



GOVERNMENT OF SINDH



SINDH COAL AUTHORITY

**ENERGY DEPARTMENT
SINDH COAL AUTHORITY**

Bidding Documents (Volume - 1)

December, 2016

Improvement / Rehabilitation of Remaining
Portion of Road from Sujawal to Badin (52 Km)
Near Khore Wah to Start of Badin Bypass
(Km 27+750 to Km 79+750)

Scheme No.I (ADP # 2227/2016-17)

CONTRACT PACKAGE # SCA/EA/CP-X

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SINDH COAL AUTHORITY

BID DOCUMENTS

FOR

**Improvement/Rehabilitation of Remaining Portion of Road From Sujawal to Badin
(52 Km) Near Khore Wah to Start of Badin Bypass (Km 27+750 to Km 79+750), Scheme
No. I, (ADP # 2227/2016-17).**

CONTRACT PACKAGE #SCA/EA/CP-X

BID DOCUMENTS ARE PLACED IN THE FOLLOWING FOLDERS

VOLUME I:

- 1) INVITATION FOR BID**
- 2) INSTRUCTION TO BIDDERS**
- 3) BIDDING DATA**
- 4) FORM OF BID AND APPENDICES TO BID**
- 5) CONTRACT FORMS**
- 6) GENERAL CONDITIONS OF CONTRACT**
- 7) SPECIAL CONDITIONS OF CONTRACT**
- 8) SPECIAL PROVISIONS**
- 9) ADDENDA TO TECHNICAL SPECIFICATIONS**

VOLUME II: DRAWINGS

VOLUME III: TECHNICAL SPECIFICATIONS

National Highway Authority (NHA) General Specifications (Dec 1998)

Bidders are instructed to purchase the Specifications from the source of origin

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INVITATION FOR BIDS

NOTICE INVITING TENDERS

Date: _____

Provincial Government Funds: ADP No. 2227/2016-17

Bid Reference No: SCA/EA/CP-X

Refer Invitation for Tenders issued by SCA

INSTRUCTIONS TO BIDDERS

INSTRUCTIONS TO BIDDERS

A. GENERAL

IB.1 Scope of Bid

- 1.1 Procuring agency as defined in the bidding data hereinafter called “the procuring agency” wishes to receive bids for the construction and completion of works as described in these bidding documents, and summarized in the bidding data hereinafter referred to as the “Works”.
- 1.2 The successful bidder will be expected to complete the works within the time specified in Appendix-A to Bid.

IB.2 Source of Funds

- 2.1 Procuring agency has received/allocated/] applied for loan/grant/ Federal/ Provincial/Local Government funds from the source(s) indicated in the bidding data in various currencies towards the cost of the project /scheme specified in the bidding data, and it is intended that part of the proceeds of this loan/grant/funds will be applied to eligible payments under the contract for which these bidding documents are issued.

IB.3 Eligible Bidders

- 3.1 This Invitation for Bids is open to all interested bidders who are eligible under provisions of Sindh Public Procurement Rules as mentioned below and the criteria given in the Notice Inviting Tender (NIT)/ Bidding Document.

Firms and individuals, national or international, may be allowed to bid for any project where international competitive bidding is feasible. Any conditions for participation shall be limited to those that are essential to ensure the bidder’s capability to fulfill the contract in question.

- (a) Bidders may be excluded if;
 - (i) as a matter of law or official regulations, commercial relations are prohibited with the bidder’s country by the federal government in case of ICB, or
 - (ii) a firm is blacklisted/ debarred by the procuring agency and the matter has been reported to the Authority, subject to Rule 30 of Sindh Public Procurement Rules 2010.
- (b) Government-owned enterprises or institutions may participate only if they can establish that they are;
 - (i) legally and financially autonomous, and
 - (ii) operate under commercial law.

Provided that where government-owned universities or research centers in the country are of a unique and exceptional nature, and their participation is critical to project implementation, they may be allowed to participate; and

Bidders shall include all those contractors who are registered or incorporated in Pakistan, irrespective of the nationality of their owners and professional staff, or

(c) Bidders are:-

- (i) pre-qualified with procuring agency for particular project/scheme;
- (ii) registered with Pakistan Engineering Council in particular category and discipline,
- (iii) registered with relevant tax authorities (income/sales tax, wherever applicable)

IB.4 One Bid per Bidder

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

IB.5 Cost of Bidding

- 5.1 The bidders shall bear all costs associated with the preparation and submission of their respective bids, and the 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 examine the site of works and its surroundings and obtain all information that may be necessary for preparing the bid and entering into a contract for construction of the works. All cost in this respect shall be at the bidder's own expense.
- 6.2 The bidders and any of their personnel or agents will be granted permission by the procuring agency to enter upon his premises and lands for the purpose of such inspection, but only upon the express condition that the bidders, their personnel and agents, will release and indemnify the procuring agency, his personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of such inspection.

B. BIDDING DOCUMENTS

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

- 7.1 The bidding documents, in addition to invitation for bids, are those stated below and should be read in conjunction with any addenda issued in accordance with Clause IB.9.
- a. Instructions to Bidders.
 - b. Bidding Data.
 - c. General Conditions of Contract, Part-I (GCC).
 - d. Special Conditions of Contract, Part-II (SCC)
 - e. Specifications.
 - f. Form of Bid and Appendices to Bid.
 - g. Bill of Quantities (Appendix-D to Bid).
 - h. Form of Bid Security.
 - i. Form of Contract Agreement.
 - j. Forms of Performance Security, Mobilization Advance Guarantee, Integrity Pact and Indenture bond for secured advance.
 - k. Drawings.
- 7.2 The bidders are expected to examine carefully the contents of all the above documents. Failure to comply with the requirements of bid submission will be at the bidder's own risk. Pursuant to Clause IB.26, bids which are not substantially responsive to the requirements of the BD will be rejected.

IB.8 Clarification of Bidding Documents (SSP RULE 23(1)):

Any interested bidder requiring any clarification(s) in respect of the bidding documents may notify the procuring agency in writing at the procuring agency's address indicated in the Invitation for Bids/NIT. Procuring agency will respond to any request for clarification provided they are received at least five calendar days prior to the date of opening of bid.

Provided that any clarification in response to query by any bidder; shall be communicated to all parties who have obtained bidding documents.

IB.9 Addendum/Modification 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 interested bidder, modify the bidding documents by issuing addendum.
- 9.2 Any addendum thus issued shall be part of the bidding documents pursuant to sub-clause IB 7.1 hereof and shall be communicated in writing to all bidders. Interested bidders shall acknowledge receipt of each addendum in writing to the procuring agency.
- 9.3 To afford 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 IB.20

C. PREPARATION OF BIDS

IB.10 Language of Bid

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

IB.11 Documents Accompanying the Bid

- 11.1 Each bidder shall:

- (a) submit a written authorization on the letterhead of the bidding firm, authorizing the signatory of the bid to act for and on behalf of the bidder;
- (b) update the information indicated and listed in the bidding data and previously submitted with the application for prequalification, and continue to meet the minimum criteria set out in the prequalification documents, which as a minimum, would include the following:
 - (i) Evidence of access to financial resources along with average annual construction turnover;
 - (ii) Financial predictions for the current year and the following two years, including the effect of known commitments;
 - (iii) Work commitments since prequalification;
 - (iv) Current litigation information; and
 - (v) Availability of critical equipment.

And

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

Appendix-E to Bid Proposed Construction Schedule

Appendix-F to Bid Method of Performing the Work

Appendix-G to Bid List of Major Equipment

Appendix-K to Bid Organization Chart for Supervisory Staff

and other pertinent information such as mobilization programme etc;

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

- (a) one of the joint venture partners shall be nominated as being in charge; and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the joint venture partners;
- (b) the bid, and in case of a successful bid, the Form of Contract Agreement shall be signed by the authorized partner so as to be legally binding on all 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 execution of works as per the terms and Conditions of Contract and in this regard to incur any and all liabilities, receive instructions, give binding undertakings and receive payments on behalf of the joint venture;
- (d) all partners of the joint venture shall at all times and under all circumstances be liable jointly and severally for the execution of the contract in accordance with the contract terms and a statement to this effect shall be included in the authorization mentioned under Sub-Para (a) above as well as in the Form of Bid and in the Form of Contract Agreement (in case of a successful bid);
- (e) a copy of the agreement entered into by the joint venture partners shall be submitted with the bid stating the conditions under which it will function, its period of duration, the persons authorized to represent and obligate it and which persons will be directly responsible for due performance of the contract and can give valid receipts on behalf of the joint venture, the proportionate participation of the several firms forming the joint venture, and any other information necessary to permit a full appraisal of its functioning. No amendments / modifications whatsoever in the joint venture agreement shall be agreed to between the joint venture partners without prior written consent of the procuring agency;
- (f) submission of an alternative Letter of Intent to execute a Joint Venture Agreement shall be mandatory.

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

IB.12 Bid Prices

- 12.1 Unless stated otherwise in the bidding documents, the contract shall be for the whole of the works as described in IB 1.1 hereof, based on the unit rates or prices submitted by the bidder or percentage quoted above or below on the rates of Composite Schedule of Rates (CSR), as the case may be.
- 12.2 The bidders shall fill in rates and prices for all items of the works described in the Bill of Quantities. Items against which no rate or price is entered by a bidder will not be paid for by the procuring agency when executed and shall be deemed to be covered by rates and prices for other items in the Bill of Quantities. In case of Composite Schedule of Rates, if the bidder fails to mention the percentage above or below, it shall be deemed to be at par with the rates of Composite Schedule of Rates.

- 12.3 The bid price submitted by the contractor shall include all rates and prices including the taxes. All duties, taxes and other levies payable by the contractor under the contract, or for any other cause during the currency of the execution of the work or otherwise specified in the contract as on the date seven days prior to the deadline for submission of bids.

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

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

IB.13 Currencies of Bid and Payment

- 13.1 The unit rates and the prices shall be quoted by the bidder entirely in Pak rupees. A bidder expecting to incur expenditures in other currencies for inputs to the works supplied from outside the procuring agency's country (referred to as the "Foreign Currency Requirements") shall indicate the same in Appendix-B to Bid. The proportion of the bid price (excluding Provisional Sums) needed by him for the payment of such Foreign Currency Requirements either (i) entirely in the currency of the bidder's home country or, (ii) at the bidder's option, entirely in Pak rupees provided always that a bidder expecting to incur expenditures in a currency or currencies other than those stated in (i) and (ii) above for a portion of the foreign currency requirements, and wishing to be paid accordingly, shall indicate the respective portions in the bid.
- 13.2 The rates of exchange to be used by the bidder for currency conversion shall be the selling rates published and authorized by the State Bank of Pakistan prevailing on the date, 07 (seven) days prior to the deadline for submission of bids. For the purpose of payments, the exchange rates used in bid preparation shall apply for the duration of the contract.

IB.14 Bid Validity

- 14.1 Bids shall remain valid for the period stipulated in the bidding data from the date of opening of bid specified in clause IB.23.
- 14.2 In exceptional circumstances, prior to expiry of the original, the procuring agency may request the bidders to extend the period of validity for a specified additional period, which shall not be for more than one third of the original period of bid validity. The request and the responses thereto, shall be made in writing. A bidder may refuse the request without the forfeiture of the bid security. In case, a bidder agreed to the request, shall not be required or permitted to modify the bid, but will be required to extend the validity of the bid security for the period of the extension, and in compliance with Clause IB.15 in all respects.

IB.15 Bid Security

- 15.1 Each bidder shall furnish, as part of the bid, a bid security in the amount stipulated in the bidding data in Pak Rupees or an equivalent amount in a freely convertible currency.
- 15.2 The bid security shall be at the option of the bidder, in the form of deposit at call, Pay order or a bank guarantee issued by a Scheduled Bank in Pakistan or from a foreign bank duly counter guaranteed by a Scheduled Bank in Pakistan in favour of the procuring agency, which should commensurate with the bid validity period. The bank guarantee for bid security shall be acceptable in the manner as provided at Annexure BS-1
- 15.3 Any bid not accompanied by an acceptable bid security shall be rejected by the procuring agency as non-responsive.
- 15.4 Bid security shall be released to the unsuccessful bidders once the contract has been signed with the successful bidder or the validity period has expired.
- 15.5 The bid security of the successful bidder shall be returned when the bidder has furnished the required Performance Security and signed the Contract Agreement.
- 15.6 The bid security may be forfeited:
 - (a) if the bidder withdraws his bid except as provided in sub- clause IB 22.1;
 - (b) if the bidder does not accept the correction of his bid price pursuant to sub-clause IB 27.2 hereof; or
 - (c) In the case of successful bidder, if he fails within the specified time limit to:
 - (i) furnish the required Performance Security; or
 - (ii) sign the Contract Agreement.

IB.16 Alternate Proposals/Bids

- 16.1 Each bidder shall submit only one bid either by himself, or as a member of a joint venture, until and unless they have been requested or permitted for alternative bid, then he has to purchase separate bidding documents and alternate bid shall be treated as separate bid.
- 16.2 Alternate proposals are allowed only for procurement of works where technical complexity is involved and more than one designs or technical solutions are being offered. Two stage two envelope bidding procedure will be appropriate when alternate proposal is required.
- 16.3 Alternate bid(s) shall contain (a) relevant design calculations; (b) technical specifications; (c) proposed construction methodology; and (d) any other relevant details / conditions, provided that the total sum entered on the Form of Bid shall be that which represents complete compliance with the bidding documents.

IB.17 Pre-Bid Meeting

- 17.1 Procuring agency may, on his own motion or at the request of any bidder, hold a pre-bid meeting to clarify issues and to answer any questions on matters related to the bidding documents. The date, time and venue of pre-bid meeting, if convened, shall be communicated to all bidders. All bidders or their authorized representatives shall be invited to attend such a pre-bid meeting at their own expense.
- 17.2 The bidders are requested to submit questions, if any, in writing so as to reach the Procuring agency not later than seven (7) days before the proposed pre-bid meeting.
- 17.3 Minutes of the pre-bid meeting, including the text of the questions raised and the replies given, will be transmitted without delay to all bidders. Any modification of the bidding documents listed in sub- clause IB 7.1 hereof, which may become necessary as a result of the pre-bid meeting shall be made by the procuring agency exclusively through the issue of an Addendum pursuant to Clause IB.9 and not through the minutes of the pre-bid meeting.
- 17.4 Absence at the pre-bid meeting will not be a cause for disqualification of a bidder.

IB.18 Format and Signing of Bid

- 18.1 Bidders are particularly directed that the amount entered on the Form of Bid shall be for performing the contract strictly in accordance with the bidding documents.
- 18.2 All appendices to bid are to be properly completed and signed.
- 18.3 Alteration is not to be made neither in the form of bid nor in the Appendices thereto except in filling up the blanks as directed. If any such alterations be made or if these instructions be not fully complied with, the bid may be rejected.
- 18.4 Each bidder shall prepare by filling out the forms without alterations and shall provide an original copy along with photocopies as per the requirement of the procuring agency specified in the bidding data. The original as well as copies of the document shall be clearly marked as “ORIGINAL” and „COPY”, as the case may be. If there is any discrepancy between original and copy(ies) then the original shall prevail.
- 18.5 The original and all copies of the bid shall be typed or written in indelible ink (in the case of copies, Photostats are also acceptable) and shall be signed by a person(s) duly authorized to sign on behalf of the bidder pursuant to sub- clause IB 11.1(a) hereof. All pages of the bid shall be initialled and stamped by the person(s) signing the bid.
- 18.6 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. Such corrections shall be initialled by the person(s) signing the bid.
- 18.7 Bidders shall indicate in the space provided in the Form of Bid their full and proper postal addresses at which notices may be legally served on them and to which all correspondence in connection with their bids and the contract is to be sent.
- 18.8 Bidders should retain a copy of the bidding documents as their file copy.

D. SUBMISSION OF BIDS

IB.19 Sealing and Marking of Bids

19.1 Each bidder shall submit his bid as under:

- (a) ORIGINAL and _____ COPIES of the bid shall be separately sealed and put in separate envelopes and marked as such.
- (b) The envelopes containing the ORIGINAL and COPIES shall be put in one sealed envelope and addressed as given in sub – clause IB 19.2 hereof.

19.2 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.

19.3 In addition to the identification required in sub- clause IB 19.2 hereof, the inner envelope shall indicate the name and postal address of the bidder to enable the bid to be returned unopened in case it is declared “late” pursuant to Clause IB.21

19.4 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.20 Deadline for Submission of Bids

- 20.1
- (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 shall 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.

20.2 The Procuring Agency may, at its discretion, extend the deadline for submission of bids by issuing an amendment in accordance with IB 09. In such case, all rights and obligations of the procuring agency and the bidders shall remain the same as mentioned in the original deadline.

IB.21 Late Bids

- (a) any bid received by the procuring agency after the deadline for submission of bids prescribed in to clause IB 20 shall be returned unopened to such bidder.
- (b) delays in the mail, 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 submit the bid in time.

IB.22 Modification, Substitution and Withdrawal of Bids

- 22.1 Any bidder may modify, substitute or withdraw his bid after bid submission provided that the modification, substitution or written notice of withdrawal is received by the procuring agency prior to the deadline for submission of bids.
- 22.2 The modification, substitution, or notice for withdrawal of any bid shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause IB.19 with the outer and inner envelopes additionally marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" as appropriate.
- 22.3 No bid may be modified by a bidder after the deadline for submission of bids except in accordance with to sub - clauses IB 22.1 and IB 27.2.
- 22.4 Withdrawal of a bid during the interval between the deadlines for submission of bids and the expiration of the period of bid validity specified in the Form of Bid may result in forfeiture of the bid security in pursuance to clause IB 15.

E. BID OPENING AND EVALUATION.

IB.23 Bid Opening

- 23.1 Procuring agency will open the bids, including withdrawals, substitution and modifications made pursuant to Clause IB.22, in the presence of bidders' representatives who choose to attend, at the time, date and location stipulated in the bidding data. The bidders or their representatives who are in attendance shall sign an attendance sheet.
- 23.2 Envelopes marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" shall be opened and read out first. Bids for which an acceptable notice of withdrawal has been submitted pursuant to clause IB.22 shall not be opened.
- 23.3 Procuring agency shall read aloud the name of the bidder, total bid price and price of any Alternate Proposal(s), if 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, and total amount of each bid, and of any alternative bids if they have been requested or permitted, shall be read aloud and recorded when opened.
- 23.4 Procuring Agency shall prepare minutes of the bid opening, including the information disclosed to those present in accordance with the sub-clause IB.23.3.

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

- 24.1 Information relating to the examination, clarification, evaluation and comparison of bid and recommendations for the award of a contract shall not be disclosed to bidders or any other person not officially concerned with such process before the announcement of bid evaluation report in accordance with the requirements of Rule 45, which states that Procuring agencies shall announce the results of bid evaluation in the form of a report giving reasons for acceptance or rejection of bids. The report shall be hoisted on website of authority and that of procuring agency if it website exists and intimated to all bidders at least seven (7) days prior to the award of contract. The announcement to all bidders will include table(s) comprising read out prices, discounted prices, price adjustments made, final evaluated prices and recommendations against all the bids evaluated. Any effort by a bidder to influence the procuring agency's processing of bids or award decisions may result in the rejection of such bidder's bid. Whereas, any bidder feeling aggrieved, may lodge a written complaint as per Rule 31; however mere fact of lodging a complaint shall not warrant suspension of the procurement process.

IB.25 Clarification of Bid (SPP Rule 43)

- 25.1 To assist in the examination, evaluation and comparison of bids, the procuring agency may, at its discretion, ask any bidder for clarification of the 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 28.

IB.26 Examination of Bids and Determination of Responsiveness

- 26.1 Prior to the detailed evaluation of bids, the procuring agency will determine whether the bidder fulfils all codal requirements of eligibility criteria given in the tender notice such as registration with tax authorities, registration with PEC (where applicable), turnover statement, experience statement, and any other condition mentioned in the NIT and bidding document. If the bidder does not fulfill any of these conditions, it shall not be evaluated further.
- 26.2 Once found to be fulfilling the eligibility criteria, as mentioned in sub- clause 26.1, the bids of eligible bidders will be evaluated for technical responsiveness as per specification and criteria given in the bidding documents. Technical and financial evaluations may be carried out in accordance with single stage-single one envelope, single stage-two envelopes, two stage or two stage-two envelopes bidding procedures, depending on the selection procedure adopted by the procuring agency.
- 26.3 A bid will be considered technically responsive if it (i) has been properly signed; (ii) is accompanied by the required bid security; and (iii) conforms to all the terms, conditions and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one (i) which affect in any substantial way the scope, quality or performance of the works; (ii) which limits in any substantial way, inconsistent with the bidding documents, the procuring agency's rights or the bidder's obligations under the contract; or (iii) adoption/rectification whereof would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

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

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

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

(B) Minor Deviations

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

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

IB.27 Correction of Errors before Financial Evaluation

- 27.1 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.

- 27.2 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 bidders. The amount thus corrected shall be considered as binding upon the bidder. If the bidder does not accept the corrected bid price, his bid will be rejected, and the bid security shall be forfeited in accordance with sub-clause IB 15.6(b) hereof.

IB.28 Financial Evaluation and Comparison of Bids

- 28.1 The procuring agency will evaluate and compare only the Bids determined to be substantially responsive in accordance with clause IB 26.
- 28.2 In evaluating the Bids, the 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 27;
 - (b) excluding provisional sums (if any), for contingencies in the Summary Bill of Quantities, but including competitively priced Day work; and
 - (c) making an appropriate adjustment for any other acceptable variation or deviation.
- 28.3 The estimated effect of the price adjustment provisions of the conditions of contract, applied over the period of execution of the contract, shall not be taken into account in bid evaluation.
- 28.4 If the bid of the successful bidder is seriously unbalanced in relation to the procuring agency's estimate of the cost of work to be performed under the contract, the procuring agency may require the bidder to produce detailed price analyses for any or all items of the Bill of Quantities to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, the procuring agency may require that the amount of the Performance Security set forth in clause IB.32 be increased at the expense of the successful bidder to a level sufficient to protect the procuring agency against financial loss in the event of default of the successful bidder under the contract.
- 28.5 Bidders may be excluded if involved in **“Corrupt and Fraudulent Practices”** means either one or any combination of the practices given below SPP Rule2(q);
- (i) **“Coercive Practice”** means any impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence the actions of a party to achieve a wrongful gain or to cause a wrongful loss to another party;
 - (ii) **“Collusive Practice”** means any arrangement between two or more parties to the procurement process or contract execution, designed to achieve with or without the knowledge of the procuring agency to establish prices at artificial, non competitive levels for any wrongful gain;
 - (iii) **“Corrupt Practice”** means the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence the acts of another party for wrongful gain;

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

28.6 Evaluation Report (SPP Rule 45)

After the completion of evaluation process, as described in clauses IB 27 and IB 28, the procuring agency shall announce the results of bid evaluation in the form of report (available on the website of the authority) giving reasons for acceptance and rejection of bid. The report shall be hoisted on website of the authority and that of procuring agencies if its website exists and intimated to all bidders at least seven (7) days prior to the award of contract.

F. AWARD OF CONTRACT

IB.29 Award (SPP Rule 49)

- 29.1 Subject to clauses IB 30 and IB 34 and provision of the rule: The procuring agency shall award the contract to the bidder whose bid has been determined to be substantially responsive to the bidding documents, and who has offered the lowest evaluated bid, but not necessarily the lowest submitted price, within the original or extended period of bid validity. Provided that such bidder has been determined to be eligible in accordance with the provisions of clause IB 03 and qualify pursuant to sub-clause IB 29.2.
- 29.2 Procuring agency, at any stage of the bid evaluation, having credible reasons for or having prima facie evidence of any deficiency(ies) in contractor’s capacities, may require the contractor to provide information concerning their professional, technical, financial, legal or managerial competence whether already pre-qualified or not for the said project.

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

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

Notwithstanding clause IB 29 and provision of the rule: (1) A procuring agency reserves may cancel the bidding process at any time prior to the acceptance of a bid or

proposal; (2) The procuring agency shall incur no liability towards bidders solely by virtue of its invoking sub-rule (1); (3) Intimation of the cancellation of bidding process shall be given promptly to all bidders and bid security shall be returned along with such intimation; (4) The procuring agency shall, upon request by any of the bidders, communicate to such bidder, grounds for cancellation of the bidding process, but is not required to justify such grounds.

IB.31 Notification/Publication of the Award of Contract (SPP Rule 25).

- 31.1 Prior to expiry of the period of bid validity, including extension, prescribed by the procuring agency, the procuring agency shall notify the successful bidder in writing (“Letter of Acceptance”) that his bid has been accepted. This letter shall mention the sum which the procuring agency will pay to the contractor in consideration of the execution and completion of the works by the contractor as prescribed by the contract (hereinafter and in the conditions of contract called the “Contract Price”).
- 31.2 No negotiation with the bidder having evaluated as lowest responsive or any other bidder shall be permitted, however, procuring agency may hold meetings to clarify any item in the bid evaluation report.
- 31.3 The notification of award and its acceptance by the bidder will constitute the formation of the contract, binding the procuring agency and the bidder till signing of the formal Contract Agreement.
- 31.4 Upon furnishing by the successful bidder of a Performance Security and signing of the contract, the procuring agency will promptly notify the name of the successful bidder to all bidders and return their bid securities accordingly.
- 31.5 Within seven days of the award of contract, procuring agency shall publish on the website of the Authority and on its own website, if such a website exists, the results of the bidding process, identify the bid through procurement identifying numbers, and the following information:
 - (1) Evaluation Report;
 - (2) Form of Contract and letter of Award;
 - (3) Bill of Quantities or Schedule of Requirement.

31.6 Debriefing (SPP Rule 51).

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

IB.32 Performance Security (SPP Rule 39)

- 32.1 The successful bidder shall furnish to the procuring agency a Performance Security in the form of pay order or demand draft or bank guarantee, and the amount stipulated in the bidding data and the Conditions of Contract within a period of 28 days after the receipt of Letter of Acceptance.
- 32.2 Failure of the successful bidder to comply with the requirements of Sub-clause IB.32.1 or clauses IB 33 or IB 35 shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security.
- 32.3 Validity of performance security shall extend at least ninety days beyond the date of completion of contract, or as mentioned in the bidding data to cover defects liability period or maintenance period subject to final acceptance by the procuring agency.

IB.33 Signing of Contract Agreement (SPP Rule 39)

- 33.1 Within 14 days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the procuring agency will send the successful bidder the Contract Agreement in the form provided in the bidding documents, incorporating all agreements between the parties.
- 33.2 The formal Agreement between the procuring agency and the successful bidder shall be executed within 14 days of the receipt of the Contract Agreement by the successful bidder from the procuring agency.
- 33.3 A procurement contract shall come into force when the procuring agency requires signs contract, the date on which the signatures of both the procuring agency and the successful bidder are affixed to the written contract. Such affixing of signatures shall take place within the time prescribed in the bidding documents.

Provided that the procuring agency may reduce the maximum time limit for signing of contract, as and when required, and shall be mentioned in the bidding documents.

33.4 Stamp Duty.

The formal Agreement between the Procuring Agency and the successful bidder shall be duly stamped at rate of ----% of bid price (updated from time to time) stated in Letter of Acceptance

IB.34 General Performance of the Bidders

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

IB.35 Integrity Pact (SPP Rule 89)

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

IB.36 Instructions not Part of Contract

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

IB.37 Arbitration (SPP Rule 34)

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

BIDDING DATA

Contact/Bidding Data

Instructions to Bidders

Clause Reference

- 1.1 Name and address of the procuring agency:

Sindh Coal Authority

House No 16, E Street, Behind Zamzama Park,

DHA Phase V, Karachi.

Telephone No: 021-99251059 & 021-99251507 Fax No. : 021-99251038

- 1.2 Name of the Project and Summary of the works:

Name of Project:

Construction of New Roads Links, Bypasses and Improvement / Widening / Rehabilitation of Existing Roads in District Thatta, Sujawal, Badin, Tharparkar and Mirpurkhas.

Name of Work:

Improvement/Rehabilitation of Remaining Portion of Road From Sujawal to Badin (52 Km) Near Khore Wah to Start of Badin Bypass (Km 27+750 to Km 79+750), Scheme No. I, (ADP # 2227/2016-17).Contract Package # SCA/EA/CP-X

- **Excavation in Common Soil,**
- **Formation of Embankment from roadway and borrow excavation**
- **Laying of Sub-base, Aggregate Base Course, Asphaltic Base Course, Asphaltic Wearing Course.**
- **Pipe & Box Culverts.(RCC / Prestressed)**
- **RCC Concrete Bridges**
- **Construction of drainage/erosion control structures**
- **Construction of slope protection structures**
- **Ancillary works (Traffic Signs, Pavement Marking, Kerbs etc)**
- **Etc. (As detailed in Drawings, Specifications and BOQ)**

- 1.2 **The successful bidder will be expected to complete the works within the time specified in Special Stipulations (Appendix-A).**

- 2.1 Name of the Funding Source;

Funds provided by the Government of Sindh (ADP No.2227/2016-17)

- 2.1 Amount and Type of Financing/Scheme Cost and Allocated Funds.

Allocation for 2016-17 Pak Rs. 1595.871 million.

- 3.1 Eligible Bidders:

This bidding is open to Prequalified Bidders only

- 8.1 Time limit for clarification:

The written clarification should reach the addressee of the NIT on any working day but not later than 7 working days prior to last date of bid submission.

- 10.1 Bid language:

Bid language is English

11.1(a) The bidder along with letter of authorization shall submit the (i) Registration Certificate with Sindh Revenue Board, Government of Sindh (ii) PEC Registration Certificate for 2014 in category CB CE01 & CE-02 (iii) NTN Certificate (iv) Professional Tax payment. The failure to submit above mentioned documents shall lead to rejection of bid.

11.1(b) Deleted

11.1(c) Add following
The bidder shall submit the detailed CVs of proposed staff as per the requirement laid down in Appendix K. It is mandatory for the successful bidder to mobilize the same staff proposed in Appendix K after approval from the Engineer

13.1 Bidders to quote entirely in Pak. Rupee
The currency of Bid is Pakistan Rupee (PKR). All payment will be made in PKR only

13.2 **IB Clause 13.2 is Not applicable**

14.1 Period of Bid Validity:
Period of Bid Validity shall be 90 days

15.1 Amount of Bid Security:
The amount of the Bid Security shall be 2% of the Bid Price.

16.1 Alternate Proposals/Bid
Alternative bids is not permitted, Alternative times for completion is not permitted, Alternative technical solutions is not permitted for any part of the Works

17.1 Venue, time, and date of the pre-Bid meeting:
**At the office of Sindh Coal Authority mentioned in IB Clause 1.1 above
Date: As per Invitation for Bid**

18.4 Number of copies of the bid to be completed and returned:
Original + One Copy

19.2 (a) Procuring Agency's address for the purpose of bid submission:
**Director General
Sindh Coal Authority
House No 16, E Street, Behind Zamzama Park,
DHA Phase V, Karachi.
Telephone No: 021-99251059 & 021-99251507 Fax No. : 021-99251038**

(b) Name and Identification Number of the Contract:

Improvement/Rehabilitation of Remaining Portion of Road From Sujawal to Badin (52 Km) Near Khore Wah to Start of Badin Bypass (Km 27+750 to Km 79+750), Scheme No. I, (ADP # 2227/2016-17). Contract Package # SCA/EA/CP-X.

