GOVERNMENT OF SINDH

IRRIGATION DEPARTMENT

STANDARD FORM FOR BIDDING DOCUMENT

FOR THE
CONSTRUCTION OF CEMENT CONCRETE LINING OF ROHRI MAIN CANAL FROM RD 589+000 TO RD 610+250 (ADP SCHEME NO.1116/2026-27)

National / International Bidding

Single Stage-Two Envelope Procedure

Issued to: M/s. _____

NOVEMBER 2026

EXECUTIVE ENGINEER DAD DIVISION
SHAHEED BENAZIR ABAD

EXECUTIVE ENGINEER
DAD DIVISION
SHAHEED BENAZIR ABAD

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INSTRUCTIONS
TO
PROCUREMENT AGENCIES

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INSTRUCTIONS TO PROCURING AGENCY

(Not to be included in bidding documents)

As stated in Clause IB.7 of the Instructions to Bidders, the complete bidding documents shall comprise eleven items listed therein and any Addenda issued in accordance with Clause IB.9. The Standard Bidding Documents, in addition to the Invitation for Bids, include the following:

1 Instructions to Bidders.
2. Bidding Data.
3. General Conditions of Contract, Part I (GCC).
4. Special Conditions of Contract, Part II (SCC).
5. Specifications
6. Form of Bid and Appendices to Bid.
7. Bill of Quantities.
8. Form of Bid Security.
9. Form of Agreement.
10. Form of Performance Security, Mobilization Advance Guarantee, Indenture Security Bond and Integrity Pact.
11. Drawings.

The Instructions to Bidders can be used as given. The procuring agency may have to make changes in the text under some special circumstances subject to provisions of Rules and Regulations.

General Conditions of Contract shall not be changed. The procuring agency may carry out changes in General Conditions of Contract through Special Conditions of Contract, as per provisions of Sindh Public Procurement Rules 2010, updated from time to time, in Province of Sindh. However, such changes in General Conditions shall be made with due care. Completion of the Forms and preparation of Bill of Quantities should be made as suggested hereinafter.

Procuring Agency is required to prepare the following documents for completion of the bidding documents:

(i) Special Conditions of Contract Part-II (SCC)
(ii) Specifications.
(iii) Bill of Quantities.
(iv) Drawings

A. Notice Inviting Tender

1. The "Notice Inviting Tender" is advertised in the newspapers shall appear in at least three widely circulated leading dailies of English, Urdu and Sindhi languages as well as on SPPRA Website as explained in the SPP Rules, 2010 (17) (2). All the blank spaces are

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to be filled in by the procuring agency.

2. The eligible bidders are defined in Clause IB.3 of Instructions to Bidders.

3. The notice shall be published so as to give the interested bidders, sufficient time for preparation and submission of bids which shall be minimum of 15 days for National Competitive Bidding (NCB) and minimum of 45 days for International Competitive Bidding (ICB) SPP Rule 18.

4. Non-refundable tender fee for the sale of bidding documents shall be nominal so as to cover cost of photocopying or printing only SPP Rule 20. However, cost of mailing the documents on request of the interested bidder may be charged separately. Last date for the sale of the bidding documents is mentioned in the Notice Inviting Tender.

5. The procuring agency shall require the bidders to furnish a bid security not below one percent and not exceeding five percent of the bid price, which shall remain valid for a period of 28 days beyond the validity period for bids, in order to provide the procuring agency reasonable time to act, if the security is to be called, SPP Rule 37(1).

6. The venue and time of receipt of bids and the venue and time of opening of bids are to be mentioned in Notice Inviting Tender. Last date for the receipt and opening of bids shall be the same SPP Rule 41(1).

7. In IB 11.1 (b) of bidding data, procuring agency should list relevant information, which is considered vital at the time of post-qualification, when prequalification process is not followed. Subsequently, this information is required to be submitted along with bid and shall be verified by the procuring agency during evaluation process.

8. All blank spaces in the bidding data are to be filled in by the procuring agency to complete this document**.**

9. Referring to IB 19.2 (b) of bidding data, the Bid Reference Number should be the same as given in Notice Inviting Tenders and form of bid.

B. Instructions to Bidders and Bidding Data

1. If the works are not financed from a loan/credit, IB 2.1 of bidding data should be modified accordingly.

2. Procuring agency shall prepare the documents listed at Serial Nos. b, d, e, f, g, i, and k of IB 7.1 of Instructions to Bidders in order to complete the bidding documents comprising the Bid.

3. For completion of documents at Serial No. g and i, detailed instructions are given at Para C below.

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4. Referring to IB 7.1 of bidding data, the period should be inserted as given in the bidding documents and Notice Inviting Tender (NIT).

5. In IB 11.1 (b) of bidding data, the bidder shall provide additional or updated information to the procuring agency regarding the post-qualification criteria as and when required.

6. Referring to IB 14.1 of bidding data, a bid validity period shall be specified therein, keeping in view the nature of the procurement, it shall not exceed 90 days in case of National Competitive Bidding (NCB) and 120 days in case of International Competitive Bidding (ICB) SPP Rule 38(1).

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7. Referring to IB 15.1 of bidding data, the amount is to be filled in by the procuring agency; bid security shall not be below than one percent and not exceeding five percent of the bid price SPP Rule 37(1).

C. Form of Bid and Appendices to Bid

1. Form of Bid:

Only Bid Reference Number shall be filled in by the procuring agency (refer Para A.8 above). All other blank spaces are to be filled in by the bidder.

2. Appendix-A to Bid:

(a) The minimum amount of third-party insurance should be assessed by the procuring agency and entered at Sr. No. 3.

(b) The time for completion of the whole of the works shall be entered by the procuring agency at Sr. No. 5.

(c) The amount of Liquidated Damages per day of delay shall be entered by the procuring agency at Sr. No. 7.

Amount of the Liquidated Damages for each day of delay in completion of the whole of the works, or if applicable, for any Section thereof, shall be (a sum equal to 10% of the estimated cost of the works divided by one-fourth of the number of days specified as completion time).

Formula: LD (per day) = 10% of Estimated or Bid Cost ÷ [0.25 ×Time for completion (days)].

(d) The Defects Liability Period is to be entered by the procuring agency keeping in view the nature and size of the work at Sr. No. 7.

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This is generally taken as 365 days/one year.

(e) The minimum amount of Interim Payment Certificate should be determined by the procuring agency depending upon the size and duration of the works and to be entered at Sr. No 10.

3. Appendix-B to Bid:

Where foreign currency payments are foreseen, the entire Appendix-B to bid should be left blank to be filled in by the bidder.

Where no foreign currency payments are foreseen, the procuring agency should stamp this Appendix-B as "Not Used" and, referring to 1.1.4.6 and 13.4 of GCC, and state in SCC that all payments shall be in local currency only. Clause IB-13 should also be modified accordingly through the changes in bidding data.

4. Appendix-C to Bid:

(a) National Competitive Bidding (NCB):

Escalations on local funded projects/schemes shall be paid to the contractor only on following items with their base prices and sources shown in the bidding document at time of issuing NIT:-

(i) Steel (ii) Cement (iii) Wood for Doors, windows & Partition walls (iv) Bitumen (v) Bricks.

(b) International Competitive Bidding (ICB):

(i) Contracts having duration of twelve months or more should be liable to price adjustment as per conditions of contract. Provided that the procuring agency may add or delete any item from the list given at the relevant appendix, as deemed appropriate.

(ii) Blank spaces for weight-age of each cost item in column 3 of the table should be filled in by the procuring agency, while preparing the bidding documents.

(iii) In case the price adjustable items are not covered in the Federal Bureau of Statistics, the base price and the source thereof shall be mentioned by the procuring agency and the corresponding column of the table should be amended accordingly.

(iv) This mechanism shall be applicable only for price adjustment in local currency.

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(v) Price adjustment as mentioned above shall be applicable to all contracts including item rate, lump sum and %age quoted above or below on Composite Schedule of Rates (CSR), provided these provisions are part of the contract.

5. Appendix-D to Bid:

Bills for various items are given by way of example only. The procuring agency should prepare the Bill of Quantities (BoQs) appropriate to the works. In preparation of the Bill of Quantities, columns under (1), (2), (3) and (4) in item rate contract should be completed by the procuring agency, whereas, spaces under columns (5) and (6) as well as the totals at the bottom shall be left blank to be filled in by the bidder. But in case of Composite Schedule of Rates, all columns are to be filled by procuring agency, only percentage above or below are to be quoted by bidder.

Referring to Schedule of Day Work Rates for labour, materials and constructional plant, types of labour, materials and constructional plant under column (2) as well as quantities under column (4) are given by way of example only. The procuring agency should determine the types of labour, materials and constructional plant as well as the quantities thereof, estimated to be utilized, on day work basis

depending upon the nature of the works.
Percentage for overhead and profit on labour and materials, and the total amounts should be left blank to be filled in by the bidder.

Day Work summary is to be left blank to be filled in by the bidder.

6. Appendix-E to Bid:

If the procuring agency requires partial completion of the works by sections (for example Parts-A, B, C etc.), these should be identified and time for completion thereof, are to be specified, and the blank spaces may be filled in by the procuring agency.

7. Appendix-F to Bid:

The procuring agency may expand the requirements as stated in this Appendix, keeping in view the requirements of the works.

8. Appendix-G to Bid:

It pertains to the list of major equipment's to be provided by the bidder, if applicable. All blank spaces are to be filled in by the bidder.

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9. Appendix-H to Bid:

The bidder has to provide details about camps and housing facilities. Procuring agency may modify the requirements as stated in this Appendix, keeping in view requirements of the works.

10. Appendix-I to Bid:

The bidder has to provide list of sub-contractors along with the details of works assigned. The blank spaces are to be filled in by the bidder.

11. Appendix-J to Bid:

The bidder has to provide the estimated value of work to be executed in the period mentioned therein. The blank spaces are to be filled in by the bidder.

12. Appendix-K to Bid:

The bidder has to provide the organizational chart for supervisory staff and labour. The blank spaces are to be filled in by the bidder.

13. Appendix-L to Bid:

Procuring agency shall provide the Integrity Pact form duly signed, stamped and submit the same along with the bid.

D. Forms

1. Bid Security:

Procuring agency, before issuing the bidding documents, should fill in following blank spaces:

(a) Amount/ Percentage of bid security, in words as well as figures, which should be the same as provided at Sub-Para A.5 above.

(b) Bid Reference Number should be the same as per Sub-Para B.7 above.

(c) Standard Forms of Securities provided in this document are to be issued by a scheduled bank.

E. Special Conditions of Contract

1. Name and full address of the procuring agency as well as that of the Engineer in charge or, in case a consultant is hired by the procuring agency, then Consultant's Engineer, as the case may be, should be filled in by the procuring agency in the blank spaces provided under Sub-Para (a) (i) and (iv) of Sub-Clause 1.1 of SCC.

2. Referring to first paragraph of Sub-Clause 3.1 of GCC, information

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as applicable is provided there under.

3. Referring to Sub-Clause 1.5 of GCC, the procuring agency may add, in the order of priority, such other documents which form part of the contract.

4. Referring to 8.3 of GCC, the procuring agency should specify the form in which the programme is to be submitted by the bidder, e.g., Critical Path Method (CPM), Bar Chart or Programme Evaluation and Review Technique (PERT).

5. (a) Referring to Sub-Clause 5.3 of GCC, if the procuring agency desires the Bidder to use the services of nominated subcontractor(s), the procuring agency should make necessary provisions of provisional sums and provide blank spaces to be filled in the percentage rate(s) and estimated amounts, resulting therefrom in Appendix-D to Bid. The blank spaces for the rate(s) and the estimated amount(s) shall be filled in by the bidder.

(b) Suitable text referring to such provisions should be added in SCC.

If provisional sums and Day Work are not to be provided, then same should be ***mentioned in special conditions of contract.***

6. **Mobilization Advance/Advance Payment:**

Procuring agency shall extend mobilization advance to the contractor *on submission of Bid Bond/ Bank Guarantee.*

7. Referring to 20.6 of GCC, the procuring agency should state the venue of Arbitration, which should be located within the province of Sindh and according to Arbitration Act, 1940 (up dated from time to time).

8. Addresses of the procuring agency and the Engineer or in case a consultant is hired

by the procuring agency, then Consultant's Engineer, as the case may be, are to beentered by the procuring agency to completely fill in the blanks in Sub-Clause 1.3.

F. **Specifications.**

To be prepared and incorporated by the procuring agency.

(Precise and clear specifications are prerequisite for bidders to respond realistically and competitively to the requirements of the procuring agency without qualifying or conditioning their bids. In the context of both national and international competitive bidding, the specifications must be drafted to permit the widest possible

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competition and, at the same time, present a clear statement of the required standards of materials, plant, other supplies, and workmanship to be provided. Only if this is done, the objectives of economy, efficiency and equality in procurement will be realized, responsiveness of bids be ensured, and the subsequent task of bid evaluation be facilitated. The specifications should require that all materials, plant, and other supplies to be incorporated in the works are new, unused, of the most recent or current models, and incorporate all recent improvements in design and materials unless provided otherwise in the contract. A clause setting out the scope of the works is often included at the beginning of the specifications, and it is customary to give a list of the drawings. Where the contractor is responsible for the design of any part of the permanent works, the extent of his obligations must be stated.

Specification shall be generic and shall not include references to brand names, model numbers, catalogue numbers or similar classifications. However, if the procuring agency is convinced that the use of or a reference to a brand name or catalogue number is essential to complete an otherwise incomplete specification, such use or reference shall be qualified with the words "or equivalent".

Care must be taken in drafting specifications to ensure that they are not restrictive. In the specification of standards for materials, plant, other supplies, and workmanship, recognized international standards should be used as much as possible. The specifications shall consider all site conditions, but not limited to seismic and weather conditions, and environmental impact. Where other particular standards are used, whether national or other standards, the specifications should state that materials, plant, other supplies, and workmanship meeting other recognised standards, and which ensure equal performance, to the mentioned standards, will also be acceptable.)

G. Drawings

To be prepared and incorporated by the procuring agency.

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INVITATION FOR BIDS

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NOTICE INVITING TENDERS

OFFICE OF THE EXECUTIVE ENGINEER, DAD DIVISION SHAHEED BENAZIR ABAD

Phone No. 0244-9370223 - Fax No. 0244-9370222

No. TC/G-55 / 1841 of 2026,
S.B.A Dated: - 02/11/ 2026.

NOTICE INVITING E-TENDERS (NATIONAL/INTERNATIONAL COMPETITIVE BIDDING)

The Executive Engineer, Dad Division, Shaheed Benazirabad, Irrigation Department, Government of Sindh, invites electronic sealed bids (E-Tenders) through the e-Pak Acquisition and Disposal System (EPADS) from eligible contractors, firms, joint ventures, and companies for the execution of the work mentioned below.

The procurement shall be carried out in accordance with the Sindh Public Procurement Regulatory Authority (SPPRA) Rules, 2010 (as amended to date) through International Competitive Bidding (ICB) using the Single Stage – Two Envelope Procedure.

Eligible bidders shall be registered with the Pakistan Engineering Council (PEC), possessing a valid PEC Registration Certificate up to June 2027 in the relevant engineering discipline and appropriate category, along with all applicable registrations with the Federal Board of Revenue (FBR), Sindh Revenue Board (SRB), and other statutory authorities, wherever applicable.

S.No	Contract Package Name	Estimated Cost In (Rs. Million)	Bid Security 5% of Estimated Cost	Category Required according to PEC	Tender Fees	Completion Period
1	CEMENT CONCRETE LINING OF ROHRI MAIN CANAL FROM RD 589+000 TO RD 610+250 (ADP No: 1116 / 2026-27)	PKR. **3,967.796** Million	PKR. **198.40** Million	CA (No limit)	PKR. 10,000/-	18 Months

PROGRAMME FOR ISSUE / RECEIPT / UPLOAD AND OPENING OF TENDERS

S.#	Particulars	1st Attempt	2nd Attempt
1	Deadline for submission of E-Bids through E-PADS at 11.00 AM	07/12/2026	15/12/2026
2	Tender will be opened on the same day through E-PADS at 11:30 AM	07/12/2026	15/12/2026

The scope of work mainly includes the following:

i. Earth Work & PCC Lining from RD 589+000 to 610+250.
ii. Rehabilitation of Hydraulic Structures

1. **Method of Procurement (Single Stage Two Envelopes National / International Competitive Bidding)**

2. **Eligibility / Mandatory**

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a. The applicants, including contractors, companies, firms and joint ventures, fulfilling the prescribed eligibility and qualification criteria shall be considered for further evaluation.

b. The International Competitive Bidding shall be open to interested bidders, firms and joint ventures registered with the Pakistan Engineering Council in Category **CA (No Limit)** and possessing the relevant specialized codes. The PEC Registration Certificate shall be **valid up to June 2027** and onwards and shall cover the relevant engineering and specialized codes **CE-01, CE-02, CE-04, CE-09 and CE-10**.
The foreign bidder is entitled to bid only in a joint venture with a Local Firm in accordance with the relevant provisions of PEC bye-laws.

c. The bidders shall provide a list of works with the same specifications and similar nature, equivalent or more than the estimated cost of work completed in a similar environment or (a) one similar nature of work having minimum 80% of the estimated cost of work; or (b) at least two similar nature works each having minimum 50% of the estimated cost during the last 05 years, duly supported with a completion.

d. Biodata of engineering and technical staff proposed to be engaged on the work, including complete details of their qualifications, experience and length of service with the firm, shall be provided

e. List of machinery and equipment available with the firm shall be furnished along with documentary evidence of ownership or availability.

f. Annual certified audited reports from QCR-rated registered audit firm for the last three (03) years (2023-2024, 2024-25 and 2025-26).

g. Credit Line Facilities Certificate of **20% of the estimated cost** from any Scheduled Bank shall be furnished.

h. Annual Income Tax returns of the last three (03) years, i.e., (2023-2024, 2024-25, and 2025-26).

i. The average annual turnover is calculated based on total certified payments received within the last three (03) years. It shall be equal to or more than the estimated cost of the works, i.e., PKR **3,967.796 million and US$ 14.324 million** (2023-2024, 2024-25, and 2025-26).

j. The firm shall provide a bank statement showing a standing balance of at least 20% of the estimated cost of the work as on the date of publication of the advertisement and an average monthly closing balance of at least 20% of the estimated cost during the preceding (06) six months.

k. National bidders shall possess valid registration with the Sindh Revenue Board (SRB) and Federal Board of Revenue (FBR) and shall have active status. Foreign bidders shall provide equivalent statutory registration and tax documents applicable to them.

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l. The bid security shall be submitted in one of the forms prescribed under the SPPRA Rules, preferably in the form of a Bank Guarantee or Call Deposit issued by a Scheduled Bank of Pakistan. In case of a foreign bank guarantee, the requirements prescribed under the applicable PEC/SPP rules shall be followed

3. Affidavit on E-Stamp (PKR. 500/-) declaring "Neither the firm nor its Directors, Stakeholders, as a whole or as a part of the firm have ever been black listed/ defaulted by any government agency/ department/organization".

4. Each page of the Technical Proposal must be numbered, signed, and stamped by the authorized person of the company/firm / JV. No overwriting will be accepted in submitted documents.

5. Pre-bid meeting will be held on **16.11.2026** at **12:00 Noon** in the **office of the Executive Engineer, Dad Division, Shaheed Benazirabad.**

6. **Bidding / Tender Documents.**
The bidding documents and other terms and conditions may be seen and downloaded from the official SPPRA/EPADS procurement portal, i.e., **https://portalsindh.eprocure.gov.pk.** The downloaded bidding documents shall be accompanied by a non-refundable tender fee of **PKR 10,000**/- in the prescribed manner. The bid security against work **amounting to PKR 198.40** million in the shape of Bank Guarantee or Call Deposit from any scheduled bank of Pakistan on the prescribed form in favour of the ***Executive Engineer, Dad Division, Shaheed Benazirabad*** on account of (Name of firm), should be attached with the Technical Bid; otherwise, such bids will not be entertained.

7. The **Technical Proposal** and **Financial Proposal**, together with all required supporting documents, shall be clearly scanned and uploaded electronically through the **e-Pak Acquisition and Disposal System (EPADS)** on or before the prescribed bid submission deadline. Only bids submitted electronically through **EPADS** within the stipulated time shall be considered. Bids submitted by any other means or after the specified deadline shall not be entertained.

8. Bid Security shall be submitted to the Procuring Agency at the time of opening of Technical Proposals, failing which the bid shall be rejected.

9. The Technical Proposals shall be opened through EPADS at the prescribed date and time in the presence of the Procurement Committee and participating contractor firms or their authorized representatives who may wish to attend. The Technical Proposals shall initially be evaluated in accordance with the eligibility and qualification criteria specified in the bidding documents.

10. The Financial Proposals of only technically qualified and substantially responsive bidders shall be opened in accordance with the SPPRA Rules and the procedure specified in the bidding documents.

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The date, time, and procedure for opening of the Financial Proposals shall be communicated to the technically qualified bidders through the prescribed procurement system.

11. The criteria for a Joint Venture are mentioned in the bidding documents.

12. The bid found to be the most "**advantageous bid**" shall be accepted.

13. No amendments to the Technical Proposal shall be permitted during the technical evaluation.

14. Original Bid Security of technically non-responsive bidders may be collected from the office of the undersigned on any working day.

15. Fresh affidavit on E-Stamp (PKR. 500/-) (in original) with the effect that all the documents/particulars/machinery information furnished are true and correct. In case of Bogus / Tempered or false information/certificates provided by the company/firm / JV shall be liable to be black listed at any stage.

16. A representative should have authority on E-Stamp (Rs. 500/-) from the owner. Authority other than E-Stamp (PKR. 500/-) will not be accepted, and such tender will not be entertained.

17. In case of a firm, giving full particulars of Directors / Proprietors or other connected persons along with Power of Attorney. In case of being sole proprietors, such an undertaking on a fresh Affidavit on E-Stamp (PKR. 500/-) (in original) be furnished.

18. The Tenders should be submitted through E-PADS along with the above required documentation / Information. If any of the required documents/information are lacking, then the tender will not be considered by the procuring committee, and no such documents will be accepted after the prescribed submission deadline date and time.

- The submission and opening of bids shall take place at the following address:
  Address: **Office of the Executive Engineer Dad Division, near Gymkhana Restaurant, Nawabshah, District Shaheed Benazirabad**

Terms & Conditions:

Under the following conditions, the bid will be rejected: .

i Conditional, electronic (E-mail) and telegraphic bids / Tenders.
ii Bids not accompanied by bid security of required amount and form;
iii Bids received after the prescribed deadline submission date and time.
iv Bid Validity period is 120 days.
v Black listed/debarred firms.
vi The procurement authority reserves the right to reject any or all the tenders/bids as per SPPRA Rules 2010 (Amended to-date).

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INSTRUCTIONS TO BIDDERS

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INSTRUCTIONS TO BIDDERS

(Note: These Instructions to Bidders along with bidding data will not be part of the Contract and will cease to have effect once the contract is signed.)

A. GENERA

L 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.

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(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.

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B. BIDDING DOCUMENTS

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

7.1 The bidding documents, in addition to the 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. The 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 a 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 an interested bidder, modify the bidding documents by issuing an 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

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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, especially 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 program etc;

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

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(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.

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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 13.7of 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'scountry (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

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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 a 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

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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 initialed 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 initialed by the person(s) signing the bid.

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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 TECHNICAL PROPOSAL alongwith Original Bid Security uploaded on E-PADS must be reached before submission deadline in sealed envelope in office of the Procuring agency.

IB.20 Deadline for Submission of Bids

20.1 (a) Bids must be Uploaded on E-PADS and 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

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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 The 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

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

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

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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 fulfill 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

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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

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the procurement process or contract execution, designed to achieve with or without the knowledge of the procuring agency to establish prices at artificial, noncompetitive levels for any wrongful gain;

(iii) **"Corrupt Practice"** means the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence the acts of another party for wrongful gain;

(iv) "**Fraudulent Practice"** means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(v) **"Obstructive Practice"** means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in a procurement process, or affect the execution of a contract or deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements before investigators in order to materially impede an investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or acts intended to materially impede the exercise of inspection and audit rights provided for under the Rules.

28.6 Evaluation Report (SPP Rule 45)

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

F. AWARD OF CONTRACT

G. 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 Engineer'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.

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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 Requirements.

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 the procuring agency shall give him the reasons for such non-acceptance, either in writing or by holding a debriefing meeting with such a bidder.

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(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 says 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.

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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.

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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.

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Annexure-A

Evaluation Criteria for Technical Proposal

The criteria developed for calculation of the Technical Proposal are detailed as under:
"The Invitation to Bid is open to all Bidders meeting the following requirements".

Furthermore, the financial, technical, and experience capabilities of each contractor/firm shall be evaluated based on the maximum score (points) allocated to each capability, as given below:

Item/Capability	**Maximum Score (Points)**
i) Financial	35
ii) Technical	25
iii) Experience	40
Total Score (Points)	**100**

Factor	Maximum Score(points)	Minimum Acceptable Score (Points) for clearing the capability
Financial Capacity	35	24.5
Technical Capacity	25	17.5
Experience	40	28.0

Overall minimum acceptable score points will be 70% for eligibility for financial bid.

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1. Financial Capacity

Financial Capacity is assessed based on two factors, namely Estimated Cost of work (V) in Million rupees and Time of Completion of Contract (T) in years, as under:
(V= Estimated Cost)

Sub-Factors	Weighting (Points)

a) Average Annual Income (i.e. Profit after Tax) from Contract works (Last 03 years)

$$\text{Average Annual Income} = \frac{\text{Annual Income of Works executed in last 3 years}}{3}$$

$$\text{Ratio} = \frac{\text{Average Annual Income}}{V}$$

Between 0.20 to 0.40	08
between 0.4 to 0.80	10
Between 0.80 to 1.0	12

b) Bid Capacity (Based on last 5 years)

Ratio B.C/V

Less than 0.2	02
Between 0.2 and 0.4	06
Between 0.4 and 0.6	08
Between 0.6and 0.8	10
Between 0.8 and 1.0	12
Over 1.0	15

Note: Bid Capacity (B.C) = 5 x Net worth (NW) minus 0.2 x Total value of Balance works (BW) under ongoing Contracts
Where Net worth (NW)= Total Assets minus Total liabilities (Average of last 5 years) and (V= Estimated Cost)

c) Available (C.L) from Reputable Bank
Ratio C.L/V

Less than 0.4	04
Between 0.5 to 0.9	06
1.00 and above	08

Maximum Points	**35**

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2. Personnel and Technical Capability

(a) Personnel Required as under: 12.5 Points

Sr. No.	Position with Minimum Qualification	Minimum staff required	Total Work Experience [years]	Experience in Similar Work [years]	Points
1	Project Manager (B.E Civil)	01	15	10	2
2	Site Construction Manager (B.E Civil)	01	10	05	1.75
3	Contracts Manager (B.E Civil)	01	10	05	1.5
4	Planning Engineer (B.E Civil)	01	05	03	1.5
5	Mechanical Engineer (B.E)	01	05	03	0.75
6	Materials Engineer (B.E Civil)	01	05	03	0.75
7	Quality Assurance Engineer (B.E Civil)	01	05	03	0.75
8	Materials Laboratory Tech (D.A.E Civil)	02	10	05	0.75
9	Batching Plant Technician (D.A.E)	04	10	05	0.75
10	Site Inspector (D.A.E Civil)	04	10	05	0.75
11	Site Surveyor (D.A.E Civil)	04	10	05	0.5
12	Quantity Surveyor (D.A.E Civil)	01	10	05	0.75
				Total	**12.5**

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(b) Requirement of equipment is as under: 12.5 Points

Sr. No.	Equipment/Machinery Type and Characteristics	Minimum Numbers Required	Points
1	Excavator	50	1.50
2	Dump Trucks	40	1.50
3	Transit Mixers	40	1.50
4	Vibratory Roller (Sheep foot)	08	1.00
5	Dozers	10	1.00
6	Concrete Batch Plant 1.5m^3	4	1.25
7	Conventional Concrete Batch Plant	5	1.00
8	Electric Generators >50 KVA	3	0.50
9	Motor Graders	05	0.50
10	Front End Loaders	05	0.50
11	Water Bowsers	05	0.50
12	Tractor Trolleys	20	1.25
13	Crane > 25 Ton	02	0.50
		Total	**12.50**

Total Points (a+b) 25

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3. Experience

a) Experience as Main constructor/lead partner

Less than 2 years' Experience	02
Between 2- and 5-years' Experience	03
Between 5- and 8-years' Experience	05
More than 8 years' Experience	06

a) Experience as Main constructor/lead partner Similar Construction Works.

Less than 2 years' Experience	02
Between 2- and 5-years' Experience	03
Between 5- and 6-years' Experience	05
More than 8 years' Experience	06

c) Experience with Similar nature works (No. of Contracts of not necessary Size "V" completed in last 05 years)

One Contract	04
Two Contracts	06
Three Contracts	08
Four Contracts	10
More than Four Contracts	12

d) Experience with similar site conditions (No. of contracts of size (V estimated cost) completed in last 05 years.

One Contract	02
Two Contracts	04
Three Contracts	06
Four Contracts	08
More than Four Contracts	10

e) Past Performance (Completion Certificates of last 05 years)
Number of references in support of satisfactory and timely completion of Contracts executed

One satisfactory reference	02
Two satisfactory references	04
Three or more than three satisfactory references	06
Maximum Points	**40**

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BIDDING DATA

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NOTES ON BIDDING DATA

This Section is intended to assist the procuring agency in providing the specific information in relation to corresponding clauses in Instructions to Bidders and should be prepared to suit each contract.

The procuring agency should provide in the bidding data information and requirements specific to the circumstances of the procuring agency, the processing of the bid, the applicable rules regarding bid price and currency, and the bid evaluation criteria that will apply to the bids. In preparing this section, the following aspects should be checked:

(1) Information that specifies and complements the provisions of the section; Instructions to Bidders must be incorporated.

(2) Amendments and/or supplements, if any, to the provisions of Instructions to Bidders, necessitated by the circumstances of each individual contract, can be introduced only in this section since Instructions to Bidders will remain unchanged.

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Contact/Bidding Data

(*This section should be filled in by the procuring agency before issuance of the bidding documents.)* The following specific data for the works to be tendered shall complement, amend, or supplement the provisions in the Instructions to Bidders. Wherever there is a conflict, the provisions herein shall prevail over those in the Instructions to Bidders.

[Instructions are provided, as needed, in italics.]

Instructions to Bidders

Clause Reference

1.1 Name and address of the procuring agency: **Executive Engineer, Dad Division, Shaheed Benazirabad, Sindh, Pakistan**

1.2 Name of the Project and Summary of the works: **Cement Concrete Lining of Rohri Main Canal from RD 589+000 to RD 610+250 (ADP Scheme No.1116/2026-27)**

2.1 Name of the Borrower/Source of Financing/Funding Agency/Funding Source; **(ADP Scheme No.1116/2026-27), Government of Sindh (Pakistan)**

2.1 Amount and Type of Financing/Scheme Cost and Allocated Funds.
PKR: 430.0 million (FY 2026-27)

8.1 Time limit for clarification:

Not later than 7 working days before the last date of submission

10.1 Bid language: **English**

11.1 (a) Prequalification Information to be updated (where applicable):
Not Applicable

11.1 (b) Furnish and Technical Proposal:

The bidder shall upload the clearly scanned Bidding Document(s) through https://portalsindh.eprocure.gov.pk, E-PADS, and submit a comprehensive Technical Proposal in original, containing sufficient details to demonstrate the adequacy, capability, and suitability of the bid, on or before the prescribed submission deadline.13.1 Bidders to quote entirely in: **Pak Rupees**

14.1 Period of Bid Validity: **120 days**

15.1 Amount of Bid Security: **The Bid Security amount is 5% of the Estimated Cost**

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17.1 Venue, time, and date of the pre-bid meeting: **The Pre-bid meeting will be held in the office of the Executive Engineer, Dad Division, near Gymkhana Restaurant, Shaheed Benazirabad, Sindh, Pakistan, on 16-11-2026. at 12:00 Noon**

18.4 (a) Number of copies of the bid to be completed and returned: ***The bid must be uploaded on the website of SPPRA on E-PADS. The original bid security must be brought at the time of Bid opening in the*** **Office of the Executive Engineer, Dad Division, near Gymkhana Restaurant, Nawabshah, District Shaheed Benazirabad, Sindh, Pakistan.**

(b) Name and Identification Number of the Contract: No. **TC/G-55/1841 of 2026, S.B.A Dated: 02/11/ 2026.**

(c) Bidding Documents download: From the official website of Irrigation Department **https://irrigation.sindh.gov.pk/public/tender**

20.1 (a) Deadline for submission of bids: **07-12-2026 at 11:00 AM**

(b) Venue, time, and date of bid opening: **Executive Engineer, Dad Division, Shaheed Benazirabad, Sindh, Pakistan at 11:30 AM on 07-12-2026**

32.1 Standard form and amount of Performance Security acceptable to the procuring **agency: The bid security of PKR 198.40 million, in the prescribed form in favour of the Executive Engineer, Dad Division, Shaheed Benazirabad on account of (Name of firm) should be attached with the Technical Bid; otherwise, such bids will not be entertained.**

32.3 Stamp duty

0.35% will be paid by the successful bidder as stamp duty.
[*% will depend upon the rules*]

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FORM OF BID AND APPENDICES TO BID

EXECUTIVE ENGINEER
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FB-1

FORM OF BID

Bid Reference No. **TC/G-55/ 1841 of 2026, S.B.A Dated: 02 /11/2026**
Name of Contract/Work: **Cement Concrete Lining of Rohri Main Canal from RD 589+000 to RD 621+250**
To:

The Executive Engineer,
Dad division,
Shaheed Benazirabad

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 the procuring agency and valid for a period _____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.

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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:_____

.

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Appendix-A to Bid

SPECIAL STIPULATIONS
Clause Conditions of Contract

1.	Engineer representing Consulting Firm hired by the procuring agency to issue variation in case of emergency.	3.1	*Up to 2% of the* contract price stated in the Letter of Acceptance.
2.	Amount of Performance Security	4.2	*Up to 5% of contract price*. Total amount including performance security and retention money deducted from bills should not exceed 10% of contract price stated in the Letter of Acceptance.
3.	Time for Furnishing Programme	8.3	Within 14 days from the date of receipt of Letter of Acceptance.
4.	Minimum amount of Third-Party Insurance	18.3	Rs.1,000,000 per occurrence with number of occurrences unlimited.
5.	Time for Commencement	8.1	Within 14 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.
6.	Time for Completion (works & sections)	8.2 & 10.2	**540** days from the date of receipt of Engineer's Notice to Commence.
7.	Amount of Liquidity Damages/Delay Damages/Penalties	8.7	**0.05%** Damages per day *(are to be mentioned)* but total amount will not be more than 10% of contract Price.
8.	Defects Liability Period	11.1	**180** days from the effective date of Taking Over Certificate.
9.	Percentage of Retention Money	14.2	5% of the amount of Interim / Running Payment Certificate.
10.	Limit of Retention Money	14.2	5 % of Contract Price stated in the Letter of Acceptance.
11.	Minimum amount of Interim/ Running Payment Certificates	14.2	**Rs.250 million**
12.	Time of Payment from delivery of Engineer's Interim/Running Payment Certificate to the procuring agency.	14.7	30 days in case of local currency or 42 days in case of foreign funded projects.
13.	Mobilization Advance.	14.2	10% of Contract Price stated in the Letter of Acceptance.

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BB-1
Appendix-B to Bid

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

4.

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

NOT APPLICABLE

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PRICE ADJUSTMENT UNDER CLAUSE 70/13.8 OF CONDITIONS OF CONTRACT

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

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

(*To be filled by the procuring agency)*

Cost Element	Description	Weight ages	Applicable index
1	2	3	4
(i)	Fixed Portion	0.350	
(ii)	Local Labor		Government of Pakistan (GoP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin of District Shaheed Benazirabad.
(iii)	Cement – in bags		" " "
(iv)	Reinforcing Steel		" " "
(v)	High Speed Diesel (HSD)		" " "
(vi)	Bricks		" " "
(vii)	Bitumen		" " "
(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 weight age of Fixed Portion considering only those cost elements having cost impact of seven (7) percent or more on his specific project.

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B When Escalation is allowed on the materials only.

Price adjustment on the following items shall be allowed:

Cost Element	Description	Base price	Applicable index
1	2	3	4
(i)	Cement – in bags		Government of Pakistan (GoP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin. " "
(ii)	Reinforcing Steel		" " "
(iii)	Bricks		" " "
(iv)	Bitumen		" " "
(v)	Wood (Composite item)		" " "
	Total five items.		

'

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Appendix-D to Bid

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 Engineer'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 in case of ICB/NCB respectively, 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 summarized 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. Bidders shall price the bill of quantities in Pakistani rupees only.

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BILL OF QUANTITIES

CEMENT CONCRETE LINING OF ROHRI MAIN CANAL FROM RD 589+000 TO 610+250

SUMMARY

Bill No.	Name of work	Amount (Rs.) Schedule Items	Amount (Rs.) Non-Schedule Items
1	Earth Work & PCC Lining from RD 589+000 to 610+000 & Structure Work (Bilawal Minor X-Regulator, Direct Outlets)	2,781,996,517	111,911,262
	Total Rs.	2,781,996,517	111,911,262
Percentage quoted _____above/below the item price based on the Composite Schedule of Rates (CSR) Except item No.04 Carriage of material (Rs.10,883,982/-)			--
	Add Non-Schedule Amount Rs.	111,911,262	--
	Sub Total Rs.		--
	Add 5% SRB Rs.		--
	Total Bid Amount Rs.		**--**

In words Rupees …….

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BILL OF QUANTITIES

BILL NO. 1: - EARTH WORK & PCC LINING FROM RD 589+000 TO 610+250 & STRUCTURE WORK (BILAWAL MINOR X-REGULATOR, DIRECT OUTLETS)

S. No.	Item	Quantity	Rate	Unit	Amount Schedule Items	Amount Non-schedule Items
A	**LINING WORKS**					
1	Jungle clearance and removing within 100 feet. (a) Light (CSR-2024, P-78, Item-4 (a).	4,250,000 Sft	0.40	P/Sft	1,700,000	-
2	Plugging 3 times. (CSR-2024, P-81, Item-41).	97.57 Acre	8365.50	P/Acre	816,222	-
3	Borrowpit excavation undressed lead upto 100 ft. (a) Ordinary Soil. (CSR-2024, P-15, Item-2 (a).	1,794,530 Cft	7.29	P/Cft	13,082,124	-
4	Carriage of 100 cft / 05 Tons of all materials like stone, aggregate, spawl, surkhi, etc. (2 Miles) (BSR-2024, P-1, Item-1)	1,166,445 Cft	933.09	% Cft	10,883,982	
5	Extra for every 50 ft. additional lead or part therof. (a) For earth work (Soft, ordinary, hard and very hard. (02 Leads rate of Rs.0.12x2) (CSR-2024, P-16, Item-8 (a).	628,086 Cft	0.24	P.Cft	150,741	-
6	Earth work compaction by Sheep Foot Roller and Power Roller with optimum moisture content. (b) For 90% modified AASHO density. (CSR-2024, P-212, Item-7).	7,876,563 Cft	6991.67	%0 Cft	55,070,329	-
7	Earth work excavation in irrigation channels, drains etc, dressed to designed section grades and profiles excavated material disposed off and dressed within 50 ft. lead.(a) Ordinary Soil. (CSR-2024, P-15, Item-5.	17,979,903 Cft	7.92	P.Cft	142,400,832	-
8	Rehandling of earth work. (b) Upto a lead of 50 ft. (CSR-2024, P-16, Item-9 (b) (a) 1 Lead	17,979,903 Cft	4.44	P.Cft	79,830,769	-
9	Formation, dressing and preparing sub grade.					
	(a) In bed. (CSR-2024, P-65, Item-1 (a).	4,377,500 Sft	14.83	P.Sft	64,918,325	-
	(b) On slope. (CSR-2024, P-65, Item-1 (b).	1,589,925 Sft	20.12	P.Sft	31,989,291	-
10	Erection and removal of centering for R.C.C or plain cement concrete works of Partal wood b) (ii) Vertical. (CSR-2024, P-27, Item-19 (b-ii).	317,496 Sft	106.48	P.Sft	33,806,974	-
11	Cement concrete lining ratio 1:2:4.					

