISPOSAL LINE
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6	FRL	FINISH ROAD LEVEL
7	IL	INVERT LEVEL
8		KERB INLET
9		FLUSH GULLY
10		150mm Ø uPVC PIPE

ED.NO	DATE	DESCRIPTION	BY	CKD	APPRO
8	MAY,14	CHANGE OF STP LOCATION	S.A	W.A.F	A.A
7	MAR,14	SEWER LENGTH REVISED AS PER SITE	A.M	N.B	A.A
6	NOV,13	COMMENTS INCORPORATED	A.M	N.B	A.A
5	OCT,13	REVISION IN MASTER PLAN NEAR TRUCK STAND.	S.A	N.B	A.A
4	SEP,13	COMBINED SYSTEM	A.M	N.B	A.A
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CLIENT:–
CITY DISTRICT GOVERNMENT KHAIRPUR

CONSULTANT:–
EA Consulting (Pvt.) Limited
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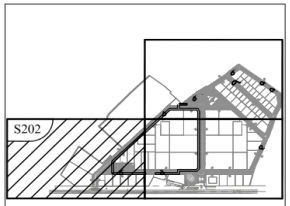
CONSULTING ENGINEERS, ARCHITECTS, ECONOMISTS & PLANNING EXPERTS

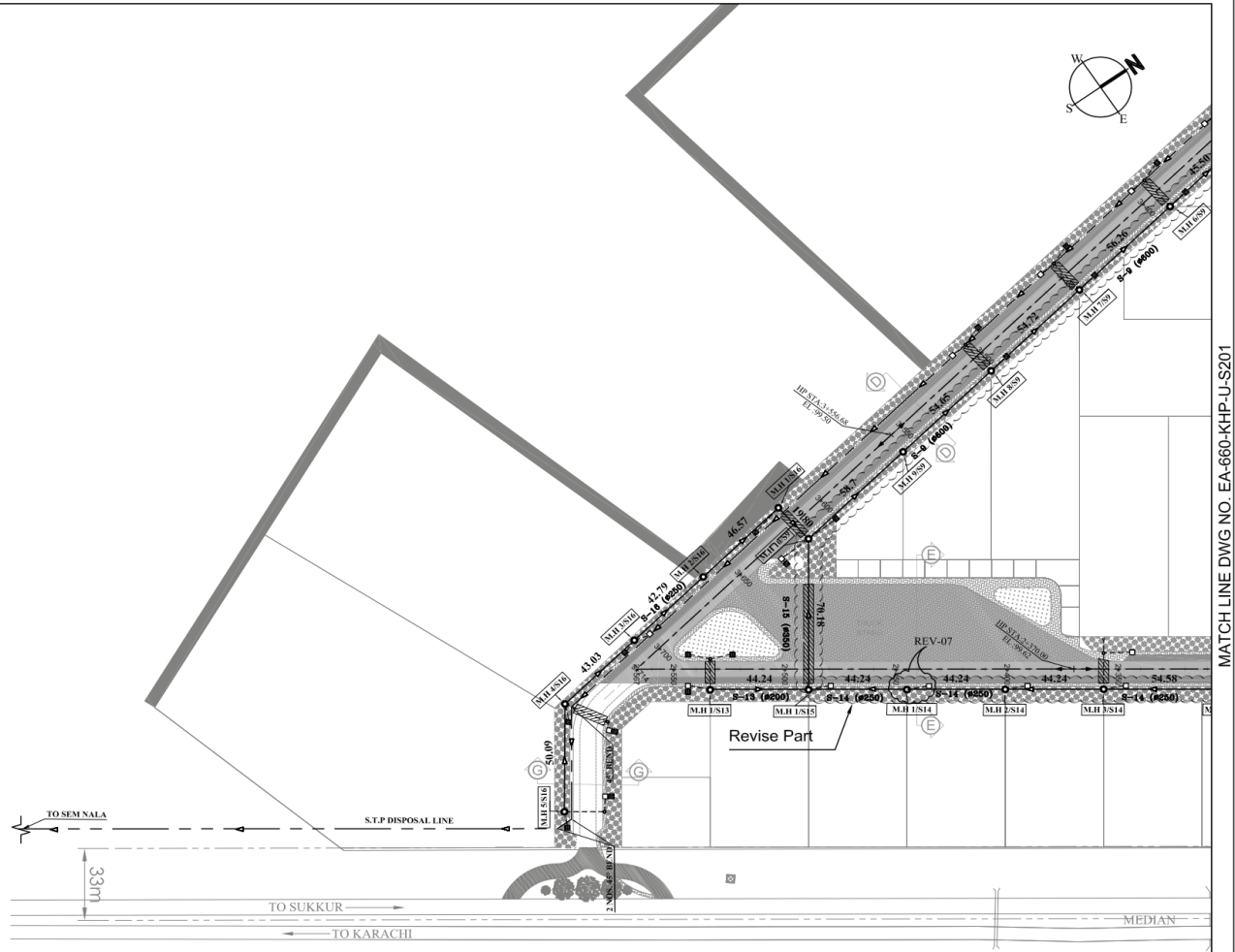
PROJECT:
SPECIAL ECONOMIC ZONE KHAIRPUR

DRAWN BY	S.A.A
DESIGNED BY	S.A
CHECKED BY	N.B
APPROVED BY	A.A

TITLE: LAYOUT PLAN OF COMBINED SEWERAGE & DRAINAGE SYSTEM
SCALE: 1:1000
DWG.NO. EA-660-KHP-U-S201



SHEET INDEX AND LOCATION PLAN



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PROJECT:

SPECIAL ECONOMIC ZONE KHAIRPUR

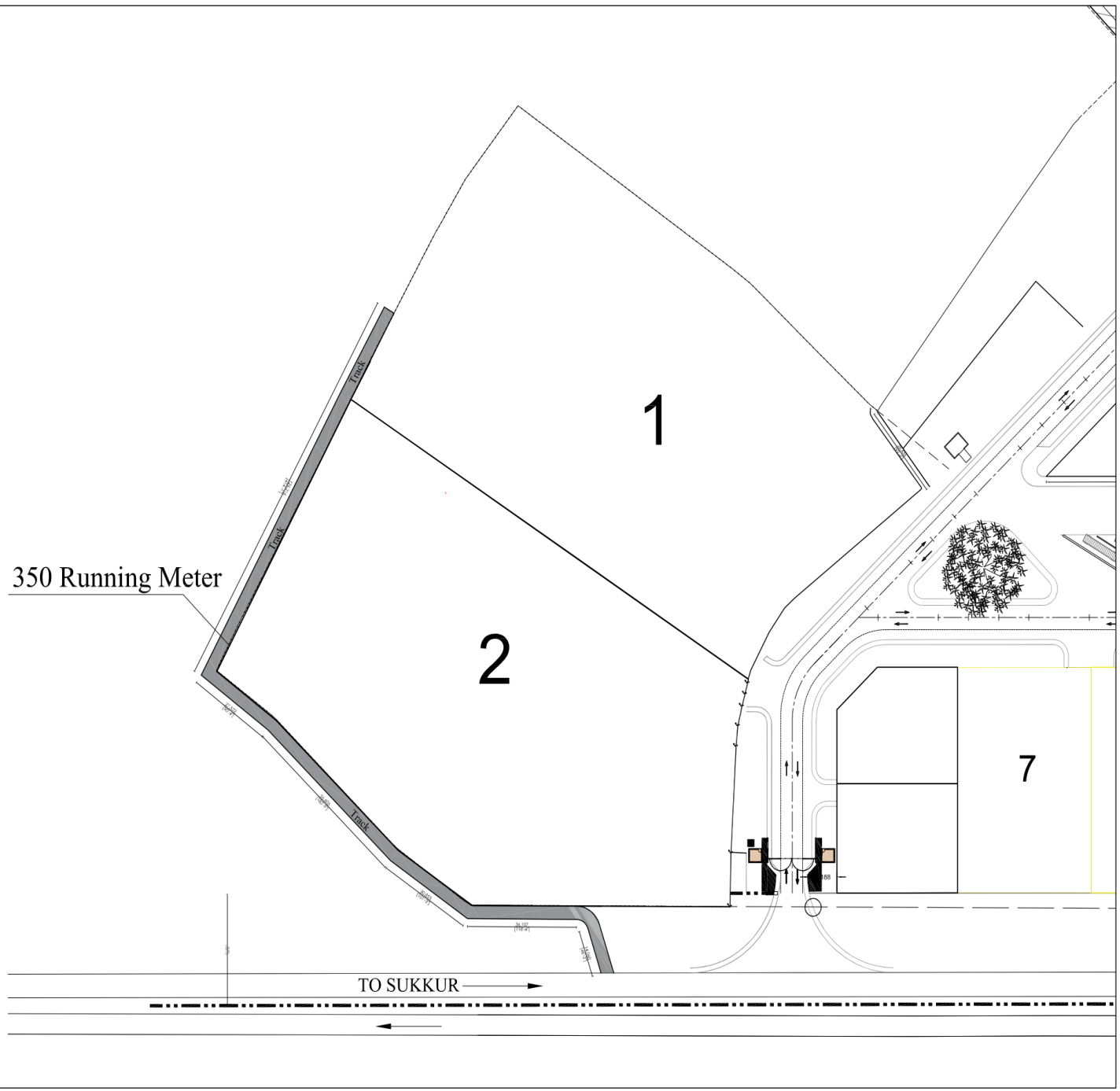
DRAWN BY	S.A.A
DESIGNED BY	S.A
CHECKED BY	N.B
APPROVED BY	A.A

TITLE: LAYOUT PLAN OF COMBINED SEWERAGE & DRAINAGE SYSTEM

SCALE: 1:1000

DWG.NO. EA-660-KHP-U-S202

EARTHWORK NEAR PERIPHERY WALL


1
2
7
Track
Track
Track
350 Running Meter
TO SUKKUR

Repair and Maintenance of RCC Boundary Wall and Perimeter steel Fencing, Desilting and Cleaning of Storm Water Drainage, Sewerage Manholes/Network, and Cleaning of Underground Wastewater Tank / STP Tank, UPVC doors & Paint work at Admin building at Khairpur Special Economic Zone (KSEZ).

S. No.	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
1	2	3	4	5	6 = (4 x 5)
1	**EXCAVATIONS, BACKFILLING AND DEWATERING** Excavation in all kinds of sub-surface materials, timbering upto following depths including disposal of surplus / rejected excavated materials to designated places.				
	0 ft to 5 ft	C.FT	9,375		
2	**LEAN CONCRETE (1:4:8)** Providing and laying Plain Cement Concrete (Lean Concrete) in proportion 1:4:8 (one part cement, four parts sand, and eight parts graded stone aggregate), including supplying, mixing, placing, compacting, leveling, finishing, and curing complete in all respects. The work shall also include the cost of all materials, labour, tools and plants, formwork/shuttering wherever required, and all incidental works necessary to execute the item in accordance with the approved drawings, standard specifications, and as directed by the Engineer-in-Charge.	C.FT	1280		
3	**RCC CONCRETE (1:2:4)** Reinforced cement concrete using slag cement conforming to BS-146, 3000 psi (28 day cylinder strength) in following complete in all respect as per drawings and specification in:				
a)	**Fotting**	C.FT	1245		
b)	**Column**	C.FT	1820		
c)	**Plinth Beam**	C.FT	1338		
4	**BRICK MASONRY** Solid brick masonry wall with using slag cement conforming to BS-146 set in 1:4 cement sand mortar, straight or curve below plinth beam, planters including all anchors, walls ties and other fixtures required to be built in brick masonry, complete in all respect as per Drawings and Specifications.				
a)	9" thick	C.FT	9535		
b)	13" thick	C.FT	1874		
5	**Stone Pitching in bed**				
	stone Pitching in bed hand packed with surface voids filled in 1:8	CUM	950		

S. No.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rs.)
1	3	3	4	5	6 = (4 x 5)
5	**PLASTER WORK** Providing and laying 12 mm (½") thick cement sand plaster in cement mortar 1:4 (one part cement and four parts fine sand) on the external face of the boundary wall, including preparation and cleaning of the surface, raking out joints, scaffolding, mixing, application, finishing to a smooth and even surface, curing, and all labour, materials, tools, and incidental works complete in all respects, in accordance with the approved drawings, standard specifications, and as directed by the Engineer-in-Charge.	SQ.FT	22140		
6	**Steel Grade-60** Providing and placing high yield deformed reinforcement steel bars Grade-60 conforming to ASTM A615 or approved equivalent standard, including cutting, bending, straightening, placing in position, tying with 16 SWG annealed binding wire, supporting, and maintaining the bars in correct position during concreting, complete in all respects as shown on the drawings and as directed by the Engineer-in-Charge. The rate shall include all labour, tools, equipment, wastage, hooks, bends, laps, chairs, spacers, and incidental works necessary for proper completion of the work.	Tone	13.5		
7	**Periphery Fence** Care and safe removal of damaged existing boundary periphery fence panel (size 7 ft height × 8 ft width) affected by wall collapse. Scope includes straighting/repairing reusable materials, fabricating new MS pipe structural frame (including vertical posts/horizontal rails) and fixing heavy-duty wire mesh (jaali) complete in panel. The work comprises cutting, welding, grinding, rust-cleaning, applying one coat of anti-corrosive red oxide primer, followed by two coats of approved enamel paint, and securely anchoring/re-fixing the fabricated panel back on the boundary structure/column with proper alignment, all complete as per site engineer's	Nos	30		

Total Amount					

Kandhra Village Track Back Filling

Item No.	Description of Item	Unit	Quantity	Rate	Total Amount
A-1	Earthwork / Backfilling Item: "Providing, laying, spreeding and compaction approved quality earth/soil backfilling for pathway, in layers not exceeding 8 inches (200mm) loose thickness, including excavation, loading, transportation, unloading, spreading, watering to achieve optimum moisture content (OMC) complete in all respects as per site requirements and engineer's directions."	CFT	54,746.00		

	Admin building				
S. No.	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT (Rs.)**
1	**2**	**3**	**4**	**5**	**6 = (4 x5)**
1	Providing and fixing in position uPVC doors Single-leaf UPVC door 3′-6″ × 7′-0″ (1,050 × 2,100 mm)=14 Nos:and Bathroom/Washroom door 2′-6″ × 7′-0″ (750 × 2,100 mm) = 4No:s, including uPVC frame andand shutter, handles, stoppers, hinges, locking arrangement and all necessary accessories, complete in all respects as per approved specifications and instructions of the Engineer/inCharge.	Nos	18		
2	Preparing the surface and painting with weather coat 2 coats, including rubbing the surface with rubbing brick/sandpaper, filling voids with chalk/plaster of Paris, and applying weather coat of approved make, complete in all respects.	sq.M	8500		
	Total				

S. No.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rs.)
1	2	3	4	5	6 = (4 x5)
	Component A: Desilting and Cleaning of Sewerage Manholes Network				
1	Desilting of Manholes: Manual or mechanical extraction of accumulated silt, grit, stones, and hardened sludge from inside the manholes (varying depths) using buckets or grab-bucket machines.	Nos	135		
2	Loading & Offsite Disposal: Loading, transportation, and environmentally compliant dumping of excavated toxic silt/sludge from the site to the municipal designated dumping yard.	Trips	15		
	Component B: Cleaning and Desilting of UG WasteWater Tank / STP Tank				
3	Sludge & Slurry Dewatering: Pumping out bottom-layer muddy water and removing settled thick sludge/silt layers from the base of the UG/STP concrete tanks.	CFT	1200		
Total Amount					

S.No	DESCRIPTION	AMOUNT (Rs.)
A	Repair and maintenance of Boundary Wall Work	
B	Desilting and Cleaning of Sewerage Manholes Network & UG wastewater Tank / STP Tank	
c	Construction of Unpaved Earth Road along the Periphery Wall	
d	Admin Building	

	TOTAL COST OF THE PROJECT		

Repair and Maintenance of RCC Boundary Wall and Perimeter steel Fencing, Desilting and Cleaning of Storm Water Drainage, Sewerage Manholes/Network, and Cleaning of Underground Wastewater Tank and STP Tank, UPVC doors & Paint work of Admin building at Khairpur Special Economic Zone (KSEZ).

TENDER DOCUMENTS (VOLUME – II)

SPECIFICATIONS FOR CIVIL WORKS

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1.	Section-1	General	SP-C-1 to 2
2.	Section-2	Site Clearing	SP-C-3 to 4
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4.	Section-4	Termite Control	SP-C-8 to 9
5.	Section-5	Water	SP-C-10 to 10
6.	Section-6	Concrete	SP-C-11 to 28
7.	Section-7	Steel Reinforcement	SP-C-29 to 31
8.	Section-8	Stone Soling / Paving	SP-C-39 to 45
9.	Section-9	Dewatering	SP-C-46 to 49
10.	Section-10	Moisture Protection & Waterproofing	SP-C-50 to 58
11.	Section-11	Metal Works	SP-C-81 to 88
12.	Section-12	Brick Masonry	SP-C-89 to 95
13.	Section-13	Plastering	SP-C-96 to 99
14.	Section-14	Painting, Distempering and White / Color Washing etc	SP-C-114 to 117

SECTION – 1

1.0 GENERAL

1.01 This General Specification is to be taken as applying to all the works in this Contract. Figured dimensions on the working drawings shall be followed in preference to the scale.

1.02 Until and unless specified otherwise, all goods and materials are to be Pakistan manufactured and to be of the best quality, and where not otherwise specified shall be according to latest engineering practice and conforming to Pakistan Standards (P.S) or British Standard Specifications (B.S.S) or Standard of American Society of Testing Materials (ASTM). The Engineer or the Consultants may also supplement such specifications during the progress of work.

1.03 All materials and goods used for such and other items shall be subjected to standard testing and if found below the specified standard such as PS or BSS or ASTM or their equivalent shall be removed from the site immediately at Contractor's own expense. All testing of materials finished and unfinished, shall be carried out by the Contractor at his cost, in the presence of Engineer or Engineer's Representative for which the Contractor shall maintain a reasonably well-equipped laboratory of his own, close to the site of work or make any other additional arrangement to the satisfaction and convenience of the Engineer. The Contractor shall include testing charges in his quotations and shall not be entitled to any reimbursement on this account for routine testing.

1.04 The Contractor must give early attention to the submission of samples of materials for approval of the Engineer, indicating the names of the manufacturing firms, where applicable specially of cement, sand, aggregates, steel, water, tiles, hard-core and all fittings. Whenever practicable, samples shall be submitted at least three weeks before it is proposed to use the materials. Until and unless specified otherwise and whenever materials are ordered to be forwarded to a testing laboratory other than site laboratory for check/ testing, the Contractor will be reimbursed the cost of fees for such tests if proved satisfactory, by the Employer. The Contractor, however, will be required to bear the cost of the fees for tests, which proved unsatisfactory.

1.05 The Contractor must take all steps necessary to prevent damage or interference with all supply lines such as water, electric power, fuel, telephones, drains, buried cables and any construction designed for the use of the public, government or semi government authorities or the Employer. The Contractor shall be responsible for any damage caused to such services or constructions and settle all claims in respect of such damage.

1.06 The Contractor shall protect from injury by covering all work, internally and externally needing protection including new concrete, brickwork, surface renderings, floors, etc., to the satisfaction of the Engineer, including the work of his sub-contractors at his own cost.

1.07 The whole work shall be carried out in the best manner in accordance with the instructions contained in these documents and those given by the Engineer from time to time during the

progress of the work. The work shall be carried out in conformity with the best of the standard construction practices preferably the British Codes of Practices.

