Standard Bidding Document

LANDSCAPING AND HORTICULTURE WORKS IN SECTOR F-14 & F-15, ISLAMABAD.
(Works)

National

Single Stage-Two Envelope

November 25, 2026

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REQUEST FOR BIDS

PROCUREMENT OF CIVIL WORKS

1. The **Federal Government Employees Housing Authority (Federal Government Employees Housing Authority-FGEHA)** has reserved Funds for the procurement planned for FY **2026-27**. The **Federal Government Employees Housing Authority (Federal Government Employees Housing Authority-FGEHA)** intends to apply part of the proceeds of this Fund to cover eligible payments under the contract for the "**LANDSCAPING AND HORTICULTURE WORKS IN SECTOR F-14 & F-15, ISLAMABAD.**" with the reference of **"P200199"**

2. The **Federal Government Employees Housing Authority (Federal Government Employees Housing Authority-FGEHA)** invites electronic Bids from eligible Bidders for procurement of Works **(LANDSCAPING AND HORTICULTURE WORKS IN SECTOR F-14 & F-15, ISLAMABAD.)** described in the bidding documents on **EPADS v2.0**.

3. **Single Stage-Two Envelope** will be used by adopting **Least Cost Based Selection (LCBS)** Technique for the subject procurement, in line with the Public Procurement Rules, 2026 and any Regulations, Regulatory Guides, Procurement Guidelines or Instructions issued by the Authority from time to time.

4. All Bids must be accompanied by a Bid Security amounting described in Bid Security Section in Bidding Document in the form of **Call at Deposit**. Or all bids must be accompanied by bid securing declaration in the format specified in the Bidding documents

5. E-Bidding documents, containing detailed terms & conditions, specifications and requirements etc. are available on **e-Pak Acquisition and Disposal System (EPADS)** at **https://epads.gov.pk/opportunities/federal/procurements/200199** for all the interested bidders registered on **EPADS v2.0**. Bidders are required to get themselves registered on **EPADS v2.0** to participate in Bidding process.

6. The e-bids, prepared in accordance with the instructions in the e-Bidding documents, must be submitted through **EPADS v2.0** on or before **Wednesday, December 16, 2026 12:00 PM**. E-bids will be opened by using **EPADS v2.0** on the same day at **Wednesday, December 16, 2026 12:30 PM**. Manual submission of Bids shall not be entertained. Those vendor who have not yet registered on the new version of **EPADS v2.0**, may register themselves on **https://vendors.epads.gov.pk/**. A tutorial to explain the registration process is available at **https://www.youtube.com/watch?v=MNW6T38v7tc.**

In terms of Rules 65 of Public Procurement Rules, 2026 Grievance Redressal Committee (GRC) is notified for the subject procurement and notification copy is available on the procuring agency's website and on Authority's website at (**www.ppra.gov.pk**).

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Instructions to Bidders

A. INTRODUCTION

1. **Scope of Bid**

1.1. The Procuring agency/Employer (PA), as indicated in the **Bid Data Sheet** (BDS) invites Bids for the execution of Works as specified in the BDS and **Section VI- Works Requirements**. The name, identification, and number of lots (contracts) of this National/ International Competitive Bidding process are specified in the BDS.

2. **Source of Funds**

2.1. Source of funds as referred in Clause 2 of Bid Data Sheet.

3. **Eligible Bidders**

3.1. A bidder may be natural person, company or firm or public or semi-public agency of Pakistan or any foreign country, or any combination of them with a formal existing agreement (on Judicial Papers) in the form of a joint venture or consortium. In the case of a joint venture or consortium, all members shall be jointly and severally liable for the execution of the Contract in accordance with the terms and conditions of the Contract. The joint venture or consortium shall nominate a Lead Member as nominated in the BDS, who shall have the authority to conduct all business for and on behalf of any and all the members of the joint venture or consortium during the Bidding process, and in case of award of contract, during the execution of contract. Verifiable copy of the agreement that forms a joint venture, consortium or association shall be required to be submitted as part of the Bid.

Any bid submitted by the joint venture shall indicate the part of proposed contract to be performed by each party and each party shall be evaluated (or post qualified if required) with respect to its contribution only, and the responsibilities of each party shall not be substantially altered without prior written approval of the Procuring Agency and in line with any instructions issued by the Authority.

(The limit on the number of members of JV or Consortium may be prescribed

in BDS, in accordance with the guidelines issued by the PPRA).

3.2. The invitation for bids is open to all prospective bidders subject to any provisions of incorporation or licensing by the respective national/ international incorporating agency or statutory body established for that particular trade or business. Procuring agencies shall specify the registration/licensing requirements for the foreign bidder keeping in view the requirement of that business.

3.3. A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidders may be considered to have a conflict of interest with one or more parties in this Bidding process, if they:

3.3.1. are associated or have been associated in the past, directly or indirectly with a firm or any of its affiliates which have been engaged by the Procuring agency/Employer to provide consulting services for the preparation of design or technical specifications of the works that are the subject of the bid; or

3.3.2. have controlling shareholders in common; or

3.3.3. receive or have received any direct or indirect subsidy from any of them; or

3.3.4. have the same legal representative for purposes of this Bid; or

3.3.5. have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another bidder, or influence the decisions of the Procuring agency/Employer regarding this Bidding process; or

3.3.6. Submit more than one bid in this bidding process.

3.4. A Bidder may be ineligible if –

3.4.1. he is declared bankrupt or, in the case of company or firm, insolvent;

3.4.2. payments in favor of the bidder is suspended in accordance with the judgment of a court of law other than a judgment declaring bankruptcy and resulting (in accordance with the national laws) in the total or partial loss of the right to administer and dispose of its property;

3.4.3. the bidder is convicted, by a final judgment of a Court of Law or relevant Professional Statuary Body, of any offence involving professional conduct;

3.4.4. The bidder is debarred/ blacklisted by a national level Procuring agency/Employer and hence debarred due to involvement in corrupt and fraudulent practices, or performance failure or due to breach of bid securing declaration.

3.5. As and when required, bidders shall provide to the Procuring agency/Employer evidence of their eligibility, proof of compliance with the necessary legal requirements to carry out the contract effectively.

4. **Eligible Material and Equipment**

4.1. All the material and equipment to be mobilized under the contract shall have their origin in eligible source countries, and all expenditures made under the contract will be limited to such materials and equipment. For this purpose, ineligible countries are stated in the section-IV titled as “Eligible Countries”.

B. BIDDING DOCUMENTS

5. **Contents of Bidding Documents**

5.1. The scope of Works, bidding procedures, and terms and conditions of the contract are prescribed in the bidding documents. In addition to the Invitation for Bids, the bidding documents which should be read in conjunction with any addenda issued in accordance with ITB 7.1 include:

i. Section I Instructions to Bidders (ITBs)

ii. Section II Bid Data Sheet (BDS)

iii. Section III Evaluation and Qualification Criteria

iv. Section IV Bidding Forms

v. Section V Eligible Countries

vi. Section VI Works Requirements

vii. Section VII General Conditions of Contract (GC)

viii. Section VIII Particular Conditions of Contract (PC

ix. Section IX Contract Forms

5.2. The bidder is expected to examine all instructions, forms, specifications, terms and conditions prescribed in the bidding documents. Failure to furnish all the information required in the bidding documents will be at the bidder's risk and may result in the rejection of his bid.

6. **Clarification of Bidding Document, Pre-bid Meeting**

6.1. A prospective bidder requiring any clarification of the bidding document may notify the Procuring agency/Employer through **EPADS v2.0**.

6.2. The Procuring agency/Employer shall respond to the request for clarification in accordance with the Public Procurement Rules 2026, Rule No.38 i.e. **Clarifications of bids**.

6.3. Should the Procuring Agency deem it necessary to amend the BIDDING document as a result of a clarification, it shall do so following the procedure under **ITB 7**.

6.4. If indicated in the **BDS**, the bidder's designated representative is invited at the bidder's cost to attend a pre-bid meeting at the place, date and time mentioned in the BDS. During this pre-bid meeting, prospective bidders may request clarification of the schedule of requirement, the evaluation criteria or any other aspects of the bidding documents.

6.5. Minutes of the pre-bid meeting, if applicable, including the text of the questions asked by bidders, including those during the meeting (without identifying the source) and the responses given, together with any responses prepared after the meeting will be uploaded on **EPADS v2.0**. Any modification to the bidding documents that may become necessary as a result of the pre-bid meeting shall be made by the Procuring agency/Employer exclusively through the use of an Addendum pursuant to **ITB 7**. Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder.

6.6. The bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the bidder's own expense.

6.7. The bidder and any of its authorized personnel will be granted permission by the Procuring agency/Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the bidder and its personnel will release and indemnify the Procuring agency/Employer 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 the inspection.

7. **Amendment of Bidding Documents**

7.1. The procuring agency may issue notification of any change, addition, modification or deletion in accordance with the Public Procurement Rules 2026, rule no. 34 i.e. **Bidding Documents**.

7.2. To give prospective bidders reasonable time in which to take an addendum/corrigendum into account in preparing their bids, the Procuring agency/Employer may, at its discretion, extend the deadline for the submission of bids:
Provided that the Procuring agency/Employer shall extend the deadline for submission of bid in pursuance of Public Procuement Rules 2026, rule no. 39 i.e. ***Extension of time for submission of bids****, if such an addendum*

is issued within last three (03) days of the bid submission deadline.

