PUNJAB INDUSTRIAL ESTATES DEVELOPMENT AND MANAGEMENT COMPANY (PIEDMC)

Bidding Documents

For

"WIDENING OF MAIN BOULEVARD (DENIM ROAD) FROM PLOT # 73/M TO PLOT # 90/M AT QUAID-E-AZAM INDUSTRIAL ESTATE KOT LAKHPAT LAHORE"

Contract # PIE/P&C/RW/BOM-QIE/25/22

Volume I : Bidding Documents

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Section-I: INVITATION FOR BIDS

INVITATION TO BID

1. PIEDMC intends to hire a Contractor for widening of main boulevard (Denim Road) from 73/M to 90/M at Quaid-e-Azam Industrial Estate Kot Lakhpat Lahore.
2. Sealed Bids are invited for the above said work from Contractors registered with PEC in category C-5 or above and having experience in similar works.
3. Bidding will be conducted under the provision of PPRA Rules -2014 (amended up to date) on Single Stage One Envelope Basis
4. For bids submission on E-procurement, Bidders are requested to register at www.punjab.eprocure.gov.pk.
5. Bidding Documents are available on PPRA website: www.ppra.punjab.gov.pk, PIEDMC website www.pie.com.pk and EPADS Portal **i.e.** http://punjab.eprocure.gov.pk free of cost.
6. **The Bidding documents, completed, signed, stamped must be submitted online E-Pak Acquisition and Disposal System (EPADS) Portal i.e. http://punjab.eprocure.gov.pk till 12th May, 2025 by or before 03:00 PM and bids shall be opened at same date on 03:30 PM, as per the PPRA Rules, 2014**
7. Bid must contain Bid Security in shape of Bank Guarantee / CDR / Bank Draft / Pay Order amounting to Rs. 532,279/- in favor of "PIEDMC" (which is 2% of the estimated cost), without which the offer shall be rejected being non-responsive. The bid security must be attached in PDF format and submitted in original in Chief Engineer (P&C) office by post before bid submission.
8. Bids that are incomplete, not signed and stamped, late, or submitted by other than specified mode will not be considered.
9. In case, the firm is found Black-listed by PIEDMC and PPRA or provide false / misleading information, it's Bid will be cancelled and will be recommended for punitive action.

Note: PIEDMC management may reject all bids or proposals at any time prior to the acceptance of bids or proposals, as provided under Rule-35 of Punjab Procurement Rules, 2014 (amended from time to time)

Your Faithfully

Chief Engineer (P&C)

Section-II:

INSTRUCTIONS TO BIDDERS (ITB)

A. GENERAL

IB.1 Scope of Bid

Quaid-e-Azam Industrial Estate Lahore hereinafter called "the Procuring Agency" Widening of Main Boulevard (Denim Road) From 74/M to 90/M QIE invites bids complete in all respects as per requirement of bidding documents, and summarized in the Bidding Data hereinafter referred to as the "work".

1.2 The successful Bidder will be required to execute the work within the given time line specified in the Bidding Documents.

1.3 For purposes of this Clause, the term "Works" includes commodities, raw material, machinery, equipment, and industrial plants.

1.4 The term "country of origin" means the country where the Works have been mined, grown, cultivated, produced, manufactured, or processed; or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its imported components.

1.5 The bidding process shall be open National Competitive Bidding.

IB.2 Source of Funds

2.1 BOM-QIE approved Budget.

IB.3 Eligible Bidders

3.1 This Invitation for Bids is open to all Bidders/Applicants who are on active taxpayer list of FBR (Valid Copy of NTN and GST certificates) shall be required to be submitted along with bid to substantiate the claim. Eligibility of Bidder shall be based on data provided as per clause IB.11.

IB.4 One Bid per Bidder

4.1 Each Bidder shall submit only one bid either by himself, or as a partner in joint venture. A Bidder who submits or participates in more than one bid (other than alternatives pursuant to Clause IB.20) 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 Procuring Agency 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 inspect the Location of Delivery 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 work. All cost in this respect shall be borne by the bidders.

B. BIDDING DOCUMENTS

IB.7 Contents of Bidding Documents

7.1 The Bidding Documents, in addition to Invitation for Bids, shall include as mentioned below and should be read in conjunction with any Addenda issued in accordance with Clause IB.9.

1. Instructions to Bidders
2. Bidding Data Sheet
3. Form of Bid and
4. Schedules to Bid

   (i) Schedule A: Price Schedule for Works to be offered
   (ii) Schedule B: Manufacturer's Authorization
   (iii) Schedule C: List of Works / BOQ
   (iv) Schedule D: Delivery and Completion Schedule

5. Standard Forms
   (i) Form of Bid Security
   (ii) Form of Performance Security
   (iii) Form of Contract Agreement
   (iv) Form of Advance Payment Security

6. General Conditions of Contract (GCC)
7. Special Conditions of Contract

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.30, bids which are not substantially responsive to the requirements of the Bidding Documents will be rejected.

IB.8 Clarification of Bidding Documents

8.1 A prospective bidder requiring any clarification(s) in respect of the Bidding Documents may notify through **EPADS**.

IB.9 Amendment of Bidding Documents

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

9.2 Any addendum pursuant to Sub-clause 7.1 advertised as the original was advertised thus issued shall be part of the Bidding Documents in terms of rule 25(4) shall be communicated.

9.3 To afford prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, the Procuring Agency may extend the deadline for submission of bids in accordance with Clause IB.24

C. PREPARATION OF BIDS

IB.10 Language of Bid

10.1 The bid as well as all correspondence and documents related to the bid exchanged by a bidder and the Procuring Agency shall be in the bid language stipulated in the Bidding Data. 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 Comprising 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.

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

(a) 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;
(b) 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;
(c) The partner-in-charge shall always be duly authorized to deal with the Procuring Agency regarding all matters related with and/or incidental to the supply 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); and

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

Mandatory Documents to be attached with Bid

Applicant/Bidder must attach following documents with Bid: -

1. Profile of company.
2. Bidder shall submit their financial capabilities in form of Balance Sheet / Bank Statement for last Complete year.
3. At least three documentary evidences of General Civil works in the last three years.
4. Documentary evidence of registration with FBR regarding Income /Sales Tax & PRA.
5. Firms/Manufacturers/Contractors shall be registered with valid PEC under C-5 or above.
6. Undertaking on Rs. 100 stamp paper regarding not blacklisted by PIEDMC and PPRA.
7. Price schedule duly filled, signed and stamped.
8. Copy of Tender purchase Slip.
9. 2% Bid security i.e. **PKR 532,279/-** of estimated price should attach issued by scheduled bank of Pakistan in shape of CDR/Pay order/Bank draft/Bank Guaranty issued by a schedule bank in Pakistan in favor of **PIEDMC Quaid-e-Azam Industrial Estate Board Lahore**.
10. Form of Integrated pact duly filled and signed and stamped.

IB.12 Bid Prices

12.1 The Bidder shall submit the Form of Bid using the form attached herewith. This form must be completed without any alterations to its format, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.

12.2 The Bidder shall submit the Price Schedules for Works, according to their origin as appropriate, using the forms furnished in Appendices to Bid along with Manufacturer's Authorization (on the format provided) in case the Bidder is not himself the manufacturer.

12.3 Unless stated otherwise in the Bidding Documents (in Lots under Schedule C to Bid), 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.

12.4 The Bidders shall fill in rates and prices for all items of the Works described in the Price Schedules. Items against which no rate or price is entered by a bidder will not be paid for by the Procuring Agency when delivered and shall be deemed covered by rates and prices for other items in the Price Schedules.

12.5 All duties, taxes and other levies payable by the Contractor / Vendor 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. The Supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted Works to the Procuring Agency. If any tax exemptions, reductions, allowances or privileges may be available to the Supplier in the Procuring Agency's Country, the Procuring Agency shall use its best efforts to enable the Supplier to benefit from any such tax savings to the maximum allowable extent.

IB.13 Currencies of Bid and Payment

13.1 The unit rates and the final prices shall be quoted by the Bidder entirely in Pak rupees including all Taxes Duties and levies applicable.

IB.14 Documents Establishing the Eligibility of the Bidder

To establish their eligibility in accordance with IB 4, Bidders shall:

(a) Provide the eligibility documents as per IB 3;

(b) If the Bidder is an existing or intended JV in accordance with IB 4.1 and 11.2, submit a copy of the JV Agreement, or a letter of intent to enter into such an Agreement. The respective document shall be signed by all legally authorized signatories of all the parties to the existing or intended JV, as appropriate.

IB.15 Documents Establishing the Eligibility of the Works

15.1 To establish the eligibility of the Works in accordance with IB Clause 1-3, Bidders shall complete the country-of-origin declarations in the Price Schedule Forms, & Appendices to Bid.

IB.16 Documents Establishing the Conformity of the Works to the Bidding Document

16.1 To establish the conformity of the Works to the Bidding Document, the Bidder shall furnish as part of its Bid the documentary evidence that the Works and be supplied conform to the specified requirements.

16.1 The documentary evidence may be in the form of literature, drawings or data, and shall consist of a detailed item-by-item description of the essential technical and performance characteristics of the Works.

16.2 Standards for workmanship, process, material, and equipment, as well as references to brand names or catalogue numbers specified by the Procuring Agency in the Delivery and Completion Schedule, are intended to be descriptive only and not restrictive. The Bidder may offer other standards of quality, brand names, and/or catalogue numbers, provided that it demonstrates, to the Procuring Agency's satisfaction, that the substitutions ensure substantial equivalence or are superior to those specified in Delivery and Completion Schedule of Supply.

IB.17 Documents Establishing the Qualification of the Bidder

17.1 The documentary evidence of the Bidder's qualifications to perform the contract, if its bid is accepted, shall establish to the Procuring Agency's satisfaction that the Bidder meets each of the qualification criterion specified in Bidding Documents.

17.2 If so required in the Bidding Data, a Bidder that does not manufacture or produce the Works it offers to supply shall submit the Manufacturer's Authorization using the appended form to demonstrate that it has been duly authorized by the manufacturer or producer of the Works to supply these Works in the Procuring Agency's country.

17.3 If so required in the Bidding Data, a Bidder that does not conduct business within the Procuring Agency's Country shall submit evidence that it will be represented by an Agent in the country equipped and able to carry out the Supplier's maintenance, repair and spare parts-stocking obligations prescribed in the Conditions of Contract and/or Technical Specifications.

IB.18 Bid Validity

18.1 Bids shall remain valid for the period stipulated in the Bidding Data after the Date of Bid Opening specified in Clause IB.27.

18.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Procuring Agency 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.19 in all respects.

IB.19 Bid Security

19.1 Each Bidder shall furnish, as part of his bid, a Bid Security in the amount **stipulated in the Bidding Data in Pak Rupees.**

19.2 The Bid Security shall be, at the option of the Bidder, in the form CDR/DD/PO/Bank Guarantee from Scheduled Bank in favor of **PIEDMC Quaid-e-Azam Industrial Estate Board, Lahore.**

19.3 Any bid not accompanied by an acceptable Bid Security shall be rejected by the Procuring Agency as non-responsive.

19.4 The bid securities of unsuccessful Bidders will be returned as promptly as possible, but not later than 28 days after the expiration of the period of Bid Validity.

19.5 The Bid Security of the successful Bidder will be returned when the Bidder has signed the Contract Agreement/issuance of Purchase Order.

19.6 The Bid Security may be forfeited:

(a) If the Bidder withdraws his bid except as provided in Sub-Clause 26.1;
(b) If the Bidder does not accept the correction of his Bid Price pursuant to Sub-Clause 31.2 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.20 Alternate Proposals by Bidder

20.1 Should any Bidder consider that he can offer any advantages to the Procuring Agency by a modification to the designs, specifications or other conditions, he may, in addition to his bid to be submitted in strict compliance with the Bidding Documents, submit any Alternate Proposal(s) containing (a) relevant design calculations; (b) technical specifications; (c) proposed manufacturing methodology; and (d) any other relevant details / conditions, provided always that the total sum entered on the Form of Bid shall be that which represents complete compliance with the Bidding Documents.

20.2 Alternate Proposal(s), if any, of the lowest evaluated responsive Bidder only may

be considered by the Procuring Agency as the basis for the award of Contract to such Bidder.

IB.21 Performance Security

21.1 10% of contract amount after issuance of Letter of Intent to successful bidder.

In case the total tendered amount is less than 5% of the approved estimated (DNIT) amount, the lowest bidder will have to deposit additional performance security of notice or within expiry period of bid, whichever is clear.

IB.22 Format and Signing of Bid

22.1 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.

22.2 All Appendices and Schedules to Bid are to be properly completed and signed.

22.3 No alteration is to be made in the Form of Bid nor in the Appendices and Schedules thereto except in filling up the blanks as directed. If any such alterations be made or if these instructions be not fully complied with, the bid may be rejected.

22.4 Each Bidder shall prepare by filling out the forms completely and without alterations one (1) original and number of copies, specified in the Bidding Data, of the documents comprising the bid as described in Clause IB.7 and clearly mark them "ORIGINAL" and "COPY" as appropriate. In the event of discrepancy between them, the original shall prevail.

22.5 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- Clauses 11.1(a) and 11.2 hereof. All pages of the bid shall be initialed and stamped by the person or persons signing the bid.

22.6 The bid shall contain no alterations, omissions or additions, except to comply with instructions issued by the Procuring Agency, 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.

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

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

D. SUBMISSION OF BIDS

IB.23 Sealing and Marking of Bids

23.1 Each Bidder shall submit his bid as under:

(a) Technical/Financial proposal as per clause **IB.11** shall be submitted in sealed envelope.
(b) Both technical and financial proposals shall be placed in single envelope.
(c) The outer envelope shall be clearly marked as ORIGINAL and COPY of bid and addressed/identified as given in Sub-Clause 23.2 hereof.
(d) The Bids shall be opened and evaluated as per Single Stage One Envelope procedure of PPRA rules.

23.2 The inner and outer envelopes shall:
(a) be addressed to the Procuring Agency at the address provided in the Bidding Data;
(b) bear the name and identification number of the Contract as defined in the Bidding Data; and
(c) Provide a warning not to open before the time and date for bid opening, as specified in the Bidding Data.

23.3 In addition to the identification required in Sub- Clause 23.2 hereof, the inner envelope shall indicate the name and address of the Bidder to enable the bid to be returned unopened in case it is declared "late" pursuant to Clause IB.25

23.4 If the outer envelope is not sealed and marked as above, the Procuring Agency will assume no responsibility for the misplacement or premature opening of the Bid.

IB.24 Deadline for Submission of Bids

24.1 (a) Bids must be received by the Procuring Agency at the address specified not 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.

(c) Where delivery of a bid is by mail and the Bidder wishes to receive an acknowledgment of receipt of such bid, he shall make a request for such acknowledgment in a separate letter attached to but not included in the sealed bid package.

(d) Upon request, acknowledgment of receipt of bids will be provided to those

making delivery in person or by messenger.