1.08 The Contractor shall submit to the Engineer for his approval before beginning the work, a

complete plan of the proposed sequence and methods of operations for the execution of the works. Detailed drawings showing the location and construction of dumping and working platforms, gantries, building and all other structures in connection with the Contractor's plant and material storage sheds shall also be submitted to the Engineer for his approval before construction.

1.09 Orders and directions may be given orally by the Engineer or his Representative, and shall be received and promptly obeyed by the Contractor or his Representative or any superintendent or foreman or any supervisor of the Contractor whosoever may have charge of the particular part or section of work in relation to which the orders or directions are given, and a confirmation in writing of such order or directions will be given to the Contractor by the Engineer, if so requested. The Contractor shall provide and maintain at his own expense during the performance of the work an office in the vicinity of work. Orders or directions, written or oral, from the Engineer or his Representative delivered at such office shall be considered as delivered to the Contractor. The Contractor's office shall be fitted with a telephone connected to the local Telephone Exchange.

1.10 The Contractor shall not use the site for any other purpose than that of carrying out this Contract work. The operations of the Contractor shall be confined to the area immediately adjoining the buildings and the works included in this Contract but site clearance shall be kept to the satisfaction of the Engineer to permit carrying out of other works by other Contractors. The Contractor shall not affix advertisements; neither shall he permit advertisements to be displayed without the written consent of the Engineer.

1.11 The contract drawings are the working drawings to guide the Contractor generally about the shape and size of all the structures and fittings. Before proceeding to make preparations, fabrication, execution, erection of any such fittings and other details of any temporary works, scaffolds, railings, shutterings, details of doors, windows, partitions, iron mongery works, etc; the Contractor shall be under obligation to prepare and submit all detailed shop drawings to the satisfaction and the approval of the Engineer, before doing any or all of that described above or as directed. Approval of the contractor’s drawings shall not relieve the Contractor for any part of his obligation to meet all the requirements of the specifications or correctness of his drawings.

1.12 No cement work shall be permitted during extreme cold weather when unless otherwise authorized by the engineer.

1.13 **PAYMENT**

Contractor shall not be entitled to any separate or additional payment on account of all these general requirements and any other arrangement or action Contractor has to undertake under the direction of the Engineer for a proper carrying out of the works and meeting all obligations of the Contract.

SECTION – 2

2.0 SITE CLEARING, GRUBBING AND SETTING OUT OF WORKS

2.01 SCOPE OF WORK

The work covered by this section of specifications consist of furnishing all labour, necessary equipment, services, miscellaneous and necessary items required to satisfactorily complete the clearing, grubbing and setting out of the works, as indicated on drawings, specified herein or both.

2.02 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 Engineer or his 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 Engineer's Representative. Clearing operation shall be conducted in a manner that existing structures and installations under construction, employees and others remain safe.

2.03 GRUBBING

Grubbing shall consist of the removal and disposal of all stumps, roots and matted roots in the designated grubbing areas. Stumps, roots, logs and timber and other debris, shall be excavated and removed to a depth not less than 2 feet below any sub-grade level. In areas where the cut is over 3'-6" grubbing shall not be necessary.

2.04 DISPOSAL OF DEBRIS

Timber and other refuse to be disposed off by burning shall be burned at location, approved by the Engineer's Representative, in a 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 burning 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 withought 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. All debris shall be disposed off by the Contractor as directed by the Engineer.

2.05 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. 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 of the Engineer. The Contractor shall construct accurate benchmarks so that the lines and levels can easily be checked by the Engineer.

2.06 **DRAINAGE DITCHES**

The Contractor shall construct and maintain such ditches, in addition to those shown on drawings or as may be ordered by the Engineer to adequately drain and areas under construction.

2.07 **PAYMENT**

No separate payment shall be made for the work covered in this section of the specification and all costs of site clearing and setting out shall be covered in the unit rates of the Contractor for other items.

SECTION - 3

3.0 EXCAVATION, FILLING, BACKFILLING AND DISPOSAL

3.01 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.

3.02 BORING LOG DATA

A preliminary report on Sub-Soil investigation and exploratory data of the site area is available for reference only in the office of the Engineer. The Employer or Engineer's predications, regarding character or extent of soil or other sub-surface conditions to be encountered during the work are not binding on the Contractor. The Contractor shall make his own deductions for sub-surface conditions which may affect methods or cost of constructions of the work hereunder and he shall make no claim whatsoever for damages or compensation, should he find conditions during the progress of the work, different from those indicated by the soil investigation report of Engineer.

3.03 EXCAVATION

(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 Engineer.

(b) The excavation shall conform to the dimensions and elevations 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 Engineer. 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 to 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 Bracing:

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) Dewatering 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 Engineer or his Representative.

(f) Protection of utility lines:

When any existing utility lines whether to be retained or be removed are encountered within the area of operations, the Contactor shall notify the Engineer and his Representative, and shall not proceed until necessary measures are taken for protection or removal of the lines and instructions are obtained from the Engineer.

(g) Excess and undesirable material from 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.

3.04 **FILL AND BACKFILL**

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, unadulated local river sand or gravel and shall be free from wood, stones and other debris. Excavated material shall only be used for fill if approved by the Engineer 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 upto 95% modified AASHTO Density by a Power vibratory roller, mechanical rammer, or other approved equipment, in layers not more than 6 inch 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 Engineer 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 6 inches thick and shall have proper moisture content for the required degree of compaction of 95%. Each layer shall be compacted by mechanical tampers or by other suitable equipment approved by the Engineer. Backfill shall be brought to a suitable elevation above grade to provide for anticipated settlement and shrinkage thereof.

Backfill shall not be placed against foundation walls etc., prior to the damp proofing treatment, if specified and approved by the Engineer or his Representative. Backfill shall be brought up evenly on each sidewall 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.

3.05 **COMPACTION:**

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.

3.06 **ROUGH GRADING:**

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

(b) Where paving or slabs are specified, all rough grading shall be done to the sub-grade of the base course, removing all large stones and debris and shall be compacted uniform to the correct lines and levels ready to receive the paving or slab. Refilling,

where required shall be executed with suitable selected materials in layers not exceeding 6 inch thick and thoroughly compacted to the required density. In place density tests shall be carried out by the Contractor for the approval of the compaction by the Engineer.

3.07 **FOOTING BOTTOM LEVELS:**

The levels as noted in the Drawings are only approximate and must be adjusted in the field with the approval of Engineer, depending on the soil conditions encountered. No concreting shall begin until the soil bearing capacity is substantiated by visual inspection by the Engineer or his Representative. The Contractor in planning his work shall make arrangement and provisions to construct the lowest level footings first.

3.08 **FIELD LEVELS:**

Prior to starting the work, the Contractor shall arrange to take the levels of the piece of land on which the building is located as directed by the Engineer. The same shall be simultaneously checked by the Engineer or his Representative and shall form the basis of payments for excavation and filling etc.

3.09 **DISPOSAL OF SURPLUS EARTH AND RUBBISH:**

All surplus earth and rubbish shall be disposed off at site as directed by the Engineer. The term disposal shall include all operations of loading, unloading, stacking, spreading, rehandling, filling in depressions, including consolidating and ramming in layers not exceeding 6 inch thickness.

3.10 **MEASUREMENTS AND PAYMENTS:**

All excavation shall be measured net and perpendicular and no allowance shall be made for any increase in bulk of the excavated material after excavation or for sloping sides, or widened trenches to accommodate formwork, shoring and bracing etc. Similarly the measurements for filling of granular materials/backfilling shall be thoroughly compacted and measured net and no allowance shall be made for any increase in bulk after excavation. Excavation, filling and Disposal shall include all leads and lifts as specified elsewhere in these specifications. Payment for all the items under this section shall be made at the rates entered in the BOQ appended to the contract and in accordance with the applicable conditions of the contract.

SECTION - 4

4.0 TERMITE CONTROL

4.01 SCOPE OF WORK:

The work covered by this section of Specification consists of furnishing all labour, materials, equipment, services, miscellaneous and necessary items required to complete Termite Control work, related works as indicated on drawings specified herein or both.

4.02 MATERIALS:

(a) Pesticides shall be solution of an approved chlorinated hydrocarbon such as O.5% Dieldrin or O.5% Aldrin mixed in clean water for application to or in earth, and mixed in pure turpentine for application to wood.

(b) Pesticides (dieldrin and aldrin) shall be obtained from the Government of Pakistan, Department of Agriculture, in sealed drums at rates in force at the time of their acquisition and only in the quantity necessary for work of this Project. All mixing shall be done at site and the number of pesticides used shall be verified by the Engineer his Representative.

4.03 METHOD OF APPLICATION:

Pesticide's solution shall be applied with approved pressure spraying equipment maintaining a pressure of IN/Sq.mm (15O lb/sq.in.) for all applications, to, on, or in earth. Spraying to wood shall be done by hand compassion sprayers with an approximate pressure of O.15 N/Sq.mm (2O lb/Sq.in).

4.04 EXTENT OF APPLICATION:

(a) At excavation, all walls and bottoms of all pits or trenches for footings or foundations are to be sprayed. Pesticide shall penetrate to a depth of 1'-O" minimum in porous earth at bottom and 3" minimum at sides of excavations.

(b) Stockpiled excavated material to be used as back fill is to be treated as above. After back-filling to plinth level, area of the whole building upto 1O'-O" outside the building line is again to be sprayed penetrating a minimum of 1 ft. into soil.

(c) After grading, compaction and sand filling before formation of hard core/soling under floor slabs all areas to be covered shall be sprayed with pesticides, penetrating a minimum of 1 ft. into soil.

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

4.05 **LOCATION AND SCHEDULING:**

(a) Saturation of earth is to be done in such a manner as to in no way disrupt the progress of work.

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

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

4.06 **STANDARD:**

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

4.07 **GUARANTEE:**

The Contractor is to guarantee that the building shall be free from termite (white ants), wood bores and other pests or rodents which cause damage to wood or other organic material for 1O years from the date of acceptance of the building.

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

4.08 **TESTING:**

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

4.09 **PAYMENT:**

No separate payment will be made for wood work etc. covered under this section of the specifications, and all costs in connection thith shall be deemed to have been included in the unit rates of the various items of wood works requiring treatment, except only building site which will be paid separately on the basis of plinth area covered by this treatment including all ditches, pits, excavation, fills etc. complete as per rate quoted in the Bill of Quantities.

SECTION - 5

5.0 WATER

5.01 SCOPE:

The work covered by this section of the Specification consists of furnishing all labour, appliances and in performing all operations in connection with obtaining, conveying and storing water at site of work.

5.02 QUALITY OF WATER:

The water used for construction shall be free from impurities and fit for drinking purpose.

5.03 TESTING:

Water if required, shall be subjected to standard testing at the cost of the Contractor and if found to be unsuitable for construction work then the Contractor shall take such action as directed by the Engineer.

5.04 TEMPORARY STORAGE TANK:

The Contractor shall provide on site at his own cost temporary storage water tank with all necessary G.I. Pipes and fittings as per instructions of the Engineer. No separate payment will be made for tank, pipes and accessories, etc. These tanks shall be removed or dismantled or demolished and the area shall be cleaned and made good on completion of work as per direction of Engineer.

5.05 PAYMENT:

No separate payment will be made for the work covered under this section, and all costs in connection therewith shall be deemed to be included in the unit rates.

SECTION - 6

6.0 CONCRETE

6.01 SCOPE OF WORK:

The work covered by this section of the Specifications consists of furnishing all plants, labour equipment appliances and materials and in performing all operations in connection wit concrete work complete in strict accordance with the applicable Drawings and the Specifications herein and subject to the terms and conditions of the Contract.

6.02 GENERAL:

Full cooperation shall be extended to other trades to install embeding items, and form ducts and openings etc. Embedded items shall have been inspected and check tested for concrete and other materials or for mechanical operations and approved before concrete is placed.

6.03 MATERIALS:

6.03.1 CEMENT

i) Grey/ white Portland Cement shall be normal setting cement of the specific gravity, fineness and chemical composition fully conforming to Pakistan Standard Specifications P.S. No.232:1967 and shall be capable of satisfying all tests such as the tensile strength tests contained therein. Standard test briquettes prepared with 1:3 cement sand mortar shall give the following tensile strengths:

At 3 days not less than 3OO Lbs/Sq.in(2.1N/Sq.mm). At

7 days not less than 4OO Lbs/Sq.in(2.8N/Sq.mm).

ii) Sulphate Resistant Cement where required shall be sulphate Resistant Cement type 'A' fully conforming to Pakistan Standard Specification PS No.612:1967 and satisfying the requirements for fineness, chemical composition strength, setting time and soundness, etc.

iii) For all types of cements, described in sub-Clauses (i) and (ii) above, the average compressive strength of three concrete cubes shall not be less than 12OO Lbs/Sq.in(8.2 N/Sq.mm) at three days and not less than 2OOO Lbs/Sq.in(14 N/Sq.mm) at seven days as described in Ps.No.232.1962. Alternatively, the average compressive strength of three mortar cubes prepared with 1:3 cement and standard silica sand mortar shall not be less than 22OO Lbs/Sq.in(15.2 N/Sq.mm) at three days and not less than 34OO Lbs/Sq.in(23.5 N/Sq.mm) at seven days. The initial setting time shall not be less than 45 minutes and final setting time not more than 1O hours.

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

deterioration during transit.

v) The Contractor shall provide at his own cost, on the Site, all necessary sheds, which

shall be perfectly dry and watertight for the storing of cement to be delivered to the works, to ensure adequate supplies being available at site of work.

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

vii) Cement shall be consumed in the sequence of receipt of shipments unless otherwise directed by the Engineer or his Representative.

6.03.2 **AGGREGATES**

i) All fine and coarse aggregates to be used shall be supplied from approved sources, which shall not be changed without permission in writing from the Engineer. Aggregates shall conform to the test requirements of Pakistan Standard 243:1963 or equivalent.

ii) Fine aggregates, shall be approved sand and shall be clean, sharp, free from clay, earth, vegetable and organic matters, alkaline or acid reactions or other deleterious matter or impurities.

iii) Fine aggregates shall conform to Pakistan Standard Specifications PS No.243:1963 "Natural Aggregates for Concrete" and shall be graded as follows:-

B.S.SIEVE NUMBER.	PERCENTAGE (BY WEIGHT) PASSING	
	Grading Zone 1.	Grading Zone 2.
3/8"(9.5 mm)	100	100
3/16"(4.8 mm)	90 - 100	90 - 100
No. 7	60 - 95	75 - 100
No. 14	30 - 70	55 - 90
No. 25	15 - 34	35 - 59
No. 52	5 - 20	08 - 30
No.100	0- 10	00 – 10

iv) Coarse aggregates shall be approved hard crushed stone from a source approved by the Engineer and shall be clean, free from sand, dust, salt, lime, chalk, clay and organic impurities or other deleterious matter.

v) Coarse aggregates shall conform to the relevant Pakistan Standard Specifications PS No.243:1963 Coarse aggregate shall be graded as follows:-

FOR CONCRETE CLASSES A, B & C (Nominal Size of Graded Aggregate 3/4" to 3/16" (19 mm to 4.8 mm).

B.S.SIEVE NUMBER	PERCENTAGE (BY WEIGHT) PASSING
1" (25.4mm)	100
3/4" (19 mm)	090 - 100
3/8" (9.5mm)	020 - 55
3/16"(4.8mm)	000 - 10

FOR CONCRETE CLASSES D & E (Nominal Size of Graded Aggregate 1-1/2" to 3/16" (38 mm to 4.8 mm).

1 1/2" (38 mm)	100
1" (25.4 mm)	95 - 100
3/4" (19 mm)	35 - 70
3/8" (9.5mm)	10 - 33
3/16"(4.8mm)	0 - 5

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

vii) If required, aggregates shall be washed and screened to the satisfaction of the Engineer or his Representative before use by processing through proper screening and washing plant. Adequate time is to be allowed therefore, for the moisture content to become substantially uniform before use in works.

viii) Sieve analysis and other necessary tests of all aggregates shall be carried out as and when required by the Engineer or his Representative. Samples for such tests shall be taken in the presence of the Engineer or his Representative. All costs in connection with the tests shall be borne by the Contractor.

ix) All aggregates shall be subject to the approval of the Engineer. Any batch of aggregates not found to the required standard shall be rejected by the Engineer or his Representative and shall have to be removed from site without delay. Concrete structures executed with rejected aggregates shall be dismantled and rebuilt at the Contractor's expense.

x) Special fine gravel of 9 mm (3/8") or 12 mm (1/2") maximum size shall be used if and where called for on the Drawings or as directed by the Engineer.

xi) If suitable gravel meeting with the Specifications is not procured by the Contractor, he will have to arrange suitable crush stone if demanded by the Engineer. No extra payment shall be made to the Contractor to effect this change.

6.03.3 WATER shall be as specified under section on water.

6.04 **CLASSIFICATION OF CONCRETE:**

Classes of concrete to be used in various parts of the works shall be as indicated on the drawings and mentioned in Bill of Quantities. The concrete of various grades shall be proportioned as set out in Table-I appended hereto.

TABLE-I: Showing minimum required compressive strengths on Standard test cylinders, water/cement ratio and minimum quantity of cement required per m3 or 100 cft. of finished concrete for various mixes and under various conditions.

Class of Concrete	Min. Qty. of Cement		Cylindrical Compressive Strength at 28 days		Water/Cement Ratios
	Lbs. per 100 cft.	Kg /cu.m			
			Lbs./Sq.in	N/Sq.mm	
A.	3024	485	5000	35	0.4
B.	2520	404	4000	28	0.45
C.	2016	323	3000	21	0.5
D.	1344	216	1500	10.5	0.5
E.	1008	161	1000	7	0.5

6.05 **PROPORTIONING OF CONCRETE MIXES:**

6.05.1 All concrete shall be proportioned by weight for concrete mixes, unless specifically directed by Engineer to proportion them by volume. The Contractor shall submit to the Engineer proposed mix designs for concrete to be used, based on preliminary laboratory tests to determine proportion of cement, aggregates and water in the concrete conforming to the quality and strength requirements specified herein. Preliminary test results of at least three different mixes of each class of concrete with varied water cement ratios shall be submitted. The results of 7 days and 28 days cube tests shall be used to establish the ratios between 7 days and 28 days strengths. The Engineer may make adjustments in the ratio of fine to coarse aggregate in the mix for a certain work. Preliminary design of mixes and testing shall be the responsibility of the Contractor. The proportion of voids in the coarse aggregate shall be controlled and if it exceeds 45% than sand and consequently the cement content shall be increased by the Contractor without any charge. If the proposition is less than 4O%, sand shall be decreased but not the cement.

6.05.2 **MAXIMUM ALLOWABLE WATER CONTENT:**

All concrete specimens shall be made, cured and tested in accordance with British Standard or ASTM Standard. A curve representing the relation between the water content and the average 28 days Compressive Strength or earlier strength at which the concrete is to receive its full working load shall be established for a range of values, including all the compressive strengths shown on the plans, The curve shall be established by at least four points each point representing average values for atlease four specimens. The maximum allowable water content for the concrete shall be as determined from this curve and shall correspond to a strength 15% greater than indicated on the plans. No substitution shall be made in the materials used in the work without additional tests in accordance with this procedure to

indicate that the quality of the concrete is satisfactory.

6.05.3 **SLUMP TEST:**

The Slump for concrete, determined in accordance with PS No.422:1964 "Slump Test for Concrete" shall be minimum of 25 mm (1") and a maximum of 75 mm (3") provided the requisite strength is obtained. Corrective additions to remedy deficiencies in aggregate gradations shall be used only with the written approval of the Engineer. When such additions are permitted the materials shall be measured separately for each batch of concrete.