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S. No.	Item	Quantity	Rate	Unit	Amount Schedule Items	Amount Non-schedule Items
	(a) In bed. (CSR-2024, P-65, Item-11 (a).	2,188,750 Cft	353.68	P.Cft	774,117,100	-
	(b) On slope. (CSR-2024, P-65, Item-11 (b).	794,963 Cft	450.80	P.Cft	358,369,095	-
12	Filling expansion joints with bitumen (CSR-2024, P-82, Item-52).	592,493 Lft	118.82	P.Lft	70,400,018	-
13	Gravel Bedding. (BSR-2024, P-34, Item-66).	10,217,425 Cft	3633.00	% Cft	371,199,050	-
14	Laying stone or spawl filling. (a) On level. (CSR-2024, P-39, Item-28 (a)	10,217,425 Cft	14.36	P.Cft	146,722,223	-
15	Full hire charges of pumping set per day inclusive of the wages of driver and assistant fuel or electric energy plate form required for placing pumps etc. at lower depths with suction and delivery pipes for pumping out water found at various depths from trenches including the cost of erection and dismantling after completion of the job. (ii) Hire charges of pumping set above 10 H.P pumping out water from 15' deep trench. (CSR-2024, P-165, Item-23- (ii).	10,976 Days	11205.60	P.Day	122,992,666	-
16	NOTE:- For working the pump beyond 8 hours the following payment shall be made, the higher of the pumping set it self being for 24 hours. i) For pumping set of above 10 H.P. (CSR-2024, P-165, Item-23(i).	131,712 Hrs	933.60	P.Hrs	122,966,323	-
17	UPVC Perforated pipes (6" dia) fixing in trench i/c cutting, fitting and jointing etc complete. (R.A attached).	63,750 Rft	925.00	P/Rft	-	58,968,750
18	Installation of PRVs (R.A. attached).	639 Nrs	77,758	Each	-	49,687,362
19	Laying Murum flooring consisting of 1" layer of fine powdery or flakey variety of Murum laid over 6" good hard layer of Murum spread over 9" thick sub base comprising of hand packed rubble or broken bricks properly watered and rammed provided over well rammed earth. (CSR-2024, P-44, Item-01)	510,000 Sft	100.78	P/Sft	51,397,800	-
20	Stone filling dry hand packed as filling behind retaining walls or in pitching and aprons. (CSR-2012, P-38, Item-16)	400,000 Cft	67.42	P/Cft	26,968,000	-
B	**ROAD WORK**					
21	**Sub-Base- Course**					

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S. No.	Item	Quantity	Rate	Unit	Amount Schedule Items	Amount Non-schedule Items
	Preparing sub base course by supplying and spreading stone metal 1-1/2" - 2" guage of approved quality from approved quarry in required thickness to proper camber and grade including hand packing, filling voids with 20cft Pit/Canal sand having plasticity index not more than 6% of suitable quality ,watering and compacting to achieve 98-100% density as per modified AASHO specification.(Rate includes all cost of materials, T&P and carriage upto 3 chains). (CSR-2024, P-212, Item-11 (c.).	196,988 Cft	14560.62	% Cft	28,682,674	-
22	**Brick on End Edging**					
	Laying brick on end edging including supply of 9"x4-1/2"x3" 1st class bricks excavation for laying edging with small size parallel to the road. Rate includes lead upto 3 chains. (CSR-2024, P-213, Item-12).	43,775 Rft	8652.58	% Rft	3,787,667	-
23	**Base Course**					
	Preparing Base course i.c supplying and spreading stone metal of approved quality properly graded to maximum size 1-1/2" in required thickness to proper camber and grade including supplying and spreading 15 cft: screening & non plastic quarry fines filling depressions with stone metal after initial rolling including watering and compaction the same as to achive 100% density as per modified AASHO specification. (Rate includes providing & using Templates, camber plates, screen,forms as directed). (Rate includes all cost of materials T&P and carriage upto 3 chains). (CSR-2024, P-213, Item-13).	196,988 Cft	15676.75	% Cft	30,881,316	-
24	**Two Coats**					
	Providing Two coats of surface dressing on new or existing surface with 30+25=55 lbs of bitumen of 80-100 penetration 4.0+3.50 = 7.50cft crush bajri of 1/2"-3/4"guage including cleaning to road surface rolling after each coat etc complete.Rate includes all coat of material labour, T&P and carriage upto site of work. (CSR-2024, P-214 & 215, Item-16 & 17).	393,975 Sft	7402.65	% Sft	29,164,590	-
25	**2" thick Asphalt concrete.**					

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S. No.	Item	Quantity	Rate	Unit	Amount Schedule Items	Amount Non-schedule Items
	Laying to proper line and grade plant mixed Asphalt concrete paver finished (Hydraulic / Electronic control) prepared to specified fomula according to job mix formula approved by Engineer incharge including rolling and finishing to proper line, grade, level and camber etc complete. (Machinery with POLs, cost of material carriage) (Bitumen 102.29 lbs for mixing at plant of bitumen grade 60/70 and 15 lbs of grade 80/100 for tack coat). (CSR-2024, P-218, P-24 (b).	393,975 Sft	19876.84	% Sft	78,309,780	-
26	**Tharmo Plastic Paint (Lane Marking).**					
	Pavement marking in Reflective Tharmo Plastic Paint for Linesof 6" Width. (CSR-2024, P-221, Item-13).	54,719 Rft	86.10	P.Rft	4,711,306	-
27	**Cat Eyes / Road Studs**					
	Supplying and fixing of reflectorized Road Studs Double Face, Flush surface type. (CSR-2024, P-221, Item-12).	2,655 Nos	1520.42	Each	4,036,715	-
C	**STRUCTURE WORK**					
28	Dismantling cement concrete reinforced separating reinforcement from concrete, cleaning and straightening the same. (CSR-2024, P-20, Item-20).	29,048 Cft	229.72	P.Cft.	6,672,907	-
29	Dismantling brick work in lime or cement mortar (CSR-2024, P-19, Item-13)	18,299 Cft	59.41	P/Cft	1,087,144	-
30	Excavation in foundation of Building Bridges and other structures including dagbelling dressing, refilling around structure with excavated earth, watering and ramming lead upto 5 ft. (b) In ordinary soil. (CSR-2024, P-17, Item-18 (b).	246,746 Cft	11.88	P/Cft	2,931,342	-
31	Rehandling of earthwork. (b) Upto a lead of 50 ft. (CSR 2024, P-16 item-9(b).	209,734 Cft	4.44	P/Cft	931,219	-
32	Extra for wet earth work. (CSR-2024, P-17, Item-15)	37,012 Cft	4.75	P/Cft	175,807	-
33	Erection and removal of centering for R.C.C or plain cement concrete works of Partal wood b) (ii) Vertical. (CSR-2024, P-27, Item-19 (b-ii).	7,153 Sft	106.48	P.Sft	761,651	-

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S. No.	Item	Quantity	Rate	Unit	Amount Schedule Items	Amount Non-schedule Items
34	Cement concrete plain including placing compacting, finishing and curing, comlete (including screening and washing at stone aggregate without shuttering (I) Ratio 1:4:8 (CSR-2024,P-24, Item-5 (i)	3,598 Cft	348.83	P/Cft	1,255,090	-
35	Cement concrete plain including placing compacting, finishing and curing, comlete (including screening and washing at stone aggregate without shuttering (f) Ratio 1:2:4. (CSR-2024,P-24, Item-5 (f)	3,090 Cft	443.54	P/Cft	1,370,539	-
36	Reinforced cement concrete work including all labour and material except the cost of steel reinforcement and its labour for bending and binding which will be paid separately. This rate also includes all kinds of forms moulds: lifting shuttering curing rendering and finishing the exposed surface (including screening and washing of shingle.) (a) R.C work in roof slab, beams columns rafts, lintels and other structural members laid in situ or precast laid in position complete in all respects (II) Ratio 1:1-1/2:3 90 Lbs of cement, 1 1/2 Cft sand and 4Cft shingle 1/8" to 3/4" gauge. (CSR-2024, P-25, Item-6 (a-II).	38,342 Cft	787.71	Per Cft	30,202,377	-
37	Reinforced cement concrete work, including all labour and materials, except the cost of steel reinforcement and its labour for bending and binding, which will be paid separately. This rate also includes all kinds of forms moulds: lifting shuttering curing rendering and finishing the exposed surface (including screening and washing of shingle.) (a) R.C work in roof slab, beams columns rafts, lintels and other structural members laid in situ or precast laid in position complete in all respects. (I) Ratio (1:2:4) 90 Lbs cement 2 Cft. Sand 4 Cft. Shingle 1/8" to 1/4" gauge.(CSR-2024, P-25, Item-6 (a-I).	10,166 Cft	717.59	Per Cft	7,295,020	-
38	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings including cost of binding wire (also includes removal of rust from bars). c) Tor Steel (CSR-2024, P-24, Item-8 (a).	3,031.75 Cwt	18271.01	P/Cwt	55,393,135	-
39	Pacca brick work other than building including striking of joints upto 10ft. (3 meter) height (d) Cement sand mortar. 1:5 (CSR-2024, P-30, Item-7 (I-d)	10,872.00 Cft	370.04	P/Cft	4,023,075	-

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S. No.	Item	Quantity	Rate	Unit	Amount Schedule Items	Amount Non-schedule Items
40	Cement plaster 1:5 upto 12' height. (a) 3/8" thick. (CSR-2024, P-52, Item-12 (a)	8,963 Sft	37.02	P/Sft	331,810	-
41	Cement plaster 1:2 upto 12' height. (b) 1/2" thick. (CSR-2024, P-52, Item-9 (b).	8,963 Sft	44.52	P/Sft	399,033	-
42	Providing and Fixing PVC Water stopper. (CSR-2024, PHE, P-88, Item-127 (iii)	1,148 Rft	2665.177	P/Rft	3,058,344	-
43	Bitumen caoting to plastered or cement concret surface (CSR-2024 Item No: 09 Page 63)	2,424 Sft	21.83	P/Sft	52,916	-
44	Radial gate complete with embedded parts, pivot beam and anchorages, hand-operating gear, gear bearers, platform and handrailing (R.A. attached).	150 Sft	21,701	P/Sft	-	3,255,150
45	Boring for Tubewell in all water bearing, soils from ground level up to 100 ft: or 30.50 meter depth i/c sinking and with drawing of casing pipe. (e) 200 mm. (8" dia). (PHES-2024, P-129, Item-1) (e).	24 Rft	3678.26	P/Rft	88,278	-
46	Supplying M.S bail plug. (PHES-2024, P-44, I-8 (b)	1 No	15373.80	Each	15,374	-
47	Supplying and installing PVC strainers 'C' class of approved design quality and make i/c necessary sockets etc complete. b) 150 mm (6" dia) (PHES-2024, P-131, Item-10 (b).	15 Rft	1162.95	P/Rft	17,444	-
48	Supplying and installing M.S blind pipe 3/16" thich (5 mm thick) of best and approved quality and make including necessary socket etc. complete. (b) 150 mm (6" dia) (PHES-2024, P-131, Item-13 (b).	9 Rft	2620.22	P/Rft	23,582	-
49	Full hire charges of pumping set per day inclusive of the wages of driver and assistant fuel or electric energy plate form required for placing pumps etc. at lower depths with suction and delivery pipes for pumping out water found at various depths from trenches including the cost of erection and dismantling after completion of the job. (ii) Hire charges of pumping set above 10 H.P pumping out water from 15' deep trench.	270 Days	11205.60	P/Day	3,025,510	-

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S. No.	Item	Quantity	Rate	Unit	Amount Schedule Items	Amount Non-schedule Items
50	NOTE:- For working the pump beyond 8 hours the following payment shall be made, the higher of the pumping set it self being for 24 hours. i) For pumping set of above 10 H.P. (PHES-2024, P-165, Item-23(i).	3,780 Hrs	933.60	P/Hrs	3,529,008	-
				Sub Total Rs.	2,781,996,517	**111,911,262**
				Add Non-Schedule Amount Rs.	111,911,262	-
				Bill No. 01 Rs.	**2,893,907,779**	-

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Appendix-E to Bid

PROPOSED CONSTRUCTION SCHEDULE

Pursuant to Sub-Clause 43.1 of the General Conditions of Contract, the works shall be completed on or before the date stated in Appendix-A to Bid. The bidder shall provide as Appendix-E to Bid, the Construction Schedule in the bar chart (CPM, 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 and parts 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):

Description	**Time for Completion**
1) Whole works	**540 days**

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METHOD OF PERFORMING THE WORK

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

1. Organization Chart indicating head office and field office personnel involved in management and supervision, engineering, equipment maintenance and purchasing.

2. Mobilization in Pakistan, the type of facilities including personnel accommodation, office accommodation, provision for maintenance and for storage, communications, security and other services to be used.

3. The method of executing the works, the procedures for installation of equipment and machinery and transportation of equipment and materials to the site.

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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 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.]

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BG-2
Appendix-G to Bid

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						

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CONSTRUCTION CAMP AND HOUSING FACILITIES

The Contractor, in accordance with Clause 6 of the Conditions of Contract, shall describe 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.).

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Appendix-I to Bid

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

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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 thousands)**
1	**2**
Ist Quarter	
2nd Quarter	
3rd Quarter	
4th Quarter	
5th Quarter	
6th Quarter	
Bid Price	

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Appendix-K to Bid

ORGANIZATION CHART FOR THE SUPERVISORY STAFF AND LABOUR

(To be filled in by the bidder)

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(INTEGRITY PACT)

BL-1
Appendix-L to Bid

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

Contract No: **TC/G-55/1841 of 2026, S.B.A, Dated: 02/11/2026**
Contract Value:_____
Contract Title**:- Cement Concrete Lining of Rohri Main Canal from RD 589+000 to RD 610+250**

…… [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

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amount equivalent to ten time the sum of any commission, gratification, bribe, finder's fee or kickback given by [name of Contractor] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from PA.

……

[Procuring Agency] [Contractor]

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FORMS

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

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BS-1

BID SECURITY
(Bank Guarantee)

Security Executed on _____
(Date)

Name of Surety (Bank) with Address: _____
(Scheduled Bank in Pakistan)

Name of Principal (Bidder) with Address _____

_____

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

Bid Reference No. _____

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

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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

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FORM OF PERFORMANCE SECURITY
(Bank Guarantee)

[Letter by the Guarantor to the Procuring Agency]

Guarantee No._____

Executed on _____

Expiry date _

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 49, Defects Liability, of Conditions of Contract are fulfilled.

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

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be discharged of our liability, if any, under this Guarantee.

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

_____
Guarantor (Bank)

Witness:

1. _____ Signature _____

_____ Name_____
Corporate Secretary (Seal)

Title _____

2. _____

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

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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 priced Bill of Quantities (Appendix-D to Bid);
   (h) The completed Appendices to Bid (B, C, E to L);
   (i) The Drawings;
   (j) The Specifications.
   (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.

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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 Contractor	Signature of Procuring Agency
_____	_____
(Seal)	(Seal)

Signed, Sealed and Delivered in the presence of:

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

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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 the 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.

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GUARANTOR

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

WITNESS

1. _____

_____
Corporate Secretary (Seal)

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

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INDENTURE FOR SECURED ADVANCES.

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

This INDENTURE made the …….. day of ..... ……. 20…… BETWEEN (hereinafter called "the Contractor" which expression shall, where the context so admits or implies, be deemed to include his heirs, executors, administrators and assigns) of the one part and THE GOVERNOR OF SINDH (hereinafter called "the Government" of the other part).

WHEREAS by an agreement, dated (hereinafter called the said agreement, the contractor has agreed to perform the under-mentioned works (hereinafter referred to as the said work):-

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

AND WHEREAS the contractor has applied to the …….. ……..……..for an advance to him of Rupees ……..…… (Rs. .....) on the security of materials absolutely belonging to him and brought by him to the site of the said works the subject of the said agreement for use in the construction of such of the said works as he has undertaken to execute at rates fixed for the finished work (inclusive of the cost of materials and labour and other charge) AND WHEREAS the Government has agreed to advance to the Contractor the sum of Rupees, (Rs. .....) on the security of materials the quantities and other particulars of which are detailed in Part II of Running Account Bill (B). the said works signed by the contractor

Fin R.Form.l7.A

On …….. and on such covenants and conditions as are hereinafter contained and the Government has reserved to itself the option of marking any further advance or advances on the security of other materials brought by the Contractor to the site of the said works.

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

And doth hereby covenant and agree with the Government and declare ay follow :-

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

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(2) That the materials detailed in the said Running Account Bill (B) which have been offered to and accepted by (he Government as security for the said amount are absolutely by the Contractors own property free from encumbrances of any kind and the Contractor will not make any application for or receive a further advance on the security of materials which are not absolutely his own property and free from encumbrances of any kind and the contractor hereby agrees, at all times, to indemnify and save harmless the Government against all claims whatsoever to any materials in respect of which an advance has been made to him as aforesaid.

(3) That the said materials detailed in the said Running Account Bill (B) and all other materials on the security of which any further advance or advances may hereafter be made as aforesaid (hereinafter called the said materials) shall be used by the Contractor solely in *the* execution of the said works in accordance with the directions of the Divisional Officer (hereinafter called the Divisional Officer) and in the terms of the said agreement.

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

(5) 'Hurt the said materials shall not on any account be removed from the site of the said works except with the written permission of the Divisional Officer or an officer authorized by him in that behalf

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

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(7) If the Contractor shall at any time make any default in the performance or observance in any respect of any of the terms and provisions of the said agreement or of these presents the total amount of the advance or advances that may still be owing to the Government shall immediately on the happening of such default be repayable by the Contractor to the Government together with interest thereon at twelve percent per annum from the date or respective dates of such advance or advances to the date or repayment and with all costs, charges, damages and expenses incurred by the Government in or for the recovery thereof or the

enforcement of this security or otherwise by reason of (he default of the Contractor and any moneys so becoming due and payable shall constitute a debt due from the Contractor to the Government and the Contractor hereby covenants and agrees with the Government to repay and the same respectively to it accordingly.

(8) That the Contractor hereby charges all the said materials with the repayment to the Government of the said sum of Rupees..... ..... (Rs. .....) and any further sum or sums which may be advanced as aforesaid and all costs charges damages and expenses payable under these present PROVIDED ALWAYS and it is hereby agreed and declared that not, withstanding anything in the said agreement and without prejudice to the powers contained therein if and whether the covenant for payment and repayment hereinbefore contained shall become enforceable and the money owing shall not be paid to accordingly.

Once there with the Government may at any time thereafter adopt all or any of following courses as it may deem best ;-

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

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

(c) Deduct all or any part of the moneys owing out of the security deposit or any sum due to the Contractor under the said agreement.

(9) That except as is expressly provided by the presents interest on the said advance shall not be payable.

(10) That in the event of any conflict between the provisions of these presents and the said agreement the provisions of these presents shall prevail and in the event of any dispute or difference arising over the construction or effect of these presents the settlement of which has not been hereinbefore expressly provided for the same shall be referred to the Superintending Engineer/Executive District Officer/Officer one grade

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higher to officer signed the agreement Circle whose.....decision shall be final and the provisions of the Arbitration Act 1940 for the time being in force so far as they are applicable shall apply to any such reference.

Singed, sealed and delivered by*
In the presence of

SEAL

1st witness
2nd witness

Signed, sealed and delivered by*
In the presence of

SEAL

1st witness

2nd witness

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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 International des Ingenieurs-Conseils, or FIDIC), and is commonly known as the FIDIC Conditions of Contract. (The version used 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 purposes 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.*

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* Add the following text if the bidding documents, as issued, do not include a copy:
"Copies of the FIDIC Conditions of Contract can be obtained from: To request such permission, please contact:

FIDIC CASE POSTALE, CH-1215
Switzerland; Tel. +41 22 799 49 00;
Fax; +41 22 799 49 01f
E-mail: fidic@fidic.org.

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Conditions of Contract for
CONSTRUCTION

FOR BUILDING AND ENGINEERING WORKS DESIGNED BY THE EMPLOYER

Multilateral Development Bank Harmonised Edition March 2006

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FÉDÉRATION INTERNATIONALE DES INGÉNIEURS-CONSEILS INTERNATIONAL FEDERATION OF CONSULTING ENGINEERS INTERNATIONALE VEREINIGUNG BERATENDER INGENIEURE FEDERACIÓN INTERNACIONAL DE INGENIEROS CONSULTORES

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General Conditions
General Provisions

1.1 Definitions

In the Conditions of Contract ("these Conditions"), which include Particular Conditions, Parts A and B, and these General Conditions, the following words and expressions shall have the meanings stated. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

The Contract

1.1.1.1 "Contract" means the Contract Agreement, the Letter of Acceptance, the Letter of Tender, these Conditions, the Specification, the Drawings, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance.

1.1.1.2 "Contract Agreement" means the contract agreement referred to in Sub- Clause 1.6 [Contract Agreement].

1.1.1.3 "Letter of Acceptance" means the letter of formal acceptance, signed by the Employer, of the Letter of Tender, including any annexed memoranda comprising agreements between and signed by both Parties. If there is no such letter of acceptance, the expression "Letter of Acceptance" means the Contract Agreement and the date of issuing or receiving the Letter of Acceptance means the date of signing the Contract Agreement.

1.1.1.4 "Letter of Tender" means the document entitled letter of tender or letter of bid, which was completed by the Contractor and includes the signed offer to the Employer for the Works.

1.1.1.5 "Specification" means the document entitled specification, as included in the Contract, and any additions and modifications to the specification in accordance with the Contract. Such document specifies the Works.

1.1.1.6 "Drawings" means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract.

1.1.1.7 "Schedules" means the document(s) entitled schedules, completed by the Contractor and submitted with the Letter of Tender, as included in the Contract. Such document may include the Bill of Quantities, data, lists, and schedules of rates and/or prices.

1.1.1.8 "Tender" means the Letter of Tender and all other documents which the Contractor submitted with the Letter of Tender, as included in the Contract.

1.1.1.9 "Bill of Quantities", "Daywork Schedule" and "Schedule of Payment Currencies" mean the documents so named (if any) which are

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comprised in the Schedules.

1.1.1.10 "Contract Data" means the pages completed by the Employer entitled contract data which constitute Part A of the Particular Conditions.

1.1.2

Parties and Persons

1.1.2.1 "Party" means the Employer or the Contractor, as the context requires.

1.1.2.2 "Employer" means the person named as employer in the Contract Data and the legal successors in title to this person.

1.1.2.3 "Contractor" means the person(s) named as contractor in the Letter of Tender accepted by the Employer and the legal successors in title to this person(s).

1.1.2.4 "Engineer" means the person appointed by the Employer to act as the Engineer for the purposes of the Contract and named in the Contract Data, or other person appointed from time to time by the Employer and notified to the Contractor under Sub-Clause 3.4 [Replacement of the Engineer].

1.1.2.5 "Contractor's Representative" means the person named by the Contractor in the Contract or appointed from time to time by the Contractor under Sub-Clause 4.3 [Contractor's Representative], who acts on behalf of the Contractor.

1.1.2.6 "Employer's Personnel" means the Engineer, the assistants referred to in Sub-Clause 3.2 [Delegation by the Engineer] and all other staff, labour and other employees of the Engineer and of the Employer; and any other personnel notified to the Contractor, by the Employer or the Engineer, as Employer's Personnel.

1.1.2.7 "Contractor's Personnel" means the Contractor's Representative and all personnel whom the Contractor utilises on Site, who may include the staff, labour and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Works.

1.1.2.8 "Subcontractor" means any person named in the Contract as a subcontractor, or any person appointed as a subcontractor, for a part of the Works; and the legal successors in title to each of these persons.

1.1.2.9 "DB" means the person or three persons appointed under Sub-Clause 20.2 [Appointment of the Dispute Board] or Sub-Clause 20.3 [Failure to Agree on the Composition of the Dispute Board].

1.1.2.10 "FIDIC" means the Fédération Internationale des

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Ingénieurs-Conseils, the international federation of consulting engineers.

1.1.2.11 "Bank" means the financing institution (if any) named in the Contract Data.

1.1.3 Dates, Tests, Periods and Completion

"Borrower" means the person (if any) named as the borrower in the Contract Data.

1.1.3.1 "Base Date" means the date 28 days prior to the latest date for submission and completion of the Tender.

1.1.3.2 "Commencement Date" means the date notified under Sub-Clause 8.1 [Commencement of Works].

1.1.3.3 "Time for Completion" means the time for completing the Works or a Section (as the case may be) under Sub-Clause 8.2 [Time for Completion], as stated in the Contract Data (with any extension under Sub-Clause 8.4 [Extension of Time for Completion]), calculated from the Commencement Date.

1.1.3.4 "Tests on Completion" means the tests which are specified in the Contract or agreed by both Parties or instructed as a Variation, and which are carried out under Clause 9 [Tests on Completion] before the Works or a Section (as the case may be) are taken over by the Employer.

1.1.3.5 "Taking-Over Certificate" means a certificate issued under Clause 10 [Employer's Taking Over].

1.1.3.6 "Tests after Completion" means the tests (if any) which are specified in the Contract and which are carried out in accordance with the Specification after the Works or a Section (as the case may be) are taken over by the Employer.

1.1.3.7 "Defects Notification Period" means the period for notifying defects in the Works or a Section (as the case may be) under Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects], which extends over twelve months except if otherwise stated in the Contract Data (with any extension under Sub-Clause 11.3 [Extension of Defects Notification Period]), calculated from the date on which the Works or Section is completed as certified under Sub-Clause 10.1 [Taking Over of the Works and Sections].

1.1.3.8 "Performance Certificate" means the certificate issued under Sub-Clause 11.9 [Performance Certificate].

1.1.3.9 "day" means a calendar day and "year" means 365 days.

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1.1.4
Money and Payments

1.1.4.1 "Accepted Contract Amount" means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.

1.1.4.2 "Contract Price" means the price defined in Sub-Clause 14.1 [The Contract Price], and includes adjustments in accordance with the Contract.

1.1.4.3 "Cost" means all expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit.

1.1.4.4 "Final Payment Certificate" means the payment certificate issued under Sub-Clause 14.13 [Issue of Final Payment Certificate].

1.1.4.5 "Final Statement" means the statement defined in Sub-Clause 14.11 [Application for Final Payment Certificate].

1.1.4.6 "Foreign Currency" means a currency in which part (or all) of the Contract Price is payable, but not the Local Currency.

1.1.4.7 "Interim Payment Certificate" means a payment certificate issued under Clause 14 [Contract Price and Payment], other than the Final Payment Certificate.

1.1.4.8 "Local Currency" means the currency of the Country.

1.1.4.9 "Payment Certificate" means a payment certificate issued under Clause 14 [Contract Price and Payment].

1.1.4.10 "Provisional Sum" means a sum (if any) which is specified in the Contract as

a provisional sum, for the execution of any part of the Works or for the supply of Plant, Materials or services under Sub-Clause 13.5 [Provisional Sums].

1.1.4.11 "Retention Money" means the accumulated retention moneys which the Employer retains under Sub-Clause 14.3 [Application for Interim Payment Certificates] and pays under Sub-Clause
14.9 [Payment of Retention Money].

1.1.4.12 "Statement" means a statement submitted by the Contractor as part of an application, under Clause 14 [Contract Price and Payment], for a payment certificate.

1.1.5
Works and Goods

1.1.5.1 "Contractor's Equipment" means all apparatus, machinery, vehicles and other things required for the execution and completion of the Works and the

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remedying of any defects. However, Contractor's Equipment excludes Temporary Works, Employer's Equipment (if any), Plant, Materials and any other things intended to form or forming part of the Permanent Works.

1.1.5.2 "Goods" means Contractor's Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.

1.1.5.3 "Materials" means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.

1.1.5.4 "Permanent Works" means the permanent works to be executed by the Contractor under the Contract.

1.1.5.5 "Plant" means the apparatus, machinery and vehicles intended to form or forming part of the Permanent Works, including vehicles purchased for the Employer and relating to the construction or operation of the Works.

1.1.5.6 "Section" means a part of the Works specified in the Contract Data as a Section (if any).

1.1.5.7 "Temporary Works" means all temporary works of every kind (other than Contractor's Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.

1.1.5.8 "Works" mean the Permanent Works and the Temporary Works, or either of them as appropriate.

1.1.6 Other Definitions

1.1.6.1 "Contractor's Documents" means the calculations, computer programs and other software, drawings, manuals, models and other documents of a technical nature (if any) supplied by the Contractor under the Contract.

1.1.6.2 "Country" means the country in which the Site (or most of it) is located, where the Permanent Works are to be executed.

1.1.6.3 "Employer's Equipment" means the apparatus, machinery and vehicles (if any) made available by the Employer for the use of the Contractor in the execution of the Works, as stated in the Specification; but does not include Plant which has not been taken over by the Employer.

1.1.6.4 "Force Majeure" is defined in Clause 19 [Force Majeure].

1.1.6.5 "Laws" means all national (or state) legislation, statutes, ordinances and other laws, and regulations and by-laws of any legally constituted public authority.

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1.1.6.6 “Performance Security” means the security (or securities, if any) under Sub-Clause 4.2 [Performance Security].

1.1.6.7 “Site” means the places where the Permanent Works are to be executed, including storage and working areas, and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site..

1.1.6.8 “Unforeseeable” means not reasonably foreseeable by an experienced contractor by the Base Date.

1.1.6.9 “Variation” means any change to the Works, which is instructed or approved as a variation under Clause 13 [Variations and Adjustments].

1.2

Interpretation

In the Contract, except where the context requires otherwise:

(a) words indicating one gender include all genders;
(b) words indicating the singular also include the plural and words indicating the plural also include the singular;
(c) provisions including the word “agree”, “agreed” or “agreement” require the agreement to be record in writing;
(d) “written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record; and
(e) the word “tender” is synonymous with “bid”, and “tenderer” with “bidder” and the words “tender documents” with “bidding documents".

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

In these Conditions, provisions including the expression “Cost plus profit” require this
profit to be one-twentieth (5%) of this Cost unless otherwise indicated in the Contract
Data.

1.3

Communications

Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

(a) in writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the Contract Data; and
(b) delivered, sent or transmitted to the address for the recipient’s

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communications as stated in the Contract Data. However:

(i) if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and
(ii) if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued.

1.4 Law and Language

1.5 Priority of Documents

Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Engineer, a copy shall be sent to the Engineer or the other Party, as the case may be.

The Contract shall be governed by the law of the country or other jurisdiction stated in the Contract Data.

The ruling language of the Contract shall be that stated in the Contract Data.

The language for communications shall be that stated in the Contract Data. If no language is stated there, the language for communications shall be the ruling language of the Contract.

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence:

(a) the Contract Agreement (if any),
(b) the Letter of Acceptance,
(c) the Tender,
(d) the Particular Conditions - Part A,
(e) the Particular Conditions - Part B,
(f) these General Conditions,
(g) the Specification,
(h) the Drawings, and
(i) the Schedules and any other documents forming part of the Contract.

If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction.

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PART II - SPECIAL /PARTICULAR CONDITIONS OF CONTRACT

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".

1.1.1.10 "Bidding" is synonymous with "contract".

The following paragraph is added:

1.1.1.11"Programme" means the programme to be submitted by the contractor in accordance with Sub-Clause 8.3 and any approved revisions thereto.

1.12.2 "Employer" is synonymous with "Procuring Agency"

1.1.2.9 "DB" is synonymous with "Committee".

1.1.3.1 Replace 28 days by 7 days in LCB and 15 days in ICB..

1.1.3.7 "Defects notification Period" is synonymous with "Defects liability Period".

1.15 **Inspections and Audit by the Bank**
Deleted
Procuring Agency can retain this clause with or without changes, in case of contracts under Project, Bank and donor's programme.

3.1 Engineer's Duties and Authority.

The following paragraph is added after duties:

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)

4.3 Contractor's Representative

The following text is to be added after the last line:

The Engineer'sauthorised representative and his other professional engineers working at the site shall register themselves with the Pakistan Engineering Council.

6.10 Records of Contractor's Personnel and Equipment

The following paragraph is added:

The Contractor shall, upon request by the Engineer at any time in relation to any item,

of hired Engineer's Equipment, forthwith notify the Engineer in writing the name

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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.

The following sub-clause 7.9 is added in (GCC):

7.9 Use of Pakistani Materials and Services

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.

8.1 Commencement of Works

The last para is deleted and substituted with the following:

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.

8.11 Prolonged
Suspension
Replace 84 days
by 120 days.

8.3 Programme

The following text is to be added after [Commencement of Works]
The programme shall be submitted in the either form of:

a) Bar Chart identifying the critical activities.
b) Critical Path Method (CPM) identifying the critical path/activities.
c) Program Evaluation and Review Techniques (PERT).
(Procuring Agency to select appropriate one)

13.1 Right to vary

In the last line of Para, after the word “Variation", the word “in writing” is added.

13.3 Variation procedure

In the tenth line, after the words “as soon as practicable,” the following is added: “and within a period not exceeding one-eighth of the completion time”

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13.8 Adjustment for changes in cost

This clause will be applicable for Foreign funded Project/ Schemes or Contracts (locally & foreign funded) only. *ICB*

The following provision is added for Local funded Project/ Schemes/National Competitive Bidding Contracts:

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

14.1 The Contract Price Sub-para (d) is deleted.

14.2 Advance Payment

The Text is deleted and replaced with the following:

Advance Payment/Mobilization Advance shall be made available to the Contractor by the procuring agency on the following conditions:

Mobilization Advance/Advance Payment

(i) Mobilization advance up to 10 % of the Contract Price may be paid by the procuring agency to the Contractor on the works costing Rs2.5 million or above on the following conditions:

a. on submission by the Contractor of a mobilization advance guarantee for the full amount of the advance in the specified form, from a Scheduled Bank in Pakistan, acceptable to the procuring agency;

b. [XXX][1]

(ii) This Advance [XXX] shall be recovered in 5 equal installments from the 5 R.A bills and in case the number of bills is less than 5 then 1/5 of the advance [XXX] shall be recovered from each bill and the balance [XXX] 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.

14.5 Plants and Materials intended for Works

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) The Contractor shall be entitled to receive from the procuring agency Secured

[1] Deleted in the light of amendment in Sindh Financial Rules, vide Finance Department's Notification dated 27th April, 2017 and approval from SPPRA Board in its 30th Meeting held on 9th August, 2017.

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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:

(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 Engineer'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 purpose of valuation of materials and providing evidence of ownership and payment therefor;

(v) Ownership of such materials shall be deemed to vest in the procuring agency, and these materials shall not be removed from the site or otherwise disposed of without written permission of the procuring agency;

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

(vii) Secured Advance shall not be allowed unless and until the previous advance, if any, is fully recovered;

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

(ix) Secured Advance may be permitted only against materials/quantities anticipated to be consumed / utilized on the work within a period of 3 months from the date of issue of secured advance and in no case for full quantities of materials for the entire work/contract.

(II) Recovery of Secured Advance:

Secured Advance paid on non-perishable materials to the Contractor under the above provisions shall be affected from the monthly payments on an actual consumption basis, but not later than the period specified in the rules, not more than three months (even if unutilized);

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14.8 Delayed Payment

Second Para is replaced with the following text:

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 a 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.

15.2 Termination by Employer

The following Para is added at the end of the sub-clause:

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.

15.6 Corrupt and fraudulent Practices.

The following text is to be added as 3rd paragraph:

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:

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

(b) terminate the Contract; and

(c) recover from the Contractor any loss or damage to the procuring agency as a result of such termination or of any other corrupt business practices of the Contractor or any of his Subcontractors, agents or servants.

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.

16.4 Payment on Termination

Sub-paragraph (c) is deleted.

17.3 Employer's/ Procuring Agency's Risks

Sub-Clause 17.3 (h) is deleted.

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The following text is added in Clause 18.1 (GCC):

18.1 General Requirements for Insurance

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//Procuring Agency valid for a period 28 days after beyond the Bid Validity date.
Costs of such insurances shall be borne by the contractor.

19.6 Optional Termination, Payment and release by the Employer
Sub-clauses (c), (d) and (e) are deleted.

20.6 Arbitration

Text will be replaced as under;

Any dispute in respect of which:

(a) the decision, of the Dispute Board has not become final and binding pursuant to sub- clause 20.2, and

(b) 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.

The place of arbitration shall be....., in Sindh Province.

Procuring Agency can retain this clause without changes, in case of contracts under Project,

Bank and donor's programme except the place of arbitration shall be , in Sindh Province.

Annex PROCEDURAL RULES

Procuring Agency can retain these rules with or without changes, in case of contracts under Project, Bank and donor's programme.

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SPECIFICATIONS

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GENERAL

Mobilization for Construction of the Works

The Contractor shall mobilize all resources as required for the construction of Works according to Contract Provisions. The major items of mobilization are listed and described hereof for illustration. The Contractor shall make his assessment for the provision and maintenance of mobilization and demobilization requirements and shall ensure their availability to the satisfaction of the Engineer.

(a) Mobilization of Contractor's plant to the Site.

(b) Mobilization of Contractor's personnel and labor at the Site.

(c) Provision of camps.

(d) Provision of such administrative and field offices as the Contractor considers necessary for his organization.

(e) Provision of workshops, warehouses, sheds, and storage yards required by the Contractor for the proper and sufficient execution of the Works.

(f) Arrangements for supply of water for use in construction, including installation of the necessary wells, pumps, pipes, storage tanks, and suitable arrangements for the delivery of water at the various points of requirement.

(g) Maintenance of temporary site facilities provided by the Contractor for performance in connection with the Contract.

(h) Demobilization on completion of Contract.

The Contractor shall submit in advance for approval of the Engineer his plans for mobilization and demobilization giving full details of resources, manpower, and equipment involved.

Shipment of Contractor's Plant and Equipment to Site

The Contractor shall be responsible for the shipment of plant, equipment, and machinery required for the execution of the Work to the specified Site within the specified time.

Provision of Camps

The Contractor shall provide such camps as are required for the proper and efficient progress of the work to house his employees and to provide such Site office facilities for use of the Engineer and Employer as specified elsewhere in the Specifications. On the completion of the Contract, the Contractor shall remove the said camps and facilities and reinstate the camp area to the satisfaction of the Engineer.

The Contractor's camps shall comply with the rules of the Pakistan Labour Camp Rules, 1960, 2001 issued by the Pakistan Health, Welfare and Local Government Department and the requirements therein set forth. The said rules are available with the Employer's Representative.

Provision of Contractor's Office

The Contractor shall provide such administrative and field offices as the Contractor considers necessary for his organization.

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Latrines

The Contractor shall provide throughout the construction of the Works and shall maintain and cleanse sufficient latrines for the use by his employees. He shall ensure that his employees do not foul the Site but make use of the latrines.

Provision of Contractor's Workshops, Warehouses, etc.

The Contractor shall provide workshops, warehouses, shades, and storage yards required by the Contractor for the proper and sufficient execution of the Works.

The Contractor shall provide, maintain, and operate such temporary buildings as his staff quarters, stores, workshops, labor camps, and other temporary buildings necessary for the execution of the Works at the place the Employer will provide. The Contractor shall submit site plans and general particulars of the prescribed buildings to the Engineer for his approval within the prescribed period. The construction of the buildings shall not be started until his proposals have been finally approved by the Engineer.

The Contractor's staff quarters and labor camps shall be provided with all necessary services for drainage, lighting, roads, paths, parking places, fencing, sanitation, cook-houses, fire prevention, and firefighting equipment.

The Contractor shall also provide an adequate water supply system to the Contractor's office, his staff quarters, labor camps, workshops, and other places of the Work on the Site. The Contractor shall make his arrangements for electricity supply to the Contractor's office, his quarters, labour camp, workshop, and stores.

Provision of Power Supply to offices, Facilities, Workshops, Camps, etc.

The Contractor shall make his arrangements for the supply of electric power for the Contract.

Supply of Water for Construction

The Contractor will be required to furnish water for all aspects of construction
All other items of Mobilization not Specifically Stated. Provision of such roads and other works as may be deemed necessary by the Contractor for the proper execution of the works.

Maintenance of Site Facilities of Contractor

The Contractor shall arrange service for all of his mobilization works, fixtures, and equipment including provision of all water, electricity, sewerage, and refuse disposal services, until the end of the Maintenance Period. The Contractor shall replenish consumable items as and when required. At the end of the Maintenance Period, the Contractor shall remove his camp and facilities and reinstate the camp area to the satisfaction of the Engineer.

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Measurement and Payment

No separate payment shall be made for complying with any other provisions of this chapter except where otherwise detailed in the Bill of Quantities.

Provisional Sum

In the Bill of Quantities, there is an item having the words “Prov. Sum” in the unit column which means a sum included in the Contract for the execution of any part of the Works or for the supply of goods, materials, Plant or services or for contingencies, which sum may be used in whole or in part or not at all on the instructions of the Engineer. The Contractor shall be entitled to only such amounts in respect of Work, supply, or contingencies to which such Provisional Sum relates as the Engineer shall determine on the production of quotations, invoices, vouchers, and accounts or receipts by the Contractor in connection with expenditure in respect of Provisional Sums. The Engineer shall notify the Contractor of any such determination with a copy to the Employer.

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THE SITE

General

The site shall be that area where the Contractor will perform the execution of the works. The right of way for access to the Works from existing roads shall be provided by the Contractor through his arrangements. The Contractor shall make his investigations of the condition of available public or private roads and of clearance, restrictions, bridge load limits, and other limitations that affect or may affect transportation and ingress at the job sites and shall bear all responsibilities in that respect.

Use of Land for Construction Facilities

The Contractor shall make his arrangements at his own cost to acquire land for field offices, construction plants, storage yards, and other facilities required for construction operations under the Contract.

The location, construction, maintenance, and operation of the Contractor's construction facilities shall be subject to the approval of the Engineer.

Access to the Works

Before the commencement of any part of the works, the Contractor shall make temporary access tracks including all necessary temporary diversions and bridge works to the part of the Site concerned, both for the Contractor's access and for the maintenance of public access, all to the approval of the Engineer. The Contractor shall maintain such access tracks in a condition suitable for the safe and easy passage of plant, vehicles, and pedestrians until these tracks are no longer required for the Contract. Other Contractors employed upon the Project may use such access. The Contractor shall pay particular attention to the maintenance of existing irrigation channels and watercourses.