24.2 The Procuring Agency 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 Procuring Agency and the Bidders previously subject to the original deadline shall remain consistent with the deadline as extended.

IB.25 Late Bids

25.1 (a) Any bid received by the Procuring Agency after the deadline for submission of bids prescribed in Clause IB.24 will not be entertained.

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

IB.26 Modification, Substitution and Withdrawal of Bids

26.1 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 Procuring Agency at least three days prior to the deadline for submission of bids.

26.2 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.23 with the outer and inner envelopes additionally marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" as appropriate.

26.3 No bid shall be allowed to be modified by a Bidder after the deadline for submission of bids except in accordance with Sub-Clauses 26.1 and 31.2.

26.4 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.19.

E. BID OPENING AND EVALUATION

IB.27 Bid Opening

27.1 The Procuring Agency will open the bids, in the presence of Bidders' representatives who choose to attend, at the time, date and location stipulated in the Bidding Data. The Bidders' representatives who are present shall sign a register evidencing their attendance.

27.2 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.26 shall not be opened.

27.3 The Bidder's name, 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, will be announced by the Procuring Agency at the opening of bids. The bid validity time shall be 180 days commencing from the date of opening of the bid

27.4 Procuring Agency shall prepare minutes of the bid opening, including the information disclosed to those present in accordance with the Sub-Clause 27.3.

IB.28 Process to be Confidential

28.1 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 which shall be done at least ten (10) days prior to issue of Letter of Acceptance. 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 not later than ten (10) days after the announcement of the bid evaluation report; however mere fact of lodging a complaint shall not warrant suspension of the procurement process.

IB.29 Clarification of Bids

29.1 To assist in the examination, evaluation and comparison of bids, the Procuring Agency 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 Procuring Agency in the evaluation of the bids in accordance with Clause IB.32.

IB.30 Examination of Bids and Determination of Responsiveness

30.1 Prior to the detailed evaluation of bids, the Procuring Agency will determine whether each bid is substantially responsive to the requirements of the Bidding Documents or not.

30.2 The envelope containing Technical Proposal will be opened first and bid will be evaluated as per IB.11. The envelope containing Financial Proposal will be opened only of those bidders who found technically responsive. Financial bid of non-responsive bidders shall be returned unopened except those who prefer going for grievance against the technical evaluation.

30.3 A substantially **Responsive Bid** is one which (i) meets the eligibility criteria; has been properly signed; (iii) is accompanied by the required Bid Security; (iv) prepared in-line with requirements stated under clause **IB.11** and (iv) 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.

30.4 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.31 Correction of Errors

31.1 Bids determined to be substantially responsive will be checked by the Procuring Agency for any arithmetic errors. Errors will be corrected by the Procuring Agency 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 Procuring Agency 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.

31.2 The amount stated in the Form of Bid will be adjusted by the Procuring Agency 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 19.6(b) hereof.

IB.32 Evaluation and Comparison of Bids

32.1 In evaluating the Bids, the Procuring Agency 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.31;
(b) Excluding Provisional Sums and the provision, if any, for contingencies; and
(c) Making an appropriate adjustment for any other acceptable variation or deviation from specification or performance criteria

32.2 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.

32.3 If the Bid of the successful Bidder is seriously unbalanced in relation to the Procuring Agency's estimate of the cost of Works to be delivered under the Contract, the Procuring Agency may require the Bidder to produce detailed price analyses for any or all items of the Price Schedules to demonstrate the internal consistency of those prices with the manufacturing methodology and schedule proposed. After evaluation of the price analyses, the Procuring Agency may require that the amount of the Performance Security set forth in Clause IB.37 be increased at the expense of the successful Bidder to a level sufficient to protect the Procuring Agency against financial loss in the event of default of the successful bidder under the Contract.

IB.33 Post Qualification of the Bidder

33.1 An affirmative determination shall be a prerequisite for award of the Contract to the respective Bidder. A negative determination shall result in rejection of the Bid.

33.2 The Procuring Agency reserves the right to obtain information regarding performance of the bidders on their previously awarded contracts. The Procuring Agency may in case of consistent poor performance of any Bidder as reported by the Procuring Agency's of the previously awarded contracts, interalia, reject his bid.

F. AWARD OF CONTRACT

IB.34 Award

34.1 Subject to Clauses IB.35 and IB.39, the Procuring Agency will award the Contract to the Bidder whose bid has been determined to be the lowest evaluated bid. In case the lowest evaluated bidder fails to execute the contract. The Procuring Agency in such eventuality shall proceed to the next lowest evaluated bid.

34.2 The Procuring Agency, at any stage of the bid evaluation, having credible reasons for or *prima facie* evidence of any defect in supplier's or contractor's capacities, may require the suppliers or contractors to provide information concerning their professional, technical, financial, legal or managerial competence whether already pre-qualified or not:
Provided that such qualification shall only be laid down after recording reasons therefore in writing. They shall form part of the records of that bid evaluation report.

IB.35 Procuring Agency's Right to accept any Bid and to reject any or all Bids

35.1 Notwithstanding Clause IB.34, the Procuring Agency reserves the right to reject all the Bids, and annul the bidding process, at any time prior to award of Contract, without thereby incurring any liability to the affected Bidders or any obligation except that the grounds for rejection of all bids shall upon request be communicated to any Bidder who submitted a bid, without justification of grounds. Rejection of all bids shall be notified to all Bidders promptly by notifying it on Procuring Agency website.

35.2 At the time the Contract is awarded, the Procuring Agency reserves the right to increase or decrease the quantity of Works originally specified in Delivery and Completion Schedules which shall not be more than 15% of the contract value duly provided in the bidding documents, and without any change in the unit prices or other terms and conditions of the Bid and the Bidding Document.

IB.36 Notification of Award

36.1 Prior to expiration of the period of bid validity prescribed by the Procuring Agency, the Procuring Agency will notify the successful Bidder in writing ("Letter of Acceptance") that his Bid has been accepted. This letter shall name the sum which the Procuring Agency will pay to the Contractor in consideration of the delivery of Works by the Contractor as prescribed by the Contract (hereinafter and in the Conditions of Contract called the "Contract Price").

36.2 No Negotiation with the Bidder having evaluated as lowest responsive or any other Bidder shall be permitted, however, Procuring Agency may seek clarification in writing to clarify any item in the bid evaluation report; and

response of the Bidder shall also be in writing.

36.3 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.

36.3 Upon signing of contract agreement / issuance of purchase order to the successful Bidder, the Procuring Agency will promptly notify the other Bidders that their Bids have been unsuccessful and return their bid securities.

IB.38 Signing of Contract Agreement

38.1 Within 07 day from the issuance of Letter of Acceptance under the Conditions of Contract, the bidder shall be required to provide the contract on Pakistan judicial paper as per prevailing price.

38.2 The formal Agreement between the Procuring Agency and the successful Bidder shall be executed within 07 days w. e. f. contract award.

IB.39 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.40 Margin of Preference

Unless otherwise specified in the Bidding Data, no margin of preference shall apply.

[Domestic Preference shall be applicable in case of International Competitive Bidding as per policy of the government, in accordance with the procedure given in the Bidding Data.]

Section-III: Bidding Data Sheet

BIDDING DATA

1. **Name and address of the Employer:**
   Board of Management Quaid-e-Azam Industrial Estate,
   169/A-S, Quaid-e-Azam Industrial Estate Lahore.

2. **Name of the Project & Summary of the Works**:
   "Widening of Main Boulevard (Denim Road) From 73/M to 90/M QIE"

3. **Time limit for clarification:**
   The bidder may request clarification of the bid documents, submitted through EPADS portal.

4. **Bid language:**
   All bids shall be in the English language.

5. **Period of Bid Validity:**
   180 days from the date of bid opening. as mention in IB 27.3

6. **Amount of Bid Security:**
   Two (02) percent (i.e. **PKR: 532,279/-)** of the total Estimated Budget Value.

7. **Defect Liability Period:**
   One Year w.e.f completion of work at site Quaid-E-Azam Industrial Estate.

8. **Estimated Budget Value:**
   PKR: **26,613,950**/-

9. **Number of copies of the bid to be completed and returned:**

10. **Employers address for the purpose of bid submission:**
    Bid submitted through EPADS portal

11. **Name and number of the contact**:
    The Sr. Estate Engineer, BOMQIE ,042-99330357

12. **Deadline for submission of bids:**
    As stated in advertisement

13. **Venue, time and date of bid opening:**
    As stated in advertisement

14. **Time for Completion** with delivery to QIE**:**
    03 Month w.e.f Work Order/signing of contract agreement

15. Responsiveness of Bids:

The responsiveness of the tenders shall be ascertained as the conditions below:

a) The Bids meet with clause IB.3 and in-line with requirements stated in clause IB.11 to these bidding documents.
b) The bid is valid till the required period.
c) The bid prices are firm and final for the contract.
d) Completion period offered is within specified limits.
e) The Tender does not deviate from Basic Requirements.

16. Currency:

Payment of Contract Price shall be in Pakistani Rupees.

17. Terms of Payments:

The quantities given in the BOQ are merely estimation. Payment to the Contractor shall be made as per actual work done dully verified by the Engineer In charge of the project" The minimum value of IPC shall be 25 % of the value of work done.

18. Retention of Payment

Retention money equal to Ten (10%) of the Work done will be deducted from each payment and 5% out of 10% of retention money may be released at issuance of completion certificate and remaining 5% will be released after successful completion of Defect Liability period (DLP).

19. Performance Security:

10% of Contract amount. And will be released after successful completion of Project and issuance of (TOC).

20. Liquidated Damages for Delay

The rate of liquidated damages shall be at the rate of 0.1 Percent per day up to maximum of Ten (10) Percent of Contract Price.

21. Pre-Bid Meeting

N/A

Section-IV: BIDDING FORMS

Form of Bid

Date: _____

Bid Reference No. _____
(Name of Contract)

To:

_____
_____
_____

Gentleman,

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Document, including Addenda No.: _____;

(b) We offer to supply in conformity with the Bidding Document and in accordance with the Delivery and Completion Schedule, the following Works _____

_____;

(c) The total price of our Bid, excluding any discounts offered in item (d) below is: __
_____;

(d) The discounts offered and the methodology for their application is: _____
_____
_____
_____
; _____

(e) Our Bid shall be valid for a period of _____ days from the date fixed for the bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(f) If our Bid is accepted, we commit to obtain a Performance Security in the amount of _____percent of the Contract Price for the due performance of the Contract;

(g) Our firm, including any subcontractors or suppliers for any part of the Contract, have Nationalities from the following eligible countries
_____;

(h) We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Document;

(i) Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part

of the Contract, has not been declared ineligible by the Procuring Agency;

(j) The following commissions, gratuities, or fees have been paid or are to be paid with respect to the bidding process or execution of the Contract:

Name of Recipient	Address	Reason	Amount

(If none has been paid or is to be paid, indicate "none.")

(k) We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.

(l) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

(m) We agree to permit the Procuring Agency or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by the Bank.

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Witness:

Name: _____

Signature: _____

Address: _____

Occupation: _____

Section-V: SCHEDULES TO BID

Schedule-A

PUNJAB INDUSTRIAL ESTATES DEVELOPMENT AND MANAGEMENT COMPANY (PIEDMC)

WIDENING OF MAIN BOULEVARD (DENIM ROAD) FROM PLOT # 73/M TO PLOT # 90/M AT QUAID-E-AZAM INDUSTRIAL ESTATE KOT LAKHPAT LAHORE.

BID SCHEDULE SUMMARY

A.	**SCHEDULE ITEMS:-**	**Rs=**	**24,139,611/-**
	Sub Total (A)	**Rs =**	**24,139,611/-**

TENDER AMOUNT

B.	Schedule Items **Rs 24,139,611_x_____** % Above /Below	**Rs=**	
C.	Provisional Sum / Contingences	**Rs=**	**1,206,980/-**
D.	Total (A+B+C)	**Rs=**	
E.	5% PRA on D	**Rs=**	
	Grand Total Amount(D+E) Inclusive all applicable Taxes	**Rs=**	

Amount in Words:_____

_____

Sr #	Description	MRS 2025 1st Bi-Annual	Unit	Qty	Rate	Amount
1	Dismantling cement concrete reinforced, separating reinforcement from concrete, cleaning and straightening the same.	Ch-4-20	Cft	682.70	270.86	184,916.34
2	Dismantling of PCC at Gate ways	Ch-4-19-c	Cft	6770.05	165.52	1,120,578.68
3	Dismantling of Brickwork	Ch-4-13	Cft	506.25	63.95	32,374.69
4	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming lead upto one chain (30 m) depth upto 5 ft (1.5m) iii) in hard soil or soft murum.	Ch-3-21-1-iii	Cft	25582.73	17.73	453,581.71
5	1st chain (1st 30 m) to 1000 to 3000 ft. (300 to 900 m)	Ch-1-1	Cft	36541.73	1890.55	690,839.60
	1st Km		Cft	36541.73	360.25	131,641.57
	2nd Km		Cft	36541.73	170.95	62,468.08
	3rd Km		Cft	36541.73	133.05	48,618.77
	4th Km		Cft	36541.73	94.05	34,367.49
	5th Km		Cft	36541.73	87.60	32,010.55
6	Compaction of earthwork with power road roller, including ploughing, mixing, moistening earth to optimum moisture ontent in layers, etc. complete) 95% to 100% maximum modified AASHTO dry density.	Ch-3-25-i	Sft	30975.00	1.70	52,657.50
7	Supplying and filling sand under floor; or plugging in wells.	Ch-10-3	Cft	2437.50	54.27	132,283.13
8	Placing, compacting, finishing and curing of concrete using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; including screening, washing of aggregates and mixing of constituents using batching plant, Transportation by transit mixer, pouring with pump in the required proportions to achieve a nominal cylindrical strength in the field as per ACI 214, with the specified consistency. i/c the cost of shuttering, compaction with Viberator, excluding the cost					

	of Admixture, as approved and directed by the Engineer Incharge. (a) Reinforced cement concrete in roof slab, beams, columns lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:-					
8	RCC 4000 PSI	Ch-6-9-a-iv	Cft	5533.13	871.3	4,821,011.81
9	PCC 3000 PSI	Ch-6-9-a-vi	Cft	3110.25	773.65	2,406,244.91
10	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-	Ch-6-12-c	Kg	11333.83	303.21	3,436,530.32
11	Providing and laying bituminous priming coat, using 10 lbs. kerosene oil and 10 lbs. binder per 100 Sft. or 0.5 Kg kerosene and 0.5 Kg binder per square metre	Ch-18-6	Sft	10500.00	20.8	218,400.00
12	a) Providing and laying plant premixed bituminous carpet including compaction and finishing to required camber, grade and density	Ch-18-10-iv	Sft	10500.00	153.7	1,613,850.00
13	Providing and fixing precast Edge Kerb Stone (4"to 6" thick), of 3500 PSI Compressive Strength, embeded in PCC 1:2:4 over lean concrete 1:4:8 etc complete in all respect.	Ch-6-53-b-i	Rft	3000.00	692.25	2,076,750.00
14	Providing and fixing precast Edge Kerb Stone (4"to 6" thick), of 3500 PSI Compressive Strength, embedded in PCC 1:2:4 over lean concrete 1:4:8 etc complete in all respect.	Ch-6-53-a-i	Rft	1450.00	140.3	203,435.00
15	Pacca brick work in foundation and plinth in:- i) Cement, sand mortar:-Ratio 1:4	Ch-7-4-i	Cft	1284.15	422.84	542,988.02
16	4 Cement Neru plaster 1:2 (cement and sand) upto 20' (6.00 m) height:-	Ch-11-4-a	Sft	1411.40	46.77	66,011.39
17	Cement plaster 1:4 upto 20' (6.00 m) height:- c) ¾" (20 mm) thick	Ch-11-9-c	Sft	1411.40	63.28	89,313.67