C. PREPARATION OF BIDS

8. Language of Bid

8.1. The bid prepared by the bidder, as well as all correspondence and documents relating to the bid exchanged by the bidder and the Procuring agency/Employer shall be written in the English language unless specified in the **BDS**. Supporting documents and printed literature furnished by the bidder may be in another language provided they are accompanied by an accurate translation of the relevant pages in the English language unless specified in the **BDS**, in which case, for purposes of interpretation of the bidder, the translation shall govern.

9. **Documents Comprising the Bids**

9.1. The Bid prepared by the Bidder shall constitute the following components: -

9.1.1. Documentary evidence established in accordance with ITB 9 that the material and equipment to be utilized by the Bidder for the executions of works are eligible material and equipment and conform to the Bidding Documents;

9.1.2. Documentary evidence established in accordance with ITB 10 that the Bidder has been authorized to carry out the Construction works;

9.1.3. Documentary evidence established in accordance with ITB 10 that the Bidder is eligible and/or qualified for the subject Bidding process;

9.1.4. Letter of Bid and Schedules and Bid Prices completed in accordance with ITB 11 and 12;

9.1.5. Completed schedules as required, including priced Bill of Quantities in accordance with ITB 11.

9.1.6. Technical Proposal completed in all aspects in accordance with ITB 14.

9.1.7. Bid security or Bid Securing Declaration furnished in accordance with ITB 16;

9.1.8. Any other Document required in the BDS.

9.2. In addition to the requirements, Bids submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful Bid shall be signed by all members and submitted with the Bid, together with a copy of the proposed Agreement. Bids submitted by a joint venture of two (2) or more firms specified in Bidding Data, shall comply with the following requirements:

9.2.1. The bid, and in case of a successful bid, the Form of Contract Agreement shall be signed by all members so as to be legally binding on all partners;

9.2.2. 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;

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

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

9.2.5. 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 and corresponding duties & responsibilities 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 Employer.

9.3. The Bidder shall furnish, as part of its Bid, all those documents establishing the eligibility in conformity to the terms and conditions specified in the Bidding Documents for all material, equipment and works which the Bidder proposes to execute.

9.4. The documentary evidence of conformity of the material, equipment and works to the Bidding Documents may be in the form of literature, drawings, and data, and shall consist of:

9.4.1. a detailed description of the work methodology, approach, schedule and resources to be mobilized at site;

9.4.2. any other procurement specific documentation requirement as stated in the BDS.

9.5. The Bidder shall furnish in the Letter of Bid name(s) of the potential DAAB member(s) and attach their curriculum vitae. The list of potential DAAB member(s) proposed by the Employer (Contract Data 21.1) and by the Bidder (Letter of Bid) shall be subject to mutual review and agreement of the Parties in accordance with Sub-Clause 21.1 of the Conditions of Contract, and shall form the basis for the constitution of the DAAB in the event of Contract award.

10. **Documents Establishing Eligibility and Qualification of the Bidder**

10.1. The bidder shall furnish, as part of its bid, all those documents establishing the bidder's eligibility to participate in the bidding process and/or its qualification to perform the contract if its bid is accepted.

10.2. The documentary evidence of the bidder's eligibility to bid shall establish to the satisfaction of the Procuring agency/Employer that the bidder, at the time of submission of its bid, is from an eligible country as defined in Section-V titled as "Eligible Countries".

10.3. The documentary evidence of the bidder's qualification to perform the contract if its bid is accepted shall establish to the satisfaction of Procuring agency/Employer that:

10.3.1. The bidder has the financial and technical capability necessary to perform the Contract, meets the qualification criteria specified in Section-III, Evaluation and Qualification Criteria and **BDS**.

10.3.2. In the case of a bidder not doing business within Pakistan, the bidder is or will be (if awarded the contract) represented by a local bidder (Joint Venture) in accordance with the PEC works bylaws, and in case of award of works such foreign firm is required to participate in the execution of works to carry out its obligations as prescribed in the Conditions of Contract and /or Technical Specifications.

10.3.3. That the bidder meets the qualification criteria listed in Section-III, Evaluation and Qualification Criteria and **BDS**.

11. **Letter of Bid and Schedules**

11.1. The Bidder shall fill the Form of Bids furnished in the bidding documents. The Bids Form must be completed without any alterations to its format and no substitute shall be accepted.

12. **Bid Prices**

12.1. The bid prices quoted by the bidder in the Bidding Forms, Bill of Quantities and in the Price Schedule to Bid shall conform to the requirements specified below or exclusively mentioned hereafter in the

bidding documents.

12.2. The bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. If a Price Schedule shows items listed but not priced, their prices shall be construed to be included in the prices of other items in the Bill of Quantities and will not be paid for separately by the Procuring agency/Employer.

12.3. The Bid price to be quoted in the Form of Bid in accordance with ITB 11 shall be the total price of the bid

12.4. Unless otherwise specified in the BDS and the Contract, the rates and prices quoted by the bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract.

12.5. Unless otherwise specified in the **BDS** and the Contract, the rates and prices quoted by the bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract.

12.6. If so specified in ITB 1.1, bids may be invited for individual lots (contracts) or for any combination of lots (packages).

12.7. Prices quoted by the Bidder shall either be fixed or adjustable during the Bidder’s performance of the contract if specified in the BDS.

12.8. All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date twenty-eight (28) days prior to the deadline for submission of bids, shall be included in the rates and prices and the total bid price submitted by the bidder.

13. **Currencies of Bid and Payment**

13.1. The unit rates and the prices shall be quoted by the Bidder entirely Pakistani Rupees. A Bidder expecting to incur expenditures in other currencies for inputs to the Works supplied from outside the Employer’s country (referred to as the “Foreign Currency Requirements”) shall indicate in Table III of Schedule-A to Bid the proportion of the Bid Price (excluding Provisional Sums) needed by him for the payment of such Foreign Currency

Requirements; in such case the unit rates and the prices shall be quoted by the Bidder in Equivalent Pakistani Rupees.Comparison of Bids and tie of Bid shall be treated in accordance with the Public Procurement rules 2026, rule no. 42.

14. **Documents Comprising the Technical Proposal**

14.1. The bidder shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section IV– Bidding Forms, in sufficient detail to demonstrate the adequacy of the bidder’s proposal to meet the work requirements and the completion time.

15. **Bid Validity Period**

15.1. Bids shall remain valid for the period specified in the BDS after the bid submission deadline prescribed by the Procuring agency/Employer. A bid valid for a shorter period shall be rejected by the Procuring agency/Employer as non-responsive. The period of bid validity will be determined from the complementary bid securing instrument i.e. the expiry period of bid security or bid securing declaration as the case may be.

15.2. Under exceptional circumstances, prior to the expiration of the initial Bids/Bid validity period, the Procuring Agency may request the Bidders’ consent to an extension of the period of validity of their Bids/Bid. Such request for extension of the period of bid validity shall be carried out in accordance with the Public Procurement rules 2026, rule no. 37 i.e. Bid Validity.

16. **Bid Security or Bid Securing Declaration**

16.1. Pursuant to ITB 10.1 unless otherwise specified in the BDS, the bidder shall furnish as part of its bid, a Bid Security in accordance with the Public Procurement Rules 2026, rule no. 36 in the amount and currency specified in the BDS or Bid Securing Declaration as specified in the BDS in the format provided in Section IV (Bidding Forms).

In case Procuring agency/Employer is inviting bids in lots / packages, the

bidder shall be required to submit his bid security against the respective lot/ package for which he is submitting his bid.
Until the development of functionality of auto verification of financial instrument in **EPADS v2.0**, the scanned copy of bid security or bid securing declaration, as the case may be, shall be uploaded on **EPADS v2.0** whereas the original instrument to be submitted to the procuring agency before closing of bid submission deadline, failing which shall result in rejection of Bid as non-responsive.

16.2. The Bid Security shall be denominated in the local currency or in another freely convertible currency, and it shall be in the form specified in the BDS which shall be in any of the following:

16.2.1. A bank guarantee, an irrevocable letter of credit issued by a Scheduled bank in the form provided in the Bidding Documents or another form acceptable to the Procuring agency/Employer and valid for twenty-eight (28) days beyond the end of the validity of the Bid. This shall also apply if the period for Bid Validity is extended. In either case, the form must include the complete name of the bidder;

16.2.2. A cashier’s or certified cheque; or

16.2.3. Another security as indicated in the **BDS**.

16.3. The Bid Security or Bid Securing Declaration shall be in accordance with the Form of the Bid Security or Bid Securing Declaration included in Schedule to Bid or another form approved by the Procuring agency/Employer prior to the bid submission.

16.4. The Bid Security shall be payable promptly upon written demand by the Procuring agency/Employer in case any of the conditions listed in **ITB 16.9** are invoked.

16.5. Any bid not accompanied by a Bid Security or Bid Securing Declaration in accordance with **ITB 16.1 or 16.3** shall be rejected by the Procuring agency/Employer and shall be declared as non-responsive bid, pursuant to **ITB 25**.