The Contractor shall make a record to be agreed by the Engineer of the condition of the surfaces of any private lands or any public cultivated or maintained lands over which access for the Site lies before use for access, and he shall keep such surfaces in a reasonable state of cleanliness and repair during the execution of the Works. On the termination of the Contractor's use of such access, he shall restore the surfaces to a condition at least equal to that obtained before his first entry on them. The Employer will provide assistance where the Contractor encounters any difficulties in establishing a right of way to the works from existing roads.

Roadways Crossings

Where channels, crossroads or tracks cross the works, these shall be kept open, or temporary diversion roads must be constructed. Construction of temporary diversions and reinstatement of roads and tracks shall be by the provisions of the Contract.

Damage to Channel and Drain Banks and Operating Roads

The Contractor shall limit his loads, speeds, and hauling operations over the existing roads to minimize damage to other existing facilities. Ruts and scars resulting from the Contractor's

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operations shall be removed and any damage to Channel embankments shall be promptly corrected to the satisfaction of the Engineer.

Site Operations

(i) General

The Site may be located through and adjacent to tracts of improved property. Where the channel access to the Works are adjacent to, cross, or disturb improvements such as gardens, trees, irrigation and drainage facilities, crops, and cultivated fields, the Contractor shall conduct his operations to minimize disturbance to or destruction of improvements, crops or property and to interfere as little as possible with the operations of cultivators.

(ii) Restoration of Disturbed Lands within Right of Way

The Contractor shall be responsible for restoring the surface of the lands disturbed by the Work within the right of way as close as possible to the original condition as found, to the satisfaction of the Engineer. Upon the Contractor's application, the Engineer will agree on a schedule of conditions before the Contractor's entry.
Except as otherwise provided for the disposal of excavated materials, and for the settlement of crop damage claims, the cost of all work described in this section, shall be included in the relevant section of the Bill of Quantities.

Utilities, Transmission, and Telephone Lines

The locations of utility, transmission, and telephone lines are shown on the layout drawings insofar as the information is available or as field surveys have been completed at the time of bidding. The Contractor shall exercise due care during construction to ensure that no damage is done to such lines. The Employer is responsible for providing the reference data required for buried utility locations. The Employer will indemnify the Contractor against all claims for damages and the costs of repairs to the utility, transmission, and telephone lines arising out of the Contractor's operations, excluding any claims arising from willful damage or negligence by the Contractor.

Grazing Livestock

The Contractor shall provide reasonable care by hiring watchmen to ensure that livestock are not allowed within the construction right of way during operations but he will not be responsible under this Contract for any damages, injury, or death of livestock resulting from the construction operations.

Safety

High standards of safety for men and machines must be observed at all times. Contractors shall comply with existing Pakistani laws.
Men working in trenches shall be protected from cave-ins by sloping the trench sides or by proper trench shoring; men should not work alone in trenches.
Moving parts of the machines shall be protected by proper guards. Casual observers shall not be permitted close to excavating operations.

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Clearance of Site

The Contractor shall clear the Site to the extent required by the Engineer for checking setting-out. The Contractor shall also clear the parts of the Site to be occupied by the Works of all vegetation and artificial obstructions. The Contractor shall fill and make good with appropriate material those cavities and losses of soil which result from clearing for setting-out as specified in this Clause. The material arising from such clearance shall be removed from the Site and disposed of by the Contractor. The Contractor shall make periodic clearance of vegetation as is necessary to preserve the amenity and appearance of the neighborhood of the Site.

Condition of Site

The Contractor shall maintain the Site in a neat, tidy, and healthy condition and free from accumulation of waste or rubbish.

Disposal of Waste Materials

(i) General

Waste materials including, but not restricted to, refuse, garbage, sanitary wastes, industrial wastes, and oil and other petroleum products shall be disposed of by the Contractor. Disposal of waste materials shall be by burying, where burial of such materials is approved by the Engineer; by burning where burning of such materials is permitted by local laws; or by removal from the construction area.

(ii) Disposal of Material by Burning

All materials to be burned shall be piled in designated burning areas in such a manner as will cause the least fire hazards. Burning shall be thorough and complete and all charred pieces remaining after burning, except for scattered small pieces, shall be removed from the construction area and disposed of. The Contractor shall, at all times, take special precautions to prevent fire from spreading beyond the piles being burned and shall be liable for any damage caused by his burning operations.

(iii) Disposal of Material by Removal

Disposal of material by removal from the construction area shall be accomplished before the completion of any section of the Works. All materials removed except trees, shall become the property of the Contractor. Materials to be disposed of by dumping shall be hauled to an approved dump. It shall be the responsibility of the Contractor to make any necessary arrangements.

(iv) Disposal of Trees

Trees and bushes cleared from the construction area shall be placed at the edge of the construction area or right of way. The Employer shall arrange the use and disposal of the wood. Where large trees are to be removed the Engineer will determine how the trees are to be cut and removed and at the same time try not to impede the progress of the Works. All trees, tree roots, and bushes not required by the Employer will be burned or removed from the Construction area at the Contractor's expense.

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Prevention of Pollution

(i) Landscape Preservation

The Contractor shall exercise care to preserve the natural landscape and shall conduct his construction operations to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work.

(ii) Prevention of Water Pollution

The Contractor shall comply with applicable regulations concerning the control and abatement of water pollution.

The Contractor's construction activities shall be performed by methods that will prevent entrance, or accidental spillage of solid matter, contaminants, debris, and other objectionable pollutants and wastes into flowing streams, flowing or dry watercourses, lakes, and underground water sources; sanitary wastes shall be disposed of on land by burial at approved sites or by other approved methods.

Preservation of Historical and Archaeological Findings and Graveyards

The Contractor agrees that should he or any of his employees and Subcontractors in the performance of the Contract discover evidence of possible scientific, pre-historical, historical, or archeological materials, he will notify the Engineer immediately in writing giving the location and nature of the findings. Where appropriate because of a discovery, the Engineer may order delays in the time of performance and/or changes in the Work.

The Contractor shall not trespass, excavate in, or otherwise disturb graveyards whether shown on Drawings or not. In the case of unidentified graveyards or burial sites, the Contractor shall notify the Engineer in writing and the Engineer shall make such design changes as required.

Measurement and Payment

No separate payment shall be made for complying with the requirements of this chapter except where otherwise detailed in the Bill of Quantities.

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MATERIALS AND WORKMANSHIP

Sampling and Testing

The Contractor shall keep records of all tests he conducts in compliance with Specifications, or as required by the Engineer, and shall submit copies of the results of such tests to the Engineer when required. Tests required by the Engineer may be carried out at the laboratory nominated by the Engineer at the Contractor's expense.

Samples required for tests in the nominated laboratory shall be supplied and delivered by the Contractor in appropriate containers, suitably packed and labeled.

The Contractor shall provide for the approval of the Engineer samples of all construction materials and manufactured items required for the Works if ordered. All samples rejected by the Engineer shall be removed from the Site. All approved items shall be stored on the Site by the Contractor for the duration of the Contract under conditions which will prevent deterioration of the approved sample. Any materials or manufactured items subsequently delivered to the Site for incorporation in the Works shall be at least equal to the approved sample.

About sampling, testing, and the costs thereof, nothing in the foregoing shall be deemed to derogate from the responsibilities placed on the Contractor.

The Contractor shall, when required by the Engineer, provide suitable assistants for use in the supervision of the construction of the Works and these assistants shall be available to help carry out sampling and testing of materials and workmanship. The Engineer will notify the Contractor of his requirements in this respect at least one (1) day in advance. The Contractor shall provide the Engineer with a list of staff he proposes to use and details of their qualifications and experience. The Engineer may reject any or all of the nominated staff.

Concrete Sampling and Testing

The Contractor shall be responsible for providing samples of concrete and its constituent materials either for testing by himself or on behalf of the Engineer for testing at a nominated laboratory. Samples may also be taken by the Engineer for testing under the Contract at a nominated laboratory. Concrete test cubes/cylinder, which shall be made by BS 1881 part 116/ASTM C-31 and C-39, shall be deemed to be sampled for this Clause. All sampling of constituent materials shall be carried out by the provisions of the appropriate British / ASTM Standard, and all sampling of fresh and hardened concrete shall be carried out by the provisions of BS 1881/ASTM C-172 unless such provision is at variance with the Specifications. Details of all such samples shall be recorded by the Contractor and passed to the Engineer. The frequency with which such samples are to be delivered to the laboratory will be given by the Engineer in the form of a sampling plan. The Engineer will make available to the Contractor the results of each test carried out on the samples provided.

The tests, which the Contractor is required to undertake himself on behalf of the Engineer, are those to be carried out on fresh concrete at the place of final deposit, or elsewhere in the Site as directed by the Engineer. These tests comprise slump tests to BS 1881, part 102/ASTM C-143. The frequency with which these tests are carried out shall be as directed by the Engineer in the form of a testing plan.

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The Contractor shall also test aggregates for moisture content and determine the water/ cement ratio of the fresh concrete. Determinations of water/cement ratio shall be carried out as required by the Engineer and the results and calculations submitted to him.

The Contractor shall, until the Maintenance Period (or such earlier date as directed by the Engineer) supply, service, and operate the necessary apparatus for sampling concrete and its constituent materials by the requirements and for slump tests on fresh concrete as described above.

Sampling of fresh concrete for concrete test cubes shall be carried out whenever possible, at the place of deposition in the Works. From each such sample three (3) such cubes shall be made. Each cube shall be marked indelibly for identification when it is in the mould. After retention at the place where they are made for 24 hours, the cubes shall be delivered to the nominated laboratory for removal from their moulds, curing, and testing. Moulds shall be returned to the Contractor for reuse. Sampling fresh concrete for such cubes shall be carried out by the Contractor by a sampling plan drawn up by the Engineer by the following principles.

The frequency of sampling for each class of concrete from each batching center on each active day shall be at a rate of:

(a) One sample from one batch of every 10 batches; or
(b) One sample per 350 cubic feet of concrete; or
(c) One sample;

Whichever involves the greatest number of samples? Where more than 700 cubic feet from one batching center is placed in one location in one day, the rate of sampling may be decreased, with the approval of the Engineer to one sample from one batch of every 20 batches or one sample per 700 cubic feet of concrete, whichever involves the greatest number of samples. The actual rate of sampling may vary to the approval of the Engineer according to the random selection of batches to be sampled and shall be increased when ordered by the Engineer in appropriate circumstances.

In addition to his other duties in connection with the sampling and testing of concrete, the Contractor shall provide the instruments for, and record the temperatures of the concrete and concrete materials, as required by the Engineer, and copies of such records shall be supplied to the Engineer.

Tests and Testing Equipment

The following tests will be carried out in the Engineer's nominated laboratory as required under the Contract or ordered by the Engineer. The Contractor shall provide samples for the tests. Equipment to carry out these tests shall be repaired as necessary by the Contractor, or provided to the Engineer's nominated laboratory by the Contractor, as required and ordered by the Engineer. The Contractor shall service the equipment as required and as ordered by the Engineer for the duration of the Contract.

(a) Soil and Earthwork Testing

(The number in brackets refers to the tests as specified in BS or ASTM standards)

(i) Determination of the Moisture Content:
(BS 1377: Part 2: 1990: 3);
(ASTM: D 2216-98) (ASTM C 566)

(ii) Determination of Atterburg Limits:
(BS 1377: Part 2: 1990: Clauses 4 and 5);
(ASTM: D 423 - 63; ASTM: D424 - 59).

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(iii) Determination of the Particle Size Distribution - (Wet/Dry Sieving as appropriate):
(BS 1377: Part 2: 1990: Clause 9.2/9.3);
(ASTM: D422 - 63), (ASTM C 136).

(iv) Standard Proctor Compaction Test/ Using modified effort
(BS 1377: Part 4: 1990: Clause 3);
(ASTM D 1557).

(v) Determination of the Dry Density of soil on site:
Sand Replacement Method:
(BS 1377: Part 9: 1990: Clause 2.1 or Clause 2.2);
(ASTM D 1556), (ASTM D 1558). Core Cutter Method:
(BS 1377: Part 9: 1990: Clause 2.4).

(b) Concrete Testing

(the number in brackets refers to the tests as specified in BS or ASTM standards)

(i) Aggregate moisture tests for determination of Water Cement Ratio:
(ASTM: C 566 - 78).

(ii) Compression testing of test cubes/cylinders
(BS 1881: Parts 115 and 116);
(ASTM: C39-81).

(c) Cement Testing

(The number in brackets refers to the tests as specified in BS or ASTM standards)

(i) Compressive strength (mortar cubes): (BS 4550: Part 3: Section 3.4)
(ASTM C 348 and C 349).

(ii) Effect of Organic Impurities in Fine Aggregate on Strength of Mortar:
(ASTM: C87-69) , (ASTM C 40).

(d) Fine and Coarse Aggregate Testing

(the number in brackets refers to the tests as specified in BS or ASTM standards)

(i) Flakiness index: (BS 812: Section 105.1).

(ii) Elongation index: (BS 812: Part 1: Para. 7.4).

(iii) Particle size and grading: (BS 812: Part 103); (ASTM: C 136 - 82).

(iv) Silt content by field settling test: (BS 812: Part 1: Para. 7.2);
(ASTM: C117-95).

(v) Aggregate impact value: (BS 812: Part 3: Para. 6).

(vi) Aggregate crushing value: (BS 812: Part 3: Para. 7).
(ASTM: C -131).

(vii) 10% fines value: (BS 812: Part 3: Para. 8).

(viii) Soluble sulphates: 0.4% maximum of each aggregate proposed

(ix) Chloride content: (BS 812: Part 4).

(e) Water Testing

(i) Total dissolved solids and electrical conductivity
(BS 3148-80) , (ASTM D 586) (Earth Manual E8).

(ii) Sulphate content:
(BS 1377: Part 3: 1990: Section 5).

(iii) Chloride content:
(BS 812, Part 4).

Measurement and Payment

No separate payment will be made for complying with the provisions of the specifications. Except where otherwise provided for in the Bill of Quantities, no separate payment shall be made, interalia, for taking samples; delivery of samples to the Engineer's nominated laboratory; making

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slump tests; testing of aggregates and making moisture content tests; making concrete cubes; supply of instruments for, and recording of temperatures of concrete and concrete materials; preparation and submission of Site records, trials and proving of alternative Construction Plant, materials and methods of working suggested by the Contractor.

For tests on materials for incorporation in the works or tests on the Works, no payment shall be made for delivery of any sample to a laboratory nominated by the Engineer if such sample or test shall fail to meet the requirements of the Specification, where such test is ordered or normally required to demonstrate compliance with the Specification.

For tests on materials before selection and approval of sources of materials for incorporation in the Works and for trials of Constructional Plant and methods of working for approval for use in constructing the Works including tests for resulting workmanship where not provided for in the Bill of Quantities, no separate payment shall be made.

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CARE AND HANDLING OF WATER

General

The Employer does not guarantee or describe the conditions that may be encountered in performing the Works. The Contractor must assume all responsibility for any conclusions he may derive from any information provided. The Contractor should also inspect and examine the site and its surroundings to collect all the pertinent information in this regard.

Scope of Work

The Works to be done under the care and handling of water, consist of the following:

Protecting all Works from damage by groundwater, rains, and surface runoff during the entire construction period

Maintaining regular irrigation supplies during the period of construction of the Works.

They are dewatering foundations and care of water to maintain all excavations and surfaces dry and free of water as required for the proper construction of the Works.

Protection of Works

The Contractor's proposals for protecting works constructed under the Contract from damage by flooding or otherwise shall be submitted to the Engineer, but such submission shall not in any way absolve the Contractor from responsibility for any damage, which may be incurred subsequently.

Maintaining Drainage System

The Contractor shall neither interrupt nor interfere with the natural drainage system of the area for any reason or purpose without the written approval of the Engineer.

Construction of Diversion Channel approved by the Engineer

The diversion channel is to be provided as the channel is a perennial canal and cannot be closed. Furthermore, the magnitude of lining is enormous and cannot be done in the annual closure. Diversion channel would be having the same discharge. This diversion channel can be either placed away from the main channel or cut in one of the banks depending upon the local conditions. The diversion channel placed close to the original prism, has the advantage of being constructed in sections and utilizing the existing outlets, while the lining work proceeds in reaches between outlets, but it has the disadvantage of causing seepage into the channel prism hampering the lining progress beside effects the quality of lining work or involves heavy dewatering plumage. The Contractor should expect all earthworks operations to be undertaken whilst the channel is flowing. Contractor shall make temporary arrangement to ensure water supply flow in temporary diversion channel.

The material for compacted fill obtained from borrow areas shall comply with the following requirements:

(a) Sandy material with greater than 20% passing on a sieve nr. 200 sieves is unsuitable;
(b) The borrow areas to the approval of the Engineer;
(c) The borrow areas to be outside of the inspection path but, wherever possible, within the right of way;
(d) Material excavated from borrows areas more than 2 feet in depth or from areas near standing crops or with vegetation will generally not be approved.

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The construction of any protection or diversion works, the Contractor shall submit for approval of the Engineer his proposed plan for each protection and diversion work including all design features of the channels and other facilities. The plan may be placed in operation upon approval but nothing in the Contract Document shall relieve the Contractor from full responsible for and shall repair at his own expenses any damage to the foundations, or any other part of the Works caused by floods, water or failure of any part of the protection works.

The Contractor shall furnish all labour, equipment and materials for constructing and maintaining all necessary bunds, channels, diversions, sumps, and other temporary protection. All such temporary protection and diversion works shall be removed or left and graded and so as not to interfere in any way with the operation or usefulness of the completed works.

Measurement and Payment

No separate payment shall be made for complying with all provisions of the chapter except where otherwise detailed in the Bill of Quantities.

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EARTHWORKS

Jungle Clearance

Jungle is defined as any weeds, reeds, long grass, pan grass, bushes, hedges, trees, undergrowth or the like which may affect the visibility and access along the berms, inspection and non-inspection paths. Jungle wherever occurs along the length of channel will be cleared only were ordered by the Engineer. The trees shall not be fallen down without prior written authorization of the Engineer. The Work includes the clearance and disposal of jungle from the berms, inspection and non-inspection paths and side slopes. The Contractor shall generally remove the same, which is visible above the ground including roots.

Scarifying Ground Surface and Ploughing

Where fill in embankments and in channels is to be compacted, the surface of the ground under the embankment shall be scarified to a depth of 6 inches so as to provide a satisfactory bond between grounds and fill. The moisture content of the scarified surface shall be carefully controlled either by natural drying or by wetting with a fine spray. If for any reason, progress in compacting the fill is interrupted for a significant time, the surface of the fill material shall be scarified before compaction continues. After the site clearance work has been completed, the ground surface under all embankments to be compacted shall be ploughed three times to a depth not less than 9 inches, moistened, if so, required as specified.

Earthworks Specification

The Contractor shall make excavations in any material and any conditions for the several parts of the works and shall dispose of the excavated materials all as specified, shown on the Drawings, or ordered by the Engineer. The earthworks specification is divided into three sub-divisions, as follows:

A. General

B. Canal and Embankment

C. Structures.

General

The Contractor shall give the Engineer at least seven days written notice of his intention to commence earthworks on any part of the Site. The earthworks shall not be commenced until the Contractor has received written approval from the Engineer.

Earthworks to Lines and Levels

The whole of the earthworks for the several parts of the Works shall be carried out to the dimensions and the levels shown on the drawings or to such other dimensions and levels as may be ordered by

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the Engineer. Dimensions, which are based on, or related to, ground levels or chainages, shall be referred to the Engineer before commencing earthworks at any locations

For the Specification the term ground level shall refer to the original profile before the start of earthwork operations.

Extent of Excavations

The extent of excavations shall be the minimum practicable in the opinion of the Engineer for the construction of the Works.

The excavation of the channel shall at any one time be limited to lengths previously approved by the Engineer in writing. Except with the written approval of the Engineer, work on each approved length shall be completed to the satisfaction of the Engineer before work on any new length is commenced.

Excavation of Unsound Material

(1) If any unsound material occurs in the bed or sides of a channel, in foundations, or below embankments, the Contractor shall remove and dispose of it to the satisfaction of the Engineer. Unsound material shall include roots, organic matter, mud, gypsum, surface layers of boulders, cobbles and gravel, and deleterious substances. Unless otherwise specified or ordered by the Engineer, the Contractor shall fill the voids so formed, with concrete Class D for structures, with compacted fill for canal and embankments, and with approved granular material for embankment pitching.

If the Contractor encounters any material which in his opinion may be unsound, he shall immediately inform the Engineer, who will instruct the Contractor in writing as to whether or not the material is to be treated as unsound.

(2) The above notwithstanding, where the drawings show the placing of earthworks on vegetation existing prior to commencement of earthwork operations at any location, such vegetation shall not be considered to be unsound material except to the extent that the vegetation, or its roots etc, is deemed by the Engineer to be unsuitable.

(3) The drawings show excavation below the line of future embankments in order to remove roots of reeds, etc. The material so excavated shall not be classed as unsound if comprising roots, organic matter or mud, but shall fall within the classification of general excavation.

Slips and fall

The Contractor shall exercise the greatest possible care and take all necessary precautions to prevent slips and falls of material from the sides of the excavation and embankments. In the event of slips and falls occur, the Contractor shall make all earthworks and associated works and execute any requisite modifications of the Works to the satisfaction of the Engineer.

Fill

Fill means selected suitable material placed to fill the channel to form pad. Selection shall, interalia, be such as to exclude material of particle size exceeding 6 inches unless otherwise specified or approved by the Engineer. Notwithstanding other provisions of the specifications all suitable sandy, silt and clayey earth material will be accepted in the fill. Where canal excavation at any section does not furnish sufficient suitable fill material, the material shall be taken from designated borrow areas as approved by the Engineer. Fill placed against a structure shall not contain particles exceeding 2 inches in size unless otherwise specified or approved.

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Borrow Areas

Where specified or ordered by the Engineer, fill material for incorporation in the Works shall be obtained from approved borrow areas after the completion of any tests to confirm the suitability of the material. On completion of excavation, the Contractor shall, where applicable, trim, grade and leave the borrow area in a tidy condition and shall carry out any further earthworks necessary to prevent accumulation of water in the area, all to the satisfaction of the Engineer.

Borrow areas located in cultivable land shall be as shallow as is practicable in order that the land so used may be subsequently ploughed over and brought under cultivation. In such cases where land has been temporarily acquired, the Contractor shall remove top soil prior to excavation in the borrow area and shall replace it on completion of excavation and, following reinstatement, the maximum depth of excavation shall not exceed one foot.

The borrow areas shall not be continuous. For every 200 feet, ten feet wide strip shall remain unexcavated, to avoid the formation of a continuous channel.

Material within the right of way of the channel which is in excess of the requirements of the inspection path and non-inspection path shall be considered as borrow material, if so directed by the Engineer.

The Contractor shall make his own arrangements with the landowners for procurement of borrow material from their lands.

Approved Material for Compacted Fill and Backfill

The material for compacted fill obtained from borrow areas shall comply with the following requirements:

(a) Sandy material with greater than 20% passing on a sieve nr. 200 sieves are unsuitable;
(b) The borrow areas to the approval of the Engineer;
(c) The borrow areas to be outside of the inspection path but, wherever possible, within the right of way;
(d) Material excavated from borrows areas more than 2 feet in depth or from areas near standing crops or with vegetation will generally not be approved.

Compaction of Fill or Backfill

Embankment and backfill designated on the Drawing as compacted shall be compacted to the line, grade and slopes shown on the Drawing or directed in writing by the Engineer.

The compacted embankment shall be constructed of the most suitable material for impermeability and stability as approved by the Engineer. The material to be compacted shall be deposited in horizontal layer 6 inches thick as compacted. The compaction of earthwork used to fill the existing channel shall be carried out by mechanical rollers, rammers, vibrators or other approved plant so as to produce 90% modified AASHTO density at optimum moisture content. Whereas the compaction of the fill material used to construct diversion channel will be carried out mechanically so as to produce 85% modified AASHTO density at optimum moisture content

The Contractor shall exercise careful control of the moisture content of the fill material prior to and during compaction such that it lies within a range of values established to the approval of the Engineer during the trials and is suitable for the fill material and the method of compaction adopted.

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Preliminary Trial for Compacted Fill

At least one month before commencing compaction of the fill in the Works, the Contractor shall submit to the Engineer details of the method and constructional plant proposed to be used, and shall make trials on Site. The Contractor shall make such tests of the materials before and after compaction as the Engineer considers necessary, both of the trials and of the works, to ascertain to the Engineer's satisfaction that the degree of compaction specified is attained.

Any approval given by the Engineer to the Contractor's method of working will not relieve the Contractor of his responsibility to meet the requirements.

Allowances for Settlement

The Contractor shall make due allowance for the effects of consolidation, including the settlement of fill and compacted fill, such that the levels, widths and dimensions of the finished surfaces at the end of the Maintenance Period are in accordance with the Contract.

Irrigation Operation during Earthwork Operations

There are planned closure periods for the irrigation system, which is only for one month, and so the Contractor should expect all earthworks operations to be undertaken whilst the channels are flowing. The Contractor shall make temporary arrangements to ensure water supply to watercourses, maintaining flow in temporary diversion channels.

Haul Routes

The operations of the Contractor on haul routes shall be in accordance with specifications. The hauling of materials and other intra-job hauling and transportation over public highways, roads and bridges shall comply with local regulations. Where haul routes cross public highways or roads, the Contractor shall provide barricades, flagmen and other necessary precautions for safety. Where haul is necessary to take material from a borrow area to the site of an earthworks filling operation, the Contractor shall submit to the Engineer full details of the route and the distance, for his approval.

Canal and Embankments

Construction Methods

Earthwork in excavation/compaction for Rehabilitation/Lining of canal shall be carried out as outlined below or by a similar method subject to the approval of the Engineer. Full details of the Contractor’s proposed method of working and earth moving plant shall be provided in accordance with the instruction for bidding. Rehabilitation of canal will be by excavation through mechanical means. The inspections paths shall be generally formed with material excavated from bed and from borrow areas.

Excavation for Channel

Excavation for channel shall be to the designed section as shown in the drawings. The Contractor shall undertake excavation using the equipment and methods to the approval of the Engineer. The excavation shall be to the lines and levels specified.

Suitable material excavated from channel shall generally be placed alongside in fill to form maintenance berms, inspection paths and free board embankments as shown on the drawings.

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The Contractor shall prepare a plan of earthworks operation for each distributary/minor to be constructed at any one time, detailing the location and program of placing the fill in the channels. The Contractor shall submit his proposed plan of operation at least twenty-eight days before his intended date to commence earthworks on each particular location for the Engineer's approval.

Fill for Channel

The fill material for the construction of canal embankment the Contractor shall spread at the approximately level layers of 9 inches loose thickness, by mechanical means including dressing and leveling and the compaction shall be carried out by mechanical rollers, rammers, vibrators or other approved plant so as to produce 90% modified AASHTO density at optimum moisture content in the channel prism and embankment and 85% modified AASHTO density for diversion channel. Embankments with bank top level above ground level, shall not exhibit any signs of incipient seepage after prolonged retention at the maximum level.

Carriage of Material

When suitable material is not available within the range of haulage distance of 100 ft, the borrow area shall be selected within a maximum distance of 1 mile of the site with the approval of Engineer. The material shall be carted by approved methods, or as directed by Engineer.

Dressing and levelling of earth work

Earthwork for the embankments, which carry un-surfaced roads shall be aligned and graded on the top surface by use of a motorized grader to permit the safe and easy passage of a light vehicle at a speed of 25 miles/hour and shall be maintained in this condition to the end of the Maintenance period. The side slopes of the embankments shall be trimmed and all large lumps broken upto the satisfaction of the Engineer.

Transitions

Except where otherwise shown, at all changes in cross section necessitated by design or any other reason, transitions shall be formed in the bed and side slopes of the channel such that the horizontal or vertical change in direction does not exceed a deviation of 1 in 10.

Gaps in Embankments.

The Contractor shall create no gaps in the channel embankments unless express permission has been granted by the Engineer.

Over Excavation

Should any channel be excavated or any embankment or any berm be formed beyond the tolerance specified, the Contractor shall form the specified cross section or such other section as the Engineer may direct.

C. Structures

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Dewatering

Where the Contractor is required to open up excavations in order to undertake construction of new structure or repair to an existing structure, he shall keep such excavation clear of water during the construction and repair work and, in case of structures being constructed in saline or any other aggressive groundwater, for such further period as may be necessary to avoid the submersion of newly placed concrete within 28 days of being placed. The method of keeping the excavation clear of water, dewatering, and disposal of water shall be subject to the approval of the Engineer. The Contractor shall ensure that sufficient stand-by plant is on the site at all times to avoid any interruption in continuity of dewatering.

Method of Excavation

If required by the Engineer, the Contractor shall submit his proposed method of excavation, including details of necessary supports for the excavations, to the Engineer for his written approval.

Working Space

Excavation shall be carried out to such minimum dimensions as will permit adequate dewatering, proper support of the sides of the excavation, the erection of shuttering, placing of concrete and fill, including compaction, and any other construction operation.

Backfill and Fill

Backfill means selected material obtained from that excavated for the structure and replaced below original ground level. All backfill and fill above original ground level at or adjacent to structures shall be compacted, as directed by the Engineer.

Test on Formation Level

On reaching the level for hand trimming, the Engineer may order in-situ or other tests as specified to determine the nature and strength of the soil.

Structure Foundations

For structures, where the underside of part of the foundation lies between 4 inches and 18 inches below the existing ground level, the plan area of such section of the structure that is to be repaired shall be excavated in foundation to 18 inches below existing ground level and the space between the foundation and the under slab or blinding layer and the surface so exposed shall be made up with fill compacted in accordingly.

Where the underside of any repair to part of a structure foundation is higher than 4 inches below the existing ground level, the ground shall be excavated in the foundation to 12 inches below ground level and the volume between the surface so exposed and the underside of the foundation slab shall be filled with Class D concrete.

For structures, where the underside of any repair is found less than 12 inches below existing ground level, the ground shall be excavated in foundation to 12 inches below ground level and the space between foundation slab or blinding layer and the surface so exposed shall be made up with fill or backfill, as necessary compacted.

Over-excavation

Any excavation for structures beyond the limits specified or ordered, other than, shall be filled by the Contractor at his own expense with concrete of the same class as the concrete in the foundation or with gravel backing material or with specially compacted fill as the Engineer may require.

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Hand Trimming at Formation Level

Where the formation level of any excavation is to receive concrete or backfill, the final 6 inches of the excavation shall be trimmed by hand, or such other method as may be approved or ordered by the Engineer, after removal of any slurry and immediately before the placing of concrete or backfill. The lining of distributaries and minors involves the filling of the existing channel with suitable fill material obtained from an approved borrow area to the required level and further excavation of the channel in the pad so formed to the design section by mechanical means. The inspection paths shall be generally formed with material excavated from the channel and from borrow areas. Full details of the Contractor's proposed method of working and earth moving plant shall be provided in accordance with the instructions for bidding.

Protection of the Works

The Contractor's proposals for protecting work constructed under the Contract from damage by flooding or otherwise shall be submitted to the Engineer, but such submission shall not in any way absolve the Contractor from responsibility for any damage which may be incurred subsequently.

Minor Repairs to Earthworks around Structures

A structure may be damaged by erosion or piping of the fill material around it as a result of poor quality backfill. Three potential problems may be recognized:

a) Swallow holes appearing at the surface, possibly indicating that material is being washed through the structure;
b) Erosion runnels around the sides of the structure, possibly leading to an undermining of a part of the structure;
c) Ponding due to a shallow depression close to the structure, possibly leading to a weakening of the foundations, and the development of deep ruts if traversed by vehicles.

In order to remedy these problems, the Contractor shall undertake any excavation as ordered by the Engineer to investigate the cause and severity of the problem. As a result of such investigation, or otherwise the Engineer shall order the Contractor to undertake such backfilling or local re-profiling as he considers necessary.

Filling, Watering and Ramming in Floors

The floor shall be filled in with excavated material if approved by Engineer in 9-inch layers well rammed and compacted. Surplus earth obtained from foundation or new earth (excavated from outside) lead upto one chain and lift upto 5ft shall be used to the site of fill. The material shall be brought to the proper moisture content at the site in so far as it is practicable, but such moisture shall be supplemented by sprinkling water at the site.

The Contractor shall be responsible for making good all the settlement of filling and damage occurring thereby upto the end of Maintenance Period. No extra payment shall be made for this purpose.

Measurement and Payment

(i) General

a) Earthwork (excavation and embankment) shall be measured in volume. The unit of measurement shall be cubic foot unless specified differently in Bill of Quantities.

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The unit rates for earthwork quoted in the Bill of Quantities shall be deemed to cover earthwork in all types of soils (dry or submerged under water, soft or hard). Volume of excavation for Channels, structures and embankment foundation shall be measured net as the product of cross-sectional area and lengths within the limits shown on Drawings or as approved by the Engineer. The limits of measurement shall be pay lines as shown on the drawings unless otherwise specifically approved by the Engineer.

b) No separate measurement and payment shall be made for clearing and grubbing removal and disposal of unsound materials, foundation preparation, scarifying, providing material for backfilling around structures, surveying and making records of ground levels and topography within earthwork and structures reservation limits; supporting excavations; making good slips and falls; excess excavations for working space or any other reason; trimming and dressing surfaces of excavations and embankments; additional material placed on account of, or in anticipation of settlement; compaction trials; control of moisture content; preparation and restoration of borrow pits; re-handling; location and shaping of disposal heaps and embankments, and delays due to testing of in-situ materials. All costs on these accounts shall be deemed to be included in the unit rates of respective Bill of Quantities items.

No measurement or payment shall be made of earthwork for the construction and removal of temporary works required for completion of the specified works. Measurement shall not be made for earthwork for any structure or feature that is paid for as a lump sum or Provisional Sum.

No measurement or payment shall be made of earthwork of the existing channel for filling of until it is compacted to the specified dry density.

Neither excess excavation nor backfill of excess excavation beyond unsuitable material shall be measured for payment.

(ii) Jungle Clearance, ploughing, Grubbing and Stripping

a) Measurement for payment of Jungle clearance shall be made in Sq.ft. The unit rate of jungle clearance shall constitute full payment for all operations involved in Jungle clearance including cutting and uprooting of bushes, weeds, reeds, plants etc., and disposal at locations designated by the Engineer as per specifications set forth and or as directed by the Engineer.

No separate measurement for payment of stripping the area under embankments and Channel bed shall be made and all costs for such activities shall be deemed to have been included in the unit rate of the other earthwork pay items.

Measurement for ploughing three times shall be made in acres. Payment shall be made at the unit price quoted in the Bill of Quantities

(iii) Excavation for Channels

a) Except as specified herein, measurement for payment of unclassified excavation for the Channels, will be made in cubic foot to the lines and grades shown on the Drawings or as prescribed by the Engineer. No payment shall be made for any additional excavation or backfilling required to adjust the sub-grade to correct levels during preparation of the sub-grade as specified.

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b) Payment for unclassified excavation for the Channels will be made at the unit rates quoted in the Bill of Quantities for item "Earthwork Excavation in Irrigation Channels".

c) The amount tendered for the Bill of Quantities item "Earthwork Excavation in Irrigation Channels" shall constitute full payment for excavation, placing the material in embankments, in spoil banks or in selected material stockpiles at specified locations, re-handling the material to be transported from stockpiles to the place of its use, refilling any excess excavation, and all work necessary to maintain the excavations in good order during construction.

(iv) Excavation for Structures

a) Measurement for payment for excavation for structures (unclassified) will be made in cubic foot of the material in excavation only outside of or below the excavation "pay line" of the Channel or Channel prism and will be made only for material excavated at the direction of the Engineer. The division planes for measurement and payment between excavation for structures and excavation for Channel will be such that all excavation within the excavation "pay line" of the Channel prism, regardless of the existence of structures or other required works, and regardless of whether the excavation for structures or other required works precedes or follows the excavation of the Channel prism, shall be paid for at the unit rate tendered in the Bill of Quantities for the Item "Earthwork Excavation in Irrigation Channel" and all excavation for structure outside of or below the excavation "pay line" of the Channel prism shall be paid at the unit rate tendered for the relevant item in Bills of Quantities.

b) Payment for unclassified Excavation for Structures will be made at the unit price quoted for the relevant item in Bill of Quantities.

c) The unit price quoted for Excavation for Structures shall constitute full payment for excavation, carrying out dewatering, placing the excavated material in embankment, backfill around structures, placing the material in stockpiles, re-handling the material to be transported from stockpiles to the embankments/backfill around structures, refilling any excess excavation; disposing of the excess or unsuitable material in spoil banks and all work necessary to maintain the excavations in good order during construction in accordance with the specifications set forth and as directed by the Engineer.

No separate measurement for payment of dewatering due to excavation of structures shall be made and all cost for such activity shall be deemed to have been included in the unit rate for the item "Excavation for Structures".

(v) Furnishing of Earthfill material (fill/select fill) in Embankments, underneath the structures or in backfill around the structures etc; obtained from Borrow Areas.

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a) Measurement for payment for furnishing earth fill material obtained from excavation or from Borrow Areas to the locations of its use in (v) above according to the lines and grades shown on the drawings or established by the Engineer and duly accepted will be made on the basis of the compacted volume in thousand cubic feet.

b) When borrow areas are designated on private lands, the Contractor shall be responsible for the ownership payment of borrowed earth material. If so required to be paid, and the rates and prices stated in the priced Bill of Quantities shall be deemed to cover all such ownership payments.

c) The amount tendered shall be full payment for furnishing the earthfill material obtained from suitable Borrow Areas; stripping and clearing borrow areas, preparation of material by ripping, excavating, moistening etc. loading and hauling from any distance to the location of its use, reinstatement of Borrow Areas after excavation and all other operations related to these items in accordance with the specifications or as directed by the Engineer.

d) The earth movement from borrow area with haul more than 100 ft should be undertaken in accordance with mass haul diagrams the positions of balancing lines on these mass haul diagrams shall have been agreed with the Engineer prior to commencement of earth moving, and such balancing lines shall generally have been positioned so as to provide the least cost to the Employer having regard to the rates for the earthwork involved as given in the Bill of Quantities. In the event that prior agreement has not been reached on the position of a balancing line the Engineer shall be entitled to choose how it shall be placed; the work shall be deemed to have been carried out to that effect and the measurement determined accordingly. Haul of more than 100ft shall be measured in haul unit (Hu) where one Hu represents the cartage of one cubic foot (1cft) of material over a distance of 50 feet (1 lead).Compaction of embankment shall be measured in cubic ft for the volume of fill compacted above ground surface to the finished level of embankment according to Drawings and as approved by the Engineer.

(vi) Compaction of Earth fill Material (fill/Select fill material) in Embankments
Measurement for payment of compaction for earth fill materials placed in embankments shall be made in cubic feet of compacted volume of earth fill/backfill as shown on the drawings or as otherwise directed by the Engineer in accordance with the specifications.
Payment for compaction of earth fill material in embankments shall be made at the unit rates quoted in the Bill of Quantities (Bill of Quantities) for compaction of earth fill in Embankments.

(vii) Compaction of Fill/Select fill material underneath the structures or of backfill around the structures.

a) Measurement for payment of compaction for fill/select fill materials placed underneath the foundations or in backfill around the structures shall be made in cubic feet of

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compacted volume of earthfill/ backfill as shown on the drawings or as otherwise directed by the Engineer in accordance with the specifications.

b) Payment for compaction of fill/select fill material placed underneath the foundations or in backfill around the structures shall be made at the unit rates quoted in the Bill of Quantities for compaction of fill/select fill.

c) The amount tendered shall constitute full payment for compacting earth fill material (fill/backfill or select fill) including foundation preparation, moistening the soil, machinery for compaction, labour and/or any other activity required complete in all respects for item "Compaction of earth fill in Embankments and Backfill around or underneath the Structures" in accordance with the specification or as directed by the Engineer.

The Payment for the carriage of material shall be made after the carriage is approved by Engineer and agreed by the Consultants.

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CONCRETE

Cement

The cement used in the Works shall be ordinary Portland cement (OPC) complying with BS 12, or sulphate resisting cement (SRC) complying with BS 4027, as may be specified in the Contract.

The Contractor shall supply samples of cement, when requested by the Engineer, both from the Contractor's store on Site and from the place of manufacture.

The Contractor shall supply the manufacturer's test certificate for each consignment of cement received at the Site as provided for in Clauses 10 and 12 of BS 12. He shall maintain a record available for inspection by the Engineer of the locations of concrete made from each consignment.

For BS 12, the Site shall be deemed to have a tropical climate.

Aggregates

Aggregates for concrete shall comply with BS 882 at the time of use. Aggregates which are likely to cause alkali aggregate reaction in the concrete shall not be used.

Fine aggregate shall consist of natural sand. The Engineer will permit the addition of suitable crushed rock fine aggregate, as necessary, to the natural sand where in his opinion it is impracticable to obtain the required grading of the combined aggregates otherwise than by such addition. The maximum quantities of clay, silt and fine dust shall, in any event, not exceed 3 percent by weight as determined by the test given in Clause 7.2.4 of BS 812, Part 1:1975.

Coarse aggregate shall comply with the requirements in Table 4 of BS 882:1983 for graded aggregate to the nominal maximum size specified for the appropriate class of concrete.