18	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate. ii) Crushed stone aggregate	Ch#18-03-a-ii	Cft	1980.00	219.74	435,085.20
19	Providing and laying Tuff Pavers, having 7000 PSI, crushing strength of approved manufacturer, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope complete in all respect. (50% Grey / 50% Coloured)	Ch#10-45-b	Sft	5800.00	202.35	1,173,630.00
20	Removal of Tuff Tile	NSI	Sft	9000.00	25	225,000.00
21	Dismantling of Kerb Stones	NSI	Rft	3000.00	70	210,000.00
22	Road Cut	NSI	Rft	2950.00	117.51	346,654.50
23	M.S Angle Iron Frame + Sheet	NSI	No	90.00	23249.1	2,092,416.30
24	New Manholes	NSI	No	64.00	18843	1,205,952.00
Total Amount					**Rs.**	**24,139,611.22**

Signature & Stamp of PIEDMC_____ Signature & Stamp of Contractor_____

Section-VI: STANDARD FORMS

BID SECURITY
PERFORMANCE SECURITY
CONTRACT AGREEMENT
ADVANCE PAYMENT SECURITY
INTEGRITY PACT

FORM OF BID SECURITY

(Bank Guarantee)

Guarantee No._____
Executed on _____

(Letter by the Guarantor to the Employer)

Name of Guarantor (Scheduled Bank in Pakistan) with address:_____
Name of Principal (Bidder) with address:_____
_____
Penal Sum of Security (express in words and figures):_____
_____
Bid Reference No._____ Date of Bid _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at the request of the said Principal, we the Guarantor above-named are held and firmly bound unto the _____, (hereinafter called The "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 Principal has submitted the accompanying Bid numbered and dated as above for _____ (Particulars of Bid) to the said Employer; and

WHEREAS, the Employer has required as a condition for considering the said Bid that the Principal furnishes a Bid Security in the above said sum to the Employer, conditioned as under:

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

(2) That in the event of;

(a) The Principal withdraws his Bid during the period of validity of Bid, or

(b) The Principal does not accept the correction of his Bid Price, pursuant to Sub-Clause 16.4 (b) of Instructions to Bidders, or

(c) Failure of the successful bidder to

(i) Furnish the required Performance Security, in accordance with Sub-Clause IB-21**.**1 of Instructions to Bidders, or

(ii) Sign the proposed Contract Agreement, in accordance with Sub-Clauses IB-20.2 & 20.3 of Instructions to Bidders,

the entire sum be paid immediately to the said Employer for delayed completion and not as penalty for the successful bidder's failure to perform.

NOW THEREFORE, if the successful bidder shall, within the period specified therefore, on the prescribed form presented to him for signature enter into a formal Contract Agreement with the said Employer in accordance with his Bid as accepted and furnish within fourteen (14) days of receipt of Letter of Acceptance, a Performance Security with good and sufficient surety , as may be required, upon the form prescribed by the said Employer for the faithful performance and proper fulfilment of the said Contract or in the event of non-withdrawal of the said Bid within the time specified then this obligation shall be void and of no effect, but otherwise to remain in full force and effect.

PROVIDED THAT the Guarantor shall forthwith pay to the Employer the said sum stated above 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 Guarantor at its address given above.

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

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

_____

Guarantor (Bank)

Witness: 1. Signature _____

1. _____ 2. Name _____

_____ 3. Title _____

Corporate Secretary (Seal)

2. _____

_____

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

FORM OF PERFORMANCE SECURITY

(Bank Guarantee)

Guarantee No._____
Executed on _____

(Letter by the Guarantor to the Employer)

Name of Guarantor (Scheduled Bank in Pakistan) with

address:_____

Name of Principal (Contractor) with
address:_____
_____

Penal Sum of Security (express in words and
figures)_____
_____

Letter of Acceptance No._____Dated _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bidding Documents and above said Letter of Acceptance (hereinafter called the Documents) and at the request of the said Principal we, the Guarantor above named, are held and firmly bound unto the _____ (hereinafter called the Employer) in the penal sum of the amount stated above, which amount to the % of the Contract Value 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 the said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause 9, Remedying Defects, of Conditions of Contract are fulfilled.

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

We, _____ (the Guarantor), waiving all objections and defenses under the Contract, do hereby irrevocably and independently guarantee to pay to the 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, for 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 bounded Guarantor has executed this Instrument under its seal on the date indicated above, the name and corporate seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____

Guarantor (Bank)

Witness:

1. _____

_____

Corporate Secretary (Seal)

2. _____

_____

(Name, Title & Address)

1. Signature _____

2. Name _____

3. Title _____

_____

Corporate Guarantor (Seal)

FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the _____ day of _____ 200 _____ between _____(hereinafter called the "Employer") of the one part and _____ (hereinafter called the "Contractor") of the other part.

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

NOW this Agreement witnessed as follows:

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

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

3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy defects therein in conformity and in all respects within the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of the Contract, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract. IN WITNESS WHEREOF the parties hereto have caused this Contract Agreement to be executed on the day**,** month and year first before written in accordance with their respective laws.

Signature of the Contactor	Signature of the Employer
_____	_____
(Seal)	(Seal)
Signed, Sealed and Delivered in the presence of:	
Witness:	Witness:
_____	_____
(Name, Title and Address)	(Name, Title and Address)

FORM OF BANK GUARANTEE FOR ADVANCE PAYMENT

Guarantee No._____

Executed on_____

(Letter by the Guarantor to the Employer)

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

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

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

AND WHEREAS _____ (Scheduled Bank) (hereinafter called the Guarantor) at the request of the Contractor and in consideration of the Employer agreeing to make the above advance to the Contractor, has agreed to furnish the said Guarantee.

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

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

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

This Guarantee shall expire not later than _____

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

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

_____

Guarantor (Scheduled Bank)

Witness:

1. _____

_____

Corporate Secretary (Seal)

2. _____

_____

(Name, Title & Address)

1. Signature _____

2. Name _____

3. Title _____

_____

Corporate Guarantor (Seal)

INTEGRITY PACT

DECLARATION OF FEE AND COMMISSION ETC. PAYABLE BY THE SUPPLIERS OF WORKS, SERVICES & WORKS IN CONTRACTS WORTH R S. 10.00 MILLION OR MORE

Contract No._____Dated _____

Contract Value: _____

Contract Title: _____

Hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Punjab (GOP) or any administrative subdivision or agency thereof or any other entity owned or controlled by GOP through any corrupt business practice.

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

[Name of Supplier] certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with GOP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

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

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

Name of Seller/Supplier: ----------

_____

Signature: ----------

Date: ----------

Section VII:
CONDITIONS OF CONTRACT & CONTRACT DATA

CONDITIONS OF CONTRACT

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CONDITIONS OF CONTRACT

1. GENERAL PROVISIONS

1.1 Definitions

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

The Contract

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

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

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

Persons

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

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

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

Dates, Times and Periods

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

1.1.8 "Day" means a calendar day

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

Money and Payments

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

Other Definitions

1.1.11 "Contractor's Equipment" means all machinery, apparatus and other things required for the execution of the 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 organizations. Words importing singular or one gender shall include plural or the other gender where the context requires.

1.3 **Priority of Documents**

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

1.4 **Law**

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

1.5 **Communications**

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

1.6 **Statutory Obligations**

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

2. THE 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, licenses or approvals which are required for the Works.

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

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

2.4 **Approvals**

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

3. ENGINEER'S/EMPLOYER'S REPRESENTATIVES

3.1 **Authorized 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 @ 10% of the contract amount at the option of the bidder, in the form of Bank Guarantee or CDR 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) Ionizing 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 Programmed

Within the time stated in the Contract Data, the Contractor shall submit to the Engineer/Employer a programmed 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, or

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

f) Market Rate System (MRS) District Lahore issued by Govt. of the Punjab Finance Department.

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 minimize 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.

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 satisfactory execution of work as per specifications, be paid by the Employer to the Contractor within 30 days after such Interim Payment Certificate has been jointly verified by Employer and Contractor, or, in the case of the Final Certificate subject to satisfactory execution of work as per specifications, 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

(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 thirty (30) days from the said date of submission by the Contractor, the Employer shall pay to the Contractor the sum verified by the Engineer less retention money at the rate stated in the Contract Data.

11.4 **Retention**

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

11.5 **Final Payment**

Within twenty one (21) days from the date of issuance of the Maintenance Certificate the Contractor shall submit a final account to the Engineer to verify and the Engineer shall verify the same within fourteen (14) days from the date of submission and forward the same to the 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

demobilize 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 demobilize from the Site.

12.3 **Insolvency**

If a Party is declared insolvent under any applicable law, the other Party may by notice terminate the Contract immediately. The Contractor shall then demobilize from the Site leaving behind, in the case of the Contractor's insolvency, any Contractor's Equipment which the 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 demobilization 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.

12.5 **Mobilization Advance**

The Contractor will be entitled for payment of Mobilization Advance upto maximum 15% of contract amount against bank guarantee of equivalent amount.

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 demobilize the Contractor's Equipment.

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

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

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 here above, the Party may give notice of dissatisfaction referring to this Sub-Clause within fourteen (14) days of receipt of the decision or the expiry of the time for the decision. If no notice of dissatisfaction is given within the specified time, the decision shall be final and binding on the Parties. If notice of dissatisfaction is given within the specified time, the decision shall be binding on the Parties who shall give effect to it without delay unless and until the decision of the 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 there under and any statutory modifications thereto. Any hearing shall be held at the place specified in the Contract Data and in the language referred to in Sub-Clause 1.5.

16 INTEGRITY PACT

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

17. Liquidated Damages for Delay

If the Contractor fails to comply with the Time for Completion in accordance with Clause 48, for the whole of the Works or, if applicable, any Section within the relevant time prescribed in the Contract, then the Contractor shall pay to the Employer the relevant sum stated in the Contract Data as liquidated damages for such default and not as a penalty (which sum shall be the only monies due from the Contractor for such default) for every day or

part of a day which shall elapse between the relevant Time for Completion and the date stated in a Taking-Over Certificate of the whole of the Works or the relevant Section, subject to the applicable limit stated in the Appendix to Tender. The Employer may, without prejudice to any other method of recovery, deduct the amount of such damages from any monies due or to become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the Contract.

18 Provisional Sum

18.1 Definition of "Provisional Sum

Provisional Sum" means a sum included in the Contract and so designated in the Bill of Quantities for the execution of any part of the Works or for the supply of goods, materials, Plant or services, or for contingencies, which sum may be we in whole or in part, or not at all on the instructions of the Engineer The Contractor shall be entitled to only such amounts in respect of the work, supply of contingencies to which such Provisional Sums relate as the Engineer shall determine in accordance with this Clause The Engineer shall notify the Contractor of any determination made under this Sub-Clause, with a copy to the Employer.

18.2 Use of Provisional Sums

In respect of every Provisional Sum the Engineer shell have authority to issue instruction for the execution of work or for the supply of goods, material, plant or services by:

(a) the contractor, in which case the contractor shell be entitled to an amount equal to the value thereof determined in accordance with clause I.B-12 and

(b) a nominated Ccontractor, as hereinafter defined, in which case the sum to be paid to the Contractor therefore shall be determined and paid in accordance with Sub-Clause I.B-12.

18.3 Production of Vouchers

The Contractor shall produce to the Engineer all quotations, invoices, vouchers and accounts or receipts in connection with expenditure in respect of Provisional Sums, except where work is valued in accordance with rates or prices set out in the Tender.

CONTRACT DATA

Conditions of Contract

1.1.4 **The Employer** means;

Board of Management, Quaid-e-Azam Industrial Estate

1.1.5 **The Contractor** means;

Widening of Main Boulevard (Denim Road) From 73/M to 90/M QIE at Quaid-e-Azam Industrial Estate.

1.1.7 **Commencement Date** means;

The date given in the Letter of Award / Acceptance.

1.1.9 **Time for Completion**:

03 Month

1.1.20 **The Engineer:**

The Sr. Estate Engineer, BOM-QIE

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

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

2.1 **Provision of Site:**

Date Commencement will be The Date for provision of Site.

3.1 **Authorized person:**

The Sr. Estate Engineer, 042-99330357-9

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

The Sr. Estate Engineer, 169/A-S Quaid-e-Azam Industrial Estate, Lahore.

4.4 **Performance Security:**

10% of Contract amount and will be released after successful completion of Project and issuance of (TOC).

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

Not Applicable

7.2 **Program:**

Time for submission:

Within Ten (10) days of the receipt of Acceptance Letter.

9.1 **Period for remedying defects**

One Year from date of Completion / Issuance of TOC.

11.1 **Terms of Payments:**

The quantities given in the BOQ are merely estimation. Payment to the Contractor shall be made as per actual work done dully verified by the Engineer In charge of the project" The minimum value of IPC shall be 25 % of the value of work done.

11.4 **Retention of Payment**

Retention money equal to Ten (10%) of the Work done will be deducted from each payment and 5% out of 10% of retention money may be released at issuance of completion certificate and remaining 5% will be released after successful completion of Defect Liability period (DLP).

11.6 **Currency of payment:**

Pak. Rupees

15.3 **Arbitration**

Place of Arbitration: Lahore.

17. **Liquidated Damages for Delay**

The rate of liquidated damages shall be at the rate of 0.1 Percent per day up to maximum of Ten (10) Percent of Contract Price)

SPECIAL CONDITIONS OF CONTRACT

1. The Bidder shall agree with the Procuring agency the time and place for the testing of any material as provided within contract.

2. If as a result of the inspection, examination or testing, the delivered Works / work do NOT fulfill the agreed requirements of the Employer, the Engineer may reject the products and upon failure to meet the Employer's requirements as per the Tender Documents, the contract may be terminated. Putting the supplier/contractor in default.

3. The original offer / bid security should be submitted. Photocopies shall not be entertained and result in rejection of Bid.