16.6. Unsuccessful bidders' Bid Security will be discharged or returned as promptly as possible, however in no case later than thirty (30) days after the expiration of the period of Bid Validity prescribed by the Procuring agency/Employer pursuant to **ITB 15**. The Procuring agency/Employer shall make no claim to the amount of the Bid Security, and shall promptly return the Bid Security document, after whichever of the following that occurs earliest:

16.6.1. The expiry of the Bid Security;

16.6.2. The entry into force of a procurement contract and the provision of a performance security (or guarantee), for the performance of the contract if such a security (or guarantee), is required by the Biding documents;

16.6.3. The rejection by the Procuring agency/Employer of all Bids;

16.6.4. The withdrawal of the bid prior to the deadline for the submission of bids, unless the biding documents stipulate that no such withdrawal is permitted.

16.7. The successful bidder's Bid Security will be discharged upon the bidder signing the contract pursuant to **ITB 38**, or furnishing the performance security (or guarantee), pursuant to **ITB 39**.

16.8. The Bid Security may be forfeited or the Bid Securing Declaration executed:
if a Bidder:

16.8.1. Withdraws its Bid during the period of Bid Validity as specified by the Procuring agency/Employer, and referred by the bidder on the Form of Bid except as provided for in ITB 15.2; or

16.8.2. In the case of a successful bidder, if the bidder fails:

16.8.2.1. to sign the contract in accordance with ITB 38; or

16.8.2.2. to furnish performance security (or guarantee) in accordance with ITB 39.

16.9. In case of Bid Security issued by the foreign bank is allowed by the Procuring agency/Employer, the same should be counter guaranteed by a corresponding bank in Pakistan. Furthermore, in case of joint venture, it should be in the name of Joint venture to ensure joint responsibility. In case the JV is not legally constituted at the time of bid submission, the bid security or bid securing declaration shall be in the names of Joint Venture or Lead/either Firm of the JV or in ratio of shares of the individual JV partners, submitting the bid.

17. **Withdrawal of Bids**

17.1. The Bidder shall prepare and submit Bids through EPADS with due diligence after carefully reading all the terms and condition before Bid submission deadline.

D. SUBMISSION OF BIDS

20. **Submission of Bids**

20.1. All bids shall be submitted through **EPADS v2.0**.

21. **Deadline for Submission of Bids**

21.1. All bids shall be received through **EPADS v2.0** not later than bid submission deadline as specified in the **BDS**.

21.2. The Procuring agency/Employer may, under exceptional circumstances and at its discretion, extend the deadline for the submission of bids, pursuant to Public Procurement Rules 2026, rule no. 39 Extension of Time for submission of bid, by amending the Bidding Documents in accordance with ITB 7, in which case all rights and obligations of the Procuring agency/Employer and bidders previously subject to the deadline will thereafter be subject to the new deadline.

22. **Withdrawal, Substitution and Modification of Bids**

22.1. A bidder may substitute or modify his bid after it has been submitted, provided that written notice of the substitution or modification of the bid, is received by the Procuring agency/Employer prior to the deadline for submission of bids.

22.2. Revised bid may be submitted after the substitution or modification made in the original bid in accordance with ITB 20.1.

E. OPENING AND EVALUATION OF BIDS

23. **Opening of Bids**

23.1. The Procuring Agency will open bids in accordance with the Public Procurement rules 2026, rule no.40 as specified in the **BDS**.

24. **Confidentiality**

24.1. Information relating to the examination, clarification, evaluation and comparison of bids and recommendation of contract award shall not be disclosed to bidders or any other persons not officially concerned with such process until the time of the announcement of the respective evaluation report.

25. **Clarification of Bids**

25.1. Clarification of Bidding Documents shall be carried out in accordance with the Public Procurement Rules 2026, rule no. 38 i.e. Clarifications.

25.2. The alteration or modification in the bid which in any case affect the following parameters will be considered as a change in the substance of a bid:

25.2.1. evaluation & qualification criteria;

25.2.2. required scope of work;

25.2.3. contract price;

25.2.4. all securities requirements;

25.2.5. tax requirements;

25.2.6. terms and conditions of bidding documents.

25.2.7. change in the ranking of the bidder

26. **Preliminary Examination of Bids**

26.1. Prior to the detailed evaluation of bids, the Procuring agency/Employer will determine whether each bid:

26.1.1. has been prepared as per the format and contents defined by the Procuring agency/Employer in the bidding documents;

26.1.2. has been properly signed;

26.1.3. is accompanied by the required securities; and

26.1.4. is substantially responsive to the requirements of the bidding documents.

The Procuring agency/Employer's determination of a bid's substantial responsiveness will be based on the contents of the bid itself.

26.2. A substantially responsive Bid is one which conforms to all the terms, conditions, and specifications of the Bidding Documents, without material deviation or reservation. A material deviation or reservation is one that: -

26.2.1. affects in any substantial way the scope, quality, or performance of the Works;

26.2.2. limits in any substantial way, inconsistent with the bidding documents, the Procuring agency/Employer's rights or the bidders' obligations under the Contract; or

26.2.3. if rectified, would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

26.3. The Procuring agency/Employer will confirm that the documents and information specified under ITB 9, 10 and 11 have been provided in the bid. If any of these documents or information is missing, or is not provided in accordance with the Instructions to Bidders, the bid shall be rejected.

26.4. The Procuring agency/Employer may waive-off any minor informality, nonconformity, or irregularity in a bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Bidder.

Explanation: A minor informality, non-conformity or irregularity is one that is merely a matter of form and not of substance. It also pertains to some of the invitation that can be corrected or waived without being prejudicial to other bidders. The defect or variation is immaterial when the effect on quantity, quality, or delivery is negligible when contrasted with the total cost or scope of the works. The Procuring agency/Employer either shall give the bidder an opportunity to cure any deficiency resulting from a minor informality or irregularity in a bid or waive the deficiency, whichever is advantageous to the Procuring agency/Employer. Examples of minor informalities or irregularities include failure of a bidder to –

26.4.1. Submit the number of copies of signed bids required by the invitation;

26.4.2. Furnish required information concerning the number of its employees;

26.4.3. the firm submitting a bid has formally adopted or authorized, before the date set for opening of bids, the execution of documents by typewritten, printed, or stamped signature and submits evidence of such authorization and the bid carries such a signature.

26.5. Provided that a Technical Bid is substantially responsive, the Procuring agency/Employer may request the bidder to submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the Technical Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any such aspect of the

technical Proposal linked with the ranking of the bidders. Failure of the bidder to comply with the request may result in the rejection of its bid.

26.6. Provided that a Technical Bid is substantially responsive, the Procuring agency/Employer shall rectify quantifiable nonmaterial nonconformities or omissions related to the Financial Proposal. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of the missing or nonconforming item or component.

26.7. If a bid is not substantially responsive, it will be rejected by the Procuring agency/Employer and may not subsequently be evaluated for complete technical responsiveness.

27. **Examination of Terms and Conditions; Technical Evaluation**

27.1. The Procuring agency/Employer shall examine the bid to confirm that all terms and conditions specified in the GC and the PC have been accepted by the bidder without any material deviation or reservation.
For this purpose:
"**Deviation**" means departure from the requirements specified in the Bidding Document.
"**Reservation**" means setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document.

27.2. The Procuring agency/Employer shall evaluate the technical aspects of the bid submitted in accordance with ITB 28, to confirm that all requirements specified in Section VI – Works Requirement, Technical Specifications of the Bidding Documents have been met without material deviation or reservation.

27.3. If after the examination of the terms and conditions and the technical evaluation, the Procuring agency/Employer determines that the bid is not substantially responsive in accordance with ITB 25, it shall reject the bid.

28. **Correction of Arithmetic Errors**

28.1. Bids determined to be substantially responsive will be checked for any arithmetic errors. Errors will be corrected as follows: -

28.1.1. if there is a discrepancy between unit prices and the sub-total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail, and the sub-total price shall be corrected, unless in the opinion of the Procuring agency/Employer there is an obvious misplacement of the decimal point in the unit price, in which the total price as quoted shall govern and the unit price shall be corrected;

28.1.2. if there is an error in a total corresponding to the addition or subtraction of sub-totals, the sub-totals shall prevail, and the total shall be corrected; and

28.1.3. where there is a discrepancy between the amounts in figures and in words, the amount in words will govern.

28.1.4. Where there is discrepancy between grand total of price schedule and amount mentioned on the Form of Bid, the amount referred in Price Schedule shall be treated as correct subject to elimination of other errors.

28.2. The amount stated in the Bid will, be rectified by the Procuring agency/Employer in accordance with the above procedure for the correction of errors and, with, the concurrence of the bidder, shall be considered as binding upon the bidder. If the bidder does not accept the corrected amount, its bid shall be rejected after forfeiture of Bid Security or execution of the Bid Securing Declaration, as the case may be, in accordance with ITB 39.3.

29. **Conversion to Single Currency**

29.1.
Comparison of bids quoted in different currencies and conversion of bids into a single curre
Procurement Rule 2026, rule no. 42(2) as specified in the BDS.

30. **Evaluation of Bids**

30.1. The Procuring agency/Employer shall evaluate and compare only the bids determined to be substantially responsive, pursuant to ITB 25.

30.2. In evaluating the Technical Proposal of each Bid, the Procuring agency/Employer shall use the criteria and methodologies listed in the BDS and in terms of works requirement. No other evaluation criteria or methodologies shall be permitted.

30.3. The Procuring agency/Employer's evaluation of a bid will take into account:

30.3.1. the bid price, excluding provisional sums and the provision, if any, for contingencies in the summary bill of quantities, but including day work items, where priced competitively;

30.3.2. converting the amount resulting from applying above, if relevant, to a single currency in accordance with ITB 27;

30.4. 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.