The aggregate shall be such that concrete, when made and tested in accordance with Building Research Station Digest 35 (2nd series), shall not show a drying shrinkage greater than 0.065 percent.

Immediately after commencement of the Works the Contractor shall supply and deliver samples of proposed aggregates for testing at an Approved Laboratory. If the material in the samples passes the specified tests for quality the Engineer will give approval to the source of aggregates proposed by the Contractor.

Alternatively, and subject to the approval of the circumstances by the Engineer, the Contractor may submit test certificates in respect of the proposed aggregates from an independent laboratory.

Unless otherwise specified, separate fine aggregate and 0.78" nominal maximum size coarse aggregate shall be used. When 1.57" nominal maximum size coarse aggregate is specified or approved, it shall be a separate grading additional to the 0.78" aggregate added at the time of batching the concrete ingredients.

During the performance of the Contract, the Contractor shall supply samples of aggregates when required by the Engineer (the samples shall be taken in accordance with BS 812) at a frequency at least once every six months at each source of each grading approved by the Engineer.

Water

The water used for making and curing concrete shall be from a source approved by the Engineer and at the time of use shall be free from objectionable quantities of silt, organic matter, alkali salts or other polluting matter in any quantity which:

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

(b) Prevents the achievement of the specified test cube strengths at 28 days for the appropriate class of concrete;

(c) produces discoloration or efflorescence on the surface of the hardened concrete;

(d) Aggravates or promotes an "alkali-aggregate" reaction.
Inorganic matter in solution shall not exceed 500 parts per million by weight and in suspension shall not exceed 30 parts per million by weight.

The Contractor shall make regular tests of the water taken from the points of delivery into the other ingredients of concrete and mortar in a pattern and at a frequency approved by the Engineer and shall furnish the Engineer with two copies of each test result.

Additives

Concrete shall be made from cement, aggregates and water as specified. No other ingredient shall be mixed with the concrete or mortar without the Engineer's approval.
If the Engineer approves the use of retarding or workability agents, this use shall be subject to the following conditions:

(a) No reduction of testing plan mean strength compared with additive-free concrete of the same class (see Clause 6.8);
(b) No reduction of cement content prescribed;
(c) No corrosive effect on reinforcement steel;
(d) No alkali-aggregate reaction promoted; and
(e) Dosage and admixture strictly in accordance with the manufacturer's instructions in respect of the specific conditions obtaining. Dosage to be by approved dispenser.

The Contractor may use a retarder to facilitate the preparation of construction joints, subject to the approval of the Engineer to the composition of the retarder and its method of application.

Chemicals in Materials

The total sulphate content, whether as gypsum or more soluble salts, of concrete ingredients when measured as SO3 shall together not exceed 4.0 percent of the weight of cement in the concrete.
The chloride content of concrete ingredients when measured as Cl shall together not exceed 0.2 percent of the weight of cement in the concrete.

Storage of Materials

The Contractor's arrangements for storing and handling the materials for concrete shall be to the approval of the Engineer. Such arrangements shall be directed towards preventing the deterioration, adulteration or segregation of the various materials and ingredients thereof and shall ensure the ready identification and orderly use of consignments of cement.

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Formwork

Formwork shall be constructed to obtain the required profiles and surface textures of the structures and be such that it remains rigid during the placing and setting of the concrete. It shall be fixed in accurate alignment and to the true shape and dimensions of the Works shown on the Drawings or ordered by the Engineer.

A method of support which would result in holes extending the whole width from face to face of concrete which forms part of the Works may be permitted at the Engineer's sole discretion. Any such holes shall be made good to the satisfaction of the Engineer and shall be located a minimum of 2 inches clear of any reinforcement.

No plugs, bolts, wire ties, holdfasts or any other appliance whatsoever, for the purpose of supporting the formwork or reinforcement, shall be fixed permanently into the structure so that they have less cover than the reinforcement or in any way impair the strength or appearance of the work, nor shall they be placed in such a manner that damage to work would result in the removal of the same at the time of striking the formwork.

Unless otherwise approved, top formwork shall be provided for concrete upper surfaces where the slope exceeds one vertical in three horizontal.

Except where otherwise specified, formwork for concrete faces which will remain exposed in the Works, shall be "face formwork", which is to say that it shall be such as will prevent the loss of any ingredients from the concrete and will produce a dense smooth concrete surface without discontinuities of line, texture or appearance. Face formwork shall be prepared from suitably thick "partal" wood to the satisfaction of the Engineer.

Except where otherwise specified, formwork for concrete faces which will remain hidden in the Works, shall be "back formwork", which is to say that it shall be such as will prevent the loss of any ingredient from the concrete and will produce a dense concrete surface.
Unless otherwise shown on the Drawings, exposed concrete edges shall be formed with a chamfer measuring 1 inch by 1 inch.

Before each concreting operation is commenced, formwork shall be carefully examined and cleaned. All formwork in contact with concrete shall be treated with an approved composition before each usage to prevent adhesion of the concrete. Such composition shall be carefully applied in such a manner that there is no contamination of the reinforcement or previously placed concrete by the composition.

When so instructed the Contractor shall submit his proposed design and details of formwork for the Engineer's approval.

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Formwork shall only be removed with the permission of the Engineer, and the work of removing it after the receipt of such permission shall be carried out under the personal supervision of a competent foreman. Great care shall be exercised during the removal to avoid shocks to, or reversal of stress, in the concrete.

Class of Concrete

The concrete used in the Works shall be of the class shown on the Drawings or indicated in the Bill of Quantities or is ordered by the Engineer. Characteristics of the of concrete used.
Except where otherwise specified herein, the concrete ingredients, manufacture, testing and workmanship shall conform with the requirements of CP 110: Part 1:1972 or equivalent.

The water/cement ratios referred to in the Specification are the ratios by weight of free water to cement in the mix and are based on the aggregates being in a saturated surface-dry condition.
The Contractor shall not commence concreting in the Works until a trial mix design for the class of concrete required has been approved by the Engineer.

Adjustment to approved concrete mix proportions will only be made if, in the opinion of the Engineer, such adjustments are necessary.
The Contractor shall neither alter the mix proportions nor the source of supply of any of the ingredients without having previously obtained the approval of the Engineer.

TABLE

Ratio	Class	Maximum Water/ cement Ratio	Minimum Strength (PSI)
1:2:4	BS	0.50	3000

Compliance with Strength Requirements

The three cubes made from each sample of fresh concrete in accordance with the specification one will be crushed at 7 days and the other two at 28 days. The average of the two 28 days strengths will be taken as the test result. Compliance with the specified strength requirements shall always be judged on the results of tests taken at 28 days.
Concrete shall be considered to have failed to comply with the Specifications;

(a) if a test result is less than the testing plan minimum specified for that class of concrete, in which case the concrete which it represents shall be broken out and removed by the Contractor when ordered;

(b) if the average of four consecutive test results for that class/grade of concrete shall have failed to exceed the testing plan mean strength as specified, in which case no further concrete of that class shall be placed in the Works until the Contractor shall have discovered the cause of such failure and rectified it to the satisfaction of the Engineer.

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Control and Mixing Ingredients

The Contractor shall proportion the ingredients of each batch of concrete accurately by weight or volume. The water shall be added to the aggregates and cement in a mechanical batch mixer; it shall not exceed the amount specified herein and shall otherwise be the minimum amount necessary consistent with complete compaction. The device for measuring the water shall show accurately the weight or volume required having regard to the moisture content of the aggregate and shall be so designed that the water supply will be stopped automatically when the correct quantity has been discharged into the mix. The concrete ingredients shall then be mixed thoroughly.

The Contractor may use volume batching if approved by the Engineer and if customized volume boxes are provided for each mix and if the cement content in all classes other than D is increased by 5 percent above the cement content of the design mix.

The Contractor shall provide standard test weights and any other auxiliary equipment required for checking the operating performance of each scale or other measuring device, and shall make periodic tests over the range of measurements involved in the batching operations. The tests shall be made in the presence of, and the test procedure shall be subject to the approval of, the Engineer. Unless otherwise directed, tests of equipment in operation shall be made at least once every six months. The Contractor shall immediately make such adjustments, repairs or replacements as may be necessary to meet the specified requirements for accuracy of measurement.

Truck Mixed Concrete

Truck mixed concrete may be used with the prior approval of the Engineer provided that it complies with the Specification and with BS 5328, and that the water for the mix is added at the Site adjacent to the point of final deposit. Truck mixers shall comply with BS 4251. The manufacturer's data listed in Appendix B of BS 4251 shall be submitted to the Engineer for approval if requested.

Transportation, Placing and Compaction of the Concrete

The concrete shall be handled so that at the point of deposition it is of the specified quality and consistency, nothing having been added to it or lost from it since leaving the mixer, and segregation of the concrete ingredients is avoided. Any concrete which has stiffened to a degree where proper placement cannot be assured should be wasted and no payment will be made to the Contractor for such wastage.

The Contractor shall obtain the approval of the Engineer to his proposed arrangements before commencing concreting. Concrete shall only be placed in the presence of the Engineer or his authorized representative.

The Contractor shall regard the compaction of the concrete as a work of fundamental importance and shall produce a watertight concrete of maximum density compatible with the approved mix. Compaction shall be assisted by the use of mechanical vibrators of the immersion type but shall not involve the vibration of reinforcement or formwork except that vibration of formwork may be allowed in the case of pre-cast concrete with the approval of the Engineer.

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The number and type of vibrators available for use during each period of concreting shall be to the approval of the Engineer, which will not be given if sufficient standby vibrators are not readily available in good working order.

Surface Finishing

Concrete surfaces of carriageways of roads and bridges shall have a finish similar to that left by a vibrated hardwood board, 50 mm (2 inches) thick, when used for screeding concrete to its proper level and profile immediately after deposition. Unformed exposed upper water-conducting or water-retaining surfaces of concrete shall be floated with a steel float to a smooth finish. The floating shall be executed so as not to bring excess laitance or fine material to the surface. Special care shall be taken when forming curved crest profiles to ensure such profiles are accurately formed and junctions with other surfaces of concrete are free from discontinuities of line, level or appearance by use of templates or such other measures as the Engineer may deem necessary.

Except at movement joints, concrete surfaces which are to be covered by further concrete or cement mortar shall be thoroughly cleaned to expose the surface of the aggregate and to remove all laitance by hacking, wire brushing, washing with water or air under pressure or other approved means.

Concreting in Unfavourable Weather

The Contractor shall not place concrete:

(a) During heavy rain or dust storms; or

(b) When the air temperature is more than 430C.

When the air temperature exceeds 300C the Contractor shall not place concrete without the approval of the Engineer and without taking such precautions as may be required to keep the temperature of the concrete during mixing and setting below 380C, for example, by keeping the concrete materials and formwork shaded from the sun and the aggregates and shutters sprayed with water. Concrete shall not be poured against formwork, which is hotter than 300C without the approval of the Engineer.

Curing Concrete

Until it has thoroughly hardened, concrete shall be protected from the harmful effects of wind, sun, temperature and variations of temperature, premature loading or deflection or impact, and aggressive groundwater. Where structures are constructed in aggressive groundwater, the excavation shall be kept clear of water. Unless otherwise approved by the Engineer, all concrete shall be cured by water curing; concrete cured with water shall be kept wet for at least 7 consecutive days immediately following placement of the concrete, by covering with water saturated material, or by a system of perforated pipes, mechanical sprinklers, or porous hose, or by any other approved method which will keep all surfaces to be cured continuously (not periodically) wet. Water used for curing shall meet the requirements of these specifications for water used for mixing concrete.

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Precast Concrete

Unless otherwise specified or approved all precast work shall be of Class A / Grade 35 or Class BS concrete. Each mould for concrete work which is specified or approved by the Engineer to be precast shall have a different embossed or recessed identification mark in a position to the approval of the Engineer.

Each precast unit shall be indelibly marked with the date of casting and after the mould is removed shall not be disturbed for 28 days thereafter. Each precast unit shall, where required, be provided with lifting eyes and holes located to the approval of the Engineer so as to avoid unsafe stresses during handling.

RD Markers

RD markers shall be placed at RD intervals on the edge of inspection paths; existing RD markers shall remain undisturbed. Where the path is realigned, existing markers shall be relocated, except where their condition is such that the Engineer orders them to be removed and a new marker substituted. The RD markers shall be constructed as shown on the drawings and as instructed by the Engineer. Markers shall be painted white with two coats of an approved external paint and letters shall be dark blue on two sides as directed by Engineer.

Pre-cast RD Markers shall be erected on cement concrete base as shown in drawings at the locations described above.

Repairs of Existing Concrete

Repairs to concrete may be ordered by the Engineer to repair natural or man-made damage or deterioration to concrete. The repair must be durable and ensure the structural integrity of the concrete. Such repairs shall be to the lines and levels of the original structure as shown on the Drawings, or to modified lines and levels as ordered by the Engineer.

Where any concrete is to be placed against existing concrete, the existing concrete shall be cut back at least 6 inches to expose clean reinforcement and a sound irregular clean concrete face. The face shall be coated with epoxy resin in compliance with the manufacturer's instructions prior to placing the new concrete.

Where shown on the Drawings, or were ordered by the Engineer, dowel bars shall be fixed into the existing concrete. Holes drilled into the existing concrete to a depth equal to the embedded length of dowel bar and of a diameter to ensure a snug fit. Prior to insertion into the hole, the length to be embedded shall be fully coated with a resin approved by the Engineer.

When placing concrete as a repair to an existing structure the Contractor shall take all reasonable precautions to ensure that the concrete is well compacted and shrinkage is limited. The Contractor shall submit to the Engineer for his approval a proposed method of working to meet the requirements of this paragraph. Should the resulting repair not meet such requirements the Contractor shall submit a revised methodology to overcome any problems that have been identified. Such a procedure does not restrict the Engineer from ordering that the repair be broken out and repeated, if in the Engineer's opinion the resulting concrete is not acceptable. Once the Contractor

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has established an acceptable method of working for concrete repairs, he shall always employ the same technique in similar circumstances.

Surface Repair to Existing Concrete and RCC Structures

Repair to concrete or RCC surfaces may be ordered by Engineer to repair natural or man-made damage or deterioration of concrete. The repair must be durable and ensure the structural integrity of the concrete. Such repair shall be to the lines and levels of the original structure as shown on the Drawing, or to modified lines and levels as ordered by the Engineer.

Where shown on drawing or ordered by the Engineer, fine cracks on the concrete or RCC surface will be filled up with injecting resins such as Concresive1300 series or any other equivalent, using injection system. Similarly other cracks will be routed out by cutting grooves and will be filled up with non-shrinking cement grout of plastic consistency.

When placing concrete as a repair to an existing structure the Contractor shall take all reasonable precautions to ensure that the concrete is well compacted and shrinkage is limited. The Contractor shall submit to the Engineer for his approval a proposed method of working to meet the requirements of this paragraph. Should the resulting repair not meet such requirement the Contractor shall submit a revised methodology to overcome any problem that have been identified. Such a procedure does not restrict the Engineer from ordering that the repair be broken out and repeated, if in the Engineer's opinion the resulting concrete is not acceptable. Once the Contractor has established an acceptable method of working for concrete repair, he shall always employ the same technique in similar circumstances.

Concrete Sampling and Testing

The Contractor shall be responsible for providing samples of concrete and its constituent materials for testing. For this purpose, concrete test cubes which be made in accordance with BS 1881; Part 3, Clause 2, shall be deemed to be 'samples. All sampling of constituent materials shall be carried out in accordance with the provisions of the appropriate British Standard, and all sampling of fresh and of hardened concrete shall be carried out in accordance with the provisions of BS 1881 unless other specified.

Details of all such samples shall be recorded by the Contractor and passed to the Engineer. The frequency with which such samples are to be delivered for testing will be given by the Engineer in the form of sampling plea. The Engineer will make available to the Contractor and results of each test carried out on the samples so provided.
The frequency of sampling for each class of concrete from each batching centre in each active day to be at the rate of:

one sample from one batch of every 10 batches; or
one samples per 3540 cubic feet of concrete; or one sample

Which involves the greatest number of samples where more than 700 cubic feet from one batching center placed in one location in one day, the rate of sampling may be decreased with the approval of the Engineer to one sample from one batch of every 20 batches or one sample per 700 cubic feet

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of concrete, whichever involves the greater number of samples. The actual rate of sampling may vary to the approval of the Engineer according to the random selection of batches to be sampled and shall be increased when ordered by the Engineer in appropriate circumstances.

Measurement and payment

Measurement for payment will be made in cubic foot of the volume of concrete acceptably placed in the Permanent Works within the lines and grades shown in the Drawings or as otherwise directed or approved by the Engineer. Where concrete is placed upon earth, measurement will be made to the foundation lines and grades shown in the Drawings or as otherwise directed and approved by the Engineer. No deductions will be made for rounded or beveled edges or for space occupied by reinforcing steel. No deduction will be made for voids, piping, electrical conduits or any other embedded items which are each less than 100 square inches in cross section. No measurement will be made for concrete that is wasted for any reason or that is rejected.

All concrete required for works under these Specifications shall be included in the unit rates tendered in the Bill of Quantities for the appropriate items in which such concrete is incorporated. The unit rates tendered for such work shall be deemed to cover all costs of concrete, other than reinforcing steel which is measured separately, including, but not limited to furnishing water, sand and aggregates, curing, forms and form oil or compound and also including all operations, but not limited to, batching mixing, temperature control, transportation, preparation for placing, placing, curing, protection, finishing and repairing concrete surfaces, installing and removing forms, shuttering, scaffolding and jointing materials, and carrying out all tests and other operations, procedures, stipulations and requirements set forth herein or otherwise related to the item.

No measurement for payment will be made for the concrete used in making test cylinders/cubes for the purpose of quality control. No payment will be made to the Contractor for casting concrete specimens for testing, their curing, transportation to the laboratory and their testing. No additional payment except that mentioned in the respective Bill of Quantities Items will be made to the Contractor for any change in mix design of concrete to achieve the required strength.
The reinforcing steel will be measured and paid separately for furnishing and laying including labour according to rates coated in the respective Bill of Quantities.

RD Marker Posts

Measurement for payment of RD Marker Post shall be made for the number of markers constructed in accordance with the Specifications and as per Engineer's instructions. Payment will be made as quoted in the Bill of Quantities. No separate measurement and payment shall be made for painting and lettering under this item.

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REINFORCING STEEL BARS

General

The work consists of furnishing, cutting, fabrication, bending and placing steel reinforcement and welded wire fabric in concrete structures or elsewhere at any elevation as shown on the drawing or/and as directed by the Engineer for a complete job.

Materials

Reinforcing bars, except ¼" dia bars, shall conform to the requirements of ASTM A-615 Gr. 60 for deformed hot rolled new stock billet steel bars and shall have a minimum yield strength of not less than 60,000 psi (420 Mpa) and ¼" dia bars shall conform to the requirements of ASTM A-615 Gr. 40.

Reinforcement shall be free from all loose or flaky rust and mill scale, or coating including ice, and any other substance that would reduce or destroy the bond. Reduced section steel reinforcement shall not be used.

The Engineer shall have the right to witness routine testing of steel reinforcing bars at the manufacturer's workshop. When required by the Engineer, the Contractor shall take samples from the reinforcing steel bars delivered to the site and shall arrange for the samples to be tested by an approved testing agency. Test certificates from the agency shall be submitted to the Engineer.

The Contractor shall submit certificates of compliance from the manufacturer stating that the supplied reinforcement conforms to the specifications. In addition, wherever and as directed by the Engineer, conformance of the supplied reinforcing bars with the specifications shall be demonstrated by the Contractor through laboratory tests, in accordance with the relevant standards.

Storage of Reinforcing Bars

The Contractor shall stack separately and label different types of reinforcement for positive identification of the manufacturer, size and productive run or other number, which relates to the last certificates furnished by the manufacturer. All reinforcement shall be stored under cover on wooden or concrete supports at least 6" above the ground.

Placing Reinforcing Bars

The reinforcing bars shall conform to the requirements shown on the reinforcement design drawings. The steel bars shall be securely and accurately fixed in position as shown on the drawings using approved spacer blocks or chairs. All interconnection of bars shall be secured with soft wire, the ends turned into the body of the concrete.

Splices shall be located where shown on the Drawings. The location of splices may be altered subject to the written approval of the Engineer.

Splice lengths shall be according to ACI requirements or as shown on the Drawings. All additional splices allowed for the convenience of the Contractor shall be at the expense of the Contractor and with prior written approval of the Engineer.

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Bars shall be cut and bent in accordance with ACI 315, bending shall be carried out slowly at a steady even pressure without jerking or heating.

Unless otherwise prescribed, placement dimensions shall be to the centerline of the bars. Reinforcement will be inspected for compliance with requirements as to size, shape, length, splicing, position, and amount after it has been placed.

Before reinforcement is embedded in concrete, the surfaces of the bars and the surfaces of any supports shall be cleaned of flaky rust, loose mill-scale, dirt, oil, and grease, or other foreign substances, which may impair the bond between concrete and the reinforcement. When there is delay in placing concrete, reinforcement shall be re-inspected and re-approved by the Engineer before placing the concrete.
Reinforcement shall be accurately placed to meet the following tolerances:

a). The amount of concrete covering reinforcement shall not deviate from that specified by more than ¼ inch if the cover specified is more than 2½ inches, nor by more than 1/8 inch if the cover specified is 2½ inches or less.

b). The spacing of reinforcing bars shall not deviate from the required spacing by more than ½ inch and the total number of bars shall be as shown on the drawings.
Reinforcement shall be secured in position so that it will not be displaced during the placing of the concrete, and special care shall be exercised to prevent any disturbance of the reinforcement in concrete that has already been placed. Bars shall not be field bent to the extent of permanent set, nor straightened, except as approved by the Engineer or shown on the Drawings. Bars bent without approval shall be replaced to conform to the Drawings. Welding or tack welding of reinforcing bars will not be permitted except where approved by the Engineer. Chairs, hangers, spacers, and other supports for reinforcement shall be of concrete, metal or other approved material. Where portions of such supports will be exposed on finished concrete surfaces, the exposed portion of the supports shall be galvanized or made of corrosion-resistant material. Unless otherwise shown on the Drawings, reinforcement in structures shall be so placed that there will be a clear distance of at least one(1) inch between the reinforcement and any anchor bolts, form ties, or other embedded metalwork.

The Contractor shall provide for the immediate availability of competent steel fixers and carpenters during the whole period of any concrete placement.

Fabrication & Cleaning

Steel reinforcement, before being positioned, shall be free from loose mill and rust scale, oil, grease and from coatings that destroy or reduce the bond at the time of concreting.
Reinforcement shall accurately conform to the dimensions shown on the relevant construction/shop Drawings. Bends for bars shall be made around a pin having a diameter not less than six times the bar diameter, except for stirrups less than 5/8-inch diameter for which the pin diameter shall be four (4) times the diameter of bar. The bend for bars larger than one inch (25.4 mm) shall be made around a pin of eight (8) bar diameters as per requirement of ACI-318. All bars shall be bent cold. Bars with kinks or bends not shown on the drawings, shall not be used. Reinforcement shall not be straightened or re-bent in a manner that will injure the material.

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The Contractor shall prepare Bar Bending Schedule for the construction Drawings and submit four (4) copies to the Engineer for his approval 28 days prior to commencement of fabrication of reinforcement steel. Fabrication shall be carried out in accordance with approved Bar Bending Schedule.

Reinforcement Drawings to be prepared by the Contractor

The Contractor shall prepare and submit reinforcement detail drawings for review and approval, including bar-placing drawings, bar bending diagrams, and bar bending schedules, in accordance with the following provisions:

The Contractor's reinforcement detail drawings shall be prepared from reinforcement design drawings issued by the Engineer. These shall be submitted, in one (1) sepia and four (4) blueprints, at least 28 days before scheduled concrete placement for all structures.

The Contractor's reinforcement detail drawings shall be prepared following the recommendations established by the American Concrete Institute's "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 318-02) unless otherwise shown on the reinforcement design drawings.

The Contractor's detailed reinforcement drawings shall clearly show necessary details such as quantities, shapes, lengths, sizes, and weights of the bars and laps, for checking the bars during placement and for use in establishing payment quantities.

The Contractor's reinforcement detail drawings shall be clean, legible, and accurate and checked by the Contractor before submittal. Acceptable reinforcement detail drawings will be reviewed by the Engineer for adequacy of general design and controlling dimensions. Errors, omissions, or corrections will be marked on the print, and one print of each drawing will be returned to the Contractor for correction. The Contractor shall make all necessary corrections shown on the returned prints, and resubmit the corrected drawings as before. Such review and approval shall not relieve the Contractor of his responsibility for the correctness of details or for conformance with the requirements of these Specifications.

Placing Dowel Bars

Where shown on the Drawings, or where ordered by the Engineer, dowel bars shall be fixed into the existing concrete. Holes drilled into the existing concrete to a depth equal to the embedded length of dowel bar and of a diameter to ensure a snug fit. Prior to insertion into the hole, the length embedded shall be fully coated with a resin approved by the Engineer.

For the reconstruction / replacement of damaged parapet walls, the walls should be removed without producing impact on the existing structure. 3/8" inch diameter dowel bars, or as specified in the Drawings, should be embedded in the drilled holes in the existing concrete slab as specified above. The vertical bars of parapet wall should be placed as overlap with the embedded dowel bars.

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When placing dowel bars in the existing structure the Contractor shall submit to the Engineer for his approval a proposed method of working. Should the resulting repair not meet such requirements the Contractor shall submit a revised methodology to overcome any problems that have been identified. Such a procedure does not restrict the Engineer from ordering that the repair be broken out and repeated, if in the Engineer's opinion the resulting concrete is not acceptable. Once the Contractor has established an acceptable method of working for concrete repair he shall always employ the same technique in similar circumstances.

Measurement and Payment

Measurement of reinforcing steel bars will be made of the net weight of the reinforcing steel bars acceptably placed in the concrete for Works in accordance with the approved bar bending schedule. The net weight of reinforcing steel shall be calculated as the length of bars placed in accordance with the theoretical number of pounds as determined from the approved bar bending schedules multiplied by the weight per unit length.
The weights of the standard (deformed) bars per unit length are given in the following table.

Diameter and Weight of Standard (Deformed) Bars

Nominal Diameter (inch)	Weight Per Foot (lb)
3/8	0.376
½	0.668
5/8	1.043
¾	1.502
7/8	2.044
1	2.670
1 1/8	3.379
1 ¼	4.173
1 3/8	5.049

Measurement for payment will include reinforcing bars placed as shown on the Contractor's drawings and schedules as approved by the Engineer.

No measurement for payment will be made of reinforcing bars in additional splices allowed for the convenience of the Contractor.

No measurement for payment shall be made for tie wires, chairs, spacers, supports, bracings, and other means of holding reinforcement in position and tests on reinforcing bars.

Payment will be made for the number of cwt measured as above at the unit price per cwt tendered in the Bill of Quantities for the respective Items. The unit price for reinforcing steel bars shall be deemed to cover all costs of reinforcing steel including preparing detailed reinforcement drawings and schedules and supplying, cutting, bending and fixing the reinforcing steel, wastage and all other work related to these Items.

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CANAL CONCRETE LINING

Scope of Work

The work to be done by the Contractor under this item shall include preparation of the subgrade and dressing with layer wise. The original channel section is filled-up in properly compacted layers, to prepare a base pad for excavation of the channel prism, of course after cleaning the original prism. After the compaction in the pad is ensured, the channel section is excavated, and side slopes are again tested for compaction percentage. This process sometimes requires repetition of compaction effort, although such repetitions are site-specific. The above operation provides the base pad for excavation of the channel section. The drawings show that the channel has a side slope of 1:2 in accordance with the drawings and these specifications or as directed by the Engineer.

Drainage Arrangement

Rohri Main Canal is proposed to be concrete-lined to enhance discharge capacity, from RD 589+000 to RD 610+250. Presently, ground water table in the adjacent area of RMC is very shallow. The groundwater profile along the length of the RMC canal has a high-water table level endangers the stability of concrete lining during closure due to developed pore pressure and necessitates the provision of an under-drainage network along with a filter material; i.e., *bedding gravel shall comprise a (50:50) mix of 3/4-inch and 3/8-inch aggregates, free from clay, silt, and other irrelevant materials,* beneath the concrete lining.

The seepage from unlined RMC Canal is 580 cusecs. During the closure of RMC, seepage from the adjoining area exerts pressure and may puncture the concrete lining. To prevent the lining from damage, the perforated pipe drains under the bed of RMC. The drains will capture the excess water.

Exerting pressure on the lining and the pore pressure will eventually decrease. It is Necessary to provide filter material behind the lining to prevent the entrance of fine soil in the drain, which may cause piping in embankments. Drainage under-lining has been preferred due to long life and easy laying.

Pressure Relief Valves

The canal lining is a thin structure. It is capable of resisting small differential heads but cannot counter balance the hydrostatic pressure to which the lining may be subjected during sudden drawdown or when the canal is empty. The water table is high, so it is very difficult to stabilize the lining to prevent the lining from uplift pressure.

Trial Section

Before starting full-scale channel lining operations, the Contractor shall carry out a trial section of the complete prism of the channel for a length of not less than 50 feet. This trial section should be carried out in the same area on which trial section for earthwork has already been accepted and approved by the Engineer. The Contractor shall submit his proposal for this trial section to the Engineer for approval at least 14 days before starting the trial.

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The trial section shall demonstrate the sequences of lining operation, the effectiveness and the quality control of the method including, but not limited to the following aspects:

- Preparation of sub-grade by trimming and compacting surfaces excavated and dressing.
- Laying and curing of plain cement concrete.
- Wetting of the surface on which the lining concrete is to be placed.
- Concrete batching arrangements
- Arrangements for construction of concrete lining, forms, transporting, placing, vibrating, screening and finishing concrete, placement of joints and associated fillers, sealants, curing etc.

The trial section will be incorporated into the works provided it complies in all respects with these Specifications. In case of non-compliance, the Engineer may either instruct remedial measures, or complete removal of the trial section, reinstatement of the foundations, and a repeat trial, all at the Contractor's expense.

Preparation of Sub-grade by providing bedding gravel before Lining of bed & slope of the canal

The work shall consist of spreading, levelling, and compacting clean, hard, durable, and well-graded gravel beneath the canal concrete lining, in accordance with the approved drawings and as directed by the Engineer.

The bedding gravel shall comprise a (50:50) mix of 3/4-inch and 3/8-inch aggregates, free from clay, silt, and other irrelevant materials. The mix shall be subject to the Engineer's approval based on sieve analysis and its suitability for the underlying subgrade.

The bedding gravel shall be uniformly spread to the specified depth of 2 ft and finished to the required lines, levels, and slopes. The surface shall be firm, even, and stable before placement of the concrete lining. All materials and completed work shall be subject to inspection and approval by the Engineer.

The Contractor shall ensure and prove to the satisfaction of the Engineer by means of field density tests that the sub-grade of the whole canal prism (slopes and bed) has attained 90% modified AASHTO density at optimum moisture content.

Refilling of Over-excavated Areas: If at any point material has been excavated beyond the neat lines required to receive the canal lining, the excess excavation shall be refilled with compacted fill in accordance with Chapter 4 – "Earthwork". If at any point the foundation material is disturbed or loosened during excavation or otherwise, it shall be moistened, if required, and compacted by tamping, rolling, or other approved methods in accordance with Chapter 4 – Earthwork to form firm foundations for the concrete lining.

Finishing to Lines and Grades: In addition to the above, the work under sub-grade preparation shall include but not be limited to cutting, filling, compacting, reworking, dressing and finishing the

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canal prism to true and even surfaces to the lines and grades shown on the Drawings in accordance with these Specifications and as directed by the Engineer.

Concreting Lining

General: Concrete for canal lining shall be of ratio 1:2:4 un-reinforced, and shall be constructed in the channel prism as shown on the Drawings, and its strength shall be as specified in the chapter of "CONCRETE". The prism will be lined manually with thickness of lining as 6" Plain cement concrete for canal lining, which shall be plastic enough to consolidate well and stiff enough to stay in place on the specified slopes of the sub-grade. Slump shall be in the range of 1 to 2 inches. The water-cement ratio shall be adjusted accordingly to achieve the specified slump. The concrete will be cured by application of a curing compound conforming to ASTM C-309. The Contractor shall submit the manufacturer's literature including the methods of application of the curing compound to the Engineer for his approval well in advance of procurement. Water retention of the compound shall be tested in accordance with ASTM C-156. Nominal maximum size of aggregate for concrete in Canal Lining shall be ¾ inches. The sub-grade shall be well moistened but not muddy at the time of placing concrete.

(i) Materials and Procedures: All the materials used in concrete canal lining, including cement, sand, aggregate, water admixtures etc., mixing and matching, sampling and testing shall be in accordance with the standards and specifications given in the relevant section of these specifications.

(ii) Formwork: forms for the concrete canal lining shall be in accordance with Chapter of "Concrete" and as approved by the Engineer.

(iii) The construction Joints: The place where a contraction joint is not required but the concrete lining operations are interrupted because of breakdown or delayed by other causes, the edge of the fresh concrete lining shall be bullheaded to a perpendicular surface to the lining along transverse or longitudinal lines. When placing operations are resumed, the surface of the hardened concrete shall be prepared as a construction joint as specified herein. The fresh concrete shall then be placed against the existing concrete to form a permanent bond with the existing concrete. No payment shall be made to the Contractor for making construction joints.

(iv) The temperature of mixed concrete for canal lining, immediately before placing shall not be more than 27°C and not less than 10°C. Aggregates, water and equipment shall be cooled as necessary to produce concrete within this temperature limit. Neither aggregate nor mixing water shall have temperature exceeding 65°C. Adequate refrigeration facilities shall be provided to ensure that the temperature of concrete when placed shall not exceed the specified limits. The used of liquid nitrogen to cool the concrete shall be permitted. Ice may be used to chill the mixing water but, in all circumstances, must be fully melted before addition of water to the cement.

(v) The Contractor shall carry out concrete lining manually, unless any other method is approved by the Engineer.

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(vi) Protection of Concrete lining: While carrying out lining operation, the Contractor shall exercise utmost care in moving the equipment, machinery and transport vehicle to ensure that the lining is not damaged. In case any damage occurs, the Contractor shall repair the same at his own cost to the satisfaction of Engineer.

(vii) Curing: The Contractor shall cure lined surfaces of the channel as follows:

a) The exposed surfaces of the concrete shall be membrane cured with an approved white pigmented curing compound which forms a water-retaining membrane on the surfaces of the concrete. Curing compound shall conform at ASTM Designation: C-309. The compound shall be of uniform consistency and quality within each container and from shipment to shipment. No water curing will be permitted for concrete placed for lining.

b) Curing compound shall be applied to the concrete surfaces by spraying in one coat to provide a continuous, uniform membrane over all areas. Coverage shall not exceed 150 square feet per gallon and on rough surfaces coverage shall be decreased as necessary to obtain the required continuous membrane. Mortar encrustation and dirt on surfaces shall be removed prior to application of the curing compound. The repair of all other surface imperfections shall not be made until after application of curing compound.

c) When curing compound is used on concrete surfaces where forms are not used, application of the compound shall commence immediately after finishing operations are completed. When curing compound is to be used on concrete surfaces where forms are used, the surfaces shall be moistened with a light spray of water immediately after the forms are removed and shall be kept wet until the surfaces will not absorb more moisture. As soon as the surface film of moisture disappears but while the surface still has a damp appearance, the curing compound shall be applied. Special care shall be taken to ensure ample coverage with the compound at edge, corners and rough spots of formed surfaces. When application of the curing compound has been completed and the coating is dry to touch, any required repair to concrete surfaces shall be performed. Each repair, after being finished shall be moistened and coated with curing compound in accordance with the foregoing requirements.

d) Equipment for applying curing compound and the method of application shall be in accordance with the provisions of Chapter VI of the 8th Edition of the Bureau of Reclamation Concrete Manual. The twenty-eight (28 days) have passed since application; any sealing membrane that is damaged or begins to peel away from concrete surfaces must be fixed as soon as possible and in an acceptable way.

e) Curing compound will be accepted on Manufacturer's certification of compliance with specifications, but the acceptance on certification shall in no way relieve the Contractor of the responsibility for furnishing the compound meeting specification requirements. Curing compound shall be subject to sampling and testing. The Contractor shall provide without charge to the Employer such facilities and assistances as may be necessary to obtain test samples. Sampling will be in accordance with the 8th Edition of the Bureau of Reclamation Concrete Manual.

f) The cost of furnishing and applying all materials for curing concrete shall be

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included in the unit rate tendered in the Bill of Quantities for the applicable concrete item on which the curing materials are used.

(viii) Tolerances for Concrete Construction: The canal lining shall be built to the lines, grades and dimensions shown on the Drawings. The dimensions shown on the Drawings will be subject to such modifications as may be found necessary by the Engineer to adapt to the conditions exposed by the excavation or to meet other site conditions. Where thickness of any portion of concrete is variable, it shall vary uniformly between the dimensions shown.

Tolerances for Concrete Lining

Description	Limit
Departure from established alignment	± 2 inches on tangents ± 4 inches on curves
Departure from established profile grade.	

Departures set forth above shall be uniform and no correction shall be made in less than 100 feet ± 1 inches

(iii) Reduction in thickness of lining (-¼) inch of specified thickness provided that average thickness over any 20 feet length is not less than the specified thickness

(iv) Variation from specified width at any height ± 1 inch of specified width

(v) Variation from specified height of lining ± 1 inch of established height

Joints in Canal Lining

General: Three types of joints are generally used in concrete channel lining

i. Construction joints
ii. Contraction Joints
iii. Expansion Joints.

The joints shall be made along straight lines and the required shape and dimensions shall be maintained during any subsequent finishing operations until the concrete has hardened.

The Contractor shall drill 6-inch diameter cores for inspection of joints at locations designated by the Engineer to determine the effectiveness of the Contractors joint installation procedures. Additional cores shall be drilled by the Contractor for any other purpose if directed by the Engineer. All core holes shall be required by and at the cost of the Contractor immediately following completion of the inspection of the holes by the Engineer unless otherwise directed. The method and manner of repair shall be approved by the Engineer.

(i) If inspection reveals that the joint does not meet these Specifications, the Contractor shall promptly modify equipment and installation procedures to ensure compliance with these Specifications and in addition shall, at his own expense, correct the defective work as directed by the Engineer.

(ii) Construction joints: Construction joints are purposely placed in concrete at spacing that may vary from the spacing shown on the drawings and in order to facilitate special conditions at structures, interruption because of breakdown, or delayed by other causes. The spacing shall not be less than one-half of the spacing shown on the drawings. These joints are provided to reduce initial shrinkage stresses and cracks, to allow time of the

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installation of embedded metal work; or to allow for the subsequent placing of other concrete. Bond shall be ensured at construction joints.The location of all construction joints in concrete work shall be subject to approval of the Engineer, and the joints shall be constructed in accordance with the Specifications. No payment shall be made to the Contractor for making construction joints.

(iii) Contraction Joints: Contraction joints shall be the joints placed in concrete to provide for volumetric shrinkage of a monolithic unit or movement between monolithic units. The concrete lining placing operations should be scheduled such that stoppage of day's work is at specified location of the contraction joint as for as possible. The joints shall be so constructed that there will be no bond between the concrete surfaces forming the joint.

Contraction joints shall be constructed shown on the drawings. The joints shall be made by forming the concrete on one side of the joint and allowing it to set and curing the side with curing compound. The surface of the concrete first placed at the contraction joint shall be coated with two coats of hot bitumen before the concrete is placed on the other side of the joint. Special care shall be taken to ensure proper compaction of concrete near the joint faces.

(iv) Expansion Joints: This type of joints in concrete channel lining are ordinarily required where the lining abuts fixed structures or under other extreme conditions, or as shown on the drawing.

(v) Approval of Joints: One copy and one reproducible of the drawings and data showing the joints, joint intersections, and the method of construction shall be submitted by the Contractor to the Engineer for approval.

(vi) Edges: The Contractor shall tool or chamfer edges of concrete where shown on the drawings and elsewhere as directed by the Engineer.
A groove will be formed at the top of lining on one side of the joint and filled with joint sealant and joint filler as shown in the drawings.

The joint sealant comprising cement, sand, bitumen in the ratio (1:2:3) to the depth of 1″ from the top shall be filled in the groove as soon as the concrete has gained its 14 days strength in order to avoid deposition and consolidation of any undesirable material in the groove which may impair the function of the joint. The top surface of joint sealant shall be tooled to the shape as shown on the drawing.

The concrete groove shall be cleaned to remove all debris, scale, dirt, oil, laitance, curing compound, and other foreign materials just before the application of the joint sealant. The concrete shall be at least 14 days old before it is filled with sealing compound. The joint sealant shall not be placed in dusty weather or while rain is falling. At the time of placing the joint sealant, the joint groove shall be clean and dry.

The joint filler comprising bitumen, sand and sawdust in the ratio (1:2:2) shall be extruded at the bottom of the joint groove for the remaining depth of 2″ to work the joint filler into intimate contact with the concrete without entrapping air.

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The joint sealant which does bond to the joint – groove faces or to this specification shall be removed and replaced by the Contractor at no additional cost to the Employer.

Measurement and Payment

(i) Cement Sand Mortar: Cement Sand Mortar shall be measured in square feet. The unit of measurement shall be sq feet.