4. Bidder shall submit warranty/guarantee certificate on company letter head duly signed and stamped of one year at time of delivery at Procuring Agency's site. (if Applicable)

5. In case of Public Holiday / Close Day on the day of tender opening, tender shall be opened on next working day.

6. Any bidder, that fail to meet the eligibility criteria and submit uncompleted documents shall be rejected.

7. It shall be responsibility of bidder to develop understanding with project at their own risk and cost.

8. Cleaning of Site during working and after completion responsibility of Contractor.

9. Safety arrangement shell be responsibility of contractor.

10. All material related to project, safety and security responsibility of contractor.

11. All required test responsibility of contractor

12. The procuring Agency reserve the right to impose a penalty of PKR 5000/- per day or cancel the work order/ purchase order with forfeit of the performance security, if successful Bidder do not start the project within 15 days from the date of signing of work order/ Purchase order.

13. Where there shall be discrepancy, PPRA Standard Bidding document shall prevail.

14. Conditional Bid will not be acceptable and liable for rejection of Bid.

Section-IX:
Technical Specifications

TECHNICAL SPECIFICATIONS

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 Works 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 Works 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 or his 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 especially 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 Buyer. 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 Buyer. 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 subcontractors 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, cranes, 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, shuttering, details of doors, windows, partitions, iron mongers work, 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.

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 or his 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 or his 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 without written approval of the owner/owners. The stones and concrete shall be broken and removed from the site for receiving the structure/flooring where required. 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

Lump sum 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 this item.

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 Subsoil investigation and exploratory data of the site area is available for reference only in the office of the Engineer. The Buyer or Engineer's predications, regarding character or extent of soil or other subsurface conditions to be encountered during the work are not bounding on the Contractor. The Contractor shall make his own deductions for subsurface 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:

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 levelled 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, unadulterated 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 subgrade walls shall be done with clean local river sand or approved excavated soil. Fill shall be compacted up to 95% modified AASHTO Density by a Power vibratory roller, mechanical 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 side walls as far as practicable. Heavy equipment for spreading and compacting backfill shall not be operated closer to the wall than distance equal to the height of the backfill above the top of footing.

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 subgrade 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. Disposal of surplus earth and rubbish can only be carried out in timings allowed by the local authorities. The term disposal shall include all operations of loading, unloading, stacking, spreading, re-handling, 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/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.

4.0 WATER

4.01 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.

4.02 QUALITY OF WATER:

The water used for construction the contractor shall supply sufficient water for all purposes, including mixing the concrete, curing and cleaning plants and tools. Where doubt exists as to the suitability of the water, it shall be tested at the cost of the contractor in accordance with BS3148.

Where water shall be shown to contain any organic impurities sugar or an excess of acid, alkali or salt or inorganic impurities in solution or suspension, the engineer shall refuse to permit its use. The suitability of water shall be subject to test when required by the engineer.

4.03 CHEMICAL REQUIREMENTS

As a guide, water may be used as mixing water if the chemical contents do not exceed the following limits, otherwise control test's to show the suitability have to be made.

Kinds of Ingredient	Permissible Limits
Dissolved Solids	2,000 ppm
Alkali Carbonate and Bicarbonate	1,000 ppm
Chloride*	500 ppm
	1,000 ppm
Sulphate (So_4)	3,000 ppm
Alkalies ($Na_2O+0.658\ K_2O$)	600 ppm
PH - Value	4 (min)

* The maximum concentration of chloride in prestressed concrete should not be higher than 500 ppm.

In general, for reinforcement concrete in moist environment, or concrete containing imbedded aluminum structures with dissimilar metals, a maximum concentration of 1000 ppm is acceptable.

If the result of the acceptance tests are within 90% of the permissible limits, the quality control tests for above impurities shall be down each month, of not otherwise directed by the engineer.

If the amounts of each chemical ingredient are lower than specified in the section, and trial mixes show that no harmful effects appear due to the subject tested, the water can be used as mixing water.

4.04 TEMPORARY STORAGE TANK:

The Contractor shall provide onsite 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.

4.05 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

6.0 STEEL REINFORCEMENT

6.01 SCOPE OF WORK:

The work covered by the section of the specification consists of furnishing all materials, tools, labour, equipment & appliances and in performing all operations in connection with the providing, straightening, cutting, bending, binding, fixing, elsewhere with necessary overlaps, wastage including binding wire, chairs, pins, spacer block complete in strict accordance with this section of the Specifications, the applicable drawings, approved bar bending schedule according to BS-4466 and the terms and conditions of the Contract. All steel reinforcement should be placed at locations, to lines and level as shown in the drawings and as the directed by the Engineer.

6.02 MATERIALS:

6.2.1 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.

6.2.2 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. 4449 or PS-231

a) Tensile Strength: 438 to 517 N/Sq. mm (63.5 to 75 Kips/Sq. in).
b) Yield Strength : 250 N/Sq. mm (36 Kips/Sq. in)
c) Elongation : 16% to 24% (average 20%).

ii) Hot rolled deformed bars conforming to ASTM A-615 Grade 60 or PS-605

a) Tensile Strength : 560 N/Sq. mm (81 Kips/Sq. in).
b) Yield Strength : 415 N/Sq. mm (60 Kips/Sq. in).
c) Elongation : 11%

6.2.3 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 90 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.

6.2.4 18 gauge galvanized wire shall be used for binding the steel reinforcement.

6.03 TESTING:

Reinforcement shall be obtained only from manufacturers approved by the Engineer or his Representative. All reinforcement shall be tested according to ASTM standard. 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 is a minimum three (03) samples will be tasted per twenty (20) ton of steel.

6.04 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.

6.05 REINFORCEMENT CUTTING AND PLACING

6.5.1 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 conform to ACI 318-02 section 12.5. 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. ll reinforcement bars within the limit of a day's 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.

6.5.2 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.

6.06 LAPS AND SPLICES

6.6.1 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 or in conform to ACI-318-02 section

12.5 and in no case shall lap length be less than 40 times the diameter of the bigger lapping bars for nominal M.S. bars. Hard grade bars and tor steel shall have laps of 50 times the bigger diameter of lapping bars. Splices of adjacent bars shall be staggered unless approved otherwise by the Engineer or his Representative.

6.6.2 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.

6.07 MANUFACTURE

Steel shall be manufactured from prime Pakistan Steel billets or equivalent quality approved.

6.08 MEASUREMENT AND PAYMENT

6.8.1 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.

6.8.2 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 Inch	Weight in		Size Inch	Weight in	
	Lbs / ft.	Kg. / ft.		Lbs / ft.	Kg / ft.
¼	0.167	0.076	¾	1.502	0.681
3/8	0.376	0.170	7/8	2.044	0.927
½	0.668	0.303	1	2.672	1.212
5/8`	1.043	0.473	1-1/18	3.382	1.534

6.8.3 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.

6.8.4 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.

6.8.5 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 40 ft (12 m).

6.8.6 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.

7.0 BRICK WORK

7.01 SCOPE

The work under this section includes First Class brick work in wails, both internal and external of any thickness and of the heights shown on the drawings. The brick work shall be carried out in cement sand mortar of proportion specified in the Bill of Quantities.

7.02 CONFORMITY TO %V.P. SPECIFICATIONS VOL. PART I AND IT

Except as otherwise specified, all brickwork shall be erected in conformity with West Pakistan Schedule of Rates Volume I Part II Section 21.1 “Brick Work General “as applicable to the work shown on the drawings and as specified.

7.03 Materials

7.3.1 Brick shall he first class, strong and sound of well burnt clay, uniform in shape, colour and shall measure 220x105x67 mm with dimensional tolerance of l.6 nun so that every four courses laid shall measure 305mm in height. Bricks should produce a ringing sound when struck. The brick shall be free from flaws, cracks, chip stones, nodules of lime or kankar or other blemishes. The brick shall not absorb more than l/6th its weight when soaked in water for an hour. Minimum compressive strength shall not be less than 140kg/sq.cm. Bricks of only one size shall be used throughout the work and bricks from different kilns not having the same size shall not be allowed. All the bricks shall, conform to W.P. Specifications Vol. I, Part I14o.4.1 for First Class Burnt Clay Bricks.

7.3.2 Mortar for Brick Work

a. Mortar shall be mixed in proportion as specified in Bill of Quantities and shall be done by volume except directed ‘otherwise by the Engineer.

b. Cement and sand shall be thoroughly mixed in a dry state on a hard platform or in a trough & appropriate quantity of water shall be a to make the mortar of workable consistency. The mortar in any single batch shall be of quantity which could be used within 30 minutes of mixing water. Such mortar which has not been used within 30 minutes Of addition of water shall be discarded. The mixing platform or, trough shall be thoroughly, washed and cleaned at the close of the day’s’

work.

c. Portland cement shall conform to BS: 12.1958.

d. Sand shall be as specified under section" Concrete Work".

e. Water shall be clean, free from any organic impure &-. ties, acids, alkaline, greasy or oily substances, either in solution or in suspension as specified under section "Concrete Work".

7.3.3 Wall Ties

Mild steel bars, wall ties, lugs, anchors etc. shall be provided as per drawing and instructions of the Engineer.

7.04 SAMPLES

The samples of 'all the material used for brick work shall be approved by the Buyer after necessary testing. The Contractor shall incorporate in the work only approved materials during the work in progress. If the Engineer, desires to get the material tested, this will be got done by the Contractor from a Laboratory approved by the Engineer at the Contractor's expenses.

7.05 WORKMANSHIP FOR BRICK WORK

7.5.1 Brick Laying:

Brick laying shall conform to the applicable requirements of W.P. Specifications Vol. 1, Part II. ll brick work shall be 'done with approved bricks and shall be strictly in accordance with the drawings. The bricks shall be laid in mortar specified in the Bill of Quantities. Before the bricks are used they shall be soaked in water tanks (to be constructed by the Contractor at his own cost) for at least four hours. They shall be placed in the water tanks in a manner that they do not get damaged.

7.5.2 Bricks shall always be laid in English bond (unless otherwise directed by the Consultants) with frogs upwards. Bricks shall be laid with bed and vertical Joints pa tilled with specified mortar. Brick work must be truly plumb and must be checked by plumb bob and straight 4dge frequently. Brick work should present a perfect straight and vertical surface and no chipping or rubbing shall be allowed. Brick work where necessitated by the d have curved or chamfer surface shall be cut and chiseled finely such as when placed in position they do not present an ugly look or require leveling up with extra mortar. Where work has to be left incomplete, it shall be left in slope and in no case the difference of height between different walls shall be more than 1.5 feet at any section of the building.

7.5.3 All brick work shall be bonded where it abuts oilier brick work, concrete walls and concrete

columns. Where brick walls and partitions intersect or abut, it is absolutely necessary to interlock the masonry of the two walls in a way as not to leave a straight vertical joint between the two walls. In such cases the bond shall be obtained by placing the closer 115 mm from the face in every alternate course of the wall or masonry ties shall be provided. Where brick work abuts concrete, wall ties engaging in dovetail, slots shall be provided at every fourth course. 76mm long brick course height shall be considered sufficient under these specifications, unless the Contractor considers continuous length of slots convenient for his working. %there 14.S.bar wall ties are shown on drawings; these shall supersede dovetail wall ties specified herein.

7.5.4 Brick work shall be wedged to the underside of floor and roof slabs and the top moat horizontal joints shall be, filled with mortar well compacted. Putlog holes shall always be along headers and not more than one brick in length and shall be neatly bricked I on removal of scaffolding. All the built-in items such as anchor bolts, inserts, pipe supports, hangers, pipe sleeves, dowels, ties and all items shown on the drawings or specified are required to be built into the masonry as the work progresses. Frames and other built-in work shall be maintained in their proper position and bracing shall not be removed until they are securely held in position by the masonry. The spaces around all built in items shall be filled with masonry. Where required for later' building in, opening in masonry for heating and plumbing pipes, electric conduits etc. shall be left, and after piping or conduits have been installed, filled around with brick work and mortar.

7.5.5 All cutting and patching of masonry required for installation of built in work or work supported by masonry shall be kept properly cured, for at least 10 days where cement mortar is used. Where according to plans and sections the masonry work requires cut bricks to be used, the same shall be done by 'the Contractor free of cost, to obtain correct thickness according to drawings.

7.5.6 Jointing

Vertical joints in alternate course must be directly one over the other, horizontal joints shall be truly level. The thickness of joints shall be between 8mm to I3mm or as shown otherwise on the drawings. The thickness of joints must be kept uniform throughout the progress of work and varying sizes of joints shall not be allowed. The joints of the masonry must be raked out uniformly at the close of each day's work and any extra mortar sticking on the face of the work must be scrubbed out and cleaned daily.

7.06 MEASUREMENT AND PAYMENT

7.6. Brick work in wall having 230 mm thickness shall be measured in square meter i.e. multiplying the length or breadth of wall with height of the wall. 115 and 76 mm thick walls shall also be measured in square meter. All the openings left in masonry wall will be deducted. ll mild steel reinforcement shall be measured as specified in section "Concrete Work". The rate for

items of work in this section shall include:

7.6.2 The cost of material, labour, curing, scaffolding and‘ appliances at site and all operations in connection with the installation of brick work in accordance with the drawings, finish schedules and as specified above, and cutting and patching work required for installation built in work.

8.0 PLASTERING

8.01 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.

8.02 General

Except as may be otherwise shown on the drawings or specified elsewhere; the plaster surfaces shall include walls, partitions jambs, returns, reveals, backs of recesses and jambs and heads of windows and doors and all the soffits, alcoves etc.

8.03 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.

9. CONCRETE PAVEMENTS

9.1 DESCRIPTION

This work shall consist of a pavement composed of Portland cement concrete with or without reinforcement as specified constructed on a prepared subgrade or base course in accordance with these specifications and in conformity with the lines, grades, thickness and typical Cross-sections shown on the plans. Both plain and reinforced concrete shall include deformed bars for contraction joints and dowel bars for expansion joints or as shown on the Drawings.

9.2 MATERIAL REQUIREMENTS

9.2.1 Concrete

Concrete materials shall conform to the requirements indicated in item 401 and as specified hereinafter. In addition to it the contractor shall advise the Engineer immediately after the award of the contract of the source of all materials to be used in proportioning concrete for the work. If the contractor later proposes to obtain materials from a different source, he shall notify the Engineer at least thirty (30) days before such materials are to be used.

9.2.2 Reinforcing Steel

Concrete reinforcement shall conform to item 404 or as indicated on the Drawings. If required, steel fabric for reinforcement of concrete shall conform to AASHTO M 55-73. It must be supplied in sheets.

9.2.3 Polythene Sheeting

Polythene sheeting for placing immediately below concrete slabs shall be 0.065 mm thick or having a minimum weight of fifty (50; grams per square meter (whichever is greater) made from polythene or other approved hydrocarbon thermoplastic resin (produced by the polymerization of ethylene under high pressure and density) and given an antistatic treatment to reduce dust attraction and reduce friction. The sheeting shall have the minimum mechanical properties shown in table as under:

PROPERTIES OF POLYTHENE SHEETING

Properties	Direction	
	Machine	Transverse
Tensile Strength Method ASTM D882-73 Kgf/SM	140	105
Elongation at Break %	150	500
Tear Strength Elmendorf Method ASTM D689-62 (1974)-Kg/cm^2	390	310

9.2.4 Joint Filler

Joint filler shall be of approved quality and consist of cane or other suitable long fibers of a cellular nature uniformly impregnated with asphalt. The asphalt content of the joint material shall be between thirty and fifty per cent. The joint material will not deteriorate under any weather conditions and is to be of such a character as not to be permanently deformed or broken by moderate twisting, bending or other ordinary handling. Strips of the joint filler which do not conform to the specified dimensions within the tolerance + two (2) mm for thickness and + twelve (12) mm for depth are to be rejected. All damaged strips are to be rejected too.