30.5. If these bidding documents allow bidders to quote separate prices for different lots, and the award to a single bidder of multiple lots, the methodology of evaluation to determine the lowest evaluated lot combinations in the Form of Bid, is specified in the BDS.

30.6. If the bid, which results in the Evaluated Bid Price (Successful Bid), is seriously unbalanced or front loaded in the opinion of the Employer, the Employer 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, taking into consideration the schedule of estimated Contract payments, the Employer may require that the amount of the performance security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

Explanation:

“Unbalanced” or “front-loaded” bids consist of deliberately submitting bids with artificially high prices or unit rates for the early stages of a construction project, offset by artificially low prices or unit rates for the later stages of the project, to improve the contractor’s cash flow.

31. **Domestic Preference**

31.1. If the BDS so specifies, the Procuring agency/Employer will grant a margin of preference to the domestic contractor in line with the rules, regulations, regulatory guides or instructions issued by the Authority from time to time.

32. **Determination of Successful Bid**

32.1. The Procuring agency/Employer shall compare the evaluated bids in accordance with the predefined bidding procedure, of all substantially responsive bids to determine the Successful bidder.

33. **Qualification of Bidder**

33.1. The Procuring agency/Employer shall determine to its satisfaction whether the bidder is substantially responsive and whose bid is declared as Successful bid either continues to meet (if prequalification applies) or meets (if post-qualification applies) the qualifying criteria specified in Evaluation and Qualification Criteria.
Note: In case of international bidding, the parameters for incorporation or licensing within Pakistan may be fulfilled as part of post qualification.

33.2. The determination shall be based upon an examination of the documentary evidence of the bidder’s qualifications submitted by the bidder, pursuant to ITB 10.

33.3. Prior to contract award, the Procuring agency/Employer will verify that the successful bidder (including each member of a JV) is not blacklisted/debarred. The Procuring agency/Employer will conduct the same verification for each sub-contractor proposed by the successful bidder.

34. **Sub-Contractors**

34.1. The bidder shall provide details regarding any specialized sub-contractor to the Procuring agency/Employer. In case change of sub-contractors, the bidder shall promptly notify the Procuring agency/Employer and obtain approval for replacement of sub-contractors.

34.2. Bidders may propose sub-contracting up to the percentage of total value of contracts or the volume of works as specified in the BDS.

35. **Abnormally Low Financial Bid**

35.1. A procuring Agency may reject abnormally low bids in accordance with the Public Procurement Rules 2026, rule no. 43. The decision of the Procuring agency/Employer to reject a bid and reasons for the decision shall be recorded in the procurement proceedings and promptly communicated to the bidder concerned. Moreover, the Procuring agency/Employer shall not incur any liability solely by rejecting abnormally bid

Guidance for Procuring agency/Employer:

An abnormally low Bid means, a Bid containing Bid price that is less or lesser than twenty five percent (25%) of the Procuring agency/Employer's estimate.

35.2. The Procuring agency/Employer will determine to its satisfaction whether the bidder that is selected as having submitted the successful bid is qualified to perform the contract satisfactorily, in accordance with the criteria listed in ITB 10.

35.3. The determination will take into account the bidder's financial and technical capabilities. It will be based upon an examination of the documentary evidence of the bidder's qualifications submitted by the bidder, pursuant to ITB 10, as well as such other information as the Procuring agency/Employer deems necessary and appropriate. Factors not included in these bidding documents shall not be used in the evaluation of the bidders' qualifications.

35.4. Procuring agency/Employer may seek "Certificate for Independent Price Determination" from the bidder and the results of reference checks may be used in determining award of contract.

Explanation: *The Certificate shall be furnished by the bidder. The bidder*

shall certify that the price is determined keeping in view of all the essential aspects such as raw material, its processing, value addition, optimization of resources due to economy of scale, transportation, insurance and margin of profit etc.

35.5. An affirmative determination will be a prerequisite for award of the contract to the bidder. A negative determination will result in rejection of the bidder's bid, in which event the Procuring agency/Employer will proceed to the next ranked bidder to make a similar determination of that bidder's capabilities to perform satisfactorily.

F. AWARD OF CONTRACT

36. **Criteria of Award**

36.1. Subject to ITB 34 and 35, the Procuring agency/Employer will award the Contract to the bidder whose bid has been determined to be substantially responsive to the bidding documents and who has been declared as Successful Bidder, provided that such bidder has been determined to be:

36.1.1. eligible in accordance with the provisions of ITB 3;

36.1.2. is determined to be qualified to perform the Contract satisfactorily; and

36.1.3. Successful negotiations have been concluded, if any.

37. **Negotiations**

37.1. The Committee of the Procuring agency/Employer may negotiate with the Successful Bidder in accordance with Public Procurement Rules 2026 rule no. 26(3).

38. **Procuring agency/Employer's Right to reject All Bids**

38.1. The procuring agency has the right to reject all bids in accordance with the Public Procurement Rules 2026, rule no. 45 However, the Authority (i.e.

PPRA) may call from the Procuring agency/Employer the justification of those grounds.

39. **Notification of Award**

39.1. The procuring agency shall announce and publish the evaluation result in accordance with the Public Procurement Rules 2026, rule no 48.

39.2. Where no complaints have been lodged, the bidder whose bid has been accepted will be notified of the award by the Procuring agency/Employer prior to expiration of the bid validity period through EPADS. However, the Procuring agency/Employer shall not award any procurement contract at least for five (05) days after the announcement of final evaluation report. The notification letter (herein after and in the condition of the contract and contract form called “Letter of Acceptance” will specify the sum that the Procuring agency/Employer will pay the successful bidder in consideration for the execution and completion of the works as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price).

39.3. The notification of award will constitute the formation of the Contract, subject to the bidder furnishing the Performance Security (or guarantee) in accordance with ITB 39 and signing of the contract in accordance with ITB 38.

39.4. Upon the successful bidder’s furnishing of the performance security (or guarantee) pursuant to ITB 39, the Procuring agency/Employer will promptly notify each unsuccessful bidder, the name of the successful bidder and the Contract amount and will discharge the Bid Security or Bid Securing Declaration of the bidder(s) pursuant to ITB 16.

40. **Signing of Contract**

40.1. Promptly after notification of award, Procuring agency/Employer shall send the successful bidder the draft agreement, incorporating all terms and conditions as agreed by the parties to the contract.

40.2. Immediately after the Redressal of grievance by the GRC, and after fulfillment of all conditions precedent of the Contract Form, the successful bidder and the Procuring agency/Employer shall sign the contract.

40.3. Where no formal signing of a contract is required, work order issued to the bidder shall be construed to be the contract.

41. **Performance Security (or Guarantee)**

41.1. After the receipt of the Letter of Acceptance, the successful bidder, within the specified time, shall deliver to the Procuring agency/Employer a Performance Guarantee in the amount and in the form stipulated in the BDS and PC, denominated in the type and proportions of currencies in the Letter of Acceptance and in accordance with the Conditions of Contract.

41.2. If the Performance Guarantee is provided by the successful bidder and it shall be in the form specified in the BDS which shall be in any of the following:

41.2.1. certified cheque, cashier’s or manager’s cheque, or bank draft;

41.2.2. irrevocable letter of credit issued by a scheduled bank of Pakistan or in the case of an irrevocable letter of credit issued by a foreign bank, the letter shall be confirmed or authenticated by a scheduled bank of Pakistan;

41.2.3. bank guarantee confirmed by a reputable local bank or, in the case of a successful foreign bidder, bonded by a foreign bank; or

41.2.4. surety bond callable upon demand issued by any reputable surety or insurance company.
Any Performance Guarantee submitted shall be enforceable in Pakistan.

41.3. Failure of the Most Advantageous Bidder to comply with the requirement of ITB 40 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security or declare blacklisted (in case bid securing declaration is submitted) in which event the Procuring agency/Employer may make the award to the next most advantageous bidder or reinitiate the procurement process afresh (as a case may be).

42. **Advance Payment**

42.1. Advance payment will be provided to the bidder in percentage and in the manner as agreed by the both parties in terms of Conditions of the Contract.

42.2. The Procuring agency/Employer will provide an advance payment as stipulated in the Conditions of Contract, subject to a maximum amount, as stated and/or Conditions of the Contract. The advance payment request shall be accompanied by an advance payment security (guarantee) in the form provided in Section X. For the purpose of receiving the advance payment, the bidder shall make and estimate of, and include in its bid, the expenses that will relate to the purchase of equipment, machinery, materials, and on the engagement of labor during the first month beginning with the date of the Procuring agency/Employer's "Notice to Commence" as specified in the PCC.

43. **General Performance of the Bidders**

43.1. The Procuring agency/Employer reserves the right to obtain information regarding performance of the bidders on their previously awarded contracts / works. The Procuring agency/Employer may seek information / report from the previous employer for consideration. However, the Procuring agency/Employer shall incorporate such parameters in the evaluation criteria and accordingly decide the fate of the bid submitted.

44. **Corrupt & Fraudulent Practices**

44.1. Procuring agencies (including beneficiaries of Government funded projects and procurement) as well as Bidders/Suppliers/Contractors under Government financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts, and will avoid to engage in any corrupt and fraudulent practices.

G. GRIEVANCE REDRESSAL & COMPLAINT REVIEW MECHANISM

45. Grievance Redressal

45.1. Grievance Redressal shall be carried out in accordance with the PPRA, rules i.e. Redressal of grievances by the procuring agency and “Redressal of Grievances Regulations”.