(ii) Concrete Lining: Measurement for payment of concrete placed in lining shall be made of the volume of the concrete placed for channel lining, and PC Profiles etc; according to the design lines in cubic feet. The rate for item 3/8 shall include for all the requirements of specifications under chapter of "Concrete" including the provision and removal of formwork of any kind.
Payment shall be made at the unit rate tendered in the Bill of Quantities for concrete for channel lining and shall constitute full compensation for the work performed for concrete placement including material, labour, equipment and its operation, curing and testing etc., complete in all respects.

(iii) Payment for supply and installing of joint filler and joint sealant shall be made at the unit rate tendered per running feet in the Bill of Quantities for joints in canal lining.
Trial Section: Measurement and payment for the trial section shall be made in accordance with the relevant items for the work completed to Specifications and incorporated in the Works. No separate payment shall be made for complying with the specific additional requirements for the Trial Section.

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STRUCTURES

BRIDGES, CULVERTS, ROAD AND PILES WORKS

General

The general description of the specific items of work, the materials, construction requirements, and methods of measurement and payment for all concrete structures including bridges, culverts, piles, composite structures of concrete such as barriers and steel, pre-stressed and post tensioned girder and all brick and stone masonry structures built as indicated on the drawings and in conformity with the lines, grade, dimension in conjunction with any instructions issued by the Engineer regarding materials, equipment, workmanship and construction methods applied in the work shall conform to the requirements laid down herein and shall also follow the best modern construction practices with the approval of Engineer.

Materials

The materials used shall be those prescribed for several contract items which are to constitute the complete structure

CONSTRUCTION REQUIREMENTS

Clearance of Site

The contractor shall clear the sites for proposed structures of trees, bushes, stumps and debris. Special clearing of site such as removal of existing bridges, buildings, concrete pavement etc. The removal or relocation of public or private utilities such as optic fiber, telephone, cable lines, power lines, sewer and water pipe lines, railway tracks and their appurtenances etc. shall be arranged by the Employer with the concerned Government Agency/Agencies, Autonomous Bodies, Utility companies involved.

Foundation Data

Foundation data including the location of all boreholes together with the records of ground conditions encountered have been obtained from soil investigation by test boring, test pits or other sources. It is the Engineer's responsibility to ensure by additional investigations through the contractor at the very beginning of construction work that the foundation levels given in the Drawings coincide with the local requirements.

Alignment and Grade

The structures on vertical curves or the structures which have super elevated roadways because of horizontal curves and those spans on which definite finished camber is necessary in order to form a uniform grade line, all require special care and attention regarding to the elevation and alignment of their railing and kerbs.

Final Clearing

Upon completion of structure, the contractor shall clean up the site; remove all temporary buildings, false work, lumber, equipment and all other debris. The contractor shall level off all excavated

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material not used for back fill around piers, bents, abutment, culvert, headwalls and on embankment slopes. Bridge decks and sidewalks shall be left in clean and workman like condition. No separate/specific payment for clearing up shall be paid.

Erection Method

Before moving any construction equipment to the site, the contractor shall submit for approval an outline of the method he proposes to follow in the erection of structure.

Navigable Streams

The channel of navigable streams shall be kept clear for safe passage of water. The contractor shall provide and maintain all necessary light and signals in accordance with the requirements. The contractor shall pay due regard to the hazard of the river/canal flow during period of intense rainfall. All material deposited in the channel shall be removed to the required depth and clearance lines at the contractor's expense.

Concreting

The concrete of Bridges or culverts shall be poured and surface finished and cured as per requirements.

Final Clearing

Upon completion of structures, the contractor shall clean up the site conforming to requirements

Public Bodies/Service Authorities

The Contractor's methodology shall meet all statutory requirements of the railway, irrigation or Service Authorities meeting with the requirements.

Measurement and Payment

The quantities of various pay items of Bridges and culverts which constitute the completed and accepted structures shall be measured for payment according to the plans and specification for the several pay items appearing in the Bill of Quantities and in term of the prescribed units provided for the several pay items. Only accepted work shall be included for payment and the measured quantity shall be based on the dimension of component as shown on the drawings. The quantities measured as provided above shall be paid for at the unit prices bid for the several pay items appearing in the Bill of Quantities which payment and prices shall be full compensation for furnishing, preparing, fabricating, transporting, placing and erecting all material for the complete structure; for all labour, equipment, tool and all other items necessary for the completion of work. Such payment shall constitute full payment for completed structure and no separate payment will be made for cofferdam construction, form lumber, false work and other incidental expenses.

CONCRETE

General

This work consists of furnishing placing, curing, finishing including transport of cement concrete made from approved type of Cement, water, fine and coarse aggregates all in accordance with the requirements in these specifications and conforming to the lines, grades, and typical sections shown on the Drawings by the approval of the Engineer.

Classes of Concrete

The classes of concrete recognized in these specifications shall be designated: A, B, C, D1, D2, D3, Y and Lean Concrete. The Class of concrete to be used shall be as called for on the Drawings

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or as directed by the Engineer or specified in the Special Provisions. The following requirements shall govern unless otherwise shown on the Drawings.
Class B Concrete shall be used only where specified.

Class C Concrete shall be used for cribbing, or as otherwise directed by the Engineer or specified in the Special Provisions or on the Drawings. Lean Concrete shall be used in thin layers underneath footings and when called for on the Drawings or directed by the Engineer.

TYPES OF CONCRETE WORKS

Underground Concrete

Concrete poured below Natural Surface Level with or without shuttering and shoring e.g. Piles, Pile Caps etc.

On Ground Concrete

Concrete poured by erecting formwork with necessary bracings on ground e.g. Piers, Columns, Slabs on-grade, NJ Barriers, Retaining Walls (H<3.0m) etc.

Elevated Concrete

Concrete poured by erecting props, bracing and towers to support the formwork at higher levels e.g. Deck Slabs, Retaining Walls (H>3.0m), Transoms, and Diaphragms etc.

Portland Cement

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 may be retested before use and shall be rejected if it fails to meet any of the specification requirements.
Portland cement shall conform to the requirements of the Standard Specifications for, AASHTO designation M85 (ASTM Designation C150). The type of the cement to be used, unless otherwise shown on the Drawings. The Sampling of cement shall be in accordance with AASHTO Designation T-127.

General Features of the main types of Portland Cement

Type	Classification	Characteristics	Applications
Type I Type II Type	General Purpose	Fairly high C3S content for good early strength development	General construction (most buildings, bridges, pavements, precast units, etc)
III Type IV Type V	Moderate sulfate resistance	Low C3A content (<8%)	Structures exposed to soil or water containing sulfate ions Rapid
White	High early strength	Ground more finely, may have slightly more C3S Low	construction, cold weather concreting
	Low heat of hydration (slow reacting)	content of C3S (<50%) and C3A	Massive structures such as dams. Now are.
	High sulfate resistance	Very low C3A content (<5%)	Structure exposed to high levels of sulfate ions
	White color	No C4AF, low MgO	Decorative (otherwise has properties similar to type I)

The mill certificates shall accompany with during the delivery of the material to the work. Cement

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shall be delivered in sufficient quantities to ensure that there is no suspension of the work of concreting at any time. Different brands or 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 written approval by the Engineer, after preparing new mix design.

Fine Aggregate

The fine aggregate shall consist of sand, stone screenings or other approved inert materials with similar characteristics, or a combination thereof, having clean, hard, strong, sound, durable, uncoated grains free from injurious amount of dust, lumps, soft or flaky particles, shale alkali, organic matter, material reactive with alkalis in the cement loam or other deleterious substances, and shall not contain more than three (3) percent of material passing the No.200 sieve by washing nor more than one percent of clay lumps or one (1) percent of shale. The use of beach sand is prohibited without the written consent of the Engineer.

For exposed work, the fine aggregate shall be free from any substance that will discolour the concrete surface. The fine aggregate shall be uniformly graded and when tested in accordance with AASHTO Designation T-11 and T-27 shall meet the following grading requirements:

GRADING OF FINE AGGREGATES

Sieve Designation	Percentage Passing by Weight.
3/8 inch	100
No. 4	95-100
No. 16	45-85
No. 50	10-30
No. 100	2-10
No. 200	0-3

In case if fine aggregates fail under Fineness Modulus or Gradation however material passing No. 4 in combined aggregate qualifies for these requirements, then the material can be accepted.

Fine aggregates shall be of such quality that mortar specimens, prepared with standard Portland cement and tested in accordance with AASHTO Designation T-71, shall develop a compressive strength at 7 days of not less than 90 percent of the strength developed by a mortar prepared in the same manner with the same cement and graded sand having a fineness modulus of 2.3 to 3.1. Natural aggregates if required shall be thoroughly and uniformly washed before use. Sand equivalent (T-176) shall be 75 min.

For the purpose of determining the degree of uniformity, a fineness modulus determination shall be made upon representative samples submitted by the Contractor from such sources as he proposes to use. Fine aggregate from any one source having a variation in fineness modulus of greater than 0.20 either way from the fineness modulus of mix design samples submitted by the Contractor may be rejected till new trial mixes are prepared and tested by the Contractor.

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Coarse Aggregate

The coarse aggregate shall consist of crushed or broken stone, gravel or other approved inert materials with similar characteristics, or a combination thereof, having clean, hard, strong, sound, durable uncoated particles, free from injurious amount of soft, friable, thin elongated or laminated pieces, alkali, organic or other deleterious matter and conforming to the requirements of these Specifications.

The coarse aggregate shall be of uniform grading with maximum sizes as required for the various classes of concrete as shown in Table and when tested in accordance with AASHTO Designation T-11 & T-27 shall meet the following grading requirements.

Grading of Coarse Aggregates

Designated Sizes	Percentage by Weight Passing Laboratory Sieves Having Square Openings, in Inches							
	2 1/2	2	1 1/2	1	3/4	1/2	3/8	No. 4
1/2-in. to No. 4	–	–	–	–	100	90-100	40-70	0-15*
3/4-in. to No. 4	–	–	–	100	90-100	–	20-55	0-10*
1 -in. to No. 4	–	–	100	95-100	–	25-60	--	0-10*
11/2 -in. to No. 4	–	100	95-100	–	35-70	–	10-30	0-5
11/2-in. 3/4 -in.	–	100	90-100	20-55	0-15	–	0-5	–
2 -in. to No. 4	100	95-100	–	35-70	–	10-30	–	0-5
2 -in. to 1-in.	100	90-100	35-70	0-15	–	0-5	–	–

Not more than five 5 percent shall pass No.8 sieve.

Coarse aggregate shall contain not more than one (1) percent by weight of material passing the No.200 sieve by washing and not more than five (5) percent of soft fragments. It shall have an abrasion loss of not more than forty (40) percent at five hundred (500) revolutions, when tested in accordance with AASHTO T-96. When tested in accordance with AASHTO T-104, for five cycle, the loss with the sodium sulphate soundness test shall be not more than 12 percent. Natural aggregates shall be thoroughly washed before use. Testing of coarse aggregate is specified Specifications.

The aggregate shall be non-alkali/silica reactive where the concrete is to be poured under water or exposed to humid conditions. In case the Contractor proposes to use the aggregate having the alkaline/siliceous characteristics with the intention to use it with Blast Furnace Slag Cement, he will undertake to carry out the job without any extra cost and shall arrange to conduct the necessary tests as directed by the Engineer.

Storage of Cement and Aggregates

a). All cement shall be stored, immediately upon arrival on the site of the work, in weather-proof building, which will protect the cement from dampness. The floor shall be raised from the ground. The buildings shall be placed in locations approved by the Engineer.

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Provisions for storage shall be ample, and the shipments of cement as received shall be separately stored in such a manner as to provide easy access for identification and inspection of each shipment. Storage buildings shall have capacity of a sufficient quantity of cement for at least thirty (30) days use. Bulk cement, if used, shall be transferred to elevated air tight and weather-proof bins. However, if approved, sacked cement on small jobs may be stored in the open, upon a raised platform provided that ample waterproof covering is ensured. Stored cement shall meet the test requirements at any time after storage when retest is ordered by the Engineer. At the time of use all cement shall be free flowing and free of lumps. Cement bags shall be weighed at random to check for variation.

b). Copies of cement records shall be furnished to the Engineer showing such detail as, the quantity used during the day run or at each part of the work. Cement held in storage for a period of over sixty (60) days, or cements which, for any reason the Engineer may suspect of being damaged, shall be subject to a retest before being used in the work.

c). The handling and storing of concrete aggregates shall be such as to prevent segregation or the inclusion of foreign materials. The Engineer may require that aggregates be stored on separate platforms at satisfactory locations.

In order to secure greater uniformity of the concrete mix, the Engineer may require that the coarse aggregate be separated into two or more sizes. Different sizes of aggregate shall be stored in separate bins or in separate stock piles to prevent the material at the edges of the piles from becoming intermixed.

If aggregates are stored on the ground the bottom layer of aggregate shall not be disturbed or used without re-cleaning and as approved by the Engineer

Water

The water for curing, for washing aggregates and for mixing shall be subject to the approval of the Engineer. It shall be free from oil and shall contain not more than one thousand (1,000) parts per million of chlorides nor more than one thousand three hundreds (1,300) parts per million of sulfates (SO4). In no case shall the water contain an amount of impurities that will cause a change in the setting time of Portland cement of neither more than twenty five (25) percent nor a reduction in the compressive strength of mortar at fourteen (14) days of more than five (5) percent when compared to the result obtained with distilled water.

In non-reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than two thousand (2,000) parts per million of chlorides nor more than one thousand five hundreds (1,500) parts per million of sulfates as SO4. In addition to the above requirements, water for curing concrete shall not contain any impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

Admixtures

Admixtures shall only be allowed to be used with written permission from the Engineer. If air-entraining agents, water reducing agents, set retarders or strength accelerators are permitted to be used, they shall not be used in greater dosages than those recommended by the manufacturer, or

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permitted by the Engineer, and shall conform to the requirements for each of the agents specified by the manufacturer. When required by the Engineer, the quality of the mixing water shall be determined by the Standard Method of Test for Quality of Water to be used in concrete, AASHTO Methods of Sampling and Testing, Designation: T 26 and ASTM C1602/C1602M-22.

CONSTRUCTION REQUIREMENTS

The manufacturing, transport, handling and placing of concrete shall conform to the requirements given hereinafter. Unless otherwise specified, ordinary Portland cement shall be used for all types of concrete. When sulphate-resisting cement or other type of cement is required, it will be specified on the Drawings/or in BOQ or ordered by the Engineer.

Proportioning of Concrete

All concrete shall be proportioned by weighing, except as specified herein. The proportions by weight of cement fine aggregates, coarse aggregates and water necessary to produce concrete of the required strength and consistency shall be approved by the Engineer. Such approval may be withdrawn at any time, and changes in the proportions may be required for the purpose of required workability, density, impermeability, durability and strength.

Based on the approved mix proportions, the Contractor shall prepare lists showing the number of kilograms of the various materials to be used in the batch size adopted. The required consistency shall also be shown. Such lists are subject to approval by the Engineer, and shall be posted at the mixer. The amount of water in the mix is the total amount of free water, including the free water held by the aggregates.

No concrete shall be placed in the works until the results of the twenty eight (28) days test indicate that the design proportions are satisfactory as per requirements Adjustment of the proportions shall be subject to the following provisions:

Adjustment for variation in workability - If it is found impossible to obtain concrete of the desired workability with the proportions originally approved, the Engineer shall make such changes as are necessary.

Adjustment for new materials - No change in the source or character of the material shall be made without due notice to the Engineer and no new materials shall be used until the Engineer has accepted such materials and has approved new proportions based on trial mixes.

The Contractor's attention is drawn to the time required to prepare and test trial batches and the Contractor shall be responsible for production of trial batches at a sufficiently early date so that the progress of the work is not delayed.

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Consistency

Concrete shall have a consistency such that it will be workable in the required position. It shall be of such a consistency that it will flow around reinforcement steel but individual particles of the coarse aggregate when isolated shall show a coating of mortar containing its proportionate amount of sand. The consistency of concrete shall be determined to be as dry as it is practicable to satisfy the requirements for transportation and placing of the concrete as described hereinafter. Consistency of concrete shall be determined as specified in AASHTO T-119 and ASTM C143.

Mixing Concrete

General

The concrete shall be mixed only in the quantity required for immediate use. Concrete that has developed an initial set shall be rejected. Concrete shall be thoroughly mixed in a mixer of an approved size and type that will ensure a uniform distribution of the materials throughout the mass.

All concrete shall be mixed in mechanically operated mixers. Mixing plant and equipment for transporting and placing concrete should be arranged with an ample auxiliary installation to provide a minimum supply of concrete in case of breakdown of machinery or in case the normal supply of concrete should be disrupted. The auxiliary supply of concrete shall be sufficient to complete the casting of a section up to a construction joint.

Equipment having components made of aluminum or magnesium alloys, which would have contacted with plastic concrete during mixing, transporting or pumping of Portland cement concrete, shall not be used.

Concrete mixers shall be equipped with adequate water storage and a device for accurately measuring and automatically controlling the quantity of water used.

Materials shall be measured by weighing, except as otherwise specified or where other methods are specifically authorized by the Engineer. The apparatus provided for weighing the aggregates and cement shall ensure accurate measurement of each ingredient.

The accuracy of all weighing devices except that for water shall be such that successive quantities can be measured to within one (1) percent of the desired value. Cement in standard packages (bags) approved by the Engineer need not be weighed. The water measuring device shall be accurate to plus or minus half percent + 0.50%. All measuring devices shall be subject to the approval of the Engineer. Scales and measuring devices shall be tested at the expense of the Contractor as frequently as the Engineer may deem necessary to ensure their accuracy.

Weighing equipment shall be isolated so that vibration or movement of other operating equipment does not affect the accuracy of reading. When the entire plant is running, the scale reading at cut-off shall not vary from the weight designated by the Engineer more than one (1) percent for cement, one and half (1.1/2) percent for any size of aggregate, or one (1) percent for the total aggregates in any batch.

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Where volumetric measurements are authorized by the Engineer, the weight proportions shall be converted to equivalent volumetric proportions. In such cases, suitable allowances shall be made for variations in the moisture condition of the aggregates, including the bulking effect in the fine aggregates. Boxes or similar containers of the exact volume required shall be filled and struck off. Measurement by wheel barrow volumes will not be permitted.

Mixing at Site

Concrete mixers may be of the revolving drum or the revolving blade type and the mixing drum or blades shall be operated uniformly at the mixing speed recommended by the manufacturer. The pick-up and throw-over blades of mixer shall be restored or replaced when any part or sections is worn two and half (2.5) cms. or below than the original height of the manufacturer's design. Mixers and agitators, which have an accumulation of hard concrete or mortar, shall not be used.
When bulk cement is used and volume of the batch is one cubic meter or more, the scale and weigh hopper for Portland cement shall be separate and distinct from the aggregate hopper or hoppers. The discharge mechanism of bulk cement weigh hopper shall be interlocked against opening before the full amount of cement is in the hopper. The discharging mechanism shall also be interlocked against opening when the amount of cement in the hopper is underweight by more than one percent or overweight by more than three (3) percent of the amount specified.

When the aggregates contain more water than the quantity necessary to produce a saturated surface-dry condition, representative samples shall be taken and the moisture content determined for each kind of aggregate.
The temperature of mixed concrete, immediately before placing, shall be not more than 32oC. Aggregates and water shall be cooled as necessary to produce concrete within this temperatures limit. If ice is used to cool the concrete, discharge of the mixer will not be permitted until all ice is melted.

The batch shall be so charged into the mixer that some water will enter in advance of cement and aggregates. All water shall be in the drum by the end of the first quarter of the specified mixing time.
Cement shall be batched and charged into the mixer by means that will not result in loss due to the effect of wind, or in accumulation of cement on surfaces of conveyors or hoppers, or in other conditions which reduce or vary the required quantity of cement in the concrete mixture.

The entire contents of a batch mixer shall be removed from the drum before materials for a succeeding batch are placed therein. The materials composing a batch except water shall be deposited simultaneously into the mixer.

All concrete shall be mixed for a period of not less than one and half (1-1/2) minutes after all materials, including water, are in the mixer. During the period of mixing, the mixer shall operate at the speed for which it has been designed.

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Mixers shall be operated with an automatic timing device that can be locked by the Engineer. The time device and discharge mechanism shall be so interlocked that during normal operation no part of the batch will be discharged until the specified mixing time has elapsed. In case of failure of the timing device, the Contractor will be permitted to operate while it is being repaired, provided he furnishes an approved timepiece equipped with minute and second hands. If the timing device is not repaired within twenty-four (24) hours, further use of the mixer will be prohibited until repairs are made.

The first batch of concrete material placed in the mixer shall contain cement, sand, and water in excess to the requirement of mix, to ensure that the drum does not extract mortar from the mix changing its design characteristics. When mixing is to stop for a period of one hour or more, the mixer shall be thoroughly cleaned.

Plant Mixing

At central mixing plant, batches shall be discharged from the weighing hopper into the mixer either directly by gravity or by an elevating container large enough to contain the batch. The plant shall be arranged to ensure that there is no loss of cement during transfer from weighing hopper to the mixer drum. The mixing time shall neither be less than 50 second, nor more than 90 seconds.

Hauling

Mixed concrete may be transported to the delivery point in truck agitators or truck mixers operating at the speed designated by the manufacturer, provided the consistency and workability of the mixed concrete upon discharge at the delivery point is suitable for adequate placement and consolidation in place. Truck agitators shall be loaded not to exceed the manufacturer's rated capacity. They shall maintain the mixed concrete in a thoroughly mixed and uniform mass during hauling. Bodies of non-agitating hauling equipment shall be so constructed that leakage of the concrete mix, or any part thereof, will not occur at any time, and they shall be self- cleaning during discharge.

For zero slump concrete to by lay by paver, concrete will be allowed to be hauled in open trucks. However concrete hauled in open-top vehicles shall be protected during hauling against rain, or exposure to the sun for more than twenty (20) minutes when the ambient temperature exceeds twenty five (25) degree C.

No additional water shall be incorporated into the concrete during hauling or after arrival at the delivery point. The rate of discharge of mixed concrete from truck mixer agitators shall be controlled by the speed of rotation of the drum in the discharge direction with the discharge gate fully open.

When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be completed within one hour, or before two hundred fifty (250) revolutions of the drum or blades, whichever comes first, after the introduction of cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is thirty

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(30) degree C or above, a time less than one hour will be required except when retarder is used in which case it shall be one (1) hour.

When non-agitating hauling equipment is used for transporting concrete to the delivery point, discharge shall be completed within one hour after the addition of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30OC or above, the time between the introduction of cement to the aggregates and discharge shall not exceed 45 minutes.

Handling and Placing Concrete

General

In preparation for the placing of concrete all sawdust, chips and other construction debris and extraneous matter shall be removed from inside the formwork, and struts, stays and braces serving temporarily to hold the forms in correct shape and alignment, pending the placing of concrete at their locations, shall be removed when the concrete placing has reached an elevation rendering their services unnecessary. These temporary members shall be entirely removed from the forms and not buried in the concrete.

No concrete shall be used that does not reach its final position in the forms within the stipulated time. Concrete shall be placed so as to avoid segregation of the materials and the displacement of the reinforcement. The use of long troughs, chutes, and pipes for conveying concrete to the forms shall be permitted only on written authorization of the Engineer. In any case the Engineer will reject the use of equipment for concrete transportation that will allow segregation, loss of fines, or in any other way will have a deteriorating effect on the concrete quality.

Open troughs and chutes shall be of metal or metal lined; where steep slopes are required, the chutes shall be equipped with baffles or be in short lengths that reverse the direction of movement.

All chutes, troughs and pipes shall be kept clean and free from coatings of hardened concrete by thoroughly flushing with water after each run; water used for flushing shall be discharged clear off the structure. When placing operations would involve dropping the concrete more than one and half (1.1/2) meters, it shall be conveyed through sheet metal or other approved pipes. As far as practicable, the pipe shall be kept buried in the newly placed concrete. After initial set of the concrete, the forms shall not be jarred and no loading of any kind shall be placed on the ends of projecting reinforcement bars.

The concrete shall be placed as nearly as possible to its final position, and the use of vibrators for extensive shifting of the mass of fresh concrete will not be permitted. The plasticizer, accelerator or retarder or water-reducing admixture, if required, shall be fed separately at the rate recommended by the manufacturer, or as established by laboratory trials.

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Transit Mixing

Truck mixers, unless otherwise authorized by the Engineer, shall be of the revolving drum type, watertight, and so constructed that the concrete can be mixed to ensure a uniform distribution of materials throughout the mass. All solid materials for the concrete shall be accurately measured and charged into the drum at the proportioning plant. The truck mixer shall be equipped with a device by which the quantity of water added can be readily verified. The mixing water may be added directly to the batch, in case the concrete batch is poured within twenty-five (25) minutes of adding water.

The maximum size of batch in truck mixers shall not exceed the maximum rated capacity of the mixer as stated by the manufacturer, and stamped in metal on the mixer. Truck mixing shall be continued for not less than fifty (50) revolutions after all ingredients, including water, are in the drum. The mixing speed shall not be less than six (6) rpm, nor more than ten (10) rpm.

Mixing shall begin within thirty (30) minutes after the cement has been added either to the water or aggregate, but when cement is charged into a mixer drum containing water or surface-wet aggregate and when the temperature is above thirty-two (32) degree C, this limit shall be reduced to fifteen (15) minutes. The limitation in time between the introduction of the cement to the aggregate and the beginning of the mixing may be waived when, in the judgment of the Engineer, the aggregate is sufficiently free from moisture, so that there will be no harmful effects on the cement.

Pumping

The placing of concrete by pumping will be permitted only if specified in the Special Provisions or if authorized by the Engineer. The equipment shall be so arranged that no vibration will occur that might damage freshly placed concrete.

Where concrete is conveyed and placed by mechanically applied pressure the equipment shall be suitable in kind and adequate in capacity for the work. The operation of the pump shall be such that a continuous stream of concrete without air pockets is obtained. When pumping is completed, the concrete remaining in the pipeline, if it is to be used, shall be ejected in such a manner that there will be no contamination of the concrete or separation of the ingredients. After this operation, the entire equipment shall be thoroughly cleaned.

Placing Concrete under Water

Concrete shall not be placed under water except where inevitable, in which case approval must be sought from the Engineer and the work carried out under his immediate supervision. In this case the method of placing shall be as hereinafter specified.

The slump of concrete shall be maintained between ten (10) and fifteen (15) cm. To prevent segregation, it shall be carefully placed in a compact mass, in its final position, by means of a tremie, a bottom-dump bucket, or other approved means, and it shall not be disturbed after being placed. Water must not be allowed to flow past the fresh concrete surface.

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A tremie shall consist of a tube having a diameter of not less than 25 cm constructed in sections having flanged couplings fitted with gaskets with a hopper at the top. The tremie shall be supported so as to permit free movement of the discharge end over the entire top surface of the work and so as to permit rapid lowering when necessary to retard or stop the flow of concrete. The discharge end shall be closed at the start of work so as to prevent water entering the tube and shall be completely submerged in concrete at all times; the tremie tube shall be kept full to the bottom of the hopper. When a batch is dumped into the hopper, the flow of concrete shall be induced by slightly raising the discharge end, but always keeping it in the placed concrete. The flow shall be continuous until the work is completed.

When the concrete is placed with a bottom-dump bucket, the top of the bucket shall be open. The bottom doors shall open freely downward and outward when tripped. The bucket shall be completely filled and slowly lowered to avoid backwash. It shall not be dumped until it rests on the surface upon which the concrete is to be deposited and when discharged shall be withdrawn slowly until well above the concrete.

Dewatering may proceed when the concrete seal is sufficiently hard and strong. All laitance or other unsatisfactory material shall be removed from the exposed surface by scraping, chipping or other means, which will not injure the surface of the concrete.

Compaction

Concrete, during and immediately after placing shall be thoroughly compacted, except lean concrete under footings and concrete deposited under water. Concrete in walls, beams, columns, etc. shall be placed in horizontal layers not more than thirty (30) centimeters thick except as hereinafter provided. When less than a complete layer is placed in one operation, it shall be terminated in a vertical bulkhead. Each layer shall be placed and compacted before the preceding layer has taken initial set to prevent injury to the green concrete and avoid surfaces of separation between the layers. Each layer shall be compacted so as to avoid the formation of a construction joint with a preceding layer, which has not taken an initial set.

The compaction shall be done by mechanical vibration. The concrete shall be vibrated internally unless special authorization of other methods is given by the Engineer or is provided herein. Vibrators shall be of a type, design, and frequency approved by the Engineer. The intensity of vibration shall be such as visibly to affect a mass of concrete with a 3 cm slump over a radius of at least half a meter. The Contractor shall provide a sufficient number of vibrators to properly compact each batch immediately after it is placed in the forms. Vibrators shall be manipulated so as to thoroughly work the concrete around the reinforcement and embedded fixtures and into the corners and angles of the forms and shall be applied at the point of placing and in the area of freshly placed concrete. The vibrators shall be inserted into and withdrawn from the concrete slowly. The vibration shall be of sufficient duration and intensity to compact the concrete thoroughly but shall not be continued at any one point to the extent that localized areas of grout are formed. Application of vibrators shall be at points uniformly spaced and not farther apart than twice the radius over which the vibration is visibly effective. Vibration shall not be applied directly to the reinforcement

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or to sections or layers of concrete that have hardened to the degree that the concrete ceases to be plastic under vibration. It shall not be used to make concrete flow in the forms over distances so great as to cause segregation, and vibrators shall not be used to transport concrete either in the forms or in troughs or chutes.

Vibration shall be supplemented by such external vibrator as is necessary to ensure smooth surfaces and dense concrete along form surfaces and in corners and locations impossible to reach with the normal vibrators.

Casting Sections and Construction Joints

The concrete in each integral part of a structure shall be placed continuously, and the Contractor will not be allowed to commence work on any such part unless sufficiently inspected and approved material for the concrete is at hand, and manpower and equipment are sufficient to complete the part without interruption in the placing of the concrete.

Construction joints shall be allowed only where specified on the plans or otherwise approved. If not detailed on the plans, or in the case of emergency, construction joints shall be placed as directed. Shear keys or inclined reinforcement shall be used where necessary to transmit shear or bond the two sections together. When shear keys or inclined reinforcement are not provided, the concrete shall be roughened as directed. Joints in the concrete due to discontinuity of work shall be avoided as far as possible. Such joints, when necessary, shall be constructed to meet the approval of the Engineer.

When the placing of concrete is temporarily discontinued, the concrete after becoming firm enough to retain its shape shall be cleaned of laitance and other objectionable material to a sufficient depth to expose sound concrete. Where a "feathered edge" might be produced at a construction joint, as in the sloped top surface of a wing wall, an inset formwork shall be used to produce an edge thickness of not less than 15 centimeters in the succeeding layer. Work shall not be discontinued within fifty (50) centimeters of the top of any face, unless provision has been made for a coping less than 50 centimeters thick, in which case, if permitted by the Engineer, the construction joint may be made at the underside of the coping.

Immediately following the discontinuance of placing concrete all accumulations of mortar splashed upon the reinforcing steel and the surfaces of forms shall be removed. Dried mortar chips and dust shall not be puddled into the unset concrete. Care shall be exercised, during the cleaning of the reinforcing steel, not to injure or break the concrete steel bond near the surface of the concrete.

Slab Culverts

In general, the lean concrete below the foundation shall be placed and allowed to set before the reinforced concrete is started. After the construction of masonry abutment walls, as specified in Special Provisions, the concrete bed plate and curtain walls shall be constructed monolithically. Construction joints in wing walls where unavoidable shall be horizontal and so located that no joint will be visible in the exposed face of the wing wall above the ground line.

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Girders, Slabs, and Columns

For the simple spans, concrete shall preferably be deposited by beginning at the center of the span and working from the center toward the ends. Concrete in girders shall be deposited uniformly for the full length of the girder and brought up evenly in horizontal layers. For continuous spans, where required by design considerations, the concrete placing sequence shall be shown on the plans or in the Special Provisions.

Concrete in girder haunches less than one (1) meter in height shall be placed at the same time as that in the girder stem, and the column or abutment tops shall be cut back to form seats for the haunches. Whenever any haunch or fillet has a vertical height of one (1) meter or more, the abutment or columns, the haunch, and the girder shall be placed in three successive stages; first, to lower side of haunch; second, to the lower side of the girder; and third to completion.

For hunched continuous girders, the girder stem (including haunch) shall be placed to the top of stem. Where the size of the pour is such that it cannot be made in one continuous operation, vertical construction joints shall preferably be located within the area of contra flexure.

Concrete in slab spans shall be placed in one continuous operation for each span unless otherwise provided. The floors and girders of through girder superstructures shall be placed in one continuous operation unless otherwise specified, in which case a special shear anchorage shall be provided to ensure monolithic action between girder and floor.

Concrete in T-beam or deck girder spans may be placed on one continuous operation or may be placed in two separate operations; each of which shall be continuous; first, to the top of the girder stems and second, to completion. In the latter case, the bond between stem and slab shall be provided by suitable shear keys or by artificially roughening the surface of the top of the girder stem. In general, suitable keys may be formed by the use of timber blocks approximately five (5) by ten (10) cm in cross- section and having a length of ten (10) cms less than the width of the girder stem. These key blocks shall be spaced along the girder stems as required, but the spacing shall be not greater than thirty (30) cms center to center. The blocks shall be removed as soon as the concrete has set sufficient to retain its shape.

Concrete in box girders may be placed in two or three separate operations. In either case the bottom slab shall be placed first. Bond between the bottom slab and stem shall be positive and mechanical. If the webs are placed separately from the top slab, bond between the top slab and webs shall be secured in the same manner as for T- beams requirements for shear keys for T-beams shall also apply to box girders, except that keys need not be deeper than the depth to the top of bottom slab reinforcement. Concrete in columns shall be placed in one continuous operation, unless otherwise directed. The concrete shall be allowed to set at least 24 hours before the caps are placed.

When friction collars are used to support cap forms, the concrete of columns shall have been poured at least seven (7) days earlier.

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Unless otherwise permitted, no concrete shall be placed in the superstructure until the column forms have been stripped sufficiently to determine the character of the concrete in the columns. The load of the superstructure shall not be allowed to come upon the bents until the test cylinders representing the bents have obtained the minimum compressive strength but in no case in less than seven (7) days.

Construction Joints

Construction joints shall be made only where shown on the Drawings or called for in the pouring schedule, unless otherwise approved by the Engineer. If not detailed on the Drawings, construction joints, also in cases of emergency shall be placed to meet the approval of the Engineer. Shear keys or reinforcement shall be used, unless otherwise specified, to transmit shear or to bond the two sections together.

Before depositing new concrete on or against concrete, which has hardened, the forms shall be re-tightened. The surface of the hardened concrete shall be roughened as required by the Engineer, in a manner that will not leave loose particles of aggregate or damage concrete at the surface. It shall be thoroughly cleaned of foreign matter and laitance. When directed by the Engineer, the surface of the hardened concrete which will be in contact with new concrete shall be washed with water to ensure an excess of mortar at the juncture of the hardened and the newly deposited concrete, the cleaned and watered surfaces, including vertical and inclined surface, shall first be thoroughly covered with a coating of mortar of the same proportion of sand and cement as the class of concrete used against which the new concrete shall be placed before the grout or mortar has attained its final set.

The placing of concrete shall be carried out continuously from joint to joint. The face edges of all joints, which are exposed; to view shall be carefully finished true to line and elevation.

Bridge Deck Surface Finish

A smooth riding surface of uniform texture, true to the required grade and cross- section, shall be obtained on all bridge roadway decks. The Contractor may use hand tools, or finishing machines or a combination of both, conforming to the requirements specified herein for finishing bridge roadway deck concrete.

Finishing of concrete placed in bridge decks shall consist essentially of compacting and striking off the surface of the concrete as placed and floating with longitudinal floats the surface so struck off. The placing of concrete in bridge roadway decks will not be permitted until the Engineer is satisfied that the rate of producing concrete will be sufficient to complete the proposed placing and finishing operations within the schedule time, that experienced finishing machine operators and concrete finishers are employed to finish the deck, that fogging equipment and all necessary finishing tools and equipment are on hand at the site of the work and in satisfactory condition for use. Finishing

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machines shall be set up sufficiently in advance of use to permit inspection by the Engineer during the daylight hours before each pour.

The adjustment and operation of deck finishing machines shall be verified by moving the machine over the full length of the deck section to be placed and traversing the float completely across all end bulkheads before placement of concrete is begun.
Unless adequate lighting facilities are provided by the Contractor, the placing of concrete in bridge decks shall cease at such time that finishing operations can be completed during daylight hours.
Rails for the support and operation of finishing machines and headers for hand- operated strick-off devices shall be completely in place and firmly secured for the scheduled length for concrete placement before placing of concrete. Rails for finishing machines shall extend beyond both ends of the scheduled length for concrete placement to a sufficient distance that will permit the float of the finishing machine to fully clear the concrete to be placed. Rails or headers shall be adjustable for elevation and shall be set to elevations, with allowance for anticipated settlement, camber, and deflection of false work, as required to obtain a bridge roadway deck true to the required grade and cross-section. Rails or headers shall be of a type and shall be so installed that no springing or deflection will occur under the weight of the finishing equipment and shall be so located that finishing equipment may operate without interruption over the entire bridge roadway deck to be finished. The rails or headers shall be adjusted as necessary to correct for unanticipated settlement or deflection, which may occur during finishing operations, should settlement or other unanticipated events occur, which in the opinion of the Engineer would prevent pouring of bridge deck conforming to the requirements of these specifications, placing of deck concrete shall be discontinued until corrective measures satisfactory to the Engineer are provided. In the event satisfactory measures are not provided prior to initial set of the concrete in the affected area, the placing of concrete shall be discontinued and a bulkhead installed at a location determined by the Engineer. All concrete in place beyond the bulkhead shall be removed.

Unless otherwise permitted by the Engineer, bridge deck concrete shall be placed in a uniform heading approximately parallel to the bridge pier or bent caps. The rate of placing concrete shall be limited to that which can be finished before the beginning of initial set except that concrete for the deck surface shall not be placed more than three (3) meters ahead of stick off.

After the concrete has been placed, compacted, and consolidated, the surface of the concrete shall be carefully struck off by means of a hand-operated stick board operating on headers, or by a finishing machine operating on rails. A uniform deck surface true to the required grade and cross-section shall be obtained.

Following strike off, the surface of the concrete shall be floated longitudinally. In the event strike-off is performed by means of a hand-operated strike board, two (2) separate hand-operated float boards for longitudinal floating shall be provided. The first float shall be placed in operation as soon as the condition of the concrete will permit and the second float shall be operated as far back of the first float as the workability of the concrete will permit.

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In the event the strike off is performed with a finishing machine, longitudinal floating of the concrete shall be performed by means of a hand-operated float board or a finishing machine equipped with a longitudinal wooden float. The longitudinal wooden float on the finishing machine shall have a length of not less than two and half (2.5) meters nor more than three and half (3.5) meters. When both strike off and longitudinal floating are to be performed by finishing machines, one machine, with operator, shall be used for strike off and a second machine, with a second operator, shall be used for longitudinal floating. Longitudinal floating may be performed with the same finishing machine that is used for strike off provided that the length of deck unit being placed is not more than 10 meters and the strike off operation is completed for said deck unit before the condition of the concrete requires that longitudinal floating be started.

Finishing machines used for strike off having a wheel base 1.8 meters or less shall be followed by 2 separate hand-operated float boards for longitudinal floating. All the provisions in this Item pertaining to hand-operated float boards shall apply to the 2 separate float boards for longitudinal floating. Longitudinal floats, either hand-operated or machine-operated, shall be used with the long axis of the float parallel to the center line of the bridge roadway. The float shall be operated with a combined longitudinal and transverse motion, planning off the high areas and floating the material removed into the low areas. Each pass of the float shall lap the previous pass by one-half the length of the float. Floating shall be continued until a smooth riding surface is obtained.

In advance of curing operations, the surface of the concrete shall be textured by brooming with a stiff-bristled broom or by other suitable devices, which will result in uniform scouring. The operation shall be performed at a time and in a manner to produce a hardened surface having a uniform texture.

Hand-operated float boards shall be from three and half (3.5) to five (5) meters long, ribbed and trussed as necessary to provide a rigid float and shall be equipped with an adjustable handle at each end. The float shall be wood, not less than two and half (2.5) cm thick and from ten (10) cm to twenty (20) cm wide. Adjusting screws spaced as not to exceed 60 cm on centers shall be provided between the float and the rib. The float board shall be maintained free of twist and true at all times.

Hand-operated float boards shall be operated from transverse finishing bridges. The finishing bridges shall span completely the roadway area being floated & a sufficient number of finishing bridges shall be provided to permit operation of the floats without undue delay. Not less than two (2) transverse finishing bridges shall be provided when hand-operated float boards are used. When a finishing machine is used for longitudinal floating, one finishing bridge equivalent to the transverse finishing bridge specified herein shall be furnished for use by the Engineer.

All finishing bridges shall be of rigid construction and shall be free of excessive wobble and springing when used by the operators of longitudinal floats and shall be easily moved. Immediate following completion of the deck finishing operations, the concrete in the deck shall be cured.

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The finished surface of the concrete shall be tested by means of a straightedge three (3.0) meters long. The surface shall not vary more than three (3) mm from the lower edge of the straightedge. All high areas in the hardened surface in excess of three (3) mm as indicated by testing shall be removed by abrasive means. After grinding by abrasive mean has been performed, the surface of the concrete shall not be smooth or polished. Ground areas shall not be of uniform texture and shall present neat and approximately rectangular patterns.