20.1 (a) Deadline for submission of bids:

Date: As per Invitation for Bid

Time: As per Invitation for Bid

(b) Venue, time, and date of bid opening:

Venue: Office of the Sindh Coal Authority

Date: As per Invitation for Bid

Time As per Invitation for Bid

28.4 **If the successful bidder failed to submit Performance Security of increased amount within fourteen (14) days of demand by the PA, his bid shall be cancelled and his bid security shall be forfeited.**

32.1 Standard form and amount of Performance Security acceptable to the procuring agency:

The performance security will be in the form of a “unconditional, irrevocable and acceptable bank guarantee” in the amount of 5% (Five percent) of the Accepted Contract Amount acceptable to the Procuring Agency in the attached format

32.3 Validity of performance security

The Performance Security shall be valid for a period 90 days after the date of issue of defects liability certificate

33.4 Stamp duty

The Contract will be executed on a non-judicial stamp paper of the value @ 0.35% of the contract value. The cost of the stamp duty shall be borne by the successful bidder.
[0.35% may vary depending upon the rules applicable at the time of signing the Contract]

**FORM OF BID
AND
APPENDICES TO BID**

FORM OF BID

Bid Reference No. _____
(Name of Contract/Work)

To:

1. Having examined the bidding documents including Instructions to Bidders, Bidding Data, and Conditions of Contract, Specifications, Drawings and Bill of Quantities and Addenda Nos. _____ for the execution of the above-named work, we/I, the undersigned, offer to execute and complete the work and remedy any defects therein in conformity with the Conditions of Contract, Specifications, Drawings, Bill of Quantities and Addenda for the sum of Rs. _____ (Rupees _____) or such other sum as may be ascertained in accordance with the said conditions.
2. We/I understand that all the Appendices attached hereto form part of this bid.
3. As security for due performance of the undertakings and obligations of this bid, we/I submit herewith a bid security in the amount of Rupees _____ (Rs. _____) drawn in your favour or made payable to procuring agency and valid for a period of _____ days beginning from the date, bid is opened.
4. We/I undertake, if our bid is accepted, to commence the works and to complete the whole of the works comprised in the contract within the time stated in Appendix-A to Bid.
5. We/I agree to abide by this bid for the period of _____ days from the date fixed for opening the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
6. Unless and until a formal Agreement is prepared and executed, this bid, together with your written acceptance thereof, shall constitute a binding contract between us.
7. We do hereby declare that the bid is made without any collusion, comparison of figures or arrangement with any other bidder for the works.
8. We understand that you are not bound to accept the lowest or any bid you may receive.
9. We undertake, if our/my bid is accepted, to execute the Performance Security referred to in Clause 10 of Conditions of Contract for the due performance of the Contract.

10. We confirm, if our bid is accepted, that all partners of the joint venture shall be liable jointly and severally for the execution of the Contract and the composition or the constitution of the joint venture shall not be altered without the prior consent of the procuring agency. (Please delete this in case of Bid form a single bidder)

in the capacity of _____ duly authorized to sign Bids for and on behalf of
_____ Dated this _____ day of _____ 20 _____

Signature: _____

(Name of Bidder in Block Capitals)
(Seal)

Address: _____

Witness:

Signature: _____

Name: _____

Address: _____

Occupation: _____

SPECIAL STIPULATIONS
Particular Conditions of Contract- Part A

	Description	General Conditions Clauses	Stipulations
1	Employer's name and address	1.1.2.2 & 1.3	Director General Sindh Coal Authority House No 16, E Street, Behind Zamzama Park, DHA Phase V, Karachi. Telephone No: 021-99251059 & 021-99251507 Fax No: 021-99251038 Employer's Representative, Chief Engineer, SCA
2	Engineer's name and address	1.1.2.4 & 1.3	EA Consulting (Pvt) limited AL-9, 15 th Lane, Khayaban-e-Hilal, DHA Phase VII, Karachi Telephone No: 021-111-111584 Fax No: 021-35841825
3	Sections	1.1.5.6	Not Applicable
4	Electronic transmission systems	1.3	Scanned copy via e-mail and facsimile are acceptable, if the original is received within three days.
5	Governing Law	1.4	The Laws of Islamic Republic of Pakistan.
6	Ruling language	1.4	English
7	Language for communications	1.4	English
8	Time for access to the Site	2.1	Within seven (07) days after Commencement Date
9	Engineer representing Consulting Firm hired by the procuring agency to issue variation in case of emergency	3.1	Up to 1% of the contract price stated in the Letter of Acceptance.
10	Amount of Performance Security	4.2	The performance security will be in the form of a "unconditional, irrevocable and acceptable bank guarantee" in the amount of 5% (Five percent) of the contract price stated in the Letter of Acceptance.

	Description	General Conditions Clauses	Stipulations
11	Subcontract	4.4	The aggregate amount of the Works subcontracted shall not exceed 30% of the Contract Price.
12	Normal working hours	6.5	8 hrs a day and 6 days a week.
13	Time for Commencement	8.1	Within 07 days from the date of receipt of Engineer's Notice to Commence, this shall be issued within fourteen (14) days after signing of Contract Agreement.
14	Time for Completion	8.2	545 days (18 Months) from the date of receipt of Engineer's Notice to Commence.
15	Time for Furnishing Programme	8.3	Within 28 days from the date of receipt of Letter of Acceptance.
16	Revised Programme	8.3	Revised Programme to be submitted within 14 days of the Engineer's notice.
17	Delay damages for the Works	8.7 & 14.15(b)	0.1% of the Contract Price per day, and For Interim Delay damages 0.05% of the Contract price per day Also, other charges mentioned in Special/Particular Conditions of Contract
18	Maximum amount of delay damages	8.7& 14.15(b)	10% of the final Contract Price & For Interim Delay damages 5% of the Contract price per day Also, other charges mentioned in Part B, Particular Conditions of Contract
19	Defects Liability Period	11.1	365 days from the effective date of Taking Over Certificate.
20	Evaluation	12.3	1) changed in measured quantity 25%, 2) Change in quantity 1% to 5%,
21	Provisional Sums	13.5.(b)(ii)	15%
22	Adjustments for Changes in Cost	13.8	As per Appendix C (B) to bid "Price Adjustment".
23	Advance payment	14.2	10% Percentage of the Accepted Contract Amount excluding Provisional Sum and Day work) payable in PKR:

	Description	General Conditions Clauses	Stipulations
			First Instalment: 50% of total Advance Payment shall be made after fulfilling all the requirements provided in Conditions of the Contract. Second Instalment: Remaining 50%, on mobilization of Plant, equipment and other resources at site by the Contractor to the satisfaction of the Engineer.
24	Repayment amortization rate of advance payment	14.2(b)	From five consecutive IPCs starting from third IPC in equal instalments including 10% per annum interest
25	Percentage of Retention	14.3	10 % of the amount of Interim/Running Payment Certificate.
26	Limit of Retention Money	14.3	5 % of Contract Price stated in the Letter of Acceptance.
27	Plant and Materials	14.5	Not Applicable
28	Minimum Amount of Interim Payment Certificates	14.6	3 % of the Accepted Contract Amount.
29	Payment	14.7	56 days.
30	Maximum total liability of the Contractor to the Employer	17.6	The product of two (02) times the Accepted Contract Amount
31	Periods for submission of insurance: a. evidence of insurance. b. relevant policies.	18.1	14 days 28 days
32	Maximum amount of deductibles for insurance of the Employer's risks	18.2(d)	10% of the Accepted Contract Amount
33	Minimum amount of Insurance Cover	18.1, 18.2, 18.3 and 18.4	Type of cover The Works Amount of cover The sum stated in the Letter of Acceptance plus fifteen percent (15%) Type of cover Contractor's Equipment: Amount of cover Full replacement cost plus fifteen percent (15%)

	Description	General Conditions Clauses	Stipulations
			<p>Type of cover Third Party-injury to persons and damage to property</p> <p>The Third Party compensation Policy must contain following conditions of indemnification per occurrence with the number of occurrence unlimited:</p> <ul style="list-style-type: none"> i) in case of death, Pak Rs. 1,000,000/= per person ii) in case of major injury, Pak Rs. 500,000/= per person iii) in case of minor injury, Pak Rs. 100,000/= per person iv) in case of damage to property, full amount of repair/replacement as the case may be. <p>Workers:</p> <ul style="list-style-type: none"> i) in case of death, Pak Rs. 1,000,000/= per person ii) in case of major injury, Pak Rs. 500,000/= per person iii) in case of minor injury, Pak Rs. 100,000/= per person <p>Other cover: Contractor's All Risk Policy (In each case name of insured is Contractor and Procuring Agency)</p>
34	Date by which the Dispute Board (DB) shall be appointed	20.2	28 days after the Commencement date
35	The DB shall be comprised of	20.2	Three Members
36	List of potential DB sole members	20.2	None
37	Appointment (if not agreed) to be made by	20.3	Pakistan Engineering Council
38	Rules of arbitration	20.6(a)	<p>Rules and Provisions of Arbitration Act 1940 of Islamic Republic of Pakistan enforced for the time being.</p> <p>The Place of Arbitration shall be Karachi.</p>

FOREIGN CURRENCY REQUIREMENTS

1. The bidder may indicate herein below his requirements of foreign currency (if any), with reference to various inputs to the works.
2. Foreign Currency Requirement as percentage of the bid price excluding Provisional Sums _____%.
3. Table of Exchange Rates

Unit of Currency	Equivalent in Pak. Rupees
Australian Dollar	_____
Euro	_____
Japanese Yen	_____
U.K. Pound	_____
U.S. Dollars	_____
_____	_____
_____	_____

**PRICE ADJUSTMENT UNDER CLAUSE 13.8
OF CONDITIONS OF CONTRACT**

A. Weight ages or coefficients are used for price adjustment.

The source of indices and the weightages or coefficients for use in the adjustment formula under Clause 13.8 shall be as follows:

Cost Element	Description	Weight ages	Applicable index
1	2	3	4
(i)	Fixed Portion	0.350	
(ii)	Local Labour		Government of Pakistan (GoP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin.
(iii)	High Speed Dies (HSD)		-do-
(iv)	Common Coags		-do-
(v)	Reinforcing Steel		-do-
(vi)	Pre-Stressing Strands		-do-
(vii)	Bitumen		-do-
(viii)			
	Total	1.000	

Notes:

- 1) Indices for “(ii)” to “(vii)” are taken from the Government of Pakistan Federal Bureau of Statistics, Monthly Statistical Bulletin. The base cost indices or prices shall be those applying 15 days prior to the latest day for submission of bids. Current indices or prices shall be those applying 28 days prior to the last day of the billing period.
- 2) Any fluctuation in the indices or prices of materials other than those given above shall not be subject to adjustment of the Contract Price.
- 3) Fixed portion shown here is for typical road project, procuring agency to determine the weightage of Fixed Portion considering only those cost elements having cost impact of seven (7) percent or more on his specific project.

B When Escalation is allowed on the materials only.

Price adjustment on following items shall be allowed:

Cost Element	Description	Base price	Applicable index
1	2	3	4
(i)	Cement – in bags (50kg bag)		Government of Pakistan (GP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin for Karachi (Lucky Cement)
(ii)	Reinforcing Steel Steel Billet (150x150mm)		Amreli Steel
(iii)	Bitumen 60/70 in Bulk 80/100 in drums		Attock Petroleum Karachi
	Total Three items.		

Notes:

1. The base prices shall be those applying 7 days prior to the latest day for submission of bids. Current indices or prices shall be those applying last 28 days prior to the last day of the billing period.
2. Any fluctuation in the prices of materials other than those given above shall not be subject to adjustment of the Contract Price.

BILL OF QUANTITIES

A Preamble

1. The Bill of Quantities shall be read in conjunction with the Conditions of Contract, Specifications and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work executed and measured by the Contractor and verified by the Engineer and valued at the rates and prices entered in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix as per the Contract (in case of item not mentioned in Bill of Quantities).
3. The rates and prices entered in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the contract include all costs of contractor's plant, labour, supervision, materials, execution, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the contract. Furthermore all duties, taxes and other levies payable by the contractor under the contract, or for any other cause, as on the date 14 days prior to deadline for submission of Bids shall be included in the rates and prices and the total bid price submitted by the bidder.
4. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the contractor will have failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities and shall not be paid separately.
5. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Bill of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of the works.
6. General directions and description of work and materials are not necessarily repeated nor summarised in the Bill of Quantities. References to the relevant sections of the bidding documents shall be made before entering prices against each item in the priced Bill of Quantities.
7. Provisional sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with sub-clause 13.5 of Part I, General Conditions of Contract.

8. The following abbreviations for the units or units of measurement have been used in the bidding documents including BOQ.

Unit	Abbreviations
• Linear Meter	LM or lm or M or m
• Square Meter	Sq.m. or SM or sm
• Cubic Meter	Cu.m. or CM or cm or Cum or cum
• Ton	Ton
• Kilogram	Kg or kg
• Per Number	No or Each
• Job	Job

**IMPROVEMENT/REHABILITATION OF REMAINING PORTION OF ROAD FROM SUJAWAL
TO BADIN (52 Km.)**

NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)

SCHEME NO. I (ADP# 2227/2016-17)

CONTRACT PACKAGE # SCA/EA/CP-X

SUMMARY OF BILLS

BILL NO.	DESCRIPTION	TOTAL (Rs.)
1	EARTHWORK	
2	SUB BASE AND BASE COURSES	
3	SURFACING	
4A	BOX CULVERTS & PIPE CULVERTS	
4B	BRIDGE STRUCTURE 01 (1-30m Span)	
4C	BRIDGE STRUCTURE 02 (21m Span)	
4D	BRIDGE STRUCTURE 03 (21m Span)	
4E	BRIDGE STRUCTURE 04 (12m Span)	
5	DRAINAGE & EROSION WORKS	
6	ANCILLARY WORKS	
7	ENGINEER`S FACILITIES	
SUB-TOTAL BILL 1 - 7		
DAY WORKS		
TOTAL BID PRICE (To Form of Bid)		

SEAL OF THE COMPANY

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SIGNATURE OF BIDDER

**IMPROVEMENT/REHABILITATION OF REMAINING PORTION OF ROAD FROM SUJAWAL
TO BADIN (52 Km.)**

NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)

SCHEME NO. I (ADP# 2227/2016-17)

CONTRACT PACKAGE # SCA/EA/CP-X

BILL OF QUANTITIES

BILL NO.1: EARTHWORK

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
102a	Removal of trees, 150-300 mm girth	Each	50		
103	Stripping	M ³	100		
106a	Excavation and Disposal of Unsuitable Common Material	M ³	196,883		
108a	Formation of Embankment from Roadway Excavation in Common Material	M ³	65,628		
108c	Formation of Embankment from Borrow Excavation in Common Material	M ³	26,156		
109a	Subgrade preparation and earth cut	Sq.m	61,780		
110	Improved Subgrade	M ³	12,652		
	TOTAL BILL NO. 1 EARTHWORK				

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SCHEME NO. I (ADP# 2227/2016-17)**

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BILL OF QUANTITIES

BILL NO. 2: SUB BASE AND BASE COURSES

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
201	Granular Sub-base	M ³	103,127		
202	Aggregate Base course	M ³	94,596		
209b	Scarification of Existing Road Pavement Structure	M ³	360,620		
TOTAL BILL NO. 2 SUB BASE & BASE COURSES					

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NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)

SCHEME NO. I (ADP# 2227/2016-17)

CONTRACT PACKAGE # SCA/EA/CP-X

BILL OF QUANTITIES

BILL NO. 3: SURFACING

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
203b	Asphaltic Base Course Plant mix (class "B")	M ³	30,368		
302b	Bituminous Prime Coat	Sq.m	379,600		
303b	Bituminous Tack Coat	Sq.m	379,600		
304b	Double Surface Treatment	Sq.m	260,000		
305b	Asphaltic Concrete For Wearing Course (Class "B")	M ³	18,980		
	TOTAL BILL NO. 3 SURFACING				

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**NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)
SCHEME NO. I (ADP# 2227/2016-17)**

CONTRACT PACKAGE # SCA/EA/CP-X

BILL OF QUANTITIES

BILL No. 4A: BOX CULVERTS & PIPE CULVERTS

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
510	Dismantling of Structure and Obustraction	Cu.m	3,478		
107e	Structural Backfill using Common Material	Cu.m	4,686		
401a3(i)	Concrete Class A3 (Underground)	Cu.m	2,479		
401a(i)	Extra over for Class A3 Concrete with SR Cement	Cu.m	248		
401f	Lean Concrete	Cu.m	583		
404b	Reinforcement as per AASHTO M31 Grade 60	Ton	296		
509a	Rip Rap Class A	Cu.m	416		
406a(i)	Premoulded Joint Filler with Polysulphide Joint Seal	KG	550		
501o	R.C.C. Pipe Culvert AASHTO M 170 Class IV (Dia 910 mm)	M	140		
	TOTAL BILL No. 4A: BOX CULVERTS & PIPE CULVERTS				

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**IMPROVEMENT/REHABILITATION OF REMAINING PORTION OF ROAD FROM SUJAWAL
TO BADIN (52 Km.)**

NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)

SCHEME NO. I (ADP# 2227/2016-17)

CONTRACT PACKAGE # SCA/EA/CP-X

BILL OF QUANTITIES

BILL NO. 4B: BRIDGE STRUCTURE 01 (1-30m Span)

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
510	Dismantling of Structure and Obstructions	Cu.m	400		
107a	Structural Excavation in Common Material	Cu.m	555		
107d	Granular Backfill	Cu.m	301		
107e	Common Backfill	Cu.m	64		
401a1iii	Concrete Class A1 (Elevated)	Cu.m	61		
401a3iii	Concrete Class A3 (Elevated)	Cu.m	185		
401f	Lean Concrete (Foundatin and / or Girder Casting Bed)	Cu.m	20		
401i	Extra Over Class A1 with SR Cement	Cu.m	3		
404a	Reinforcement as per AASHTO M. 31 Grade 40	Tons	0.20		
404b	REINFORCEMENT as per AASHTO M. 31 Grade 40	Tons	68		
404c	Galvanized Mild Steel	Tons	0.30		
405a	Precast Pre-stressed Concrete Member, Span 30 m	Each	4		
406a(i)	Premoulded Joint Filler with Polysulphide Joint Seal	Cu.m	0.22		
406e	Elastomeric Bearing Pads (According to size and thickness)	Cu.cm	69,120		
407d1	Cast in place Concrete Pile (dia. 760 mm)	M	264		
407h	Pile Load Test up to 240 Ton load	Each	1		
509e	Grouted Rip Rap Class B	Cu.cm	180		
509c	Rip Rap Class C	Cu.cm	180		

Cont.

**IMPROVEMENT/REHABILITATION OF REMAINING PORTION OF ROAD FROM SUJAWAL
TO BADIN (52 Km.)**

NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)

SCHEME NO. I (ADP# 2227/2016-17)

CONTRACT PACKAGE # SCA/EA/CP-X

BILL OF QUANTITIES

BILL NO. 4B: BRIDGE STRUCTURE 01 (1-30m Span)

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
SP-10	Pile Integrity Testing	Each	8		
SP-11	G.I.Pipe Railing (Not Used)	M			
SP-13	PVC sleeve pipes with CAP of dia and wall thickness as shown on drawings.	M	67		
SP-14	Permanent Steel Casing including all fixtures (wall thickness as per drawing)	Tons	4		
SP-15	Bridge Expansion Joint (NFJ OR Equivalent)	M	21		
SP-16	Exploratory / Confirmatory boring and Testing in Dry / Wet Area including Geotechnical Report (4 copies to be submitted)	Job	2		
SP-17	Providing and Fixing drainage Pipe in Bridge Deck with steel Grating (G.I. Pipe of dia as shown on drawings)	M	20		
	TOTAL BILL NO.4B: BRIDGE STRUCTURE				

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TO BADIN (52 Km.)**

NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)

SCHEME NO. I (ADP# 2227/2016-17)

CONTRACT PACKAGE # SCA/EA/CP-X

BILL OF QUANTITIES

BILL NO. 4C: BRIDGE STRUCTURE 02 (21m Span)

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
510	Dismantling of Structure and Obstructions	Cu.m	360		
107a	Structural Excavation in Common Material	Cu.m	330		
107d	Granular Backfill	Cu.m	30		
107e	Common Backfill	Cu.m	230		
401a1ii	Concrete Class A1 (On Ground)	Cu.m	35		
401a1iii	Concrete Class A1 (Elevated)	Cu.m	15		
401a3iii	Concrete Class A3 (Elevated)	Cu.m	125		
401f	Lean Concrete (Foundatin and / or Girder Casting Bed)	Cu.m	15		
401i	Extra Over Class A1 with SR Cement	Cu.m	3		
404a	Reinforcement as per AASHTO M. 31 Grade 40	Tons	0.20		
404b	Reinforcement as per AASHTO M. 31 Grade 60	Tons	43		
404c	Galvanized Mild Steel	Tons	0.30		
405a	Precast Pre-stressed Concrete Member, Span 21 m	Each	4		
406a(i)	Premoulded Joint Filler with Polysulphide Joint Seal	Cu.m	0.20		
406e	Elastomeric Bearing Pads (According to size and thickness)	Cu.cm	48,000		
407d1	Cast in place Concrete Pile (dia. 760 mm)	M	270		
407h	Pile Load Test up to 240 Ton load	Each	1		
509e	Grouted Rip Rap Class B	Cu.cm	165		
509c	Rip Rap Class C	Cu.cm	165		

Cont.

**IMPROVEMENT/REHABILITATION OF REMAINING PORTION OF ROAD FROM SUJAWAL
TO BADIN (52 Km.)**

NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)

SCHEME NO. I (ADP# 2227/2016-17)

CONTRACT PACKAGE # SCA/EA/CP-X

BILL OF QUANTITIES

BILL NO. 4C: BRIDGE STRUCTURE 02 (21m Span)

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
SP-10	Pile Integrity Testing	Each	8		
SP-11	G.I.Pipe Railing (Not Used)	M			
SP-13	PVC sleeve pipes with CAP of dia and wall thickness as shown on drawings.	M	50		
SP-14	Permanent Steel Casing including all fixtures (wall thickness as per drawing)	Tons	4		
SP-15	Bridge Expansion Joint (NFJ OR Equivalent)	M	21		
SP-16	Exploratory / Confirmatory boring and Testing in Dry / Wet Area including Geotechnical Report (4 copies to be submitted)	Job	2		
SP-17	Providing and Fixing drainage Pipe in Bridge Deck with steel Grating (G.I. Pipe of dia as shown on drawings)	M	10		
	TOTAL BILL NO.4C: BRIDGE STRUCTURE				

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**IMPROVEMENT/REHABILITATION OF REMAINING PORTION OF ROAD FROM SUJAWAL
TO BADIN (52 Km.)**

NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)

SCHEME NO. I (ADP# 2227/2016-17)

CONTRACT PACKAGE # SCA/EA/CP-X

BILL OF QUANTITIES

BILL NO. 4D: BRIDGE STRUCTURE 03 (21m Span)

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
510	Dismantling of Structure and Obstructions	Cu.m	360		
107a	Structural Excavation in Common Material	Cu.m	330		
107d	Granular Backfill	Cu.m	30		
107e	Common Backfill	Cu.m	230		
401a.ii	Concrete Class A1 (On Ground)	Cu.m	35		
401a.iii	Concrete Class A1 (Elevated)	Cu.m	15		
401a.iii	Concrete Class A3 (Elevated)	Cu.m	125		
401f	Lean Concrete (Foundatin and / or Girder Casting Bed)	Cu.m	15		
401i	Extra Over Class A1 with SR Cement	Cu.m	3		
404a	Reinforcement as per AASHTO M. 31 Grade 40	Tons	0.20		
404b	Reinforcement as per AASHTO M. 31 Grade 60	Tons	43		
404c	Galvanized Mild Steel	Tons	0.30		
405a	Precast Pre-stressed Concrete Member, Span 21 m	Each	4		
406a(i)	Remoulded Joint Filler with Polysulphide Joint Seal	Cu.m	0.20		
406e	Elastomeric Bearing Pads (According to size and thickness)	Cu.cm	48,000		
407d1	Cast in place Concrete Pile (dia. 760 mm)	M	270		
407h	Pile Load Test up to 240 Ton load	Each	1		
509e	Grouted Rip Rap Class B	Cu.cm	165		
509c	Rip Rap Class C	Cu.cm	165		

Cont.

**IMPROVEMENT/REHABILITATION OF REMAINING PORTION OF ROAD FROM SUJAWAL
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NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)

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CONTRACT PACKAGE # SCA/EA/CP-X

BILL OF QUANTITIES

BILL NO. 4D: BRIDGE STRUCTURE 03 (21m Span)

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
SP-10	Pile Integrity Testing	Each	8		
SP-11	G.I.Pipe Railing (Not Used)	M			
SP-13	PVC sleeve pipes with CAP of dia and wall thickness as shown on drawings.	M	50		
SP-14	Permanent Steel Casing including all fixtures (wall thickness as per drawing)	Tons	4		
SP-15	Bridge Expansion Joint (NFJ OR Equivalent)	M	21		
SP-16	Exploratory / Confirmatory boring and Testing in Dry / Wet Area including Geotechnical Report (4 copies to be submitted)	Job	2		
SP-17	Providing and Fixing drainage Pipe in Bridge Deck with steel Grating (G.I. Pipe of dia as shown on drawings)	M	10		
TOTAL BILL NO.4D: BRIDGE STRUCTURE					

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BILL OF QUANTITIES

BILL NO. 4E: BRIDGE STRUCTURE 04 (12m Span)

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
510	Dismantling of Structure and Obstructions	Cu.m	480		
107a	Structural Excavation in Common Material	Cu.m	450		
107d	Granular Backfill	Cu.m	20		
107e	Common Backfill	Cu.m	175		
401a1ii	Concrete Class A1 (On Ground)	Cu.m	35		
401a1iii	Concrete Class A1 (Elevated)	Cu.m	10		
401a3ii	Concrete Class A3 (On Ground)	Cu.m	175		
401a3iii	Concrete Class A3 (Elevated)	Cu.m	75		
401f	Lean Concrete (Foundatin and / or Girder Casting Bed)	Cu.m	20		
401i	Extra Over Class A1 with SR Cement	Cu.m	3		
404a	Reinforcement as per AASHTO M. 31 Grade 40	Tons	0.10		
404b	Reinforcement as per AASHTO M. 31 Grade 60	Tons	55		
404c	Galvanized Mild Steel	Tons	0.30		
405a	Precast Pre-stressed Concrete Member, Span 21 m	Each	40		
406a(i)	Remoulded Joint Filler with Polysulphide Joint Seal	Cu.m	0.20		
406e	Elastomeric Bearing Pads (According to size and thickness)	Cu.cm	36,000		
407d1	Cast in place Concrete Pile (dia. 760 mm)	M	240		
407h	Pile Load Test up to 240 Ton load	Each	1		
509e	Grouted Rip Rap Class B	Cu.cm	75		
509c	Rip Rap Class C	Cu.cm	75		

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**IMPROVEMENT/REHABILITATION OF REMAINING PORTION OF ROAD FROM SUJAWAL
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NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)

SCHEME NO. I (ADP# 2227/2016-17)

CONTRACT PACKAGE # SCA/EA/CP-X

BILL OF QUANTITIES

BILL NO. 4E: BRIDGE STRUCTURE 04 (12m Span)

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
SP-10	Pile Integrity Testing	Each	12		
SP-11	G.I.Pipe Railing (Not Used)	M			
SP-13	PVC sleeve pipes with CAP of dia and wall thickness as shown on drawings.	M	30		
SP-15	Bridge Expansion Joint (NFJ OR Equivalent)	M	21		
SP-16	Exploratory / Confirmatory boring and Testing in Dry / Wet Area including Geotechnical Report (4 copies to be submitted)	Job	1		
SP-17	Providing and Fixing drainage Pipe in Bridge Deck with steel Grating (G.I. Pipe of dia as shown on drawings)	M	8		
TOTAL BILL NO.4E: BRIDGE STRUCTURE					

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BILL OF QUANTITIES

BILL NO. 5: DRAINAGE & EROSION WORKS

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
107a	Structural Excavation In Common Material	M ³	3,855		
509b	Rip Rap Class B	Cu.m	16,962		
509h	Filter Layer of Granular Material	M ³	6,939		
	TOTAL BILL NO. 5: DRAINAGE & EROSION WORKS				

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BILL OF QUANTITIES

BILL NO. 6: ANCILLARY WORKS

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
604 a	Metal Beam Guard Rail I/C End Pice And Post	M	10,280		
607 a	Traffic Road Sign				
	a) Category 1	Each	208		
	b) Category 2	Each	208		
	c) Category 3A	Each	156		
	d) Category 3B	Each	156		
	e) Category 3C	Sq.m	104		
608 i1	Pavement Marking In Reflective Tp Paint For Lines of 15 Cm Width				
	i) White Lines	M	17,333		
	ii) Yellow Lines	M	104,000		
609 di	Reflectorized Pavement Stud (Raised Profile Type - Double)	Each	17,333		
TOTAL BILL NO. 6: ANCILLARY WORKS					

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BILL OF QUANTITIES

BILL NO. 7: ENGINEER'S FACILITIES

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
SP-3					
(a)	Provide Engineer's Central Office (Rental)	Per Month.			
(b)	Equip and Furnish Engineer's Office	P. S.			
SP-4	Provide Engineer's Housing				
(a)	Provision of residential accomodation for Senior Staff (Rental)	Per Month			
(b)	Provision of residential accomodation for Junior Staff (Rental)	Per Month			
(c)	Provide Furnishing and Equipment for Engineer's Housing	P. S.			
SP-5					
(a)	Provide Engineer's Laboratory on Rental Basis	Per Month.			
(b)	Provide New Equipment & Furniture for Engineer's Laboratory	P.S			
SP-6	Maintain Engineer's Office, Housing and Laboratory				
a	Maintain Engineer's Office	Per Month			
b	Maintain Engineer's Housing for Senior Staff	Per Month			
c	Maintain Engineer's Housing for Junior Staff	Per Month			
d	Maintain Engineer's Laboratory	Per Month			
SP-7					
a	Provide New Survey Equipment	P.S			
b	Maintain Survey Equipment	Per Month			
SP-8					
a	Providing Engineer's Vehicles (Rental Basis)				
	Toyota Fortuner Fully Loaded with A/C (Automatic) (01 No.)	Per Month	24		
	Toyota Corolla GLI with A/C (Automatic) (01 No.)	Per Month	24		

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**IMPROVEMENT/REHABILITATION OF REMAINING PORTION OF ROAD FROM SUJAWAL
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NEAR KHORE WAH TO START OF BADIN BYPASS (KM. 27+750 TO KM 79+750)

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BILL OF QUANTITIES

BILL NO. 7: ENGINEER'S FACILITIES

Item No.	Item Description	Unit	Estimated Quantities	Rate (Rs.)	Amount (Rs.)
SP-9	Suzuki Cultus with A/C and CNG...(02 No.)	Per Month	48		
	Suzuki Bolan A/C and CNG...(01 No.)	Per Month	24		
	b Maintain Engineer's Vehicles				
	Toyota Fortuner Fully Loaded with A/C (Automatic)...(01 No.)	Per Month	24		
	Toyota Corolla GLI with A/C (Automatic)...(01 No.)	Per Month	24		
	Suzuki Cultus with A/C and CNG...(02 No.)	Per Month	48		
	Suzuki Bolan A/C and CNG...(01 No.)	Per Month	24		
	a Provide, furnish, equip Engineer’s Site Office	N/A			
	b Maintenance of Engineer’s Office	N/A			
TOTAL BILL NO. 7 : Bill of Quantities					

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BILL OF QUANTITIES

C. Day work Schedule

General

1. Reference is made to Sub-Clause 13.6 of the General Conditions of Contract. Work shall not be executed on a day work basis except by written order of the Engineer. Bidders shall enter basic rates for day work items in the Schedules, which rates shall apply to any quantity of day work ordered by the Engineer. Nominal quantities have been indicated against each item of day work, and the extended total for day work shall be carried forward to the bid price.

Day work Labour

2. In calculating payments due to the contractor for the execution of day work, the actual time of classes of labour directly doing the day work ordered by the Engineer and for which they are competent to perform will be measured excluding meal breaks and rest periods. The time of gangers (charge hands) actually doing work with the gang will also be measured but not the time of foreman or other supervisory personnel.
3. The contractor shall be entitled to payment in respect of the total time that labour is employed on day work, calculated at the basic rates entered by him in the Schedule of day work Rates for labour together with an additional percentage, payment on basic rates representing the contractor's profit, overheads, etc., as described below:
 - a) the basic rates for labour shall cover all direct costs to the contractor, including (but not limited to) the amount of wages paid to such labour, transportation time, overtime, subsistence allowances and any sums paid to or on behalf of such labour for social benefits in accordance with Pakistan law. The basic rates will be payable in local currency only; and
 - b) the additional percentage payment to be quoted by the bidder and applied to costs incurred under (a) above shall be deemed to cover the contractor's profit, overheads, superintendence, liabilities and insurances and allowances to labour timekeeping and clerical and office work; the use of consumable stores, water, lighting and power; the use and repair of staging, scaffolding, workshops and stores, portable power tools, manual plant and tools; supervision by the contractor's staff, foremen and other supervisory personnel; and charges incidental to the foregoing.