6.06 **BATCHING AND MIXING:**

6.06.1 Concrete shall be mixed by a mechanical batch type mixing plant with adequate facilities for accurate measurements and control of each material entering the mixer and for changing the proportions to conform to varying conditions of the work. The mixing plant assembly shall permit ready inspection of operations at all times. The plant and its location shall be subject to approval of the Engineer. However, if approved by the Engineer, Volumetric batching can be adopted, using cement by weight, at 20°C or 70°F according to the following table:

Class	Nominal* Mix.	Cement Lbs.	Cement Kg	Sand Cft.	Sand Litre	Coarse Aggregate Cft.	Coarse Aggregate Litre
A	1:1:2	110	50	1 3	35	2 2	70
B	1:1 1/2:3	110	50	1 3/4	50	3 2	106
C	1:2:4	110	50	2 2	70	5	140
D	1:3:6	110	50	3 2	106	7 2	212
E	1:4:8	110	50	5	140	10	280

Water shall be measured for every batch with due allowance made for water already present in aggregates.

** Nominal mixes and Quantities of Cement, Sand and aggregates as shown above are indicative only and Contractor need to submit concrete mix design to arrive at appropriate mix ratios.*

6.06.2 **Batching** units where used shall be supplied with the following items:-

i) Weighing unit shall be provided for each type of material to indicate the scale load at convenient stages of the weighing operations. Weighing units shall be checked at times directed by and in the presence of the Engineer or his Representative and required adjustments shall be made before further use.

ii) Water mechanism shall be tight with the valve interlocked so that the discharge valve cannot be opened before the filling valve is fully closed and shall be fitted with graduated gauge.

iii) Discharge gate shall control the mix to produce a rib boning and mixing of cement with aggregates. Delivery of materials from the batching equipment to the mixer shall be accurate within the following limits:-

MATERIAL	PERCENTAGE BY WEIGHT
Cement	1/2

Water	1/4
Fine Aggregate	1
Coarse Aggregate	2

6.06.3 **MIXING UNIT:**

i) Operations:

Mixers shall not be charged in excess of noted capacity nor be operated in excess of noted speed. Excessive mixing requiring addition of water to preserve required consistency shall not be permitted. The entire batch shall be discharged before re-charging.

ii) Mixing time shall be measured from the instant water is introduced into the mixer drum containing all solids. All mixing water shall be introduced before one-fourth of the mixing time has elapsed. Mixing time for mixers of one cubic meter or less shall be 2 minutes; for larger than one cubic meter capacity mixers time shall be increased 15 seconds for each additional half cubic meter or fraction thereof. If an air-entraining agent is used, additional mixing time shall be allowed such as to provide the specified air-content.

ii) Discharge Lock:

Unless waived by the Engineer device to lock the discharge mechanism, until the required mixing time has elapsed, shall be provided on each mixer.

iv) No hand mixing under any circumstances even with extra cement shall be permitted. If during concreting, the mixing plant fails, the concrete already poured shall be removed, unless directed otherwise by the Engineer or his Representative.

6.07 **SAMPLES AND TESTING:**

6.07.1 **GENERAL:**

Test cubes of concrete shall be prepared and stored by the Contractor, in accordance with PS No.56O:1965, as and when directed by the Engineer or his Representative. Test cubes be tested in a laboratory and the Contractor shall bear the charges for the same. Aggregates shall be tested as prescribed.

6.07.2 **CEMENT:**

Cement shall be tested as prescribed in Pakistan Standard or British Standard or ASTM Standard.

6.07.3 **AGGREGATES:**

Aggregates shall be tested as prescribed in relevant Pakistan Standard or British Standard 812. In addition, fine aggregates shall be tested for organic impurities in conformity with B.S. 812 or equal ASTM Standard or Pakistan Standard.

6.07.4 **REINFORCEMENT:**

Reinforcing bars shall be tested as prescribed in relevant Pakistan or British or ASTM Standards. Mesh Reinforcement shall be tested as prescribed in B.S.785 or ASTM A-185.

6.07.5 **TESTING OF CONCRETE**

i) The Contractor shall provide for test purposes one set of six cubes taken for each class of concrete poured on each day. The Engineer or his Representative may,

however, order for more cube tests if any irregularity is found in the concrete.

ii) All test cubes shall be 15O x 15O x 15O mm (6"x6"x6") size.

iii) All test cubes of the same set shall be made from the same batch of concrete.

iv) Three cubes of the set shall be tested at 7-days and three shall be tested at 28 days or at such ages as directed by the Engineer or his Representative.

v) All test specimens shall be made and cured in accordance with Pakistan Standard PS 56O:1965 or British Standard B.S. 1881 or ASTM C-31.

vi) Specimens shall be cured under laboratory conditions except that the Engineer or his Representative may require curing under field conditions.

vii) All cube moulds shall be steel moulds perfectly true having all internal and the meeting faces machined to a smooth surface.

viii) If the strength tests of the laboratory controlled specimens for any portion of the work falls below the minimum allowable compressive strength at 28 days required for the class of concrete used in that portion, the Engineer or his Representative shall have the right to order replacement of the effected work.

ix) All test cubes cast at site shall bear distinguishing mark showing serial number, date of casting, quality of concrete and place from where sample was taken and where that batch of concrete was placed in the structure. A proper daily record of test specimens made, test results obtained shall be maintained by the Contractor and weekly test results shall be submitted to the Engineer or his Representative.

x) The Engineer or his Representative may require load tests for the part of the structure from where test specimens have shown unsatisfactory results at the cost of the Contractor. In the event that load tests indicate bad quality of concrete, measures as prescribed by the Engineer shall be taken to correct the deficiency at no additional cost to the Department. The nature, description and details of load test shall be determined by the Engineer and shall be binding on the Contractor.

6.08 **TRANSPORTING AND PLACING CONCRETE:**

a. Concrete shall be conveyed and deposited as quickly as possible after mixing and shall proceed so that, as far as possible, a complete section of the work is done in one operation.

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

c. All foundations and portions of work to be concreted shall be approved by the Engineer's Representative before concrete is poured.

d. All forms and reinforcement shall be completed, cleared inspected and approved before pouring of concrete. No concrete is to be deposited till the Engineer's Representative has inspected and approved in writing all reinforcement, foundations, forms, details, positioning of all fixture and materials to be embedded in concrete, control levels and screeds, etc. and is satisfied with the arrangements the Contractors has made to efficiently proceed with the work such as sufficient

labour, materials, plants etc. Such an approval will not relieve the Contractor from any of his obligations under this Contract. Water shall be removed from excavations before

concrete is deposited.

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

f. All concrete shall be thoroughly compacted and consolidated by means of Pneumatic or mechanical vibrators or other approved compacting method. Care shall be taken to avoid segregation due o excessive vibration. The Contractor shall maintain on site at all times one or more stand-by vibrators. Tapping or other external vibration of forms shall not be allowed, unless so directed by the Engineer's Representative. Compaction shall be done until the whole mass assumes a jelly like appearance and consistency with the water just appearing on the surface. Concrete shall be sufficiently tamped and consolidated around the steel rods, care taken that the vibrator does not touch steel or formwork and into all parts of the moulds in order that no voids or cavities are left. Steel shall not be disturbed during operations of concreting. Concrete shall be brought up in even layers not more than 15O mm (6") thickness and worked against side of forms to give a smooth and uniform surface. No excessive water shall be allowed to come out and lie on the surface of concrete. The concrete must be of such a consistency that after ramming, consolidating and tamping is completed, a thin film of water is just appearing on the surface.

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

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

i. Concrete shall not be dropped freely from a height of more than 3.5 m (12 ft) in columns and 1.5 m (5 ft) elsewhere. Incases where an excessive drop is inevitable the Contractor shall provide spouts, down pipes, chutes, or side parts to forms with pockets which will let concrete stop and flow easily into the form without any risk of segregation. The discharge of the spouts, down pipes or chutes shall be controlled so that the concrete may be effectively compacted into horizontal layers not more than 300 mm (12") thick.

j. Concrete is to be deposited as quickly as possible after mixing and to proceed continuously. Concrete which has attained its initial set or has contained its mixing water for more than 3O minutes shall not be allowed to be placed in the work.

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

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

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

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

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

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

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

All exposed surfaces and lines of the concrete work are to be true and fair without cracks, bends, windings and distortions of all kinds, and if occuring, shall be removed without any extra charges by the Contractor. All un-plastered concrete works is to be fair face, smooth, pleasing and to the entire satisfaction of the Engineer or his Representative.

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

6.09 **PROTECTION AND CURING:**

All exposed concrete shall be cured. Curing shall be accomplished by preventing loss of moisture, rapid temperature change and mechanical injury or injury from rain or flowing water for a period of at least ten (10) days. Curing shall be started as soon as the concrete has hardened sufficiently for the surface not to be marked. Curing shall be done either by continuous sprinkling of water on the surface or by covering with sand, hessian, canvas or other approved fabric mats, which shall be kept continually wet. If required and so directed

by the Engineer or his Representative, formed surfaces with forms in position shall also be cured by keeping all forms continually wet. As an alternative, curing of concrete, on all

exposed surfaces which could not be kept covered, such as sides of the beams, under side of the slabs, may also be done by sealing concrete surfaces with curing compounds like "Paccacure" or equal so as to arrest loss of moisture from concrete, with approval of Engineer or his Representative. The Contractor shall take special care that curing of concrete is satisfactorily carried out and in accordance with methods specified herein and / or as instructed by the Engineer or his Representative. Any negligence in this regard may result in total rejection of such concrete works, which in the opinion of the Engineer or his Representative have not been adequately cured.

Minimum period of curing for any concrete shall be 10 days or more as directed by the Engineer. All concrete components of concreted structures shall be clearly marked with non-washable paints to indicate the date of placing concrete. During hot weather, curing shall be done even at night.

6.10 FORMWORK:

6.10.1 General

The formwork shall be inclusive of all labour, material, workmanship and alike. All form work and supports thereto shall be designed by the Contractor and relevant drawings shall be submitted to the Engineer and his Representative for approval before the work is put in hand. Such an approval shall not relieve the contractor from all the obligations of the contract or give rise to any claims.

6.10.2 Making Forms

The form-work for columns, beams, slabs lintels fins, shells, blocks, panels, purdees, surrounds for windows, and all other works whether to be precast or cast in situ shall be made of sound and properly seasoned timber or other approved material and shall be rigidly formed and designed by the Contractor to the shapes and forms as per drawings in accordance with the best of the existing practices so as to be able to withstand, without displacement, deflection or deformation movements of any kind, the pressure of the moist concrete and all other loads. For concrete work to show an even finish the timber forms be properly lined with plywood or steel sheets to give a fair face concrete of a homogenous, perfectly even and smooth appearance in exposed surfaces of all beams, columns, walls, slabs, etc.

6.10.3 Rigid with Allowance for Camber and Bulges

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

6.10.4 Exposed Surfaces Left Unplastered

For concrete work covered in this contract where concrete Surface is to be exposed in the finished work and left unplastered, the form-work shall be smoothly faced by using plywood

sheets or lining the shuttering with smooth steel sheet or non-absorbent material like formica sheets or in any manner as approved by the Engineer or his Representative, so as to make a perfectly smooth surface of the finished concrete. Where any surface defects on the exposed

concrete surfaces occur and which do not impair the structural performance, being in excess of the designed surfaces, and the architectural appearance of the work in the opinion of Engineer or his Representative, such defects may be removed by guniting and grinding with corborandum stone or in any other approved manner, at the cost of the Contractor, otherwise the whole or part of the work may have to be removed and remade good by the Contractor at his own cost. For precast concrete members the forms shall be rigid, exact, smooth and made of steel.

6.10.5 **Materials and Labour**

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

6.10.6 **Form Work not to Interfere or Injure Work**

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

6.10.7 **Opening in Form-work**

Wherever the Concreting is required to be carried out within forms of considerable depths, temporary openings in the side of the form shall be provided to facilitate the pouring and consolidation of the concrete. Small temporary openings shall be provided at the bottom of all forms to permit the removal of rubbish etc.

6.10.8 **Openings and other details**

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

6.10.9 **Joints in Form-work**

All joints in the formwork shall be sufficiently closed to prevent undue leakage of mortar for concrete surface not to be exposed in the finished work. The joints in the form-work for all concrete surfaces to be exposed in the finished work shall be close jointed and perfectly smooth so as not to allow any leakage of the mortar from the concrete; and show any appearance of leaking mortar on concrete surface.

6.10.10 **Treatment and Inspection of Forms**

All rubbish, particularly chipping, shavings, and sawdust etc. shall be removed from the interior of the forms, immediately before fixing of bars. Forms shall be coated with approved mould oil before reinforcement is placed. Surplus oil on forms and any oil on reinforcing steel shall be removed. Forms surface not exposed to view or normal watering may thoroughly be wetted with soap and water in place of oiling before placing concrete. If the forms are not used within 24 hours, a fresh coat of oil shall be given before placing of

concrete.

6.10.11 **Striking Shuttering**

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

Removal of Shuttering	10 °C (50°F)	20 °C (70°F)
Beams sides, walls & Columns (unloaded)	3	2
Slabs soffits (props left under)	9	6
Removal of props to slabs	18	14
Beams soffits (props left under)	18	12
Removal of props to beams, and shuttering under shells.	24	18

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

6.10.12 **Injury or Damage.**

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

6.10.13 **Treatment after Removal of Forms.**

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

No form-work shall be measured and paid for separately and shall be deemed to be included in the unit price of concrete whether cast-in-situ or precast and subsequently fixed in position.

6.11 FINISHING OF FORMED SURFACES

6.11.1 SPECIAL ARCHITECTURAL FINISHES

i) Textured finishes - Textured form liners may be of form plastic sheet, wood sheet,

metal, or other material. Liner panels shall be secured in forms by cementing or stapling, but not by methods which will permit impressions of nail heads, screw heads, washers, or the like to imparted to the surface of the concrete. Edges of textured panels shall be sealed to each other or to divider strips (if specified or shown) to prevent bleeding of grout. The sealant used shall be non-staining to the surface.

iii) Aggregate transfer finishes - Aggregate transfer and other special finishes shall be produced using methods and materials in such a way as to duplicate sample panels prepared in advance.

iii) Applied finishes - When special finishes are to be applied, the surface of the concrete shall be prepared to ensure permanent adhesion of the finish. If the concrete is less than about 24 hours old, it can be roughened with a heavy wire brush or scoring mechanically or by etching with dilute hydrochloric acid. After roughening the surface shall be washed free of all dust, acid, chemical retarder, and other foreign material before the final finish applied.

6.11.2 **RUBBED FINISHES**

The following finishes shall be produced to concrete with a smooth form finish. Where smooth rubbed finish is to be applied, the forms shall have been removed and necessary patching completed as soon after placement as possible without jeopardizing the structures.

i) Smooth rubbed finish - Smooth rubbed finish shall be produced on newly hardened concrete not later than the day following from removal. Surfaces shall be wetted and rubbed with car texture are produced. No cement grout shall be used other than the cement paste drawn from the concrete itself by rubbing process.

ii) Grout cleaned finish - No cleaning operation shall be permitted until all continuous surfaces to be cleaned are completed. Mix 1 part Portland cement cement and 1 1/2 parts fine sand with sufficient water to produce a grout having the consistency of thick paste. White Portland cement shall be substituted for a part of the grey Portland cement in order to produce color matching the color of the surrounding concrete, as determined by a trial patch. Wet the surface of the concrete sufficiently to prevent absorption of water from the grout and apply the grout uniformly with brushes or a spray gun. Immediately after applying the grout, scrub the surface vigorously with a cork flot or stone to the surface and fill all air bubbles and holes. While the grout is still plastic, remove all excess grout by working the surface with rubber float, sack, or other means. After the surface whitens from drying (about thirty minutes at normal temperatures), rub vigorously with clean burlap. The finish shall be kept damp for at least 36 hours after final rubbing.

iii) Cork floated finish - Remove from at an early stage, within 2 to 3 days of placement where possible. Remove ties . Remove all burrs and fins. Mix one part Portland cement and one part fine sand with sufficient water to produce a stiff mortar. Dampen wall surface. Apply mortar with firm rubber float or with trowel filling all surface voids. Compress mortar into voids using a slow - speed grinder or stone. if the mortar surface dries too rapidly to permit proper compaction and finishing, apply a small texture with a cork float using a swirling motion.

6.11.3 **UNSPECIFIED FINISH**

If the finish is not designated and applied finishes are also not indicated the following finishes shall be used as applicable:

i) Rough form finish - For all concrete surface not exposed to public view.

ii) Smooth form finish - For all concrete surfaces exposed to public view.

6.11.4 **RELATED UNFORMED SURFACE**

Tops of walls or buttresses, horizontal off-sets, and similar unformed surfaces occurring adjacent to formed surfaces shall be floated to a texture reasonably consistent with that of the formed surfaces. Final treatment on formed surfaces shall continue uniformly across the unformed surfaces.

6.12 **CONSTRUCTION JOINTS:**

Construction joints shall be located as indicated on the drawings and/or as approved or directed by the Engineer or his Representative. For slabs and beams construction joints shall be located at mid point of the span unless a secondary beam intersects a main beam at the centre in which case the joints in the main beam shall be off set a distance equal to twice the width of the beam and provision for shear shall be made by the use of inclined reinforcement at the cost of the Contractor. Joint in columns shall be made at the under side of the deepest beam framing thereto. Beam stems shall be poured monolithically unless directed otherwise by the Engineer. Joints not specified or shown on the drawings shall be so located as to least impair the strength and appearance of the work. Except where indicated on the drawings no jointing shall be made in footings or foundations without written approval of the Engineer or his Representative. Construction jointing shall be at right angles to the member and shall be formed against firm stop boards. The stop boards shall be removed as soon as possible after placing the concrete but without the risk of movement of the concrete and the concrete surface shall be well brushed with a hard brush and washed off with a spray of water, two to four hours after casting, to expose the aggregates and provide a key for the next pour. In all liquid retaining structures and other sub-structures pits and trenches etc. PVC or any other approved water stops shall be provided at the construction joint in the manner shown on the drawings and/or approved by the Engineer or his Representative.

Whenever a section of concrete is left unfinished, for any reasons with the approval of Engineer's Representative, leaving a surface which will be hard set before additional concrete can be joined to it, dovetails, grooves or other bonds with the new work shall be provided at cost of the Contractor. Before depositing fresh concrete upon or against any concrete

which has already set, the surface of the set concrete shall be roughened with a cutting tool, any laitance removed, thoroughly cleansed of all foreign matter, well watered and covered with cement grout, and special care shall be taken to ram the fresh concrete thoroughly up and

against the set concrete; and, if deemed necessary by the Engineer or his Representative the joints shall be reinforced with steel bars or dowels to be all furnished and done by the Contractor without any additional payment.

6.13 CONCRETE FLOOR SLAB FINISHING:

6.13.1 GENERAL

Concrete slabs shall be finished as described herein. In preparation for finishing, floor slabs shall be struck off to the required level at or below the elevation or grade of the finished floors as shown on the drawings. Floors shall be leveled with a tolerance of 1 mm in 1 m (1/8" in 1O feet) except where drains occur in which case the floors shall be pitched to the drains as indicated on the drawings or as directed by the Engineer.

6.13.2 MONOLITHIC FINISH

All concrete surfaces in floors except where other finish is specified shall be finished by steel floats or straight edges to bring the surface to the required finish level shown on the drawings. While the concrete is still green but sufficiently hardened to bear a man's weight without deep imprint it shall be wood floated to a true even plane with no coarse aggregate visible. Sufficient pressure shall be used on the wood floats to bring moisture to the surface. The concrete shall then be hand toweled to produce a smooth impervious surface free from trowel marks. If necessary, the process shall be repeated so that the final finish shall produce a ringing sound from the trowel. No separate payment shall be made for finishing floor slabs in the fore mentioned manner.