Where the concrete of the bridge deck is to be covered by bituminous surfacing, earth, or other cover, two and half 2.5 cms or more in thickness, the surface of the concrete shall not vary more than nine (9) mm from the lower edge of the three (3) meter straightedge.
Bridge deck surfaces under the curbs, railings and sidewalk shall be struck off to the same plane as the roadway and left undisturbed when future widening is shown on the plans.

Curing of Concrete

General

All newly placed concrete shall be cured in accordance with these specifications, unless otherwise directed by the Engineer.

Water Method

The concrete shall be kept continuously wet by the application of water for a minimum period of seven (7) days after the concrete has been placed. Cotton mats, burlaps, rugs, carpets, or earth or sand blankets, may be used as a curing medium to retain the moisture, the entire surface of the concrete shall be kept damp by applying water with a nozzle that so atomizes the flow that a mist and not a spray is formed, until the surface of the concrete is covered with the curing medium. The moisture from the nozzle shall not be applied under pressure directly upon the concrete in a quantity sufficient to cause a flow or wash the surface. At the expiration of the curing period the concrete surface shall be cleared of all curing mediums.

When concrete bridge decks and flat slabs are to be cured without the use of a moisture retaining medium, the entire surface of the bridge deck or slab shall be kept damp by the application of water with an atomizing nozzle as specified in the preceding paragraph until the concrete has set, after which the entire surface of the concrete shall be sprinkled continuously with water for a period of not less than seven (7) days.

Curing Compound Method

Surfaces exposed to the air may be cured by the application of an impervious membrane if approved by the Engineer. For concrete having water-cement ratio of less than 0.50, water curing shall be performed for an initial period of 3 days and then curing compound shall be applied.
The membrane-forming compound used shall conform to ASTM C-309 and shall be a practically colourless liquid. The use of any membrane forming compound that will alter the natural colour of the concrete or impart a slippery surface to any wearing surface shall be prohibited. The compound

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shall be applied with a pressure spray in such a manner as to cover the entire concrete surface with a uniform film, and shall be of such character that it will harden within 30 minutes after application. The amount of compound applied shall be ample to seal the surface of the concrete thoroughly. Power operated spraying equipment shall be equipped with an operational pressure gauge and means of controlling the pressure.

The curing compound shall be applied to the concrete following the surface finishing operation immediately after the moisture sheen begins to disappear from the surface, but before any drying shrinkage or craze cracks begin to appear. In the event of any delay in the application of curing compound, which results in any drying or cracking of the surface, application of water with an atomizing nozzle as specified under "Water Method", shall be started immediately and shall be continued until application of the compound which shall not be applied over any free standing water surface. Should the film of compound be damaged from any cause before the expiration of seven (7) days after the concrete is placed in the case of structures, the damaged portion shall be repaired immediately with additional compound.

Curing compounds shall not hard settle in storage. They shall not be diluted or altered in any manner after manufacture. At the time of use, the compound shall be in a thoroughly mixed condition. If the compound has not been used within one hundred twenty (120) days after the date of manufacture, the Engineer may require additional testing before use to determine compliance to requirements.

An anti-settling agent or combination of anti-settling agents shall be incorporated in the curing compound to prevent caking. The curing compound shall be packaged in clean barrels or steel containers or shall be supplied from a suitable storage tank located at the job-site. On-site storage tanks shall have a permanent system designed to completely re-disperse any settled material without introducing air or any other foreign substance. Containers shall be well sealed with ring seals and lug type crimp lids. The linings of the containers shall be of a character that will resist the solvent of the curing compound. Each container shall be labeled with the manufacturer's name, specification number, batch number, number of gallons, and date of manufacture, and shall have a label warning concerning flammability. The label shall also warn that the curing compound shall be well stirred before use. When the curing compound is shipped in tanks or tank trucks, a shipping invoice shall accompany each load. The invoice shall contain the same information as that required herein for container labels. Curing compound may be sampled by the Engineer at the source of supply and at the job-site.

Forms-in-Place Method

Formed surfaces of concrete may be cured by retaining the forms-in-place. The forms shall remain in place for a minimum period of seven (7) days after the concrete has been placed, except that for members over five (5) cm in least dimension, the forms shall be in place for a minimum period of five (5) days. Wooden forms shall be kept wet by watering during the curing period.

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Polyethylene Sheeting

The wet surface of fresh concrete shall be covered with white polyethylene sheeting as soon as possible without marring the surface and should cover all exposed surfaces of the concrete. The edges of the sheeting shall be weighted securely with a continuous windrow of earth or any other means satisfactory to the Engineer to provide an air-tight cover. Adjoining sheets shall overlap not less than thirty (30) cm and the laps shall be securely weighted with earth, or any other means satisfactory to the Engineer to provide an air-tight cover.

Curing Structures

All newly placed concrete for cast-in-place structures, other than highway bridge decks, shall be cured by the water method, the forms-in-place method, or, as permitted herein, by the curing compound method, all in accordance with the requirements. The curing compound method may be used on concrete surfaces which are to be buried underground, and surfaces where only Ordinary Surface Finish is to be applied and on which a uniform colour is not required and which will not be visible from any public traveled way.

The top surface of highway bridge decks shall be cured by both the curing compound method, and by the water method. The curing compound shall be applied progressively during the deck finishing operation immediately after finishing operations are completed on each individual portion of the deck. The water cure shall be applied not later than four (4) hours after completion of the deck finishing or, for portions of the decks on which finishing is completed after normal working hours, the water cure be applied not later than 8.00 a.m. the following morning.

Curing of Precast Concrete Piles

All newly placed concrete precast piles, both conventionally reinforced and prestressed shall be cured by the "Water Method" as described in specifications except that the concrete shall be kept under moisture for at least fourteen (14) days.

Testing of Aggregates

Samples of fine and coarse aggregate to be used shall be selected by the Engineer. It shall be the responsibility of the Contractor to designate the source or sources of aggregate and to obtain the necessary samples and submit them for testing at least thirty (30) days before actual concreting operations are to begin. Samples of aggregates shall be obtained and tested in accordance with the following standard AASHTO methods

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i.	Sampling aggregates	T-2
ii.	Sieve analysis	T-27
iii.	Amount of material passing the No.200 sieve	T-11
iv.	Organic impurities	T-21
v.	Abrasion loss	T-96
vi.	Specific Gravity	T-84
vii.	Absorption	T-85
viii.	Fineness Modulus	T-27
ix.	Potential Reactivity of Carbonate Rocks for Concrete Aggregate (Rock Cylinder Method)	ASTM C 586
x.	Potential Alkali Reactivity of Cement -Aggregate Combinations	ASTM C 227
xi.	Potential Reactivity of Aggregates (Chemical Methods)	ASTM C 289

No aggregate for testing during the production of concrete shall be sampled at the discharge gates of the bins feeding the weight hopper. The Contractor, at his expense, shall provide safe and suitable facilities for obtaining the samples. No concreting work on the project will be permitted until the Engineer signifies in writing his approval, following the performance of the necessary tests, on all the materials involved in making concrete.

Testing of Compressive Strength

Concrete compressive strength requirements consist of a minimum strength at the age of twenty-eight (28) days and the minimum strength which must be attained before various loads or stresses are applied to the concrete. The compressive strength of concrete will be determined from test cylinders, which have been fabricated from concrete sampled and tested in accordance with AASHTO T 23 and AASHTO T 22 and ASTM C109 (Cubes) & C39 (Cylinders).

A set of six (6) cylinders shall be taken from each fifty (50) cubic ft of each class of concrete or fraction thereof placed each day, three (3) of the six (6) cylinders to be tested after seven (7) days and three (3) after twenty-eight (28) days.

The minimum average 28 days test result of all samples tested at any time shall be the specified twenty-eight (28) days strength.

No individual samples tested after 28 days shall show a test result lower than eighty-five (85) percent of the required twenty-eight (28) days.
Concrete represented by any single test cylinder that fails to comply with the requirement under (b) above will be rejected unless the Contractor at his expense provides evidence that the strength and quality of the concrete placed in the work are acceptable. If such evidence consists of tests made

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on cores taken from the work, the cores shall be obtained and tested in accordance with the specifications of AASHTO T-24 and ASTM D5581-07A (2021).

Test results of the cores shall meet the following requirements: -

Average test result of the cores shall be less than the minimum required twenty-eight (28) days strength.

No individual core shall show strength less than ninety-five (95) percent of the required twenty-eight (28) days strength. Should the above test results fail to comply with the requirements, concrete of that particular pour shall be rejected and removed as directed by the Engineer. Furthermore, contractors shall redesign the concrete mix for approval of the Engineer. In case, seven (7) days strength shows less than seventy (70) percent of the twenty-eight (28) days strength (in case of type-I cement), Engineer may stop further work on that particular portion of concrete, unless twenty eight (28) days strength gives satisfactory results.

Measurement Payment

The accepted quantity measured as provided above shall be paid for at the contract unit price rate as in the Bill of Quantities. No extra payment shall be made to the contractor if any item is not available /provided in the Bill of Quantities.

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BRICKWORK

General

All bricks shall be new and of the best quality of their respective kinds. They shall be clean, hard, sound and well burnt, equal in size, straight and sharp in the arris, and shall be obtained from manufacturers approved by the Engineer. Samples of ten bricks from each consignment of 2000 bricks or less are to be submitted to the Engineer for his approval, and every consignment delivered to the Works shall be equal in quality to the approved samples retained by the Engineer.

Bricks delivered to and within the Site shall be unloaded by hand and not tipped.

Materials

Bricks

All bricks shall be new and of the best quality of their respective kinds. They shall be clean, hard, sound and well burnt, equal in size, straight and sharp in the arises and shall be obtained from manufacturers approved by the Engineer. Samples of ten bricks from each consignment of 2000 bricks are to be submitted to the Engineer for his approval and every consignment delivered to the Works shall be equal in quality to the approved samples retained by the Engineer.
The testing of bricks shall comply with ASTM C 67 physical requirements of the bricks shall be as given below.

Bricks	Minimum Compressive Strength (brick flat wise)	Maximum Water Absorption in 5-hour Boiling	Maximum Saturation Co-efficient
Individual	2,000 Psi	25%	0.90
Average of 5 bricks	2,100 Psi	22%	0.88

The saturation coefficient is the ratio of absorption by 24-hours submersion in cold water to that after 5-hours submersion in boiling water.

Sand

The sand for mortar used in the construction of brick paving, brick lining and brick masonry shall be natural sand furnished by the contractor from approved source and when tested by means of standard screens (ASTM Designation: E11-81), shall conform to the following limits:

Screen No.	Percent, By Weight, Passing Screen
8 100	100 15 (Maximum)

Within the above range, the sand shall be well-graded and shall be as coarse as practicable for the production of workable mortar.

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Cement & Water

The specifications shall be same

Cement Mortar for Brickwork

Cement: sand mortar shall be in the proportion by volume as shown on the drawings/specification mixed with just sufficient water to make it workable. Mortar shall be mixed only in sufficient quantities for immediate use, and all mortar not used within 30 minutes after addition of the water shall be discarded.

Laying

If not stated otherwise, English Bond shall be used for laying brickwork. Bricks shall be laid true to line in level courses and to the dimensions shown on the Drawings or ordered by the Engineer. Immediately before being laid, the bricks shall be thoroughly soaked in clean water, and before continuing partly completed work, the exposed bed joint shall be likewise soaked. The joints shall generally be not more than 0.25 inch in the beds, and 0.50 inch at the ends or such other dimensions as may be agreed by the Engineer and the whole joint shall be filled with mortar.

Brickwork shall be carried up in a uniform manner, and no one portion carried more than 3 ft above another, the ends being racked not toothed.

Pointing

Unless otherwise specified exposed faces shall be racked out to a depth of 1/2 inch and pointed as the work proceeds, care being taken to ensure uniform colour. The mortar used for pointing shall consist of one part of Cement to three parts of building sand by volume mixed with just sufficient water to make it workable.

Areas of existing brickwork to be re-pointed shall have existing mortar removed from all exposed joints to a minimum depth of 1/2 inch and the joints re-pointed with a 1:3 cement: sand mortar.The Contractor shall thoroughly clean brickwork that is to be re-pointed. Where brickwork is generally sound, existing mortar shall be removed to a depth of 1/2 inch or deeper where the mortar is found to be soft or otherwise deteriorated. The method of removal shall be by pointing chisel or by such other mechanical means approved by the Engineer. After removal of mortar the brickwork shall be thoroughly washed with clean water after which the brickwork shall be dried so as to leave a small amount of free water on the surface and in the joints.

All joints in faces not exposed shall be filled flush with mortar.
All brickwork shall be cured as it is constructed and for not less than 10 days.

Plastering

The joints of brickwork to be rendered shall be raked out to a depth of 1/2 inch and the surface shall be washed and cleaned and well wetted before the work is executed. Plastering shall be in the

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Cement: Sand proportions as shown on the drawing/specification by volume mixed with just sufficed water to make it workable.

Areas of existing brickwork to be re-plastered shall have existing mortar removed from all exposed joints to a minimum depth of 1/2 inch. The Contractor shall thoroughly clean brickwork that is to be re-plastered.

Where brickwork is generally sound, existing mortar shall be removed to a depth of 1/4 inch or deeper where the mortar is found to be soft or otherwise deteriorated. The method of removal shall be by pointing chisel or by such other mechanical means approved by the Engineer. After removal of mortar the brickwork shall be thoroughly washed with clean water after which the brickwork shall be dried so as to leave a small amount of free water on the surface and in the joints.

The top coat shall be finished to a true and even surface with a wood float. Corners shall be finished true, vertical, and even carried out at the same time as adjacent wall surfaces. All brickwork shall be cured as it is constructed and for not less than 10 days.

Measurement and Payment

Brickwork shall be measured by volume. The unit of measurement shall be cubic foot. The unit rate for brickwork shall include the cost of carrying out brickwork, cutting bricks, whenever required, curing and protecting as per specifications or as directed by the Engineer. It shall further include the cost of providing, using and removing scaffolding, shuttering, centering, staging, ladders, supports and other tools and plants required for carrying out brickwork in accordance with the specifications.

The unit rate shall include the cost of pucca/burnt bricks, cement sand mortar and any other material required Cement plaster will be measured by surface area in square feet in accordance with the Specifications to the limits shown on the drawings or ordered by the Engineer.

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DISMANTLING OF EXISTING STRUCTURES

General

The Contractor shall provide labour, equipment and material to perform the dismantling/demolition of structures completely or partially as specified on the Drawings and directed by the Engineer.

Works included in Dismantling

Dismantling shall include, but will not be limited to, the following:

a) demolition of structures to be completely removed;

b) removing cement or lime plaster;

c) demolition of protection works to be completely removed;

d) dismantling carefully a part of a structure without causing damage to the part of the structure to be retained as a part of the new structure;

e) protecting structures or parts of the same structure from damage during dismantling operations;

f) disposing of the waste materials to the approved waste pile or as directed by the Engineer;

Masonry and Concrete (Plain or Reinforced) Works

Dismantling of masonry and concrete (Plain or Reinforced) as required to be carried out to existing structures which are to be partially preserved shall be undertaken using pickaxes and crowbars by manual labour up to the lines and levels as shown on the Drawings or as instructed by the Engineer. Any damage caused to the Works during the dismantling operations shall be repaired or replaced at the expense of the Contractor. Dismantled material shall be stacked or disposed of as directed by the Engineer.

Removal and Reuse

Pre-cast concrete blocks, stone, bricks and other materials which the Engineer instructs for reuse shall be removed safely using mechanical equipment, if necessary, and stored in a nearby place as directed by the Engineer. The removed material shall be cleaned and reused at locations as directed. Steel and wood shall be stacked item-wise in Employer's stores irrespective of whether it will be re-used or not, as directed by the Engineer.

Measurement and Payment

Dismantling shall be by bulk, surface area or linear dimensions depending upon the article to be dismantled. The units of measurement shall be cubic foot square foot or one (1) Rft.
The unit rate for dismantling shall include demolition of material, its careful lowering to the ground, sorting out and stacking within 300 feet of the site of demolition.

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INSTALLATION OF GATES, PAINTING AND PROTECTION

General

Unless otherwise specified, the workmanship and quality of materials for painting shall comply with BS 6150: 1991 "Code of Practice for Painting of Buildings" and BS 5493; 1977; "Code of Practice for Protection of Iron and Steel Against Corrosion". No paint shall be used after the date of expiry of the "shelf life" marked on its container, and on such expiry, the paint shall be immediately removed from the Site.

Paint shall be thoroughly mixed under the supervision of a competent foreman in a manner approved by the Engineer and shall not be passed to the painters until both it and the surface to be painted have been properly prepared.

Paints

The Contractor shall submit certificates from the approved manufacturer(s) giving a guarantee that the paints offered conform to the relevant standard (e.g. BS 5493), and the Specifications, are suitable for the local climate and compatible with the surface of application. The Manufacturer and types of paint shall not be changed unless prior written approval is obtained from the Engineer. The Contractor shall use the advisory services of the paint Manufacturer. Should any such advice conflict with these Specifications, the Contractor shall obtain written instructions from the Engineer before proceeding with the work. The paint Manufacturer shall be allowed to inspect the preparation and painting during all stages of the Contract and to report to the Engineer.

All coats of paint for coating a given system shall be compatible with each other and shall be of the same Manufacturer unless otherwise approved in writing by the Engineer.

Each consignment of paint shall be delivered in containers sealed by the Manufacturer, accompanied by a certificate guaranteeing that the paint conforms to relevant Standards and Specifications. The date and results of tests and analyses performed during manufacturing shall be attached. The capacity of the containers shall not exceed 0.03 m3. The name of the Manufacturer, type of paint, batch number, special storage conditions, etc. shall be clearly shown on each container. Containers shall remain unopened, apart from necessary sampling, until required for use, and used in order of delivery.

Paint not used within the period specified on the containers or within 12 months of the date of manufacture, whichever is less, shall be replaced.

Paint shall retain its properties during storage at the site, and any paint which fails in this respect shall not be allowed to be used in the Works.

Livered, gelatinized, or otherwise deteriorated paints shall not be used.

Testing of Paint

Before ordering any materials for painting the Contractor shall produce samples thereof, tested, as specified by the Engineer, by a testing authority, proposed by the Contractor and approved by the

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Engineer, to establish that the painting system is capable of withstanding any handling or site conditions that are likely to occur. Test pieces shall be painted by the Contractor, separately for each type of paint.

If the Engineer so requires, samples from the containers shall be taken and tested at any time after delivery at the site.

Preparation and Maintenance of Surfaces to be Coated

The Contractor shall regard the preparation of surfaces to be painted as a work of fundamental importance, the object of which is to ensure the production of sound. These clean and dry surfaces shall have no detrimental effect on the material to be treated and the subsequent treatment. Contact surfaces in welded construction that will be completely sealed shall be left unpainted.
The surface that will be in contact with concrete when erected on Site shall receive no treatment or painting.

The contact surface of sub-assemblies which are put together at the manufacturer's workshop and which will be in permanent contact or concealment after shop assembly shall each be cleaned and painted with one coat of priming paint before assembly and brought finally together while the paint is still wet. Rags, brushes, and tools used in the preparation of surfaces for painting shall be clean. Surfaces contaminated with oil or grease shall be cleaned with white spirits. Immediately before paint is applied, the whole of the surface to be painted shall be thoroughly cleaned of all dust, loose paint, or dirt by washing down with fresh clean water and as necessary by brushing with a bristle brush and allowed to dry thoroughly.
Contract surfaces and surfaces to be painted shall be maintained clean of cement grout or concrete, and any such contamination shall be thoroughly washed away with fresh, clean water before it has hardened. The surface to be painted shall be properly prepared and ample time shall be allowed for dry and hardening before the application of successive coats of paint, and no exterior painting shall be done in wet, foggy, or frosty weather.

Preparation of the initial surface of the material to be coated shall be as described in the relevant material-related clauses. Immediately before any coat is applied the whole of the surface to be painted shall be thoroughly cleaned of all dust, loose paint, or grease by washing down with fresh clean water and, where necessary, brushing with a bristle brush.
The Contractor shall examine all surfaces before applying any coats. No paint shall be applied to wet, alkaline, damp, rough, or greasy surfaces. No coating shall be applied to any surface before the Engineer has inspected the cleaned and prepared surface.

Painting Workmanship and Conditions

All works shall be carried out only by skilled labor, experienced in using the materials specified. All paints shall be thoroughly mixed until homogeneous, and, if necessary, be strained free from skins, lumps, or sediment. Thinners and driers may only be added to enable the paint to comply

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with the specified application or drying requirements. Thinners and driers shall be compatible with the paint and shall not be used without the approval of the Engineer and paint Manufacturer.

To prevent loss of adhesion and solvent entrapment, the paint Manufacturer's instructions shall be followed particularly in respect of minimum and maximum periods between coats and temperature range for application.

The methods of application of paint shall be subject to the approval of the Engineer and shall be by the paint Manufacturer's recommendations. Where spoiling of an adjacent surface is likely to occur, and in the case of paints containing lead, no spraying shall be permitted.

If surfaces to be brushed or roller painted are not smooth, they shall be rubbed down and dusted off to obtain a smooth and matt surface to which the next coat will firmly adhere. Rags, brushes, and tools used in the preparation and painting of surfaces shall be cleaned with white spirit or a thinner as approved by the Engineer.

Paint film shall not have excessive or uneven thickness and the finished surface shall be defects-free. The final coat shall be smooth and free from defects, including those showing through from preceding coats. At the end of every working period paints with a limited "pot life" shall be discarded and not be mixed with fresh paint.

Painting work shall not be exposed to direct sunlight. Prepared, primed or undercoated work shall not be left exposed for an undue period before completion of the painting process. Fittings such as ironmongery, switches, electrical fittings, etc. not required to be painted shall be removed before the painting process is commenced and refitted after completion of the painting.

After each coat is applied the Contractor shall, in the presence of the Engineer, test the paintwork. The maximum dry film thickness shall not exceed the minimum figure specified for the particular class of protection by more than twenty percent (20%). The Contractor shall be responsible for the provision of all equipment for testing the protective coatings and shall remedy all defects to the Engineer's satisfaction.
The Contractor shall take measures to prevent any paint coat in any way at any stage from being damaged. If notwithstanding such measures a paint coat is damaged, the Contractor shall immediately repair such damages to the satisfaction of the Engineer.

Protection of Hardwood

Hardwood surfaces shall not be painted but shall be treated with three coats of white linseed oil to BS 242 well rubbed in.

Protection and Painting of Softwood

All softwood joinery in contact with external walls or exposed to the elements shall not be painted but shall be made from timber that has been given preservative treatment by vacuum/pressure impregnation with water-borne preservative by BS 4072 Class B or other approved.

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Joinery that is to be painted shall be primed with one coat immediately after fabrication. The primer shall be lead-based complying with BS 2521. Spraying of paint will not be allowed in the application of the first priming coat. Contact surfaces with brick, masonry or concrete shall be given a second coat or primer. After fixing and before applying any subsequent coats of paint, the primer shall be examined for defects and holidays. Powdery, brittle, or peeling primer shall be removed, holes, cracks, and blemishes in exposed surfaces shall be stopped with putty, and knots shall be treated with approved knotting, and such surfacing shall be made good with primer joinery shall then be painted with one undercoat and two gloss finishing coats of compatible alkyd resin paints from the same manufacture, of approved colors. The first gloss-finishing coat shall be rubbed down on interior surfaces before the top coat is applied.

Painting of Concrete, Plaster and Blockwork

The surface of concrete, rendering, plaster, and blockwork that are specified or ordered to be painted shall be allowed to dry after preparing them as specified in Clause 8.04 hereof and shall then be treated with a fungicidal wash. Subject to the approval of the Engineer the fungicidal wash may be omitted. Oil-painted surfaces shall be primed with one coat of approved sealer, and painted with one undercoat and gloss finishing coat of alkyd resin paint. Epoxy-painted surfaces shall be primed with one coat of dry film thickness of not less than 100 microns.

Protection and Painting of Aluminium

Aluminum shall be decreased by the use of solvents that are compatible with any of the same manufacture as the paint finishes to be applied. Within four hours of degreasing polyamide-cured epoxy etch primer shall be applied to give a minimum film thickness of 50 microns. The final finish shall be coats of polyamide-cured pure epoxy resin incorporating inert pigments of an approved color to give a dry film thickness of no loss of 100 microns.

If damage occurs before applying the final finish, any damaged areas of the previous finish shall be made good by a powered or hand-operated wire brush. The surfaces shall be degreased with a suitable solvent and further coats of the previous finish applied to obtain the original quality and thickness. In any event, the previous finish shall be thoroughly cleaned, all grease, dirt, and dust removed from the surface as appropriate and within two hours the final finish applied.

Galvanizing

Where steel or wrought iron is specified to be galvanized the galvanizing shall be executed by BS 729 after all fabrication has been completed. The articles shall be cleaned and pickled in hydrochloric or phosphoric acid. They shall be thoroughly washed, stoved dipped in molten zinc, and brushed so that the whole of the metal shall be evenly covered and the additional weight thereof after dipping shall be not less than 0.6 kg/m2 of surface galvanized, except in the case of tubes to BS 1387 when it shall be not less than 0.45kg/m2. Edges shall be clean and surfaces bright.

Galvanizing of steelwork is to be carried out as described in this Clause and is indicated as Coating System C. Steelwork to be galvanized shall be cleaned from all weld spatters, slag, mill scale, and other contaminants. Removal of corrosion products and surface treatment immediately before galvanizing shall be done by pickling. Pickling shall be done in a solution of hydrochloric acid.

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The acid shall then be neutralized, after which the steelwork shall be washed and dried. Finally, the steelwork shall be dipped in the galvanizing bath.

Unless otherwise specified, all steelwork shall be hot dip galvanized according to BS 729 with a minimum deposition rate of 460 g/m2, after completion of all welding, drilling, grinding, and trimming of the metal. Hand railings and other big steelwork items may be galvanized in sections. The galvanized surface shall be smooth and free from slag and other impurities. All parts shall be passivated after galvanizing to minimize discoloration.

Any damage to galvanizing due to transport or installation shall be made good at the Contractor's expense by a method approved by the Engineer. Where galvanized items have been cut or damaged on site, the Contractor shall immediately make good the damage to the galvanizing or the cut edge using an approved zinc-rich cold galvanizing paint. The paint shall be applied strictly by the manufacturer's instructions and with the approval of the Engineer. Repairs to damaged items shall only be carried out with the express permission of the Engineer.

Painting of Galvanized Surfaces

If galvanized surfaces as per System C or manufacture-galvanized surfaces of sheet, wire, door frames, etc. are to be painted this shall conform to the requirements of this Clause, indicated as Coating System D.

Galvanized surfaces shall be passivated or weathered before painting with an approved etch primer (other than a mordant containing copper), which shall be a two-pack primer applied by the Manufacturer's instructions.

After drying the etch primer surface shall be thoroughly rinsed with clean fresh water and allowed to dry. The finish shall consist of two coats of two-pack epoxy enamel (of color as approved by the Engineer) with a dry film thickness of fifty (50) microns per coat.

Protection and Painting of Metal

Unless otherwise specified, metal surfaces shall be cleaned by manual or mechanical processes. Flame cleaning or chemical processes may only be used on-site with the Engineer's prior approval. Fabricated steel that is not galvanized shall be primed with one coat of red lead before leaving the works. After erection, any damaged areas shall be cleaned of all rust, grease, and scale and reprimed with one coat of red lead paint. Subsequently, after cleaning off all dirt and grease, two coats of silver-grey micaceous iron oxide paint shall be applied.

Galvanized steel surfaces shall be treated before painting with an approved etching primer (other than a mordant containing copper) which shall be supplied in two parts for mixing at the site by the manufacturer's instructions. The surfaces shall afterward be thoroughly rinsed with clean water and allowed to dry. Galvanized steel surfaces shall be painted as specified for softwood except that no other priming coat only one undercoat and one gloss-finishing coat are required.

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Where bituminous-coated metalwork is required, it shall have a minimum of three coats of bituminous paint.

Other steel or metalwork, unless otherwise specified, immediately after cleaning shall be primed with one coat of red lead paint to BS 2521 and 2523 and painted as specified for joinery.
Unless otherwise specified, all iron and steelwork surfaces shall before painting be blast cleaned. Blast cleaning shall be dry blasting using metallic grit or other silica-free abrasive. The grade of cleanliness after blasting shall conform to grade SA 2.5 according to Swedish Standard SIS 05-59-00; 1967.
Care shall be taken to blast clean bolt holes and other penetrations. Before coating, all dust shall be removed from the surface. The first layer of coating shall be applied within one (1) hour after blast cleaning. If the relative humidity is more than seventy-five percent (75%) this time shall be reduced to one-half (½) of an hour. Field welds shall be cleaned of welding slag and have sharp edges rounded off before applying paint coating.

Blast cleaning and application of all paint coats shall be done where the structural steel is fabricated. All workshop painting shall be carried out under cover and remain so until the paint has fully cured. Workshop painting shall be carried out by high-pressure airless spray. The methods of painting shall be according to the manufacturer's recommendations and instructions.
The following coating systems shall be applied to steelwork:
Coating System A, for steel in continuous contact with water or exposed to permanent humid conditions:

Blast cleaning to SA 2.5;

One coat of two-pack zinc-rich epoxy primer with a minimum dry film thickness of twenty-five (25) microns within the specified time (0.5 or 1 hour);
Two coats of two-pack high-build coal tar epoxy paint, each coat with a minimum dry film thickness of two hundred (200) microns to be applied within forty-eight (48) hours after priming.

Coating System B, for all other steelwork the following system shall be used:

Blast cleaning to SA 2.5.

One coat of two-pack zinc-rich epoxy primer with a minimum dry film thickness of twenty-five (25) microns within the specified time (0.5 or 1 hour);
One or two coats of two-pack high-build epoxy coating pigmented with micaceous iron oxide, with a total minimum dry film thickness of one hundred and fifty (150) microns;
Two coats of two-pack epoxy enamel of a color to be specified with a minimum dry film thickness of fifty (50) microns per coat. If the steelwork is concealed, one coat of enamel can be omitted.

Painting of Rainwater Gutter

The rainwater gutter to the valve tower superstructure shall be protected with a system manufactured by All-weather Evode Paints Ltd., 36 Great Queen Street, London WC2 B5Ap, or similar approved; as follows: -
The surface shall be cleaned and degreased with Pitan Etch Primer Thinners.
After a minimum of one hour and a maximum of four hours apply one coat of Pitakote Hi-build, dry film thickness 125 microns.

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After a further minimum of 16 hours apply a second coat of Pitakote Hi-build, dry film thickness of 125 microns.

Summary of Surface Coatings

Table presents the essentials for surface coatings.

Coating Systems

System	Application	Description
A	For steel in contact with water, soil, or exposed to humid conditions.	Blast cleaned to SA 2.5. One coat of two-pack zinc-rich epoxy primer with a minimum dry film thickness of 25 microns. Two coats of two-pack high-build coal tar epoxy paint, each coat with a minimum dry film thickness of 200 microns to be applied within 48 hours after priming.
B	For other steel structures.	Blast cleaning to SA 2.5. One coat of two-pack zinc-rich epoxy primer with a minimum dry film thickness of 25 microns One or two coats of two-pack high-build epoxy coating pigmented with micaceous oxide, with a total minimum dry film thickness of 150 microns. Two coats of two-pack epoxy enamel of a color to be specified with a minimum dry film thickness of 50 microns per coat.
C	For steel in special conditions and cast in concrete.	Removal of slag, scale, and other impurities. Pickling in hydrochloric acid, neutralizing, washing and drying. Hot dip galvanizing following BS 729.
D	For galvanized steel.	For freshly galvanized surfaces, passivation, and or weathering. Cleaning and degreasing. One coat of two-pack etch primer. Two coats of two-pack epoxy enamel of a color to be specified with a minimum dry film thickness of 50 microns per coat.
E	For softwood carpentry – visible.	Preservative treatment conforming BS 4072 to the tropical proofing schedule. Cleaning, scouring, and dusting down. One coat of solvent-based wood primer conforming to BS 5358. Scouring and dusting down. One oil-based undercoat. Two oil-based gloss finishing coats of a color to be specified.
F	For softwood Joinery – not visible.	Preservative treatment conforming BS 4072 to tropical proofing schedule. One coat of lead or red lead/red oxide-based wood primer, two coats on contact surfaces to blockwork or concrete.
G	For hardwood – visible.	Preservative conforming BS 4072 to tropical proofing schedule. Water-repellent penetrating varnish exterior grade – full gloss.
H	For wood in water or soil.	- Immersion in a hot (117°C) mixture of 1:1 creosote-fuel oil for 40 minutes.
J	For cementitious surfaces such as concrete, block work, and rendering.	One coat of primer or undercoat for cement surfaces with incorporated fungicide. Two coats of acrylic emulsion of a color to be specified.

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Conditions for Painting

Each coat of paint shall be allowed to dry and harden thoroughly before the application of the next coat. No painting shall be done in wet or foggy weather or without the Engineer's prior approval when during the period of painting or hardening the temperature is or is likely to be less than 150C or more than 320C or the relative humidity more than 90%. During hot weather and when requested by the Engineer the surfaces shall be shaded from the direct rays of the sun during the application and hardening of paint.

Internal paintwork to buildings other than priming and scaling shall not be commenced until all other trades have finished and, on plastered or rendered surfaces until the surfaces have fully hydrated and dried.

Measurements and Payment:

No separate payment shall be made for complying with any other provisions of this chapter except where otherwise detailed in the Bill of Quantities

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QUALITY CONTROL AND QUALITY ASSURANCE

SCOPE OF WORK

General

The Contractor shall be responsible for providing all Quality Control measures to ensure compliance of the Works with the Drawings or as stated in the Bidding Documents. The Engineer may perform activities such as surveying quantity measurements materials testing, as are necessary to verify the quality, accuracy and quantity of the completed Works. The Construction shall not be undertaken without the Engineer's approval and no payments will be made to the Contractor for quantities of construction works which are not accepted by the Engineer.

CONTRACTOR'S QUALITY CONTROL PLAN

General

The Contractor Quality Control Plan shall include a detailed description of the organization, procedures and facilities proposed to ensure that the construction is carried out in accordance with the Specifications and Drawings. This plan shall be applicable to work performed by any sub-contractor.

The Quality Control Plan shall include, but not be limited to detailed procedures, instructions or statements covering the following items. The Contractor shall submit his Quality Control Plan to the engineer with sufficient time for review and approval prior to the commencement of work. The Contractor's Quality Control Plan shall be periodically reviewed as the work proceeds.

Organization

The Quality Control Plan shall describe the Contractor's organization and delineate the responsibility and authority of the various personnel and groups involved. The Quality Control Department's internal structure and relationship with other departments shall be defined. An organizational chart shall be prepared showing lines of authority and communication.

Personnel

The Contractor shall supply properly trained and qualified personnel to procure samples for testing, to conduct tests and analyze samples of soils, concrete, and other construction materials. The Contractor shall provide for the duration of the Contract, competent, suitably qualified engineers whose sole duties shall consist of material location, testing and control in accordance with the Specifications.

The Contractor shall supply properly trained and qualified personnel to prepare construction drawings as required. Drawings, when prepared by the Contractor, will include all information and data required for preparation by the engineer of As-Built Drawings. The Contractor shall provide properly trained and qualified surveyor and survey crews and all necessary survey equipment as may be required to perform all construction survey activities, measurement of quantities, and for any surveys required for preparation by the Engineer of As-Built Drawings. The above personnel will be subject to approval by the Engineer.

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The Contractor shall provide labour, equipment and materials to the Engineer for examining measuring and testing any works.

Document Control

The Quality Control Plan shall assure that the Specification requirements are correctly translated into and included in the Contractor's procedures, documents and drawings. The Plan shall further assure that the latest approved documents, including changes, are available to and use by the required manufacturing, inspection and test personnel.

Source Approval

The Contractor shall obtain source approval of all materials prior to their use in the Work. Source approval submittals shall include the name and address of all manufactures and suppliers, recent test results showing complete compliance with the Specifications specified standards, the date of manufacture, storage conditions and shelf life if appropriate. In addition the Contractor shall provide representative samples of the material of a sufficient size that the engineer may perform all specified tests. Once source approval has been granted by the Engineer all deliveries of the material to the site must in turn be submitted for approval accompanied by all relevant test reports to show full compliance of the material with the Specifications.

Where the required tests cannot be performed at the site Quality Control Laboratory then the Contractor shall arrange for independence testing, at a laboratory approved by the Engineer, to be performed to show that the material complies with the Specified standards Cost of such testing will not be reimbursed.

The Contractor's procurement process shall assure that purchased items comply with the requirements of the Specifications.

Processed Material Control

The Quality Control Plan shall provide assurance that procured and subsequently processed material complies with the Specifications. Material identification shall be provided and maintained. Control shall be provided for the documentation and disposal of no-conforming material, and their subsequent rework or repair and re-inspection. The Programme shall also provide for the prior notification to the Engineer of proposed rework or repair or non-conformance for his evaluation and approval.

Special Processes

Special Processes such as sandblasting, installation of elastomeric sealant, welding, etc., shall be performed in accordance with documented process procedures and by qualified personnel. The procedure shall describe the process sequence and methods, process prerequisites, equipment, qualification of personnel and equipment, and acceptance criteria. The procedure shall describe the preparation and retention of documents used to record the results of special Processes.

Inspection

The Quality Control shall provide for the inspection of activities and completed items of work by the Contractor to assure compliance with the Specifications prior its submittal to the Engineer. Examination or measurements shall be performed at each applicable work operation. The Contractor's inspection shall be performed by qualified individuals other than those who performed the activities being examined

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Calibration

Procedures shall be established to assure that tests and measuring devices used to test, or accept materials or components are calibrated at specified intervals to maintain the proper accuracy. Devices use shall be of a proper range, type and sensitivity to reliably measure the parameters being evaluated. The calibration of such devices shall be documented and shall be performed using certified measurement standards, and submitted to the Engineer for approval.

Documentation

The Quality Plan shall include a system to ensure that the documentation necessary to attest the completion of any phase of the work, use of correct materials, completion of required inspections and tests, and acceptability of results is generated, reviewed, maintained and submitted to the Engineer at the required time. The system shall ensure that such documentation is reviewed by the Contractors for legibility, completeness, validity of data, and traceability of the document to activity or equipment.

The documentation to be issued and maintained shall include.

Test reports for raw material (cement, steel, aggregates, etc.)
Survey and layout procedures
Inspection and test procedures
Inspection and test reports
Final Inspection Reports
Weld and weld repair procedures

Submittal of Contractor's documents

The Contractor shall submit a draft of the Quality Control Plan for review by the Engineer within 28 days of the Engineer's Notice to Commence. The final version shall be submitted within 28 days of receipt of the Engineer's comments.

The Contractor's Quality Control Plan shall be periodically reviewed and revised as the work proceeds.

CONTRACTOR'S QUALITY CONTROL TEST PROGRAMME

General

The Contractor shall submit his Quality Control Test Programme to the Engineer for review and approval prior to the commencement of work. The Contractor's Test Programme shall be suitably documented to assure that the required materials and component testing is properly performed. The test Programme shall address pertinent test prerequisites, such as test instrumentation selection and calibration, acceptance criteria, documentation of test results, and evaluation of test results by qualified personnel. The Quality Control Test Programme shall include, but not be limited to, location of facilities, type, number and capacity of equipment, plant layout drawings, staff, vehicles and procedures.

The Contractor shall ensure that the proper number and types of samples are obtained, identify the tests and analyses required, and ensure that the tests and analyses conducted are in accordance with accepted procedures and standards. The Engineer shall be invited to be present during the test or inspection. If the Engineer decides not to be present, the work may proceed. The Engineer will supervise as necessary tests performed by the Contractor both in the field and in the Contractor's

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laboratories. The Engineer may himself perform such independent tests and analyses as are necessary to verify the results of all tests and analyses conducted by the Contractor. The Engineer may request retesting by the Contractor of any material when and wherever required, supervised by the Engineer.

Quality Control Testing Facilities

As a part of the construction materials' Quality Control Programme, the Contractor shall set up laboratories in full working order, suitably equipped and staffed to carry out the sampling and testing to the extent and frequency necessary to ascertain that the work complies with the Specifications. The Contractor's laboratories shall include sufficient office space and furniture for the Engineer's supervisory personnel. A testing facility shall be erected at each concrete batching plant capable of performing all routine aggregate tests and sampling of constituents and concrete.

Quality Control Tests to be Performed by the Contractor

All samples and tests shall be taken by the Contractor at such locations and in such a manner as instructed by the Engineer. The sampling frequency may vary at the discretion of the Engineer.

The Contractor shall inform the Engineer at least 4 hours before he proposes to carry out any field test or at least 1 hour before any laboratory test so that the Engineer may supervise the test or the taking of the sample.

If in the opinion of the Engineer field density test results are anomalous, 2 additional test shall be made by the Contractor under the supervision of the Engineer in the same layer arid the average of the 2 additional tests shall be adopted as the true representative value. Results of field density test shall be made to one decimal place.