SCHEDULE OF DAYWORK RATES**I. Labour**

Item No.	Description	Unit	Nominal Quantity	Rate (Rs) in Figure	Rate (Rs) in Words	Extended Amount (Rs.)
1	2	3	4	5	6	7
D101	Labour	Hr	10			
D102	Foremen	Hr	10			
D103	LTV Driver	Hr	10			
D104	HTV Operator	Hr	10			
	Sub Total					
	Allow _____ percent of subtotal for Contractor's overhead, profit, etc, in accordance with Paragraph 3(b) of Day work Schedule _____					
	Total for Day work: Labour : _____					
	(Carried forward to Day work Summary)					

Note: Input of other staff shall be included in overhead of Contractor.

Day work Material

4. The contractor shall be entitled to payment in respect of materials used for day work (except for materials for which the cost is included in the percentage addition to labour costs as detailed heretofore), at the basic rates entered by him in the Schedule of Day work Rates for materials together with an additional percentage payment on the basic rates to cover overhead charges and profit, as follows:
 - a) the basic rates for materials shall be calculated on the basis of the invoiced price, freight, insurance, handling expenses, damage, losses, etc., and shall provide for delivery to store for stockpiling at the site. The basic rates shall be stated in local currency but payment will be made in the currency or currencies expended upon presentation of supporting documentation;
 - b) the additional percentage payment shall be quoted by the bidder and applied to the equivalent local currency payments made under Sub-Para(a) above; and
 - c) the cost of hauling materials used on work ordered to be carried out as Day work from the store or stockpile on the site to the place where it is to be used will be paid in accordance with the terms for Labour and Constructional Plant in this Schedule.

SCHEDULE OF DAYWORK RATES**II. Materials**

Item No.	Description	Unit	Nominal Quantity	Rate (Rs) in Figure	Rate (Rs) in Words)	Extended Amount (Rs.)
1	2	3	4	5	6	7
D201	Fill (earth) of suitable quality	Cum	5			
D202	Sand for filling	Cum	5			
D203	Sub-Base	Cum	5			
D204	Aggregate Base Course	Cum	5			
D205	Asphalt Base Course	Cum	5			
D206	Asphalt Wearing Course	Cum	5			
D207	Bitumen grade 60/70	Ton	5			
D208	Bitumen grade 80/100	Ton	5			
D209	Cement (SR) in bags	M:Ton	2			
D210	Cement, ordinary Portland or equivalent in bags	M:Ton	2			
D211	Fine aggregate for concrete	Cum	10			
D212	Coarse aggregates for concrete	Cum	10			
D213	Lean Concrete	Cum	5			
D214	Concrete Class B	Cum	5			
D213	Grade 60 reinforcing bar	M:Ton	5			
D214	Traffic Signs, Barricade etc	Each	5			
	Sub Total					
	Allow _____ percent of subtotal for Contractor's overhead, profit, etc., in accordance with Paragraph 4(b) of Day work Schedule _____					
	Total for Day work: Materials _____					
	(Carried forward to Day work Summary)					

Day Work Constructional Plant

5. The contractor shall be entitled to payments in respect of constructional plant already on site and employed on Day work at the basic rental rates entered by him in the Schedule of Day work Rates for constructional plant. The said rates shall be deemed to include complete allowance for depreciation, interest, indemnity and insurance, repairs, maintenance, supplies, fuel, lubricants, and other consumables, and all overhead, profit and administrative costs related to the use of such equipment. The cost of drivers, operators and assistants will be paid for separately as described under the section on Day work Labour.
6. In calculating the payment due to the Contractor for constructional plant employed on Day work, only the actual number of working hours will be eligible for payment, except that where applicable and agreed with the Engineer, the travelling time from the part of the site where the constructional plant was located when ordered by the Engineer to be employed on Day work and the time for return journey thereto shall be included for payment.
7. The basic rental rates for constructional plant employed on Day work shall be stated in Pakistani Rupees.

SCHEDULE OF DAYWORK RATES**III. Constructional Plant**

Item No.	Description	Unit	Nominal Quantity	Rate (Rs.) in Figure	Rate Rs.) in Words	Extended Amount (Rs.)
1	2	3	4		5	6
D301	Bulldozer, 200 HP	Hr.	1			
D302	Motor Grader, 140HP	Hr.	1			
D303	Vibratory Roller, 10-12 Ton	Hr.	1			
D304	Pneumatic Roller, 18-21 Ton	Hr.	1			
D305	Tandem Roller, 8-12 Ton	Hr.	1			
D306	Wheel Loader, 2.5 Cum	Hr.	1			
D307	Plate Compactor, 11 HP (230 KG)	Hr.	1			
D308	Dump Truck, 18 Ton	Hr.	1			
D309	Dump Truck, 10 Ton	Hr.	1			
D310	Excavator, 105 HP	Hr.	1			
D311	Water Tanker, 10,000 Ltr	Hr.	1			
D312	Aggregate Crushing & Screening Plant, 45 Ton/hr	Hr.	1			
D313	Asphalt Plant, 120 Ton/hr	Hr.	1			
D314	Asphalt Distributor, 3,000 Ltr	Hr.	1			
D315	Asphalt Paver, 145 HP(3-6 m wide)	Hr.	1			
D316	Concrete Batching Plant (30 cum/hr)	Hr.	1			
D317	Wheel Tractor, 80 HP	Hr.	1			
D318	Concrete Transit Mixer, 6 Cum	Hr.	1			
D319	Concrete Vibrator, 5 HP	Hr.	1			
D320	Road Marking Machine, Heavy Duty	Hr.	1			

Item No.	Description	Unit	Nominal Quantity	Rate (Rs.) in Figure	Rate Rs. in Words	Extended Amount (Rs.)
D321	Concrete Mixer	Hr.	1			
D322	Air Compressor, 300 CFM	Hr.	1			
D323	Pneumatic Jack Hammer	Hr.	1			
D324	Crane 25 Ton	Hr.	1			
D325	Water Pump, 4" delivery	Hr.	1			
D326	Concrete Pump	Hr.	1			
D327	Tractor Trolley	Hr.	1			
D328	1000 – 1300 cc Car	Hr.	1			
D329	Single Cabin	Hr.	1			
D330	Double Cabin	Hr.	1			
	Total for day work: Constructional Plant _____ (Carried forward to day work summary)					

DAYWORK**Summary (Day work)**

		Amount (Rs.)
(I)	Total for day work: Labour	_____
(II)	Total for day work: Materials	_____
(III)	Total for day work: Constructional Plant	_____
Total for day work (Carried forward to summary page of Bill of Quantities)		_____

PROPOSED CONSTRUCTION SCHEDULE

Pursuant to Sub-Clause 8.2 of the General Conditions of Contract, the works shall be completed on or before the date stated in Appendix-A to Bid. The bidder shall provide as Appendix-E to Bid, the Construction Schedule in the bar chart (CPM, PERT or any other to be specified herein) showing the sequence of work items and the period of time during which he proposes to complete each work item in such a manner that his proposed programme for completion of the whole of the works may meet procuring agency's completion targets in days noted below and counted from the date of receipt of Engineer's Notice to Commence (Attach sheets as required for the specified form of Construction Schedule):

METHOD OF PERFORMING THE WORK

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

1. Organization Chart indicating head office and field office personnel involved in management and supervision, engineering, equipment maintenance and purchasing.
2. Mobilization at site, the type of facilities including personnel accommodation, office accommodation, provision for maintenance and for storage, communications, security and other services to be used.
3. The method of executing the works, the procedures for installation of equipment and machinery and transportation of equipment and materials to the site.

Safety Plan

The Bidder is required to submit an outline Construction Safety and Health Plan for this particular Project. The outline Safety and Health Plan shall be in accordance with the requirements of relevant decrees and/or bye laws governing Occupational Safety and Health Programme in the construction industry being implemented in the Islamic Republic of Pakistan, and shall cover the following topics:

1. Organizational structure for handling all Safety and Health Matters
2. Composition of the Contractor's Construction Safety and Health Committee
3. Specific Safety Policies which the Contractor will undertake to observe and maintain
4. Provision of Protective Equipment
5. Safety Personnel
6. Emergency Occupational Health Personnel and Facilities
7. Worker's Welfare Facilities
8. Emergency Procedures

Award of the Contract to the Bidder shall not be deemed to mean that the outline Construction Safety and Health Plan is considered acceptable, and the Engineer shall be at liberty to instruct the Contractor to implement such safety and health procedures as he may deem necessary.

LIST OF MAJOR EQUIPMENT – RELATED ITEMS

[The bidder will provide on Sheet 2 of this Appendix a list of all major equipment and related items, under separate heading for items owned, to be purchased or to be arranged on lease by him to mobilize at site to carry out the works. The information shall include make, type, capacity, and anticipated period of utilization for all equipment which shall be in sufficient detail to demonstrate fully that the equipment will meet all requirements of the Specifications.]

Equipment Type and Characteristics		Minimum Number required	Proposed by the Bidder
1	Bulldozer	4	
2	Motor Grader	4	
3	Vibratory Roller	4	
4	Pneumatic Roller	4	
5	Tandem Roller	3	
6	Wheel Loader	4	
7	Dump Truck	10	
8	Dump Truck	18	
9	Excavator	4	
10	Water Tanker	4	
11	Asphalt Plant	1	
12	Asphalt Paver	2	
13	Concrete Batching Plant	2	
14	Concrete Transit Mixer	6 Cum	
15	Crane	25 Ton	
16	Concrete Pump		

LIST OF MAJOR EQUIPMENT (SAMPLE)

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

CONSTRUCTION CAMP AND HOUSING FACILITIES

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

The contractor shall be responsible for pumps, electrical power, water and electrical distribution systems, and sewerage system including all fittings, pipes and other items necessary for servicing the contractor's construction camp.

The bidder shall list or explain his plans for providing these facilities for the service of the contract as follows:

1. Site Preparation (clearing, land preparation, etc.).
2. Provision of Services.
 - a) Power (expected power load, etc.).
 - b) Water (required amount and system proposed).
 - c) Sanitation (sewage disposal system, etc.).
3. Construction of Facilities
 - a) Contractor's Office. Workshop and Work Areas (areas required and proposed layout, type of construction of buildings, etc.).
 - b) Warehouses and Storage Areas (area required, type of construction and layout).
 - c) Housing and Staff Facilities (Plans for housing for proposed staff, layout, type of construction, etc.).
4. Construction Equipment Assembly and Preparation (detailed plans for carrying out this activity).
5. Other Items Proposed (Security services, etc.).

LIST OF SUBCONTRACTORS

I/We intend to subcontract the following parts of the work to subcontractors. In my/our opinion, the subcontractors named hereunder are reliable and competent to perform that part of the work for which each is listed.

Enclosed are documentation outlining experience of subcontractors, the curriculum vitae and experience of their key personnel who will be assigned to the contract, equipment to be supplied by them, size, location and type of contracts carried out in the past.

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

ESTIMATED PROGRESS PAYMENTS (SAMPLE)

Bidder's estimate of the value of work which would be executed by him during each of the periods stated below, based on his Programme of the works and the Rates in the Bill of Quantities, expressed in Pakistani Rupees:

Quarter/ Year/ Period	Amounts (in million)
1	2
Ist Quarter	
2nd Quarter	
3rd Quarter	
Bid Price	

**ORGANIZATION CHART
FOR THE
SUPERVISORY STAFF AND LABOUR**

(To be filled in by the bidder)

PROPOSED STAFF

(Detailed CVs of following Key staff shall be provided, it is mandatory. PEC registration Certificate and qualification certificates/degrees etc shall also be provided. It will be mandatory for successful bidder to mobilize same staff as proposed below after the approval of the Engineer. The proposed staff must be employee of the bidder)

Position	Qualification & Experience	Proposed Staff			
		Name	Qualification	Total Exp.	Relevant. Rxp
Project Manager	Qualification Msc (Civil) with 7 years experience (3 years relevant experience) or BE (Civil) with 15 years experience (8 years relevant experience)				
Planning Engineer	BE (Civil) with 10 years experience				
Contracts Engineer	BE (Civil) with 15 years experience				
Structures Engineers	BE (Civil) with 15 years experience with 10 years relevant experience of bridges				
Highway Engineer	BE (Civil) with 15 years experience with 10 years relevant experience of roads				
Material Engineer	Msc (Geology) with 15 years experience				
Site Engineers	BE (Civil), with 8 years experience, Experience 3 bridges assignments,				
Site Engineers	BE (Civil), with 8 years experience, Experience 3 highway assignments,				
Sr. Surveyors	Diploma in Civil, Number (01), 10 years experience, Experience 3 years highway project				
Surveyor	Diploma in Civil, Number (04), 5 years experience, Experience 1 year similar projects				
Quantity Surveyor	Diploma in Civil, Number (01), 10 years experience, Experience 3 years similar projects				

(INTEGRITY PACT)

DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC; PAYABLE BY CONTRACTORS.

(FOR CONTRACTS WORTH RS. 10.00 MILLION OR MORE)

Contract No. _____ Dated _____

Contract Value: _____

Contract Title: _____

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

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

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

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

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

.....
[Procuring Agency]

[Contractor]

FORMS

**BID SECURITY
PERFORMANCE SECURITY
CONTRACT AGREEMENT
MOBILIZATION ADVANCE GUARANTEE
INDENTURE BOND FOR SECURED ADVANCE**

Security Executed on _____

(Date)

Name of Surety (Bank) with Address: _____

(Scheduled Bank in Pakistan)

Name of Principal (Bidder) with Address _____

Penal Sum of Security Rupees. _____ (Rs. _____)

Bid Reference No. _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the bid and at the request of the said Principal (Bidder) we, the Surety above named, are held and firmly bound unto _____

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

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Bidder has submitted the accompanying bid dated _____ for Bid No. _____ for _____ (Particulars of Bid) to the said Procuring Agency; and

WHEREAS, the Procuring Agency has required as a condition for considering said bid that the **bidder** furnishes a bid security in the above said sum from a Scheduled Bank in Pakistan or from a foreign bank duly counter-guaranteed by a Scheduled Bank in Pakistan, to the procuring agency, conditioned as under:

- (1) that the bid security shall remain in force up to and including the date 28 days after the deadline for validity of bids as stated in the Instructions to bidders or as it may be extended by the procuring agency, notice of which extension(s) to the Surety is hereby waived;
- (2) that the bid security of unsuccessful bidders will be returned by the procuring agency after expiry of its validity or upon signing of the Contract Agreement; and
- (3) that in the event of failure of the successful bidder to execute the proposed Contract Agreement for such work and furnish the required Performance Security, the entire said sum be paid immediately to the said procuring agency pursuant to Clause 15.6 of the Instruction to bidders for the successful bidder's failure to perform.

NOW THEREFORE, if the successful bidder shall, within the period specified therefore, on the prescribed form presented to him for signature enter into a formal Contract with the said procuring agency in accordance with his bid as accepted and furnish within twenty eight (28) days of his being requested to do so, a Performance Security with good and sufficient surety, as may be required, upon the form prescribed by the said procuring agency for the faithful performance and proper fulfilment of the said Contract or in the event of non-withdrawal of the said bid within the time specified for its validity then this obligation shall be void and of no effect, but otherwise to remain in full force and effect.

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

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

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

SURETY (Bank)

WITNESS:

Signature _____

1. _____

Name _____

Title _____

Corporate Secretary (Seal)

Corporate Guarantor (Seal)

2. _____

Name, Title & Address

FORM OF PERFORMANCE SECURITY
(Bank Guarantee)

Guarantee No. _____
Executed on _____
Expiry date _____

[Letter by the Guarantor to the Procuring Agency]

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

Name of Principal (Contractor) with address: _____

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

Letter of Acceptance No. _____ Dated _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the bidding documents and above said Letter of Acceptance (hereinafter called the Documents) and at the request of the said Principal we, the Guarantor above named, are held and firmly bound unto the _____ (hereinafter called the procuring agency) in the penal sum of the amount stated above for the payment of which sum well and truly to be made to the said procuring agency, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

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

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the procuring agency, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract and of any and all modifications of 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 11, Defects Liability, of Conditions of Contract are fulfilled.

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

We, _____ (the Guarantor), waiving all objections and defences under the Contract, do hereby irrevocably and independently guarantee to pay to the procuring agency without delay upon the procuring agency's first written demand without cavil or arguments and without requiring the procuring agency to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the

procuring agency's written declaration that the Principal has refused or failed to perform the obligations under the Contract which payment will be effected by the Guarantor to Procuring Agency's designated Bank & Account Number.

PROVIDED ALSO THAT the procuring agency shall be the sole and final judge for deciding whether the Principal (Contractor) has duly performed his obligations under the Contract or has defaulted in fulfilling said obligations and the Guarantor shall pay without objection any sum or sums up to the amount stated above upon first written demand from the procuring agency forthwith and without any reference to the Principal or any other person.

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

Witness:

1. _____

Corporate Secretary (Seal)

2. _____

Name, Title & Address

Guarantor (Bank)

Signature _____

Name _____

Title _____

Corporate Guarantor (Seal)

FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the _____ day of _____ (month), 20____ between _____ (hereafter called the "Procuring Agency") of the one part and _____ (hereafter called the "Contractor") of the other part.

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

NOW this Agreement witnesseth-- as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents after incorporating addenda, if any, except those parts relating to Instructions to bidders shall be deemed to form and be read and construed as part of this Agreement, viz:
 - (a) The Contract Agreement;
 - (b) The Letter of Acceptance;
 - (c) The completed Form of Bid;
 - (d) Special Stipulations (Appendix-A to Bid);
 - (e) The Special Conditions of Contract – Part II;
 - (f) The General Conditions – Part I;
 - (g) The completed Appendices to Bid (B, C, E to L);
 - (h) The Drawings;
 - (i) Special provisions
 - (j) Addenda to NHA General Specifications 1998
 - (i) The NHA General Specifications
 - (j) The Ppriced Bill of Quantities (Appendix-D to Bid);
 - (k) _____ (any other)
3. In consideration of the payments to be made by the procuring agency to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the procuring agency to execute and complete the works and remedy defects therein in conformity and in all respects with the provisions of the contract.
4. Procuring agency hereby covenants to pay the contractor, in consideration of the execution and completion of the works as per provisions of the contract, the contract Price or such other sum as may become payable under the provisions of the contract at the times and in the manner prescribed by the contract.

IN WITNESS WHEREOF the parties hereto have caused this Agreement to be executed on the day, month and year first before written in accordance with their respective laws.

Signature of the Contactor

(Seal)

Signature of Procuring Agency

(Seal)

Signed, Sealed and Delivered in the presence of:

Witness:

(Name, Title and Address)

Witness:

(Name, Title and Address)

MOBILIZATION ADVANCE GUARANTEE

Bank Guarantee No. _____ Date _____

WHEREAS _____ (hereinafter called the 'Procuring Agency') has entered into a Contract for _____

(Particulars of Contract)
with _____ (hereinafter called the "Contractor").

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

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

AND WHEREAS, _____
(Scheduled Bank in Pakistan)

(hereinafter called the "Guarantor") at the request of the Contractor and in consideration of the **procuring agency** agreeing to make the above advance to the Contractor, has agreed to furnish the said Guarantee.

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

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

This Guarantee shall remain in force until the advance is fully adjusted against payments from the Interim Payment Certificates of the Contractor or until _____ whichever is earlier.

(Date)

The Guarantor's liability under this Guarantee shall not in any case exceed the sum of Rupees _____ (Rs _____).

This Guarantee shall remain valid up to the aforesaid date and shall be null and void after the aforesaid date or earlier if the advance made to the Contractor is fully adjusted against payments from Interim Payment Certificates of the Contractor provided that the Guarantor agrees that the aforesaid period of validity shall be deemed to be extended if on the above mentioned date the advance payment is not fully adjusted.

GUARANTOR

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

WITNESS

1. _____

Corporate Secretary (Seal)

2. _____
(Name Title & Address)

Corporate Guarantor (Seal)

Condition of Contract

Federation International des Ingenieurs-Conseils, or FIDIC)

- (a) **Part I - General Conditions of Contract**
- (b) **Part II - Special Conditions of Contract**

Notes on the Conditions of Contract

The Conditions of Contract comprise two parts:

(a) Part I - General Conditions of Contract

(b) Part II - Special Conditions of Contract

Over the years, a number of “model” General Conditions of Contract have evolved. The one used in these Standard Bidding Documents was prepared by the International Federation of Consulting Engineers (Federation Internationale des Ingenieurs-Conseils, or FIDIC), and is commonly known as the FIDIC Conditions of Contract. (The used version is the harmonized Edition March 2006).

The FIDIC Conditions of Contract have been prepared for an ad measurement (unit price or unit rate) type of contract, and cannot be used without major modifications for other types of contract, such as lump sum, turnkey, or target cost contracts.

The standard text of the General Conditions of Contract chosen must be retained intact to facilitate its reading and interpretation by bidders and its review by the procuring agency. Any amendments and additions to the General Conditions, specific to the contract in hand, should be introduced in the Particular Conditions of Contract.

The use of standard conditions of contract for all civil works will ensure comprehensiveness of coverage, better balance of rights or obligations between procuring agency and Contractor, general acceptability of its provisions, and savings in time and cost for bid preparation and review, leading to more economic prices.

The FIDIC Conditions of Contract are copyrighted and may not be copied, faxed, or reproduced. Without taking any responsibility of its being accurate, Pakistan Engineering Council with prior consent of FIDIC Secretariat, has reproduced herein the FIDIC General Conditions of Contract for reference purpose only which cannot be used by the users for preparing their bidding documents. The bidding document may include a purchased copy, the cost of which can be retrieved as part of the selling price of the bidding document. Alternatively, the FIDIC Conditions of Contract can be referred to in the bidding documents, and the bidders are advised to obtain copies directly from FIDIC

Copies of the FIDIC Conditions of Contract can be obtained from:

FIDIC CASE POSTALE, CH-1215 Switzerland;

Tel. +41 22 799 49 00;

Fax; +41 22 799 49 01

E-mail: fidic@fidic.org.

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1.1	Definitions
1.1.1.4	“Form of Bid” is synonymous with “Letter of Tender”.
1.1.1.5	“Bid” is synonymous with “Tender”.
1.1.1.8	“The word ‘Tender’ is synonymous with ‘Bid’, and the words ‘Bidding’ with ‘Tendering’ and the words ‘Appendix to Tender’ with ‘Appendix to Bid’ and words ‘Tender Documents’ with ‘Bid Documents’”.
1.1.1.11	Insert this Sub Clause “Programme” means the programme to be submitted by the contractor in accordance with Sub-Clause 8.3 and any approved revisions thereto.
1.1.2.2	“Employer” is synonymous with “Procuring Agency” The Employer is: Director General Sindh Coal Authority House No 16, E Street, Behind Zamzama Park, DHA Phase V, Karachi. Telephone No: 021-99251059 Fax No: 021-99251038 Employer’s Representative, Chief Engineer, SCA
1.1.2.4	The Engineer is: EA Consulting (Pvt) Limited Al-9, 15 th Lane, Khayaban-e-Hilal, Phase VII, DHA Karachi.
1.1.2.9	“DB” is synonymous with “Committee”
1.1.3.1	“Replace 28 days with 7 days”
1.1.3.7	“Defects Notification Period is synonymous with Defects Liability Period”
Sub-Clause 1.5 Priority of Documents	<i>Replace sequence of priority of documents with the following:</i> (a) the Contract Agreement (if completed), (b) the Letter of Acceptance, (c) the Tender including Letter of Bid, Appendix to Bid, Annexure, and tables excluding Appendix D Bill of Quantities”., (d) the Particular Conditions – Part A, (Special Stipulations Appendix A) (e) the Particular Conditions – Part B (f) the General Conditions

	<ul style="list-style-type: none"> (g) the Drawings, (h) the Addenda to Specification (i) Special Provisions (j) Specification, (k) the Appendix D, Bill of Quantities and (l) the Schedules and any other documents forming part of the Contract.
Sub-Clause 1.6 Contract Agreement	<i>Replace the word “Employer” with “Contractor” in last line</i>
Sub-Clause 1.15 Inspections and Audit by the Bank	This Sub-Clause is deleted entirely.
Sub-Clause 2.4 Employer’s Financial Arrangements	This Sub-Clause is deleted entirely.
Sub-Clause 3.1 Engineer’s Duties and Authority	<p><i>The following paragraph is added after duties:</i></p> <p>Procuring agency shall ensure that the Engineer’s Representative/Staff is a professional engineer as defined in the Pakistan Engineering Council Act 1975 (V of 1976)</p> <p><i>Replace part of Clause after the sentence “The following provisions shall apply” with following:</i></p> <p>The Engineer shall obtain the specific approval of the Employer before taking action under the following Sub Clauses of these conditions:</p> <ul style="list-style-type: none"> a) Sub-Clauses 1.9, 2.1, 4.7, 4.12, 4.24, 7.4, 8.4, 8.5, 8.9, 10.3, 13.7, and 19.4: Agreeing or determining an extension of time and / or additional cost. b) Approving subletting of any part of the Works under Clause 4.4. c) Sub-Clause 8.8: Instructing suspension of Works; d) Sub-Clause 10.1: Issuing Taking Over Certificate e) Sub-Clause 10.2: Issuing Taking Over Certificates f) Sub-Clause 11.9: Issuing Performance Certificate(s) g) Sub Clause 13.1: Instructing a Variation, except; <ul style="list-style-type: none"> i) in an emergency situation as determined by the Engineer, or ii) if such Variation would increase the Accepted Contract Amount not more than 1% cumulatively of such Amount. h) Sub-Clause 13.3: Approving a proposal for Variation submitted by the Contractor in accordance with Sub Clause 13.1 or 13.2. i) Sub Clause 13.4: Specifying the amount payable in each of the applicable currencies j) Sub-Clause 13.7: Before Adjustment for Changes in Legislation k) Sub-Clause 13.8: Before Adjustment for Changes in Cost l) Sub-Clause 20.1: Approving Claims of the Contractor (Time / Financial) under Clause 20.1 and accepting principles of the Claims

	<p>Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of Works or adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Employer.</p>
<p>Sub-Clause 3.6 Management Meetings</p>	<p><i>Insert this Sub Clause at the end of Clause 3</i></p> <p>“The Engineer or the Contractor’s Representative may require the other to attend a management meeting in order to review the progress with reference to the agreed program and arrangements for future works. The Engineer shall record the business of management meetings and supply copies of the record to those attending the meeting and to the Employer. In the record, responsibilities for any actions to be taken shall be in accordance with the Contract”.</p>
<p>Sub-Clause 4.1. Contractor’s General Obligation</p>	<p><i>Add following at the end of Sub-Clause 4.1:</i></p> <p>The Contractor shall prepare and submit one complete set of "As-Built" Documents on one master CD and two complete sets of print copies of "As-Built" Documents together with the back-up of the quantity calculation to the Engineer within 28 days after the date of taking over by Employer. These “As-Built” Documents shall indicate all approved changes made during construction, superimposed on the original plans / “As-Staked Documents”.</p> <p>The final measured quantities for all pay items shall be included on all "As-Built" Documents. These "As-Built" Documents shall be prepared continuously as execution of the Works progresses and shall be submitted to the Engineer for review as sections or parts of the Project are completed. No Taking-Over Certificate for a Sector or the whole of Works shall be issued to the Contractor by the Engineer without the approved "A</p> <p>s-Built" Documents. The preparation of the "As-Built" Documents shall be at the expense of the Contractor, payment for which is subsidiary to the pay items of the Contract.</p> <p>The review and approval by the Engineer or by the Employer of the "As-Built" Documents does not relieved the Contractor of any responsibility for and/or liabilities arising out of inaccurate, false or otherwise incorrect "As-Built" Documents prepared and submitted by the Contractor. The approved “As-Built Documents” shall be reproduced by the Contractor in four (4) hard copies and one (1) soft copies and return the same to the Employer.</p> <p>Shop Drawings. The Contractor shall furnish to the Engineer all Contractor's, and Subcontractor's Shop Drawings. Shop Drawings shall be deemed to include design drawings, fabrication drawings,</p>

	<p>catalogue cuts, brochures, illustrations, material lists, design calculations, reference standards and performance data which may be required by the specification necessary for the proper execution of the Work, or as otherwise required by the Engineer for assurance that there is intent to meet the requirements of the specifications. All Shop Drawings shall be in English.</p> <p>The Contractor shall submit all Shop Drawings to the Engineer in the manner hereinafter described, in sufficient time to prevent delays in the delivery of materials or in the progress or completion of the work. Regardless of the source of Shop Drawings, all submissions shall be deemed to be submissions by the Contractor under the Contract.</p> <p>All Subcontractors' Shop Drawings shall first be sent directly to the Contractor. The Contractor shall thoroughly check all such Shop Drawings for measurements, sizes of members, materials and all other details, to assure him that the Shop Drawings conform to the intent of the Drawings and Specifications.</p> <p>The Contractor shall return to the Subcontractors for correction, such Shop Drawings that are found inaccurate or otherwise in error. After the Contractor has checked and approved such Shop Drawings he shall place thereon the date of such approval and the legible signature of the checker, and shall then submit them to the Engineer for review. The Engineer may refuse to check or review any Shop Drawings that are not submitted in compliance with the foregoing requirements.</p> <p>The Contractor shall submit five (5) copies of Shop Drawings plus the number that the Contractor wishes to return for his own and his Subcontractor's use.</p> <p>For all Equipment, Shop Drawings shall be completed in all respects and shall show clear compliance with the Specifications. Where applicable, performance figures of equipment, finishes and reference to other relevant drawings must be noted on the Shop Drawings. Details of ancillary items being supplied with the particular equipment must be submitted. Piecemeal submissions will not be considered.</p> <p>Descriptive brochures that are applicable shall be included for information. Any notation on the Shop Drawings which is on the prints and not on the original from which the prints were made shall be in GREEN INK.</p> <p>The Engineer will review submitted Shop Drawings within a reasonable time and will return them stamped with "NO COMMENT", "SEE COMMENTS" or "RESUBMIT".</p> <p>The Engineer may, at his discretion, require an immediate re-submission of Shop Drawings noted "SEE COMMENTS" so that he can make a further review or amendments. Drawings requiring re-submission shall be either amended and re-submitted or shall be</p>
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	<p>superseded by another Shop Drawings. Comments on Shop Drawings are not orders for Extra Work.</p> <p>Shop Drawings re-submitted for further review will be reviewed for response to previous notations only and the Contractor, by such re-submission shall be held to have represented that such Shop Drawings contain no other alterations, additions or deletions, unless the Contractor (in writing) directs the Engineer specific attention to the same.</p> <p>Should the Contractor question, or dissent, from such notations or comments, he shall direct the Engineer's attention to the same for further clarification before re-submitting.</p> <p><i>By reviewing Shop Drawings, the Engineer does not assume responsibility for errors or omissions and non-compliance with the Contract requirements. Such errors and omissions must be made good by the Contractor, irrespective, of the receipt, checking, or review of the Shop Drawings by the Engineer and even though the Work is done in accordance with such Shop Drawings.</i></p> <p>As-Staked Drawings. "As-Staked" Drawings shall be prepared for the entire project. These drawing shall be submitted to the Employer for review and approval regardless of the nature of the changes in the original design, if there is increase/decrease of more than five percent (5%) in quantities of major items of work and more than ten percent (10%) for minor items of work. Variation Order shall be prepared in accordance with Sub-Clause 13.1.</p> <p>The preparation of the "As-Staked" drawings and the corresponding back-up calculations must be completed within a reasonable period from the commencement of the project. The plans shall indicate major modifications (i.e. change in road alignment, change in type or main components of structures, introduction of new work items), superimposed on the original plans.</p> <p>The approved "As-Staked" drawings shall be reproduced (white print) by the Contractor in five (5) copies. The preparation of the "As-Staked" drawings and reproduction cost shall be at the expense of the Contractor, payment for which is subsidiary to the pay items of the contract.</p> <p>All data pertaining to As-Staked survey shall be jointly signed by the Contractor's and Engineer's representatives.</p> <p>Quality of Plans ("As-Built", "As Staked" and other Drawings for Variation). All sheets of the "As-Built", "As-Staked" and other drawings for Variations should be of uniform size and one (1) standard size (A1) using Mylar or other quality tracing paper. The sheets must be neat and clean and without any crossed-out or voided portion. The title block should be made an integral part of the sheet plans and not merely patched-up.</p>
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	<p>Supplementary Drawings and Instructions. The Engineer shall have the authority to issue to the Contractor from time to time such supplementary drawings and instructions to the proper and adequate execution of the Works and the remedying of any defects therein. The Contractor shall carry out and be bound by the same.</p> <p>The Contractor shall designate an additional set of drawings as “Record Drawings” and keep them to the site.</p> <p>The Contractor shall clearly and neatly mark the Record Drawing in ink to indicate all authorized changes in the work, and also as actually constructed. These additional plans will not change the work of the Contract but will elucidate or explain it.</p>
Sub-Clause 4.3 Contractor’s Representative	<p><i>Insert additional paragraph at the end of Sub-Clause 4.3</i></p> <p>The Contractor’s authorized representative and his other professional engineers working at site shall register themselves with the Pakistan Engineering Council.</p>
Sub-Clause 4.4 Subcontractors	<p><i>Replace first line with the following</i></p> <p>The Contractor may subcontract the Works for the maximum value equal to 30% of the Accepted Contract Amount.</p>
Sub-Clause 4.8 Safety Procedures	<p><i>Insert additional paragraph at the end of Sub-Clause 4.8</i></p> <p>In the event of work being carried out at night, the Contractor shall at his own cost, provide and maintain such good and sufficient light as will enable the work to proceed satisfactorily and without danger. The approaches to the Site and the Works where the night-work is being carried out shall be sufficiently lighted. All arrangement adopted for such lighting shall be to the satisfaction of the Engineer.</p>
Sub-Clause 4.18 Protection of the Environment	<p><i>Final paragraph to be added to after second paragraph</i></p> <p>The Contractor shall exercise care to protect the natural landscape and shall conduct his construction operation so as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of the Works, except where clearing is required for permanent works, approved temporary works and for excavation operations. All trees and native vegetation shall be preserved and shall be protected from damage, which may be caused, by the Contractor’s construction operations and equipment. On completion of the Works, all work areas shall be smoothed and graded in a manner to scarring damage or defacing may occur as a result of the Contractor’s operations, it shall be repaired, replanted or otherwise corrected as directed by the Engineer at Contractor’s expense.</p> <p>Borrow areas shall be located and operated so as not to detract from the future usefulness or value of the sites. Upon completion of operations, borrow areas shall be left in a safe and sightly conditions. No borrow areas shall be located within 500 meter from the right of way.</p>