6.13.3 CONCRETE TOPPING

Where indicated on the drawings base slab under concrete topping shall receive a screeded finish. After the base slab is thoroughly cured and when directed concrete topping shall be laid to the thickness as indicated on the drawings in alternate panels of suitable sizes as directed by the Engineer or his Representative.

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

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

6.15 WATERPROOF CONCRETE:

Wherever specified on the drawings all liquid or water retaining structures and those subject to water pressure shall be executed with approved waterproof concrete. The water proofing compound shall be of the approved type and shall be mixed with the concrete in strict accordance with the manufacturer’s directions and/or as directed by the Engineer or his Representative.

6.16 CLEANING AND REMOVAL OF RUBBISH:

On completion of works herein the Contractor shall remove all concrete debris, rubbish, shuttering materials, scrapes etc., from the vicinity of the structures completed. All areas shall be cleaned to the satisfaction and approval of the Engineer or his Representative.

6.17 COORDINATION:

The Contractor shall provide chases and openings required for other sections of the work and

will co-operate and coordinate with other trades in placing their pipes, ducts, reglets and

other built-in-items as the work proceeds.

6.18 **EXTERNAL EXPOSED CONCRETE SURFACE:**

All external exposed un-plastered concrete surfaces of cast in situ or precast units shall be given smooth or pattern finish as shown in the finishing schedule or as directed by the Engineer or his Representative. No separate payment shall be made to the Contractor for this work and it shall be included in the item rates of the respective concrete items in the bill of quantities.

6.19 **PARTICULAR SPECIFICATIONS FOR CONCRETE**

a) Allowable bearing pressure of soil for foundation is marked on the drawing of the foundation. It is to be checked that no foundation is placed on the soil with a lower bearing capacity. In cases any weaker strata is encountered at any level the matter is to be reported to the Engineer for necessary changes in footings.

b) Level of foundations as indicated on the drawings may be varied at site to reach the suitable strata. This matter is to be decided by the Engineer at site.

c) Before concreting, the excavated surface to receive the concrete should be cut to proper levels. All loose soil is to be removed.

d) Minimum strength requirements of various concrete mixes at 28 days actually being used for work using ordinary Portland cement shall be as follows:-

Concrete Mix:	1:1:2	-	4500 p.s.i. (Class 'A')
	1:1 1/2:3	-	3750 p.s.i. (Class 'B')
	1:2:4	-	3000 p.s.i. (Class 'C')
	1:3:6	-	1500 p.s.i. (Class 'D')
	1:4:8	-	1000 p.s.i. (Class 'E')

e) All R.C.C. work shall be in 1:2:4 concrete mix unless otherwise indicated for a richer mix on the drawing or specified.

f) All concrete is to be thoroughly vibrated mechanically:

i. Any concrete failing to meet the specified strength or not formed as shown on drawings, concrete out of alignment, concrete with surfaces beyond require tolerances or with defective surfaces which cannot be properly repaired or patched in the opinion of Engineer=s Representative shall be removed and replaced at Contractor=s expense. The Engineer=s Representative may reject any defective concrete and order it to be cut out in part or in whole and replaced at the Contractors expense. Only in case of minor surface defects the Engineer=s Representative may approve a surface treatment immediately after from removal.

ii. All ties and bolt holes and all repairable defective area shall be patched immediately after removal.

iii. All honeycombed and other defective concrete shall be remove down to sound concrete. The area to be patched and area at least 150 mm wide surrounding it shall be dampened to prevent absorption of water from the patching mortar. A bonding grout shall be prepared using a mix of approximately 1 part cement to 1 part fine sand passing a No. 25 B.S. Sieve, shall be mixed to the consistency of thick cream and shall then be well brushed into the surface.

iv. The patching mixture shall be made of the same material and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and mortar shall consist of not more than 1 part cement to 22 parts sand by damp loose volume. White Portland cement shall be substituted for a part of the grey Portland cement on exposed concrete in order to produce a color matching the color of the surrounding concrete, as determined by a trial patch.

v. The quantity of mixing water shall be not more than necessary for handling and placing. The patching mortar shall be mixed in advance and allowed to stand with frequent manipulation with a trowel, without addition of water, until has reached the stiffest consistency that will permit placing.

vi. After surface water has evaporated from the area to be patched, the bond coat shall be well brushed into the surface. When the bond coat begins to lose the water sheen, the premixed patching mortar shall be applied. The mortar shall be thoroughly consolidated into place and struck off so as to permit initial shrinkage, it shall be left undisturbed for at least 1 hour before being finally finished. The patched area shall be kept damp for 7 days. Metal tools shall not be used in finishing a patch in a formed wall, which will be exposed.

g) For heavy concrete members the form work is to be properly designed and approved by the Engineer.

h) Shuttering should not be struck earlier than the time specified unless otherwise approved by the Engineer.

i) 18 gauge G.I. binding wire to be used for securely binding the reinforcing bars to avoid dislocation or displacement during concreting.

j) Clear cover to main reinforcement in concrete members be as follows:-

i) For slabs, projections chajjas, fins, walls, staircases precast slabs. 3/4"
ii) For beams, Columns, all members of water tank on the side in contact with water. 1 1/2"
iii) For foundations, retaining walls and foundation beams. 2"

k) All the reinforcing bars are to be properly placed as shown on the working drawings.

Steel chairs and concrete spacer blocks are to be used without any extra cost. Concrete spacer blocks are to be properly cured to avoid their damage during concreting, thereby causing displacement of bars. Holes made by bolts etc.

introduced for keeping the shuttering in tact should be properly treated after striking the shuttering. No such holes shall be allowed in walls of water retaining structures and earth retaining walls.

l) All bent up bars in slabs are to be properly secured in position. Workers or trollies shall not be allowed in any case over the reinforcement mesh.

m) Special care is to be taken to see that all expansion joints shown on the drawings are made in perfect straight line and treated as specified.

n) Construction joints in beams and slabs shall be located at the centre of the span (such that a proper seat is formed for the next part to be cast); unless otherwise indicated on drawings or approved by the Engineer.

o) DPC

The Concrete mix of DPC will be CC 1:2:4 as specified in this chapter.

To protect the dampness water proofing agent APudlo@ or any other water proofing agent as approved by the Engineer will be mixed in CC 1:2:4 @ the ratio of 5 lbs per bg of cement. The DPC will be cured for at least 10 days.

6.20 MEASUREMENT AND PAYMENT

All the concrete work shall be measured net as per execution at site in square or cubic meter for the related items and shall be paid at the rate entered in the BOQ appended to the contract in accordance with the conditions of contract. The rates are exclusive of all type of formwork, unless otherwise specified its erection and removal, all scaffolding and inclusive the all cost of mixing and batching plants, all T&P required for executing and placing the concrete work in position. Defective and honey-combed work will not be measured & paid and will be liable to be rejected and redone at contracts' cost.

SECTION - 7

7.0 STEEL REINFORCEMENT

7.01 SCOPE OF WORK:

The work covered by the section of the specification consists of furnishing all materials, tools, labour and in performing all operations in connection with the providing, straightening cutting, bending, binding, fixing, including binding wire, chairs, pins, 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.

7.02 MATERIALS:

A. 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.

B. The Contractor shall furnish to the Engineer's Representative Manufacturers' mills certificate to guarantee that steel meets the standard, specifications requirements and minimum certified yield stresses as follows:-

i) Mild Steel plain bars conforming to B.S.S. 15 or B.S.S. 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 24% (av. 20%).

ii) Hard grade deformed bars conforming to ASTM, A-15-85 T. or PS-6O5-1962

a) Tensile Strength - 560N/Sq.mm (35.7 Tons/Sq.in).
b) Yield Strength - 350 N/Sq.mm(22.3 Tons/Sq.in).
c) Elongation - $1100\,000 \times \%$ / Tensile Strength

iii) Ribbed Tor steel conforming to B.S. 4461

a) Tensile Strength - 490 N/Sq.mm(70,000 lbs/Sq.in).
b) Yield Strength - 420 N/Sq.mm(60,000 lbs/Sq.in).
c) Elongation - 14.5%

C. All steel to be true to the Standard Specifications with regard to bend ability specially the hard grade deformed bars under 19 mm (3/4") dia. shall be capable of being bent cold through 9O degree round a bar of four times its own diameter without fractures or injury of any kind. In case of deformed bars over 19 mm (3/4") dia. and under 28 mm (1-1/8")dia. round a bar of 6 times its own diameter.

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

7.03 **TESTING:**

Reinforcement shall be obtained only from manufacturers approved by the Engineer=s Representative.

If and when required samples shall be tested for above specification in an approved laboratory when required by the Engineer or his Representative and all costs of such tests shall be borne by the Contractor.

7.04 **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 shall not be used in the works unless brushed and cleaned by proper steel wire brushes and after being approved for use by the Engineer or his Representative.

7.05 **REINFORCEMENT CUTTING AND PLACING**

A. All reinforcement steel shall be cut and bent cold in strict accordance with bar bending schedules approved and drawings supplied by Engineer. The Contractor shall prepare bar bending schedule from approved structural working drawings and instructions to be provided to him by the Engineer. The bending schedules shall be drawn on approved forms and submitted to the Engineer 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 bars, 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 Engineer, 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. The system of holding bars in place shall ensure that all steel in top section will support weight of workmen without displacement or distortion. Suitable spacers and chairs as approved by the Engineer or his Representative shall be used for supporting and spacing purposes of bars. In case any bars are bent or displaced they shall be straightened or replaced prior to pouring. All reinforcement bars within the limit of a days pour shall be in place and firmly tied with 18 gauge G.I. wires. Bars with kinks or bends not shown on drawings shall not be used.

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

7.06 **LAPS AND SPLICES**

A. No splicing of bars shall be allowed at position other than shown on the drawings. All lap lengths shall be of the minimum sizes as indicated on the drawings and in no case shall lap length be less than 4O times the diameter of the bigger lapping bars for nominal M.S. bars. Hard grade bars and tor steel shall have laps of 5O time the bigger diameter of lapping bars. Splices of adjacent bars shall be staggered unless approved otherwise by the Engineer or his Representative.

B. All reinforcing steel fixed in position shall be inspected by the Engineers Representative and no concrete shall be poured until steel placement has been

approved by the Engineers Representative. For inspection purposes the Contractor shall give to the Engineers Representative reasonable notice before the scheduled pouring time. Clear concrete cover to reinforcement steel shall be as indicated on the drawings/specified.

7.07 **MEASUREMENT AND PAYMENT**

A. The quantity to be paid for shall be the calculated in theoretical number of metric ton of 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.

B. 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 in.	Weight in Ibs per ft.	Size in.	Weight in Ibs per ft.
1/4	0.167	3/4	1.502
3/8	0.376	7/8	2.045
1/2	0.668	1	2.670
5/8	1.043	1 1/8	3.380

C. 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 the Contractor's request and as a result more steel is used than specified only the amount specified shall be included.

D. 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.

E. 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 the individual bars not being shorter than 4O ft.

F. The accepted quantity measured as provided above shall be paid for at the contract unit price for the 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-8

8.0 STONE SOLING/PAVING

8.1 GENERAL

A. Stone Abrasion Resistance: Minimum abrasive-hardness value of 12, as determined per ASTM C241.

B. Static Coefficient of Friction: ASTM C 1028, values as follows:
Level Surfaces: A minimum of 0.6.
Ramp Surfaces: A minimum of 0.8.

C. Submittals: Submit the following:
Product Data: For each variety of stone, stone accessory, and other manufactured products specified.

Shop Drawings: Show details of fabrication and installation of stone paving and flooring, including dimensions and profiles of stone units; arrangement and details of jointing; and details showing relationship with, attachment to, and reception of related work.

Stone Samples: Sets for each color, grade, finish, and variety of stone required; not less than 12 inches (300 mm) square.

D. Mockups: Before installing stone paving and flooring, construct mockups, in locations and of sizes indicated, to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution.

8.2 PRODUCTS

8.2.1 Provide stone from a single quarry for each variety of stone required.

Match Architect's samples for variety, color, finish, and other stone characteristics relating to aesthetic effects.

Match existing stone for variety, color, and finish where stone is indicated to match existing.

Provide stone that is free of cracks, seams, and starts impairing structural integrity or function.

Provide matched blocks extracted from contiguous locations in a single bed of quarry stratum unless stone from blocks randomly selected for aesthetic effect is approved by Architect.

8.2.2 Granite: ASTM C 615 and the National Building Granite Quarries Association's (NBGQA) "Specifications for Architectural Granite."

8.2.3 Limestone: ASTM C 568.

8.2.4 Marble: ASTM C 503.

8.2.5 Quartz-Based Stone: ASTM C 616.

8.2.6 Slate: ASTM C 629 with a fine, even grain and with uniform, unfading color from clear, sound stock.

8.2.7 Pattern: As follows:
Rectangular-grid pattern of 18 by 18 inches (457 by 457 mm).
Rectilinear pattern of 12-by-24-inch (305-by-610-mm) units, laid in brickwork pattern.
Random, rectangular pattern composed of units not less than 6 inches (152 mm) nor more than 24 inches (610 mm) in nominal dimension.
Random, polygonal pattern composed of units not less than 1 sq. ft. (0.09 sq. m) nor more than 5 sq. ft. (0.46 sq. m) in area.

8.2.8 Mortar Materials: As follows:

8.2.8.1 Portland Cement: ASTM C 150, Type I or II; natural color, white, or a blend to produce mortar color indicated.

8.2.8.1.1 Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C 114.

Hydrated Lime: ASTM C 207, Type S.

1. Aggregate: ASTM C 144 and as indicated below:

a. For joints narrower than 1/4 inch (6 mm), use aggregate graded with 100 percent passing No. 16 (1.18-mm) sieve.

b. For pointing mortar, use aggregate graded with 100 percent passing No. 16 (1.18-mm) sieve.

c. White-Mortar Aggregates: Natural, white sand or ground, white stone.

d. Colored-Mortar Aggregates: Natural, colored sand or ground marble, granite, or other sound stone, as required to match Architect's sample.

Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in stone mortars.

Latex-Portland Cement Mortar: ANSI A118.4, factory-packaged dry-mortar mix with water-emulsion latex additive added at Project site.

Water: Potable.

8.2.9 Grout Materials: As follows:

8.2.9.1 Grout Colors: Provide Architect's selection from manufacturer's full range of

colors.

8.2.10 Sand-Portland Cement Grout: ANSI A108.10.

8.2.11 Latex-Portland Cement Grout: ANSI A118.6 and as follows:

8.2.11.1 Factory-Prepared Dry-Grout Mixture: Factory-prepared mixture of portland cement; dry, redispersible, ethylene vinyl acetate additive; and other ingredients to produce the following:

8.2.11.1.1 Un-sanded grout mixture for joints 1/8 inch (3 mm) and narrower.

8.2.11.1.2 Sanded grout mixture for joints 1/8 inch (3 mm) and wider.

8.2.11.2 Mixture of Dry-Grout Mix and Latex Additive: Mixture of factory-prepared dry-grout mix and latex additive to comply with the following requirements:

8.2.11.2.1 Un-sanded Dry-Grout Mix: Dry-set grout complying with ANSI A118.6, for joints 1/8 inch (3 mm) and narrower.

8.2.11.2.2 Sanded Dry-Grout Mix: Commercial Portland Cement grout complying with ANSI A118.6, for joints 1/8 inch (3 mm) and wider.

8.2.11.2.3 Latex Additive: Styrene butadiene rubber.

8.2.11.2.4 Latex Additive: Acrylic resin.

8.2.12 Accessories: As follows:

Cleavage Membrane: Polyethylene sheeting, ASTM D 4397, 4 mils (0.1 mm) thick.
Reinforcing Wire Fabric: Galvanized, welded-wire fabric, 2 by 2 inches (50.8 by 50.8 mm) by 0.062-inch- (1.6-mm-) diameter wire, complying with ASTM A 185 and ASTM A 82, except for minimum wire size.

Divider Strips and Edging: Metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications consisting of the following:

a. Exposed-Edge Material: As follows:

1. Material: Half-hard brass. 2) Material: Stainless steel; ASTM A 666, Type 302.

b. Cross-Section Profile and Size: As indicated; height to match stone thickness.

1) Width: 0.063 inch (1.6 mm). 2) Width: 1/8 inch (3.2 mm).3) Width: 1/4 inch (6.4 mm).

c. Control-Joint Filler: Neoprene, in color selected by Architect from manufacturer's full range of colors.

Cork Joint Filler: Preformed strips complying with ASTM D 1752, Type II.

Cleaner: Specifically formulated for stone types, finishes, and applications indicated. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.

Floor Sealer: Colorless, slip- and stain-resistant sealer not affecting color or physical properties of stone surfaces, as recommended by stone producer for application indicated.

8.2.13 Stone Fabrication: Fabricate stone paving and flooring in sizes and shapes required to comply with requirements indicated, including details on Drawings and Shop Drawings. For granite, comply with recommendations of National Building Granite Quarries Association's (NBGQA) "Specifications for Architectural Granite."

For marble, comply with recommendations of Marble Institute of America's (MIA) "Dimensional Stone-Design Manual IV."
For limestone, comply with recommendations of Indiana Limestone Institute of America's (ILI) "Indiana Limestone Handbook."

8.2.14 Pattern Arrangement: Fabricate stone from one block or contiguous, matched blocks, and arrange units with veining and other natural markings to comply with the following requirements:

Arrange units with veining horizontal.
Arrange units with veining vertical.

Arrange units with veining as indicated on Drawings.

8.2.15 Mortar and Grout Mixes: Comply with referenced standards and with manufacturers' written instructions. Do not use admixtures.

Mortar: Comply with ASTM C 270, Proportion Specification, Type N for interior applications and Type S for exterior applications.

La&ex-Modified-Portland Cement Mortar: Proportion and mix Portland cement, aggregate, and latex additive to comply with latex additive manufacturer's written instructions.

1. Cement-Paste Slush Coat: Mix to consistency of thick cream and consisting of either cement and water or cement, sand, and water.

   a. For latex-modified-portland cement mortar, substitute latex admixture for part or all of water according to latex additive manufacturer's written instructions.

   b. Pigmented Pointing Mortar: Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment-to-cement ratio of 1:10, by weight.

   c. Colored-Aggregate Pointing Mortar: Produce color required by combining colored aggregates with Portland cement of selected color.

Joint Grout: Comply with mixing requirements of referenced ANSI standards and manufacturer's written instructions.

8.3 EXECUTION

8.3.1 Vacuum clean substrates to remove dirt, dust, debris, and loose particles.

8.3.2 Remove substances from substrates that could impair mortar bond.

8.3.3 Clean stone surfaces before setting by thoroughly scrubbing with fiber brushes

and then drenching with clear water.

8.3.4 Execute stone paving and flooring installation by skilled mechanics and employ

skilled stone fitters at the site to do necessary field cutting as stone is set.

8.3.4.1 Use power saws to cut stone.

8.3.5 Set stone to comply with Drawings and Shop Drawings. Match for color and pattern by using units numbered in sequence as indicated on Shop Drawings.

8.3.6 Scribe and field-cut stone as necessary to fit at obstructions. Produce tight and neat joints.

8.3.7 Stone Paving over Waterproofing: Carefully place stone and setting materials over waterproofing so protection materials are not displaced and waterproofing is not punctured or otherwise damaged.

8.3.7.1 Provide cork joint filler, where indicated, at waterproofing that is turned up on vertical surfaces or, if not indicated, provide temporary filler or protection until stone paving installation is complete.