Tests required to be performed for purposes of Clause 36 of Conditions of Contract shall include, without limitation as to the other tests required for purposes of the said Clause 36 or required specific sections of the Specifications the following:

A. Tests:

Auger sampling (ASTM D 1452)
Liquid Limit (LL) (ASTM D 4318)
Plastic Limit (PL) (ASTM D 4318)
Classification, Dilatancy (ASTM D 2488)
Sieve Analysis (ASTM C 136)
Hydrometer Test (ASTM D 422)
Moisture Density Relationship (ASTM D 698)
Moisture Density Relationship (ASTM D 1157)
Relative Density of Granular Soil (ASTM D4253 and D 4254)
Shrinkage Limit (ASTM D 427)
Proctor Needle Penetration (ASTM D 1558)
Moisture Content (ASTM C 566)
Soluble Salts (Earth Manual E8)
Specific Gravity of Soil (ASTM D 854)
Aggressively (NF 18011) for Soil/Water

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DAD DIVISION
SHAHEED BENAZIR ABAD

All references above to 'Earth Manual" are to the Earth Manual of the U.S Bureau of Reclamation, except for Soil/Water Aggressively, where a French standard is used to match with official Pakistani Laboratory procedure.

B. Concrete and its Constituents

Sampling of Aggregates (ASTM D 75)
Sampling of fresh concrete (ASTM C 172)
Sampling of cement (ASTM C 183)
Screen analysis of sand (ASTM C 136)
Screen analysis of Coarse Aggregate (ASTM C 136)
Specific Gravity and Absorption of sand (ASTM C 128)
Specific Gravity of Absorption of Coarse Aggregates (ASTM C 127)
Slump of concrete (ASTM C 143)
Unit Weight and Volume of Fresh (ASTM C 138)
Unit Weight of Aggregate (ASTM C 29)
Air Content of Fresh Concrete (ASTM C 231)
Total moisture content of aggregate (ASTM C 566)
Preparation of Laboratory Concrete (ASTM C 192)
Casting Cylinders in Cast Iron Disposable Molds (ASTM C 31)
Capping Concrete Cylinders (ASTM C 617)
Compressive Strength (ASTM C 39)
Abrasion Resistance of Coarse Aggregate (ASTM C 131)
Soundness of Fine and Coarse Aggregate (ASTM C 88)
Obtaining and Drilling of Cores (ASTM C 42)
Alkali Aggregate Reaction (Accelerated) as approved by the Engineer
Materials tests in Laboratories
Physical properties of steel (ASTM 615)

Engineer's Laboratory Equipment

The Contractor shall maintain all essential Laboratory Equipment and chemicals including consumable items in his Laboratories to fulfill the testing requirements. The equipments shall be new, unused, and to the approval of the Engineer.

Contractor Quality Control Test Results

All test results from the field and laboratories conducted as part of the Quality Control procedure shall be submitted to the Engineer. The test results show full compliance with the Specifications, in order for the Works to be approved. The materials and test reports submitted to the Engineer shall include, but shall not be limited to the following

Soil reports showing location, materials source, materials type, density, moisture content, density-moisture content relationship.

Concrete reports showing source of all constituents, testing of source material, date of manufacture, testing of material after processing, including determination of moisture content of aggregates,

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DAD DIVISION
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qualities, pour records and testing of manufactured concrete. Certification of all admixtures, cement supplies and storage records.

Ancillary reposts for materials such as steel, electrometric bearings, jointing compounds, paints, etc, showing name of source date of manufacture, shall life storage conditions, place of storage, test results showing compliance with the Specifications, and placing records.

Engineer's Laboratory and Equipment

In addition to the Engineer's Laboratories, which will be air conditioned and having facilities for carrying out the Contractor shall supply Laboratory equipments for the Engineer's laboratory. Water Supply, Power, and sanitation are included. The Contractor shall also be responsible to maintain the laboratory building and equipment in working condition throughout the Contract period. The Contractor shall submit to the Engineer for approval a complete list of all essential equipment along with the name of the manufacturer. All equipment shall be new and unused. Final approval of the equipment shall only be granted on delivery and inspection of each item at the Engineer laboratory.

Survey Equipment for Engineer

The Contractor shall supply and maintain during the course of the Contract survey equipment for use of the Engineer. The Contractor shall submit for the approval of the Engineer prior purchase a list of all survey equipment including details of make and model. The equipment shall be new and final approval shall only be granted on delivery and inspection of each item.

Quality Assurance

The Contractor will submit with his Quality Control Plan a Programme of procedures, materials submittals, approved staff and equipment in order to allow the Engineer to run a quality assurance Programme.

Each activity/ materials/equipment/staff will have to be identified in each of the procedures applicable to the Works. The list of procedures will then expand along with the Works. In this respect, the Contractor should also note the requirement for submittals.

SUBMITTALS

Contractor's Equipment

The Contractor will resubmit his equipment list from the Tender documents, giving details for each phase of the work. The equipment list shall match his technical proposal, construction schedule and cash flow.

Method Statements

Within 30 days before starting any aspect of the Works, the Contractor shall submit to the Engineer for approval detailed method statements describing complete details of the operation including plant, equipment, materials, testing, personnel, schedule and organization. The work items requiring submission of method statements shall include, but not be limited to the following:

- setting out the works
- care of water
- surveying
- excavation (Canal Structures)
- embankments

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- roads
- backfilling of structures
- production of sand and coarse aggregates
- manufacture of concrete
- transport and placing of concrete
- furnishing and installing of gates.
-

TOLERANCES

Unless otherwise shown on the Drawings or directed by the Engineer the following tolerances, shall apply:

A. TOLERANCES FOR CONCRETS LINING

(i)	Departure from established alinement	±2 inches on tangents
(ii)	Departure from established profile grade	±4 inches on curves
iii)	Reduction in thickness of lining	10 percent of specified thickness. Provide that the average thickness per 5000 feet is not less than specified thickness
(iv)	Variation from specified width of section at any height	0.25 percent of specified width plus 1 inch
(v)	Variation from established height of lining	0.50% of established height plus1 inch

Any departure from alignment or grade shall be uniform and no correction in alignment shall be made in less than 100 feet.

B. TOLERANCES FOR STRUCTURES

i) Regulator and similar structures:

a) Departure from established alignment = 1 inch

b) Departure from established grad = 1 inch

c) Variation from plumb or specified batter for lines and surfaces of columns, piers, and walls and for arises.

1) When overall length of line or surface is:

10 feet or less Exposed = ±3/8 inch Buried = ±¾ inch

More than 10 feet Exposed = ½ inch

Buried = ±1 inch

2) For any two successive intermediate points on the line or surface separated by:

10 feet Exposed 3/8 inch

Buried ¾ inch

20 feet or more Exposed ½ inch

Buried 1 inch

variation from level or specified grades for slabs:

When overall length of line or surface is:

10 feet or less Exposed ± 3/8 inch

Buried ±3/4 inch

More than 10 feet Exposed ± ½ inch

Buried ±1 inch

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For any two successive intermediate points on the line or surface separated by:

10 feet	Exposed 3/8 inch
	Buried ¾ inch
20 feet or more	Exposed ½ inch
	Buried 1 inch

Variation in cross-section dimensions of slabs, walls and similar parts of the structures in above from those specified. -¼ inch ± ½ inch

Variation in sizes and locations from those specified for slab and wall openings ±½ inch

Variation from plumb of pipe erected vertically in any length of 10 feet ±½ inch

C. TOLERANCES FOR BRIDGES AND CULVERTS

i) Departure from established alignment ±¼ inch

ii) Footings:

Variation in length and width dimensions from those specified

-½ inch

+ 2 inches

(b) Horizontal misplacement or eccentricity:

2 percent of the footing width in the direction of misplacement but not more that 2 inches

c) Reduction in thickness 5 % of specified thickness

iii) Variation from plumb or specified batter for lines and surfaces of piers and walls:

Exposed construction:

1) When overall height of line or surface is:

10 feet or less	±3/8 inch
More than 10 feet	±½ inch

For any two successive intermediate points on the line or surface separated by:

10 feet or less	±3/8 inch
20 feet or more	±½ inch

b) Buried construction Twice the amounts listed in C.iii (a)

Variation from level or specified grades for beams, horizontal grooves, railing offsets, and diaphragms:

a) Exposed construction:

1) When overall height or line or surface is:

10 feet or less	3/8 inch
More than 10 feet	½ inch

2) For any two successive intermediate points on the line or surface separated by:

10 feet or less	3/8 inch
20 feet or more	½ inch

b) For buried construction Twice the amounts listed in C iv (a)

v) Departure of deck and rails from specified grades ¼ inch

vi) Variation in cross-sectional dimensions from those\

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specified for piers, walls, beams, and similar parts of structures
-¼ inch
+½ inch

Variation from that specified in
the thickness of slabs -1/8 inch
+ ¼ inch

D. TOLERANCES FOR REINFORCING STEEL

Placement for flexural members, walls, and compression members

a) Tolerance in clear distance to formed soffit -¼ inch

b) Tolerance in depth "d" (where d is the distance from the extreme compression fiber to the centroid of tension reinforcement)

depth "d"	
8 in or less	±3/8 inch
More than 8 in	±½ inch

c) Tolerance on minimum cover
For cover greater or equal to

2 ½ inch, tolerance	¼ inch
For cover less than 2 1/1 inch tolerance	1/8 inch
d) Tolerance on minimum distance between bars	±¼ inch
Tolerance in uniform spacing of reinforcement from theoretical location	± 2 inch
Tolerance in uniform spacing of stirrups and ties from theoretical location	1 inch
Tolerance in longitudinal location of bends and ends	
Of bars General	± 2 inch
Discontinuous ends of member's	± ½ inch
h) Tolerance in length of bar laps	-1 ½
i) Tolerance in embedded length	
No. 3, No. 6	-1 inch
No. 6, No. 11	-1 ½ inch
No. 14 and No. 18	-2 inch

E. TOLERANCE OF EMBEDDED MATERIAL

i) Tolerance from specified clearance relative to reinforcing
±1 inch

ii) tolerance from specified location ±¼ inch

F. CONCRETE SURFACE IRREGULARITIES

i) General – Bulges, depressions and offsets are defined as concrete surface irregularities, Concrete surface irregularities are classified as" abrupt" or "gradual" and are measured relative to the actual concrete surface.

ii) Abrupt surface irregularities – Abrupt surface irregularities are defined herein as offsets such as those caused by misplaced or loose forms, loose knots in form lumber, or other similar forming faults. Abrupt surface irregularities are measured using a short straight edge, at least 6 inches long, held firmly against the concrete surface over the irregularity,

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and the magnitude of the offset is determined by direct measurement.

iii) Gradual surface irregularities – Gradual surface irregularities are defined herein as bulges and depressions resulting in gradual changes on the concrete surface. Gradual surface irregularities are measured using a template conforming to the design profile of the concrete surface being examined. Templates for measuring gradual surface irregularities shall be provided by the Contractor. Templates shall be at least 5 feet in length for measurement of irregularities in formed surface, and 10 feet for measurement of irregularities in unformed surfaces held against the concrete surface.

The magnitude of gradual surface irregularities on concrete surfaces shall be checked by the Contractor to ensure that the surfaces are within specified tolerances, as under:

Abrupt and gradual irregularities:		
a)	F1 surfaces, depression only	1 inch
b)	F2 surfaces, gradual	½ inch
F2 surfaces, abrupt		¼ inch
c)	F3 surfaces, gradual	¼ inch
F3 surfaces, abrupt		1/8 inch
d)	U1 surfaces, all surfaces	½ inch
e)	U2 surfaces, all surfaces	¼ inch

Prevention of repeated failure to meet tolerances, when concrete placements result in hardened concrete that does not meet specified tolerances, the Contractor shall upon request submit to the Engineer an outline of all preventative actions such as modifications to forms, modified procedure for setting screeds, and deferent finishing techniques to be implemented by the contractor to avoid repeated failures. The Engineer reserves the right to delay concrete placements until the Contractor implements such preventative actions which are approved.

G. TOLERANCE OF JOINTS

i) After making the joint, the surface of the concrete shall be continuous and smooth and shall have no local irregularities greater than 1/8 inch.

ii) Location normal to the surface +/- inch.

iii) Straightness shall be +/- ½ inch in any 3 feet

H. TOLERANCES FOR EARTHWORKS

i)	Bed level of distributary	+0 inches, -2 inches
ii)	Slopes	+0 inches, -2 inches measured

normal to the slope

ii)	Embankment crest level	+2 inches, ‘ -0 inches
iv)	Location:	+3 inches, -3 inches

For the distributary bed and slopes the absolute value of i) and ii) the variation within a length of 30 feet shall not exceed 4 inches.

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DAD DIVISION
SHAHEED BENAZIR ABAD

I. TOLERANCES FOR ROADS

i)	Subbase		
	a)	Thickness	±¾ inches
	b)	Level	+¾ inches-1 ½ inch
	c)	Evenness 9 feet straight edge	1 inch
	d)	Cross Fall	0.5%
	e)	Longitudinal Grade in 100 feet	0.1%
	f)	Location	2 inch

Gravel Base

Thickness	±½ inch
Level	1/2 inch, 1 inch
Evenness 9 feet straight edge	¾ inch
Cross Fall	0.3%
Longitudinal Grade in 100 feet	0.1%
Location	

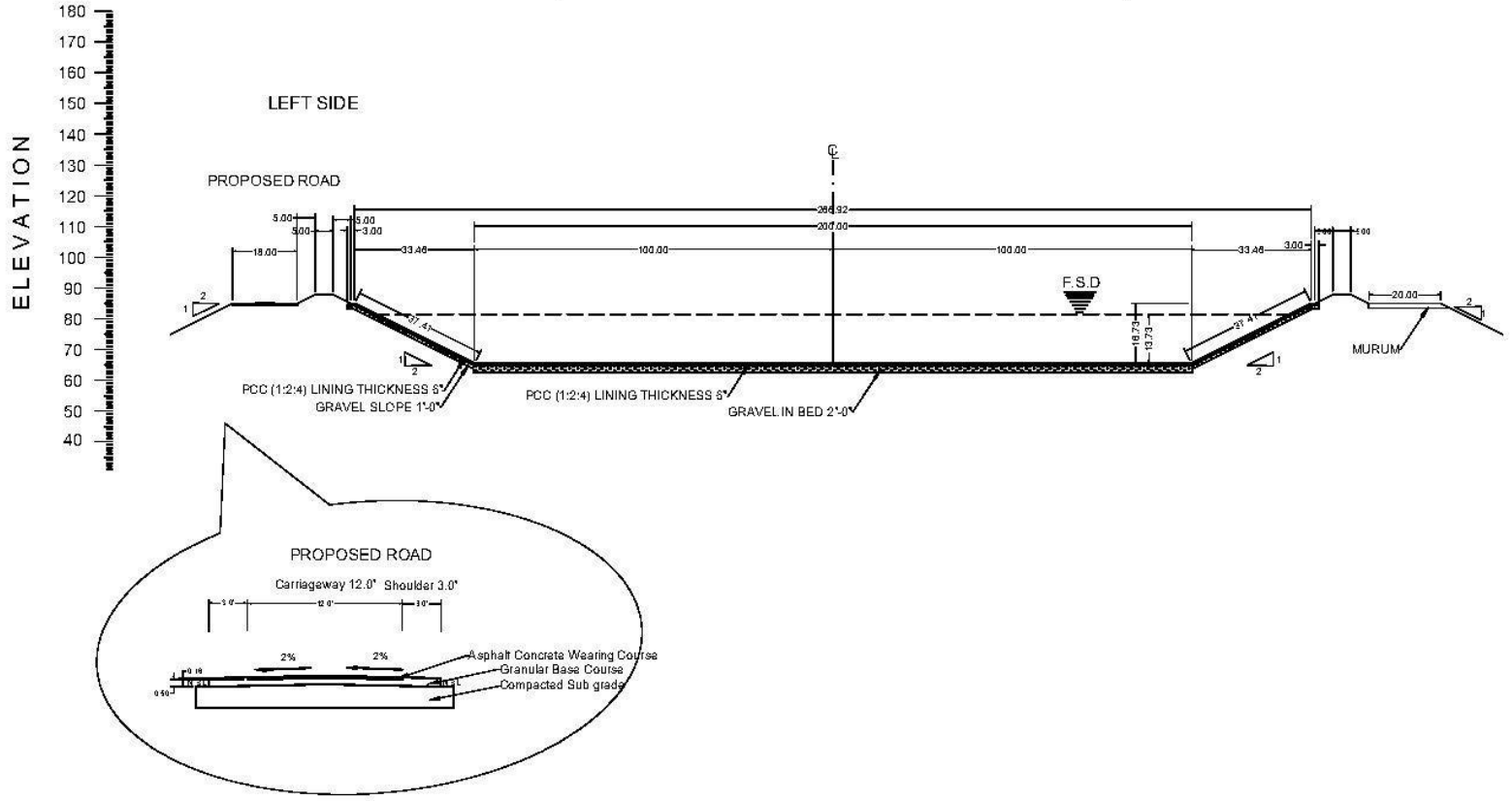
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DRAWINGS

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SHAHEED BENAZIR ABAD

TYPICAL X SEC
C.C LINING OF ROHRI MAIN CANAL



Sub Engineer

Assistant Executive Engineer
Sakrand Sub Division-II
@ Sakrand

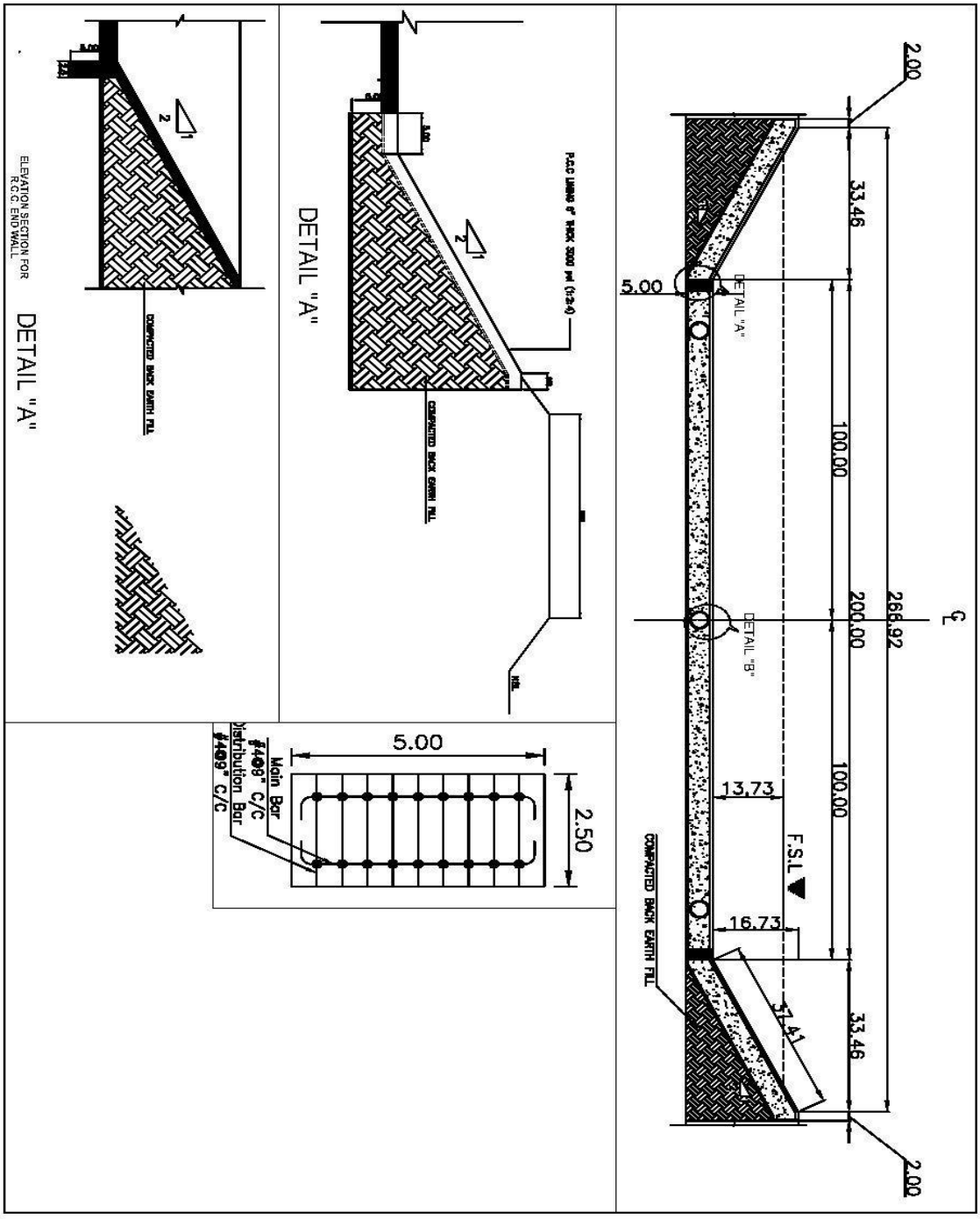
Executive Engineer
Dad Division
Shaheed Benazirabad

NOTES
ALL DIMENSIONS ARE IN FEET

LEGEND:-
DESIGN CROSS SECTION
EXISTING CROSS SECTION

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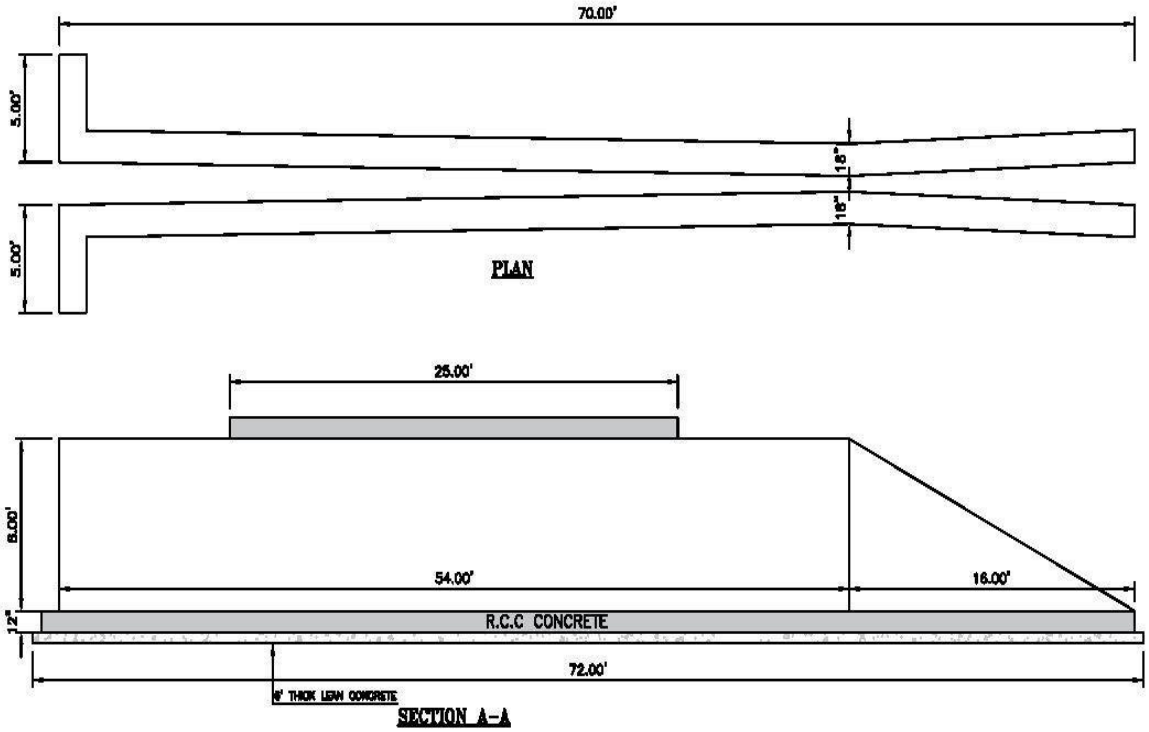


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NOTES:

1. ALL DIMENSIONS AND LEVELS ARE IN FEET UNLESS OTHERWISE INDICATED.

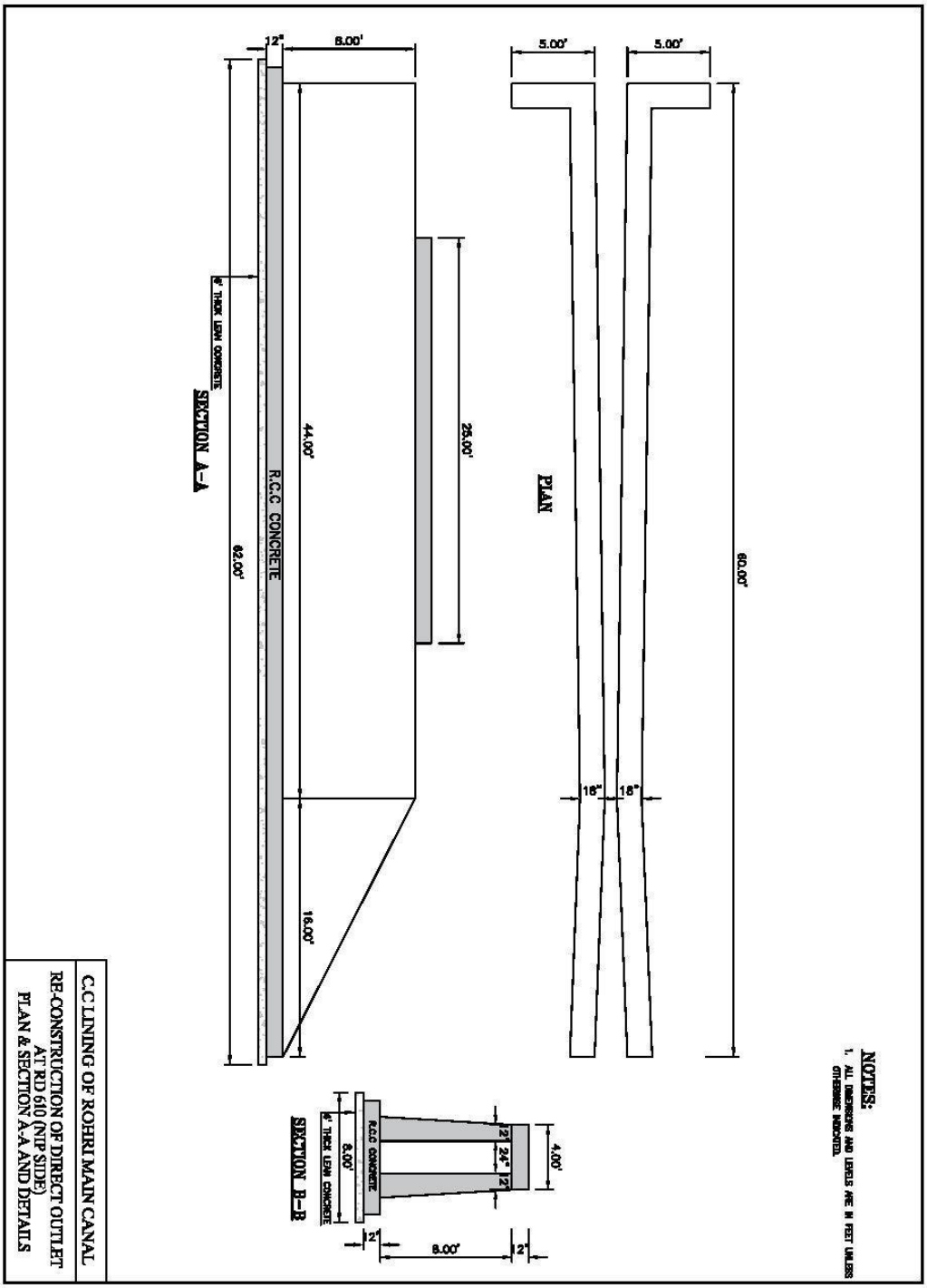


Sub Engineer

Assistant Executive Engineer
Sakrand Sub Division-II
@ Sakrand

C.C LINING OF ROHRI MAIN CANAL

RE-CONSTRUCTION OF DIRECT OUTLET
AT RD 613 (IP SIDE)
PLAN & SECTION A-A AND DETAILS



EXECUTIVE ENGINEER
DAD DIVISION
SHAHEED BENAZIR ABAD

PROCURMENT PLAN FOR THE YEAR 2026-27

PROCUREMENT PLAN FOR CEMENT CONCRETE LINING OF ROHRI MAIN CANAL FROM RD 589+000 to 610+250 (ADP SCHEME NO. 1116 / 2026-27), DAD DIVISION, SHAHEED BENAZIRABAD

S.No./ADP No.	Name of Work	Allocated Funds Rs. In million	Cost of ongoing works (Expenditure already incurred)	Funds earmarked for ongoing works	Cost of new works (Components)	Funds for new works (C-E)	Nature of procurement	Method of Procurement	Anticipated / actual date of advertisment	Anticipated / actual date of start	Anticipated / actual date of completion
A	B	C	D	E	F	G	H	I	J	K	L
(1116/2026-27)	PROCUREMENT PLAN FOR CEMENT CONCRETE LINING OF ROHRI MAIN CANAL FROM RD 589+000 to 610+250	430.00 Million	-	-	3967.796 Million	430.00 Million	ICB / National Single Stage Two envelop	ICB Single Stage Two envelop	02.11.2026	02.11.2026	18 Months (Completion Period)

EXECUTIVE ENGINEER
DAD DIVISION
SHAHEED BENAZIR ABAD

No: WB-11/P.C/DAD/ 2026/4-W/1454
OFFICE OF THE CHIEF ENGINEER
SUKKUR BARRAGE LEFT BANK REGION
SUKKUR DATED 08 /06/ 2026.

Phone # 071-9310192
Fax # 071-5805163

NOTIFICATION

A Procurement Committee consisting on following officers is hereby constituted for opening of Bids from Contractors / Firms for procurement of ADP, PSDP, M&R and Flood Protection Works for the current financial year 2026-27 in Dad Division Shaheed Benazirabad of Rohri Canal Circle Hyderabad :-

S.NO.	DESIGNATION	COMMITTEE / DESIGNATION
01	Executive Engineer, Dad Division, Shaheed Benazirabad.	Chairman
02	Executive Engineer, Nasrat Division, Shaheed Benazirabad.	Member
03	Executive Engineer, Highway Division, Shaheed Benazirabad.	Member

Sd/-
CHIEF ENGINEER
SUKKUR BARRAGE LEFT BANK
REGION SUKKUR

Copy forwarded to :-

1. The Secretary to Government of Sindh Irrigation Department Karachi for favour of kind information.
2. The Superintending Engineer, Rohri Canal Circle Hyderabad with reference to his office letter No. AC/G-55/ 1514 dated 04-06-2026.
3. The Executive Engineer, Dad Division, Shaheed Benazirabad.
4. The Executive Engineer, Nasrat Division, Shaheed Benazirabad.
5. The Executive Engineer, Highway Division, Shaheed Benazirabad.

CHIEF ENGINEER
SUKKUR BARRAGE LEFT BANK
REGION SUKKUR.

CamScanner

No: WB-1/CRC/RCC/2026/1-W/ 1386
OFFICE OF THE CHIEF ENGINEER
SUKKUR BARRAGE LEFT BANK REGION
SUKKUR, DATED 02/06/2026

Phone # 071-9310187
Phone # 071-5805163

Read:- Secretary to Government of Sindh Irrigation Department Karachi's Order No. SO (R&S)8-110/2019-20/Part-XII/1706 dated 16-10-2020 regarding authorization of Notify the Complaint Redressal Committee.

NOTIFICATION

Based on the recommendations received from the Superintending Engineer, Rohri Canal Circle, Hyderabad vide letter No. AC/G-55/ 1471 dated 01-06-2026, the Complaint Redressal Committee comprising upon following officers is hereby constituted as per Rule 31 of SPPRA Rules 2010 (Amended upto-date) for procurement of Development and Non-Development Works for the year 2026-27 in Rohri Canal Circle Hyderabad :-

S.No.	Designation	Committee / designation
01	Superintending Engineer Rohri Canal Circle Hyderabad.	Chairman
02.	Divisional Accounts Officer (Concerned Division) being representative of Accountant General Sindh Karachi.	Member
03.	Mr. Irfan Ahmed Memon, Civil Engineer (Nominated as Independent Professional for the Rohri Canal Circle).	Independent Member

Sd/-
CHIEF ENGINEER
SUKKUR BARRAGE LEFT BANK
REGION SUKKUR

Copy forwarded for information and necessary action to :-

01. The Secretary to Government of Sindh Irrigation Department Karachi.
02. The Managing Director, Sindh Public Procurement Regulatory Authority Karachi.
03. The Accountant General Sindh Karachi.
04. The Superintending Engineer Rohri Canal Circle Hyderabad.
05. The Executive Engineers Rohri Division Moro, Nasrat Division Shaheed Benazirabad, Dad Division Shaheed Benazirabad, Hala Irrigation Division Hala & Nasir Division Hyderabad.
06. Mr. Irfan Ahmed Memon, Civil Engineer(Nominated as Independent Professional).

CHIEF ENGINEER
SUKKUR BARRAGE LEFT BANK
REGION SUKKUR.

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OFFICE OF THE EXECUTIVE ENGINEER, DAD DIVISION SHAHEED BENAZIR ABAD

Phone No. 0244-9370223 - Fax No. 0244-9370222

No. TC/G-55 /1841 of 2026, S.B.A. Dated: - 02/11/2026.

NOTICE INVITING E-TENDERS (NATIONAL/INTERNATIONAL COMPETITIVE BIDDING)

The Executive Engineer, Dad Division, Shaheed Benazirabad, Irrigation Department, Government of Sindh, invites electronic sealed bids (E-Tenders) through the e-Pak Acquisition and Disposal System (EPADS) from eligible contractors, firms, joint ventures, and companies for the execution of the work mentioned below.

The procurement shall be carried out in accordance with the Sindh Public Procurement Regulatory Authority (SPPRA) Rules, 2010 (as amended to date) through International Competitive Bidding (ICB) using the Single Stage – Two Envelope Procedure.

Eligible bidders shall be registered with the Pakistan Engineering Council (PEC), possessing a valid PEC Registration Certificate up to June 2027 in the relevant engineering discipline and appropriate category, along with applicable registrations with the Federal Board of Revenue (FBR), Sindh Revenue Board (SRB), and other statutory authorities, wherever applicable.

S.No	*Contract Package Name*	*Estimated Cost In Million*	*Bid Security 5% of Estimated Cost*	*Category Required according to PEC*	*Tender Fees*	*Completion Period*
1	CEMENT CONCRETE LINING OF ROHRI MAIN CANAL FROM RD 589+000 TO RD 610+250 (ADP No: 1116 / 2026-27)	PKR. 3,967.796 Million	PKR. 198.40 Million	CA (No limit)	PKR. 10,000/-	18Months

PROGRAMME FOR ISSUE / RECEIPT / UPLOAD AND OPENING OF TENDERS

S.#	*Particulars*	*1st Attempt*	*2nd Attempt*
1	Deadline for submission of E-Bids through E-PADS at 11.00 AM	07/12/2026	15/12/2026
2	Tender will be opened on the same day through E-PADS at 11:30 AM	07/12/2026	15/12/2026

The scope of work mainly includes the following:

i. Earth Work & PCC Lining from RD 589+000 to 610+250.
ii. Rehabilitation of Hydraulic Structures

1. **Method of Procurement (Single Stage Two Envelops National / International Competitive Bidding)**
2. **Eligibility / Mandatory**
   a. The applicants, including contractors, companies, firms and joint ventures, fulfilling the prescribed eligibility and qualification criteria shall be considered for further evaluation.
   b. The International Competitive Bidding shall be open to interested bidders, firms and joint ventures registered with the Pakistan Engineering Council in Category **CA (No Limit)** and possessing the relevant specialized codes. The PEC Registration Certificate shall be valid up to **June 2027** and onwards and shall cover the relevant engineering and specialized codes **CE-01, CE-02, CE-04, CE-09 and CE-10**.
   The foreign bidder is entitled to bid only in a joint venture with a Local Firm in accordance with the relevant pro visions of PEC bye-laws.
   c. The bidders shall provide a list of works with the same specifications and similar nature, equivalent or more than the estimated cost of work completed in a similar environment or (a) one similar nature of work having minimum 80% of the estimated cost of work; or (b) at least two similar nature works each having minimum 50% of the estimated cost during the last 05 years, duly supported with a completion.
   d. Biodata of engineering and technical staff proposed to be engaged on the work, including complete details of their qualifications, experience and length of service with the firm, shall be provided.
   e. List of machinery and equipment available with the firm shall be furnished along with documentary evidence of ownership or availability.
   f. Annual certified audited reports from QCR-rated registered audit firm for the last three (03) years (2023-24, 2024-2025 and 2025-26).
   g. Credit Line Facilities Certificate of 20% of the estimated cost from any Scheduled Bank shall be furnished.
   h. Annual Income Tax returns of the last three (03) years, i.e., (2023-24, 2024-2025 and 2025-26).
   i. The average annual turnover is calculated based on total certified payments received within the last three (03) years. It shall be equal to or more than the estimated cost of the works, i.e., **PKR 3,967.796 million and USS 14.324 million (2023-2024, 2024-25, and 2025-26).**
   j. The firm shall provide a bank statement showing a standing balance of at least 20% of the estimated cost of the work as on the date of publication of the advertisement and an average monthly closing balance of at least 20% of the estimated cost during the preceding (06) six months.
   k. National bidders shall possess valid registration with the Sindh Revenue Board (SRB) and Federal Board of Revenue (FBR) and shall have active status. Foreign bidders shall provide equivalent statutory registration and tax documents applicable to them.
   l. The bid security shall be submitted in one of the forms prescribed under the SPPRA Rules, preferably in the form of a Bank Guarantee, Call Deposit issued by a Scheduled Bank of Pakistan. In case of a foreign bank guarantee, the requirements prescribed under the applicable PEC/SPP rules shall be followed.
3. Affidavit on E-Stamp (PKR. 500/-) declaring "Neither the firm nor its Directors, Stakeholders, as a whole or as a part of the firm have ever been black listed/ defaulted by any government agency/department/organization".
4. Each page of the Technical Proposal must be numbered, signed, and stamped by the authorized person of the company/firm / JV. No overwriting will be accepted in submitted documents.
5. Pre-bid meeting will be held on **16.11.2026** at **12:00 AM** in the office of the **Executive Engineer, Dad Division, Shaheed Benazirabad.**
6. **Bidding / Tender Documents.**

The bidding documents and other terms and conditions may be seen and downloaded from the official SPPRA/EPADS procurement portal, i.e., **https://portalsindh.eprocure.gov.pk.** The downloaded bidding documents shall be accompanied by a non-refundable tender fee of **PKR 10,000/-** in the prescribed manner. The bid security shall be submitted in one of the forms prescribed under the SPPRA rules, preferably in the form of bank guarantee, call deposit or pay order against work **amounting to PKR 198.40 million** in any Scheduled bank of Pakistan on the prescribed form in ***favour of the Executive Engineer, Dad Division, Shaheed Benazirabad on account of (Name of firm)***, should be attached with the Technical Bid; otherwise, such bids will not be entertained.

7. The **Technical Proposal** and **Financial Proposal**, together with all required supporting documents, shall be clearly scanned and uploaded electronically through the **e-Pak Acquisition and Disposal System (EPADS)** on or before the prescribed bid submission deadline. Only bids submitted electronically through EPADS within the stipulated time shall be considered. Bids submitted by any other means or after the specified deadline shall not be entertained.
8. Bid Security shall be submitted to the Procuring Agency at the time of opening of Technical Proposals, failing which the bid shall be rejected.
9. The Technical Proposals shall be opened through EPADS at the prescribed date and time in the presence of the Procurement Committee and participating contractor firms or their authorized representatives who may wish to attend. The Technical Proposals shall initially be evaluated in accordance with the eligibility and qualification criteria specified in the bidding documents.
10. The Financial Proposals of only technically qualified and substantially responsive bidders shall be opened in accordance with the SPPRA Rules and the procedure specified in the bidding documents. The date, time, and procedure for opening of the Financial Proposals shall be communicated to the technically qualified bidders through the prescribed procurement system.
11. The criteria for a Joint Venture are mentioned in the bidding documents.
12. The bid found to be the most "**advantageous bid"** shall be accepted.
13. No amendments to the Technical Proposal shall be permitted during the technical evaluation.
14. Original Bid Security of technically non-responsive bidders may be collected from the office of the undersigned on any working day.
15. Fresh affidavit on E-Stamp (PKR. 500/-) (in original) with the effect that all the documents/particulars/machinery information furnished are true and correct. In case of Bogus / Tempered or false information/certificates provided by the company/firm / JV shall be liable to be black listed at any stage.
16. A representative should have authority on E-Stamp (Rs. 500/-) from the owner. Authority other than E-Stamp (PKR. 500/-) will not be accepted, and such tender will not be entertained.
17. In case of a firm, giving full particulars of Directors / Proprietors or other connected persons along with Power of Attorney. In case of being sole proprietors, such an undertaking on a fresh Affidavit on E-Stamp (PKR. 500/-) (in original) be furnished.
18. The Tenders should be submitted through E-PADS along with the above required documentation / Information. If any of the required documents/information are lacking, then the tender will not be considered by the procuring committee, and no such documents will be accepted after the prescribed submission deadline date and time.