	<p>During the performance of the work required under the Contract, the Contractor shall carryout proper and efficient measures as often as necessary to reduce the dust nuisance, and to prevent dust originating from his operations. For waste water disposal, the provision of septic tank alone for worker's camp etc. will not be sufficient and may have to be supplemented with secondary treatment in form of gravel drains / constructed wetland depending on the laboratory results of effluent from the septic tank.</p> <p>The Contractor shall take all necessary measures to prevent water from the Site causing a nuisance on or, in any neighbouring land or property either by causing flooding or by depositing sediment on the surface of the ground or in drains or watercourses. Wherever necessary to prevent this, the Contractor shall construct temporary drainage channels, layer sumps and traps (in addition to those shown on the Contract) discharging into existing drain, ditches or watercourses. The Contractor shall remove over all sediment, which may accumulate on any land or in any drains, ditches or watercourses or in any other property as a result of his operations.</p> <p>All works including those below sub-soil standing water level shall be carried out in the dry unless specified otherwise. The Contractor's arrangements for controlling the inflow of water into the parts of the excavation being worked and during the placing of concrete and other works therein and for the collection and disposal of water shall be to the Engineer's Approval. Such arrangements may include interalia temporary cofferdams, well-point systems, pumps; drains trenches, flumes and other recognized means. All Costs and charges in dealing with water in any way whatsoever and the effects thereof will be deemed to be included in the Contract Price and in the unit rates or prices of the Contractor for excavations.</p> <p>Water flowing into excavations shall be carried by trenches, drainage layers or open jointed drains to sumps from which it shall be pumped. Such trenches drains or sands shall generally be clear of the Permanent Works unless approved otherwise by the Engineer. If, with the said Approval of the Engineer trenches drains or sumps are excavated under or immediately adjacent the Permanent Works, these shall comprise open-jointed pipes with gravel mounds. When no longer required and when approved by the Engineer they shall be filled with a cement /sand grout injected under pressure so as to fill the pipe and all voids completely.</p> <p>The Contractor shall keep all surfaces upon or against which concrete is to be deposited free from running water and no concrete shall be placed until such surfaces are properly drained. Suitable precautions shall be taken to prevent running water from washing out cement or concrete while it is setting or from injuring the Works in any other way.</p>
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	<p>Notwithstanding the Approval by the Engineer of the Contractor's methods of dealing with water, the Contractor shall be responsible for and accept all the risks and liabilities of dealing with water from whatever source and of all effects thereof.</p> <p>The Contractor shall throughout the execution and completion of the Works and the remedying of any defects therein, comply with all applicable Environment Protection Laws and Regulations of the Country.</p>
Sub-Clause 4.21 Progress Reports	<p><i>Add following paragraphs after paragraph (h)</i></p> <ul style="list-style-type: none"> (i) An updated construction schedule indicating the progress in percentage; and (j) Description of all works carried out since the last report; and (k) An updated Progress Curve/Projected Cash flow indicating the planned and actual progress; and (l) An updated Critical Resource Usage Chart showing comparison of planned and actual values; and (m) An updated material procurement plan showing comparison of planned and actual values; and (n) An updated schedule of shop drawings comparison of planned and actual values; and (o) Description of the Works planned for the next 28 days sufficiently detailed to enable the Engineer to determine his programme of inspection and testing; and (p) Summary of all submission; and (q) Information about problems and areas of concern and proposal to overcome the same.
Sub-Clause 6.5 Working Hours	<p><i>Add the following paragraph at the end of Sub-Clause 6.5:</i></p> <p>The Contractor shall pay overtime payment to the Engineer's Support Staff/Personnel who were required by the Contractor to perform their respective work assignment beyond the normal working hours stated in Part A – Particular Conditions (Appendix A).</p>
Sub-Clause 6.10 Records of Contractor's Personnel and Equipment	<p><i>The following paragraphs added:</i></p> <p>The Contractor shall, upon request by the Engineer at any time in relation to any time of hired Contractor's Equipment, forthwith notify the Engineer in writing the name and address of the Owner of the equipment and shall certify that the agreement for the hire thereof contains a provision in accordance with the requirements set forth above.</p>
Sub-Clause 6.23 Epidemics	<p><i>Insert sub-clauses after Sub-Clause 6.22:</i></p> <p>In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government or the local medical or sanitary authorities, for the purpose of dealing with and overcoming the same.</p>

Sub-Clause 6.24 Workers' Organizations	<p><i>Insert additional sub-clauses after Sub-Clause 6.23</i></p> <p>In countries where national law recognizes workers' rights to form and to join workers' organizations of their choosing without interference and to bargain collectively, the Contractor shall comply with national law. The Contractor shall not discriminate or retaliate against Contractor's Personnel who participate, or seek to participate, in such organizations. Where national law restricts workers' organizations, the Contractor shall ensure that Contractor's Personnel have alternative means to express their grievances and defend their rights regarding working conditions and terms of employment, such as worker committees or forums to facilitate dialogue between workers' representatives and the employer. Where national is silent on this issue, the Contractor shall not discriminate or retaliate against Contractor's Personnel who participate, or seek to participate, in organizations and forums designed to promote good working conditions and favourable terms of employment, consistent with the Contract.</p>
Sub-Clause 6.25 Non-Discrimination and Equal Opportunity	<p><i>Insert additional sub-clauses after Sub-Clause 6.24</i></p> <p>The Contractor shall not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. In countries where national law provides for non-discrimination in employment, the Contractor shall comply with national law. When national laws are silent on non-discrimination in employment, the Contractor shall meet this Sub-Clause's requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on inherent requirements of the job will not be deemed discrimination.</p>
Sub-Clause 7.9 Use of Pakistani Materials and Services	<p><i>Insert additional sub-clauses after Sub-Clause 7.8</i></p> <p>The contractor shall, so far as may be consistent with the contract, make the maximum use of materials, supplies, plant and equipment indigenous to or produced or fabricated in Pakistan and services, available in Pakistan provided such materials, supplies, plant, equipment and services shall be of required standard.</p>
Sub-Clause 8.1 Commencement of Works	<p><i>Delete paragraph (b) entirely and substituted with the following.</i></p> <p>The contractor shall commence the works on site within the period named in Appendix-A to Bid from the date of receipt by him from the Engineer of a written Notice to Commence. Thereafter, the contractor shall proceed with the works with due expedition and without delay</p>
Sub-Clause 8.3	<p><i>Insert following additional paragraphs at the end of Sub Clause 8.3;</i></p>

<p>Programme</p>	<p>The program shall be submitted in the form of CPM charts. The Contractor will also have a licensed copy of the software from a reputed firm which shall be accessible to the Engineer as well as his assistants. Contractor shall organize a training program for his and Engineer's staff so that the program can be updated regularly as required. The Contractor shall pay a penalty of Rs.200,000/- (Rupees Two Hundred Thousands only) for each day of delay in the submission of said Programme of programme. The Employer shall recover such amount from any payment due to the Contractor under the Contract, on the Engineer's recommendations.</p> <p>The revised programme, in accordance with the Contract, shall be submitted within fourteen (14) days of the request received from the Engineer. The Contractor shall pay a penalty of Rs.100,000/- (Rupees Hundred Thousands only) for each day of delay in the submission of said revised programme. The Employer shall recover such amount from any payment due to the Contractor under the Contract, on the Engineer's recommendations.</p> <p>Notwithstanding General Conditions of the Contract Sub Clause 8.3, the program to be submitted for the execution of the works shall, in addition to the program of pure construction activities, include an alleviation program for site staff and labour and their families (if allowed to stay at camp) in respect of Sexually Transmitted Infections (STI), Sexually Transmitted Diseases (STD) including HIV/AIDS. The STID and HIV/AIDS alleviation program shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of Sub Clause 6.7 herein and the related Specifications.</p> <p>The Contractor shall submit the Programme of Works on Primavera Project Planner P-5 or the latest (both hard and soft copy) for the consent of the Engineer. All items of works and activities including mobilization should be included in the Programme of Works. The programme shall identify and highlight those activities, which are on the Critical Path. The programme shall be revised monthly and should include a chart of principal activities of the work forecast for monthly execution and an updated schedule of the payment to be made by the Employer to the Contractor. This programme of works as scheduled shall form basis of Delay Damages pursuant to Sub-Clauses 8.7.</p> <p>In addition, cash flow estimates shall be supported with inputs of over drafts organized with financial institutions at various stages of the projects to meet the funding requirements of the project. The Contractor shall supply and maintain at his site office for his and Engineer's use a licensed copy of the project management computer software package namely Primavera for programming and to monitor the progress. It shall be supplied complete with manuals and technical training and support for the duration of the Contract as per requirements assessed by the Engineer.</p> <p>In order to assist the Engineer's Project Management Team, the</p>
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	<p>Contractor shall be required to submit at 2 weeks intervals data to the Engineer on the cost and quantities and other data relevant to the monitoring of progress according to a particular format suitable for computer processing.</p> <p>The programme should be computerized and drawn up on the CPM with all details as illustrated in this Clause, identifying all items of work including temporary work. Progress reporting by the Contractor should be supported on a monthly basis with an up-to-date analysis of the progress including a statement on items, which are or are about to become critical to the progress of the work along with the proposals on how the Contractor intends to alleviate the situation.</p> <p>General Requirements:</p> <ol style="list-style-type: none"> a. Programme should be submitted (both hard and soft copy) strictly following the guidelines and format specified in this Clause. b. The Engineer at any time during the execution of the Works; direct the Contractor to change/modify the Programme / Schedule based on the Priority of Works. c. No payment shall be released to the Contractor prior to approval of the Base Line Programme by the Engineer. d. Submittal of Programme consists of: <ol style="list-style-type: none"> 1. Construction Schedule (CPM); 2. Progress Curve/Project Cash Flow; 3. Critical Resources Usage Chart; 4. Detailed Method Statement; 5. Material Procurement Plan; 6. Schedule of Submittals and Shop-Drawings; 7. Any other details as required by the Engineer; <p>Construction Schedule:F</p> <ol style="list-style-type: none"> a. Construction Schedule shall be developed on the basis of Work Breakdown Structure provided or approved by the Engineer. b. Construction Schedule shall be detailed up to level 4 or as required by the Engineer. c. Durations of construction activity should be calculated practically in relation to quantity of work done and allocated resources. Any activity that demands duration greater than seven (07) calendar days should be split into number of activities to monitor the same accordingly. d. Construction activities of the schedule should be logically linked with preceding and succeeding activities and showed in submitted construction schedule. e. Critical Activities and Critical Path of the project should be highlighted with red colour in bar chart and precedence diagram. Total Float for non-critical activities should also be shown in the schedule.
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	<p>f. Appropriate quantity of direct resources (material, labour, equipment and non-consumable material) should be allocated to all activities and showed in submitted construction schedule. Labour resource should be divided according to related trades (e.g. Mason, Operator, helper etc.) Contractor should make sure that no resource is being over allocated. Indirect resources should be allocated to supervision / summary activity.</p> <p>g. BOQ amount should be loaded to reach construction activity. Accrual basis should be indicated to construction activity.</p> <p>h. Construction Schedule should show Activity ID, Activity Description, BOQ Quantity, Duration, Start Date, Finish Date, Total Float, Predecessors, Resource names with quantity, BOQ Amount and timescale where the bars show start and finish dates.</p> <p>Progress Curve / Projected Cash Flow:</p> <p>a. Progress Curve / Projected Cash Flow should be developed and presented on Project Management Software – Primavera Project Planner.</p> <p>b. S-Curve should be plotted between time (in weeks) and progress of work done (in % of work). The progress should be shown in cumulative percent of work done. Percent of work done should be calculated with the BOQ amount and payment terms.</p> <p>Critical Resources Usage Chart:</p> <p>a. Critical Usage Chart should be developed.</p> <p>b. List of Critical Resources included Labourers, equipments, consumable/non-consumable materials and/or identified by the Engineer.</p> <p>c. Resource usage chart should show Resource Name and weekly utilization (numbers) of resources on each activity.</p> <p>Detailed Method Statement:</p> <p>a. Detailed method statement should be presented in descriptive format explaining the method of carrying out works, logistics, site layout, flow of work, quality and safety measures for each activity and any other details as required by the Engineer.</p> <p>Material Procurement Plan:</p> <p>a. Material Procurement Plan for major items of purchase should be presented in a Tabular Format to be submitted to the Engineer for pre-approval. The Plan must as a minimum show the list of local & imported materials to be used, their specification reference, and planned dates for submittal to Consultant, approval process, placing of order, vendor contact, required delivery on site, status of Line of Credit (LOC) if applicable, and usage of material.</p>
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	<p>Schedule of Shop Drawings and Submittals: Schedule of Shop Drawings and other Submittals should be presented in a Tabular Format to be submitted to the Engineer for pre-approval. Plan must as a minimum show the list of shop drawings required and their specification reference, planned dates for submittal to consultant, approval process, and usage of shop drawing.</p> <p>Cash Flow Estimates: The Contractor shall, within 28 days from the receipt of the Letter of Acceptance, provide to the Engineer for his information a detailed cash flow estimate in quarterly periods, of all payments to which the Contractor will be entitled under the Contract and the Contractor shall subsequently supply revised cash flow estimates at quarterly intervals, if required to do so by the Engineer.</p> <p>Revised Programme: If at any time it should appear to the Engineer that the actual progress of the Works does not conform to the programme to which consent has been given under Sub-Clause 8.3, the Contractor shall produce, at the request of the Engineer, a revised programme showing the modifications to such programme necessary to ensure completion of the Works within the Time for Completion.</p>
<p>Sub-Clause 8.7 Delay Damages</p>	<p><i>Insert following additional paragraphs at the end of Sub-Clause 8.7</i></p> <p>Notwithstanding the provision of above stated conditions following shall prevail: The rate of Delay Damages shall be 0.1% per day of the Contract Price for every day of delay in which whole or part of the work(s) remained unfurnished subject to a maximum of 10% of the Final Contract Price.</p> <p>In addition to the Delay Damages, the Contractor shall borne all the cost/expenses related to the supervision of the works by the Engineer and his staff covering salaries of the Engineer and all of his Site Supervision staff including all the benefits, providing, running and maintenance of all the Engineer's Facilities up to the issuance of the Taking Over Certificate by the Employer. All the above cost/expanses will not be reimbursed / paid to the Contractor beyond the approved completion period of the works.</p> <p>If, before the Time for Completion of the whole of the Works or, if applicable, any Section, a Taking-Over Certificate has been issued for any part of the Works or of a Section, the delay damages for delay in completion of the remainder of the Works or of that Section shall, for any period of delay after the date stated in such Taking-Over Certificate, and in the absence of alternative provisions in the Contract, be reduced in the proportion which the value of the part so certified bears to the value of the whole of the Works or Section, as applicable. The provisions of this Sub-Clause shall only apply to the rate of delay damages and shall not affect the limit thereof.</p> <p>Interim Delay Damages Contractor's works programme submitted under Sub-Clause 8.3 of</p>

	<p>the Conditions of Contract shall be considered part of the Contract Agreement. If the Contractor's progress is not as per approved programme of works, the Contractor shall be liable for Interim Delay Damages at the rate of 0.05% of the Contract Price for each day of delay, which shall be refunded if the progress again matches the approved programme of works during the currency of works.</p> <p>The amount of interim delay damages deducted by the Employer from the payment of the Contractor and refunded shall be taken into consideration while determining the delay damages for the whole of the Works.</p> <p>If the progress of works is observed to be behind approved programme of works against three consecutive months then the Employer may invoke Sub-Clause 15.2 of the Conditions of Contract.</p>
Sub-Clause 8.11 Prolonged Suspension	Replace 84 days by 120 days.
Sub-Clause 10.1 Taking Over of the Works and Sections	<p><i>Insert following as 3rd paragraph after 2nd paragraph</i></p> <p>Within 14 days of the date of receipt of Contractor's notice for issuance of Taking Over Certificate the Employer shall on the written request of the Engineer constitute a committee comprising of Engineer/Engineer's Representative, Employer's and Contractor's Representatives. The Committee shall conduct a detailed inspection of the works completed by the Contractor to ascertain the completion or the extent of completion to decide about the issuance of Taking Over Certificate.</p> <p>The Engineer shall take further action on the Contractor's application in pursuance to the recommendations of the committee.</p>
Sub-Clause 11.9 Performance Certificate	<p><i>Insert following as 2nd paragraph after 1st paragraph</i></p> <p>At the completion of the Defects Notification Period the Employer shall constitute a committee comprising of Engineer / Engineer's Representative, Employer's and Contractor's Representatives. The Committee shall conduct a detailed inspection of the works to ascertain the issuance of Performance Certificate or otherwise.</p>
Sub-Clause 13.1 Right to Vary	In the last line of Para, after the word "Variation", the word "in writing" is added.
Sub-Clause 13.3 Variation Procedure	In the tenth line, after the words "as soon as practicable" following is added: "and within a period not exceeding one-eighth of the completion time"
Sub-Clause 13.8 Adjustment for Changes in cost	<p><i>The following provision is added:</i></p> <p>The amounts payable to the Contractor, pursuant to Sub-Clause 14.6, shall be adjusted in respect of the rise or fall in the cost of materials only, and will be paid to the contractor on those items mentioned in the Appendix –C (B). Similarly reduction in the cost of these materials will also be recovered from the contractor accordingly.</p>

<p>Sub-Clause 14.1 The Contract Price</p>	<p><i>Renumber subparagraphs (c) and (d) as (f) and (g) and delete subparagraph (e).</i></p> <p><i>Insert following paragraphs (c), (d) and (e):</i></p> <p>(c) The Contract Price shall include all taxes, duties and other charges imposed outside the Country on the production, manufacture, sale and transport of the Contractor's Equipment, Plant, Materials and supplies to be used on or furnished under the Contract, and on the services to be performed under the Contract.</p> <p>(d) The Contractor's staff and labour will be liable to pay personal income taxes in the Country in respect of such of their salaries and wages as are chargeable under the Laws for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such laws.</p> <p>(e) Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts therefore, imported by the Contractor for the sole purpose of executing the Contract shall be temporarily exempt from the payment of import duties and taxes upon initial importation, provided the Contractor shall post with the customs authorities at the port of entry an approved export bond or bank guarantee, valid until the Time for Completion plus six months, in an amount equal to the full import duties and taxes which would be payable on the assessed imported value of such Contractor's Equipment and spare parts, and callable in the event the Contractor's Equipment is not exported from the Country on completion of the Contract. A copy of the bond or bank guarantee endorsed by the customs authorities shall be provided by the Contractor to the Employer upon the importation of individual items of Contractor's Equipment and spare parts. Upon export of individual items of Contractor's Equipment or spare parts, or upon the completion of the Contract, the Contractor shall prepare, for approval by the customs authorities, an assessment of the residual value of the Contractor's Equipment and spare part to be exported, based on the depreciation scale(s) and other criteria used by the customs authorities for such purposes under the provisions of the applicable Laws. Import duties and taxes shall be due and payable to the customs authorities by the Contractor on (a) the difference between the initial imported value and the residual value of the Contractor's Equipment and spare parts to exported; and (b) on the initial imported value that Contractor's Equipment and spare parts remaining in the Country after completion of the Contract. Upon payment of such dues within 28 days of being invoiced, the bond or bank guarantee shall be reduced or released accordingly; otherwise the security shall be called in the full amount remaining.</p>
<p>Sub-Clause 14.2 Advance Payment</p>	<p><i>Delete the Clause in entirety and replace with following</i></p> <p>The Employer if requested by the Contractor shall make an advance payment for mobilisation and cash flow support, when the Contractor submits a guarantee in accordance with this Sub-Clause. The total advance payment, the number and timing of instalments</p>

	<p>(if more than one) shall be as stated in the Appendix A.</p> <p>The Advance Payment (if required) shall be paid in two equal instalments after the following conditions have been fulfilled.</p> <p>Installment-1: 50% of the total amount of the Advance Payment</p> <ul style="list-style-type: none"> • That the Contract Agreement has been signed by the Parties. • The Contractor has submitted bank guarantee for the full amount of the advance payment in the form of irrevocable without recourse bank guarantee. • The Contractor has submitted the Performance Security in the form as prescribed in Sub-Clause 4.2. • The Contractor has submitted the Programme of Works in the form detailed in Sub-Clause 8.3 and the Engineer has given his concurrence. <p>Installmentt-2: Remaining 50% of the total amount of the Advance Payment shall be paid on mobilization of Plant, Equipment and other resources at site by the Contractor to the satisfaction of the Engineer</p> <p>Unless and until the Employer receives this guarantee, or if the total advance payment is not stated in the Appendix A, this Sub-Clause shall not apply.</p> <p>The Contractor shall pay interest on the mobilization advance at the rate of 10% per annum on the advance.</p> <p>The Engineer shall deliver to the Employer and to the Contractor an Interim Payment Certificate for the advance payment or its first instalment after receiving a Statement (under Sub-Clause 14.3 [Application for Interim Payment Certificates]) and after the Employer receives (i) the Performance Security in accordance with Sub-Clause 4.2 [Performance Security] and (ii) a guarantee in amount equal to the advance payment. This guarantee shall be issued by an entity and from within a country (or other jurisdiction) approved by the Employer, and shall be in the form annexed to the Particular Conditions or in another form approved by the Employer.</p> <p>The Contractor shall ensure that the guarantee is valid and enforceable until the advance payment has been repaid, but its amount shall be progressively reduced by the amount repaid by the Contractor as indicated in the Payment Certificates. If the terms of the guarantee specify its expiry date, and the advance payment has not been repaid by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the guarantee until the advance payment has been repaid.</p> <p>At any time, the bank guarantee shall be valid for an amount not less than the amount of the original Advance Payment less any partial repayment of that Advance Payment which may have been affected. The Contractor shall inform the guaranteeing bank, by letter, counter signed by the Employer, of the required amount of the guarantee from time to time. Reduction of the amount shall not be made without such authorizing letter.</p> <p>Unless stated otherwise in the Appendix A, the advance payment</p>
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	<p>including interest shall be recovered in 5 equal instalments starting from third running bills (IPCs) and in case the number of bills is less than 5 then 1/5 of the advance inclusive of the interest thereon shall be recovered from each bill and the balance together with interest be recovered from the final bill. It may be insured that there is sufficient amount in the final bill to enable recovery of the Mobilization Advance.</p> <p>If the advance payment has not been repaid prior to the issue of the Taking-Over Certificate for the Works or prior to termination under Clause 15 [Termination by Employer], Clause 16 [Suspension and Termination by Contractor] or Clause 19 [Force Majeure] (as the case may be), the whole of the balance then outstanding shall immediately become due and in case of termination under Clause 15 [Termination by Employer] and Sub-Clause 19.6 [Optional Termination, Payment and Release], payable by the Contractor to the Employer.</p> <p>In the event that the amount of money certified and due to the Contractor under the contract at any time is less than the total of due repayments of Advance Payment, the balance of the due repayments shall be paid to the Employer by the Contractor within seven days of demand by the Employer. If the balance is not so paid, the Employer shall be empowered to call in sufficient of the Advance payment bank guarantee to cover the said balance.</p> <p>The Employer shall be empowered to call in the guarantee in whole or in part(s) if the Contractor defaults in the repayment(s) for any reason(s).</p>
<p>Sub-Clause 14.5 Plant and Materials intended for the Works</p>	<p><i>Add the following paragraph as sub-clause 14.5 (d) for Secured Advance on non – perishable materials and sub-clauses (a), (b) and (c) will be applicable for plants only :-</i></p> <p>I. The Contractor shall be entitled to receive from the procuring agency Secured Advance against an INDENTURE BOND in Public Works Account Form No.31 (Fin. R. Form No. 2) acceptable to the procuring agency of such sum as the Engineer may consider proper in respect of non-perishable materials brought at the site but not yet incorporated in the Permanent Works provided that:</p> <ol style="list-style-type: none"> i. The materials are in accordance with the specifications for the permanent works; ii. Such materials have been delivered to the site and are properly stored and protected against loss or damage or deterioration to the satisfaction and verification of the Engineer/Assistant Engineer but at the risk and cost of the Contractor; iii. The Contractor's records of the requirements, orders, receipts and use of materials are kept in a form approved by the Engineer, and such records shall be available for inspection by the Engineer; iv. The Contractor shall submit with his monthly statement the estimated value of the materials on site together with such documents as may be required by the Engineer for the

	<p>purpose of valuation of materials and providing evidence of ownership and payment therefore;</p> <p>v. Ownership of such materials shall be deemed to vest in the procuring agency and these materials shall not be removed from the site or otherwise disposed of without written permission of the procuring agency;</p> <p>vi. The sum payable for such materials on site shall not exceed 75 % of the (i) landed cost of imported materials, or (ii) ex-factory /ex-warehouse price of locally manufactured or produced materials, or (iii) market price of stands other materials;</p> <p>vii. Secured Advance shall not be allowed unless and until the previous advance, if any, is fully recovered;</p> <p>viii. Detailed account of advances must be kept in part II of running account bill or a separate statement; and</p> <p>ix. Secured Advance may be permitted only against materials/quantities anticipated to be consumed / utilized on the work within a period of 3 months from the date of issue of secured advance and in no case for full quantities of materials for the entire work/contract.</p> <p>II. Recovery of Secured Advance:</p> <p>Secured Advance paid on non-perishable materials to the Contractor under the above provisions shall be effected from the monthly payments on actual consumption basis, but not later than period specified in the rules not more than three months (even if unutilized);</p>
Sub-Clause 14.6 Issue of Interim Payment Certificates	<p><i>Add following in second line after the words “Performance Security.”</i></p> <p>No amount shall be certified or paid until the Engineer has received and approved the Programme of Works.</p>
Sub-Clause 14.8 Delayed Payment	<p><i>Second Para is replaced with following text:</i></p> <p>In the event of the failure of the Procuring Agency to make the payment within the time stated, the procuring agency shall pay to the contractor in case of ICB contracts only, the compensation at rate of KIBOR+2% per annum in local currency and Libor+1% for foreign currency, upon all sums to be paid from the date of which the same would have been paid (i.e. for NCB, no compensation is admissible).</p>
Sub-Clause 14.15 Currencies of Payment	<p>Currency of Payment is Pakistan Rupee (PKR).</p>
Sub-Clause 15.2 Termination by Employer	<p><i>Insert following as paragraph (g) after paragraph (f)</i></p> <p>(g) If the progress of works with respect to the Programme of Works is observed to be behind the approved program of works pursuant to Sub Clause 8.7 for three consecutive</p>

	<p>months.</p> <p><i>The following Para is added at the end of the sub-clause:</i></p> <p>Provided further, that in addition to the action taken by the procuring agency against the Contractor under this Clause, the procuring agency may also refer the case of default of the Contractor to Pakistan Engineering Council for punitive action under the Construction and Operation of Engineering Works Bye-Laws 1987, as amended from time to time.</p>
<p>Sub-Clause 15.6 Corrupt and Fraudulent Practices</p>	<p><i>The following text is to be added as 3rd paragraph:</i></p> <p><i>Successful Contractor has to provide Integrity Pact (for contracts worth Rs.10.0 million and above). If the Contractor or any of his Subcontractors, agents or servants is found to have violated or involved in violation of the Integrity Pact signed by the Contractor as Appendix-L to his Bid, then the procuring agency shall be entitled to:</i></p> <ol style="list-style-type: none"> recover from the Contractor an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by the Contractor or any of his Subcontractors, agents or servants; terminate the Contract; and recover from the Contractor any loss or damage to the procuring agency as a result of such termination or of any other corrupt business practices of the Contractor or any of his Subcontractors, agents or servants. <p>The termination under sub-para (b) of this Sub-Clause shall proceed in the manner prescribed under sub-clauses 15.2 & 15.5 and the payment under Sub-Clause 15.4 shall be made after having deducted the amounts due to the procuring agency under Sub-Para (a) and (c) of this Sub-Clause.</p>
<p>Sub-Clause 16.1 Contractor's Entitlement to Suspend Work</p>	<p><i>Delete words "... Sub-Clause 2.4 [Employer's Financial Arrangements] or ..." from first paragraph</i></p> <p>Delete paragraph 2 <i>in entirety</i> (i.e. from words "Notwithstanding" to "notification from the bank").</p>
<p>Sub-Clause 16.2 Termination by Contractor</p>	<p><i>Delete paragraph (a) in entirety.</i></p>
<p>Sub-Clause 17.3 Employer's Risks</p>	<p>Delete paragraph (a) in entirety.</p>
<p>Sub-Clause 18.1 General Requirements for Insurance</p>	<p>Add following text</p> <p>The contractor shall be obliged to place all insurances relating to the contract (including, but not limited to, the insurances referred to in Clauses 18.1,18.2,18.3,18.4) with Insurance Company having at least AA rating from PACRA/JCR in favour of the Employer valid for a period 28 days after the expiry of Defects Liability Period.</p>

	Costs of such insurances shall be borne by the contractor.
Sub-Clause 19.6 Optional Termination, Payment and release by the Employer	Delete paragraph (c), (d) and (e) in entirety.
Sub-Clause 20.1 Contractor's Claims	<p><i>Insert following at the end of Sub-Clause 20.1</i></p> <p>The Contractor shall not be entitled for any extension of Time for Completion and/or additional payment in respect of the claim(s) if the Contractor fails to comply with the requirements or any of the requirement of Sub-Clause 20.1 within the time period stipulated there in the Clause above mentioned and or fails in keeping and producing necessary records whenever demanded by the Engineer.</p>
Sub-Clause 20.6 Arbitration	<p><i>Delete the Clause in entirety and replace with following</i></p> <p>Any dispute in respect of which:</p> <ol style="list-style-type: none"> the decision, of the Dispute Board has not become final and binding pursuant to sub-clause 20.2, and amicable settlement has not been reached within the period stated in sub-clause 20.5, shall be finally settled, under the provisions of the Arbitration Act, 1940 as amended or any statutory modification/Rules of Conciliation And Arbitration PEC Islamabad or re-enactment thereof for the time being in force. <p>The place of arbitration shall be Karachi, in Sindh Province.</p> <p>The arbitrators shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, and any decision of the DB, relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Engineer from being called as a witness and giving evidence before the arbitrators on any matter whatsoever relevant to the dispute.</p> <p>Neither Party shall be limited in the proceedings before the arbitrators to the evidence or arguments previously put before the DB to obtain its decision, or to the reasons for dissatisfaction given in its notice of dissatisfaction. Any decision of the DB shall be admissible in evidence in the arbitration.</p> <p>Arbitration shall be commenced after completion of the Works. The obligations of the Parties, the Engineer and the DB shall not be altered by reason of any arbitration.</p>

APPENDIX: DISPUTE BOARD

General Conditions of Dispute Board Agreement

1. Definitions

Each “Dispute Board Agreement” is a tripartite agreement by and between:

- (a) the “Employer”;
- (b) the “Contractor”; and
- (c) the “Member” who is defined in the Dispute Board Agreement as being:
 - (i) the sole member of the "DB" and, where this is the case, all references to the “Other Members” do not apply, or
 - (ii) one of the three persons who are jointly called the “DB” (or “Dispute Board”) and, where this is the case, the other two persons are called the “Other Members.”