9.2.5 Joint Sealing Compound

Joint sealing compound is to be as BS 2499(1973) type A1 or A2, or as approved by the Engineer. The compound is to be impermeable, is to withstand all weather conditions and is to be capable of adhering to the concrete without cracking, spalling or disintegrating and will not require an impracticable condition of dryness or cleanliness of the concrete slabs.

Where recommended by the manufacturer of the sealing compound, a primer supplied by him is to be used to improve adhesion.

9.2.6 Dowel Bars

Dowel bars shall be cut from mild steel bars and will be approved by the Engineer. The Contractor's attention is directed to the requirement that one end of each dowel bar in all joints, except bonded construction joints, shall be sawn and not sheared so that no irregularities likely to interfere with, sliding action in the concrete shall occur. The minimum length of the dowel bars spaced at one meter center to center or as shown on the drawings, shall be thirty five (35) times the diameter of the bar used unless otherwise specified or as directed by the Engineer.

9.2.7 Expansion Caps

Expansion caps for dowel bars in expansion joints shall consist of pressed metal sleeves plugged at one end by punching the specified joint filler board of a wad of cotton waste of similar compressibility and sealed at the end against entry of mortar. The tube shall have an internal diameter permitting sliding on the dowel bar but close enough to prevent entry of mortar.

9.2.8 Darkening Agent

Darkening agent for the top course of concrete pavements if ordered and specified shall be carbon black; either as an aqueous dispersion containing at least 25% of solids, to be added to the mixing water, or as a self dispensing powder to be added to aggregate and cement. It shall be approved by the Engineer as non-deleterious giving grey colour and shall be added at the rate of 0. 1 % by weight of the mixed concrete or as specified by the manufacturer if it is aqueous dispersion. The minimum quantity of self dispersing powder shall be 0.025% by weight of the concrete aggregate.

The darkening agent shall be free from Sulphur trioxide and from any other matter deleterious to concrete. Crack inducing battens shall be of wood or of any other suitable material proposed by the Contractor at the time of tendering and approved of at the award of the Contract or approved by the Engineer at his discretion after the award of the Contract. Battens of highly absorbent wood or other material shall be of cross-sectional dimensions shown on the Drawings, and treated to prevent adhesion between them and the concrete.

9.2.10 Sampling and Testing

All materials shall be approved by the Engineer prior to use in the work. Additional samples will

be taken and tested by the Buyer during the progress of the work to check on the quality of the materials being supplied and/or placed by the Contractor. The results of these tests will be available for the Contractor's use, however they are not intended for construction control purpose. The contractor should set up his own test facilities or arrange the same from a private laboratory, to assure that his materials and workmanship comply with the specification.

9.3 CONSTRUCTION REQUIREMENTS

9.3.1 Pavement Base

The base upon which the concrete pavement is laid shall be levelled compacted and true to the grades and cross-sections shown on the plans and shall be so maintained, as provided under such other items throughout the period of placing concrete pavement. To ensure the proper depth and section, a, scratch template true to depth and section and resting on accurately set side forms shall be moved over the surface immediately before placing concrete, and any irregularities shall be immediately corrected. High spots shall be planned down and the Contractor shall have the option of either filling low spots to the proper elevation with approved material, which shall be watered compacted and struck off to the required grade or of placing additional concrete. No measurement or payment will be made for such additional concrete. Until the subgrade has been checked and approved, no material shall be deposited thereon. Storing or stock piling of materials on the subgrade and placing of surfacing material or laying of pavement on muddy or frozen subgrade will not be permitted.

9.3.2 Forms

Side forms shall be made of metal of an approved section and construction provided with adequate devices for secure setting so that when in place, they shall withstand the impact and vibration of the compacting and finishing equipment with settlement not exceeding 1.5 mm in three (3) meters form a true plane surface on the top of the form and inside face shall not vary more than six (6) millimeters from a plane surface. The width of the bases of steel forms shall be not less than their height except that the forms having a base not less than two third (2/3) of their height and meeting all other requirements herein may be used for manual laying of nonrectangular bays. The depth shall be equal to the thickness of the pavement at the edge or as shown on the plans. The forms sections shall be tightly joined by each joint free from play in any direction. These forms shall be stacked with steel stakes and shall be of a length approved by the Engineer. Each section of forms shall have stake pocket* at each end and at intervals of not more than one and one-half (1:5) meters between ends. Each section of forms shall be straight and free form bends and warps at all times. Side forms for machine placing 5hall have rolled section steel rails which shall be of adequate stiffness to carry the laying, compaction and finishing machines.

These machines shall not run on folded sheet metal form tops. The top faces of the forms are to be carefully cleaned and maintained. The forms shall be without horizontal joints and with flange braces extending outward on the base not less than two thirds (2/3) the height of the forms. Each stack pocket shall be equipped with a positive non detachable wedge. These forms shall be placed by using at least three steel pins of the size and length approved by the Engineer or as shown on the plans. They shall be equipped with positive locking devices which will permit neat tight joints and do not, deform under impact vibration by trust. Pins for stacking forms in place shall be made of steel at least two (2) centimeters in diameter as directed by the Engineer in case of impractical use, Wooden forms may be used for curves having a radius of less than fifty (50) meters. They shall be made of two and half (2.5) centimeters well-seasoned surfaced planks fastened together and shall be attached securely to a wooden base in width. All wooden forms shall be braced at least every sixty (60) centimeters with steel pins of the size and length here in specified. Straight forms shall be set out as chords to convex edges and as tangents to concave edges, but payment will not be made for concrete outside the curved edges shown on the Drawings. Before placing forms the underlying material shall be excavated to the required grade, and shall be firm and compact. The forms shall have full bearings upon the foundation throughout their length and shall be placed with exactness to the required grade and alignment of the edge of the finished pavement. Forms shall be set to the required lines and grades well in advance of placing concrete, preferably not less than two hundred (200) meters, Forms shall not be removed for at least twelve (12) hours after the concrete has been placed. Forms shall be carefully removed in a manner to avoid damage to the pavement. Under no circumstances will the use of pry bars between the forms and the pavement be permitted. Pavement which in the opinion of the Engineer is damaged due to the careless removal of forms shall be repaved by the Contractor as directed by the Engineer at the Contractor's own expense.

Forms shall be thoroughly cleaned and oiled each time they are used.

Special forms or other supporting devices meeting the approval of the Engineer shall be used to support the joint filler at transverse control joints when concrete is to be placed on only one side of the filler When pavement is placed adjoining existing concrete pavement upon which the finishing machine will travel, any irregularities in the old pavement shall be ground down to a true uniform surface of sufficient width to accommodate the wheels of the finishing equipment if necessary to obtain proper smoothness of the pavement.

9.3.3 Composition and Compressive Strength of Concrete

9.3.3.1. Strength Requirement

(a) All concrete shall be proportioned by weighing and conform to the following strength and mix requirements

I.	Minimum cylindrical compressive strength at 28 days:	280 kg/sq.cm.
II.	Cement content, 50 Kg sacks:	7-5 bags
III.	Maximum water cement ratio:	0.45

IV.	Slump range:	25-75 mm
V.	Entrained air in percent:	3+0.6 %
VI.	Nominal size of aggregate:	$^1/_2$" Max.

(b) At least 35 days prior to the start of paving operations and after approval of all materials to be used in the concrete, the contractor shall submit for approval, the mix design he intends to use based on proportioned weights of cement, air entrainment agent, saturated surface dry aggregates and water. This mix design will be tested by the Engineer and approval will not be granted unless the average twenty eight (28) days compressive strength exceeds the minimum strength requirement by at least 1-5-~nt. However the Engineer may allow paving operation on the basis of seven (7) days strength if he is satisfied with the results of seven (7) days strength.

(c) The cement content given in the foregoing table is the minimum. If it is not sufficient to produce concrete of the compressive strength specified it shall be increased as necessary without additional compensation under the contract.

(d) The compressive strength of the concrete will be determined by testing standard cylinders made from concrete taken from the mixer. The making, curing and testing of the specimens will be in accordance with AASHTO T23-73..

(e) During the course of construction, when the source of any material for the concrete is to be changed, or if there is any variation in the quality of the materials furnished, additional tests and necessary adjustments in the mix shall be made as required to obtain the specified strengths.

9.3.3.2 Composition

The required consistency of the concrete mixture shall be such that the mixture will be cohesive, uniform and plastic, permitting proper handling and finish. When deposited it shall not flow, but shall remain in a conical pile. There shall be minimum segregation and surplus water during the process of handling and finishing. The slump shall be determined by AASHTO T1 19-74 except that during the course of construction control of concrete may be accomplished by the ball penetration as outlined in AASHTO T183-72. Two and a half (2.5) centimeter ball penetration is considered equivalent to a slump of five (5) centimeters. The cement content shall be determined by means of a yield test in accordance With AASHTO T 121-74.

9.3.4 Placing Concrete

9.3.4.1 General

The mixer shall be operated outside of the forms at all times except at locations where the Engineer deems it not feasible to do so.

When ordered by the Engineer, the subgrade shall be moistened as directed, prior to the placement of the subgrade paper such as polythene sheeting.

Concrete mixed in central plant shall be transported without delay from the mixing plant to the position for laying and any concrete which in the opinion of Engineer has been mixed too long

before reaching, the work will be rejected and shall be removed from the site. The concrete shall be deposited on the subgrade in successive batches for the full width between forms and in a manner which will require as little re handling as possible. Spreading shall be done by an approved mechanical spreader in *a manner that will prevent segregation and separation of the materials.
Necessary hand spreading shall be done with shovels, not rakes. Workmen shall not be allowed to walk in the freshly mixed concrete with boots or shoes coated with earth or foreign substances. The amount of material deposited shall be sufficiently in excess of that required to form the pavement to the required cross-section after consolidation in order to provide a roll of concrete ahead of the front screed of the finishing machine for the full length of the screed.

Concrete shall be thoroughly consolidated against and along the faces of all forms and along the full length and on both sides of all expansion joint assemblies by means of vibrators inserted in the concrete. Vibrators shall not be permitted to come in contact with a joint assembly, the grade or a side form. In no case shall the vibrator be operated longer than fifteen (15) seconds. Concrete shall be deposited as near td expansion and contraction joints as possible without disturbing then) but shall not be dumped from the discharge bucket or hopper on to a joint assembly. The hopper is well cantered on the joint assembly. Damage to joint assemblies caused by dumped concrete shall be repaired immediately as directed by the Engineer at Contractor's expense. Trucks delivering concrete shall not run on polythene sheeting nor shall they run on, completed slabs until at least fourteen (14) days after placing the concrete.

Should any concrete materials fall on or be worked into the surface of completed slab, they shall be removed immediately by methods approved by the Engineer.

Placement of concrete ahead of the initial spreader strike off shall not be more than fifteen (15) minutes ahead of final spreader strike off. If concrete is placed in one (l) layer only, the placement of concrete shall not be more than twenty (20) minutes ahead of the spreader strike off.

In order to secure adequate compaction, the concrete is to be spread with a surcharge above the finished level of the layer. Spreading, compacting and finishing operations are to be completed without delay.
The total time taken from the addition of the water to the mix until the completion of the surface finishing operations shall not exceed thirty (30) minutes when the shade or mix temperature exceeds twenty seven (27) degree C or forty (40) minutes when less than twenty seven (27) degree C. The mixing and placing of the concrete shall progress only at such a rate as to permit proper finishing, protecting and curing of the pavement.
The additives shall be added to the concrete mix so as to ensure more setting time. The top of the forms shall be kept free from accumulation of concrete or foreign material. The Contractor shall not permit the accumulation of laitance along the edge of a slab poured adjacent to one previously placed. Any accumulation of laitance shall be removed and replaced with fresh concrete. As soon as the side forms are removed, the edges of the slab shall first be inspected by the Engineer and

any minor honey combed areas shall then be filled in With mortar composed of one part of cement to two parts of fine aggregate under the supervision of the Engineer.

9.3.4.2 Weather Conditions

For concreting during hot/cold weather, requirements 401.3.6 (1) of these specifications will be followed.

9.3.6 Placing Reinforcement All pavement reinforcement shall be placed as shown on the plans. All marginal bars, dowel bars, and tie bars required by the plans shall be held in proper position by sufficient, number of metal bar supports or pins as approved by the Engineer. If the center joint is to be sawed in lieu of placing the metal center strip, the tie bars may be installed mechanically by means of equipment and methods approved by the Engineer. The satisfactory placement of the tie bars shall depend upon the ability of the mechanical device to place the tie bars in their true position- The Engineer may require, when satisfactory placement is not obtained by mechanical" means, that the tie bars be installed ahead of placing the concrete and that they be securely staked and tied if necessary to hold them in their exact position. The use of removable devices, supporting the bars from the forms, will not be permitted.

Following the placing of the concrete, it shall be struck off to conform to the cross section shown on the plans and to an elevation such that when the concrete is properly consolidated and finished, the surface of the pavement will be at the elevation shown on the plans. When reinforced concrete pavement is placed in two (2) layers, the entire width of the bottom layer shall be struck off to such length and depth that the sheet of fabric or bar mat may be laid full length on the concrete in its final position without further manipulation. The reinforcement shall then be placed directly upon the concrete after which the top layer of the concrete shall be placed, struck off and screed. Any position of the bottom layer of the concrete which has been placed more than thirty (30) minutes without being covered with the top layer shall be removed and replaced with freshly mixed concrete at the contractor's expense. Plain concrete and bar reinforced bridge approach pavement may be placed in one (1) layer.

Where two (2) layers of wire mesh reinforcement are required, such as bridge approaches, the bottom layer shall be supported in the required position with bar chairs. Separators shall be used for the top layer if the strike off cannot be properly used for the operation. Laps in adjustment sheets or mats of reinforcement shall be as shown on the plans. Laps parallel to the centerline of the pavement will not be permitted except for unusual widths of pavement lanes or for irregular areas. If the plans do not show dimensions for taps, the minimum lap either perpendicular or parallel of the centerline of the pavement shall be fifteen (15) centimeters. The adjacent sheets shall be fastened or tied together to hold all parts of the sheets in the same plane. Reinforcing steel shall be free from detrimental amounts of dirt, oil, paint, grease, loose mill scale, and loose or thick rust which could impair bond of the steel with the concrete.

9.3.7 Joints

Joints shall be constructed exactly in accordance with the details shown on the plans and specifications and with the best of workmanship. Failure to construct the joints as called for and in the best possible manner, as determined by the Engineer, will be cause for suspension of work

until the cause of the defective work is remedied.