8.3.8 Expansion- and Control-Joint Installation: Locate and install according to Drawings and Shop Drawings. Joint-sealant materials and installation are specified in Division 7 Section "Joint Sealants."

Architectural Specifications

I. Installing Stone Directly over Concrete: Install as follows:
Saturate concrete with clean water before placing setting bed. Remove surface water before placing setting bed.

Apply cement-paste slush coat before placing setting bed. Limit area of slush coat to avoid its drying out. Do not exceed 1/16-inch (1.5-mm) thickness for cement-paste slush coat.

Apply mortar setting bed over cement-paste slush coat. Spread and screed setting bed to uniform thickness at elevations required for accurate setting of stone.

Mix and place only as much mortar as can be covered with stone before initial set. Cut back, bevel edge, and discard setting-bed material that has reached initial set before placing stone.

Place stone before initial set of cement occurs. Apply uniform 1/16-inch-(1.5-mm-) thick, slurry bond coat to bed or to back of each stone unit.

Tamp and beat stone to obtain full contact with setting bed. Set each unit in a single operation before initial set of mortar; do not disturb stone for purposes of realigning.

Point joints after setting. Tool joints flat, uniform, and smooth, without visible voids.

J. Installing Stone over Cleavage Membrane or Waterproofing: Install as follows: Place cleavage membrane over subfloor surfaces indicated to receive stone flooring, lapped at least 4 inches (100 mm) at joints.

Place reinforcing wire fabric, lapped at joints by at least one full mesh and supported so

mesh becomes embedded in middle of setting bed. Do not butt edges against vertical surfaces.

Place mortar setting bed with reinforcing wire fabric fully embedded in middle of setting bed. Spread and screed setting bed to uniform thickness at elevations required for accurate setting of stone.

Mix and place only as much mortar as can be covered with stone before initial set. Cut back, bevel edge, and discard setting-bed material that has reached initial set before placing stone.

Place stone before initial set of cement occurs. Apply uniform 1/16-inch-(1.5-mm-) thick, slurry bond coat to bed or to back of each stone unit.

Tamp and beat stone to obtain full contact with setting bed. Set each unit in a single operation before initial set of mortar; do not disturb stone for purposes of realigning.

Point joints after setting. Tool joints flat, uniform, and smooth, without visible voids.

K. Grout stone joints to comply with ANSI A108.10 and manufacturer's written instructions. Do not use sanded grout for polished stone.

Grout joints as soon as possible after initial set of setting bed. After initial set of grout, finish joints by tooling to produce a slightly concave polished joint.

Cure grout by maintaining in a damp condition for 7 days, except as otherwise recommended by latex additive manufacturer.

L. Remove and replace damaged and defective stone paving and flooring in a manner that results in stone paving and flooring's matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.

M. Clean stone paving and flooring after setting and grouting are complete. Use procedures recommended by stone fabricator for types of application.

N. Apply sealer to cleaned stone flooring according to sealer manufacturer's written instructions. Architectural Specifications

O. Prohibit traffic from installed stone for a minimum of 72 hours.

P. Protect stone paving and flooring during construction. Where adjoining areas require construction work access, cover stone paving and flooring with a minimum of 3/4-inch (19-mm) untreated plywood over nonstaining kraft paper.

8.4 Measurement and Payment:

All the items of work covered by this Section of the Specifications shall be measured by the Standard Method of measurements. The quantity of stone soling will be ascertained by measuring length, breadth and depth of actual volume laid deducting any section of columns and other structures penetrating throughout the under floor and shall be paid for at the individual item rates entered in the Bill of Quantities and in accordance with the applicable terms and conditions of the Contract.

SECTION -9

9.0 DEWATERING

PART 1 GENERAL

9.1 RELATED DOCUMENTS

9.1.1 Drawings and general provisions of the Contract, including General and Particular Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

9.2 SUMMARY

B. This Section includes construction dewatering.

C. Related Sections include the following:

1. Division 1 Section "Temporary Facilities and Controls" for temporary utilities and support facilities.
2. Division 2 Section "Excavation Support and Protection."
3. Division 2 Section "Earthwork" for excavating, backfilling, site grading and for site utilities.
4. Division 2 Section "Subdrainage" for permanent foundation wall, underfloor, and footing drainage.

9.3 PERFORMANCE REQUIREMENTS

D. Dewatering Performance: [**Design,**]furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control ground-water flow into excavations and permit construction to proceed on dry, stable subgrades.

1. Maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Accomplish dewatering without damaging existing buildings adjacent to excavation.
4. Remove dewatering system if no longer needed.

9.4 SUBMITTALS

E. Shop Drawings for Information: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of headers and discharge lines; and means of discharge and disposal of water.

1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
2. Include a written report outlining control procedures to be adopted if dewatering

problems arise.

3. Include Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.

F. Qualification Data: (To be submitted by the contractor for the approval)

G. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.

H. Record drawings at Project closeout identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions performed during dewatering.

1. Note locations and capping depth of wells and well points.

I. Field Test Reports: Before starting excavation, submit test results and computations demonstrating that dewatering system is capable of meeting performance requirements.

9.5 QUALITY ASSURANCE

J. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.

K. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

9.6 PROJECT CONDITIONS

L. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.

M. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for dewatering.
2. The geotechnical report is [**included**] [**referenced**] elsewhere in the Project Manual.

N. Survey adjacent structures and improvements, employing a qualified professional engineer or land surveyor, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Architect if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS (Not Used) PART 3 -

EXECUTION

9.3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

9.3.2 INSTALLATION

C. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

D. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed, or until dewatering is no longer required.

E. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.

1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.

F. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.

1. Maintain piezometric water level a minimum of [**24 inches (600 mm)**] [**60 inches (1500 mm)**] <**Insert depth**> below surface of excavation.

G. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water

in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

H. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.

1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches (900 mm) below overlying construction.

I. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

9.4.2 OBSERVATION WELLS

J. Provide, take measurements, and maintain at least the minimum number of observation wells or piezometers indicated and additional observation wells as may be required by authorities having jurisdiction.

K. Observe and record daily elevation of ground water and piezometric water levels in observation wells.

L. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. Suspend construction activities in areas where observation wells are not functioning properly until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.

1. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.

9.4.5 MEASUREMENTS AND PAYMENTS:

Payment for all the items under this section shall be made at the rates entered in the BOQ appended to the contract and in accordance with the applicable conditions of the contract.

SECTION-10

10.0 MOISTURE PROTECTION & WATERPROOFING PART 1

GENERAL

10.1 SUMMARY

10.1.1 This Specification covers the materials, workmanship, testing, design life and guarantee requirements for substructure waterproofing, including membranes and waterstops, as necessary to keep water out of the building and substructure elements, as shown on the drawings.

10.1.2 Appendix A forms part of this Specification.

10.1.3 Related Sections:

10.1.4 In addition to the general conditions of contract, the Contractor shall also refer to the following specifications:

Section 03300 : Cast-in-Place Concrete

10.2 REFERENCES

10.2.1 Except where otherwise specified, work shall be in accordance with the British Standards relevant to this Specification. The latest editions shall be used, including all current amendments and additions.

10.2.2 Any differences between their requirements and this Specification shall be submitted to the Consultant for his ruling.

10.2.3 Standards

BS 8000 1989 Part 4: Workmanship on building sites. Code of practice for waterproofing BS 8102 1990 Code of practice for the protection of structures from water in the ground

10.3 SUBMITTALS

10.3.1 Prior to starting work on the contract the Contractor shall submit for approval, details of the proposed sources of all materials, and place of manufacture, together with full documentary evidence that the materials and manufacture will comply with the specification.

10.3.2 Details shall include, but not be limited to, manufacturer's printed specifications and membrane installation instruction, including procedures and materials for terminations, penetrations, flashing, protection, compatibility and bonding.

10.3.3 Further submissions shall be made for any change of material, quality or source and the Consultant's approval obtained before the new materials or place of manufacture are used.

10.3.4 During installation, the waterproofing manufacturer's technical representative shall prepare and submit daily reports to the Consultant. The reports shall fully detail installation activities, observations, defects and corrective actions taken.

10.3.5 To certify the installation of the waterproofing system, the Contractor shall submit manufacturer's certification stating materials ordered and supplied are compatible with each other, suited for locations and purpose intended, and shipped in sufficient quantity to ensure proper and timely installation. A certificate signed by the manufacturer of the materials specified shall also be submitted, which states materials installed on the Works meet manufacturer's published performance standards, installation instructions and the requirements of this Specification.

10.4 QUALITY ASSURANCE

10.4.1 All substructure waterproofing systems shall be manufactured and supplied by a company certified to conform to the requirements of the quality standard ISO 9002.

10.4.2 The manufacturer shall supply specific instructions and a quality plan to the Contractor to form clear and unambiguous scope of works. The Contractor shall work in strict accordance with the manufacturer's instructions at all times.

10.4.3 The Contractor shall operate a quality system for all stages of the work and all work shall be in accordance with that system.

10.4.4 The labor force shall be adequately trained and supervised to ensure that the quality system is adhered to during all stages of the work.

10.4.5 Special consideration shall be given to prevent any damage of the waterproof system by plant, labour or other means. Particular attention should be paid to construction operations carried out in the vicinity of the waterproofing.

10.4.6 Where required, the Contractor shall ensure that the ground dewatering system is working sufficiently to ensure no hydrostatic pressure is exerted on the waterproof membranes and to ensure concrete substrates are sufficiently dry for lasting bond of the waterproof membrane.

10.4.7 The manufacturer is to have a technical representative present during the performance of the work as necessary to ensure the proper preparation and installation of waterproofing.

10.4.8 The representative of the manufacturer is to approve the conditions of the sub-strates prior to the application of the waterproofing. If necessary, the Contractor shall rectify conditions as necessary to obtain the manufacturer's representative's approval.

10.5 DELIVERY, STORAGE & HANDLING

10.5.1 Delivery to site, storage and handling of all materials shall be clearly controlled in strict compliance with the manufacturer's instructions and fully document by the Contractor. All documentation shall be open to inspection by the Consultant. The following information shall be shown for each delivery of each material:

10.5.1.1 Name of Manufacturer and product (M)

10.5.1.2 Batch reference (M)

10.5.1.3 Date of manufacture (M)

10.5.1.4 Shelf-life and conditions of storage (M)

10.5.1.5 Date of usage and location in the Works

Information shown (M) shall be clearly marked on the material itself when it is delivered and the Contractor shall impose this requirement upon the Manufacturer.

10.6 WARRANTY

10.6.1 The Contractor shall furnish a written warranty of all waterproof materials and workmanship for water tightness extended to include, but not limited to, seams, membranes and penetrations.

10.6.2 The warranty shall be signed by the product manufacturer agreeing to repair or replace defects in materials and workmanship, and failure of waterproofing to prevent water from entering into the building and building components for a period of fifteen years from date of the Taking-Over-Certificate. Under warranty, the membrane manufacturer shall be responsible for all costs of removal and replacement of overburden, such as floors and walls as necessary to obtain access to the waterproofing.

10.6.3 Warranty shall include the waterproofing of substructure components, including the raft foundations, to ensure that water ingress does not occur over the design life of the membrane. Special quality measures should be adopted during construction to guarantee zero defects to the raft foundation membranes.

PART 2 PRODUCTS

10.2.1 MATERIALS

Specification

A range of waterproofing options is available to the Contractor. The materials shall be in accordance with Appendix A, Water proofing systems and with the British Standards mentioned in this specification.

All materials shall be approved in accordance with the Quality Assurance procedures in this specification in conjunction with the following requirements.

Requirements of all materials

The waterproof system provided, shall form a continuous waterproof barrier, installed without damage and protected against construction operations.

Waterproofing material shall be specially formulated to allow application in the hot climatic conditions encountered in the Middle East and it should not be adversely affected by temporary heat gain whilst exposed during construction.

Penetrations by services, etc. shall be sealed with a compatible waterproof system as

recommended by the waterproofing manufacturer.
Under normal service conditions a factor of safety of at least two shall be provided against

failure of any kind. Where necessary, materials shall be designed to resist:

a. pressures from solids, liquids or gases.
b. abrasion and other effects of traffic or flow of materials over joints.
c. chemical and biological attack.
d. fire.
e. degradation from ultraviolet light, thermal effects and other natural phenomena.
f. degradation by ageing (e.g. ultra-violet) or fatigue (e.g. vibration).
g. damage cause by chemicals in the ground.
h. damage during construction.
i. damage caused by cracking of the sub-strate, up to 0.5mm crack width.

Materials shall be compatible with other materials against which they abut.

Materials shall be properly formulated for their intended use and shall be within their movement and fatigue capability, taking account of construction tolerance.

Materials shall be physically and chemically stable at handover and not liable to subsequently release of toxic agents.

Materials to be mixed on site shall have adequate pot-life to allow proper installation by the operators, taking into account the size of container and the conditions under which the operators are working.

Materials which will be in contact with potable water shall be approved under the Water Research Centre's Testing Scheme.

Materials which will be exposed to food products or used in a food-preparation or food-handling or food-storage environment, shall be fully cured at handover and shall, after curing, be inert, non-toxic, odourless, non-tainting, mould resistant and waterproof.

Materials which will be in any way exposed when the work is completed shall be resistant to attack by vermin (rodents, insects, etc).

Materials which will normally be open to view once the works are completed shall present a neat appearance. Solvents shall not bleed and stain adjacent work.

Installation shall be strictly in accordance with the manufacturer's requirements, by experienced operators.

Initial meetings and approvals

At the start of the Contract the Contractor shall meet with the Consultant to review the requirements of the job. Where additional information is necessary for the design of the joints, it is the responsibility of the Contractor to request this information from the Consultant. The Contractor shall then submit to the Consultant, for approval, his proposals for the supply of materials and for their installation into the works. If required by the

Consultant, technical representatives of the Manufacturers and of any proposed application subcontractors shall attend a meeting to review the proposals. If requested by the

Consultant, site-trials shall be carried out using mock-ups to demonstrate the system proposed.

Approval of materials and their method of application

The Contractor shall submit samples and full technical details for approval by the Consultant. Samples shall include 300 x 300mm of membranes and 300mm of strip products, as appropriate. Technical details shall include:

a. Full material analysis and properties (both initial and long-term).

b. Shelf-life and pot-life.

c. Instructions for handling, mixing, installing, finishing, curing and protecting (including Health and Safety and COSSH).

d. Requirements for preparation and condition, backing, debonding and priming.

e. Behavior under imposed movements, cross-joint pressure and fatigue.

f. Special instructions for jointing, interfaces, etc.

Colours of materials which will be visible when the works are completed shall be to the Consultant's approval.

Manufacturer's Requirements and Expertise

The Contractor shall submit to the Consultant for each material two copies of the Manufacturer's specifications and recommendations and a letter from the Manufacturer certifying that the material complies with the requirements of this Specification and is suitable for the intended application.

The requirements of the material Manufacturer shall be met by the Contractor. A technical representative of each company supplying materials shall visit the site at the commencement of the relevant part of the works and shall advise on the use of the materials. Installation shall then proceed strictly in accordance with the Manufacturer's recommendations. If required by the Consultant, the same technical representative shall make further visits to the site during the execution of the works.

Operators' Expertise

The Contractor must demonstrate to the satisfaction of the Consultant that the operators are adequately experienced and that they fully understand the requirements of the particular job being undertaken. New operators shall at no time be employed on the work without being approved by the Consultant. If the work is subcontracted, copies of the Specification and the Manufacturer's recommendations for the materials to be applied shall be furnished by the Contractor to the subcontractor.

Primers

Where the membrane Manufacturer recommends the provision of a primer, it shall be provided fully in accordance with his requirements.

Waterstops – Re-injectable hoses

Waterstops shall be provided at all joints to prevent water seepage. Construction joints are to be provided only as shown on the construction drawings.

The Contractor shall inform the Lead Sector Consultant without delay if the need for any

additional joints arises. All waterstops are to be re-injectable hoses in accordance with he appendix to this specification. Waterbars are not permitted.

10.3.0 PART 3 EXECUTION

10.3.1 WORKMANSHIP

Trials

At the start of the work the Contractor shall carry out trials which may at the discretion of the Consultant be incorporated in the final works. The quality of the work shall be to the approval of the Consultant. Once a satisfactory standard of work has been reached, the trials shall be used as a standard for the approval of the work as a whole.

Preparation for application of membrane

Surfaces to receive waterproofing shall be prepared in strict compliance with the requirements of the manufacturer. All contaminants such as dust, loose particles, moisture, oils or greases shall be removed from the surface. If necessary, rough or other unsuitable surfaces shall be improved to satisfy the manufacturer's recommendations for the product to be applied.

A technical representative of the manufacturer shall be present on site, as defined in the Quality Assurance section of this specification section. The representative is to approve the conditions of the sub-strates prior to the application of the waterproofing. If necessary, the Contractor shall rectify conditions as necessary to obtain the manufacturer's representative's approval.

The waterproofing manufacturer's representative shall verify that the installation complies with the waterproofing manufacturer's requirements and shall prevent entry of water into the building and structural components so that the installation can be warrantied. The Contractor shall provide remedial work as necessary to obtain the waterproof manufacturer's technical representative's verification.

Installation

Membranes and tanking are to be installed in strict compliance with the manufacturer's requirements and as described in Appendix A of this specification.

All waterstops shall be installed in strict compliance with the manufacturer's installation instructions and as described in Appendix A of this report.

Substandard work, which is not in accordance with this Specification, shall be completely removed and remade.

10.3.2 INSPECTION AND TESTING

Testing

The Contractor shall be responsible for all testing required by the waterproofing manufacturer, to give the required warranties. The Consultant shall be permitted access to witness any tests. Two copies of all test results shall be submitted promptly to the Consultant.

Approval of the Consultant

Wherever the Contractor is required to obtain the approval of the Lead Consultant, this must be requested in writing and written approval obtained before the work concerned is

put in hand.

Approval of materials
Full test data for all materials shall be given by the Manufacturer. If required by the Consultant, tests shall be repeated and further tests carried out.

Site Inspection
The Contractor shall provide full supervision of all operators and their work shall be thoroughly inspected on a regular basis to maintain standards.

Site testing
If required by the Consultant, samples of materials shall be removed from the works and tested at the expense of the Contractor.
Joints exposed to the weather shall be water-jet tested in the presence of the Consultant. The jet shall be from a 19mm hose under minimum 2 kN/mm^2 pressure held 600mm from the joint and moved along the joint at 600mm/minute. The joints shall be pass the test if they do not show any sign of water ingress.

Joints required to resist water or other pressure shall be tested for compliance with this Specification as directed by the Consultant.

Rectification
All work which fails to comply with this Specification either during construction or during the guarantee period shall be rectified promptly, by the Contractor at his own expense.

WATER PROOFING SYSTEMS
The systems noted below shall be obtained from a single manufacturer who shall supervise the installation on site, in accordance with this Specification.

The Contractor may propose alternative systems within the constraints of this specification.

WATERSTOPS – RE-INJECTABLE HOSES
Waterstops are to be re-injectable hoses.

Re-injectable hoses shall be provided as a complete system for each structure, by one Manufacturer. The hose shall be of a re-injectable nature and be capable of re-injection several times over the life of the structure.

The re-injectable hose and re-injectable resin shall be fully compatible, supplied by one manufacturer.

All waterstop products shall be manufactured by a company certified to conform to the requirements of the quality standard ISO 9002.

WATERPROOFING MEMBRANES:

General

The waterproof membrane is to perform as required by this specification. The membrane shall be installed in compliance with this specification and it shall be warrantied for a minimum period of 10 years. The membrane shall be free from defects. Stringent site quality control measures and supervision will be required to achieve this.