The Employer and the Contractor have entered (or intend to enter) into a contract, which is called the "Contract" and is defined in the Dispute Board Agreement, which incorporates this Appendix. In the Dispute Board Agreement, words and expressions which are not otherwise defined shall have the meanings assigned to them in the Contract.

2. General Provisions

Unless otherwise stated in the Dispute Board Agreement, it shall take effect on the latest of the following dates:

- (a) the Commencement Date defined in the Contract,
- (b) when the Employer, the Contractor and the Member have each signed the Dispute Board Agreement, or
- (c) when the Employer, the Contractor and each of the Other Members (if any) have respectively each signed a dispute board agreement.

This employment of the Member is a personal appointment. At any time, the Member may give not less than 70 days’ notice of resignation to the Employer and to the Contractor, and the Dispute Agreement shall terminate upon the expiry of this period.

3. Warranties

The Member warrants and agrees that he/she is and shall be impartial and independent of the Employer, the Contractor and the Engineer. The Member shall promptly disclose, to each of them and to the Other Members (if any), any fact or circumstance which might appear inconsistent with his/her warranty and agreement of

impartiality and independence.

When appointing the Member, the Employer and the Contractor relied upon the Member's representations that he/she is:

- (a) experienced in the work which the Contractor is to carry out under the Contract,
- (b) experienced in the interpretation of contract documentation, and
- (c) fluent in the language for communications defined in the Contract.

**4. General
Obligations of the
Member**

The Member shall:

- (a) have no interest financial or otherwise in the Employer, the Contractor or Engineer, nor any financial interest in the Contract except for payment under the Dispute Board Agreement;
- (b) not previously have been employed as a consultant or otherwise by the Employer, the Contractor or the Engineer, except in such circumstances as were disclosed in writing to the Employer and the Contractor before they signed the Dispute Board Agreement;
- (c) have disclosed in writing to the Employer, the Contractor and the Other Members (if any), before entering into the Dispute Board Agreement and to his/her best knowledge and recollection, any professional or personal relationships with any director, officer or employee of the Employer, the Contractor or the Engineer, and any previous involvement in the overall project of which the Contract forms part;
- (d) not, for the duration of the Dispute Board Agreement, be employed as a consultant or otherwise by the Employer, the Contractor or the Engineer, except as may be agreed in writing by the Employer, the Contractor and the Other Members (if any);
- (e) comply with the annexed procedural rules and with Sub-Clause 20.4 of the Conditions of Contract;
- (f) not give advice to the Employer, the Contractor, the Employer's Personnel or the Contractor's Personnel concerning the conduct of the Contract, other than in accordance with the annexed procedural rules;
- (g) not while a Member enter into discussions or make any agreement with the Employer, the Contractor or the Engineer regarding employment by any of them, whether as a consultant

or otherwise, after ceasing to act under the Dispute Board Agreement;

- (h) ensure his/her availability for all site visits and hearings as are necessary;
- (i) become conversant with the Contract and with the progress of the Works (and of any other parts of the project of which the Contract forms part) by studying all documents received which shall be maintained in a current working file;
- (j) treat the details of the Contract and all the DB's activities and hearings as private and confidential, and not publish or disclose them without the prior written consent of the Employer, the Contractor and the Other Members (if any); and
- (k) be available to give advice and opinions, on any matter relevant to the Contract when requested by both the Employer and the Contractor, subject to the agreement of the Other Members (if any).

**5. General
Obligations of the
Employer and the
Contractor**

The Employer, the Contractor, the Employer's Personnel and the Contractor's Personnel shall not request advice from or consultation with the Member regarding the Contract, otherwise than in the normal course of the DB's activities under the Contract and the Dispute Board Agreement. The Employer and the Contractor shall be responsible for compliance with this provision, by the Employer's Personnel and the Contractor's Personnel respectively.

The Employer and the Contractor undertake to each other and to the Member that the Member shall not, except as otherwise agreed in writing by the Employer, the Contractor, the Member and the Other Members (if any):

- (a) be appointed as an arbitrator in any arbitration under the Contract;
- (b) be called as a witness to give evidence concerning any dispute before arbitrator(s) appointed for any arbitration under the Contract; or
- (c) be liable for any claims for anything done or omitted in the discharge or purported discharge of the Member's functions, unless the act or omission is shown to have been in bad faith.

The Employer and the Contractor hereby jointly and severally indemnify and hold the Member harmless against and from claims from which he is relieved from liability under the preceding paragraph.

Whenever the Employer or the Contractor refers a dispute to the DB under Sub-Clause 20.4 of the Conditions of Contract, which will require the Member to make a site visit and attend a hearing, the Employer or the Contractor shall provide appropriate security for a sum equivalent to the reasonable expenses to be incurred by

the Member. No account shall be taken of any other payments due or paid to the Member.

6. Payment

The Member shall be paid as follows, in the currency named in the Dispute Board Agreement:

- (a) a retainer fee per calendar month, which shall be considered as payment in full for:
 - (i) being available on 28 days' notice for all site visits and hearings;
 - (ii) becoming and remaining conversant with all project developments and maintaining relevant files;
 - (iii) all office and overhead expenses including secretarial services, photocopying and office supplies incurred in connection with his duties; and
 - (iv) all services performed hereunder except those referred to in sub-paragraphs (b) and (c) of this Clause.

The retainer fee shall be paid with effect from the last day of the calendar month in which the Dispute Board Agreement becomes effective; until the last day of the calendar month in which the Taking-Over Certificate is issued for the whole of the Works.

With effect from the first day of the calendar month following the month in which the Taking-Over Certificate is issued for the whole of the Works, the retainer fee shall be reduced by one third. This reduced fee shall be paid until the first day of the calendar month in which the Member resigns or the Dispute Board Agreement is otherwise terminated.

- (b) a daily fee which shall be considered as payment in full for:
 - (i) each day or part of a day up to a maximum of two days' travel time in each direction for the journey between the Member's home and the site, or another location of a meeting with the Other Members (if any);
 - (ii) each working day on Site visits, hearings or preparing decisions; and
 - (iii) each day spent reading submissions in preparation for a hearing.
- (c) all reasonable expenses including necessary travel expenses (air fare in less than first class, hotel and subsistence and other direct travel expenses) incurred in connection with the Member's duties, as well as the cost of telephone calls, courier charges, faxes and telexes: a receipt shall be required for each item in excess of five percent of the daily fee referred to in sub-paragraph (b) of this Clause;
- (d) any taxes properly levied in the Country on payments made to

the Member (unless a national or permanent resident of the Country) under this Clause 6.

The retainer and daily fees shall be as specified in the Dispute Board Agreement. Unless it specifies otherwise, these fees shall remain fixed for the first 24 calendar months, and shall thereafter be adjusted by agreement between the Employer, the Contractor and the Member, at each anniversary of the date on which the Dispute Board Agreement became effective.

If the parties fail to agree on the retainer fee or the daily fee, the appointing entity or official named in the Contract Data shall determine the amount of the fees to be used.

The Member shall submit invoices for payment of the monthly retainer and air fares quarterly in advance. Invoices for other expenses and for daily fees shall be submitted following the conclusion of a site visit or hearing. All invoices shall be accompanied by a brief description of activities performed during the relevant period and shall be addressed to the Contractor.

The Contractor shall pay each of the Member's invoices in full within 56 calendar days after receiving each invoice and shall apply to the Employer (in the Statements under the Contract) for reimbursement of one-half of the amounts of these invoices. The Employer shall then pay the Contractor in accordance with the Contract.

If the Contractor fails to pay to the Member the amount to which he/she is entitled under the Dispute Board Agreement, the Employer shall pay the amount due to the Member and any other amount which may be required to maintain the operation of the DB; and without prejudice to the Employer's rights or remedies. In addition to all other rights arising from this default, the Employer shall be entitled to reimbursement of all sums paid in excess of one-half of these payments, plus all costs of recovering these sums and financing charges calculated at the rate specified in Sub-Clause 14.8 of the Conditions of Contract.

If the Member does not receive payment of the amount due within 70 days after submitting a valid invoice, the Member may (i) suspend his/her services (without notice) until the payment is received, and/or (ii) resign his/her appointment by giving notice under Clause 7.

7. Termination

At any time: (i) the Employer and the Contractor may jointly terminate the Dispute Board Agreement by giving 42 days' notice to the Member; or (ii) the Member may resign as provided for in Clause 2.

If the Member fails to comply with the Dispute Board Agreement, the Employer and the Contractor may, without prejudice to their

other rights, terminate it by notice to the Member. The notice shall take effect when received by the Member.

If the Employer or the Contractor fails to comply with the Dispute Board Agreement, the Member may, without prejudice to his other rights, terminate it by notice to the Employer and the Contractor. The notice shall take effect when received by them both.

Any such notice, resignation and termination shall be final and binding on the Employer, the Contractor and the Member. However, a notice by the Employer or the Contractor, but not by both, shall be of no effect.

8. Default of the Member

If the Member fails to comply with any of his obligations under Clause 4 (a) - (d) above, he shall not be entitled to any fees or expenses hereunder and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses received by the Member and the Other Members (if any), for proceedings or decisions (if any) of the DB which are rendered void or ineffective by the said failure to comply.

If the Member fails to comply with any of his obligations under Clause 4 (e) - (k) above, he shall not be entitled to any fees or expenses hereunder from the date and to the extent of the non-compliance and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses already received by the Member, for proceedings or decisions (if any) of the DB which are rendered void or ineffective by the said failure to comply.

9. Disputes

Any dispute or claim arising out of or in connection with this Dispute Board Agreement, or the breach, termination or invalidity thereof, shall be finally settled by institutional arbitration. If no other arbitration institute is agreed, the arbitration shall be conducted under the Rules of Arbitration of the International Chamber of Commerce by one arbitrator appointed in accordance with these Rules of Arbitration.

Annex: Procedural Rules

Unless otherwise agreed by the Employer and the Contractor, the DB shall visit the site at intervals of not more than 140 days, including times of critical construction events, at the request of either the Employer or the Contractor. Unless otherwise agreed by the Employer, the Contractor and the DB, the period between consecutive visits shall not be less than 70 days, except as required to convene a hearing as described below.

The timing of and agenda for each site visit shall be as agreed jointly by the DB, the Employer and the Contractor, or in the absence of agreement, shall be decided by the DB. The purpose of site visits is to enable the DB to become and remain acquainted with the progress of the Works and of any actual or potential problems or claims, and, as far as reasonable, to endeavour to prevent potential problems or claims from becoming disputes.

Site visits shall be attended by the Employer, the Contractor and the Engineer and shall be co-ordinated by the Employer in co-operation with the Contractor. The Employer shall ensure the provision of appropriate conference facilities and secretarial and copying services. At the conclusion of each site visit and before leaving the site, the DB shall prepare a report on its activities during the visit and shall send copies to the Employer and the Contractor.

The Employer and the Contractor shall furnish to the DB one copy of all documents which the DB may request, including Contract documents, progress reports, variation instructions, certificates and other documents pertinent to the performance of the Contract. All communications between the DB and the Employer or the Contractor shall be copied to the other Party. If the DB comprises three persons, the Employer and the Contractor shall send copies of these requested documents and these communications to each of these persons.

If any dispute is referred to the DB in accordance with Sub-Clause 20.4 of the Conditions of Contract, the DB shall proceed in accordance with Sub-Clause 20.4 and these Rules. Subject to the time allowed to give notice of a decision and other relevant factors, the DB shall:

- (a) act fairly and impartially as between the Employer and the Contractor, giving each of them a reasonable opportunity of putting his case and responding to the other's case, and
- (b) adopt procedures suitable to the dispute, avoiding unnecessary delay or expense.

The DB may conduct a hearing on the dispute, in which event it will decide on the date and place for the hearing and may request that written documentation and arguments from the Employer and the Contractor be presented to it prior to or at the hearing.

Except as otherwise agreed in writing by the Employer and the Contractor, the DB shall have power to adopt an inquisitorial procedure, to refuse admission to hearings or audience at hearings to any persons other than representatives of the Employer, the Contractor and the Engineer, and to proceed in the absence of any party who the DB is satisfied received notice of the hearing; but shall have discretion to decide whether and to what extent this power may be exercised.

The Employer and the Contractor empower the DB, among other things, to:

- (a) establish the procedure to be applied in deciding a dispute,
- (b) decide upon the DB's own jurisdiction, and as to the scope of any dispute referred to it,

- (c) conduct any hearing as it thinks fit, not being bound by any rules or procedures other than those contained in the Contract and these Rules,
- (d) take the initiative in ascertaining the facts and matters required for a decision,
- (e) make use of its own specialist knowledge, if any,
- (f) decide upon the payment of financing charges in accordance with the Contract,
- (g) decide upon any provisional relief such as interim or conservatory measures, and
- (h) open up, review and revise any certificate, decision, determination, instruction, opinion or valuation of the Engineer, relevant to the dispute.

The DB shall not express any opinions during any hearing concerning the merits of any arguments advanced by the Parties. Thereafter, the DB shall make and give its decision in accordance with Sub-Clause 20.4, or as otherwise agreed by the Employer and the Contractor in writing. If the DB comprises three persons:

- (a) it shall convene in private after a hearing, in order to have discussions and prepare its decision;
- (b) it shall endeavour to reach a unanimous decision: if this proves impossible the applicable decision shall be made by a majority of the Members, who may require the minority Member to prepare a written report for submission to the Employer and the Contractor; and
- (c) if a Member fails to attend a meeting or hearing, or to fulfil any required function, the other two Members may nevertheless proceed to make a decision, unless:
 - (i) either the Employer or the Contractor does not agree that they do so, or
 - (ii) the absent Member is the chairman and he/she instructs the other Members not to make a decision.

SPECIAL PROVISION

SPECIAL PROVISIONS

SP-1 NOT USED

SP-2 ENGINEER'S FACILITIES

2.1 SCOPE

- a) The Contractor shall provide, properly maintained and serviced, facilities for the Engineer (the "Engineer's Facilities") comprising of an office, (the "Engineer's Office"), a laboratory (the "Engineer's Laboratory"), housing (the "Engineer's Housing"), survey equipment (the "Engineer's Survey Equipment") and vehicles (the "Engineer's Vehicles") as specified hereinafter for the exclusive use of the Engineer during the whole Contract period.
- b) The Contractor shall provide and pay for all consumables, the consumption of electricity, gas and water, the installation and the use of telephones, and provide and pay for all other incidental and running costs related to the Engineer's Facilities.
- c) The Engineer's Facilities shall be available and ready for use within 30 (Thirty) days of the Commencement Date during this period of (30) thirty days the contractor shall make an interim arrangement at his own cost by hiring suitable and acceptable hotel/office/vehicles to serve the purpose to the satisfaction of Engineer.
- d) The Contractor shall be responsible for and take all necessary measures to ensure the security of the Engineer's Office, Laboratory and Housing and their contents at all times and shall employ watchmen for this purpose.
- e) The Engineer's Housing, Office and Laboratory shall be provided as per the requirements set forth in relevant SPs., under the pay item on the respective BOQ.
- f) The Engineer's Facilities, including all vehicles, equipment, furniture, fixtures fittings laboratory & survey equipment shall become the property of the Contractor as stated in relevant SPs.

2.2 SITE LAYOUT

- a) The layouts of the sites for the Engineer's Office and Laboratory are to be agreed by the Engineer and should take into account the following general requirements:
- b) Safe access from the public road.
- c) Paved areas for vehicle movement.
- d) Covered areas for vehicle parking.
- e) Dust suppression in unpaved areas.
- f) Grading of the site to provide drainage.
- g) Separate foul and surface water drainage system, with outfall and treatment as appropriate. Septic tanks being suitably distanced from and down-wind of occupied buildings.
- h) Standby electrical generating capacity located and protected to avoid noise nuisance.
- i) Suitable and convenient covered areas for storage of materials samples.
- j) Ducts, cables, pipes and sewers for services and drainage.
- k) A car washing area with a water source and proper drainage.
- l) Areas of visual amenity having trees, flower beds, shrubs and so forth, with a water source nearby.

- m) Security measures comprising perimeter fencing or walls, gates and guardhouses.

2.3 UTILITIES

- a) Back-up electrical power supply by diesel generator shall be provided. The generator shall have an automatic cut-in in case of failure of the main supply. The power circuit shall be equipped with voltage regulation to protect electrical equipment from overload and to ensure proper operation of computers and the like.
- b) A continuous water supply shall be available for normal use. All kitchens shall be provided with potable water and the source shall be tested and certified by the Contractor at least monthly or at shorter intervals as directed by the Engineer.
- c) Continuous supplies of water, gas, electricity and fuel for the stand-by generator shall be provided by the Contractor who shall be responsible for and pay all costs of installation, connection, maintenance and use.
- d) The Contractor shall take appropriate measures to discourage the presence or entry of termites, cockroaches, vermin and the like. Such measures may include chemical treatment of foundations, sealing of joints in construction and periodic fumigation.
- e) Contractor shall be responsible to do all the formalities in acquiring and installing the Gas, Telephone, Water and Electricity connection for the respective building required under this SP.

2.4 COMMUNICATIONS

- 1. The Contractor shall arrange for, provide and install in the Engineer's Office, Housing and Laboratory, communication facilities comprising a total of one (01) subscriber trunk dialing (STD) and one (01) (NSTD) telephone lines and eight (08) mobile (cellular) telephone sets with all appurtenances.
- 2. The Contractor will be required to pay for the cost of telephone calls including calls from mobile phones made by the Engineer, his staff and their dependents up to a total cost of Rs.30,000/= (Thirty Thousand Rupees) per calendar month.
- 3. Intercom facilities shall be provided between the rooms of the Engineer's Office and the Engineer's Laboratory and contractor's Project Manager if in the same compound.

2.5 ESTABLISHMENT

- 1. Within 7 (Seven) days of the Commencement Date the Contractor shall submit to the Engineer the details of furniture and equipment for the Engineer's Office and Laboratory. The rental housing/office/laboratory shall also be arranged within this period.
- 2. Within 7 (Seven) days of receiving the Contractor's proposals the Engineer will approve them with any necessary modifications and will instruct the Contractor to proceed with the procurement of the furnishings and equipment.
- 3. The Engineer's Facilities shall be available and ready for use within 30 (Thirty) days of the Commencement Date.
- 4. Till such time that the Engineer's facilities are provided the contractor shall made an interim arrangement and shall bear all expenses, such as rent, transport, communications, utilities etc. required to be provided under the provision of the relevant SPs.

SP-3 ENGINEER'S CENTRAL OFFICE

3.1 SCOPE

The contractor shall provide the Engineer's office building on rental basis.

- a) The office shall comprising six offices, a conference room, four lavatories with washing facilities, a kitchen and a tea room.
- b) The Contractor's Office will be situated adjacent to but at a reasonable distance from the Engineer's Office.
- c) The Contractor shall maintain the Engineer's Office in good condition to the satisfaction of the Engineer for as long as required for the purposes of the Contract.
- d) The office building shall be provided with underground and overhead water reservoirs of adequate capacity.
- e) The building shall be provided with all facilities in accordance with SP-2.
- f) The Engineer's office will be handed over to the Contractor six months after the date of issue of the Taking Over Certificate.
- g) The Engineer's Office fittings, equipment and furnishings shall become the property of the Contractor, six months after the date of issue of the Taking-Over Certificate.

3.2 FURNITURE AND EQUIPMENT

In addition to normal stationery requirements, the Contractor shall provide for the Engineer's Office, furnishings and equipment complying at least to the following list, all to the approval of the Engineer and all for the exclusive use of the Engineer.

No.	ITEM
------------	-------------

OFFICE FURNITURE

- | | |
|----|---|
| 5 | Standard office desks with lockable drawers and glass top |
| 4 | Small tables |
| 5 | Swivel type padded desk chairs with arms and castors |
| 1 | Executive desk with lockable drawers and glass top with computer table |
| 1 | Executive type upholstered desk chair |
| 1 | Secretary's desk with chair and matching computer table |
| 1 | Conference table for twelve persons with padded swivel chairs |
| 16 | Standard office chairs |
| 8 | Lockable metal filing cabinets for drawings (1.0 x 0.80 x 0.75) m with 4 No. Drawers |
| 6 | Metal cabinets with two lockable doors and five shelves 0.95m x 0.50m x 1.85m high |
| 2 | Metal filing cabinets with four lockable drawers |
| 4 | Metal filing cabinets with two lockable drawers |
| 4 | Book cases with two shelves |
| 1 | Executive sofa set comprising one sofa, two armchairs and coffee table with glass top |
| 6 | Display boards |
| 6 | Metal waste baskets |
| 7 | Office clock, battery powered |
| 6 | Plastic trash containers, 500 mm diameter minimum by 750 mm high. |
| 1 | Electric water coolers |
| 6 | Desk lamps, fluorescent, 20 watts |
| 1 | Desk lamp, executive type |
| 1 | Photocopier with enlarging and reduction capability with 55-65 copies/minute speed |
| 1 | Automatic voltage stabilizer for Xerox photocopier |
| 5 | Air conditioners (cooling and heating) 18,000 BTU or as required |

No. ITEM

- 1 Facsimile machine, Panasonic VF-270 or similar
- 1 Automatic voltage stabilizer for facsimile machine
- 10 Standard size staplers
- 2 Heavy duty staplers
- 3 Paper cutters
- 2 Paper hole punches, heavy duty
- 10 Paper hole punches, light duty
- 2 Pairs of scissors, heavy duty
- 10 Pencil sharpeners
- 2 Pencil sharpeners, desk mounted
- 10 Calculators Scientific
- 1 Binding machine, Model No. 212 PB by General Binding Corp or similar
- 1 Digital Camera, 35 mm single lens reflex Canon/Nikkon or similar, 35-150 mm zoom lens, electronic flash gun, carrying case, filters
- 4 Fire extinguishers (carbon dioxide), wall-hung

COMPUTER EQUIPMENT

- 6 Desktop PC, Intel Core i7 2.4 Ghz 7th Generation, 8 GB RAM, 500 GB hard disk, DVD/RW, LED/LCD 20" PCI Express Graphic Card 2GB, LAN 10/100, Sound Card.
- 2 Laser Printer (A3 + A4 paper size),
- 3 Uninterruptible Power supplies, 1 KVA.
- 1 Copies of the latest versions of the following PC software
Windows 7 32Bit or MS Office 2010
- Autocad (latest version)

MISCELLANEOUS

- 2 Oxford Shorter English Dictionary (Soft/Hard copy)
- 2 English – Urdu and Urdu – English dictionaries
- 20 Construction hard hats
- 1 Set of relevant AASHTO specifications
- 1 Set of relevant Asphalt Institute manuals
- 1 Set of relevant British Standard specifications
- 1 Set of relevant ASTM standards
- Consumables including camera film, batteries for clocks and calculators, paper, cartages and all other office supplies as required.
- Venetian blinds and cotton curtains on all windows

KITCHEN

- 1 Double stainless steel sink with drain board
- 1 Electric refrigerator, 0.50 cu.m capacity with separate freezer compartment, self defrost type
- 1 Gas stove with oven, four burners, and gas bottles as required.
- 1 Set of kitchen cabinets, lockable, with formica top
- 1 Electric kettle
- 1 Electric coffee maker
- 1 Water heater, 60 liters per minutes
- 6 Tea towels
- 2 Towel racks
- 1 Exhaust fan
- Tea pot, coffee pot, cups, saucers, glasses, spoons and serving trays for 24 persons

No.	ITEM
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LAVATORIES

- | | |
|---|--|
| 4 | Hot water heaters, 6 liters per minute |
| 4 | Water closets, pedestal style |
| 4 | Wash basins with hot and cold water |
| 4 | Stainless steel lavatory paper holders |
| 4 | Paper towel dispensers |
| 4 | Mirrors, 400 mm x 500 mm |
| 4 | Ceramic urinals |
| 4 | Exhaust fan, ½ HP, 220 Volt |
| 4 | Towel holder |

3.3 MEASUREMENT AND PAYMENT

The cost of providing, furnishing and equipping the Engineer's office shall be measured and paid for at the contract unit price quoted in the Bill of Quantities, which price and payment shall be full compensation for all costs of providing building, painting furnishing and providing all services, equipment, utilities, installations and access/service roads and for all materials, labour, equipment and incidentals for the proper completion of the work prescribed in these Specifications or as directed by the Engineer.

The office equipment and furnishing are not payable and shall be considered as incidental to other pay items.

PAY ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT
SP-3	a) Provide Engineer's Central Office (Rental) b) Equip and Furnish Engineer's Office	Per month Provisional Sum

SP-4 ENGINEER'S HOUSING (SENIOR & JUNIOR STAFF)

4.1 SCOPE

The contractor shall provide the building for Engineer's housing on rental basis. The Contractor shall also provide equipment and furniture for the Engineer's Housing as described in 4.2.

Engineer's Housing shall constitute of the following Buildings:

1. Residential accommodation for Senior staff, 6 bed rooms with attached bathrooms
2. Residential accommodation for Junior staff, 3 bed rooms with attached bathrooms
3. Provision of Furnishing of Engineer's Housing as listed but not limited to as stated in SP-4.2.

4.2 FURNITURE AND EQUIPMENT

1. The Engineer's Housing shall be fully furnished and equipped to the satisfaction of the Engineer, including curtains, linen, blankets, glassware, cutlery, crockery and kitchen utensils as indicated below, which list is intended only as a guide to indicate the minimum requirements that will be acceptable.
2. The Engineer's Housing shall be provided with efficient drainage and sanitation and shall be provided with potable water, gas and electricity supplies available throughout 24 hours of each day.
3. The Contractor shall maintain the Engineer's Housing in good condition to the satisfaction of the Engineer as long as required for the purposes of the Contract.
4. The buildings shall be provided with all necessary facilities in accordance with SP-2.
5. The buildings provided under this SP for Engineer's Housing shall be provided with underground and overhead water reservoirs of adequate capacity.
6. The Engineer's Housing for Sr. Staff will be handed over to the Contractor six months after the date of issue of the Taking Over Certificate, while Housing for Jr. Staff will be handed over to the Contractor on the date of issue of the Tking Over Certificate.
7. The fittings, equipment and furnishings of Engineer's Housing for Sr. staff shall become the property of the Contractor, six months after the date of issue of the Taking-Over Certificate, while for Jr. Staff will be handed over to the Contractor on the date of issue of the Tking Over Certificate.

ITEM	NUMBER PER HOUSE	
	Senior Staff	Junior Staff
FURNITURE		
Double bed with mattress	6	-
Single bed with mattress	2	3
Bedside table	6	3
Dressing table with mirror and stool	6	3
Chest of drawers	6	-
Wardrobe	6	3
Bedroom chair	6	3
Writing table and chair	6	3
Dining table(s) and chairs (to seat 12 persons and 6 persons)	1	1
Sideboard with drawers	2	2
Sofa set	2	1
Occasional table	4	4
Wall mirror	6	3
Kitchen cupboards and tables or fitted units	1 Set	1 Set
Side table	6	3

Bookcase	6	3
Linen, Blankets, Towels etc.	6 Sets	3Sets

ITEM	NUMBER PER HOUSE	
	Senior Staff	Junior Staff

EQUIPMENT

Air Conditioners (Cooling and Heating)

18000 BTU or as required 6 3

Television 32" screen colour 1 1

Satellite television parabolic dish and tuner 1 1

DVD player 1 1

Refrigerator, 0.5 cu.m for and 0.25 cu.m,
self-defrost type with separate
deep freeze compartment 1 1

Cooker, four burner with thermostatically -

Controlled oven 1 1

Washing machine 1 1

Shelves As reqd As reqd

Bathroom wall mirror, shelf, medicine cabinet
stool and towel rails As reqd As reqd

Glassware, cutlery, crockery, kitchen utensils etc. 2 Set 1 Set

Fire extinguisher 2 1

4.3 MEASUREMENT AND PAYMENT

The cost of providing, furnishing and equipping the Engineer's Housing under this SP shall be measured and paid for at the contract unit price quoted in the Bill of Quantities for the respective Pay Items listed below, which price and payment shall be full compensation for all costs of providing building, finishing, painting, furnishing and providing all services, equipment, utilities and installation and for all materials, labour, equipment and incidental for the proper completion of the work prescribed in these Specifications or as directed by the Engineer.

PAY ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT
SP-4	Provide Engineer's Housing	
(a)	Provision of residential accommodation for Senior Staff (Rental)	Per month
(b)	Provision of residential accommodation for Junior Staff (Rental)	Per month
(c)	Provide Furnishing and Equipment for Engineer's Housing for Senior & Junior Staff	Provisional Sum

SP-5 ENGINEER'S CENTRAL LABORATORY

5.1 SCOPE

1. The Contractor for the duration of the Contract shall provide Engineer's Laboratory on rental basis. The laboratory shall be for the exclusive use of the Engineer for testing soils, aggregate, concrete and bituminous materials. The laboratory shall be fully equipped with all utilities, furniture, apparatus and fittings appropriate to such use.
2. The Engineer's Laboratory shall be located adjacent to the Engineer's Office. It shall consist of a hall and two offices with storage, lavatory and washing facilities. The hall shall be divided into bitumen section, a soil and aggregates section, and a concrete section.
3. Outside the laboratory water tanks shall be constructed for curing concrete samples, of a size and location approved by the Engineer.
4. The laboratory shall be provided with electricity and telephone and shall be air-conditioned. It shall have a regular and dependable supply of water, gas and electricity available throughout 24 hours of each day.
5. All rooms shall be provided with exhaust fans, located particularly over fume cupboards and the like.
6. To maintain the water supply the building shall be provided with underground and overhead water reservoirs of adequate capacity.
7. The lavatory shall be connected to a septic tank of adequate capacity with a 200 mm sanitary pipe and ventilation pipe stack.
8. The Contractor shall provide two nos qualified materials technicians and two nos laboratory helpers to assist in operating the laboratory. All costs necessary for the provision and upkeep of these personnel shall be the responsibility of the Contractor and shall be considered included in the payment herein specified for providing and maintaining the Engineer's Laboratory.
9. The building for laboratory shall be provided with all the facilities in accordance with SP-2.
10. The Engineer's Laboratory will be handed over to the Contractor six months after the date of issue of the Taking Over Certificate.
11. The Engineer's Laboratory fittings, furnishings and equipment shall become the property of the Contractor six months after the date of issue of the Taking-Over Certificate.