- The submission and opening of bids shall take place at the following address:

Address: Office of the Executive Engineer Dad Division, near Gymkhana Restaurant, Nawabshah, District Shaheed Benazirabad

Terms & Conditions:

Under the following conditions, the bid will be rejected: -

i. Conditional, electronic (E-mail) and telegraphic bids / Tenders.
ii. Bids not accompanied by bid security of required amount and form.
iii. Bids received after the prescribed deadline submission date and time.
iv. Bid Validity period is 120 days.
v. Black listed/debarred firms.
vi. The procurement authority reserves the right to reject any or all the tenders/bids as per SPPRA Rules 2010 (Amended to date).

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INF/KRY: INF 4943/26

EXECUTIVE ENGINEER
DAD DIVISION,
SHAHEED BENAZIRABAD

OFFICE OF THE EXECUTIVE ENGINEER, DAD DIVISION SHAHEED BENAZIR ABAD

Phone No. 0244-9370223 - Fax No. 0244-9370222

No. TC/G-55 /1841 of 2026, S.B.A. Dated: - 02/11/2026.

NOTICE INVITING E-TENDERS (NATIONAL/INTERNATIONAL COMPETITIVE BIDDING)

The Executive Engineer, Dad Division, Shaheed Benazirabad, Irrigation Department, Government of Sindh, invites electronic sealed bids (E-Tenders) through the e-Pak Acquisition and Disposal System (EPADS) from eligible contractors, firms, joint ventures, and companies for the execution of the work mentioned below.

The procurement shall be carried out in accordance with the Sindh Public Procurement Regulatory Authority (SPPRA) Rules, 2010 (as amended to date) through International Competitive Bidding (ICB) using the Single Stage – Two Envelope Procedure.

Eligible bidders shall be registered with the Pakistan Engineering Council (PEC), possessing a valid PEC Registration Certificate up to June 2027 in the relevant engineering discipline and appropriate category, along with applicable registrations with the Federal Board of Revenue (FBR), Sindh Revenue Board (SRB), and other statutory authorities, wherever applicable.

S.No	Contract Package Name	Estimated Cost In Million	Bid Security 5% of Estimated Cost	Category Required according to PEC	Tender Fees	Completio n Period
1	CEMENT CONCRETE LINING OF ROHRI MAIN CANAL FROM RD 589+000 TO RD 610+250 (ADP No: 1116 / 2026-27)	PKR. 3,967.796 Million	PKR. 198.40 Million	CA (No limit)	PKR. 10,000/-	18Months

PROGRAMME FOR ISSUE / RECEIPT / UPLOAD AND OPENING OF TENDERS

S.#	Particulars	1st Attempt	2nd Attempt
1	Deadline for submission of E-Bids through E-PADS at 11.00 AM	07/12/2026	15/12/2026
2	Tender will be opened on the same day through E-PADS at 11:30 AM	07/12/2026	15/12/2026

The scope of work mainly includes the following:

i. Earth Work & PCC Lining from RD 589+000 to 610+250.
ii. Rehabilitation of Hydraulic Structures

1. **Method of Procurement (Single Stage Two Envelops National / International Competitive Bidding)**
2. **Eligibility / Mandatory**
   a. The applicants, including contractors, companies, firms and joint ventures, fulfilling the prescribed eligibility and qualification criteria shall be considered for further evaluation.
   b. The International Competitive Bidding shall be open to interested bidders, firms and joint ventures registered with the Pakistan Engineering Council in Category **CA (No Limit)** and possessing the relevant specialized codes. The PEC Registration Certificate shall be valid up to **June 2027** and onwards and shall cover the relevant engineering and specialized codes **CE-01, CE-02, CE-04, CE-09 and CE-10**.
   The foreign bidder is entitled to bid only in a joint venture with a Local Firm in accordance with the relevant pro visions of PEC bye-laws.
   c. The bidders shall provide a list of works with the same specifications and similar nature, equivalent or more than the estimated cost of work completed in a similar environment or (a) one similar nature of work having minimum 80% of the estimated cost of work; or (b) at least two similar nature works each having minimum 50% of the estimated cost during the last 05 years, duly supported with a completion.
   d. Biodata of engineering and technical staff proposed to be engaged on the work, including complete details of their qualifications, experience and length of service with the firm, shall be provided.
   e. List of machinery and equipment available with the firm shall be furnished along with documentary evidence of ownership or availability.
   f. Annual certified audited reports from QCR-rated registered audit firm for the last three (03) years (2023-24, 2024-2025 and 2025-26).
   g. Credit Line Facilities Certificate of 20% of the estimated cost from any Scheduled Bank shall be furnished.
   h. Annual Income Tax returns of the last three (03) years, i.e., (2023-24, 2024-2025 and 2025-26).
   i. The average annual turnover is calculated based on total certified payments received within the last three (03) years. It shall be equal to or more than the estimated cost of the works, i.e., **PKR 3,967.796 million and US$ 14.324 million (2023-2024, 2024-25, and 2025-26).**
   j. The firm shall provide a bank statement showing a standing balance of at least 20% of the estimated cost of the work as on the date of publication of the advertisement and an average monthly closing balance of at least 20% of the estimated cost during the preceding (06) six months.
   k. National bidders shall possess valid registration with the Sindh Revenue Board (SRB) and Federal Board of Revenue (FBR) and shall have active status. Foreign bidders shall provide equivalent statutory registration and tax documents applicable to them.
   l. The bid security shall be submitted in one of the forms prescribed under the SPPRA Rules, preferably in the form of a Bank Guarantee, Call Deposit issued by a Scheduled Bank of Pakistan. In case of a foreign bank guarantee, the requirements prescribed under the applicable PEC/SPP rules shall be followed.
3. Affidavit on E-Stamp (PKR. 500/-) declaring "Neither the firm nor its Directors, Stakeholders, as a whole or as a part of the firm have ever been black listed/ defaulted by any government agency/department/organization".
4. Each page of the Technical Proposal must be numbered, signed, and stamped by the authorized person of the company/firm / JV. No overwriting will be accepted in submitted documents.
5. Pre-bid meeting will be held on **16.11.2026** at **12:00 AM** in the office of the **Executive Engineer, Dad Division, Shaheed Benazirabad.**
6. **Bidding / Tender Documents.**
   The bidding documents and other terms and conditions may be seen and downloaded from the official SPPRA/EPADS procurement portal, i.e., **https://portalsindh.eprocure.gov.pk.** The downloaded bidding documents shall be accompanied by a non-refundable tender fee of **PKR 10,000/-** in the prescribed manner. The bid security shall be submitted in one of the forms prescribed under the SPPRA rules, preferably in the form of bank guarantee, call deposit or pay order against work **amounting to PKR 198.40 million** in any Scheduled bank of Pakistan on the prescribed form in ***favour of the Executive Engineer, Dad Division, Shaheed Benazirabad on account of (Name of firm)***, should be attached with the Technical Bid; otherwise, such bids will not be entertained.
7. The **Technical Proposal** and **Financial Proposal**, together with all required supporting documents, shall be clearly scanned and uploaded electronically through the **e-Pak Acquisition and Disposal System (EPADS)** on or before the prescribed bid submission deadline. Only bids submitted electronically through EPADS within the stipulated time shall be considered. Bids submitted by any other means or after the specified deadline shall not be entertained.
8. Bid Security shall be submitted to the Procuring Agency at the time of opening of Technical Proposals, failing which the bid shall be rejected.
9. The Technical Proposals shall be opened through EPADS at the prescribed date and time in the presence of the Procurement Committee and participating contractor firms or their authorized representatives who may wish to attend. The Technical Proposals shall initially be evaluated in accordance with the eligibility and qualification criteria specified in the bidding documents.
10. The Financial Proposals of only technically qualified and substantially responsive bidders shall be opened in accordance with the SPPRA Rules and the procedure specified in the bidding documents. The date, time, and procedure for opening of the Financial Proposals shall be communicated to the technically qualified bidders through the prescribed procurement system.
11. The criteria for a Joint Venture are mentioned in the bidding documents.
12. The bid found to be the most "**advantageous bid**" shall be accepted.
13. No amendments to the Technical Proposal shall be permitted during the technical evaluation.
14. Original Bid Security of technically non-responsive bidders may be collected from the office of the undersigned on any working day.
15. Fresh affidavit on E-Stamp (PKR. 500/-) (in original) with the effect that all the documents/particulars/machinery information furnished are true and correct. In case of Bogus / Tempered or false information/certificates provided by the company/firm / JV shall be liable to be black listed at any stage.
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INF/KRY: INF 4943/26

EXECUTIVE ENGINEER
DAD DIVISION,
SHAHEED BENAZIRABAD

آفيس آف دي ايگزيڪيوٽو انجنيئر، داد ڊويزن شهيد بينظير آباد

فون نمبر: 9370223 -0244 - فيڪس نمبر: 9370222-0244

No. TC/G-55/1841 of 2026, S.B.A. Dated: - 02/11/2026

اي- ٽينڈرن جي دعوت جو نوٽيس (قومي / بين الاقوامي مقابلي واري آڇ)

ايگزيڪيوٽو انجنيئر داد ڊويزن، شهيد بينظير آباد، آبپاشي کاتي، حڪومت سنڌ، هيٺ جاڪاڻي ڪم جي ٽيار ڏيڻ لاءِ اهل ٺيڪيدارن، فرمن، گڏيل منصوبن (جوائنٽ وينچرز) ۽ ڪمپنيز کان اي-باڪ ايڪزيڪٽس ايند ڊسٽربيوشن سسٹم (EPADS) ذريعي اليڪٽرانڪ سربند آڇون (اي-ٽينڈر) طلب ڪري ٿو.

خريداري سند بملڪ پروڪيورمينٽ ريگيوليٽري اٿارٽي (SPPRA) قاعدن 2010 (آڇ ٿائين ٽيل ترميمن سميت) مطابق بين الاقوامي مقابلي واري آڇ (ICB) ذريعي هڪ مرحلي - بن لفافو، واري طريقي سان ڪئي ويندي.

اهل واڪ ڏينڈرز باڪستار ايجنسٽرڪ ڪائونسل (PEC) وٽ رجسٽرڊ هجڻ گهرجن ۽ انهن وٽ لاگاپيل ايجنسٽرنگ شعبي ۾ مناسب درجي ۽ هجن 2027 ٿائين صحيح PEC رجسٽريشن سرٽيفڪيٽ هجي. گڏوگڏ فيڊرل بورڊ آف ريونيو (FBR)، سنڌ ريونيو بورڊ (SRB) ۽ بين ڪانوني اٿارٽيز سان جنهن لاءِ هجي لاڳاپيل رجسٽرڊ هجي.

ڪم جو قسم ۽ جڳهه	ڪم جي تخميني رقم (روپيا)	بولي جي ضمانت (روپيا)	PEC سان لاڳاپيل ڪيٽيگري	ڪم جي مدت
1	زهري سر ڪنارا جي آر ڊي 000 589+ کان آر ڊي 250 610+ تائين سمنٽ ڪنڪريٽ لائننگ ADP سال 2026-27/ 1116	3,967,796 ملين روپيا	198.40 ملين روپيا	CA (ڪا حد ناهي)	-/10,000 روپيا	18 مهينا

ٽينڈرن جي هاري ڪرڻ / وصولي / اپ لوڊ ۽ کولڻ جو پروگرام

	سرگرمي	آن لائن شروع ٿيندي	آن لائن ختم ٿيندي
1	EPADS درهي تي سولسن جمع ڪرائڻ جي آخري تاريخ صبح 11:00 وڳي	07/12/2026	15/12/2026
2	ٽينڈر سائگر ڏينهن EPADS تي صبح 11:30 وڳي کوليا ويندا	07/12/2026	15/12/2026

ڪم جي ڊائري ۽ خاص طور تي هيٺين شامل آهن:

الف آر ڊي 589+000 کان 610+250 تائين مٿي، جو ڪم ۽ PCC لائننگ.

ب هائيبرڊ رولڈ فلاورنگ جو ڪم.

1. **خريداري جو طريقو (هڪ مرحلو ۽ لفافا، قومي / بين الاقوامي مقابلي واري بولي)**

2. **اهليت / لازمي شرط**

الف درخواست ڏينڊر جن ۽ ٺيڪيدار، ڪمپنيون، فرمون ۽ گڏيل منصوبا شامل آهن، جيڪي مقرر ڪيل اهليت ۽ قابليت جا معيار پورا ڪن. انهن تي لاڳو ٿيندڙ لازمي شرطن جو ذڪر هيٺ ڪيو ويو آهي:

ب سمر الاقوامي مقابلي واري آڇ انهن ڏاجسپي رکندڙ واڪ ڏينڊرز، فرمن ۽ گڏيل منصوبن لاءِ کليل آهي جيڪي پاڪستان انجنيئرنگ ڪائونسل وٽ CA درجي (ڪا حد ناهي) ۾ رجسٽرڊ هجن ۽ لاڳاپيل خاص ڪيٽيگري رکندا هجن. PEC رجسٽريشن سرٽيفڪيٽ جون 2027 ۾ ان کان پوءِ ٿائين صحيح هجي ۽ ان ۾ لاڳاپيل انجنيئرنگ ۽ خاص ڪيٽيگري CE-01، CE-02، CE-04، CE-09 ۽ CE-01 شامل هجن.

غير ملڪي واڪ ڏينڊر PEC ضابطن جي شق مطابق صرف ڪنهن مقامي فرم سان گڏيل منصوبي ۾ ٽي آڇ ڏيڻ جو حقدار آهي.

ب واڪ ڏينڊر سائگر خصوصين ۽ سائڪي نوعيت وارن ڪمن جي فهرست مهيا ڪندا، جيڪي سائڊي ماحول ۾ مڪمل ٽيل ڪم جي اندازي لاڳت جي برابر يا ان کان وڌيڪ هجن. يا (الف) سائگي نوعيت جو هڪ ڪم جنهن جي قيمت گهٽ ۾ گهٽ اندازي لاڳت جو 80 سيڪڙو هجي؛ يا (ب) سائگي نوعيت جا گهٽ ۾ گهٽ ٻه ڪم، جن مان هر هڪ جي قيمت گذريل 05 سالن دوران گهٽ ۾ گهٽ اندازي لاڳت جو 50 سيڪڙو هجي، ۽ انهن سان ڀاڪاءِ تڪميل جا سرٽيفڪيٽ لڳل هجن.

ت ڪم تي مقرر ڪيل ٽيڪنيشنگ ۽ فني عملي جي سوانح سنڌن قابليت، تجربي ۽ فرم سان ملازمت جي مڪمل تفصيل سميت، مهيا ڪئي ويندي.

ٿ فرم وٽ موجود مشينري ۽ سامان جي فهرست، ملڪيت يا دستيابي جي دستاويزي ثبوت سميت، مهيا ڪئي ويندي.

ڏ گذريل تن (03) سالن (2023-24، 2024-2025 ۽ 2025-26) جون QCR جي واري رجسٽرڊ آڊٽ فرم کان تصديق ٽيل سالياني آڊٽ رپورٽون.

ڌ ڪنهن به شيڊيولڈ بئنڪ کان تازيون لاڳت جي 20 سيڪڙو جي قرض جي سهولت جو سرٽيفڪيٽ مهيا ڪيو ويندو.

ن گذريل تن (03) سالن يعني (2023-24، 2024-2025 ۽ 26-2025) جا سالياني آمدني ٽيڪس گوشوارا.

ڦ سراسري سالياني ٽرن اوور گذريل تن (03) سالن ۾ وصول ٽيل ڪل تصديق ٽيل ادائگين جي بنياد تي ڳڻيو ويندو. اهو ڪن جي اندازي لاڳت جي برابر يا ان کان وڌيڪ هجڻ، يعني 3,967,796 ملين روپيا ۽ 14.324 ملين آمريڪي ڊالر(2023-24، 2024-25 ۽ 2025-26).

ب فرم لاءِ بئنڪ اسٽيٽمينٽ مهيا ڪندي جنهن ۾ اشتهار جي اشاعت جي تاريخ تي ڪم جي اندازي لاڳت جو گهٽ ۾ گهٽ 20 سيڪڙو بيلنس ۽ گذريل ڇهن (06) مهينن دوران اندازي لاڳت جو گهٽ ۾ گهٽ 20 سيڪڙو سراسري ماهوار آخري بيلنس ڏيکاريل هجي.

ج قومي واڪ ڏينڈرن وٽ سنڌ ريونيو بورڊ (SRB) ۽ فيڊرل بورڊ آف ريونيو (FBR) سان صحيح رجسٽريشن هجي ۽ لاڳو ٽيڪس پريندرن جي فهرست ۾ شامل هجن. غير ملڪي واڪ ڏينڈر پاڻ ٽي لاڳو برابر قانوني ۽ ٽيڪس دستاويز مهيا ڪندا.

ڇ واڪ جي ضمانت SPPRA قاعدن ۽ مقرر ڪيل صورتن مان ڪنهن هڪ صورت ۾ جمع ڪرائي ويندي، بهتر آهي ته پاڪستان جي ڪنهن شيڊيولڈ بئنڪ پاران جاري ڪيل بئنڪ گارنٽي يا ڪال ڊپازٽ جي صورت ۾ هجي. غير ملڪي بئنڪ گارنٽي جي صورت ۾ لاڳو PEC/SPP قاعدن تحت گهرجن پوريون ڪيون ويندیون.

3. اي-اسٽيم (500/- روپيا) تي حلف نامو جنهن ۾ جاڪاڻي هجي ته "اسان فرم ۽ نه ئي ان جا ڊائريڪٽر، حصيدار، مجموعي طور يا فرد فرد ڪو حصو ڪنهن به سرڪاري ايجنسي/ڪاتي/اداري طرفان ڪڍڻ بليڪ لسٽ/نااهل/ڊفالٽر قرار ڏنو ويو آهي". ٽيڪنيڪل بولي سان گڏ لڳايو ويندو، بي صورت ۾ اهڙين بولين تي غور نه ڪيو ويندو.

4. ٽيڪنيڪل تجويز جو هر صفحو ڪمپني/فرم/گڏيل منصوبي جي باختيار شخص طرفان نمبر ڏنل، صحيح ٽيل ۽ مهر لڳل هجي. جمع ڪرايل دستاويز ۾ ڪا به ڪٽ ڇاٽ قبول نه ڪئي ويندي.

5. واڪ کان اڳ ڪنهتي 16.11.2026 تي 12:00 وڳي ايگزيڪيوٽو انجنيئر، داد ڊويزن، شهيد بينظير آباد جي آفيس ۾ ٽينڈر.

6. **بولي / ٽينڈر دستاويز**

واڪ جا دستاويز ۽ بيا شرط ۽ ضابطا سرڪاري SPPRA/EPADS خريداري پورٽل، يعني https://portalsindh.eprocure.gov.pk تان ڊسي ۽ ڊائنلوڊ ڪري سگهجن ٿا. ڊائنلوڊ ٿيل واڪ جي دستاويزن سان مقرر طريقي مطابق 10/-000 رپين جي ناقابل واپسي ٽينڈر فيس لڳائي ويندي. آڇ جي ضمانت SPPRA قاعدن ۽ مقرر ڪيل صورتن مان ڪنهن هڪ صورت ۾، بهتر آهي ته پاڪستان جي ڪنهن شيڊيولڈ بئنڪ جي بئنڪ گارنٽي، ڪال ڊپازٽ يا پي آرڊر جي صورت ۾ 198.40 ملين رپين جي رقم سان. ايگزيڪيوٽو انجنيئر، داد ڊويزن، شهيد بينظير آباد جي حق ۾ (فرم جو نالو) جي طرفان مقرر فارم تي. ٽيڪنيڪل بولي سان گڏ لڳائي ويندي، بي صورت ۾ اهڙين آڇن تي غور نه ڪيو ويندو.

7. ٽيڪنيڪل تجويز ۾ مالي تجويز سيني ڪوريل سندڙ دستاويزن سميت، صاف طرح اسڪين ڪري بولي جمع ڪرائڻ جي مقرر آخري تاريخ تي يا ان کان اڳ اي-باڪ ايڪزيڪٽس ايند ڊسٽربيوشن سسٹم (EPADS) تي اليڪٽرانڪ طور اپ لوڊ ڪيون ويندیون. صرف مقرر ڪيل قدر EPADS ذريعي اليڪٽرانڪ طور جمع ڪرايل بولين تي غور ڪيو ويندو. ڪنهن ٻئي طريقي سان يا مقرر آخري تاريخ کان پوءِ جمع ڪرايل بولين تي غور نه ڪيو ويندو.

8. واڪ جي ضمانت ٽيڪنيڪل تجويز ڪوڙ وڌ خريداري ڪنڊڙ اداري وٽ جمع ڪرائي ويندي، نه ته آڇ رد ڪئي ويندي.

9. ٽيڪنيڪل تجويزون مقرر تاريخ ۽ وقت تي EPADS تي خريداري ڪميٽي ۽ شرڪت ڪندڙ ٽيڪدار فرمن يا سندن بااختيار نمائندن جي موجودگي ۾ ڪوليون ويندیون، جيڪي حاضر ٿيل ڇاهين ٽيڪنيڪل تجويزن جوابنداڻي جاڙي بولي جي دستاويزن ۽ جاڪاڻي اهليت ۽ قابليت جي معيارن مطابق ورتو ويندو.

10. صرف ٽيڪنيڪل طور اهل ۽ بنيادي طور تي مطابقت رکندڙ بولي ڏينڈرن جون مالي تجويزون SPPRA قاعدن ۽ بولي جي دستاويزن ۽ جاڪاڻي طريقي مطابق ڪوليون ويندیون. مالي تجويزن ڪوڙ جي تاريخ، وقت ۽ طريقو ٽيڪنيڪل طور اهل بولي ڏينڈرن کي مقرر خريداري نظام ذريعي بتايو ويندو.

11. گڏيل منصوبي لاءِ معيار بولي جي دستاويزن ۾ جاڪاڻي آهن.

12. جڪا بولي "سب کان وڌيڪ فائديمند بولي" ثابت ٿيندي، اها قبول ڪئي ويندي.

13. ٽيڪنيڪل جاڙي دوران ٽيڪنيڪل تجويز ۾ ڪنهن به ترميم جي اجازت نه هوندي.

14. ٽيڪنيڪل طور غير مطابقت رکندڙ بولي ڏينڈرن جي اصل بولي جي ضمانت ڪنهن به ڪم واري ڏينهن هٽ صحيح ڪندڙ جي آفيس مان حاصل ڪري سگهجي ٿي.

15. اي-اسٽيمپ (500/- روپيا) تي ٿمن حلف نامو (اصل ۽ ان مطلب جو مهيا ڪيل سب دستاويز/تفصيل/مشينري جي معلومات سچي ۽ درست آهي ڪمپني/فرم/گڏيل منصوبي طرفان عملي / فيلڊ ٽيل يا غلط معلومات/سرٽيفڪيٽ مهيا ڪرڻ جي صورت ۾ ان کي ڪنهن به مرحلي تي بليڪ لسٽ ڪري سگهجي ٿو.

16. نمائندي وٽ مالڪ طرفان اي-اسٽيمپ (500/- روپيا) تي اختيار نامو هجڻ گهرجي. اي-اسٽيمپ (500/- روپيا) کان سواءِ پيپر ڪور، اختيار نامو قبول نه ڪيو ويندو ۽ اهڙي ٽينڈر تي غور نه ڪيو ويندو.

17. فرم جي صورت ۾، بااختيار ڪنڊ / مالڪن يا پين لاڳاپيل ماڻهن جا مڪمل تفصيل مختيارنامي سميت ڏنا وڃن اڪيلي مالڪ هجڻ جي صورت ۾، اهڙو اقرار اي-اسٽيمپ (500/- روپيا) تي ٿمن حلف نامي (اصل ۽) جي صورت ۾ مهيا ڪيو وڃي.

18. ٽينڈر مٿي جاڪاڻي ڪوريل دستاويزن/ معلومات سميت PADS-E ذريعي جمع ڪرايا وڃن. جيڪڏهن ڪوريل دستاويزن/معلومات مان ڪا شيءِ ڪتل هوندي تہ خريداري ڪميٽي ٽينڈر تي غور نہ ڪندي. ۽ جمع ڪرائڻ جي مقرر آخري تاريخ ۽ وقت کان پوءِ اهڙا ڪي به دستاويز قبول نہ ڪيا ويندا.

- **واڪ جمع ڪرائڻ ۽ کولڻ هيٺ جاڪاڻي پتي تي ٽينڈر:**

پتو: ايگزيڪيوٽو انجنيئر داد ويزن ۽ آفيس، جمعداڙ ريسٽورنٽ جي پرسان، نوابشاهه ضلعو شهيد بينظير آباد

شرط ۽ ضابطا:

هيٺين حالتن ۾ آڇ رد ڪئي ويندي:

الف مشروط، اليڪٽرانڪ (اي ميل) ۽ ٽيليگرافڪ بولين / ٽينڈر.

ب گهربل رقم ۽ صورت ۾ بولي جي ضمانت ڪان سواءِ بولين.

پ مقرر آخري تاريخ ڪان پوءِ وصول ٽيل بولين.

ڀ بولي جي صحيح هجڻ جي مدت 120 ڏينهن آهي.

ت بليڪ لسٽ / نااهل قرار ڏنل فرمون.

ٿ خريداري ڪنڊ اٿارٽي وٽ SPPRA قاعدن 2010 (آڇ ٿائين ترميم ٽيل) مطابق ڪنهن هڪ يا سڀني ٽينڈرن/ آڇن کي رد ڪرڻ جو حق محفوظ آهي.

ايگزيڪيوٽو انجنيئر
داد ويزن
شهيد بينظير آباد

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دفتر ایگزیکٹو انجینئر ڈویژن شہید بینظیر آباد

فون نمبر:0244-9370223 فیکس نمبر:0244-9370222

No. TC/G-55 /1841 of2026, S.B.A. Dated: - 02/11/2026.

ای-ٹینڈرز کی طلبی کا نوٹس (قومی / بین الاقوامی مسابقتی بولی)

ایگزیکٹو انجینئر، روڈ ڈویژن، شہید بینظیر آباد، نکہ آبپاشی، حکومت سندھ، ذیل میں درج کام کی انجام دہی کے لیے اہل ٹھیکیداروں، فرموں، مشترکہ منصوبوں (جوائنٹ وینچرز) اور کمپنیوں سے ای-پاک ایکوزیشن اینڈ ڈسپوزل سسٹم (EPADS) کے ذریعے الیکٹرانک سربمہر بولیاں (ای-ٹینڈرز) طلب کرتا ہے۔

خریداری سندھ پبلک پروکیورمنٹ ریگولیٹری اتھارٹی (SPPRA) قواعد 2010 (تاحال ترامیم سمیت) کے مطابق، بین الاقوامی مسابقتی بولی (ICB) کے ذریعے، ایک مرحلہ۔ دو لفافہ طریقہ کار کے تحت کی جائے گی۔

اہل بولی دہندگان کو پاکستان انجینئرنگ کونسل (PEC) کے ساتھ رجسٹرڈ ہونا لازم ہے اور ان کے پاس متعلقہ انجینئرنگ شعبے اور مناسب درجے میں جون 2027 تک کارآمد PEC رجسٹریشن سرٹیفکیٹ ہو، نیز فیڈرل بورڈ آف ریونیو (FBR)، سندھ ریونیو بورڈ (SRB) اور دیگر قانونی اداروں کے ساتھ، جہاں لاگو ہو، متعلقہ رجسٹریشن ہو۔

نمبر شمار	کام کا نام و مختصر تفصیل	تخمینی لاگت (روپے)	بولی کی ضمانت (لاگت کا 5%)	PEC کے سامان	ٹینڈر فیس
1	ڈویژن میں کینال کی آر ڈی 000+589 سے آر ڈی 250+610 تک سیمنٹ کنکریٹ لائننگ (ADP نمبر: 1116 / 27 - 2026)	3,967,796 روپے	198.40 ملین روپے	CA (کوئی حد نہیں)	10,000/- روپے

ٹینڈرز کے اجرا / وصولی / اپ لوڈ اور کھولنے کا پروگرام

نمبر شمار	کام	اجرا کی تاریخ	وصولی کی آخری تاریخ و وقت
1	EPADS کے ذریعے ای-بولیاں جمع کرانے کی آخری تاریخ، صبح 11:00 بجے	07/12/2026	15/12/2026
2	ٹینڈر ای سی EPADS پر صبح 11:30 بجے کھولے جائیں گے	07/12/2026	15/12/2026

کام کے دائرۂ کار میں بنیادی طور پر درج ذیل شامل ہیں:

الف۔ آر ڈی 000+589 سے 250+610 تک 21 کام اور PCC لائننگ۔

ب۔ ہائیڈرولک ڈھانچوں کی بحالی۔

1۔ طریقہ خریداری (ایک مرحلہ دو لفافہ، قومی / بین الاقوامی مسابقتی بولی)

2۔ اہلیت / لازمی شرائط

الف۔ درخواست دہندگان، بشمول ٹھیکیدار، کمپنیاں، فرمیں اور مشترکہ منصوبے، جو متوقعہ اہلیت اور قابلیت کے معیار پر پورا اتریں، ان پر مزید جانچ کے لیے غور کیا جائے گا۔

ب۔ بین الاقوامی مسابقتی بولی ان وینچرز کے لیے کھولی جائے گی، جو مشترکہ منصوبوں کے لیے کھلی ہے، جو پاکستان انجینئرنگ کونسل کے ساتھ CA درجے (کوئی حد نہیں) میں رجسٹرڈ ہوں اور متعلقہ خصوصی کوڈ رکھتے ہوں۔ PEC رجسٹریشن سرٹیفکیٹ جون 2027 اور اس کے بعد تک کارآمد ہونا چاہیے اور ان کے پاس متعلقہ انجینئرنگ اور خصوصی کوڈ CE-01/ CE-02/ CE-04/ CE-09 اور CE-10 شامل ہوں۔

غیر ملکی بولی دہندہ PEC نوٹیفائی شقوں کے مطابق صرف کسی مقامی فرم کے ساتھ مشترکہ منصوبے میں ہی بولی دینے کا حقدار ہے۔

پ۔ بولی دہندگان کو یکساں خصوصیات اور یکساں نوعیت کے کاموں کی فہرست فراہم کریں گے، جو یکساں ماحول میں عمل کیے گئے کام کی تخمینی لاگت کے برابر یا اس سے زیادہ ہوں، یا (الف) یکساں نوعیت کا ایک کام جس کی مالیت کم از کم تخمینی لاگت کا 80 فیصد ہو، یا (ب) یکساں نوعیت کے کم از کم دو کام، جن میں سے ہر ایک کی مالیت گزشتہ 05 سالوں کے دوران کم از کم تخمینی لاگت کا 50 فیصد ہو، اور ان کے ساتھ باقاعدہ تکمیل سرٹیفکیٹ منسلک ہوں۔

ت۔ کام پر تعینات کیے جانے والے انجینئرنگ اور تکنیکی عملے کے کوائف، بشمول ان کی قابلیت، تجربہ اور فرم کے ساتھ ملازمت کی مکمل تفصیلات، فراہم کیے جائیں گے۔

ٹ۔ فرم کے پاس دستیاب مشینری اور آلات کی فہرست، مکمل یا جزوی ملکیت یا دستیابی کے ثبوت کے ساتھ۔ فراہم کی جائے گی۔

ث۔ گزشتہ تین (03) سالوں (2024-25/2023-24/2022-23 اور 2025-26) کی QCR درجہ کی جسٹرڈ آڈٹ فرم سے تصدیق شدہ سالانہ آڈٹ رپورٹس۔

ج۔ کسی بھی شیڈول کیے گئے تخمینی لاگت کے 20 فیصد کی قرض سہولت کاسرٹیفکیٹ فراہم کیا جائے گا۔

چ۔ گزشتہ تین (03) سالوں، یعنی (2024-25، 2023-24 اور 2025-26) کے سالانہ اکم ٹیکس گوشوارے۔

ح۔ اوسط سالانہ ٹرن اوور گزشتہ تین (03) سالوں میں وصول شدہ ودائیگیوں کی بنیاد پر ثابت کیا جائے گا۔ یہ کاموں کی تخمینی لاگت سے زیادہ ہو گا، یعنی 3,967.796 ملین روپے اور 14.324 ملین امریکی ڈالر (2024-25/2023-24 اور 2025-26)۔

خ۔ فرم ایسا بیک انٹیسٹ فراہم کرے گی جس میں اشتہار کی اشاعت کی تاریخ پر کام کی تخمینی لاگت کا کم از کم 20 فیصد بیلنس، اور گزشتہ چھ (06) ماہ کے دوران تخمینی لاگت کا کم از کم 20 فیصد اوسط ماہانہ انتظامی بیلنس ظاہر ہو۔

د۔ قومی بولی دہندگان کے پاس سندھ ریونیو بورڈ (SRB) اور فیڈرل بورڈ آف ریونیو (FBR) کے ساتھ کارآمد رجسٹریشن ہو اور وہ فعال ٹیکس دہندگان کی فہرست میں شامل ہوں۔ غیر ملکی بولی دہندگان اپنے اوپر لاگو مساوی قوانین اور ٹیکس دستاویزات فراہم کریں گے۔

ذ۔ بولی کی ضمانت SPPRA قواعد میں مقررہ صورتوں میں سے کسی ایک صورت میں جمع کرائی جائے گی، جو پنجابا پاکستان کے کسی شیڈولڈ بینک کی جاری کردہ پے آرڈر، ڈیمانڈ ڈرافٹ یا کال ڈپازٹ کی صورت میں۔ غیر ملکی بینک گارنٹی کی صورت میں لاگو SPP/PEC قواعد کے تحت تقاضے پورے کیے جائیں گے۔

ر۔ اسٹامپ (500/- روپے) پر بیان حلفی جس میں درج ہو کہ "مذکورہ فرم اور نہ ہی اس کے ڈائریکٹرز، حصہ داران، یا موجودہ بولی کسی سرکاری ایجنسی / محکمہ / ادارے کی جانب سے بلیک لسٹ / کالعدم نہیں (03) سالوں، یعنی (2024-25، 2023-24 اور 2025-26) کے سالانہ اکم ٹیکس گوشوارے۔

ز۔ تکنیکی تجویز ہمراہ حلفی کنجی / فرم / مشترکہ منصوبے کے چیف ایگزیکٹو / حصہ دار شدہ / دستخط شدہ اور مہر شدہ ہو، نیز جمع شدہ دستاویزات میں کسی قسم کی کاٹ چھانٹ قبول نہیں کی جائے گی۔

س۔ بولیاں مورخہ 16.11.2026 کو 12:00 بجے ایگزیکٹو انجینئر، روڈ ڈویژن، شہید بینظیر آباد کے دفتر میں منعقد ہو گا۔

بولی / ٹینڈر دستاویزات:

بولی کی دستاویزات اور دیگر شرائط و ضوابط سمیت کارکردی SPPRA/EPADS پر دیکھ / مفت ڈاؤن لوڈ کیے جا سکتے ہیں۔ https://portalsindh.eprocure.gov.pk، یعنی لاگ ان / ڈاؤن لوڈ کے جا سکتے ہیں۔ ڈاؤن لوڈ شدہ بولی کی دستاویزات کے ساتھ مقررہ طریقے کے مطابق 10,000/- روپے کی ناقابل واپسی فیس منسلک کی جائے گی۔ بولی کی ضمانت SPPRA قواعد میں مقررہ صورتوں میں سے کسی ایک صورت میں، ترجیحاً اسٹامپ کے کسی شیڈولڈ بینک کی گارنٹی، کال ڈپازٹ یا پے آرڈر کی صورت میں، 198.40 ملین روپے کی رقم کے ساتھ، ایگزیکٹو انجینئر، روڈ ڈویژن، شہید بینظیر آباد کے حق میں (فرم کا نام) کی جانب سے مقررہ وقار پر، تکنیکی بولی کے ساتھ منسلک کی جائے گی؛ بصورت دیگر ایسی بولیوں پر غور نہیں کیا جائے گا۔

7۔ تکنیکی تجویز اور مالی تجویز، تمام مطلوبہ معاون دستاویزات سمیت، واضح طور پر الگ الگ لفافوں میں بند کر کے بولی جمع کرانے کی مقررہ آخری تاریخ سے پہلے ای-پاک ایکوزیشن اینڈ ڈسپوزل سسٹم (EPADS) پر الیکٹرانک طور پر اپ لوڈ کی جائیں گی۔ صرف مقررہ وقت کے اندر EPADS کے ذریعے الیکٹرانک طور پر جمع کرائی گئی بولیوں پر غور کیا جائے گا۔ کسی دوسرے طریقے سے یا مقررہ آخری تاریخ کے بعد جمع کرائی گئی بولیوں پر غور نہیں کیا جائے گا۔

8۔ بولی کی ضمانت تکنیکی تجاویز کھولنے کے وقت خریدار ادارے کے پاس جمع کرائی جائے گی، بصورت دیگر بولی مسترد کر دی جائے گی۔

9۔ تکنیکی تجاویز مقررہ تاریخ اور وقت پر EPADS پر دیکھ رمت کمیٹی اور شریک ٹھیکیدار فرموں یا ان کے مجاز نمائندوں کی موجودگی میں کھولی جائیں گی، جو حاضر ہونا چاہتے۔ تکنیکی تجاویز کی ابتدائی جانچ بولی کی دستاویزات میں درج اہلیت اور قابلیت کے معیار کے مطابق کی جائے گی۔

10۔ صرف تکنیکی طور پر اہل اور بنیادی طور پر مطابقت رکھنے والے بولی دہندگان کی مالی تجاویز SPPRA قواعد اور بولی کی دستاویزات میں درج طریقہ کار کے مطابق کھولی جائیں گی۔ مالی تجاویز کھولنے کی تاریخ، وقت اور طریقہ کار، تکنیکی طور پر اہل بولی دہندگان کو مقررہ وقت سے مناسب نظام کے ذریعے مطلع کیا جائے گا۔

11۔ مشترکہ منصوبے کے لیے معیار بولی کی دستاویزات میں درج ہیں۔

12۔ بولیاں "سب سے زیادہ فائدہ مند بولی" ثابت ہوگی، وہ قبول کی جائے گی۔

13۔ تکنیکی جانچ کے دوران تکنیکی تجویز میں کسی کو تبدیلی کی اجازت نہیں ہو گی۔

14۔ تکنیکی طور پر غیر مطابقت رکھنے والے بولی دہندگان کی اصل بولی کی ضمانت کسی بھی کام کے دان نہ زد تلفی کے وقت سے حاصل کی جا سکتی ہے۔

15۔ ای-اسٹامپ (500/- روپے) پر بیانیہ حلفی (اصل) اس مضمون کا کہ فراہم کردہ تمام دستاویزات / تصدیقات / مشمولہ کی معلومات درست اور صحیح ہیں۔ کسی / فرم / مشترکہ منصوبے کی جانب سے جعلی / زائد رد بدل شدہ یا غلط معلومات / سرٹیفکیٹ فراہم کرنے کی صورت میں اسے کسی بھی مرحلے پر بلیک لسٹ کیا جا سکتا ہے۔

16۔ زائد کے پاس مالک کی جانب سے ای-اسٹامپ (500/- روپے) پر اصل اختیار نامہ ہونا چاہیے۔ ای-اسٹامپ (500/- روپے) کے علاوہ کوئی اختیار نامہ قبول نہیں کیا جائے گا، اور ایسے ٹینڈر پر غور نہیں کیا جائے گا۔

17۔ فرم کی صورت میں ڈائریکٹرز / مالکان یا دیگر متعلقہ افراد کی مکمل تفصیلات بمعہ کارنامے کے ساتھ دی جائیں۔ واحد مالک ہونے کی صورت میں، ایسا اقرار نامہ ای-اسٹامپ (500/- روپے) پر سے بیان حلفی (اصل) کی صورت میں فراہم کیا جائے۔

18۔ ٹینڈر زرنہ کو رہایا مطلوبہ دستاویزات / معلومات کے ساتھ E-PADS کے ذریعے جمع کرائے جائیں۔ اگر مطلوبہ دستاویزات / معلومات میں سے کسی چیز کی کمی ہوئی تو پر کیے رمت کمیٹی ٹینڈر پر غور نہیں کرے گی، اور جمع کرانے کی صورت میں آخری تاریخ اور وقت کے بعد بھی کوئی دستاویزات قبول نہیں کی جائیں گی۔

- بولیوں کا جمع کرانا اور کھولنا درج ذیل پتے پر ہو گا:

پتہ: دفتر ایگزیکٹو انجینئر روڈ ڈویژن، مزد مجلہ، ریسٹورنٹ، نوابشاہ، ضلع شہید بینظیر آباد

شرائط و ضوابط:

درج ذیل صورتوں میں بولی مسترد کر دی جائے گی:

الف۔ مشروط، ایکسپائر (ای میل) اور نامکمل / نامکمل بولیاں / ٹینڈر۔

ب۔ خلاف ورزی قواعد صورت میں بولی کی ضمانت کے بغیر بولیاں۔

پ۔ مقررہ آخری تاریخ کے بعد موصول ہونے والی بولیاں۔

ت۔ بولی کی کارآمد مدت 120 دن ہے۔

ٹ۔ بولی کسی بھی قرداری کی نہیں ہے۔

ث۔ اگر SPPRA قواعد 2010 (تاحال ترامیم شدہ) کے مطابق کسی ایک یا تمام بولیوں کو مسترد کرنے کا حق محفوظ ہے۔

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