If removal of existing pavement of any type is required to connect with the new pavement, and the termination of the removal is not at an existing joint, the new joint shall be made - by sawing the existing pavement not less than five (5) centimeters deep before removal.

9.3.7.1 Expansion Joints

The subgrade at Expansion joints shall be accurately trimmed to the required cross section and to the proper depth of the pavement.

A string line shall be stretched between the pavement forms along the centerline of the joint. One half of the length of each dowel bar shall be painted in accordance with the directions shown on the plans and then thoroughly coated with hard grease, or lubricant as approved by the Engineer, to prevent the concrete from bonding to that portion of the dowel.

The entire joint assembly shall be of a type designated on the plans and shall be installed in such a position that the centerline of the joint assembly is perpendicular to the centerline of the pavement slab and the dowels lie parallel to the centerline of the slab. Finished joints shall not deviate more than six (6) millimeters in the horizontal alignment from a straight line. No plugs of concrete shall be permitted anywhere within the expansion space.

A slip sleeve of the dimensions shown on the plans shall be placed on the greased end of each dowel. The greased ends shall be free to slide in the dowel holder and shall extend in the direction as indicated on the plans. Any excess grease on the dowel holder shall be removed.

The joint shall be securely staked or fastened in place prior to placing the concrete and in a manner to ensure the joint and the dowel bars will remain in their proper position after the concreting and finishing operations are completed.

Joints for pavement designed for two (2) or less lanes of traffic shall be assembled and installed in one (1) continuous piece or the connections between sections shall be made rigid and tight to prevent offsets in sections of the joints. The length of individual pieces of the expansion joint filter shall be not less than the width of one (1) traffic lane of the pavement.

The finishing machine shall be operated in a manner that 011 prevent displacement of the joint. If for any reason it is necessary to straighten a joint, any depression caused by this operation shall immediately be filled with fresh concrete, reshaped and brought to the original crown in advance of the longitudinal finishers. Any fluid laitance or mortar caused by this operation shall be removed and replaced with fresh concrete.

As the finishing machine approaches the joint on the first trip, the excess concrete shall be shoveled ahead and the tamper and each screed, in turn, shall be lifted over the joint. On the second trip of the finishing machine, the screed may be operated over the joint.

9.3.7.2 Contraction Joints

Contraction joints shall be of the type and dimensions and at the spacing shown on the plans. Sawed contraction joints shall be cut by means of an approved concrete saw. The joints shall not be sawed until the concrete has hardened to the extent that tearing and reveling is precluded. All joints shall be sawed during the initial curing period and the sawing shall begin before the pavement starts shrinking and uncontrolled cracking takes place. Any procedure which results in premature and uncontrolled cracking shall be revised immediately by adjusting the sequence of cutting the joints or the time interval involved between the placing of the concrete or removal of the curing media and the cutting of the joints. In no case shall the pavement be left overnight without having the joints sawed.

The joints shall be sawed at the depth, spacing, and lines shown on the plans. Guidelines or devices approved by the Engineer shall be provided to ensure cutting the joint in a straight line and perpendicular to the centerline of the pavement. The dust resulting from sawing shall be completely removed from the joint and adjacent areas by means of an air jet or a combination of air and water applied under pressure immediately after the joint has been cut, and before filling with joint compound.

When the plan so specifies that the dowels be installed through contraction joints; the sub grade at the contraction joints shall be accurately trimmed to the required cross section and to the proper depth of the pavement. A string line shall be stretched between the pavement forms along the center line of the joint. Each dowel shall be painted and thoroughly coated with hard grease or lubricant, in accordance with the direction shown on the plans or as approved by the Engineer, to prevent the concrete from bonding to that portion of the dowel. The entire joint assembly shall be of the type designated on the plans and shall be installed in such a position that the centerline of the joint assembly is perpendicular to the centerline of the slab and the dowels lie parallel to the slab surface as well as to the centerline of the slab. The greased ends of the dowels shall be placed in the direction as indicated on the plans and shall be free to slide in the dowel holder. Any excess hard grease on the dowel holder shall be removed.

9.3.7.3 Longitudinal Joints

Longitudinal joints shall be constructed in conformance with the details shown on the plans. When the fabricated steel strip is specified, it shall be held rigidly in place with an adequate number of pins driven into the sub grade to ensure that it will remain true to line and grade during concreting and finishing operations. On multiple lane pavements, where longitudinal joints are constructed at the form line, an approved recessed form and tie bars will be required. The full depth fabricated

steel strip designated for other longitudinal joints will not be permitted. When sawed joints are specified or used, suitable guidelines or devices shall be furnished to ensure cutting the longitudinal joint on the true lines as shown on the plans. The sawing of longitudinal joints shall be performed at a time that will preclude erratic or uncontrolled cracking. Sawed joints shall be filled with the type of joint compound indicated on the plans. The dust resulting from sawing shall be completely removed from the joint and adjacent areas by means of air jet or a combination of air and water applied under pressure immediately after the joint has been cut and before filling with joint compound.

9.3.7.4 Construction Joints

A butt construction joint shall be made perpendicular to the centerline of the pavement at the close of each day's work and also when the process of depositing concrete is stopped for a length of time such that, in the opinion of the Engineer, the concrete will have taken its initial set. This joint shall be formed by using a clean plank header having a nominal thickness of five (5) centimeters, a width of not less than the thickness of the pavement and a length of not less than the width of the pavement. The header shall be cut true to the crown of the finished pavement and shall be accurately set and held in place in a plane at right angles to centerline and perpendicular to the surface of the pavement.

The top surface of the header shall be protected with steel as approved by the Engineer. On the face along with the center of the header there shall be fastened a trapezoidal piece of metal or wood the full length of the header, five (5) centimeters wide and at least twenty five (25) millimeters in depth to form a grooved joint. The header shall have drilled holes to accommodate the dowel or tie bars hereinafter specified. Upon resumption of Work any surplus concrete remaining upon the sub grade shall be removed. The header shall then be carefully removed and fresh concrete deposited against the old in such a manner as to avoid injury to the edge of the old concrete. The fresh concrete shall be vibrated into the groove in a manner to ensure an interlocking joint. Dowel bars or load transfer devices shall be used in all construction joints in accordance with the details shown on the plans. If no such details are shown on the plans, tie bars as provided for the longitudinal joint, and spaced at forty-five (45) centimeter centers, shall be placed across the joint in a plane parallel to the surface of the pavement approximately midway between the top and bottom surfaces of the pavement. The edges of the joint shall be grooved, edged, and sealed with the material used for sealing expansion and contraction joints.

No construction joint shall be placed within three (3) meters of an expansion, contraction, or other construction joint.

9.3.7.4 Sealing Joints

a) Materials: Joints shall be sealed with material of the approved type designated on the plans.
b) Hot Poured Joints: The joints shall be sawed as provided in sub item 310.33(b) and covered as

provided in sub item 310.3.7(c). After the fourteen (14) or seventeen (17) day curing period for the pavement has elapsed, the jute or other protective covering shall be removed from the joint and the joint thoroughly cleaned of all loose scale, saw dust, dirt, laitance or other matter. Cleaning may be accomplished with a compressed air jet, water under pressure, wire brushes or in extreme cases the joint shall, when directed by the Engineer, be re-sawn to ensure a completely clean joint.

The joint surfaces and adjacent areas of the slab shall be thoroughly clean.

The hot poured joint material shall be heated in a heating unit approved by the Engineer to the temperature within the range required as shown by tests. The- joint shall be filled from the bottom of the saw cut to the surface of the pavement. Any joint with a depth greater than twenty five (25) millimeters shall be filled with a minimum of two (2) layers, each layer being approximately equal in depth.

c) Cold Poured Joints: The joints shall be sawed as provided in sub~ item 310.3.7(b) & 310.3.7(c) and cleaned of all loose saw dust, laitance, dirt, other foreign matter and free water. The joints shall be filled immediately after cleaning. The nozzle used must be so designed that the joint is filled completely from bottom to top. The joint shall be filled so it is rounded on top about six (6) millimeters above the pavement surface. Immediately after the joints have been filled, they shall be covered with strip of non-absorptive paper at least four (4) centimeters wide. Eleven (11) kilogram glass line or heavy craft is suitable. The paper shall remain on the joint until it weathers or wears off.

d) Permanent Header Board

Immediately after the forms are removed from the ends of concrete pavement that will be exposed to other than permanent type surfacing and temporary and permanent traffic, a header board having dimensions of not less than eight 18) centimeters (nominal) by twenty (20) centimeters shall be bolted securely to the end of the pavement in a manner to protect the edge of the pavement from damage. The header board shall extend the full roadway width, but may be in two (2) sections.

At the time of placing the concrete , six (6) (three for each lane), thirteen (13) millimeters by twenty (20) centimeters bolts shall be embedded in the end of the pavement in a. manner that Will hold the header board securely. The header board shall be shaped to conform to the crown of the pavement and shall be installed flush with the concrete pavement surface. The finishing and installing of the header board shall be considered subsidiary Work pertaining to the other items in the Bill of Quantities and will not be paid for directly.

The header will not be required on concrete base course Work.

9.3.8 Consolidating and Finishing

After being spread and struck off as provided in sub item 310.3.5 "Placing Concrete," the concrete shall be further struck off and consolidated with an approved finishing machine to such an elevation that when finishing operations are completed, the surface will conform to the required

grade and crown. The finishing machine shall operate over the entire surface at least twice, the first time with the finishing machine tamper and both screeds in operation. A uniform roll of concrete approximately fifteen (15) centimeters above the pavement grade shall be maintained ahead of the front screed for its entire length during the first trip over with the finishing machine. Excessive tamping or finishing resulting in bringing an excess of mortar to the surface will not be permitted.

After the last pass of the finishing machine, a mechanical longitudinal finisher shall be operated over the concrete surface. The forward motion of the longitudinal finisher shall be so adjusted that the screed will pass over each portion of the surface at least twice. The longitudinal finisher shall be operated in a manner that will prevent excessive slumping of the concrete at the form lines or the metal center strip or the loss of the crown of the pavement. If necessary or when ordered by the Engineer, the finisher shall be operated in one direction only or shall be operated from only the form to the centerline in order to ensure that the proper cross section of the pavement is obtained. The leading edge of the screed shall clear the forms upon completion of each transverse pass in order to clear the pavement surface of any laitance or thin mortar.

In general, the addition of superficial water to the surface of the concrete to assist in finishing operations will not be permitted. If the application of water to the surface is permitted by the Engineer, it shall be applied as a fog spray by means of approved spray equipment.

As an alternative to the longitudinal finisher, the contractor may use a machine composed of a cutting and smoothing float, or floats, suspended from and guided by a rigid frame. The frame shall be carried by four (4) or more visible wheels riding on, and constantly in contact with, the side forms.

When directed by the Engineer, following one of the preceding methods of longitudinal finishing, long handled floats having blades not less than one and one half (1.5) meters in length and fifteen (15) centimeters in width shall be used to smooth and fill in open textured areas in the pavement, Long handled floats shall not be used to float the entire surface of the pavement in lieu of, or supplementing, one of the preceding methods of longitudinal finishing.

When the longitudinal finishing has been completed, the entire surface shall be tested with straightedges not less than three (3) meters in length. The straightedges shall be operated parallel to the pavement centerline starting at the center and progressing toward the forms. Advance along the pavement shall be in successive stages of not more than one half (112) the length of the straightedges. All laitance, surplus water, and inert material shall be removed from the surface. All high places shall be worked down and all low places filled by combined operations of floats and straight edges until no irregularities exist. The proper crown of the pavement shall be maintained throughout the operations.

After floating and straightening has been completed, the concrete shall be finished by using a belt made of canvas, rubber, or other approved belting not less than fifteen (15) centimeters in width, nor less than sixty (60) centimeters longer than the width of the pavement. This belt shall be

worked with a longitudinal and crosswise motion. Care shall be exercised in the use of the belt to ensure that the edges of the belt do not dig into the surface of the concrete or work the crown out of the pavement. Either machine belting or hand belting will be permitted.

As soon as all excess moisture has disappeared, and while the concrete is still plastic enough to make a granular surface possible, a drag shall be used which shall consist of a seamless strip of damp burlap or cotton fabric, which shall produce a uniform surface of gritty texture after dragging it longitudinally along the full width of pavement,. For pavement (5) meters or more in width, the drag shall be such that a strip or burlap or fabric at least one and one half (1.5) meters wide is in contact with the full width of pavement surface while the drag is used. The drag shall be maintained in such condition that the resulting surface is of uniform appearance and reasonably, free from grooves over two (2) millimeters in depth, as determined by the Engineer. Drags shall be maintained clean and free from encrusted mortar. Drags that cannot be cleaned shall be discarded and new drags substituted.

After dragging the surface with burlap, the concrete over the expansion joint filler shall be completely removed and the joint finished. The edges of the concrete at expansion joints shall be finished with a straight edge to the radius shown on the plans. The exposed edge of the pavement shall be finished with a straight edger to a radius of six (6) millimeters. Any tool marks appearing on the stab adjacent to the joints or edge of slab shall be eliminated by dragging the surface. In doing this, the rounding of the corner of the slab shall not be disturbed.

9.3.8.1 Hand Finishing

Unless otherwise specified, hand finishing methods will not be permitted except under the following conditions:

a. In the event of breakdown of the mechanical equipment, hand methods may be used to finish the concrete already deposited on the grade when the breakdown occurs, and no additional concrete shall be placed until such equipment is repaired to the satisfaction of the Engineer.

b. Narrow widths Or areas of irregular dimensions where operation of mechanical equipment is impractical as determined by the Engineer, may be finished by approved hand methods.

c. Short lengths of pavement, such as bridge approach pavement, where the operation of mechanical equipment is impractical may be finished by approved hand methods. Concrete, as soon as placed, shall be struck off and screed done. An approved portable screed shall be used. A second screed shall be provided for striking off the bottom layer of concrete if reinforcement is used.

The screed for the surface shall be at least one (1) meter longer than the maximum width of the slab to be struck off. It shall be of approved design, sufficiently rigid to retain its shape, and be constructed either of metal or other suitable material shod with metal.

Consolidation shall be attained by the use of a suitable vibrator or other approved equipment.

In operation the screed shall be moved forward on the forms with a combined longitudinal and transverse shearing motion, moving always in the direction in which the work is progressing and so

manipulated that neither end is raised from the side forms during the striking off process. If necessary, this shall be repeated until the surface is of uniform texture, true to grade and cross section, and free from porous areas.

After the concrete has been struck off, it shall be further smoothed, trued, and consolidated by means of a longitudinal float. The hand operated longitudinal float shall be not less than three and one-half (3.5) meters in length and fifteen (15) centimeters in width, properly stiffened to prevent flexing and warping. The longitudinal float, operated from foot bridges resting on the side forms and spanning but not touching the concrete, shall be worked with a sawing motion, while held in a floating position parallel to the road centerline, and passing gradually from one side of the pavement to the other, Movement ahead along the centerline of the pavement shall be in successive advances of not more than one half (112) the length of the float. Any excess water or soupy material shall be wasted over the side forms on each pass.