5.2 SAMPLING

It shall be the responsibility of the Contractor to take samples as required by the Engineer and to provide all necessary transport, labour, tools, containers, wrappings and so forth for uplifting and dispatching samples to the Engineer's Laboratory.

5.3 TESTS

1. The Engineer's Laboratory shall be equipped to perform the following in-house tests:

TEST	AASHTO DESIGNATION
Moisture content test by oven drying	
Atterberg limits	T-89 & T-90
Moisture density relationship of soils (standard method)	T-99
Moisture density relationship of soils (modified method)	T-180, Method B and D
Specific gravity of soils	T-100
CBR test	T-193
Sieve analysis of soils and aggregate and mineral filler	T-88, T-27 and T-37
Specific gravity and water absorption of the fine aggregates	T-84
Specific gravity and water absorption of coarse aggregates	T-85
Unit weight of aggregates	T-19
Los/Angelos abrasion test for aggregates	T-96
Chemical tests:	
- Organic impurities for sand in concrete	T-21
- Chlorides and Sulphates in fine aggregates	ASTM-1411
- Potential alkali reactivity test	ASTM-C 289
Amount of material passing No. 200 sieve	T-11
Soundness of aggregates	T-104
Clay lumps and friable particles in aggregates	T-112
Curing concrete compressive test specimens	T-23
Compressive strength of concrete cylinder specimens	T-22
Quality of water to be used in concrete	T-26
Making and curing concrete test specimens in the laboratory	T-126

TEST	AASHTO DESIGNATION
Plastic fines in graded aggregates and soils by use of sand equivalent test	T-176
Sampling bituminous materials	T-40
Marshall test and loss in stability	T-245
Specific gravity of compacted bituminous mixtures	T-166
Quantitative extraction of bitumen from bituminous paving mixtures	T-164
Viscosity of bitumen	T-20, T-202
Penetration of bitumen	T-49
Flash and fire points	T-48
Solubility of bituminous materials in organic solvents	T-44
Coating and stripping of bitumen-aggregate mixture	T-182
Petrographic analysis	

2. The Engineer's Laboratory shall be equipped to perform the following field tests:

TEST	AASHTO DESIGNATION
In-place density by sand cone method (with 15.25 cms and 30.5 cms cone)	T-191
In-place density of compacted base course containing large sizes of coarse aggregates	T-181
Sampling fresh concrete	T-141
Concrete slump	T-119
Sampling bituminous materials	T-40
Determining the temperature of bituminous paving mixtures	-
Coring and determination of bulk specific gravity of compacted bituminous Mixtures	T-230, T-166

FURNISHING

The Contractor shall provide for the Engineer's Laboratory furnishings described in the following list to a quality approved by the Engineer. Substitution of type may be made only upon approval of the Engineer.

NO.	DESCRIPTION
3	Standard office desks
1	Swivel type padded desk chairs
7	Work tables
15	Standard office chairs
6	Small tables
3	Side racks
3	Metal filing cabinets, 4-drawer
6	Electronic calculators
2	Air conditioners (cooling and heating)
1	Electric water coolers
1	Display board
3	Desk lamps, fluorescent, 20 watts
3	Standard size staplers
1	Heavy duty stapler
2	Paper cutters
2	Paper hole punches
2	Pencil sharpeners
4	Fire extinguishers

5.4 EQUIPMENT

1. The Contractor shall provide new laboratory equipment as noted in the list *Equipment for the Engineer's Laboratory* included herein. The equipment shall be purchased from international suppliers, all to the approval of the Engineer.
2. The Contractor shall submit to the Engineer within 7 (seven) days of the Commencement Date a complete list of the equipment, apparatus and supplies he proposes to furnish for the Engineer's Laboratory. The list shall include the manufacturer's name and descriptive literature.
3. Additional equipment and materials shall be supplied by the Contractor at no additional cost as and when required by the Engineer to perform any test relevant to the Works.
4. Any damaged equipment received in the laboratory shall not be accepted by the Engineer and shall have to be replaced with new one of matching quality and other specifications of the equipment. Any equipment got damaged due to the negligence of contractor's staff during the working shall be repaired or replaced as would be convenient to the contractor such that the testing schedule in any way should not be effected. The repaired equipment shall be examined by the Engineer or his representative and approved for the use in the material testing. If repaired equipment does not come up to the satisfaction of the Engineer, the same shall have to be replaced with new one.

5.5 MEASUREMENT AND PAYMENT

1. The cost of providing, furnishing and equipping the Engineer's Laboratory shall be measured and paid for at the contract unit price quoted in the Bill of Quantities for the respective Pay Items listed below, which price and payment shall be full compensation for all costs of providing building, finishing, painting, furnishing and providing all services, equipment, utilities installation and access/service roads and for all materials, labour, equipment and incidentals for the proper completion of the work prescribed in these Specifications, drawings or as directed by the Engineer.

PAY ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT
SP-5		
(a)	Provide Engineer's Laboratory on Rental basis	Per month
(b)	Provide New Equipment & Furniture for Engineer's Laboratory	Provisional Sum

EQUIPMENT FOR SITE LABORATORY

SR. NO.	EQUIPMENT DESCRIPTION	MODEL No./ NAME	UNIT	QTY.
GENERAL EQUIPMENT				
1	Laboratory oven, capacity 256 litre	LIM-600 (NEUMAR, GER)	Each	1
2	Laboratory oven, capacity 53 litre	LIM-400 (NEUMAR, GER)	Each	1
3	Hot plate, maximum temperature 350°C	L-236	Each	1
4	Gas burner, two flames	-	Each	1
5	Bunsen burner with tripod	-	Each	1
6	Heavy duty straight spring scale	China	Each	1
7	Heavy duty balance, 20 kg.	OHAUS, USA	Each	1
8	Triple beam balance, 2,610 grams	OHAUS, USA	Each	2
9	Precision mechanical balance	OHAUS, USA	Each	1
10	Wall clock	-	Each	1
11	Stop watch	CASIO	Each	1
12	Vernier caliper	China	Each	1
13	Thermometer, general, 0°C - 200°C	ZEAL, UK	Each	2
14	Maximum - minimum thermometer	Local	Each	1
15	Tongs	China	Each	2
16	Desicator	PYREX	Each	1
17	Beaker, pyrex, 250 ml	PYREX	Each	2
18	Beaker, pyrex, 500 ml	PYREX	Each	2
19	Beaker, pyrex, 1,000 ml	PYREX	Each	2
20	Funnel, 250 ml	China	Each	2
21	Funnel, 500 ml	China	Each	2
22	Volumetric flask, 100 ml	China	Each	2
23	Volumetric flask with stopper, 250 ml	China	Each	2
24	Volumetric flask with stopper, 500 ml	China	Each	2
25	Volumetric bottle flask, 250 ml	China	Each	2
26	Volumetric bottle flask, 500 ml	China	Each	2
27	Wash bottle, 100 ml	China	Each	2
28	Wash bottle, 250 ml	China	Each	2
29	Wash bottle, 500 ml	China	Each	2
30	Specific gravity bottles (100 ml)	China	Each	1
31	Graduated cylinder, 100 ml	China	Each	2
32	Graduated cylinder, 250 ml	China	Each	2
33	Graduated cylinder, 1,000 ml	China	Each	2
34	Reagent bottle stoppered, 2 litre	China	Each	2
35	Aluminium cans with cover, 2" diameter	Local	L.S.	*
36	Aluminium cans with cover, 3" diameter	Local	L.S.	*
37	Scoop	Local	Each	2
38	Brush, fine	Local	Each	1
39	Wire brush, coarse	Local	Each	1
40	Wire brush, fine	Local	Each	1
41	Bucket, 12 litre	Local	Each	2

SR. NO.	EQUIPMENT DESCRIPTION	MODEL No./ NAME	UNIT	QTY.
42	Trolley	Local	Each	1
43	Shovel, large	Local	Each	1
44	Pickaxe	Local	Each	1
45	Sample splitter, coarse	Local	Each	1
46	Sample splitter, fine	Local	Each	1
47	Sieve shaker for 8" diameter sieve, motorised	Local	Each	1
48	Tin pan/tray, 12" x 12" x 2"	Local	Each	4
49	Tin pan/tray, 18" x 18" x 3"	Local	Each	4
50	Tin pan/tray, 24" x 18" x 3"	Local	Each	4
51	Tin pan/tray, 36" x 24" x 3"	Local	Each	4
52	Mortar procelain, 200 mm diameter with rubber covered pestle	China	Each	1
COARSE AND FINE AGGREGATES SIEVE ANALYSIS				
53	Sieve set 8" diameter:			
54	3/4 inch	CBC-8075	Each	3
55	1/2 inch	CBC-8050	Each	2
56	3/8 inch	CBC-8037	Each	2
57	No. 4 (4.74 mm)	CB-84	Each	2
58	No. 8 (2.36 mm)	CB-88	Each	2
59	No. 10 (2.00 mm)	CB-810	Each	3
60	No. 16 (1.18 mm)	CB-816	Each	2
61	No. 30 (0.60 mm)	CB-830	Each	2
62	No. 40 (0.425 mm)	CB-840	Each	3
63	No. 50 (0.300 mm)	CB-850	Each	2
64	No. 80 (0.180 mm)	CB-880	Each	1
65	No. 100 (0.150 mm)	CB-8100	Each	2
66	No. 200 (0.075 mm)	CB-8200	Each	3
67	Wet washing No. 200	CL-385	Each	3
	Sieve set 12" diameter:			
68	3 inch (75 mm)	CW-18300	Each	2
69	2 1/2 inch (63 mm)	CW-18250	Each	2
70	2 inch (50 mm)	CW-18200	Each	2
71	1 1/2 inch (38 mm)	CW-18150	Each	2
72	1 inch (25 mm)	CW-18100	Each	2
73	3/4 inch (19 mm)	CW-18075	Each	2
74	1/2 inch (12.5 mm)	CW-18050	Each	2
75	3/8 inch (9.5 mm)	CW-18037	Each	2
76	No. 4 (4.74 mm)	CW-184	Each	2
	Sieve set 18" diameter:			
77	3 inch (75 mm)	CW-18300	Each	2
78	2 1/2 inch (63 mm)	CW-18250	Each	2
79	2 inch (50 mm)	CW-18200	Each	2

SR. NO.	EQUIPMENT DESCRIPTION	MODEL No./ NAME	UNIT	QTY.
80	1 1/2 inch (38 mm)	CW-18150	Each	2
81	1 inch (25 mm)	CW-18100	Each	2
82	3/4 inch (19 mm)	CW-18075	Each	2
83	1/2 inch (12.5 mm)	CW-18050	Each	2
84	3/8 inch (9.5 mm)	CW-18037	Each	2
85	No. 4 (4.75 mm)	CW-184	Each	2
86	Pan	CB-8500	Each	2
87	Cover	CB-8506	Each	2
ATTERBERG LIMITS				
88	Liquid limit test set with all accessories	CL-209	Each	1
89	Plastic limit test set with all accessories	CL-251	Each	1
SAND EQUIVALENT				
90	Apparatus complete	CL-230	Set	1
COARSE AND FINE AGGREGATE UNIT WEIGHT				
91	Density basket, brass	G-340	Each	1
92	Sand absorption cone and tamper	Local	Each	1
93	Pycnometers	Local	Each	2
94	Specific gravity bottle	China	Each	1
95	Specific gravity bottle	China	Each	1
96	Specific gravity bottle	China	Each	1
ABRASION				
97	Los Angeles abrasion machine with abrasion charge	M-600	Each	1
COARSE AND FINE AGGREGATE SOUNDNESS				
98	Distilled water	-	L.S.	*
99	Sodium sulphate solution	-	L.S.	*
MODIFIED COMPACTION				
100	Straight edge	Local	Each	1
101	Scoop	Local	Each	1
102	Scoop	Local	Each	1
103	Mixing spoons	Local	Each	1
104	Modified compaction hammer, 10 lbs	Local	Each	2
105	Modified compaction mould, 6" diameter	Local	Each	2
106	Modified compaction mould, 4" diameter	Local	Each	2
107	Preparation knife	Local	Each	1
108	Wooden hammer	Local	Each	1
109	Spatula	Local	Each	1
110	Mixing tray, 24" x 24" x 3"	Local	Each	*
LABORATORY CBR				
111	Soaking, tank 60" x 120" x 24"	-	Each	1
112	CBR mould, 6" diameter with collars, plate, screws	Local	Each	9
113	Filter Paper	Local	L.S.	*
114	Swell Plates	Local	Each	9
115	Surcharge weights	Local	Each	18
116	Surcharge weights, slotted	Local	Each	2
117	Tripod attachment	Local	Each	9

SR. NO.	EQUIPMENT DESCRIPTION	MODEL No./ NAME	UNIT	QTY.
118	Dial indicator	Local	Each	9
119	Spacer, disc	Local	Each	2
120	CBR testing machine automatic	CN-705	Each	1
121	Proving ring, 10 KN	PR-60	Each	1
122	Providing ring, 50 KN	PR-100	Each	1
FIELD DENSITY				
123	Sand cone bottle	Local	Each	2
124	Density plate	Local	Each	2
125	Plastic jug for sand	Local	Each	2
126	Replacement jug	Local	Each	2
127	Spoon	Local	Each	2
128	Plastic bags	Local	L..S	*
129	Chisel, 12"	Local	Each	2
130	Hammaer, 2.5 lbs	Local	Each	2
131	Field balance	OHAUS (USA)	Each	2
132	Sieve No. 30 (0.60 mm)	Local	Each	2
BITUMEN				
133	Bitumen penetration test, penetrometer	AP-140	Set	
ASPHALT				
134	Marshall stability compressive machine	AP-170 & PR 60	Each	1
135	Marshall specimen mould assembly	Local	Each	1
136	Base plate for compressive mould	AP-166	Each	1
137	Marshall compaction hammer	AP-165	Each	1
138	Marshall specimen mould holder	AP-167	Each	1
139	Marshall breaking head	AP-169	Each	1
140	Marshall flow meter	AP-171	Each	1
141	Marshall mixing apparatus	C-110	Each	1
142	Water bath (thermostatic) controlled to 60°C	AP-160	Each	1
143	Bituminous extractor apparatus complete	AP-174	Each	1
144	Filter disc	AP-177	L.S.	*
145	Mixing bowl (steel)	AP-190	Each	1
146	Vacuum pycnometer	AP-132	Each	1
147	Extractor for stability mould	AP-168	Each	1
148	Stability mould with collar	AP-166	Each	6
149	Compaction pedestal	AP-172	Each	1
150	Pavement core drill with 4" diameter core	DR-1304	Each	1
151	Core bit, 4" diameter	DR-1440	Each	4
152	Carbon tetrachloride	AP-178	Drum	*
153	Thermometer, metallic 350°C	-	Each	4
154	Hubbard-carmick specific gravity bottle	AP-185	Each	1
155	Stop watch for marshall test	-	Each	1
CONCRETE AND CEMENT				
156	Compressive strength machine, heavy duty, 250,0	CT-755	Each	1
157	Steel scale	-	Each	2
158	Curing tank with temperature control	-	Each	1

SR. NO.	EQUIPMENT DESCRIPTION	MODEL No./ NAME	UNIT	QTY.
159	Cement mould brush	CT-68B	Each	2
160	Flexure attachment	CT-84	Each	1
161	Concrete tray	CT-58	Each	*
162	Air meter complete	-	Set	1
163	Cylinder mould, heavy duty, 6" diameter	CT-35	Each	9
164	Cylinder capping apparatus	CT-53	Each	1
165	Concrete capping compound	-	Kg	*
166	Laboratory warming pot	L-114	Each	1
167	Slump test cone	CT-69	Set	2
168	Tamper	CT-22	Each	1
169	Vibrating table	CT-164	Each	1
170	Concrete micrometer	CT-29	Each	1
171	Vicat apparatus set	CT-1	Set	1
172	Steel straight edge	-	Each	2
173	Hand gloves, rubber	-	Pair	*
174	Trowel triangular blade	CT-67	Each	2
175	Cement cube mould	CT-60	Each	2

SP-6 MAINTENANCE OF ENGINEER'S CENTRAL OFFICE, SENIOR AND JUNIOR STAFF HOUSING AND CENTRAL LABORATORY

6.1 SCOPE

1. The Contractor shall maintain the Engineer's Office, Housing and Laboratory in all respects, including all repairs and replacements of any item and the supply of all consumables.
2. The Contractor shall provide all necessary janitorial services and supplies for the Engineer's Office, Laboratory and Housing. The services shall include normal domestic servicing and cleaning, including lavatories and bathrooms, washing windows and so forth. Janitorial services shall be performed on a daily basis with personnel and to a programme of work approved by the Engineer.
3. The Contractor shall maintain the Engineer's Office, Laboratory and Housing in a neat, hygienic and attractive manner and provide daily garbage collection and disposal services.
4. The Contractor shall maintain fire extinguishers and air-conditioners as recommended by their manufacturers and shall clean and replace air-conditioner air filters at regular intervals of one month, or more frequently if required by service conditions or as otherwise directed by the Engineer.
5. The Contractor shall provide guard services for the Engineer's Office, Laboratory and Housing on a twenty-four hour basis. The suitability, number and work schedule of all guard personnel shall be approved by the Engineer.
6. The maintenance of Engineer's office housing and laboratory shall also include payment of all utilities bills such as Gas, Telephone (includes Mobile Telephone also) Electricity and water etc. by the contractor which shall not be paid separately and shall be deemed to be included in maintenance per month cost under the respective BOQ items of SP-6.
7. The Contractor shall provide these services from the date of acceptance of the individual facilities by the Engineer until the date of issue of the Taking-Over Certificate plus six months.

6.2 MEASUREMENT AND PAYMENT

The maintenance and servicing of the Engineer's Office, Housing and Laboratory shall be measured and paid for at the contract unit price quoted in the Bill of Quantities for the respective Pay Items listed below, commencing from the date of occupancy of the premises by the Engineer. In case of a Contract Extension, maintenance and servicing will be paid for on the same monthly basis, provided that it has been approved by the Engineer or Employer in accordance with the conditions of contract.

PAY		UNIT OF
ITEM NO.	DESCRIPTION	MEASUREMENT
SP-6	Maintain Engineer's Office, Housing and Laboratory	
(a)	Maintain Engineer's Central Office	Per month
(b)	Maintain Engineer's Housing for Senior Staff	Per month
(c)	Maintain Engineer's Housing for Junior Staff	Per month
(d)	Maintain Engineer's Central Laboratory	Per month

SP-7 ENGINEER'S SURVEY EQUIPMENT

7.1 SCOPE

1. The Contractor shall provide and maintain survey equipment for the use of the Engineer. All the survey equipment shall be new and shall be maintained throughout the Contract and replaced by the Contractor free of charge in case of damage or loss howsoever caused. The Contractor shall also arrange calibration of all surveying equipments after every three months.
2. The Contractor shall provide and pay for experienced survey helpers for the Engineer as required by the Engineer.
3. The survey equipment after the completion of the project plus six months shall become the property of the Contractor.

7.2 EQUIPMENT

The Contractor shall provide and maintain the following survey equipment:

NO.	DESCRIPTION
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1	Total Station survey units complete
1	Total Station accessories complete as under: <ul style="list-style-type: none">- Interface Cable- Comms Plus Unit- Precision Wooden Tripod
1	Single Tilting Range Pole Prism complete as under: <ul style="list-style-type: none">- Prism- Single Tilting Mount with Coaxial Target- Range Pole Telescopic Tripod with Soft Case- 2 m Telescopic Range Pole- Range Pole Level- Soft Case
1	Single Tilting Prism with Coaxial Target complete as under: <ul style="list-style-type: none">- Prism- Single Tilting Mount with Coaxial Target- Simple Carrier- Tribrach with Optical Plummet- Soft
1	Triple Tilting Prism with Coaxial Target complete as under: <ul style="list-style-type: none">- Prism- Triple Tilting Mount with Coaxial Target- Simple Carrier- Tribrach with optical plummet- Soft case
2	Aluminium Telescopic Tripod
2	1 m Range Pole for Extension
1	Automatic Level complete
1	Aluminium Telescopic Tripod
3	Leveling Staff (local manufacture)
2	Range Pole Level
6	Steel measuring tape, 50 m long
6	Steel measuring tape, 20 m long

25 Steel measuring tape, 3 m long

12 Measuring rod (4 m)

18 Ranging rod with tripod

7.3 CONSUMABLES

The Contractor shall provide adequate supplies of expendable materials, such as pencils, rubbers, inks, notebooks, drawing paper, survey pegs, brushes, paints etc. as required by the Engineer.

7.4 MEASUREMENT AND PAYMENT

1. The cost of providing and maintenance of surveying equipment for the exclusive use of the Engineer, including survey helpers for the duration of the contract, shall be paid for at the contract unit price quoted in the Bill of Quantities for the respective Pay Items listed below, which price and payment shall be full compensation for all costs of providing survey equipments, survey helpers, materials and its maintenance and incidentals for the proper completion of the work prescribed in these Specifications or as directed by the Engineer.

PAY ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT
SP-7		
(a)	Provide New Survey Equipment	Provisional Sum
(b)	Maintain Survey Equipment	Per month

SP-8 ENGINEER'S VEHICLES

8.1 SCOPE

1. The Contractor shall provide, maintain and make available at all times for the exclusive use of the Engineer the following new vehicles (on rental basis), the number and type of each being as specified below:

Toyota Corolla Fortuner Fully Loaded with A/C (Automatic) -----1 no
Toyota Corolla GLI with A/C (Automatic) -----1 no.
Suzuki Cultus with A/C and CNG----- 2 nos
Suzuki Bolan A/C and CNG----- 1 no

All vehicles shall be air-conditioned.

2. All vehicles shall be fitted with 3-point inertia-reel seat belts for all occupants.
3. All the vehicles shall be provided for the Engineer's use within 28 (twenty eight) days from the Start Date.
4. If the Contractor fails to provide the vehicles within the time specified the cost incurred by the Engineer in renting similar replacement vehicles plus a 20% (twenty percent) overhead charge shall be payable by the Contractor.
5. The vehicles shall be registered, taxed, comprehensively insured, fuelled, repaired, serviced, cleaned and maintained by the Contractor for the duration of the Contract and temporarily replaced if, in the Engineer's opinion, any vehicle is not in a roadworthy condition.
6. The Contractor shall provide safe, experienced and competent drivers for all the vehicles, to the approval of the Engineer. Each driver shall be responsible for the vehicle allocated to him for the duration of the Contract. The Contractor shall promptly replace any driver who, in the Engineer's opinion, is not satisfactory.
7. The Engineer's vehicles shall become the property of the Contractor six months after the issuance of Taking Over Certificate.

8.2 MEASUREMENT AND PAYMENT

The cost of providing and maintenance of Engineer's Vehicles for the duration of the Contract, shall be paid for at the contract unit price quoted in the Bill of Quantities for the respective Pay Items listed below, which price and payment shall be full compensation for all costs of providing, maintaining including drivers, fuel, lubricants, repairs, all insurances, taxes and everything necessary for the completion of the work prescribed in these Specifications or as directed by the Engineer.

PAY ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT
SP-8	(a) Providing Engineer's Vehicles	Per month
	(b) Maintain Engineer's Vehicles	Per month

SP-9 ENGINEER'S SITE OFFICE,

9.1 OFFICE BUILDING

The contractor shall provide the Engineer's office on rental basis.

- a) The building office shall comprising Three (03) room, with lavatories and washing facilities, a kitchen and a tea room.
- b) The Contractor shall maintain the Engineer's Office in good condition to the satisfaction of the Engineer for as long as required for the purposes of the Contract.
- c) The Contractor shall provide the Engineer with at-least two office messenger and pay for the same.
- d) The office building shall be provided with underground and overhead water reservoirs of adequate capacity.
- e) The building shall be provided with all facilities in accordance with SP-2.
- f) The Engineer's Office fittings, equipment and furnishings shall become the property of the Contractor, on the date of issue of the Taking-Over Certificate.

FURNITURE AND EQUIPMENT

In addition to normal stationery requirements, the Contractor shall provide for the Engineer's Office/Laboratory, furnishings and equipment complying at least to the following list, all to the approval of the Engineer and all for the exclusive use of the Engineer.

No.	ITEM
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OFFICE FURNITURE

- | | |
|---|--|
| 3 | Standard office desks with lockable drawers and glass top |
| 2 | Small tables |
| 1 | Large table |
| 3 | Swivel type padded desk chairs with arms and castors |
| 8 | Standard office chairs |
| 3 | Lockable metal filing cabinets for drawings (1.0 x 0.80 x 0.75) m with 4 No. Drawers |
| 3 | Book cases with two shelves |
| 3 | Display boards |
| 3 | Metal waste baskets |
| 3 | Office clock, battery powered |
| 3 | Plastic trash containers, 500 mm diameter minimum by 750 mm high. |
| 1 | Electric water coolers |
| 1 | Air conditioners (cooling and heating) 18,000 BTU or as required |
| 3 | Standard size staplers |
| 1 | Heavy duty staplers |
| 2 | Paper cutters |
| 1 | Paper hole punches, heavy duty |
| 3 | Paper hole punches, light duty |
| 1 | Pairs of scissors, heavy duty |
| 3 | Pencil sharpeners |
| 1 | Pencil sharpeners, desk mounted |
| 3 | Calculators Scientific |
| 1 | Fire extinguishers (carbon dioxide), wall-hung |

COMPUTER EQUIPMENT

- 1 Desktop PC, Intel Core i7 2.4 Ghz Second Generation, 4 GB RAM, 500 GB hard disk, DVD/RW, LED/LCD 20" PCI Express Graphic Card 1GB, LAN 10/100, Sound Card.
- 1 Laser Printer (A4 paper size),
- 1 Uninterruptible Power supplies, 1 KVA.
- 1 Copies of the latest versions of the following PC software
Windows 7 32Bit or MS Office 2010

- Autocad (latest version)

MISCELLANEOUS

- 1 English – Urdu and Urdu – English dictionaries
- 6 Construction hard hats
Consumables including camera film, batteries for clocks and calculators, paper, carteges and all other office supplies as required.
Venetian blinds and cotton curtains on all windows

LAVATORIES

- 2 Hot water heaters, 6 liters per minute
- 2 Water closets, pedestal style
- 2 Wash basins with hot and cold water
- 2 Stainless steel lavatory paper holders
- 2 Paper towel dispensers
- 2 Mirrors, 400 mm x 500 mm
- 2 Ceramic urinals
- 2 Exhaust fan, ½ HP, 220 Volt
- 2 Towel holder

9.2 MEASUREMENT AND PAYMENT

The cost of providing, furnishing and equipping the Engineer's office shall be measured and paid for at the contract unit price quoted in the Bill of Quantities, which price and payment shall be full compensation for all costs of providing building, painting furnishing and providing all services, equipment, utilities, installations and access/service roads and for all materials, labour, equipment and incidentals for the proper completion of the work prescribed in these Specifications or as directed by the Engineer.

The office furniture, fixtures and equipment shall become the property of the Contractor on the date of issuance of Taking Over Certificate.

PAY ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT
SP-9	a) Provide, furnish, equip Engineer's Site Office	Per Month
	b) Maintenance of Engineer's Office	Per Month

SP-10 PILE INTEGRITY TESTING

10.1 DESCRIPTION

This work shall consist of carrying out integrity testing of working piles and interpretation of results culminating in a "Pile Integrity Testing Report". The work shall be carried out by the Contractor through an approved specialist firm or approved personnel. Only piles qualified for integrity through such testing shall be accepted as part of the permanent work.

- 10.2** This provision covers the two most widely used methods for carrying out integrity testing of piles qualified as "Crosshole Sonic Logging" and "Low Strain Method".

CROSSHOLE SONIC LOGGING METHOD (CSL)

10.2.1 METHOD OVERVIEW

By sending ultrasonic pulses through concrete from one probe to another (probes located in parallel tubes), the CSL procedure inspects the drilled shaft structural integrity, and extent and location of defects, if any. At the receiver probe, pulse arrival time and signal strength are affected by the concrete. For equidistant tubes, uniform concrete yields consistent arrival times with reasonable pulse wave speed and signal strengths. Non-uniformities such as contamination, soft concrete, honeycombing, voids and inclusions exhibit delayed arrival times with reduced signal strength. CSL procedures are standardized by ASTM 6760, Standard Test Method for Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing.

a) Personnel requirements for CSL.

Qualifications of CSL Consultant. The CSL consultant shall have a qualified professional engineer supervising the testing and interpretation of results. The CSL Consultant shall be an independent testing agency with suitable experience in CSL testing. The Consultant qualifications and the specifications for the equipment used shall be submitted to the Engineer for approval prior to beginning drilled shaft installation.

Assistance by the drilled shaft Contractor to the CSL testing consultant. The Contractor shall provide cooperative assistance, suitable access to the site and drilled shafts to be tested, and labor as required to assist the CSL Consultant in performing the required tests. Prior to testing, provide the drilled shaft lengths, tube lengths and positions, and drilled shaft construction dates to the CSL Consultant.

Equipment requirements for CSL.

The equipment shall have the following minimum requirements:

A computer based CSL data acquisition system for display of signals during data acquisition, with a minimum 12 bit A/D converter with a sampling frequency of at least 500,000 Hz, and recording of all pulse signals for full analysis and individual inspection.

Ultrasonic transmitter and receiver probes capable of producing records at a minimum frequency of 50,000 Hz with good signal amplitude and energy through good quality concrete. The probes shall be less than 1.1 inches in diameter and shall freely descend through the full depth of properly installed access tubes in the drilled shafts.

Two depth sensors to independently determine transmitter and receiver probe depths.

Triggering of the recording system time base with the transmitted ultrasonic pulse.

c) CSL access tube preparation.

Install (4) access tubes in each diameter drilled shaft. Every drilled shaft shall be equipped with access tubes to permit possible inspection by CSL. The number of drilled shafts to be tested by CSL shall be as shown in the BOQ and/or as directed by the Engineer. The drilled shafts to be tested shall be chosen after installation by the Engineer.

Nominal 38 to 50 mm (1.5 to 2.0 inch) inside diameter standard weight steel tubes or schedule PVC pipes shall be provided for probe access in each drilled shaft all according to the recommendations of the equipment supplier. Round tubes with a regular internal diameter free of defects and obstructions, including any tube joints, shall be used to permit the free, unobstructed passage of the probes. Tubes shall be watertight and free from corrosion with clean internal and external faces to ensure a good bond between the concrete and the tubes. Tubes may be extended with mechanical couplings. Duct tape or other wrapping material to seal the joints and butt welding of joints are prohibited. Tubes shall be installed by the Contractor in a manner such that the CSL probes pass through the entire length of the tube without binding. Ensure that the access tubes are plumb and verify that unobstructed passage of the probes is achievable before the CSL Consultant arrives.

The tubes shall be fit with a watertight shoe on the bottom and a removable cap on the top. Tubes shall be secured to the interior of the reinforcement cage at regular intervals not to exceed 1m. Tubes shall be installed uniformly and equidistantly around the circumference such that each tube is spaced parallel for the full length and at the maximum distance possible from each adjacent tube. Tubes shall be spaced as far as possible from the main axial reinforcing steel. Tubes shall be extended to within 150mm of the bottom of the drilled shaft, to at least 1.0m above the top of the concrete, and to at least 0.6 m, but not more than 1.5m above the ground surface. Tubes shall not be damaged during installation of the reinforcement cage.

After placement of the reinforcement cage, the access tubes shall be filled with clean fresh water as soon as possible but within at the latest one hour after concrete placement. Tube tops shall be capped to prevent debris from entering the access tubes. Do not apply excessive

torque, hammering or other stresses which could break the bond between the tube and concrete when removing caps from the tubes.

The tubes should preferably be filled with water prior to concrete placement, but must be filled with water within at most 4 hours after placing concrete to prevent debonding of the access tubes due to differential temperatures. This is particularly important for PVC tubes.