H. MECHANISM OF BLACKLISTING

46. Mechanism of Blacklisting

46.1. The Procuring agency/Employer shall proceed Blacklisting of Bidders/Contractors in accordance with Public Procurement Rules 2026, rule no. 65 rule i.e. Blacklisting and “Blacklisting and Debarment of Bidders or Contractors.

Bid Data Sheet

Bid Data Sheet (BDS)

The following specific data for the procurement of works shall complement, supplement, or amend the provisions in the Instructions to Bidders (ITBs). Whenever there is a conflict, the provisions herein shall prevail over those in ITBs.

A. Introduction

ITB Number
Amendments of, and Supplements to, Clauses in the Instruction to Bidders

ITB Number1.1

Name of Procuring agency/Employer: **Federal Government Employees Housing Authority (Federal Government Employees Housing Authority-FGEHA)**

The subject of procurement is: **LANDSCAPING AND HORTICULTURE WORKS IN SECTOR F-14 & F-15, ISLAMABAD.**

Period for completion of the works **728 Days**

Commencement date execution of the works: **14 Days**

Type of Procurement**:Local**

ITB Number2.1

Financial year for the operations of the Procuring agency/Employer: **2026-27**
Name of Project :

Name of financing institution:

Name and identification number of the Contract: **P200199**

ITB Number3.1

JV/Consortium or Association Allowed: **No**

Maximum number of members in the joint venture shall be: **Nil**.

B. Bidding Documents

ITB Number6.4

The Bidders may seek clarifications through **EPADS v2.0**: **Last Clarification Date: Sunday, December 13, 2026**
Pre-Bid Meeting: Tuesday, December 8, 2026 11:00 AM

C. Preparation of Bids

ITB Number8.1

The Language of all correspondences and documents related to the Bid is: **English**

ITB Number 5.1 & 9.1

The following documentsmust be includedto constitute the Bid

1. Technical Bid Volume - I • Section I - Invitation for Bids • Section II - Instruction to Bidders (ITBs); • Section III - Bidding Data Sheet (BDS); • Section IV - Eligible Countries; • Section V – Evaluation and Qualification Criteria; • Section VI – Works Requirements Technical Specifications & Schedule of Requirements;

2. Technical Bid Volume-I • Section VII – Standard Bidding Forms; • Section VIII – General Conditions of Contract (GCC) ; • Section IX – Special Conditions of Contract (SCC); - Part A – Contract Data; - Part B- Special Provisions; • Section X – Contract Forms

3. Technical Bid Volume-II Specifications: - Part A – Specific Provisions; - Part B – Technical Provisions.

4. Technical Bid Voulme-III Bid Drawings.

5. Financial Bid Volume – IV • Letter of Financial Bid; • Preamble to Bill of Quantities; • Bill of Quantities.

ITB Number9.4 (b)

Other procurement specific documentation requirements are:

1. The applicants must provide “Letter of Award” of in- hand projects and Taking Over/Completion Certificate of completed projects. No marks will be

given to the projects for which above letter/certificate is not provided.

2. Applicant shall provide complete information of the projects including scope, cost and covered area etc.

3. The applicant must provide verifiable proof of employment for the staff as appointment letters, salary slips for the latest months and attach detailed CVs & valid PEC Registration Certificates / Diploma / Certificates of the Engineer, DAEs staff.

4. Proportionate marks will be awarded if minimum number of corresponding equipment is less than minimum required.

5. Applicant must provide an undertaking to the effect that the aforementioned equipment is available with the firm.

6. The Bidder shall submit copies of annual audit reports for the last three years duly certified by the Chartered Accounts and must indicate the soundness of the Applicants financial position.

ITB Number12.4

The Bid price will be/will not be subject to the price adjustment **Yes**
Price Adjustment Annexure is attached in the Annexure Section with the name of Adjustment Data.

ITB Number12.6

The Bid price shall be adjusted in accordance with Schedule-A to Bid – “Schedule of Adjustment Data” if available.

ITB Number13.1

Bidders to quote entirely in**Pak rupees (PKR)**

Schedule of Adjustment Data for Local Currency (LC)

Index Code	Index Description	Source of Index	Weighting
1	Non-adjustable	---	0.45

Index Code	Index Description	Source of Index	Weighting
2	Labour (Labourer (un-skilled) per day, shall be taken as representative of all types of Labour (skilled/unskilled) deployed at site)	Government of Pakistan (GP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin.	0.24
3	Cement (OPC cement per bag shall be taken as representative of all types of cement used at the site)	Government of Pakistan (GP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin.	0.06
4	Reinforcing Steel (½" Ø round M.S. Bars per tonne shall be taken as representative of all types and diameters of Steel Reinforcement)	Government of Pakistan (GP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin.	0.04
5	Crush/Bajri (rata) (per truck) (100 CFT) (Bajri(rata) shall be taken as representative of all types of coarse aggregates, base course and sub base course)	Government of Pakistan (GP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin.	0.06
6	High Speed Diesel (HSD) (HSD shall be taken as representative of all kind of fuels used in connection with the Contract)	Government of Pakistan (GP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin.	0.15
	Total	Pakistan	1.00

ITB Number15.1

The Bid Validity period shall be **120 Days** days.

ITB Number16.1

The amount of Bid Security shall be ... *see section itemd and bid security*

The currency of the Bid Security shall be: **PKR**.

ITB Number16.2

The Bid Security shall be in the form of:**Call at Deposit**

D. Submission of Bids

ITB Number19.1

The deadline for Bid submission is:**Wednesday, December 16, 2026 12:00 PM**
Address for submission of Original Bid Security:**10, Mauve Area, G-10/4, Islamabad Capital Territory**

ITB Number21.1
The Bid opening shall take place at:**EPADS v2.0**
Day : ***Wednesday***
Date: ***December 16, 2026***
Time : ***12:30 PM***

ITB Number27.1
The currency that shall be used for Bid evaluation and comparison purposes to convert all Bid prices expressed in various currencies is: **PKR Only**
The source of exchange rate shall be: **Nil**
The date of exchange rate shall be: **Nil**

ITB Number28.2 &28.5
Least Cost Based Selection (LCBS)
see Evaluation Criteria

ITB Number29.1
Domestic preference to apply.
Domestic preference:**No**
Preference to domestic or national suppliers or contractors shall be provided in accordance with policies of the Federal Government and/or in accordance with the regulations issued by the Authority.
If Yes, The percentage for the domestic preference alongwith calculation formula is provided in the evaluation and qualification criteria.

ITB Number32.2
Sub-contracting is allowed? : **Yes**

30% of the total value of the contract.

39.1 The Performance Security (or guarantee) shall be **10.00%**

39.2 The Performance Security (or guarantee) shall be in the form of:**Bank Guarantee**

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Eligibility Criteria

All Active Taxpayers shall be eligible to participate in the procurement process, unless expressly excluded or otherwise restricted under the Eligibility Criteria specified by the Procuring Agency.

Required Registration
NADRA CITIZENSHIP (CNIC/NICOP) FBR (NTN) FBR (GSTN) PEC

Eligibility Criteria	Document
i. Valid registration with PEC in category C-1 and above having CE-09, CE-10, CE-11(i), CE-11(vii), CE-11(ix), EE-04, EE-11(vi), EE-11(vv), EE-11(xvii) and EE-11(xxv) as codes of specialization.	Yes
ii. Affidavit of no blacklisting prepared within the current month of submission of bid-ding document.	Yes
iii. Information on any litigation or arbitration resulting from contracts completed or un-der execution by the Bidder. In case, the firm has never been involved in litigation, an affidavit to such effect should be provided	Yes
iv. Registration with income tax department (Valid NTN).	Yes
v. Registration with Sales Tax Department (GST/PST).	Yes
vi. On Active Tax Payer’s List at the time of submission of Bid.	Yes

Evaluation Criteria

Least Cost Based Selection (LCBS)

Weightage

Technical Evaluation %
100

Technical Marks	100
Passing Marks	**75**
Experience Record	
Experience as a Prime Contractor in the execution of projects of similar nature and complexity, such as Roads, Earthworks, Area Development/ Area Grading, bridges etc. completed during the last five (05) years or currently in-hand. Completed Projects • 02 marks will be awarded for each completed project having cost > Rs. 1.0 billion maximum up to 04 marks. • 02 marks will be awarded for each completed project having cost from Rs. 700 million to 1.0 billion maximum up to 04 marks. • No marks will be given for projects having cost less than 700 million. (Qualitative)(Doc Required)	8
Experience as a Prime Contractor in the execution of projects of similar nature and complexity, such as Roads, Earthworks, Area Development/ Area Grading, bridges etc. completed during the last five (05) years or currently in-hand. In-hand Projects • 01 mark will be awarded for each in-hand project having cost > Rs. 1.0 billion maximum up to 02 marks. • 01 mark will be awarded for each in-hand project having cost from Rs. 700 million to Rs. 1.0 billion maximum up to 02 marks. • No marks will be given for projects having cost less than 700 million (Qualitative)(Doc Required)	4