The waterproof membrane shall comply with one of the following specifications.

Type 1: Synthetic membrane – Plasticised PVC

A single layer, plasticized PVC membrane (minimum thickness 2.0mm with welded seams) installed with overlaps and corner detailing formed and fully sealed, all in strict compliance with the manufacturer's recommendations.

The substrate, joints and laps are to be in accordance with the manufacturer's requirements, to achieve the required warranty. The manufacturer's representative shall confirm in writing that the installation, including joints, is satisfactory.

Once installed, the inspected membrane shall be permanently protected by rot proof protection boards, thermal insulation or sand and cement blinding layer as appropriate.

Type 2: Bituminous membrane with fabric reinforcement

A single layer, bituminous membrane (minimum thickness 5.0mm with torched joints) installed with overlaps and corner detailing formed and fully sealed, all in accordance with the manufacturer's recommendations.

The substrate, joints and laps are to be in accordance with the manufacturer's requirements, to achieve the required warranty. The manufacturer's representative shall confirm in writing that the installation, including joints, is satisfactory.

Once installed, the inspected membrane shall be permanently protected by rot proof protection boards, thermal insulation or sand and cement blinding layer as appropriate.

Type 3: Liquid applied membranes

Two or three coats, as recommended by the manufacturer, of a high build rubber/ bitumen emulsion with a minimum 65% solids content and 10% rubber content in the dried film.

The use of liquid applied membranes shall be limited to direct application onto finished, prepared faces of structural elements. Application of liquid applied membranes onto blinding layers below foundations is not permitted.

BITUMEN COATING ON WALLS

Unless otherwise specified all concrete and masonry work in contact with earth upto plinth level shall be given an application of two coats of Industrial Bitumen paints at the rate of 15 lbs per 100 sq.ft ensuring that no pin holes / patches are left out. Bitumen will be applied after cleaning all dirt, dust and loose material from the surface and ensuring that the concrete or masonry has been cured and dried. Second coat will be applied after the first coat completely dried backfilling of each in foundation upto plinth will only be carried out after the application of bitumen coats and after the final coat completely dried as specified

hereinabove or as directed by the Engineer. Bitumen coat shall be measured in sq.ft of area to be coated and payment for all the items under this section shall be made at the rates

entered in the BOQ appended to the contract and in accordance with the applicable conditions of the contract

10.4 MEASUREMENTS AND PAYMENTS:

Payment for all the items under this section shall be made at the individual rates entered in the BOQ appended to the contract and in accordance with the applicable conditions of the contract.

SECTION – 11

11.0 METAL WORKS

11.1 SCOPE

This Section covers requirements of steels, steel work, fabrication, methods including precautions for erection of steel structures and other general requirements incidental to steel work.

11.2 GENERAL

The applicable requirements of this section as determined by the Engineer shall apply to all structural steel works under this contract. The work covered by this Section consists of all material, labour, plant, equipment and appliances including welding, bolts, nuts, washers, anchor bolts, embedded parts etc, fabrication and erection in accordance with the specifications and as per drawings and as directed by the Engineer.

11.3 DRAWINGS

11.3.1 Design and Working Drawings

These shall be prepared by the Engineer and supplied to the Contractor. These shall contain main dimensions, sizes of member & typical details of joints, list of material etc.

11.3.2 Workshop Drawings

11.3.2.1 Before proceeding with the manufacture, or fabrication, Workshop drawings shall be prepared by the Contractor from the working drawings supplied, taking into consideration the following instructions:

11.3.2.1.1 Fabrication in convenient sub-assemblies and each shop assembly to be given an erection mark.

11.3.2.1.2 Milling (machining of bases of supporting plate) for erection without adjustments.

11.3.2.1.3 Provision of basic elements for/with erection devices.

11.3.2.1.4 Keeping with the requirements of computed strength of all connections and joints of structures not foreseen in the design and working drawings.

11.3.2.1.5 Other requirements having an influence on the technology of fabrication transportation and erection of steel structures.

11.3.2.1.6 Uniformity of elements and parts of the steel structures should be maintained for mass fabrication.

11.3.2.2 Workshop drawings shall consist of two parts:

1. An erection scheme having the following information:

   - Location of erection element in respect of these elements with each other or with the existing steel or reinforced concrete structures.
   - Erection joints showing erection welding thickness and lengths, bolts or rivet diameter and numbers.

- Chart showing list of assembling marks having columns such as Mark, Description, Quantity, Weight of each Mark, Total weight and Remarks with grand total in the end.

- Chart showing list of Erection Bolts, Nuts and Washer having columns such as size, quantity, weight and notes with grand total.

- The mark for shop assemblies of each erection scheme shall have a different index for example scheme of trusses purlins etc. shall have Marks A1, A2, A3, onwards and another scheme of columns beams etc. shall have Marks B1, B2, B3 and onwards. While marking on the plans, elevations, sections and details the index shall be omitted.

- The recommended scale of erection scheme is 1:5O, 1:100, 1:200, for joints 1:5, 1:1O or 1:2O.

- Except in special cases all scheme drawings shall be made in single fairly thick lines.

- Erection Scheme shall contain the following notes:

  i) Erection shall be done using the erection welding and bolts of normal sizes and accuracy according to the joints of the scheme.
  ii) Quality and type of electrode.
  iii) Measures against unscrewing of bolts.
  iv) Erection shall be carried out according to the standard for fabrication and erection of steel structures.
  v) Painting instructions.
  vi) References to design and working drawings.

2. A shop assembly drawing containing the following information:

- Each Shop Assembly (Mark) shall be drawn separately showing necessary lines, elevation sections with reference to axis, centre lines, location of holes, cleats, plates lugs etc .fully dimensioned with part numbers.

- Bolts, holes and symbols.

- Geometrical Setting out dimensions necessary for the assembly of an element. Location and details of joints as calculated by the Fabricators / Engineer.

- Instruction for welding, dimensions of weld (Seams) processing of edges, methods of welding, quality of welded material, length of welds on every element, requirements for welding and method of their control. Specification for Electrode selected according to specification of steel.

- Standards and quality of steel used.
- Parts List.
- Instruction for painting, primer and finish coats with derusting process.
- Recommended scale for assembly drawings is preferably 1:10 or 1:20 and for joints and details 1:1, 1:2 or 1:5.
- Notes for assembly drawings shall be as follows:

i) List of symbols for bolts and holes used.
ii) List of symbols for welds used.
iii) Edge distance (general).
iv) Welding thickness (general).
v) Material quality of steel used.
vi) Type and quality of electrodes to be used.
vii) Test for welding if any.
viii) Reference to related erection scheme drawings.
ix) Reference to design and working drawings.

11.4 MATERIAL

Except otherwise required or stated in the drawings the materials specifications shall conform to the following. Wherever necessary Contractor may use equivalent British Standard or other alternative material subject to approval of the Engineer. Material shall generally conform to the applicable requirement of ASTM A-6.

a) Structural Steel

- Structural steel for structures not requiring Welding shall conform to the requirements of ASTM A-7-66 (for bridges and buildings) or ASTM A-36-77.
- Structural steel for structures requiring welding shall conform to the requirements of ASTM A-36-77 or approved equivalent.

b) Sheet Steel

Sheet steel for structures where no welding is required shall conform to the requirement of ASTM A-366-62T (for Cold Rolled Carbon Steel Sheets commercial quality) or ASTM A-415-64 (Standard specifications for Hot Rolled Carbon Steel Sheets, commercial quality). For structures where welding is required sheet steel shall conform to the requirements of ASTM A-415-64 and steel plate to ASTM A-283-79 (Low and intermediate strength carbon steel plate) or A-514-77 (High-yield-strength, quenched and tempered alloy steel plate, suitable for welding as required.

c) Filler Metal for Welding

Welding Electrodes for manual shielded metal arc welding shall conform to the specifications for mild steel covered Arc-welding Electrodes, AWS A 5.5 (latest edition). Equivalent locally manufactured electrodes by Pakistan Oxygen may also be used subject to the approval of the Engineer.

d) Ordinary Bolts, Nuts and Washers

Bolts and nuts shall conform to the requirements of ASTM A-3O7-65 (Standard specification for low-alloy, carbon steel, externally and internally threaded, standard fasteners). Bolts shall be of Grade A for general application with square or hexagon

heads as specified in the drawings. Turned bolts shall also conform to the

requirements of ASTM A-3O7-65, except that the tolerance of the unthreaded portion of the bolt body shall be +0.0 - 0.15 mm of the diameter.

e) Cut Washers

Shall be of structural grade steel and shall conform to the dimension of the manufacturer's regular standard for plain washers for the size and type of bolts used.

f) Cast Iron

Shall conform to the requirements of ASTM A-48-64 (Standard specifications for Grey Iron Castings) or equivalent.

g) Iron Pipe

Where iron pipe is called for, it shall be genuine wrought iron fully galvanized. All Threads to be cleaned and coated with rust resistant coating.

h) Painting Materials

Painting's materials which include emulsions, epoxy-based enamel paints, sealers, primers, wax, varnishes etc., shall be standard best or top brands produced for each particular kind of material required.

11.5 ALLOWABLE STRESSES

a) Allowable stresses for steel shall be considered tabulated in Appendix A of specifications for the Design, fabrication and erection of structural steel for buildings; Part 5 of the Manual of Steel Construction published by the American Institute of Steel Construction.

b) Allowable stresses for rivets, bolts and threaded parts as per table 1.5.2.1 of AISC specifications.

c) Allowable stresses for welds as per table 1.5.3 of AISC specifications.

11.6 FABRICATION

a Straightening Material

Rolled material, before being worked upon, must be straightened within tolerances by ASTM specifications A6. Straightening, necessarily shall be done by mechanical means or by the application of limited amount of localised heat. The temperature of heated areas, as measured by approved methods, shall not exceed 1100 F for A514 steel or 1200 F for other steels. All material, before and after fabrication shall be straight or curvilinear form as required free from twists.

b) Cutting

As far as possible cutting must be done by shearing. Oxygen cutting shall be done where shear cutting is not possible and shall preferably be done by machine. All edges shall be free from gauges, notches or burs. If necessary, the same shall be removed by grinding.

c) Holes punching drilling

Holes shall be punched where thickness of the material is not greater than the diameter of bolt or rivet + 3mm. Where the thickness of the material is greater, the holes shall be drilled or sub-punched and the drill of all subdrilled holes shall be at

least 2mm smaller than the nominal diameter of the rivet of bolt. Holes for A514-77

steel plates over 1/2" thick shall be drilled. Holes shall not be allowed to formed gas cutting process.

d) Welding

1. Maximum Thickness of fillet welds

   i) Not more than 1.2 times the lesser thickness of materials being welded.

   ii) At welding of rolled profiles along edges, which are curved, not more than the thickness of the edge minus the radius of the curve.

2. Minimum thickness of fillet welds.
   Least thickness for calculation and designing requirements:

Thickness of thicker part	**Upto 10 mm**	**11mm to 20mm**	**20mm to 30mm**	**31mm to 50mm**	**Above 50mm**
Thickness of Weld for carbon steel.	4	6	8	10	12
Thickness of Weld for low alloy steel	6	8	10	12	-

3. Design length of a fillet weld shall not be less the 40 mm or 10 times thickness of fillet weld and not more than 60 times thickness of fillet weld.

4. Surfaces to be welded shall be free from loose scale, slag, rust, grease, paint or any other foreign matter except mill scale which withstands vigorous wire brushing.

e) Tolerances

1. A variation of 1 mm is permissible in the overall length of members with both ends finished for contact bearing. The bearing surface is to be prepared to common plane by milling.
2. Members without end finished for contact bearing which are to be framed to other steel parts of the structure shall have a variation from detailed length not greater than 3mm.

f) Each piece of steel work after fabrication shall be distinctly marked before delivery to site in accordance with a marking plan for erection assembly.

11.7 SURFACE PREPARATION

a) All steel work shall be cleaned free from loose scale, rust, dust, slag etc. by using suitable means. Sand blasting shall be carried out wherever so specified by the Engineer.

b) Steel work to be encased in concrete or surfaces in contact with concrete or grout shall be given a cement wash.

c) Machine finished surfaces shall be coated with rust preventive compound approved by the Engineer prior to removal from shop and immediately after finishing. Such surfaces shall be protected with wooden pad or other suitable means for transportation. Unassembled pins and bolts shall be oiled and wrapped with moisture resistant paper.

d) All other surfaces of steel work shall be painted as specified hereunder.

- Resin based special emulsion paint shall be manufactured by one of Pakistan paint manufacturers, as approved by the Engineer. The paint shall be composed of P.V.A. with pigment of Titanium dioxide with inert extenders, having viscosity of 70-75 K.U. at 25 deg. C and approximate specific gravity of 1.33. The paint shall have flat finish, smooth and free from brush marks and resistant to fungus growth.

- Enamel paint and primers shall be Dulux as manufactured by M/S Imperial Chemical Industries Pakistan Ltd. or approved equal and shall be applied in accordance with the period instructions of the manufacturers.

No separate payment shall be made for painting of structural steel works. The Contractor shall include all the cost of labour, plant and material for this work in the price as mentioned in the Bill of Quantities.

11.8 ZINC COATING (GALVANIZING)

Where ever specified by the Engineer zinc coating shall be applied in a manner and or a thickness and quality conforming to the requirements of ASTM A-123-65, standard specifications for zinc (Hot galvanized) coating on products fabricated from rolled, pressed, and forged steel shapes, plates, bars and strips.

11.9 INSPECTION AND TESTS

a) Manufacturer's Works Test certificate for all material used shall be furnished by the contractor for Engineer's scrutiny and approval. The contractor shall provide all necessary facilities to Engineer for inspection of steel structure work during fabrication and erection.

b) Rolling tolerance of all shapes and profile according to AISC (American Institute of Steel Construction) shall be in accordance with the provisions of the American Society for Testing and Materials Designation A.6 These shall be checked by the Contractor before being worked upon and shall be rejected if found not within limits.

c) The Contractor shall arrange for analysis and test of all material rolled locally at a

testing laboratory selected by the Engineer, for which Contractor will bear all expenses.

d) Nevertheless, neither the fact that the materials have been tested nor that the manufacturers work test certificates have been furnished shall affect the liberty of the Engineer to reject after delivery, material found not according to these specifications.

e) The inspection of welding shall be performed in accordance with the provisions of Section 6 of the code for Welding in Building Construction, DI. O-69 of the American Welding Society ("Structural Welding Code" AWS DI-1)

f) Materials or workmanship not in reasonable conformance with the provisions of these specifications shall be rejected at any time during the progress of the work or the completion and erection at site.

11.10 ERECTION

a) Bracing.

The frame of steel skeleton buildings shall be carried up true and plumb within the limits defined in section 7(h) of the AISC code of standard practice, and temporary bracing shall be introduced wherever necessary to take care of all loads to which the structure may be subjected including the equipment and the operation of the same. Such bracing shall be left in place as long as required for safety. Wherever piles of material, erection equipment and other loads are carried during erection, proper provision shall be made by the contractor to take care of the stresses resulting from such loads.

b) Alignment & Bolting.

No riveting, permanent bolting or welding shall be done at site during erection until as much of the structure as will be stiffened thereby has been properly aligned. The threaded portion of each bolt shall project through the nut at least one thread.

c) Painting after Erection.

Before painting of steel which is delivered unpainted is commenced, all surfaces to be painted shall be dry and thoroughly cleaned from all loose scale and rust. The specified protective treatment shall be completed after erection.

11.11 MEASUREMENT & PAYMENT

a) General

i) The cost of all the works involved within the scope of this specifications as per all the drawings and conditions of contract are covered only within the quoted rate of items of the Bill of Quantities.

ii) Unless otherwise specified and to the extent provided in the Bill of Quantities no separate or additional payment will be made for the following works, the cost of which shall be deemed to have been included in the quoted rate of the Bill of Quantities item.

- Providing nuts, bolts, screw, rivets, heads, filets welds and welding rods.

- Galvanizing and prime coating steel work.
- Painting Steel Work.
- All embedded parts other than steel.

b) Measurement

i) Items of work of structural steel for which the unit rates have been quoted on weight basis shall be measured net as acceptably supplied and installed at site as per drawings / workshop drawings and as per instruction of the Engineer. After measurement the theoretical weights shall be calculated from standard tables of section and weights in the manner followed in the preparation of workshop drawings. The cost of loading and unloading, transportation and handling of structural steel items shall be deemed to be included in the quoted unit rate of the related Bill of Quantities item.

ii) Measurement of acceptably completed installation and erection works of Structural steel items supplied free of cost by the Employer will be made on the basis of number of tons of structural steel items erected and installed in position as shown on the drawings or as directed by the Engineer. The cost of loading and unloading, transportation and handling of structural steel items shall be deemed to be included in the quoted unit rate of the related Bill of Quantities item.

c) Payment

Payment will be made for acceptable measured quantity of metal works on the basis of unit rate quoted in the Bill of Quantities and shall constitute full compensation for all the incidental works related to the item.

SECTION – 12

12.0 BRICK MASONRY

12.1.1 GENERAL

a) Scope

This section of the Specification covers solid brickwork.

b) Related sections of the specification

Section 6.1 for Cement Plaster

c) Exclusions

The scope of work does not include supply of embedded items, other than those specified herein.

d) Classification of bricks and brickworks

i) "Fair face bricks" --- bricks selected from first class bricks, having better surface and more uniform size and colour.

ii) "Fair face brickwork" --- using fair face bricks in brickwork required to be pointed and exposed to view.

iii) "First class bricks" m conforming to the requirements of Clause 3.1.2(b) specified hereinafter.

iv) "First class brickwork" --. using first class bricks, in brickwork required to be plastered.

e) Submittals

i) Specimen samples of all materials and bricks intended to be used in the Works. Specimens of bricks shall be representative of a complete range of colors, textures and sizes.

ii) Results of all the tests performed on the materials and bricks as may be considered necessary by the Engineer to establish compliance to specification.

iii) Reference panel and sample panel of brickwork as per BS 3921: 1985, if required by the Engineer.

f) Quality control and testing

i) General

Carryout regular quality control of the works and ensure that materials, construction and workmanship are in compliance with the plans and specification. Maintain quality control and test records and make available to the Engineer as a routine, as may be required by him.

ii) Quality control

Quality control shall include, but is not limited to, the following:

- that all materials meet the requirements of specification,
- that they are properly stored and prepared for use,

- that mortar and grout are properly mixed using specified proportions of ingredients, and
- that the method of measuring materials for mortar and grout are such that the proportions of the constituents are entirely controlled.

Brick shall pass a visual inspection for soundness, compact structure, reasonably uniform texture and shape; freedom from cracks, warpage, large pebbles, balls of clay or particles of lime that would affect the serviceability or strength of the brick.

iii) All brickwork shall be erected plumb and true to line and level with maximum variation in any storey height or any length of wall being one mm in one metre.

12.1.2 MATERIALS

a) Mortar

12.1.2.a.1 Cement

Comply with requirements of BS 12: 1989. Use ordinary Portland cement (grey) unless specified otherwise.

12.1.2.a.2 Sand

Comply with requirements of BS 1200: 1976 with Amendments 1, 2 & 3, for "Building sands from natural sources". Grading S of table below is preferred.

BS Sieve	ercentage by mass passing BS sieves	
	Type S	Type G
mm		
6.30	100	100
5.00	98 – 100	98 – 100
2.36	90 – 100	90 – 100
1.18	70 – 100	70 – 100
microns		
600	40 – 100	40 – 100
300	5 – 70	20 – 90
150	0 – 15	0 – 25
75	0 -5*	0 – 8**

* 0-10% for crushed stone sands

** 0-1 2 % for crushed stone sands

Store sand at the Site in such a manner that it is not mixed with foreign matter. Methods employed by the Contractor for unloading, loading, handling and storage shall be subject to the approval of the Engineer. Maintain sufficient quantity at the Site at all times to ensure continuous work.