(d) Timing of the CSL test

The drilled shaft shall be tested no sooner than 3 calendar days after placement of all concrete in any drilled shaft, but within 10 days after placement and prior to loading for test drilled shafts, or within 45 days after placement on production drilled shafts.

After all CSL testing has been completed, and after acceptance of the drilled shaft by the Engineer, the Contractor shall remove the water in the tubes, place grout tubes extending to the bottom of the access tube, and fill all access tubes in the drilled shafts with grout.

(e) CSL procedure.

Prior to CSL testing, the Contractor shall provide the Engineer and CSL Consultant with a record of all drilled shaft lengths with elevations of the top and bottom, and installation dates of all drilled shafts. The access tubes shall be clearly labeled for identification by the CSL Consultant.

The CSL testing shall be performed with the transmitter and receiver probes in the same horizontal plane in parallel tubes unless test results indicate potential defects, in which case the questionable zone may be further evaluated with angled tests (source and receiver vertically offset in the tubes). Using the labeling established for the tubes, CSL testing shall be performed between all adjacent perimeter access tube pairs and across at least (two) major diagonals within the drilled shaft. In the event that defects are detected in drilled shafts with more than four tubes, additional logs in other diagonal tube pairs may be required to estimate the extent of the defect.

Probes shall be lowered from the top, effectively measuring the access tube lengths. Probes shall be pulled simultaneously, with CSL measurements taken at intervals of 50 mm or less from the bottom to the top of the drilled shaft. Defects indicated by late pulse arrival times and significantly lower amplitude/energy signals shall be immediately reported to the Engineer. Additional tests such as the offset elevation CSL testing may be required by the Engineer to further evaluate the extent of such defects. If debonding between the access tube and the concrete is indicated by the CSL results, an alternative test method shall be required to determine the integrity of the concrete in the debonded region.

(f) CSL results.

Results of the CSL shall be presented in a written report within 5 working days of completion of testing. The report shall include presentation of CSL logs for all tested tube pairs including:

Presentation of the traditional nested signal peak (e.g. “waterfall”) diagram as a function of time plotted versus depth.

Computed initial pulse arrival time or pulse wave speed versus depth.

Computed relative pulse energy or amplitude versus depth.

A CSL log shall be presented for each tube pair. Defect zones, if any, shall be indicated on the logs and their extent and location discussed in the report text. Defect zones are defined by an increase in arrival time of more than 20 percent relative to the arrival time in a nearby zone of good concrete, indicating a slower pulse velocity.

The log for each tube pair shall be clearly identified and oriented relative to the structure. The Engineer shall have 5 working days to evaluate the results and determine whether the drilled shaft construction is acceptable or not. The Contractor shall not perform any load testing or other construction associated with these drilled shafts until after acceptance by the Engineer. If the drilled shaft is accepted by the Engineer, the Contractor may then proceed with construction. If the Engineer determines the drilled shaft is not acceptable, the drilled shaft shall be cored, repaired or replaced by the Contractor at the Contractor’s expense and with no increase in contract time.

10.3 LOW STRAIN METHOD

10.3.1 GENERAL REMARKS

Pile Integrity Testing (PIT) is a Non-Destructive integrity test method for foundation piles. It is a “Low Strain” Method (since it requires the impact of only a small hand-held hammer). The evaluation of PIT records is conducted either according to the Pulse-Echo (or Sonic Echo – a time domain analysis) or the Transient Response (frequency domain analysis) Procedure.

10.3.2 DESCRIPTION OF METHOD

Low Strain integrity testing may be applied to any concreted pile (e.g. concrete piles, drilled shafts, auger cast piles, concrete filled pipe piles). The test requires the impact of a small hand held hammer on the shaft top and the measurement of the shaft top motion (acceleration or velocity). The input compression wave from the hammer is reflected from pile toe (or a defect) and returns to the pile top at a time related to the speed of travel of the wave in the pile material.

The pile top velocity is displayed as a function of time with an exponentially increasing magnitude where high soil friction forces are present, such that the pile toe reflection is enhanced. Several records with consistent signals should be averaged.

The averaged, amplified velocity is the standard result of the Pulse Echo Method. The force as a function of time may also be depicted, if available, which provides additional information as to the pile quality near the pile top.

The Transient Response Method result shows the ratio of velocity to force transforms for all relevant frequencies. This curve is called Mobility. It should be shown together with the related low frequency pile stiffness. These Transient Response results are only available if hammer force was measured.

10.3.3 TEST EQUIPMENT

The test should be performed using digital data acquisition equipment. The signal conditioning and power supply must have very high signal-to-noise ratios since the reflected signals for long piles (and/or piles in high friction soils) are often very weak. The analog to digital resolution shall be at least 16 bits, and the sampling frequency at least 40,000 Hz. Data should be stored such that additional processing or further wave analysis is possible. The data must be displayed in the field for evaluations of preliminary data quality and interpretation.

10.3.4 TEST PERSONNEL

The field testing shall be performed by an experienced technician with suitable experience in integrity testing. The interpretation of the records, however, requires extensive experience by a graduated engineer experienced in integrity testing.

10.3.5 TEST PREPARATION

For cast in place piles, integrity testing shall not be performed until the concrete has cured for a minimum of seven) days unless otherwise approved by the engineer. The pile head shall be free from water, dirt or other debris. The concrete at the pile top surface must be relatively smooth with sufficient space for both attachments of the motion sensing device and hammer impact area.

Pile shall be tested for integrity as shown in the BOQ or as directed by the Engineer. The location of piles for designated for integrity testing shall be specified by the engineer pile installation.

10.3.6 RESULT PRESENTATION

The testing engineer shall present a report within 5 working days after performing the field test to provide the final test results and integrity evaluation. For each pile tested, the averaged, amplified velocity versus time record shall be included in the report, with a table summarizing results and conclusions. Additional plots and analyses can be included as required or suggested by the testing engineer.

10.3.7 ACCEPTANCE AND REJECTION

Shafts with no significant reflections from locations above the pile toe and with a clear pile toe reflection may be accepted. Where no clear toe reflection is apparent, the experienced test engineer shall state to which shaft depth the test appears to be

conclusive. Where reflections from locations with significant reductions above the pile toe are observed, the pile has a serious defect. If the record is complex, the results may be deemed inconclusive. Construction records (concrete usage, grout pressure records, soil borings) may be valuable in result interpretations or additional numerical analysis modeling may be used to quantify the record. The decision to reject and replace, or repair, any defective shaft is at the sole responsibility of the engineer-of-record for the foundation.

10.4 MEASUREMENT & PAYMENT

The completed Pile Integrity Testing results and report shall be paid for at the contract bid price for pile integrity testing of each pile. This shall constitute full compensation for all costs incurred and relating to the testing including, but not limited to, procurement, material, preparation and installation, conducting the tests, and subsequent reporting of results.

PAY ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT
SP-10	Pile Integrity Testing	Each

SP-11 NOT USED

SP-12 NOT USED

SP-13 PVC SLEEVE PIPES WITH CAP

13.1 DESCRIPTION

The work shall consist of providing and fixing in position for the services in manholes of length as per the specified thickness of the wall as shown on the drawing and fixing in concrete properly as indicated on the drawing.

13.2 CONSTRUCTION REQUIREMENTS

The pipes should be free from all blemishes. Proper length of pipes as required should be fixed in the concrete. All works are to be completed as per drawing specifications and as directed by the Engineer.

13.3 MEASUREMENT AND PAYMENTS

PAY ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT
SP-13	PVC SERVICE PIPES with CAP of dia and wall thickness as shown on drawings or in BOQ	M

SP-14 PERMANENT STEEL CASING

The contractor shall provide, fabricate and install a permanent lining suitable formed of twelve (12) mm minimum thickness mild steel plate complying with B.S. 4360. The plates shall be cut and rolled to the inner diameter not less than the nominal diameter of the pile or such larger diameter as to allow the requisite pile diameter hole in the unlined length of pile. The rolled plates shall be connected by full penetration butt welds generally complying with B.S. 5133. No more than three (3) longitudinal seam welds shall be employed in any one cross-section and such welds shall be staggered in position in the cross-section between one length and the next. The dimensional accuracy of the lining shall be as stated on the drawings and to the Engineer's satisfaction.

In the case of steel shells or pipes, after being driven and prior to placing reinforcing steel and concrete therein, the steel shells or pipes shall be examined for collapse or reduced diameter at any point. Any shell or pipe, which is improperly driven or broken or shows partial collapse to such an extent as to materially decrease its bearing value, will be rejected. Rejected shells or pipes shall be removed and replaced, or a new shell or pipe shall be driven adjacent to the rejected one. Rejected shells or pipes, which can not be removed, shall be filled with lean concrete by the Contractor at his expense.

PAY ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT
SP-14	Permanent Steel Casing (wall thickness as per drawings/BOQ) including all fixtures.	Tons

SP-15 BRIDGE DECK EXPANSION JOINT

- 15.1 The work covered in this item shall consist of furnishing all plant, equipment, materials and labour in performing all operations in this connection in furnishing and placing (in concrete structure) all deck expansion joints and seals, complete and in accordance with the Specifications, the Drawings and as required by the Engineer.
- 15.2 The Expansion Joint provided will conform to the Bridge deck expansion joint Escort New Monocell NMC 050 or NFJ or Equivalent relevant installation description and other details are appended, including technical specifications.
- 15.3 The Expansion Joint shall be Bridge deck expansion Joint NMC 050 or NFJ as per Drawings and details given or as directed by the Engineer for equivalents.

15.2 MEASUREMENT AND PAYMENT

The quantities to be measured under this item shall be linear meter of bridge deck expansion joint furnished and installed in place as per drawing or as directed by the Engineer.

The quantities, determined as provided above shall be paid for at the contract unit price, quoted in the Bill of Quantities, which price and payment shall be full compensation for all the costs necessary for the proper completion of the work prescribed in these Specifications and drawings or as directed by the Engineer.

PAY ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT
SP-15	Bridge Deck Expansion Joint (NFJ) OR Equivalent	M

SP-16 EXPLORATORY OR CONFIRMATORY BORING AND TESTING

16.1 DESCRIPTION

This section shall consist of subsoil investigation at bridge site locations including exploratory/confirmatory boring, field and laboratory testing, interpretation of test results and submission of report in accordance with these Specifications and in conformity with Drawings or as directed by the Engineer.

16.2 BORING/DRILLING AND TESTING

Subsurface conditions at proposed bridge sites will be investigated by Percussion/Rotary boring in all kinds of strata as specified below:

Number of boreholes at each location: 2-4 or as directed by the Engineer.

Depth of each borehole: variable, depending upon soil and loading conditions, mentioned in BOQ, shown on drawings or as directed by the Engineer.

Standard penetration tests at every 1.5m interval depending upon stratigraphy or as directed by the Engineer.

Collection of undisturbed samples in cohesive strata.

Collection of disturbed samples.

Collection of rock core samples including Rock Quality Designation (RQD) determination.

Laboratory testing shall be carried out on disturbed and undisturbed samples collected from bore holes/drill holes, by split spoon sampler (SPT) and/or thin wall tube sampler etc.

Type and number of tests will depend upon material characteristics and as directed by the Engineer.

16.3 EQUIPMENT AND METHOD

16.3.1 EQUIPMENT

The boring, drilling, sampling and testing equipment selected by the Contractor shall be such as to be most suited to the sub-surface strata likely to be encountered, to enable the accurate determination of strata changes and to minimize sample disturbance.

16.3.2 DRILLING METHOD

Drilling shall be done by rotary drilling or percussion boring methods. Percussion boring will be done until rock is reached. In rock, rotary drilling with continuous rock core sampling will be used to depths as directed by the Engineer.

16.4 FIELD TESTING AND SAMPLING

16.4.1 STANDARD PENETRATION TESTS (SPT)

The Standard Penetration Tests (SPT) shall comply with ASTM D-1586. SPT shall be carried out in the borehole at every 1.5m interval and at changes of strata (as & when applicable), and/or as directed by the Engineer.

16.4.2 UNDISTURBED SAMPLES

The undisturbed samples shall be taken in cohesive soils from the boreholes in accordance with ASTM D-1587 at the depths designated by the Engineer during the execution of work.

16.4.3 DISTURBED SAMPLES

Small disturbed samples shall be taken from the cutting shoe of thin wall tube sampler and from split spoon samples.

16.4.4 ROCK CORE SAMPLES

Continuous rock core samples including RQD determination shall be made to depths as directed by the Engineer and in accordance with ASTM D-2113.

16.4.5 GROUND WATER OBSERVATION

Ground water when encountered shall be recorded in all the boreholes. All unusual water conditions and elevations at which such conditions are encountered shall be carefully observed and recorded by the contractor.

16.4.6 LOG OF BOREHOLES

A continuous log of each borehole shall be completed by the Contractor in the field and shall be submitted in duplicate to the Engineer within two days after each borehole is completed. The format of all logs shall be in accordance with AASHTO Manual of Subsurface Investigation 1988. Chapter 10 "Compiling and Presentation of Geotechnical Information", subject to the approval of the Engineer.

16.5 LABORATORY TESTING

Laboratory testing should be conducted to estimate the most severe design criteria. Type of tests required shall be as given below:

Natural Moisture Content, Unit Weight & Specific Gravity

- Grain Size Analysis
- Atterberg Limits
- Unconfined Compression
- Consolidation
- Direct Shear
- Dry Density, Specific Gravity and Absorption on rock core
- Chemical tests on soils & water samples

Frequency of tests shall be as approved by the Engineer. All the tests shall be carried out in accordance with ASTM/AASHTO standards.

16.6 GEOTECHNICAL REPORT

The report shall include, but will not be limited to:

1. A layout plan showing the actual location of boreholes.

2. General information of site, including a description of general subsoil conditions and the subsurface strata encountered.
3. Logs of boreholes
4. Results of Field and Laboratory tests, observations and analysis.
5. Recommendation on type of foundation (i.e. shallow footings or deep pile foundation).
6. Allowable loading and bearing capacities.
7. Settlement considerations.
8. Corrosion effect of soil and water encountered in the boreholes.

16.7 MEASUREMENT AND PAYMENT

The measurement and payment for the work specified in the contract for drilling of bore holes, collection of disturbed, undisturbed and rock core samples, performing the standard penetration tests, laboratory testing and compilation and presentation of report shall be done and paid as per the items listed below and given in the BOQ, which payment shall be full compensation for furnishing all labour, material, tools, equipment and incidentals and for performing al the work involved.

PAY		UNIT OF
ITEM NO.	DESCRIPTION	MEASUREMENT
SP-16	Exploratory/Confirmatory Boring and Testing in Dry/wet Area including Geotechnical Report for Bridges (4 copies of Report to be submitted)	Job

SP-17 PROVIDING & FIXING DRAINAGE PIPE IN BRIDGE DECK (G.I. PIPE)

17.1 DESCRIPTION

This work shall consist of providing, making and fixing in position Galvanized Iron (G.I) pipes with steel grating for the drainage of water on deck slab of sizes and spacing shown on the Drawings including all threading, joining, tests, bends and fixing in concrete properly as indicated on the Drawings. The pipes shall be painted with three coats of approved enamel paint.

17.2 MATERIAL REQUIREMENTS

G.I. pipes and its fixtures shall conform to BSS & ASTM standards.

17.3 CONSTRUCTION REQUIREMENTS

The pipes should be free from all blemishes. Proper length of the pipes as referred should be cut and fixed with all fittings including fixing in the concrete. All works are to be completed as per Drawings, Specifications and as directed by the Engineer.

17.4 MEASUREMENT AND PAYMENT

The quantities to be measured under this item shall be number of drainage pipes furnished and installed in place as per drawings or as directed by the Engineer.

The quantities, determined as provided above shall be paid for at the contract unit price, quoted in the Bill of Quantities, which price and payment shall be full compensation for all the costs necessary for the proper completion of the work prescribed in these Specifications and drawings or as directed by the Engineer.

PAY		UNIT OF
ITEM NO.	DESCRIPTION	MEASUREMENT
SP-17	Providing and Fixing Drainage Pipe in Bridge Deck (G.I. Pipe of dia as shown on drawings/BOQ) with steel grating	M

SP-18 UPVC PIPES

18.1 SCOPE OF WORK

The work covered by this section of the specifications consists of furnishing all plant, labour, equipment, appliances and materials and in performing all the operations in connection with laying, jointing, testing, disinfection and commissioning of upvc pipe work complete in strict accordance with the specifications herein and the applicable drawings and subject to the terms and conditions of the contract.

18.2 UPVC PIPES

UPVC pipes shall be approved manufacture and confirm to the standard as specified in General section

18.3 STANDARDS AND SPECIFICATION

For sampling testing and tolerance limit, specification BS3505:1968 and PS 3051 1991 shall be followed. The upvc pipes jointing shall be cement solvent joint or Z- joint. The contractor should provide the Technical Detail and Boucher to the Engineer or Engineer's representative for approval.

18.4 PHYSICAL PROPERTIES

The physical properties of UPVC pipes shall fall within the following limits

Properties	Value	Unit
Specific Gravity	1.42 - 1.46	-
MECHANICAL		
Tensile strength at 23 °C	450 – 600	kgf/cm ²
Modulus of elasticity at 20°C	30,000	kgf/cm ²
Elongation at break	> 80	%
Impact strength at 0°C	0.5 – 1	Ft lb / in of notch
Impact strength at 20°C	1 – 2	Ft lb / in of notch
Compressive strength	600 – 700	Kgf/cm ²
Bending Strength	1000	Kgf/cm ²
THERMAL		
Specific heat at 20°C	0.24	Cal/gm/°C
Vacate softening point	85	°C
Heat distortion temperature at 18.5 kgf/cm ²	75	°C
Thermal conductivity	0.12 – 0.14	W/m °C
Coefficient of linear thermal expansion	0.08	Mm/mm °C
ELECTRICAL		
Dielectric constant (800 cycle)	3	-
Dielectric strength	425	Volts/mil
Inflammability	Will not support combustion	-
Water absorption (24 hrs at ambient temp.)	0.07	%

18.5 ABBREVIATIONS

uPVC	Unplasticized polyvinyl chloride
PVC	polyvinyl chloride
BS	British Standard
PS	Pakistan Standard
OD	Outside diameter
PN	Nominal Pressure

18.6 Nominal Pressure (PN)

The following class/pressure shall be followed

Class B (PN=6 bars),

Class C (PN= 9 bars)

Class D (PN=12 bars

Class E (PN= 15 bars)

18.7 THICKNESS AND DIAMETER

The diameter and thickness shall be as followed

Nominal size	Mean Outside Diameter	Wall Thickness			
		Class B 6 bar	Class C 9 bar	Class D 12 bar	Class E 15 bar
	max	min	min	min	min
Inch	mm	mm	mm	mm	mm
3"	89.1	2.9	3.5	4.6	5.7
4"	114.5	3.4	4.5	6.0	7.3
5"	140.4	3.8	5.5	7.3	9.0
6"	168.5	4.5	6.6	8.8	10.8

18.8 UPVC FITTINGS

uPVC fittings shall be approved manufacture and shall be confirm to the standard as specified in General section 1 For sampling testing and tolerance limit, BS and PS pecification shall be followed.

Metal fittings (cast iron and ductile iron fittings) can be used for diameter ranging 10 inches and above. The metal fittings are connected with the pipe using rubber ring Z-joint system.

18.9 JOINTING

18.9.1 Solvent Cement joint

Jointing is done by applying a uniform layer of solvent cement to spigot and socket ends of pipes to be jointed together and assembling them with a quick action. Right after jointing, the surplus cement shall be removed and a period of 24 hours should be allowed to elapse before pressure testing..

18.9.2 Guide to the Consumption of Lubricant, Cleaner and Solvent Cement per 100 Joints

Range of pipe and fittings diameter (mm)

Aprox.	32 – 40	50 – 63	75 - 90	110 – 125	140 - 160
	1” – 1¼”	1” – 1½”	2 ½” – 3”	4”	5” – 6”
Lubricant (kg)	-	2.0	3.50 – 4.00	4.00 – 5.00	5.0 – 6.5
Cleaner (liter)	0.35 – 0.50	0.65 – 0.90	1.00 – 2.00	3.00 – 5.00	6.5 – 9.0
Solvent Cement (Liter)	0.78 – 1.00	1.30 – 1.800	2.00 – 4.00	6.00 – 10.00	13.0 – 18.0

18.9.3 Z-joint

Z – Joint is also commonly known as “rubber ring” joint. These joints contain an electrometric sealing component which is automatically compressed to form an effective seal when the spigot end of upvc pipes inserted into the socket.

These joints are not designed to resist end thrust. Therefore, particular care should be taken to ensure that the pipeline is property anchored. Anchor blocks should be designed to withstand the thrust resulting from the maximum pressure to which the pipe is likely to be subjected, normally the test pressure. It is desirable to insulate the uPVC pipe from direct contact with the anchor block by means of a suitable flexible membrane.

18.9.4 Flanged Joint

Flanged joints can be used to connect uPVC pipes with metal pipes, valves and fittings provided with flanges. Joints are made by the compression of the gasket or a ring seal set in the adaptor of the flange. Flanged joints are also preferable, where there is a need to dismantle pipeline from time to time. Care should be taken while selecting flange accessories their flange should be compatible with the uPVC flange adaptor.

18.10 INSTALLATION OF uPVC PRESSURE PIPES

18.10.1 Installation of Buried Pipe

Un plasticized PVC pipes must be laid onto a trimmed trench bottom, where soil is uniform, fine grained and free from sharp objects. The trench width must be sufficient to enable the lying and jointing of the pipes and proper compaction around the pipe. The minimum recommended trench width (W) is equal to pipe OD plus 600 mm or as specified in the Drawings

The minimum depth of cover required for water mains is 900mm from finished surface level to the crown of the pipe. Thus, the minimum excavated depth (D) of the trench for water mains is pipe OD + 900mm + Bedding.

The normal thickness of bedding is a min of 100mm. for pipe sizes greater than 8 inches; the bedding thickness should be increased to a minimum of 150mm and or specified in the Bill of Quantities.

Because of the flexible nature of the material the pipe should be suitably anchored at all changes of direction and at fixed points. The anchors should be designed to withstand the maximum thrust developed during hydrostatic pressure testing.

Un plasticized PVC pipes should not be installed in direct sunlight or near any heat source. The liner expansion of uPVC is about six to seven times that of steel, so precaution is to be taken to compensate for it. The pipe line should be installed in such a way as to minimize the stress. The best way of doing this is to arrange piping so that bends occur between anchor points. Along walls pipe rack, hangers, clamps, straps or u-bolt can be used.

18.10.2 Support Spacing

Recommended horizontal and vertical support spacing is given in the table.

*Pipe Outside Diameter	Water Temperature °C				Vertical spacing
	20 °C	30 °C	40 °C	50 °C	
OD	Horizontal Spacing				
mm	cm	cm	cm	cm	cm
16	75	60	40	-	80
20	85	70	50	-	90
25	90	75	55	45	100
32	100	85	65	50	120

18.11 MEASUREMENT

- 18.11.1 All UPVC pipes shall be measured according to the work actually done and no allowance will be made for any waste in cutting to the exact length required. The measurement for pipes shall be in running meter nearest to a cm. Of length along the centre line of pipe as actually laid at work sites.
- 18.11.2 The rate for providing, laying and jointing of UPVC pipes shall be deemed to include the cost of collars/rubber rings, jointing material, testing and extra excavation required for ordinary bedding of pipes and also for collars and pipe sockets, if any.
- 18.11.3 If any damage is caused to the pipe line during the execution of work or while cleaning/testing, the pipe line as specified. The contractor shall be held responsible for the same and shall replace the damage pipe line and retest the same at his own cost to the full satisfaction of Engineer.
- .
- 18.11.4 Water for testing of pipeline shall be arranged by Contractor at his own cost.
- 18.11.5 Pipes shall be brought on site proportionate to the required progress for Thirty days only.

PAY		UNIT OF
ITEM NO.	DESCRIPTION	MEASUREMENT
SP-18	u.PVC pipe Dia as shown on drawings and/or BOQ.	M

ADDENDA & CORRIGENDA

ADDENDA/CORRIGENDA TO GENERAL SPECIFICATION 1998

INTRODUCTION

This Addenda/Corrigenda to NHA General Specification shall be read in conjunction with NHA General Specification 1998 and other contract documents. In case any General Specifications are at variance with any provision of these Addenda/Corrigenda, the Addenda/Corrigenda shall prevail.

1. **Page G-22: Schedule for Sampling and Testing for Asphaltic Base Course Plant Mix.**

For mixture, following tests and their designation are inserted:

Flow	AASHTO T-245
Stability	AASHTO T-245
Loss of Stability	AASHTO T-245
Bulk Sp. Gravity	AASHTO T-166 (Method 'B') & T-275

2. **Page G-26: Schedule for Sampling and Testing for Wearing Course Plant Mix.**

Following changes should be made in Sampling and Testing Frequency:

Material	Test	Designation	Sampling & Testing Frequency
Coarse Aggregate	Stripping	AASHTO T-182	3/Source plus 2/5000 CM
Fine Aggregate	Plasticity Index Specific Gravity Friable Particles	AASHTO T-89 & T-90 AASHTO T-84 AASHTO T-112	2/1000 CM. 4/Source 2/5000 CM

For mixture (Premix Asphalt), following tests and their designation are inserted:

Bulk Sp. Gravity	AASHTO T-166 (Method 'B') & T-275
Maximum Sp. Gravity	AASHTO T-209
Air Voids	AASHTO T-269

3. **Page G-28: Schedule for Sampling and Testing of Concrete.**

Replace Contents of "Tests", "Designation" and "Sampling and Testing Frequency" Columns with following:

Material	Test	Designation	Sampling & Testing Frequency
Coarse Aggregate	Gradation	AASHTO M-43 & AASHTO T-27	3/Stock pile plus 1/1000 CM for each size
	Unit Wt.	AASHTO T-19	
	Sp. Gravity	AASHTO T-85	3/Source plus 1/1000 CM
	Absorption	AASHTO T-85	3/Source plus 1/1000 CM
	Abrasion	AASHTO T-96	3/Source plus 1/1000 CM
	Soundness	AASHTO T-104	1/Source plus 1/5000 CM
	Deleterious Substance	AASHTO M-80, T-11, T-112 & T-113	1/Source plus 1/5000 CM
	Petrography	ASTM C-295 C-289 & C-586	1/Source plus 1/5000 CM for each type of test. plus 1/5000 CM
Fine Aggregate	Gradation	AASHTO M-6 & AASHTO T-27	3/Source plus 1/1000 CM for each size
	Unit Wt.	AASHTO T-19	

Material	Test	Designation	Sampling & Testing Frequency
	Sp. Gravity Absorption Organic Impurities Soundness Fineness Modulus Deleterious Substance Potential Reactivity	AASHTO T-84 AASHTO T-84 AASHTO T-21 & AASHTO T-71 AASHTO T-104 AASHTO M-6 & AASHTO T-27 AASHTO M-6, T-11, T-112 & T-113 ASTM C-295, C-289 & C-586	3/Source plus 1/1000 CM 3/Source plus 1/1000 CM 3/Source plus 1/1000 CM 1/Source plus 1/1000 CM for each type of test. 1/Source plus 1/5000 CM 3/Source plus 1/1000 CM 3/Source plus 1/5000 CM for each type of test. 1/Source plus 1/5000 CM
Cement	Setting Time Mortar Strength	AASHTO T-131 AASHTO T-106	1/Lot or 1000 Bags. 1/Lot or 1000 Bags.
Water	Chemical Tests	AASHTO T-26, ASTMD-512 & D-516	1/Source
Concrete Mix	Compressive Strength Slump Air Content	AASHTO T-22 AASHTO T-119 AASHTO T-196	6/Shift or 50 CM (2 sets of 3 each) 1 Each Batching Plant Delivery or as required by the Engineer. Minimum 1/Shift or as required by the Engineer.

4. **Page 100-3, Item 100.7.**
Line 1 write "Pipe Culverts" instead of Culverts and
5. **Page 100-3, Item 100.9.**
Line 2 Remove "Clause 17 of General" and reword the sentence as;

"The Contractor shall be responsible for setting out of the work in accordance with the Conditions of Contract, Contract Drawings and any subsequent revisions".
6. **Page 101-1, Item 101.2.1, Clearing/Grubbing,**
In fifth line of first para, replace "natural surface" with "natural surface or sub-grade".
7. **Page 101-2, Item 101.3.2.**
Line 4 Delete after "restoration of area" and add "to its original degree of compaction and to original level".
8. **Page 102-1, Item 102.3.**
Line 5 Add "The tree, stumps and roots remain the property of Employer, which shall be delivered at designated place as directed by the Engineer".
9. **Page 104-1, Item 104.2. Construction Requirements.**
Replace Table as follows:

For Height of Embankment Below sub-grade Level	Percent of Maximum Dry Density as determined by AASHTO T-180 'B' or 'D'
0 – 30 cm	95%
Over 30 cm	93%
Below the foundation of Structures	95%

10. **Page 105-1, Item 105.2.1. b) Rock Excavation.**
In the third line insert, “between two successive cross sections” after the word “provided”
11. **Page 105-1, Item 105.2.1(b). Rock Excavation.**
In the fifth line insert, “between two successive cross sections” after the word “mass”.
12. **Page 105-2, Item 105.2.2, Borrow Excavation,**
In the ninth line of first para, insert words, “in lieu thereof” in between “embankment” and “shall”.
13. **Page 105-2, Item 105.2.3, Structural Excavation.**
Insert “,” in between the words “description” and “method of measurement”.
14. **Page 105-2, Item 105.3, Rewrite second paragraph as under:**
“The material shall be considered unsuitable if soaked CBR is less than Five (5) percent or if it falls under A-6 or A-7 of AASHTO soil classification. For materials with CBR value of Five (5) percent or more but less than Ten (10) percent the Contractor shall blend such material with other suitable material so that it becomes suitable for embankment with required CBR as shown on the drawings. Payment of blending shall be considered to be included in Item 108a Formation of Embankment form Roadway Excavation”.
15. **Page 105-3, Page Item 105.3.**
Para 5 Line 1 Delete “Rock, shale and other”.
Line 4 Last word delete “Earth” and write “granular”.
16. **Page 106-1, Item 106, Excavation of Unsuitable or Surplus Material,**
Read the title of this Item as “Excavation and Disposal of Unsuitable or Surplus Material”.
17. **Page 106-2, Item 106.3.2, Payment,**
Insert Unit of Measurement “CM” for item 106d iii. Soft Rock.
18. **Page 107-1, Item 107.2.2.(c).**
Line 1 Replace “size” with “six”
19. **Page 107-4, Item 107.3.2 second para first line delete “20 cms” and write “15 cms”.**
20. Page 107-5, Item 107.3.3 (b) fifth line delete “20 cms” and write “15 cms”.
21. **Page 107-6, Item 107.3.3. Backfill,**
Replace the sub Item h) with following wording:

“h” No backfill shall be replaced against any concrete or masonry structure until permission shall have been given by the Engineer. Backfilling shall not be carried out until the concrete or masonry structure has been in place for fourteen (14) days, and subject to concrete cylinder compressive strength achieving twice the stress to which the structure will be subjected. The concrete cylinders shall be cured under identical site conditions to concrete / masonry structure and in a manner approved by the Engineer. The Contractor shall submit to the Engineer full calculation details of the stresses in question”.

22. **Page 108-1, Item 108.2. Material Requirements,**
Replace sub-item b) with following wording:
- “b) CBR of the fill material shall not be less than the value shown on the drawing, determined in accordance with AASHTO T-193. CBR value shall be obtained at a density corresponding to the degree of compaction of that layer.

23. **Page 108-1, Item 108.3.1, Formation of Embankment with Borrow Common Material**
Delete word “Borrow” from heading of this sub-item.

Replace Table as follows:

<u>Depth in Centimeters Below sub-grade Level</u>	<u>Percent of Maximum Dry Density as determined by AASHTO T-180 *</u>
0 – 30 cm	95%
Over 30 cm	93%

Method ‘B’ or ‘D’ whichever is applicable, or corresponding Relative Density in case of sand fill.