Specialized Horticulture and Landscaping Experience Experience as a Prime Contractor in the execution of projects of similar nature and complexity, such as Parks, Green Belts, beautification, Green Up-gradation, etc. completed during the last five (05) years or currently in-hand. Completed Projects • 04 marks will be awarded for each completed project having cost > Rs. 1.0 billion maximum up to 08 marks • 04 marks will be awarded for each completed project having cost from Rs. 700 million to Rs. 1.0 billion maximum up to 08 marks • No marks will be given for projects having cost less than 700 million. (Qualitative)(Doc Required)	16
Specialized Horticulture and Landscaping Experience Experience as a Prime Contractor in the execution of projects of similar nature and complexity, such as Parks, Green Belts, beautification, Green Up-gradation, etc. completed during the last five (05) years or currently in-hand. In-hand Projects • 03 marks will be awarded for each in-hand project having cost > Rs. 1.0 billion maximum up to 06 marks • 03 marks will be awarded for each in-hand project having cost from Rs. 700 million to Rs. 1.0 billion maximum up to 06 marks. • No marks will be given for projects having cost less than 700 million. (Qualitative)(Doc Required)	12
Personnel Capabilities:	
Project Manager/ Horticulturist (1) PHD or M.Sc. (Hons) Horticulture with minimum 10 years of relevant Experience to horticulture and landscaping works (Qualitative)(Doc Required)	2
Horticulturist (1) B.Sc. (Hons) Horticulture (Landscaping) with minimum 08 years of relevant Experience to horticulture and landscaping works (Qualitative)(Doc Required)	1
Civil Engineer 1 B.Sc. Civil Engineering registered with Pakistan Engineering Council (PEC) with minimum 06 years of relevant Experience to infrastructure works. (Qualitative)(Doc Required)	2
Electrical Engineer 1 B.Sc. Electrical Engineering registered with Pakistan Engineering Council (PEC) with minimum 06 years of relevant Experience to infrastructure works. (Qualitative)(Doc Required)	1
Quantity Surveyor 1 DAE (Civil) with 05 years hands on experience of beautification/up-gradation of horticulture and landscaping works/ infrastructure works (Qualitative)(Doc Required)	1

Site Supervisor (Civil) 2 01 Personnel – 01 Mark DAE (Civil) with 05 years hands on experience of beautification/up-gradation of horticulture and landscaping works/ infrastructure works (Qualitative)(Doc Required)	2
Site Supervisor (Horticulture & Landscaping) 2 01 Personnel – 01 Mark Diploma/ B.Sc. (Horticulture/ Landscaping) with 03 years hands on experience of beautification/up-gradation of horticulture and landscaping works including gardening and preparation of soft landscaping/green areas. (Qualitative)(Doc Required)	2
Surveyor 1 DAE (Civil) with 05 years hands on experience of beautification/up-gradation of horticulture and landscaping works/ infrastructure works (Qualitative)(Doc Required)	1
Gardner/Mali 20 01 Personnel – 0.15 Mark Preferably Literate with 05 years' experience of gardening, horticulture and landscaping works. (Qualitative)(Doc Required)	3
Equipment Capabilities	
Excavators 02 Nos. (Qualitative)(Doc Required)	1
Bull dozer and Wheel/ Crawler Loader 02 Nos. (Qualitative)(Doc Required)	1
Dump trucks & Compactor 03 Nos. & Plain 01 No. (Qualitative)(Doc Required)	1
Survey Equipment's Total Station & Auto Level and Concrete mixer Machine , Min.(capacity 2 bag cement) 01 Each (Qualitative)(Doc Required)	1
Tractor and trollies & Post Hole Digger 04 Nos. & 04 Nos. (Qualitative)(Doc Required)	1
Water bowsers 04 Nos. (Qualitative)(Doc Required)	1
Large Capacity Lawn Movers with collector and sweeping attachments 08 Nos (Qualitative)(Doc Required)	1
Electrical shrub cutters 04 Nos (Qualitative)(Doc Required)	1
Edging shear 04 Nos (Qualitative)(Doc Required)	1
Battery powered cordless hedge cutter 02 Nos (Qualitative)(Doc Required)	1

Battery operated brush cutter 08 Nos (Qualitative)(Doc Required)	1
Grass trimmer & Tree branch cutter 10 Nos & 08 Nos (Qualitative)(Doc Required)	1
Water pipe, 0.75” dia & Movable sprinkler with stand (or rain guns) 200 meters &10 Nos (Qualitative)(Doc Required)	1
Sprayer, separate for spraying insecticides and anti-termite & Large bins to pile garden debris before garden 04 Nos & 08 Nos (Qualitative)(Doc Required)	1
Wheel barrows 40 Nos (Qualitative)(Doc Required)	1
Financial Capabilities	
Average Annual Turn Over dur-ing the last (03) years. • Max Ten (10) marks shall be awarded if the average annual turnover for last three (03) years ≥ Rs. 01 billion. • Proportional Marks shall be awarded if the average annual turnover during the last three (03) years ≥ Rs. 700 million but ˂ Rs. 01 billion, calculated as: Marks = (Actual Turnover/ Max. Cap) x Max. Marks • For limit less than Rs. 700 million no marks shall be awarded. (Qualitative)(Doc Required)	10
Working Capitals • Ten (10) Marks shall be awarded if the working capital for the last year ≥ Rs. 200 million. • Proportional Marks shall be awarded if the working capital for the last year is ≥ Rs. 100 million but ˂ Rs. 200 million, calcu-lated as: Marks = (Actual Working Capital/ Max. Cap) x Max. Marks • For limit less than Rs. 100 million no marks shall be awarded. (Qualitative)(Doc Required)	10
Bank Credit Line (The bidder must provide an un-conditional, project specific credit line commitment letter from a scheduled bank in Pakistan on its official letterhead) • Ten (10) marks shall be awarded if the Bank Credit Line ≥ Rs. 250 million. • Proportional Marks shall be awarded if the Bank Credit Line ≥ Rs. 200 million but ˂ Rs. 250 million, calculated as: Marks = (Actual Bank Credit Line/ Max. Cap) x Max. Marks • Zero marks shall be given in case Bank Credit Line is less than Rs. 200 million (Qualitative)(Doc Required)	10

Jobs/Lots

Lot Title : LANDSCAPING AND HORTICULTURE WORKS IN SECTOR F-14 & F-15, ISLAMABAD.

Bid Security : 28568283 PKR

Job	Delivery Schedule	Quantity
Civil Works	**Address:** 10, Mauve Area, G-10/4, Islamabad Capital Territory **Schedule:** 728 Days **Quantity:** 1/job	1/job
E/M Works	**Address:** 10, Mauve Area, G-10/4, Islamabad Capital Territory **Schedule:** 728 Days **Quantity:** 1/job	1/job
Horticuture Works	**Address:** 10, Mauve Area, G-10/4, Islamabad Capital Territory **Schedule:** 728 Days **Quantity:** 1/job	1/job

Work Specifications and Market Rates

Lot Title: LANDSCAPING AND HORTICULTURE WORKS IN SECTOR F-14 & F-15, ISLAMABAD.

Specifications / Requirements:

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
1	Ch. 3 / Item 53	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the site over the whole belt, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	1000 Sft	2262000	5292.2	One Crore Nineteen Lakh Seventy Thousand Nine Hundred Fifty Six Rupees Only	11970956

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
2	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Regular excavation (cutting) of the belt to formation level, dressed to designed section and levels]	1000 Cft	1537000	8385.7	One Crore Twenty Eight Lakh Eighty Eight Thousand Eight Hundred Twenty One Rupees Only	12888821

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
3	Ch. 3 / Item 5(ii)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 90% maximum modified AASHTO dry density. [Ch. 3, Item 5(ii): Earthwork in embankment / filling to formation level with suitable material from the belt cut, including ploughing, mixing, moisture conditioning, compaction to 90% modified AASHTO and dressing]	1000 Cft	1537000	10856.75	One Crore Sixty Six Lakh Eighty Six Thousand Eight Hundred Twenty Five Rupees Only	16686825

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
4	NSI / EW-BF	Filling to formation level with approved select material borrowed from outside, in layers, watered and compacted.	1000 Cft	700950	15386.45	One Crore Seven Lakh Eighty Five Thousand One Hundred Thirty Two Rupees Only	10785132

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
5	Ch. 3 / Item 17(a)	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of surplus cut material to approved dumping ground, upto 5 km lead]	1000 Cft		7190.5	Zero Rupees Only	
6	Ch. 3 / Item 54	Compaction of natural ground. [Ch. 3, Item 54: Compaction of natural ground over the belt prior to formation of landscape works]	1000 Sft	2262000	3479.6	Seventy Eight Lakh Seventy Thousand Eight Hundred Fifty Five Rupees Only	7870855

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
7	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the boundary wall, 4 ft wide x 3 ft deep, by excavator in ordinary soil, including dagbelling and dressing]	1000 Cft	5589.4980694981	11147.4	Sixty Two Thousand Three Hundred Eight Rupees Only	62308

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
8	Ch. 6 / Item 5(i)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick x 4 ft wide, as lean course under the wall footing]	100 Cft	621.05534105534	36029.5	Two Lakh Twenty Three Thousand Seven Hundred Sixty Three Rupees Only	223763

PROCUREMENT REGULATORY AUTHORITY PUBLIC (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
9	Ch. 6 / Item 6(c)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and	Cft	1048.0308880309	697.5	Seven Lakh Thirty One Thousand Two Rupees Only	731002

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
10	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing, including cutting, bending, laying and binding]	100 Kg	2305.667953668	30827.85	Seven Lakh Ten Thousand Seven Hundred Eighty Eight Rupees Only	710788