12.1.2.a.3 Water

Do not use seawater or brackish water containing more than 100 ppm

chloride ion or 2000 ppm sulphate ion for mixing or curing concrete. Water shall be clean and free from harmful matter and shall comply with the requirements of appendix A of BS 3148: 1980. Avoid contamination during storage.

12.1.2.a.4 Mortar composition

Cement to dry sand ratio by volume as specified.

12.1.2.a.5 Mortar batching and mixing

Employ methods and equipment for mixing mortar so as to accurately determine and control the amount of each separate ingredient entering into the mortar, subject to the approval of the Engineer. Unless mixing by hand is allowed by the Engineer, mix mortar in a mixer which shall be of approved design and the mixing time after all the ingredients are in the mixer, except for the full amount of water, shall not be less than two minutes. Mix mortar only in quantities just sufficient for immediate use and waste all mortar not used within 30 minutes after addition of water to the mix. Do not retamper mortar. Thoroughly clean and wash mixing troughs and pans at the end of each day's work.

b) Bricks

Bricks shall be made from carefully selected earth which shall be good loam or clay. The earth shall be free from objectionable quantities of lime, gravel, coarse sand and roots and other organic matter. Brick shall be manufactured from clay which has been carefully weathered, worked, pugged and tampered, hand molded.

The bricks shall be thoroughly burnt but without being vitrified, uniform in shape, size, homogeneous texture, colour and shall produce a ringing sound when struck. The bricks shall be free from flaws, cracks, chips, stone, nodules of lime or kankar or other blemishes. Bricks shall have sharp edges, square corners and parallel faces.

Brick shall usually measure ***9" x 4-3/8" x 2-11/16"*** (nominal size) so that every four courses laid shall measure one foot in height.

Tolerance in dimensions shall be as under:

- Over 2" and upto 3" + 1/16”
- Over 3" and up to 4" + 1/8”
- Over 4" and up to 6" + 3/16”
- Over 6" and up to 10" ±¼”

Although bricks may have been approved at site of kiln or at Site of Work they shall be liable to rejection thereafter at any stage even after they have been built into the Work, if they are found not to comply in all respects with the specification.

c) Metal ties

Unless approved otherwise by the Engineer or shown on drawings:

(i) Cavity wall ties - comply with the requirements of BS 1243: 1978 as approved by the Engineer.

(ii) Ties for jointing concrete and brickwork - 6mm dia x 300mm long, MS

galvanized.

12.1.3 DELIVERY AND STORAGE

The methods and equipment used for transporting the bricks and mortar shall be such as will not damage the bricks nor delay the use ot mixed mortar.

Masonry materials shall be so stored that at the time of use the materials are clean and structurally suitable for use.

STACKING, SAMPLING AND TESTING

Sort out and arrange the bricks in stacks of one or two thousand or as directed by the Engineer. Each stack shall be 10 courses high and two bricks thick so that at least 0.6 metre space between the stacks shall be left for the purpose of inspection. Stack each size or class of brick separately. For purposes of inspection and tests, the sample bricks shall be selected by the Engineer.

Bricks shall be sampled and tested for compressive strength and water absorption as per BS 392: 1985. Average compressive strength shall not be less than 2000 psi and that of individual brick not less than 1600 psi. Water absorption shall not be more than one - sixth of the dry mass of brick.

12.1.4 SCAFFOLDING

Provide and erect safe scaffolding of adequate strength for use of workmen at all levels and heights. Do not use scaffolding which in the opinion of the Engineer is unsafe, until it has been strengthened and made safe for use of workmen.

12.1.5 EXECUTION OF WORK OF FIRST-CLASS BRICKWORK

a) Compliance with Standard

Comply with the relevant applicable requirements of section - 4 of BS 5628: Part 3 1985 with amendment No.1.

b) Soaking and washing bricks

Before use, soak bricks in clean water for at least 4 hours. If bricks contain soluble salts liable to cause efflorescence, wash bricks thoroughly to satisfaction of the Engineer.

c) Laying

Do not lay brickwork during rain sufficiently heavy or prolonged to wash the mortar from the bricks. Remove and replace already laid mortar which becomes diluted by rain.

Lay bricks in English bond with frogs (manufacturer's marks) upwards. Set each brick with both bed and vertical joints filled with mortar and bed-in bricks by tamping with the handle of the trowel. Do not simply cover brickwork with mortar at edges. Lay bricks with all horizontal joints parallel and truly level, and vertical joints in alternate courses directly over one another. Thickness of horizontal joints unless approved otherwise shall not be less than 6mm and not more than 10mm such that the height of 4 courses and 3 joints as laid shall not exceed by more than 25mm the height of 4 bricks piled dry one upon the other. Thickness of vertical joints shall be approximately 10mm. Lay all brickwork truly plumb and check each set of four brick courses with plumb bob and straight edge. Do not use bats except where absolutely necessary for obtaining the specified bond. At all corners lay alternate course~ of

bricks as headers and stretchers so as to bond the two walls together. Where fresh brickwork is to join brickwork that has partially or fully set, clean roughen and wet

the exposed jointing surface of the set brickwork so as to affect the best possible bond with the new work. At intersections, interlock brickwork so as not to leave a straight vertical joint.

Where neither plastering nor pointing is to be provided, as in foundations and plinth, fill the joints flush with the same mortar as used for laying brickwork as the work progresses and strike the joints. Where plastering or pointing is to be applied, rake out joints with a hook to a depth of 12mm before the mortar sets, each day.

Cut, dress or groove bricks as required for shaping jambs, fitting frames and for architectural features of the building. Make corners with cut-bricks. Build in brickwork all frames and inserts required to be installed as the work progresses, maintain them in their proper position and do not remove until they are firmly held in brick work. Fill the spaces around all built-in work with concrete of approved mix. Leave openings for ducts and other uses where required. Make and install formwork for arches to conform to the required shape.

Carry up brickwork regularly and leave no portion of work more than one metre lower than another. Rake back temporary stops left during constrllcliol1. Mark course marks with saw cuts on straight edges supplied to brick-layers and check height of courses all over the brickwork from time to time so as to keep the courses level. Clean each day's work before finishing day's work. Leave out only headers to allow put log to be inserted and do not leave more than one brick for each put log.

Any space between brickwork and slabs/beams above shall be filled with PCC 1:2:4.

d) Jointing concrete and brickwork

Where vertical faces of concrete and brickwork abut, roughen about 40% of the concrete surface by hacking or other approved means; clean the surface thoroughly and moist it for 24 hours before laying brickwork. Drill holes in concrete at 600mm centres vertically and install ties with Fisher plug unless shown otherwise in drawings. Embed wall ties in mortar bed joint of brickwork.

e) Uniting leaves of cavity walls

Unite leaves of cavity walls by wall ties embedded in the mortar, at the time the course is laid, to a minimum depth of 50mm. In non-load bearing brickwork, use ties at intervals of not more than 900mm horizontally and not more than 450 mm ventrally. In load bearing brickwork, the spacing shall be as tabulated below:

Least leaf thickness (one or both) (mm)	**Cavity Width (mm)**	**Spacing of ties**	
		Horizontally (mm)	**Vertically (mm)**
75 or more	50 – 150	450	450
90 or more	50 – 150	900	450

Ties shall be staggered and evenly distributed. Clean any mortar droppings on the ties or cover the ties with polythene in the cavity portion.

f) Removal of efflorescence

Remove efflorescence as specified in section 6.1 - of this Specification.

12.1.6 PROTECTION AND CURING

Protect all brickwork during construction from the effects of sun, rain and frost, by suitable covering if necessary in the opinion of the Engineer, and keep brickwork moist for a period of ten days.

12.1.7 EXECUTION OF WORK OF FAIR FACE BRICK WORK

Comply with the requirements of 3.1.6 and 3.1.7 except that use fair face bricks selected from first class bricks and lay the brickwork with extra care.

12.1.8 MEASUREMENT

a) No deductions shall be made for the following:

- Voids (openings) not exceeding 0.10 m2 (1 Sft) area in elevation.
- Fire place flues.
- Chases, pipes and embedded items.

b) Deductions for string courses, sills, lintels, plates and the like shall be made as regards height to the extent only of full brick courses displaced.

c) No deduction or addition shall be made on any account for ends of dissimilar materials like joists, beams, girders, rafters, purlins, trusses, corbels, steps etc, not exceeding 450 sq. cm (0.5 sq.ft) in section.

d) In cavity walls, the width of the cavity shall not be included in the thickness of the wall.

e) Pay Items

Payment shall be made only for the pay items applicable to this Contract as listed in the Bill of Quantities. Thicknesses of walls for payment shall be as stated in the pay items irrespective of the actual size of bricks approved. Pay item numbers and units for rates shall be as designated in the Bill of Quantities.

Pay Items	Description	Unit for Rate
-	Provide and lay first class brickwork in foundations and plinth in cement sand mortar of indicated ratio: (a) 228mm (9") and over thick (b) 114mm (4.5") thick	 m3/Cft. m3/Cft.
-	Provide and lay first class brickwork in superstructure: (a) 228mm (9") and over thick in cement sand mortar of indicated ratio. (b) 114mm (4.5") thick in cement sand mortar of indicated ratio (c) 75mm (3") thick in cement sand mortar of indicated ratio	 m3/Cft. m3/Cft. m3/Cft.

-	Provide and lay fair face brickwork, any thickness, in cement sand mortar of indicated ratio; (a) In plinth	m3/Cft.

	(b) In superstructure	m3/Cft.

12.1.9 Payment

All the items of work covered by this Section of the Specifications shall be paid for at the unit rates entered in the Bill of Quantities and in accordance with the applicable terms and conditions of the Contract.

SECTION - 13

13.0 PLASTERING

13.1 Scope of Work:

The work covered by this section of the Specifications consists of furnishing all plant, labour, appliances, and materials and in performing all operations in connection with the installation of plastering complete in strict accordance with this section of the Contract.

13.2 General

Except as may be otherwise shown or surfaces specified all plaster surface shall include walls, partitions jambs, returns, reveals, backs of recesses and jambs and heads of windows and doors and all the sofits, alcoves unless otherwise specified or shown on the drawings.

13.3 Materials:

a) "WATER" as specified in respective section.

b) CEMENT" shall be ordinarily Portland Cement and shall conform to B.S.S.12.

c) "SAND" shall be from approved source and free from dust and salt as specified in Section on concrete.

d) "METAL LATH" shall be expanded metal not less than 9" wide strips, and weighing at least 2.5 lbs, per square yard or as directed by the Engineer.

e) "CORNER LATH" shall be strips 6" wide bent to form two 3-inches wings.

f) **Lime:** (To be used for putty)

12.1.9.f.1 Hydrated lime shall conform to British Standard BS-890 Class A, with the further requirement that the total free (unhy drated) calcium oxide (CaO) and magnesium Oxide (MgO) shall not exceed 8 percent by weight, calculated on the "as received" basis.

12.1.9.f.2 Quicklime (pulverized) shall conform to British Standard B.S.890 A. Pulverized quicklime shall pass a No.20 sieve, and at least 90 percent shall be used throughout the work. After slaking to a putty, the pulverized quicklime shall have a plasticity figure of not less than 200 when tested in accordance with ASTM Standard `methods of Test C 110, and at the end of 72 hours the total free (unhy drated) calcium oxide (CaO) and magnesium oxide (MgO) in the hydrated product shall not exceed 8 percent by weight, calculated on the basis of the lime solids in putty.

g. **Lime Putty** shall be made from hydrated lime, except that quicklime may be used when adequate time and facilities are available for aging. Suitable precautions shall be taken to protect the putty from exposure to the sun and to prevent excessive evaporation when stored. Lime putty prepared from quicklime shall be allowed to cool completely before using. Lime putty shall be prepared as follows:

i) Quick lime (pulverized) shall be slaked in suitable large batches, and with enough water to form a thick cream. During cold weather, precautions shall be taken to maintain the heat and prevent premature cooling during the process of hydration. The slaked quicklime shall be passed through a No.10 sieve and stored for at least 72 hours before using. When the use of lump quicklime, slaked on the job, in lieu of pulverized quicklime, is specifically approved for plastering, the cooling and aging period shall be not less than 14 days.

ii) Hydrated lime shall be machine-mixed with water to form a putty and shall be allowed to stand for at least 15 minutes before using.

13.4 MIXING OF MORTAR

Except where hand-mixing of small batches is approved by the Engineer, mechanical mixers of an approved type shall be used for the mixing of mortar. Frozen, caked, or lumped materials shall not be used. Mechanical mixers, mixing boxes, and tools shall be cleaned after mixing each batch and kept free of mortar from previous mixes. Plaster mortar shall be thoroughly mixed with the proper amount of water until uniform in colour and consistency. Retempering will not be permitted and all mortar, which has begun to stiffen, shall be discarded. Mortar for scratch coats over metal lath shall be fibered by the addition of a pound of hair or fibre per bag of cement.

13.5 PROPORTIONING OF PLASTER

a) All plaster shall be Portland cement plaster, all coats of which shall be mixed in the following proportions by volume or otherwise specified.
One part cement
4 parts sand
1/4 part lime putty, if required or specified.

b) All coats of plaster in liquid retaining structures shall be water proofed by the addition of an approved compound in liquid or solid form used at the approved rate. The water proofing compound shall be commercially pure with no grease or oils or other ingredients detrimental to the cement.

13.6 APPLICATION OF PLASTER:

i) Strips of metal lath shall be provided between ceiling beams, lintels walls, columns and nearby partitions of masonry parallel to the beams if required. The lath shall be laced with the wire at joints between sheets and screwed to the concrete and masonry with galvanized offset head or hood head lath nails. Also lath not less than 3" wide shall be installed over joints between dissimilar base materials where the surface to be plastered by in the same plane and where the base materials can not be effectively bonded or tied together.

ii) Before the plaster work is commenced it shall be seen that all electric conduits, drainage and sanitary pipes inlets, outlets to tanks, brackets, clamps doors and windows frames and all sorts of inserts are fixed in position. It shall be the

responsibility of the Contractor to bring to the notice of the Engineer if such work is not carried out by the other Contractors. Chiseling and repairing of cement plaster shall not be permitted under any circumstances.

iii) The walls shall be washed with fresh water and shall be kept damp for 2 hours before the plaster is applied. All masonry joints and concrete surfaces shall be properly roughened before plaster work is commenced. The proportion of cement plaster shall be as per drawings or as specified. The ingredient shall be properly mixed. The sand used for mix shall be only sufficient for one bag of cement. The mixtures shall be turned over and over till the ingredients are thoroughly mixed. Cement slurry shall be applied to the surface to be plastered and allowed to dry before plaster work is commenced

iv) The plaster shall be from 1/2" to 3/4" thick and shall not be less than 1/2" thick at any surface. If the plaster is 3/4" or more than 3/4" 'thick it shall be done in two coats, the first coat shall be made rough. The plaster on all surfaces shall be perfectly in plumb. The edges and corners shall represent a straight line. The plaster shall be kept wet for at least 10 days. No extra payment shall be allowed for jambs, junctions, corners, edges, round surfaces, cement slurry base and for thicker plaster required due to any un-evenness in the work done by the Contractor. At edge of every horizontal projection on external faces of the building if directed by Engineer a drip course of 3/4" is to be provided for trickling of water without any extra cost. Plaster on lath shall be done in three coats. Finish coat shall have a reasonably uniform thickness of approximately 3 mm (1/8"), and the minimum thickness at any point shall not be less than 1.5 mm (1/16") and shall be applied in one continuous operation without staging breaks.

a) **The Scratch Coat** shall be full and thick and shall be applied with sufficient force to form good keys. The scratch coat shall be cross-scratched upon attaining its initial set and shall be kept damp with a fog spray.

b) **Brown Coat** shall be applied after the scratch coat has set, but not earlier than 24 hours after the application of the scratch coat. When applied directly to masonry, the brown coat similar to the scratch coat shall be applied with sufficient pressure to fill the raked-out joints in brickwork to prevent air pockets and secure a good bond. The brown coat shall be lightly scratched and broomed after attaining its initial set and shall be kept moist with a fog spray for 2 days and then be allowed to dry out.

c) **Finish Coat** shall not be applied until the brown coat has seasoned for 7 days. Just before the application of the finish coat, the brown coat shall be wetted evenly with a fog spray. All plaster shall be given a sand float finish of a uniform texture as approved or directed otherwise by the Engineer or his Representative. The finish coat shall be kept moist with a fog spray for at least 7 days and thereafter shall be protected against rapid drying until properly and thoroughly cured and dried.

13.7 SAMPLING OF PLASTER

Samples may be taken by the Engineer at any time from plaster work in place. Areas where

over sanding is observed shall be rejected and shall have to be done again at the cost of contractor.

13.8 DRIPS AND GROOVES:

The Contractor shall make drips for rainwater protection and Architectural grooves shall also be made as shown on the drawings or directed by the Engineer.

13.9 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 Engineer or his Representative.

13.10 CLEANING AND PROTECTION

Rubbish and debris shall be removed as necessary to make way for work of other trades and as directed by the Engineer or his representative.

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 any source.

Prior to plastering all Aluminium windows and finished metals should be covered by sheet of plastic or tarpaulin to protect it from damage.

Contractor shall also protect walls, floors and work of their trades from plaster materials.

13.11 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 shall be included in the unit rate of plaster and no separate payment shall be made for drips and grooves.

SECTION - 14

14.0 PAINTING, DISTEMPERING AND WHITE/COLOUR WASHING ETC.

14.1 SCOPE OF WORK:

The work covered by this section of the specifications consists of furnishing all materials, plant, labour, equipment, appliances and performing all operations in connection with surface preparation, mixing, painting concrete works, gates, frames steel works, steel and wooden doors, windows, ventilators, walls ceilings and all such surfaces as shown on the Drawings and/or as directed by the Engineer. The scope of this section of specifications is covered with detailed specifications as laid down herein.

14.2 GENERAL:

Except as otherwise specified, all painting shall be applied in conformity with BS CP 231 "Painting of Building as applicable to the work".

The Contractor shall repair at his own expense all damaged or defective areas of shop-painted metal work. Metal surfaces against which concrete is to be placed will be furnished shop-painted and shall be cleaned prior to being embedded in concrete.

Except as otherwise specified, all concrete and plastered surfaces are to be painted.

14.3 MATERIALS:

All materials shall be acceptable, proven, top-grade products and shall meet or exceed the minimum standards of reputable manufacturers as approved by the Engineer.

Colors shall be pure, non-fading pigments, mildew-proof, sun-proof, finely ground in approved medium. Colors used on plaster and concrete surfaces shall be lime-proof. All materials shall be subject to Engineer's approval.

All enamel paints and primers for wood and metal work will be the best available of its type and shall be approved by the Engineer prior to its procurement. All plastic enamel paint and primers for CC and RCC works will be the best available of its type and shall be approved by the Engineer prior to its procurement. The weather shield paint manufactured by ICI or any equivalent approved by the Engineer shall be used for painting on the surface specified.

Unslaked lime, gum and marine blue shall be used for white washing. DUROCEM a cement base heavy duty water proof coating manufactured by ICI or any equivalent approved by the Engineer shall be used for painting on the surface specified. The cement base water proof coating for concrete shall conform to ASTM C-109,C-67, D-822 and G-23.
All materials shall be delivered to site in their original unbroken containers or packages and bear the manufacturer's name, label, brand and formula and shall be mixed and applied in accordance with his directions.