At the option of the Engineer, the long handled floats having blades not less than one and one half (1.5) meters in length and fifteen (15) centimeters in width may be substituted for the hand operated longitudinal float.

All other operations after this substitution for the mechanical equipment shall be performed in the manner previously described.

Concreting operation shall be performed only in daylight, under no circumstances shall concrete pavement placed or finished at night.

9.3.9 Removing Forms

Unless otherwise provided, forms shall not be removed from freshly placed

concrete until it has set for at least twelve (12) hours, except auxiliary forms used temporarily in widened areas. F2rms shall be removed carefully so as to avoid damage to the pavement. After the forms have been removed, the sides of the slab shall be cured as specified for the surface. Major honeycombed areas will be considered as defective work and shall be removed and replaced at the Contractor's expense, as directed by the Engineer. Any area or section so removed shall neither be less than three (3) meters in length nor the full width of lane involved. When it is necessary to remove and replace a section of pavement, any remaining portion of the slab adjacent to the joints that is less than three (3) meters in length, shall also be removed and replaced.

9.3.10 Protecting and Curing of Concrete Pavement

a. Initial Curing

As the surface of the newly laid pavement is progressively finished, the initial curing and

protection operations shall be started. Upon completion the finishing operation and while the surface of concrete is still moist, but no free water remains, a liquid curing membrane approved by the Engineer shall be applied to the exposed surface of the pavement at the rate not less than one (1) liter per three and two thirds (3-2/3) square meters of surface area when mechanical pressure distributors are used. The curing membrane, except on irregular areas, shall be applied by means of approved self-propelled mechanical pressure distributors or approved hand sprays. Satisfactory means shall be provided for thoroughly mixing the curing membrane compound before and during its use. The mechanical spraying equipment may be either a full width spray bar equipped with multiple nozzles or a traversing spray which travels from one edge of the pavement to the other. In either case the path of adjacent nozzles or passes of the traversing spray shall overlap a minimum of one-half (112) the width of the spray pattern so that all portions of the surface shall receive double applications from adjacent nozzles or passes. The pumping, pressure and distribution arrangement shall be correlated with the forward speed to provide adequate and uniform coverage of the pavement at not less than the minimum rate required. Irregular areas to which the mechanical distributor cannot be adapted may be covered with hand sprays.

When hand sprays are used, the curing membrane shall be applied in two (2) applications, each at a rate of not less than one (1) liter per five (5) square meters of surface area so as to provide a total rate of application of one (1) liter per two and one half (2-112) square meters of surface area. The path of the spray on the second application shall be at right angles to the path of the spray on the first application. When hand operated sprays are permitted, the equipment supplying the pressure to them. Spray nozzle shall be capable of supplying a constant and uniform pressure to provide uniform and adequate distribution of the curing membrane compound at the rate required. If from any cause, such as rainfall soon after its application, the curing membrane is damaged, the Contractor shall immediately apply another application of curing membrane to the surface of the pavement. The rate of application for the replacement membrane shall be the same as for the original membrane.

Unless otherwise directed by the Engineer, immediately following the application of curing membrane, an approved shade canvas shall be placed approximately thirty (30) centimeters above the pavement surface. The shade canvas shall be constructed of materials and in a manner approved by the Engineer. In no case shall any portion of the shade canvas come in contact with the pavement. The initial curing shall be continued for a period of twenty-four (24) hours from the time the curing membrane is applied.

When forms are removed, whether during the initial or the final curing period, the edges of the pavement shall receive curing membrane at the rate of coverage specified for the pavement surface.

The curing membrane may be applied to the vertical edges of the pavement by means of hand sprays or by nozzles attached to the mechanical distributor, but the edges of the pavement shall be

covered with curing membrane at the rate specified within thirty (30) minutes after removal of the forms.

When cold poured joint compound is used, all joints shall be sawed during the initial curing period. The shade canvas may be moved at joint locations for short periods of time to permit the sawing. Before being sealed, the joints shall be thoroughly cleaned of all loose saw dust, laitance, dirt, other foreign matter, and free of water. As the method of final curing is different from that of the initial curing, the cleaning and sealing of joints shall be performed immediately following the removal of the shade canvas at the end of the initial curing period and prior to the application of the polyethylene sheeting.

When hot poured joint compound is used, the joints shall be sawed, cleaned, and filled with jute or other acceptable protective material in the same time sequence as for cold poured joints. In no case shall any portion of the concrete pavement be exposed to the direct rays of the sun for more than one (1) hour.

Following jointing operations, curing membrane shall be applied to the joint area at the rate specified for the pavement surface.

b. Final Curing

Upon completion of the initial curing period and after the shade canvas has been removed and jointing operation has been completed, the pavement shall be completely covered with White Opaque Polyethylene Film as specified in AASHTO M 171. Adjoining sheets shall be lapped a minimum of forty-five (45) centimeters. The sheeting shall be held in place in a manner approved by the Engineer.

Final curing shall be continued until the concrete reaches an age of fourteen (14) days. During this period, the curing membrane and polyethylene film shall be protected from damage from any cause. Any damage from one cause shall be immediately repaired by the Contractor at his expense. No traffic, including workmen and

pedestrians, shall be allowed on the surface of the pavement until the expiration of the fourteen (14) day curing period. When concrete is being placed during the time that the air temperature may be expected to drop below fifteen (15) degrees C, a sufficient supply of burlap, straw, hay, or other suitable blanketing material shall be provided along the work to protect the concrete and maintain a minimum temperature of fifteen (15) degrees C in the concrete as measured on the surface of the pavement. An approved moisture barrier such as wet burlap or plastic sheeting shall be placed on the concrete prior to placing the blanketing material. This type of cure shall be maintained for a period of seventy two (72) hours as the initial cure. After the initial cure as specified above, a final cure as specified above may be used. The final cure shall be maintained for a period of fourteen (14) days, thus making a seventeen (17) day curing period for cold weather concreting.

9.3.11 Surface Tolerance

As soon as the concrete has hardened sufficiently, the pavement surface shall be tested with a three (3) meter straightedge or other specified devices. Areas showing high spots of more than three 3 mm, but not exceeding twelve 12 mm in three (3) meters between any two contact points, shall be marked and immediately grinded down with an approved grinding tool to a tolerance of less than three (3) mm as described above.

Where the departure from correct cross section exceeds twelve 12 mm, the pavement shall be removed and replaced by the Contractor at his expense. Any area or section so removed shall neither be less than three (3) meters in length nor the full width of the lane involved. When it is necessary to remove and replace a section of pavement, any remaining portion of the slab adjacent to the joints that is less than three (3) meters in length, shall also be removed and replaced.

9.3.12 Tests for Thickness of Pavement and Degree of Compaction

a. Thickness of Pavement

The Buyer will not be liable for payment of any excess in thickness of depth of pavement. During the progress of the work, the thickness or depth of pavement will be determined by the Engineer from cores cut from the concrete pavement by the Contractor. The cost of cutting and recovering all the cores described in this clause and the following paragraph shall be deemed to be included in the rates and prices for Portland Cement Concrete Pavement entered by the Contractor in the Bill of Quantities.

Unsatisfactory work shall be repaired, replaced, or will be paid for at an adjusted price, as follows:

1) One 15cm diameter core will be removed by the Contractor from each lane, at such locations as the Engineer may direct, and shall represent not more than 1000 SM of pavement area. A lane shall be considered the pavement surface between longitudinal joints, or a longitudinal joint and pavement edge.

2) If any core measurement is deficient more than 6.5 mm from the required thickness a core measurement shall be taken at each 30m interval in both directions longitudinal from the first deficient core in the same lane, as defined herein, until the thickness of the pavement is found to be not more than 6.5 mm

deficient from the required thickness. Each deficient core shall be considered as representing the condition in the same lane or longitudinal section, as above defined, for a distance of 15m, in each direction longitudinally from the core.

3) Sections of pavement which are deficient in thickness, as determined by cores, by an amount more

than 1.3 cm shall be removed and replaced with pavement of the specified thickness at the expense of the Contractor. The removal and replacement shall start at the determined point of deficiency and proceed longitudinally as hereinafter specified, until the pavement is to be not more than 6.5 mm deficient from the required thickness. The old reinforcing steel shall be left extended a sufficient distance so as to allow the new reinforcement steel to be lapped with the old, the required distance to be welded to the satisfaction of the Engineer.

4) The removal and replacements of pavements shall extend transversely the full width each lane in which such deficiency is found.

5) All pavements within two (2) meters of the deficiency spot shall be removed, except that when any joint is more than two (2) meters, all pavements shall then be removed to the next joint.

6) Sections of pavement which are deficient in thickness, as determined by measurement of cores in accordance with AASHTO T148-49, by an amount more than 6.5 mm, but not more than 1.3 cm, will be paid for at an adjusted price as specified in Table Below:

DEFICIENCY IN THICKNESS AS DETERMINED FROM CORES

Thickness Deficient	Proportional Part of Contract of Contract Price to be allowed
3.00 mm to 6.5 mm	95%
6.5 mm to 13 mm	75%

b. Degree of Compaction

The cores that have been cut from the concrete pavement according to the requirements of (i) above shall be examined by the Engineer's Representative to check the degree of compaction achieved through the slab and to check the effectiveness of the bond between the top and bottom course concrete.

Should any core reveal that any part of the slab has not been adequately compacted by revealing honeycombed or segregated concrete and should the bond between the top and bottom layers of concrete be such that a plane of weakness. is present, then additional cores shall be taken to check the areas of defective concrete pavement according to the procedure laid down in (i) above for determining the areas of concrete pavement deficient in compaction.

Any areas of defective pavement concrete so found shall be replaced with new concrete in accordance with this section at contractor's own expense.

The Engineer reserves the right to carry out crushing tests on any or all of the concrete cores taken in accordance with this clause, and should these tests show that any area of pavement concrete has failed to meet the strength requirements of the specification, then such areas of concrete shall be

removed and replaced with new concrete, mixed, laid, compacted and finished to the requirements of this section at contractor's own expense.

c. Refilling, of Holes

Holes in the pavement created by the cutting of cores shall be thoroughly coated on the inside with a neat cement grout and shall then be filled with concrete of the same mix as shown in the pavement. The filling shall be in two equal layers and each shall be vibrated to its full depth. The surface shall be finished flush and brushed, the surface shall be kept thoroughly wet for 72 hours thereafter.

9.3.13 Replacement of Defective Concrete

Any concrete not complying with the specification shall be cut out and replaced in accordance With the specification over the full width of the slab between longitudinal construction joints and over a length extending between two transverse joints each of a type other than a warping joint.

9.3.14 Concrete Lug Anchors

"Concrete Lug Anchors" shall be constructed in accordance with the dimensions and notes and at the locations shown on the plans. Unless otherwise indicated on the plans, the class, composition, consistency, proportioning, batching, mixing and curing of the concrete used in concrete lug anchors shall conform to the same requirements as the concrete pavement. Reinforcing steel, concrete and excavation for lug anchors shall be subsidiary to the Bill of Quantities itern.0Concrete Lug Anchors."

9.4 MEASUREMENT AND PAYMENT

9.4.1 Measurement

The unit of measurement for payment shall be the cubic meters of the completed and accepted Portland Cement Concrete Pavement, as measured in place. The number of cubic meters of the completed Portland Cement Concrete Pavement shall be determined by the length measured along the center line and upon the surface of the road, times the width as shown on the Drawings plus the areas of any widening on curves, turnouts and intersection, authorized and measured separately. Measurement of pavement thickness will be ensured by erecting shutters for spreading concrete at required level.

The unit of measurement for bridge Approach Slabs shall be the square meters of the area actually constructed in accordance with the Drawings or as directed in writing by the Engineer.

Concrete Lug Anchors shall be measured by the linear meters in place, the measuring being made along the centerline of the concrete lug anchor transverse to the pavement centerline. No measurement will be made of unauthorized areas or for extra thickness.

9.4.2 Payment

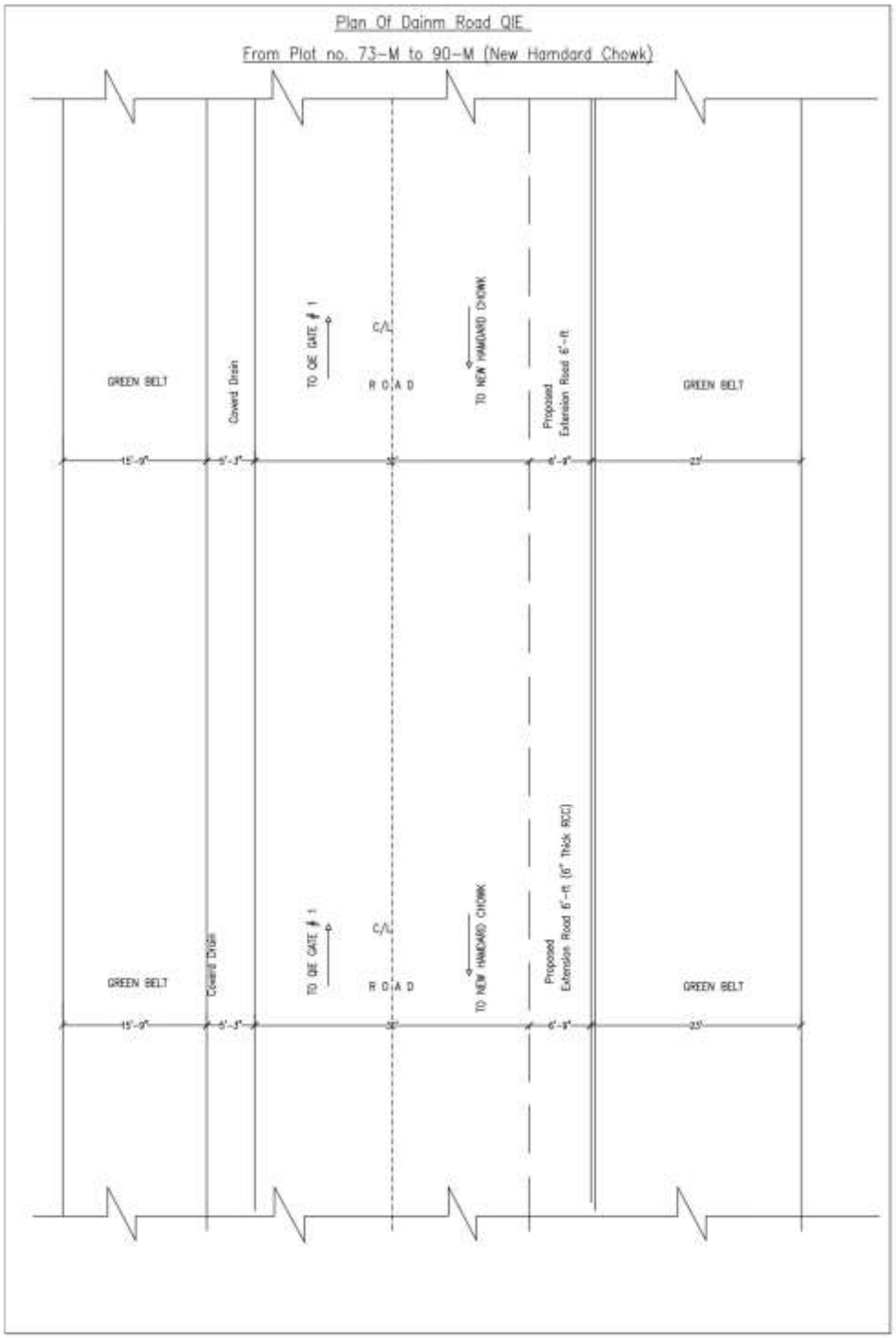
The number of cubic meters of Portland Cement Concrete Pavement, measured as specified in sub item 310.4.1 above , will be paid for , at the price tendered per cubic meter in the Bill of Quantities, adjusted as specified for deficiency in thickness, which price shall include the cost of constructing, finishing, curing, protecting and cleaning the pavement as above described; the

preparation of subgrade to receive the pavement; the construction of all joints of whatever type; cutting of cores and filling of holes, all materials, including joint filler and other material, equipment, labour and all else necessary therefore, and all other work in connection therewith and incidental there to in accordance with the specification and Drawings. Reinforcing steel shall be measured separately under relative items of work.