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
11	Ch. 8 / Item 2(d)(iii)	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in foundation and upto plinth of the boundary wall]	100 Cft	873.35907335907	35682.6	Three Lakh Eleven Thousand Six Hundred Thirty Seven Rupees Only	311637

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
12	Ch. 8 / Item 4(d)(iii)	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in the boundary wall above plinth, including scaffolding and curing]	100 Cft	1921.38996139	38677.7	Seven Lakh Forty Three Thousand One Hundred Forty Nine Rupees Only	743149

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
13	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on top of the boundary wall]	100 Cft	58.223938223938	49085.5	Twenty Eight Thousand Five Hundred Eighty Rupees Only	28580

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
14	Ch. 11 / Item 20(c)(ii)	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the stone-masonry boundary wall]	100 Sft	5123.7065637066	7231.25	Three Lakh Seventy Thousand Five Hundred Eight Rupees Only	370508

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
15	Ch. 3 / Item 5(i)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, in layers, watered and compacted]	1000 Cft	3047.0527670528	11261.3	Thirty Four Thousand Three Hundred Fourteen Rupees Only	34314

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
16	Ch. 25 / Item 34	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. railing 3 ft high, 76x76x3 mm hollow box main member, on top of the boundary wall]	Rft	465.79150579151	1587.5	Seven Lakh Thirty Nine Thousand Four Hundred Forty Four Rupees Only	739444

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
17	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of walkway sub-grade to designed level, in ordinary soil]	1000 Cft	34800	11147.4	Three Lakh Eighty Seven Thousand Nine Hundred Thirty Rupees Only	387930

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
18	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the walkway]	100 Cft	11600	10874.25	Twelve Lakh Sixty One Thousand Four Hundred Thirteen Rupees Only	1261413

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
19	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the tough pavers]	100 Cft	23200	3556.7	Eight Lakh Twenty Five Thousand One Hundred Fifty Four Rupees Only	825154

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
20	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi, 50% grey and 50% coloured, including grouting joints with sand]	Sft	69600	231.35	One Crore Sixty One Lakh One Thousand Nine Hundred Sixty Rupees Only	16101960

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
21	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone of 3500 psi to both edges of the walkway, laid in cement-sand mortar 1:3]	Rft	23200	573.35	One Crore Thirty Three Lakh One Thousand Seven Hundred Twenty Rupees Only	13301720

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
22	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of cycle-track sub-grade to designed level, in ordinary soil]	1000 Cft	7733.3333333333	11147.4	Eighty Six Thousand Two Hundred Seven Rupees Only	86207

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
23	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular base course, 1 in thick, under the cycle track]	100 Cft	3866.6666666667	10874.25	Four Lakh Twenty Thousand Four Hundred Seventy One Rupees Only	420471

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
24	Ch. 18 / Item 6	Providing and laying bituminous priming coat, using 10 lbs. kerosene oil and 10 lbs. binder per 100 Sft. or 0.5 Kg kerosene and 0.5 Kg binder per square metre. [Ch. 18, Item 6: Providing and laying bituminous priming coat over the granular base of the cycle track]	100 Sft	46400	2582.55	Eleven Lakh Ninety Eight Thousand Three Hundred Three Rupees Only	1198303

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
25	Ch. 18 / Item 10(a)	Providing and laying plant premixed bituminous carpet, including compaction and finishing to required camber, grade and density - wearing course, at the bitumen content of the approved Job Mix Formula (rate per inch thickness per 100 Sft, converted to Cft). [Ch. 18, Item 10(a): Providing and laying plant-premixed bituminous carpet wearing course, 1 in thick, to the cycle track, compacted and finished to camber and grade]	Cft	3866.6666666667	931.93	Thirty Six Lakh Three Thousand Four Hundred Sixty Three Rupees Only	3603463

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
26	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the cycle track]	Rft	11600	573.35	Sixty Six Lakh Fifty Thousand Eight Hundred Sixty Rupees Only	6650860

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
27	NSI / EW-DL	Preparation and compaction of the jogging-track formation to designed section - ploughing, moistening to optimum moisture content, levelling and compaction with power road roller.	100 Sft	46400	1650	Seven Lakh Sixty Five Thousand Six Hundred Rupees Only	765600

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
28	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying pan crush (crushed stone product of approved quality and grade), 3 in thick, on	100 Cft	11600	10874.25	Twelve Lakh Sixty One Thousand Four Hundred Thirteen Rupees Only	1261413

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
29	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the jogging track]	Rft	11600	573.35	Sixty Six Lakh Fifty Thousand Eight Hundred Sixty Rupees Only	6650860

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
30	COMP / CA-17	Construction of rain-water harvesting pit 12 ft x 12 ft x 6 ft deep, including excavation, stone-masonry stepped lining, filter media, geotextile, uPVC pipework, P.C.C. base and heavy-duty cover - complete.	Each	20	363141.15	Seventy Two Lakh Sixty Two Thousand Eight Hundred Twenty Three Rupees Only	7262823
31	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as bedding under the performance-deck stage]	100 Cft	418.87902047864	3556.7	Fourteen Thousand Eight Hundred Ninety Eight Rupees Only	14898

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
32	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 4 in thick, as base slab under the stage]	100 Cft	418.87902047864	49085.5	Two Lakh Five Thousand Six Hundred Nine Rupees Only	205609

PROCUREMENT REGULATORY AUTHORITY PUBLIC (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
33	Ch. 10 / Item 22(a)(i)	Providing and laying mosaic flooring consisting of one part of cement and marble powder in the ratio of 3:1 and two parts of marble chips, laid over 1" (25 mm) thick flooring of 1:2:4 cement concrete, including rubbing and polishing complete with finishing: 1-3/8" (35 mm) thick mosaic flooring, consisting of 3/8" (10 mm) mosaic topping, using grey cement. [Ch. 10, Item 22(a)(i): Providing and laying 35 mm mosaic / terrazzo flooring with marble chips, including rubbing and polishing, to the stage]	100 Sft	1256.6370614359	31412.9	Three Lakh Ninety Four Thousand Seven Hundred Forty Six Rupees Only	394746

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
34	Ch. 8 / Item 4(d)(iii)	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry in cement-sand mortar 1:6 in the concentric seating steps, 2 ft thick x 5 ft high, including dressing of stones and curing]	100 Cft	9738.9372261284	38677.7	Thirty Seven Lakh Sixty Six Thousand Seven Hundred Ninety Seven Rupees Only	3766797

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
35	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as cap on the masonry seating steps]	100 Cft	324.63124087095	49085.5	One Lakh Fifty Nine Thousand Three Hundred Forty Seven Rupees Only	159347
36	Ch. 11 / Item 20(c)(ii)	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing in cement mortar 1:3 to exposed stone-masonry faces of the seating steps]	100 Sft	4869.4686130642	7231.25	Three Lakh Fifty Two Thousand One Hundred Twenty Three Rupees Only	352123

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
37	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm precast concrete interlocking tuff pavers to the plaza apron around the seating circle]	Sft	5419.2473274424	231.35	Twelve Lakh Fifty Three Thousand Seven Hundred Forty Three Rupees Only	1253743

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
38	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the plaza pavers]	100 Cft	1806.4157758141	3556.7	Sixty Four Thousand Two Hundred Forty Nine Rupees Only	64249
39	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Desilting of the bed of the existing natural pond in Zone-3]	1000 Cft	243000	8385.7	Twenty Lakh Thirty Seven Thousand Seven Hundred Twenty Five Rupees Only	2037725

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
40	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Excavation of the pond to the enlarged section, 200 ft wide and 8.5 ft deep with 2:1 banks, dressed to the designed section]	1000 Cft	1367700	8385.7	One Crore Fourteen Lakh Sixty Nine Thousand One Hundred Twenty Two Rupees Only	11469122

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
41	Ch. 3 / Item 17(a)	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of the silt and the surplus excavated material of the pond to approved dumping ground]	1000 Cft	1610700	7190.5	One Crore Fifteen Lakh Eighty One Thousand Seven Hundred Thirty Eight Rupees Only	11581738
42	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Clean screened sand, 3 in thick, as filter bedding under the stone pitching of the pond banks]	100 Cft	15205.262246999	3556.7	Five Lakh Forty Thousand Eight Hundred Six Rupees Only	540806

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
43	Ch. 16 / Item 28	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Stone pitching, 1 ft thick, on the pitched banks of the pond]	100 Cft	60821.048987994	15198.5	Ninety Two Lakh Forty Three Thousand Eight Hundred Eighty Seven Rupees Only	9243887
44	Ch. 16 / Item 28	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Stone pitching, 6 in thick, to the 4 ft wide toe apron at the bottom of the banks]	100 Cft	6400	15198.5	Nine Lakh Seventy Two Thousand Seven Hundred Four Rupees Only	972704

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
45	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4 in the toe beam, 1 ft 6 in x 1 ft 6 in]	100 Cft	7200	49085.5	Thirty Five Lakh Thirty Four Thousand One Hundred Fifty Six Rupees Only	3534156
46	Ch. 16 / Item 34	Grouting stone filling or pitching, with bajri. [Ch. 16, Item 34: Grouting of the pitching and the toe apron with bajri]	100 Cft	67221.048987994	3905.7	Twenty Six Lakh Twenty Five Thousand Four Hundred Fifty Three Rupees Only	2625453