14.4 SURFACE PREPARATION:

All oil, grease, dirt, dust, loose mill, scale and any other foreign substance shall be removed from the surface to be painted, polished and white washed by the use of a solvent and clean wiping material. Following the solvent cleaning, the surfaces shall be cleaned by scraping, chipping, blasting, wire brushing or other effective means as approved by the Engineer.

In the event the surface become otherwise contaminated in the interval between cleaning and painting, recleaning will be done by the Contractor at no additional cost.

Surfaces of stainless steel, aluminium, bronze and machined surfaces adjacent to metal work being cleaned or painted shall be protected by effective masking or other suitable means, during the cleaning and painting operations.

No work in this Section shall be allowed until all surfaces or conditions have been inspected and approved by the Engineer.

14.5 APPLICATION:

All paint and coating materials shall be in a thoroughly mixed condition at the time of application. All work shall be done in a workmanlike manner, leaving the finished surface free from drips, ridges, waves, laps and brush marks. All paints shall be applied under dry and dust free conditions. Unless approved by the Engineer paint shall not be applied when the temperature of the surrounding air is below 10 Deg.C. Surfaces shall be free from moisture at the time of painting.

All primary paint shall be applied by brushing. The first coat of paint shall be applied immediately after cleaning. When paint is applied by spraying, suitable measures shall be taken to prevent segregation of the paint in the container during painting operations.

Effective means shall be adopted for removing all free oil and moisture from the air supply lines of the spraying equipment.

Each coat of paint shall be allowed to dry or harden thoroughly before the succeeding coat is applied. Surfaces to be painted that will be inaccessible after installation shall be completely painted prior to installation shall be completely painted prior to installation.

Only as much material should be mixed as can be used up in one hour. Over-thinning will not be permitted. After the first coat, the surfaces will be soaked evenly four or five times and the second coat shall be applied after leaving for at least overnight.

All steel doors, windows and ventilators shall be painted with two coats of approved enamel paint over one coat of a red oxide primer as directed by the Engineer.

Oil bound distemper shall be applied to internal wall surfaces and white wash on ceilings as specified herein after.

For applying Durocem the surface shall be dampened with clean water immediately ahead of application. Durocem and clean water shall be mixed as per directions of the manufacturer. A heavy first coat at 20 lbs/100 sft (1 kg per sq.m) shall be applied. This shall be followed by a second brush coat at 10 lbs/100 sft (0.5 kg per sq.m) after the first coat has set. When finish coat has set, it shall be floated to uniform texture with a sponge float. The work shall include cleaning the surface, sand papering and smooth finishing, scaffolding, curing etc. complete as per the approval of the Engineer.

14.6 WHITE AND COLOUR WASHING:

The surfaces shall be well cleaned and brushed before white washing. The white washing material shall be prepared from un-slaked lime. The lime shall be dissolved in a tub with sufficient quantity of water and then well mixed and strained through a clean cloth. 4 kg clean gum boiled with 12 kg of rice for each cu.m of lime shall be added to the liquid lime along with a small quantity of marine blue as directed by the Engineer.

The mixture shall be in thoroughly mixed condition and shall be applied in three coats with a brush.

Each coat of white wash shall be allowed to dry, so that no sign of cracking shall appear on the surface and also white wash shall not come off readily on fingers when rubbed. The white wash when completed, shall form an opaque coat of uniform white colour, through which the old work does not show and shall present a smooth regular surface free from powderly matter. For colour washing approved quality of coloring matter shall be added to the liquid and thoroughly mixed by stirring.

14.7 DISTEMPERING:

Oil bound distemper of approved quality and shade shall be applied on internal wall surfaces where shown in drawing or directed by the Engineer.

14.8 EXECUTIONS:

14.9 SUBMITTALS

Colour samples shall be submitted on 6"x6" (150x150 mm) asbestos cement boards, showing each type of paint for Engineer's approval.

14.10 PRODUCT DELIVERY

Deliver materials in manufacturer's original unopened containers with labels intact and legible identifying brand names and contents.

14.11 JOB CONDITION

Observe manufacturer's recommended minimum and maximum temperature but do not apply paint or finish to any surface unless ambient temperature is 10 deg.C or above and less than 43 deg.C. No painting shall be done above 90% relative humidity.

Place drop cloths to adequately protect all finished work.

Remove and replace all items of finished hardware, device plates, accessories, including

fixtures or other removable items.

The surface shall be prepared first before applying distemper by filling depressions with putty, rubbing, sand papering and cleaning. A priming coat shall first be applied of petrifying liquid of approved manufacture. Distemper shall be applied with broad stiff brush of approved make. Distemper shall be applied quickly and boldly. Each coat of distemper should first be got approved by the Engineer before applying the next coat.

14.12 MEASUREMENT AND PAYMENT:

Measurement of the work acceptably completed and specified herein as painting, distempering, and white/colour washing etc. will be made on the basis of actual area in square feet / Square meter of the respective job including all preparatory work like scraping, scratching, sand papering, filling depressions with putty, priming and scaffolding etc. complete in all respect as directed by the Engineer. Payment for these items shall be made at the approved tendered rates. No payment shall be made for painting work on doors, windows, ventilators, steel grills, cabinets and cup boards steel ladders etc. for which the contractor shall make necessary allowance in his rates for such items

FORMS

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BID SECURITY
(Bank Guarantee)

Security Executed on _____
(Date)
Name of Surety (Bank) with Address: _____
(Scheduled Bank in Pakistan)
Name of Principal (Bidder) with Address _____
_____
____

Penal Sum of Security Rupees. _____Rs. _____)
Bid Reference No. _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at the request of the said Principal (Bidder) we, the Surety above named, are held and firmly bound unto _____
(hereinafter called the 'Employer') in the sum stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Bidder has submitted the accompanying Bid dated _____ for Bid No. _____ for_____Particulars of Bid) to the said Employer; and

WHEREAS, the Employer has required as a condition for considering said Bid that the Bidder furnishes a Bid Security in the above said sum from a Scheduled Bank in Pakistan or from a foreign bank duly counter-guaranteed by a Scheduled Bank in Pakistan, to the Employer, conditioned as under:

(1) That the Bid Security shall remain in force up to and including the date 28 days after the deadline for validity of bids as stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Surety is hereby waived;

(2) That the Bid Security of unsuccessful Bidders will be returned by the Employer after expiry of its validity or upon signing of the Contract Agreement; and

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

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

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

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

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

SURETY (Bank)

WITNESS:

Signature _____

1. _____

Name _____

_____

Title _____

Corporate Secretary (Seal)

Corporate Guarantor (Seal)

2. _____

_____

Name, Title & Address

FORM OF PERFORMANCE SECURITY
(Bank Guarantee)

Guarantee No._____
Executed on _____
Expiry date _____

[Letter by the Guarantor to the Employer]

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

Name of Principal (Contractor) with address:_____

_____

Penal Sum of Security (express in words and figures)_____

_____

Letter of Acceptance No. _____Dated _____

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

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has accepted the Employer's above said Letter of Acceptance for _____ _____ (Name of Contract) for the _____

_____ (Name of Project).

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

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

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

PROVIDED ALSO THAT the Employer 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 Employer forthwith and without any reference to the Principal or any other person.

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

_____
Guarantor (Bank)

Witness:

1. _____

_____
Corporate Secretary (Seal)

2. _____

_____
Name, Title & Address

Signature _____

Name _____

Title _____

_____
Corporate Guarantor (Seal)

FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the _____ day of_____(month) 20_____ between _____ (hereafter called the "Employer") of the one part and _____ (hereafter called the "Contractor") of the other part.

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

NOW this Agreement witness as follows:

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

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

   (a) The Contract Agreement;
   (b) The Letter of Acceptance;
   (c) The completed Form of Bid;
   (d) Special Stipulations (Appendix-A to Bid);
   (e) The Particular Conditions of Contract – Part II;
   (f) The General Conditions – Part I;
   (g) The completed Appendices to Bid (B, C, E to L);
   (h) The Drawings;
   (i) The Special Provisions & Technical Specifications
   (j) The priced Bill of Quantities;
   (k) Any other document forming part of contract.

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

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

IN WITNESS WHEREOF the parties hereto have caused this 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 Employer

_____

(Seal)

Signed, Sealed and Delivered in the presence of:

Witness:

_____

(Name, Title and Address)

Witness:

_____

(Name, Title and Address)

Repair and Maintenance of RCC Boundary Wall and Perimeter steel Fencing, Desilting and Cleaning of Storm Water Drainage, Sewerage Manholes/Network, and Cleaning of Underground Wastewater Tank and STP Tank, UPVC doors and Paint work of Admin Building at Khairpur Special Economic Zone (KSEZ).

FORMS OF BID AND APPENDICES

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FORM OF BID

Bid Reference No. **Repair and Maintenance of RCC Boundary Wall and Perimeter steel Fencing, Desilting and Cleaning of Storm Water Drainage, Sewerage Manholes/Network, and Cleaning of Underground Wastewater Tank and STP Tank at Khairpur Special Economic Zone (KSEZ).**

.

(Name of Contract/Works)
To:

_____
_____
_____
Gentleman,

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

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

3. As security for due performance of the undertakings and obligations of this Bid, we submit herewith a Bid Security in the amount of Rupees _____ (Rs. _____) drawn in your favour or made payable to you and valid for a period of _____ days beginning from the date Bids are opened.

4. We undertake, if our Bid is accepted, to commence the Works and to complete the whole of the Works comprised in the Contract within the time stated in Appendix-A to Bid.

5. 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.

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

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

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

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

10. We confirm, if our bid is accepted, that all partners of the joint venture shall be liable jointly and serveably for execution of contract and the composition or the constitution of the joint venture shall not be altered without prior consent of the procuring agency

Dated this _____day of_____20_____

Signature: _____

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

_____
(Name of Bidder in Block Capitals) (Seal)

Address:_____
_____
_____

Witness:

Signature: _____
Name: _____

Address. _____
_____

Occupation_____

Appendix-A to Bid

SPECIAL STIPULATIONS

Clause/ Conditions

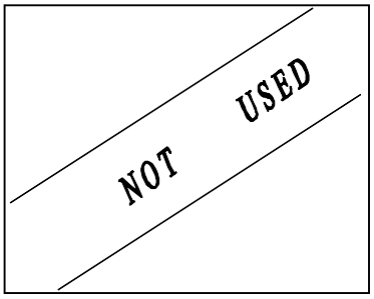
of Contract

1.	Engineer's Authority to issue Variation in emergency	2.1	2% of the Contract Price stated in the Letter of Acceptance.
2.	Amount of Performance Security	4.2	5% of Contract Price stated in the Letter of Acceptance in the form of bank guarantee from a scheduled Bank of Pakistan acceptable to the Employer, to be furnished within 14 days after receipt of Letter of Acceptance and will be released upon successful completion of defects liability period.
3.	Time for Furnishing Work Programme	8.3	Within 07 days from the date of receipt of Letter of Acceptance.
4.	Minimum amount of Third-Party Insurance	18.3	N/A.
5.	Time for Commencement	8.1	Within 07 days from the date of receipt of Engineer's Notice to Commence which shall be issued within fourteen (07) days after signing of Contract Agreement.
6.	Time for Completion	8.2	45 days from the date as notified in the Engineer's Notice to Commence.
7.	Amount of Liquidated Damages	8.7	0.1% of the contract price for each day of delay in completion of the Works subject to a maximum of 10% of Contract Price stated in the Letter of Acceptance.
8.	Defects Liability Period	11.1	90 days calculated from the date of completion of work certified by the Engineer.

9.	Percentage of Retention Money	14.2	N/A.

10.	Limit of Retention Money	14.2	N/A
11.	Minimum amount of Interim Payment Certificates (Running Bills)	14.2	Not less than Rs.5 million & above
12	Time of Payment from delivery of Engineer's Interim Payment Certificate to the Employer.	14.7	15 days in case of local currency or 28 days in case of foreign currency.
13	Mobilization Advance	14.2(b)	Not Applicable
14	Any other sum to which contractor may be entitled under the contract	Additional Condition under monthly statement	Not Applicable

FOREIGN CURRENCY REQUIREMENTS



Appendix-C to Bid

PRICE ADJUSTMENT UNDER CLAUSE 70 OF

CONDITIONS OF CONTRACT

B **Escalation is allowed on the materials only under Clause 70 shall be as follows:**

Cost Element	Description	Basic Price	Applicable index
1	2	3	4

Notes:

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

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

NOT APPLICABLE

Appendix –D to Bid

PROPOSED CONSTRUCTION SCHEDULE

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

Description	**Time for Completion**
The Project comprises of Repair and Maintenance of RCC Boundary Wall and Perimeter steel Fencing, Desilting and Cleaning of Storm Water Drainage, Sewerage Manholes/Network, and Cleaning of Underground Wastewater Tank and STP Tank at Khairpur Special Economic Zone (KSEZ). . ***Summary of Works based on Market rates*** • Maintenance of Boundary wall. • Desilting and Cleaning of Sewerage Manholes Network & UG Waste Water Tank / STP Tank at Khairpur Special Economic Zone.	45 days

Appendix-E to Bid

METHOD OF PERFORMING THE WORK

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

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

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

BF-1

Appendix-F to Bid

(INTEGRITY PACT)

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

Contract No._____Dated _____

Contract Value: _____

Contract Title: _____

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

Without limiting the generality of the foregoing, [name of Supplier/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 KSEZ / Govt. of Sindh, except that which has been expressly declared pursuant hereto.

[name of Supplier/contractor] certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with KSEZ / Govt. of Sindh and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

[name of Supplier/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 KSEZ / Govt. of Sindh under any law, contract or other instrument, be voidable at the option of KSEZ / Govt. of Sindh

Notwithstanding any rights and remedies exercised by KSEZ / Govt. of Sindh in this regard, [name of Supplier/contractor] agrees to indemnify KSEZ / Govt. of Sindh for any

loss or damage incurred by it on account of its corrupt business practices and further pay compensation to KSEZ / Govt. of Sindh in an amount equivalent to ten time the sum of any commission, gratification, bribe, finder's fee or kickback given by [name of Supplier] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from KSEZ / Govt. of Sindh.

Name of Buyer: ……	Name of Seller/Supplier: ……
Signature: ……	Signature: …… [Seal]
	[Seal]

NOTIFICATION

No. CTO/SEZMC/KSEZ/O&M/2022-23/158: With the approval of the Competent Authority, the Sindh Economic Zones Management Company is pleased to constitute a Complaint Redressal Committee (CRC) to redress the grievance in procurement of works at Khairpur Special Economic Zone in compliance with Rule 31 of Sindh Public Procurement Rules, 2010, with following composition and terms of reference:

S. No.	DESIGNATION	STATUS
1	Chief Executive Officer, SEZMC, Govt. of Sindh	Chairman
2	Representative of the Accountant General, Sindh	Member
3	Independent Professional from relevant field, to be nominated by the CEO, SEZMC	Member

Terms of Reference:

- To determine whether there exists any inconsistency in the procurement process with SPPRA Rules 2010 (amended from time to time) and regulations;
- To determine whether any unauthorized act or decision was made by the Procurement Committee;
- To reverse any decision of the Procurement Committee or substitute its own decision for such a decision;
- The Complaint Redressal Committee shall announce its decision within seven (7) days w.e.f. date of reference to the committee.

CHIEF EXECUTIVE OFFICER, SEZMC

No. CTO/SEZMC/KSEZ/O&M/2022-23/158/2814 **Karachi, dated:** 18th February 2025

A copy is forwarded for information and necessary action to:

1. All members of SEZMC Committees (CSC & Procurement)
2. P.S. to Managing Director, SPPRA, Karachi
3. All concerned

COMPANY SECRETARY

NOTIFICATION

No. CTO/SEZMC/KSEZ/O&M/2022-23/158: With the approval of the Competent Authority, the Sindh Economic Zones Management Company is pleased to constitute a Procurement Committee for procurement of works at Khairpur Special Economic Zone in compliance with Rule 7 of Sindh Public Procurement Rules, 2010, with following composition and terms of reference:

S. No.	DESIGNATION	STATUS
1	Chief Technical Officer, SEZMC, Govt. of Sindh.	Chairman
2	Project Coordinator, Education City, Govt. of Sindh.	Member
3	Manager Projects, SEZMC, Govt. of Sindh.	Member/Secretary

Terms of Reference:

- Preparation of Bidding Document
- Carrying out technical as well as financial evaluation of the bid;
- Preparing evaluation report as provided in Rule 45 SPPRA 2010 (Amended 2013).
- Making recommendations for the award of contract to the competent authority; and
- Perform any other function ancillary and incidental to the above.
- Committee may co-opt any member.

CHIEF EXECUTIVE OFFICER, SEZMC

No. CTO/SEZMC/KSEZ/O&M/2022-23/158/2811 **Karachi, dated:** 18th February 2025

A copy is forwarded for information and necessary action to:

1. Members (All) SEZMC Procurement Works & Services Committee.
2. Members (All) SEZMC Board.
3. Managing Director, SPPRA, Karachi.

COMPANY SECRETARY

ANNUAL PROCUREMENT PLAN (WORKS, GOODS & SERVICES)

FINANCIAL YEAR-2026-27

Sindh Economic Zones Management Company (SEZMC)

Sr. No	Description of Procurement	Quantity (where applicable)	Estimated Unit Cost (where applicable)	Estimated Cost	Funds Allocated	Source of funds (ADP/Non-ADP)	Proposed procurement method	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Remarks (if any)
1	Repair and maintenance of RCC boundary wall and perimeter steel fencing, desilting of Strom water drainage and sewerage manholes network, cleaning of the underground waste water tnk/STP, UPVC doors and paint of admin building at Khairpur special economic zone.	**NA**	**NA**	**31,374,118**	**32 million**	**Non-ADP**	**National Bidding**		**Yes**			**Repair and maintenance of RCC boundary wall and perimeter steel fencing, desilting of Strom water drainage and sewerage manholes network, cleaning of the underground waste water tnk/STP, UPVC doors and paint of admin building at KSEZ.**
2	Request For Expression Of Interest Shortlisting Of Firms (Architects And/ Or Engineers) To Vet & Approve Building Plans, Architectural And/ Or Structural/ Mep Drawings For Khairpur Special Economic Zone	**NA**	**NA**	**0**	**0**	**Non-ADP**	**National Bidding**	**Yes**				**Request For Expression Of Interest Shortlisting Of Firms (Architects And/ Or Engineers) To Vet & Approve Building Plans, Architectural And/ Or Structural/ Mep Drawings For Khairpur Special Economic Zone**

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NOTICE INVITING TENDER

Sindh Economic Zones Management Company invites eligible contractors/firms for repair and maintenance of the RCC boundary wall and perimeter steel fencing, desilting/cleaning of storm water drainage and sewerage manholes network, and cleaning of the underground wastewater tank / STP, UPVC doors and paint work of admin block at Khairpur Special Economic Zone.

Bidders must be active taxpayers registered with FBR and SRB, and hold valid PEC registration. Procurement will follow the Single Stage One Envelope method under SPP Rules 2010.

Interested Firms / Contractors may download "TENDER DOCUMENTS" free of cost from 27th October 2026 containing Terms & Conditions from following website: www.sezmc.gos.pk , free of cost. The bidder must be registered with E - PAK ACQUISITION & DISPOSAL SYSTEM (EPADS). Interested bidders are requested to submit their bid online through EPADS portal in accordance to the qualification/ eligibility criteria mentioned. The bid security of PKR 470,000/- in the shape of Pay Order shall be submitted in SEZMC office on or before 11:00 am, 12th November 2026. Bids will be opened on the same day at 12:00 noon.

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JOB PORTAL BY
INFORMATION DEPARTMENT

INF-KRY: 4770/26