The number of cubic meters of Bridge Approach Slabs, will be paid for at the price tendered per cubic meter in the Bill of Quantities, which price shall include the cost of constructing, finishing, curing, protecting and cleaning the slab as above described; the surface preparation of the subbase to receive the slab: the construction of all joints of whatever type; all materials, including joint filler and other joint material, equipment, labour and all else necessary therefore, and all other work in connection therewith and incidental thereto in accordance with the Specification and Drawings.

Item Number	Description	Unit of Measurement
9 a	Plain Concrete Pavement	CM
9 b	Reinforced Concrete Pavement	CM
9 c	Concrete Lug Anchors	Meters

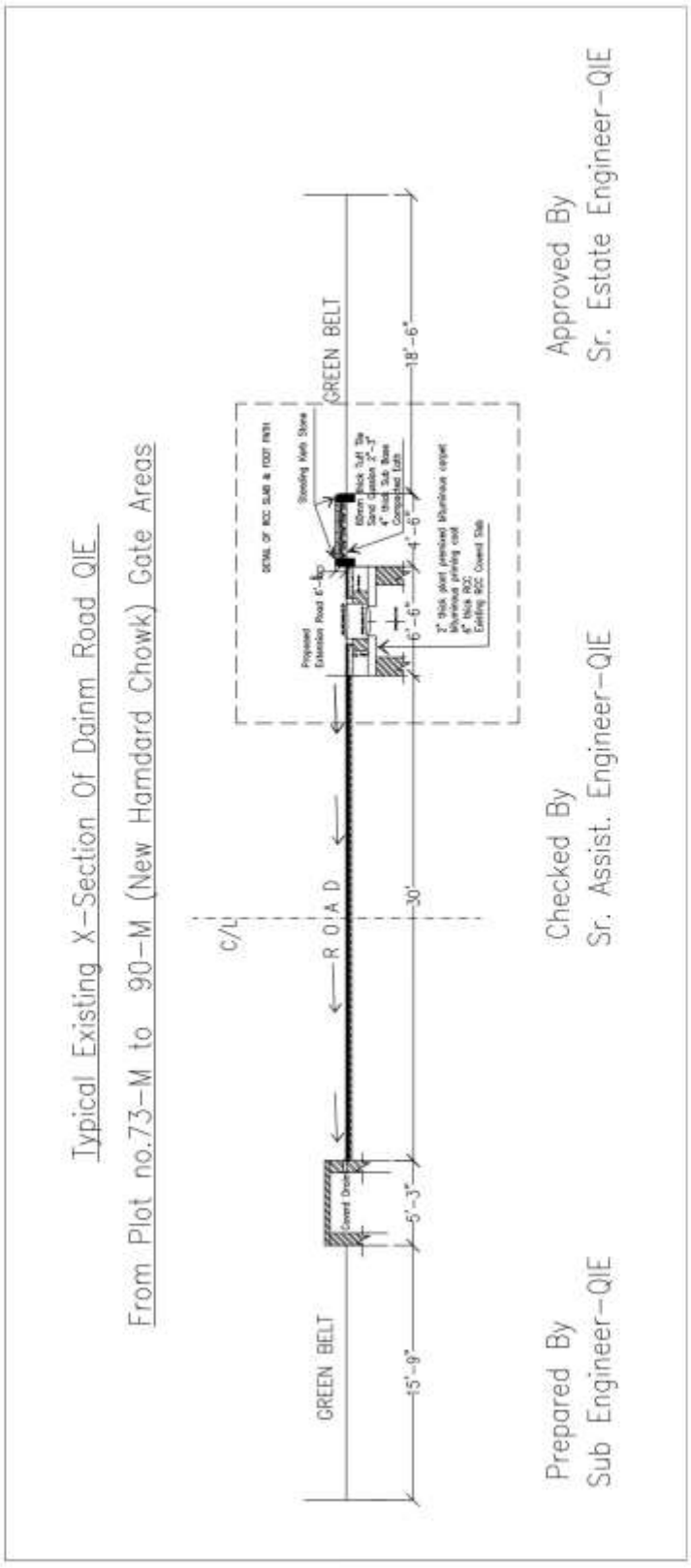
CONTRACT DRAWINGS

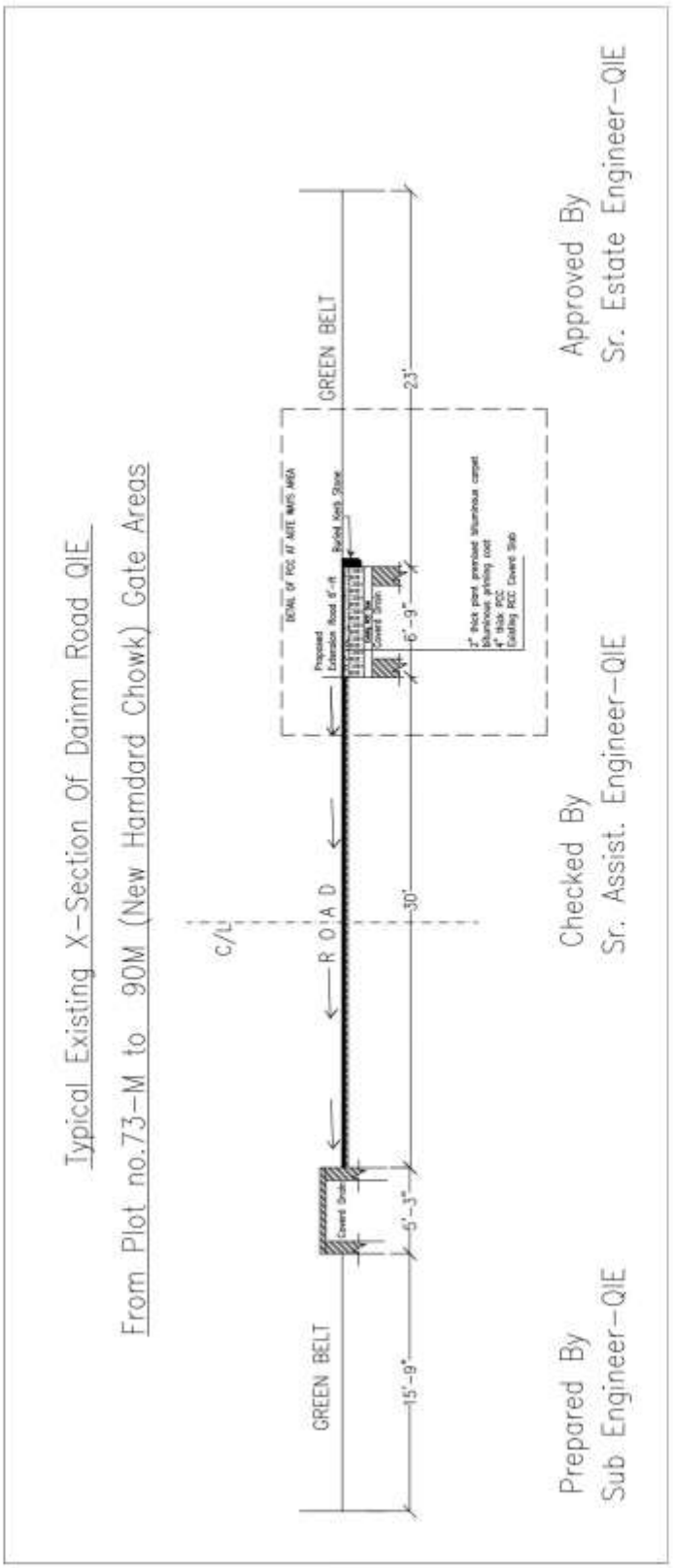


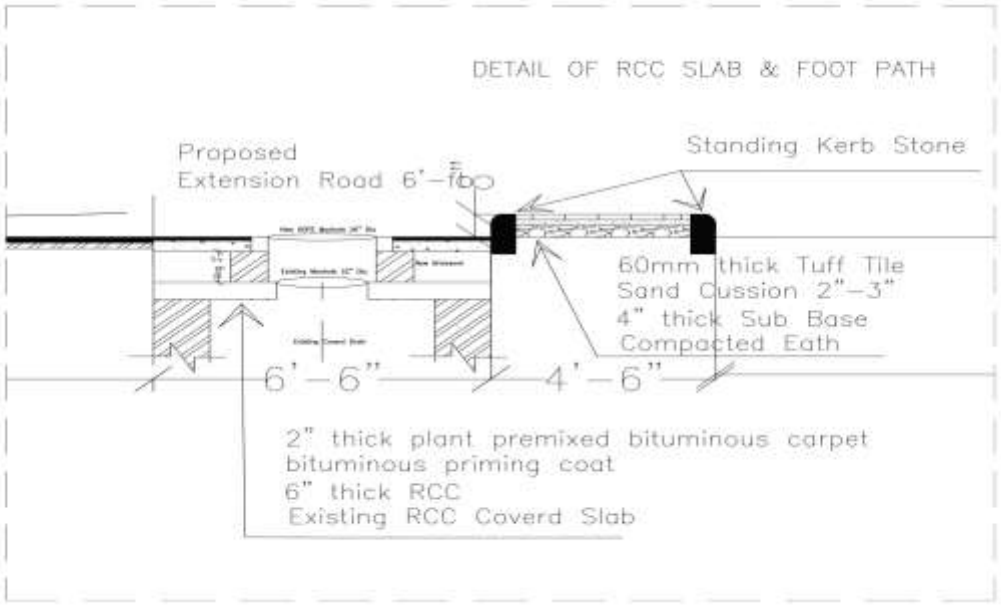
Prepared By
Sub Engineer-QIE

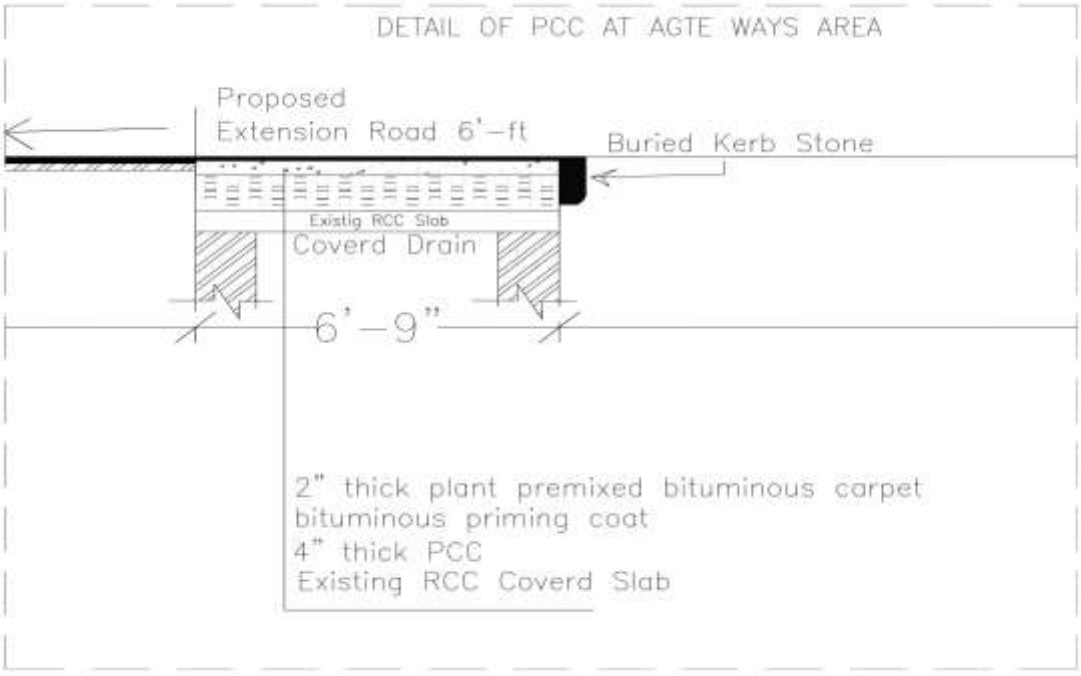
Checked By
Sr. Assist. Engineer-QIE

Approved By
Sr. Estate Engineer-QIE


Typical Existing X-Section Of Dainm Road QIE
From Plot no.73-M to 90-M (New Hamdard Chowk) Gate Areas
GREEN BELT
C/L
R O A D
GREEN BELT
30'
15'-9"
5'-3"
18'-6"
Prepared By
Sub Engineer-QIE
Checked By
Sr. Assist. Engineer-QIE
Approved By
Sr. Estate Engineer-QIE


Typical Existing X-Section Of Dainm Road QIE
From Plot no.73-M to 90M (New Hamdard Chowk) Gate Areas
GREEN BELT
15'-9"
6'-3"
C/L
ROAD
30'
GREEN BELT
23'
6'-9"
Prepared By
Sub Engineer-QIE
Checked By
Sr. Assist. Engineer-QIE
Approved By
Sr. Estate Engineer-QIE


DETAIL OF RCC SLAB & FOOT PATH
Proposed
Extension Road 6'-ft
Standing Kerb Stone
60mm thick Tuff Tile
Sand Cussion 2"-3"
4" thick Sub Base
Compacted Eath
6'-6"
4'-6"
2" thick plant premixed bituminous carpet
bituminous priming coat
6" thick RCC
Existing RCC Coverd Slab


DETAIL OF PCC AT AGTE WAYS AREA
Proposed
Extension Road 6'-ft
Buried Kerb Stone
Existig RCC Slab
Coverd Drain
6'-9"
2" thick plant premixed bituminous carpet
bituminous priming coat
4" thick PCC
Existing RCC Coverd Slab