24. **Page 108-3, Item 108.3.2. Formation of Embankment with Rock Material,**
Replace the second sentence of the third paragraph of this sub-item with the following wording:
"Rock fill shall not be placed within the following depths from top of subgrade:
- | | |
|--|---------|
| a) For rock fills upto 5 meters in depth | 60 cm. |
| b) For rock fills greater than 5 meters in depth | 100 cm. |

25. **Page 108-4, Item 108.3.5. Formation of Embankment in Water Logged Areas,**
Add the following paragraphs at the end of this sub-item:

“Irrigated area, such as rice fields and fish farms or natural ponds through which embankments are to be placed, shall be drained or kept drained of all surface water prior to commencing with placing of fill and all clearing and grubbing shall be performed, manually if necessary, in accordance with the relevant articles.

In those areas of high water levels and salinity with soft subsoil and where embankments are high such as approach fills to structures, special provisions shall be made to measure and determine likely fill settlements which may occur. These preconditions are necessary in order to specify particular construction procedures which may be necessary and to establish the time at which the pavement structure can be placed to avoid cracks and subsidence of these layers”.

26. **Page 108-5, Item 108.3.6. General Requirements,**
Add the following paragraph after the third paragraph of this sub-item:
- “Embankment filling shall be brought up and compacted over the full width of the embankment in one operation in layers parallel with the sub-grade level. At no time shall any part of the embankment width be left more than one layer lower than any other part of the embankment width.

The shoulder construction shall be brought up simultaneously with the pavement.”

27. **Page 108-5, Add Item 108.3.7 as under:**

“108.3.7” Trial Sections

“Before starting the formation of the embankment the Contractor shall construct a minimum of three trial sections of 200 meters each for each soil type proposed to be used for compaction as directed by the Engineer. The soils used in the trials shall be the same as those intended to be used for the formation of embankment and the compacting equipment shall be same equipment that the Contractor will use during compaction of embankment and that has been accepted by the Engineer.

The object of these trials will be to determine the suitable moisture content and the relationship between the number of passes of compacting equipment and density obtained for particular type of soil. No separate payment will be made for this work, which will be required as a subsidiary obligation of the Contract under Pay Item Nos. 108a, 108c, 108d, as the case may be”. If the trial sections are carried out in the permanent works and approved by the Engineer, the lengths of the trails should be deducted from the cost of the respective permanent works.”

28. **Page 108-5, Item 108.4.1. Measurement**

Delete 1st Para and replace with:

“The quantities to be paid shall be valued in cubic meters calculated from cross-sections constructed in accordance with the design lines and grades and the ground levels as established under Clause 100.9. The quantities to be paid shall have been compacted in place, accepted by the Engineer and formed with material resulting from”.

29. **Page 108-6, Item 108.4.1.**

Add word “suitable” before Roadway Excavation and Structural Excavation.

30. **Page 108-6, Item 108.4.2. Payment Para b) Formation from Structural Excavation**

Line no 3 Delete word “excavation” from “cost of excavation”

31. **Page 109-1, Item 109.2.3, Sub-grade Preparation in Earth Cut,**

In first paragraph of this sub-item:

Insert the words “natural ground” between “the” and “surface” in the second line.

32. **Page 109-2, Item 109.2.5, Sub-grade in Embankment,**

Replace the second and third sentences in the first paragraph of this sub-item with the following wording:

“Soils having a minimum CBR value as shown on the drawing and determined at 95% compaction with swell value of not more than 0.3 percent, and surcharge weights representing the over burden, shall be used”.

33. **Page 109-4, Item 109.3.2, Payment Page,.**

Add the following new pay item:

Pay item No.	Description	Unit of Measurement
109c	Subgrade Preparation in Existing Road with Aggregate Base SM	

34. **Page 110-4, Item 110.4.1 Measurement**
Replace word “square meter” with “cubic meter” in 2nd line
35. **Page 201-1, tem 201.2, Material Requirements,**
In Para a) second line, replace phrase “A, B and C given below” by “A and B given below”.
- Replace “plasticity index of 6 or less” with “Non Plastic” on page 201-2 in item 201.2 (e)
36. **Page 202-2, Item 202.2, Material Requirements,,**
Replace the sub-item e) with the following wording:
- “e) the sand equivalent determined according to AASHTO T-176 shall not be less than forty five (45) and the portion of filler and binder, including any blended material, passing 40 mesh sieve shall have a liquid limit not more than twenty five (25) and a plasticity index not more than six (6) when tested in accordance with AASHTO T-89 and T-90”.
37. **Page 203-6, Item 203.2.4, Asphalt Content,**
Change weight percent of total mix from “□ 0.3%” to “□ 0.2%”.
Add following after last para “for the materials from existing source”.
38. **Page 203-9, Item 203.3.7, Spreading and Finishing,**
Insert the following paras after second paragraph:
“Care shall be taken to ensure that material is properly compacted up to joint positions. If this is not done or results in misshapen surface on a layer, the Engineer may instruct unacceptable material to be cut back before laying the adjacent material. Joints in superimposed layers of asphaltic material must be offset longitudinally by at least 2m and transversely by at least 30cm. Longitudinal joints in wearing course shall, after cutting back, be of good alignment and preferably coincident with the position of carriageway markings. Except where laying in echelon, joints in wearing course shall be cut back to a vertical face and tack coated. Kerb faces, ironwork and the like in contact with wearing course shall be tack coated prior to laying wearing course.
- The outer edges of wearing course shall be cut back to a good alignment, parallel with the road alignment. This will require a small additional width of wearing course to be laid.
- The Contractor should allow, within his bid rates, for this additional width and for all cutting back of wearing course, which will not be measured for payment. Tack coating of vertical faces will not be measured for payment.”
39. **Page 203-10, Item 203.3.8.**
5th para, 3rd Line: Change “Ninety Seven (97)” to “Ninety Eight (98)”.
40. **Page 203-11, Item 203.3.9,**
Change “97%” to “98%”, “96%” to “97%” and “95%” to “96%” in this para.

41. **Page 203-12, Item 203.3.14,**
Add the following para as 2nd para

“No extra payment shall be made for the trial. The trial section should be minimum 200m in length and full width of the road. If the trial section has been carried out in the permanent work and approved by the Engineer, the cost of same shall be deducted from the Contract price.”

42. **Page 206-1, Item 206.2**
Replace Sieve Designation from “4.35” to “4.75” in table for fine aggregates

43. **Page 209-1, Item 209.3.2,**
Replace the following pay item:

Pay item	Description	Unit of
No.		Measurement
209b	Scarification/Grooving of existing road Pavement	SM

44. **Page 302-4, Item 302.4.2, Payment,**

Add the following wording as first paragraph of this sub-item:

“In pricing this Item, the Contractor shall assume the maximum specified quantity of asphaltic material per square meter. The price paid for other rates of spread, as directed by the Engineer, will be adjusted downwards to compensate for the actual quantity of bitumen used.”

45. **Page 303-2, Item 303.4.2, Payment,**

Add the following wording as first paragraph of this sub-item.

“In pricing this Item, the Contractor shall assume the maximum specified quantity of asphaltic material per square meter. The price paid for other rates of spread, as directed by the Engineer, will be adjusted downwards to compensate for the actual quantity of bitumen used.”

46. **Page 304-4, Item 304.3.4**

Para 3 line 1: The words “binder snows” should read “binder shows undulations”

47. **Page 305-4, Item 305.2.4, Asphalt Content,**

Change weigh percent of total mix from “□ 0.3%” to “□ 0.2%”.

Add following after last para “for the material from the existing source”.

48. **Pages 305-3, 305-5 and 305-6**

a) Item 305.3.2 Pavement Thickness and Tolerance

Para 2 line 5 replace “Ten (10) mm” with “Five (5) mm” and insert new para between para 2 and 3.

“After the wearing course has been completed, cores for full depth of asphalt base course and wearing course shall be taken for determining the thickness. Thickness of wearing course shall be considered to be equal to the thickness obtained by subtracting design thickness of asphalt base course from total thickness of core”.

b) Item 305.4.1 Measurement

Para 1 line 6 replace “Ten (10) mm” with “Five (5) mm”.

- c) **Item 305.4.2 Payment**
Para 2 line price adjustment line 3 replace “Ten (10) mm” with “Five (5) mm” and revise Table-1 as under:

Deficiency in Thickness as Determined by Cores	Proportionate Rate of Contract Price Allowed
0.0 mm to 3.0 mm	100%
3.1 mm to 5.0 mm	80%

- d) Replace after Table-1 in line 1 “Ten (10) mm” with “Five (5) mm”.

Insert in line 5 after “35 mm”.

“Replacing or overlaying due to deficient asphalt thickness shall be done in full asphalted width of roadway and for a minimum of 100 meters length with smooth transition as approved by Engineer.”

Delete next para from “Alternately..... “ to “no extra compensation”.

49. **Page 310-5, Item 310.3.3. (1a), Composition,.**

Replace para “a” with following:

“a) All concrete shall be air-entrained and proportioned by weighing and shall conform to the following strength and mix requirements.”

- | | | |
|------|---|--------------|
| i) | Minimum Cylindrical Compressive Strength at 28 days | 250 Kg/Sq.cm |
| ii) | Minimum Cement Content | 350 Kgs |
| iii) | Maximum Water Cement Ratio | 0.53 |
| iv) | Slump | 20 – 80 mm |
| v) | Total air content (including Entrained air) | 6.0 □ 0.5% |
| vi) | Maximum size of Aggregate | 20 mm |

50. **Page 310-6, Item 310.3.3(2), Consistency,**

From first paragraph in sixth line, delete from the word “except” till the end of the paragraph.

Replace second paragraph by the following:

“The total air content of the Air-entrained concrete shall be determined by AASHTO T-196.”

51. **Page 310-25, Item 310.4.1, Measurement**
Replace “square meter” with “cubic meter”

52. **Page 401-1, Item 401.1, Description,**

Add the following paragraphs to this sub item:

“Where the soil in contact with the concrete has a sulphate content of more than 0.2% or if the ground water has a sulphate content of more than 1000 ppm (or mg/l) or if so indicated on the Drawings or directed by the Engineer, sulphate resisting cement shall be used.

The maximum chloride ion concentration (as a percentage by weight of cement) arising from all sources including aggregates shall not exceed 0.06 for pre-stressed concrete, 0.15 for any concrete using sulphate resistance cement and 0.30 for all other concrete containing metal reinforcement”.

53. **Page 401-1, Item 401.1.1, Classes of Concrete,**

Replace the content on page 401-1 by the following:

“The classes of concrete recognized in these specifications shall be designated: A-1, A-2, A-3, B, C, D, Y and Lean Concrete. The Class of concrete to be used shall be as called for on the Drawings or as directed by the Engineer or specified in the Special Provisions. The following requirements shall govern unless otherwise shown on the Drawings.

Class A-1 concrete shall be used for precast concrete members and where specified in the Special provisions or on the drawings.

Class A-2 concrete shall be only where specified.

Class A-3 concrete shall be used in piles, pile caps, bridge components, deck slab, retaining walls and diaphragm with a slump between ten (10) to fifteen (15) cms.

Class B concrete shall be used only where specified.

Class C and Class Y concrete shall be used as directed by the Engineer, or specified in the Special Provisions or on the Drawings.

Class D1 and D2 concrete shall be used in pre-cast post-tensioned and pre-stressing members.

Lean concrete shall be used in thin layers underneath footings and when called for on the Drawings or directed by the Engineer.

The concrete of the various classes shall satisfy the requirements as shown in the General Specifications Table 401-1, Page 401-1.

54. **Page 401-2, Item 401.2.1, Portland Cement,**

Replace the text of this sub-item with the following paragraphs:

A) **General Requirements**

Cement remaining in bulk storage at the mill, prior to shipment, for more than six(6) months or cement stored in local storage by Contractor for more than three (3) months after shipment from the factory shall be re-tested before use and will be rejected if it fails to meet any of the Specification requirements. Factory certificates shall accompany delivery of the material to the site.

Sampling of cement shall be in accordance with AASHTO Designation T-127.

Cement shall be delivered in sufficient quantities to ensure that there is no suspension of the work of concreting at any time. Different brands of different types of cement from the same mill, or the same brand or type from different mills shall not be mixed or used alternately in the same item of construction unless authorized by the Engineer.

B) **Ordinary Portland Cement**

Ordinary Portland cement shall conform to the requirements of the Standard Specification for Portland cement, AASHTO Designation M-85 (ASTM Designation C-150). The type of the cement to be used, unless otherwise shown on the Drawings, shall be type I.

C) **Sulphate Resisting Cement**

Description

This work shall consist of providing sulphate resistant cement in place of Portland Cement to all classes of concrete mentioned in item 401 of General Specification subject to the contact with soil having sulphate content more than 1% and with Ground Water having sulphate content more than 1500 ppm or as mentioned in the drawing or directed by the Engineer.

Material Requirements

(i) **Cement**

Sulphate resistant cement where required shall be sulphate resistant cement type 'A' fully conforming to Pakistan Standard Specification PS No. 612 1967 and satisfying to requirements for fineness, chemical composition strength, setting time and soundness etc. The average compressive strength of three mortar cubes prepared with 1:3 cement and standard silica sand mortar shall not be less than 20.0 N/sq.mm. at seven days. The initial setting time shall not be less than 45 minutes and final setting time not more than 10 hours.

(ii) **Aggregate**

Fine and coarse aggregate shall be as specified in item 401 of General Specifications.

(iii) **Water**

Water shall be as specified in Article 401 of General Specifications.

Construction Requirements

The construction requirements of concrete with sulphate resistant cement shall be fully as specified in item 401 of General Specifications.

D) **Blast Furnace Slag Cement & Concrete**

Slag cement where required shall conform to BS-146 (1973) or ASTM-C114 (1983) or equivalent, and shall satisfy the requirements for chemical composition, strength, setting time and soundness etc. contained therein. The minimum compressive strength at 7 days shall not be less than 3500 psi. The initial and final setting times shall not be less than 45 minutes and not more than 10 hours respectively.

Fine and coarse aggregate shall be as mentioned in article 401.2 of General Specifications and shall also satisfy the requirements detailed in the following table (A).

TABLE-A
Additional Requirements for Aggregates in
Blast Furnace Slag Cement Concrete

Aspect	Requirements	Standard Code of Practice
test	Alkali-silica reaction	< 0.1% expansion
	Alkali-carbonate reaction	< 0.1% expansion
	Chloride (C1)	< 0.02% by wt.
	Sulphate (So2)	< 0.04% by wt.
	Water Absorption	< 3.0% by wt.

The water for washing of aggregate, mixing and curing of concrete shall conform to the requirements of article 401.2.7 of the General Specifications except that minimum chlorides and sulphates contents in water used for reinforced concrete shall not be exceed 500 mg/litre and 600 mg/litre respectively.

At least one week prior to production of concrete for use, a mix design for each class of concrete to be used for the project shall be prepared jointly by the Engineer and the Contractor in the project laboratory. Mix design shall identify the mineral aggregates, cement, water and approved admixtures, if any, in proportions conforming to specification Requirements.

After the job mix formula is established by the Engineer, all mixes furnished for the project, represented by samples taken from the concrete batching plant during operation, shall conform thereto with the requirements mentioned in articles 401.1, 401.2, 401.3 of General Specifications, and in addition, the aggregated Chloride in concentration in the mix shall not exceed 0.3% by weight of slag Cement.

Schedule for sampling and testing of concrete shall be followed as per requirements mentioned on page G-28 and G-29 of General Specification, and in addition, the aggregated Chloride concentration in the concrete mix shall be determined at a frequency of one test/100 CM.

Samples of fine coarse aggregates shall satisfy the Requirements of Table (A) as tested according to specifications contained therein. It shall also conform to the requirements of article 401.3.9 of the General Specification.

Testing of water shall be carried out as per procedure mentioned in "BS 3148:1980 - tests for water for making concrete".

55. **Page 401-3, Item 401.2.2, Fine Aggregate,**
Replace the last sentence of fourth paragraph by following:
"The sand equivalent (AASHTO T-176) determined for fine aggregate shall not be less than 75 percent".

56. **Page 401-13, Item 401.3.5 (d), Placing Concrete under Water,**
Replace second paragraph by the following:
"Concrete deposited under water shall be Class-A2 with a minimum cement content of three hundred twenty-five (325) kg. per cubic meter of concrete.

57. **Page 401-33, Item 401.4.2, Payment Page,**
Add the following new pay item:

Pay item No.	Description	Unit of Measurement
401h	i.Extra over concrete class A-3 with S. R. cement	CM

58. **Page 404-5, Item 404.4.2, Payment,**
Add the following new pay item:

Pay item No.	Description	Unit of Measurement
404	i. Galvanized Mild Steel Bar (dia 25 mm)	Kg

59. **Page 405-1, Item 405.2.1 – Pre-stressing Reinforcement Steel,**
Replace the sub item with the following:

"Uncoated, stress-relieved or low-relaxation, seven-wire strand, or uncoated plain or deformed, high-strength bars, shall conform to the following materials standards.

- AASHTO M 203M (ASTM A 416M) – Uncoated, Seven-Wire, Stress-Relieved Strand for Prestressed Concrete, or
- AASHTO M 275M (ASTM A 722) – Uncoated, High-Strength Steel Bar for Pre-stressing Concrete.

Tensile and yield strengths for these steels may be taken as specified in Table below:

PROPERTIES OF PRESTRESSING STRAND & BAR

Material	Grade or Type	Diameter in mm	Tensile Strength f_{pu} (MPa)	Yield Strength, f_{py} (MPa)
<i>Strand</i>	1725 MPa (Grade 250)	6.35 to 15.24	1725	85% of f_{pu} except 90% of f_{pu} for low-relaxation strand
	1860 MPa (Grade 270)	9.53 to 15.24	1860	
Bar	Type 1. Plain	19 to 35	1035	85% of f_{pu}
	Type 2. Deformed	15 to 36	1035	80% of f_{pu}

If the drawings indicate only the prestressing forces and locations of application, the choice of size and type of steel shall be left to the Contractor, subject to the Engineer's approval.

If more precise data are not available, the modulus of elasticity for prestressing steels, based on nominal cross-sectional area, may be taken as:

For strand: $E_p = 197\,000\text{ MPa}$, and
 For bar: $E_p = 207\,000\text{ MPa}$,

60. **Page 405-4, Item 405.3.2, Pre-stressing Equipment,.**

In the fourth sentence of this sub-item commencing "All devices, whether.....", Replace the word "jack" with "jacks, pressure".

61. **Page 405-6, Item 405.3.7, Post Tensioning,**

Add the following paragraphs before the fourth paragraph (commencing "Any surplus length.....") of this sub-item:

"Stressing shall take place within 4 weeks of the concrete attaining the required strength otherwise the Engineer will require one or more tendons in each element to be post tensioned to be withdrawn and checked (if necessary by testing) for corrosion. The cost of tendon removal, testing, replacement (if considered necessary by the Engineer), re-threading etc. shall be entirely the Contractor's responsibility. Grouting shall take place within 4 weeks of post-tensioning. Where the Contractor fails to meet this criteria the Engineer may require de-stressing of the post-tensioned member.

Where a member has, for any reason, been de-stressed the post-tensioning tendons shall not be re-used and new tendons shall be provided. Except where such de-stressing is caused by default on the part of the Engineer, all costs associated with de-stressing, including tendon replacement shall be responsibility of the Contractor. No part-payment for post tensioned member shall be made until the member is stressed and grouted to the satisfaction of the Engineer".

62. **Page 406-1, Item 406.2.2,**

Delete word "sprayed" from the line and add the following:

The weld shall be carried out in accordance with the requirement of Item 413.2.7 and the relevant clauses of these documents. Galvanizing the steel shall meet the requirements of Item 413.2.8.

63. **Page 406-4, Item 406.2.5, Elastomeric Bearing Pads**

Replace Table with following table.

Test	ASTM Designation	Requirements
Tensile Strength, Kgs per cm ²	D 412	160 Min.
Elongation at break, percent	D 412	350 Min.
Compression set, 22 hrs. at 67°C percent	D 395 (Method B)	25 Max.
Tear Strength, Kgs per cm ²	D 624 (Die C)	13 Min.
Hardness (Shore - A)	D 2240	60 \pm 5
Ozone resistance 20% strain 100 hrs at 38°C + 1°C	D 1149 (except 00 \pm 20) parts per 100,000,000)	No Cracks
Low temperature stiffeners, Young's Modules at 35°C Kgs per cm ²	D 797	350 Max.
Low temperature brittleness, 5 hours at -40°C	D 736	Passed

64. **Item 406.4.1 d), Bearing Devices, Page 406-7.**

Replace this sub-item with the following wording:

"The quantity to be paid shall be the number of bearing devices or elastomeric bearing pads installed in the work completed and accepted".

65. **Page 406-8, Item 406.4.2,**

Add the following new pay items:

Pay item No.	Description	Unit of Measurement
406h	Bridge expansion joints for movement range as mentioned in BOQ or shown on drawings	LM
406i	Polysulphide Joint Sealant as per BS-4254 (1983) Or ASTM C920-79	Kg

66. **Page 407-2, Item 407.2.1 (c), Reinforced Concrete Cylindrical Piles,**

Replace in second line of third paragraph "Class D" by "Class A-3".

67. **Page 407-2, Item 407.2.1 (e), Precast Concrete Piles,**

Replace in second sentence of first paragraph "Class D₁" by "Class D".

68. **Page 407-18, Item 407.3.9, Load Tests**

Delete the first sentence of this Clause.

Add following sentence within third paragraph after first sentence:

"Load cell / hydraulic pump pressure and dial gauges should be preferably re-calibrated at site and a certified calibration curve shall accompany each device".

Delete the second sentence of the third paragraph of this Clause and replace by the following:

"the apparatus shall have a working capacity of at least 1.5 times the specified test load."

Delete the fifth, sixth and seventh paragraphs of this Clause and replace with the following:

The pile load test should be carried out in accordance of ASTM D1143 – 81 (re-approved 1987). The load should be applied using the standard loading procedure as described Clause 5.1 of ASTM D 1143 and interpreted below:

Sr. No.	Increment No.	Load % of Design Load	Time	Sr. No.	Decrement No.	Load % of Design Load	Time
1	1	25	2 hours *	9	1	175	20 minutes
2	2	50	2 hours *	10	2	150	20 minutes
3	3	75	2 hours *	11	3	125	20 minutes
4	4	100	2 hours *	12	4	180	20 minutes
5	5	125	2 hours *	13	5	75	20

Sr. No.	Increment No.	Load % of Design Load	Time	Sr. No.	Decrement No.	Load % of Design Load	Time
							minutes
6	6	130	2 hours *	14	6	50	20 minutes
7	7	175	2 hours*	15	7	15	20 minutes
8	8	200	24 hours	16	8	0	20 minutes

*** The load should be maintained in each increment until the rate of settlement is not greater than 0.25mm/hr, but not longer than 2 hrs.**

If pile failure occurs continue jacking until settlement equal to 15% of the pile diameter. Full report should be submitted by the Contractor in accordance with ASTM 1143.

The test pile shall be considered satisfactory provided the load-settlement curve shows no signs of failure and the permanent settlement at the top of the pile after completion of the test does not exceed the value shown on the contract drawings.

69. a) **Page 407-24, Item 407.4.2, Payment**
In the last paragraph of this Sub-Clause add, "including reinforcement" after the phrase ".....furnishing all materials.....".

b) Page 407-24, Item 407.4.2, Payment

Add the following new Pay Item:

Pay item No.	Description	Unit of Measurement
407n	Pile Load Tests to 2.5 times the design load	Each

70. **Page 413-8, Item 413.2.7, Welding.**

Add the following

The Contractor shall provide suitable equipment to carry out the following inspection of production welds as required by the Engineer.

- (i) **Visual Inspection**
All welded joints shall be subjected to visual inspection in accordance with either AWS D 1.1-88 or BS 5289 prior to any non-destructive testing and galvanizing. Weld surfaces shall be free of slag residues and sharp edges. All surfaces shall be free of traces of weld spatter, arc strikes and contaminants. The surface of all welds shall be free from cracks, lack of fusion including overlap, and slag.
- (ii) **Magnetic Particle Inspection**
Magnetic particle inspection and liquid penetrant inspection shall be applied in accordance with either AWS D 1.1-88 or BS 6072 to joints selected in accordance to non destructive testing, where any of the material thickness exceeds 20mm. Notwithstanding the requirements of non destructive testing the Magnetic Particle inspection or liquid penetrant inspection in accordance

to AWS D 1.1-88 or BS 6443, shall be applied as appropriate where on visual inspection the presence of cracking or lack of fusion may be suspected.

(iii) **Ultra Sonic Testing**

All butt joints in material 8mm – thick or greater selected in accordance with the non-destructive testing shall be ultrasonically tested in accordance with either AWS D 1.1-88 or BS3923. The weld shall be free of cracks. The height of buried slag, lack of fusion or lack of penetration shall not exceed 3mm and within 6mm of the outer surface their individual lengths shall not exceed 10mm.

(iv) **Frequency of Non Destructive Testing**

Joints shall be selected as follows. All joints of each type upto a batch size of 10 components and 10% of additional components thereafter. If non-conformances are found, the scope of non-destructive testing shall be doubled. If further non-conformances are found, the whole batch shall be tested.

71. **Page 409-6, Item 409.5.2, Payment**
Replace “CM” with “LM” for item 409e Well Sinking

72. **Page 413-11, Item 413.3.6, Fit of Stiffeners**
Replace word “Fit” with Fitting”

73. Page 604-3, Item Clause 604.4.2, Payment,
Add the following new Pay Item:

Pay item No.	Description	Unit of Measurement
604e	W beam Metal Guard Rail (Single) including end Pieces and Metal Steel Post with Enamel Paint	M

74. **Page 605-2, Item 605.3.3, Concrete,**
In first line, replace “Class D₁” by “Class A-1”.

75. **Page 606-1, Item 606.2.3, Concrete,**
Replace “Class D₁” by “Class A-1”.

76. **Page 606-2, Item 606.3.3, Concrete,**
Replace “Class D₁” by “Class A-1”.

77. **Page 607-1, Item 607.1, Description,**
Add the following paragraph to this Clause:
The manufacture and installation of traffic signs shall fully conform to the requirements laid down in the latest publication of NTRC on the subject. In case of any discrepancy between NTRC requirements and these Specifications, the requirements of NTRC shall govern.

78. **Page 608-2, item 608.2.1 b), White Traffic paint**
In heading replace “White” with “Yellow”

79. **Page 608-5, Item 608.3.1.2(e), composition of mixture**
Replace Table 1 & 2 with following:

Table 1 : Proportions of Constituents of Mixture

Constituent	Percentage by mass to total mixture	
	Minimum	Maximum
Binder (resin and oil)	18	22
Pigment	6*	-
Pigment and extender	16	22
Ballotini	} 20+	-
Aggregate	}	-
Pigment	} 78	82
Extender and Ballotini	}	

* For Titanium Dioxide only. No minimum is specified for yellow material . + Glass Bead 10% pre mixed and 10% to be applied on the surface as Drop-on
Where specified, 1% in the case of material to which surface ballotini is to be applied by pressure application.

The grading of the combined aggregate, pigment, extender and ballotini (where specified) as found on analysis shall comply with the requirements of Table-2 below

Table 2 : Grading of Combined Aggregate, Pigment, Extender and Ballotini

Sieve	Percentage by mass Passing	
	Screeded	Sprayed
2.80 mm	100	100
1.18 mm	75 - 95	-
660 um (micron)	-	75 - 95

80. **Page 611-1, Item 611.2.3, Concrete Posts,.**
Replace “Class D₁” by “Class A-1”.

81. **ERRATA**

<u>Page No.</u>	<u>Para No.</u>	<u>Line No.</u>	<u>Change</u>
G-10	10th	2nd	Read ‘railroad highway’ as ‘railroad, highway’
G-11	3rd	1st	Read ‘individual firm’ as ‘individual, firm’
G-12	2nd	1st	Read ‘rejoin’ as ‘rejoins’
G-16	10th	1st	Read ‘inlets retaining’ as ‘inlet, retaining’
G-17	1st	1st	Insert ‘or embankment’ in between ‘roadbed’ and ‘material’.
G-17	5th	3rd	Replace ‘of’ by ‘,’
G-20	Col. S&T Frequency	3rd	Read ‘base’ as ‘based’
G-20	Col. S&T Frequency	7th	Read ‘1/500’ as ‘1/5000’
G-21	Col. S&T Frequency	1st	Read ‘M’ as ‘CM’
G-22	Col.Desig.	16th	Read ‘T-30’ as ‘AASHTO T-30’
G-26	Col. Mat.	4th	Replace ‘Premix Asphalt’ by ‘Mixture’
G-28	Col Desig.	8th	Replace ‘M-6’ by ‘T-27’

<u>Page No.</u>	<u>Para No.</u>	<u>Line No.</u>	<u>Change</u>
G-28	Col Desig.	14th	Replace 'M-6' by 'T-27'
G-28	Col. S&T Frequency	4th	Read '1/500' as '1/1000'
G-28	Col. S&T Frequency	9th	Replace '1/800' by '1/1000'.
G-36	-	8th	Add word 'structures' after 'concrete'
104-1	4th	3rd	Read 'meter' as 'meters'
105-3	7th	1st	Replace 'properties' by 'proportions'
107-1	Last	1st	Replace 'size' by 'six'
109-1	2nd	2nd	Read 'them outlets' as 'them, outlets'
202-1	1st	1st	Replace 'of' by ','
203-11	5th	2nd	Replace 'three (3)' by five (5)'
204-1	6th	2nd	Replace '111.2.2' by '111.2.3'
204-1	7th	2nd	Replace '111.2.3' by '111.2.4'
205-3	1st	3rd	Read 'tine' as 'time'.
214-4	2nd	5th	Replace '+0.2' by ' ± 0.2 '.
215-1	3rd	1st	Read 'one' as 'on'.
215-3	10th	1st	Read '1,5' as '1.5'.
301-1	Table	1st	Replace 'Asphalt Grade \pm ' by 'Asphalt Grade <u>*</u> '
301-1	Table	6th	Read '24 def. C(75 def. F)' as '24 deg.C (75 deg F)'
302-1	5th	2nd	Replace 'of subgrade' by 'layer'.
305-6	Table-1	4th	Read '50.0 mm' as '5.0 mm'
310-8	4th	8th	Read 'Al' as 'All'
310-8	6th	13th	Replace 'satisfactory' by 'satisfactory condition'
310-12	2nd	1st	Read '401.3.6(l)' as '401.3.6(i)'
311-8	3rd	3rd	Replace 'SM' by 'CM'
311-8	3rd	5th	Replace 'SM' by 'kg'
401-30	5th	16th	Read 'T-17' as 'T-176'.
405-1	4th	8th	Read '1.75 x 10 Kg/sq.cm' as '1.75 x 10 ⁶ Kg /sq.cm.'
407-12	3rd	6th	Delete 407-10
411-1	Heading	1st	Read 'Randum' as 'Random'.
601-1	6th	1st	Read 'performed' as 'preformed'.
605-2	Last	Last	Delete 'and Guard Rail End Pieces'.
607-1	2nd	1st	Read 'regulator' as 'regulatory'.
607-5	5th	4th	Read 'penal' as 'panel'.
607-7	5th	3rd	Replace 'to the prevent' by 'to prevent'.
608-2	1st	1st	Replace 'White' by 'Yellow'.
608-8	1st	2nd	Read 'heather' as 'heater'.
608-9	5th	1st	Read 'performed' as 'preformed'
608-9	7th	2nd	Read 'performed' as 'preformed'
G-19	Col. S&T	2nd	Read 'M' as 'CM'.
G-19	Col. S&T	4th	Read 'M' as 'CM'.
G-19	Col. S&T	5th	Read 'M' as 'CM'.
G-19	Col. S&T	6th	Read 1/200 M as 1/200 M/Layer
G-25	Heading	-	Read 'CRACK-RELIFE' as 'CRACK-RELIEF'.
G-25	Col. Mat.	6th	Read 'gradeed' as 'graded'.
609-1	2nd	1st	Replace 'of' by 'or'.