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
47	Ch. 1 / Item 1	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the lead from the approved source to site (composite of the chain and kilometre rates of the item). [Ch. 1, Item 1: Carriage of stone, aggregate and sand for the pond banks and walkway]	100 Cft	106692.97790166	4590	Forty Eight Lakh Ninety Seven Thousand Two Hundred Eight Rupees Only	4897208

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
48	NSI / EW-DL	Dressing and levelling of the walkway sub-grade to designed section, with compaction.	100 Sft	25600	1650	Four Lakh Twenty Two Thousand Four Hundred Rupees Only	422400
49	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Sand bedding, 4 in thick, under the walkway]	100 Cft	8533.3333333333	3556.7	Three Lakh Three Thousand Five Hundred Five Rupees Only	303505

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
50	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4, 4 in thick, as the walkway slab]	100 Cft	8533.3333333333	49085.5	Forty One Lakh Eighty Eight Thousand Six Hundred Twenty Nine Rupees Only	4188629

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
51	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Tuff-paver wearing surface of the walkway]	Sft	25600	231.35	Fifty Nine Lakh Twenty Two Thousand Five Hundred Sixty Rupees Only	5922560

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
52	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Precast edge kerb stone to both edges of the walkway]	Rft	6400	573.35	Thirty Six Lakh Sixty Nine Thousand Four Hundred Forty Rupees Only	3669440

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
53	Ch. 3 / Item 21, 2(a)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth from 5.1 ft. (1.5 m) to 15 ft. (4.5 m), in ordinary soil. [Ch. 3, Item 21, 2(a)(ii): Excavation in foundation of the weir, its aprons and the stilling basin, 5.1 ft to 15 ft deep]	1000 Cft	19936	13528.2	Two Lakh Sixty Nine Thousand Six Hundred Ninety Eight Rupees Only	269698

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
54	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Well-compacted granular fill of stone product, 3 ft thick, under the aprons and the weir base]	100 Cft	10050	10874.25	Ten Lakh Ninety Two Thousand Eight Hundred Sixty Two Rupees Only	1092862

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
55	Ch. 6 / Item 6(a)(3)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in roof slab, beams, columns, lintels, girders and other structural	Cft	1400	773.55	Ten Lakh Eighty Two Thousand Nine Hundred Seventy Rupees Only	1082970

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
56	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Reinforcement, deformed bars Grade-60, in the apron and base slab]	100 Kg	3080	30827.85	Nine Lakh Forty Nine Thousand Four Hundred Ninety Eight Rupees Only	949498

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
57	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4 in the downstream apron, 8 in thick]	100 Cft	833.33333333333	49085.5	Four Lakh Nine Thousand Forty Six Rupees Only	409046
58	Ch. 16 / Item 28	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Hand-placed angular hard stone laid in mortar forming the body of the weir (crest 8 ft, base 27 ft, height 10 ft)]	100 Cft	8750	15198.5	Thirteen Lakh Twenty Nine Thousand Eight Hundred Sixty Nine Rupees Only	1329869

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
59	COMP / CA-20	Shotcrete facing 6 in thick (1:2:2) to both faces and the crest of the weir.	Sft	1779.3114224134	1531.2	Twenty Seven Lakh Twenty Four Thousand Four Hundred Eighty Two Rupees Only	2724482
60	Ch. 16 / Item 27	Providing and laying stone pitching / filling, dry hand packed, as filling behind retaining walls or in pitching and aprons. [Ch. 16, Item 27: Dry hand-packed stone fill, 3 ft thick, in the stilling basin, with friction blocks]	100 Cft	3300	8234.15	Two Lakh Seventy One Thousand Seven Hundred Twenty Seven Rupees Only	271727

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
61	Ch. 1 / Item 1	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the shorter lead adopted for the nullah and lake works. [Ch. 1, Item 1: Carriage of stone, aggregate and sand for the weir and its aprons]	100 Cft	24333.333333333	3881.75	Nine Lakh Forty Four Thousand Five Hundred Fifty Nine Rupees Only	944559
62	NSI / EW-DL	Ground preparation for the plant nursery (244 ft x 200 ft) - clearing, levelling, dressing and compaction.	100 Sft	48800	1650	Eight Lakh Five Thousand Two Hundred Rupees Only	805200

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
63	NSI / EW-DL	Ground preparation for the fruit nursery (150 ft square) - clearing, levelling, dressing and compaction.	100 Sft	22500	1650	Three Lakh Seventy One Thousand Two Hundred Fifty Rupees Only	371250

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
64	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation for the footings of the shed posts, in ordinary soil, including refilling and ramming]	1000 Cft	2199.375	11147.4	Twenty Four Thousand Five Hundred Seventeen Rupees Only	24517

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
65	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4 in the footings of the shed posts, 1.5 ft x 1.5 ft x 2.5 ft]	100 Cft	2199.375	49085.5	Ten Lakh Seventy Nine Thousand Five Hundred Seventy Four Rupees Only	1079574

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
66	Ch. 25 / Item 10	Fabrication of heavy steel / iron work, with angle, tees, flat iron, round iron and sheet iron for making trusses, girders, tanks, etc., including cutting, drilling, rivetting, handling, assembling and fixing, but excluding erection in position. [Ch. 25, Item 10: Fabrication of the shed structure of G.I. pipes - 2 in posts and 1-1/2 in top runners on both grid lines - cut, welded / clamped, with base and cap fittings]	100 Kg	20327.1	36401.6	Seventy Three Lakh Ninety Nine Thousand Three Hundred Ninety Rupees Only	7399390

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
67	Ch. 25 / Item 11	Erection and fitting in position iron trusses, staging of water tanks, etc. [Ch. 25, Item 11: Erection and fitting in position of the shed structure]	100 Kg	20327.1	1535.9	Three Lakh Twelve Thousand Two Hundred Four Rupees Only	312204
68	MKT / NS-1	Green HDPE shade net over the roof and the four sides of both sheds, stretched and tied to the runners.	Sft	86180	30	Twenty Five Lakh Eighty Five Thousand Four Hundred Rupees Only	2585400

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
69	Ch. 3 / Item 21, 1(a)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft (1.5 m): 1) depth upto 5 ft (1.5 m) - a) by manual - ii) ordinary soil. [Ch. 3, Item 21, 1(a)(ii): Excavation in foundation of the room, by manual means, in ordinary soil, including refilling, watering and ramming]	1000 Cft	1880	17088.2	Thirty Two Thousand One Hundred Twenty Six Rupees Only	32126

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
70	Ch. 6 / Item 3(b)	Cement concrete brick or stone ballast 1-1/2" to 2" (40 mm to 50 mm) gauge, in foundation and plinth: (b) ratio 1:4:8. [Ch. 6, Item 3(b): Cement concrete brick / stone ballast 1:4:8 in foundation]	100 Cft	35	36435.6	Twelve Thousand Seven Hundred Fifty Two Rupees Only	12752
71	Ch. 7 / Item 4(i)	Pacca brick work in foundation and plinth in: i) cement, sand mortar - ratio 1:3. [Ch. 7, Item 4(i): Pacca brick work in foundation and plinth in cement-sand mortar 1:3]	100 Cft	164	44342.85	Seventy Two Thousand Seven Hundred Twenty Two Rupees Only	72722

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
72	Ch. 6 / Item 37(b)(ii)	Providing and laying damp proof course of cement concrete 1:2:4 (using cement, sand and shingle), including bitumen coating: (b) with 2 coats of bitumen - ii) 2" thick (50 mm). [Ch. 6, Item 37(b)(ii): Damp proof course of cement concrete 1:2:4, 2" thick, with 2 coats of bitumen]	100 Sft	62	14064.3	Eight Thousand Seven Hundred Twenty Rupees Only	8720

PROCUREMENT REGULATORY AUTHORITY PUBLIC (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
73	Ch. 6 / Item 39(b)(2)(b)	Providing and laying vertical damp proof course with cement sand plaster and bitumen coating: (b) with 2 coats of bitumen - 2) ratio 1:3 - b) 3/4" thick (20 mm). [Ch. 6, Item 39(b)(2)(b): Vertical damp proof course of cement-sand plaster 1:3, 3/4" thick, with 2 coats of bitumen]	100 Sft	86	9434.5	Eight Thousand One Hundred Fourteen Rupees Only	8114
74	Ch. 7 / Item 5(i)	Pacca brick work in ground floor: i) cement, sand mortar - ratio 1:4. [Ch. 7, Item 5(i): Pacca brick work in the superstructure (ground floor) in cement-sand mortar 1:4]	100 Cft	384	43384.35	One Lakh Sixty Six Thousand Five Hundred Ninety Six Rupees Only	166596

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
75	Ch. 3 / Item 15(i)	Filling, watering and ramming earth under floors: i) with surplus earth from foundation, etc. [Ch. 3, Item 15(i): Filling, watering and ramming earth under the floor with surplus earth from the foundation]	1000 Cft	1190	8155.5	Nine Thousand Seven Hundred Five Rupees Only	9705
76	Ch. 3 / Item 15(ii)	Filling, watering and ramming earth under floors: ii) with new earth excavated from outside, lead upto one chain (30 m). [Ch. 3, Item 15(ii): Filling, watering and ramming earth under the floor with new earth from outside, lead upto one chain]	1000 Cft	390	17545.5	Six Thousand Eight Hundred Forty Three Rupees Only	6843

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
77	Ch. 3 / Item 16(i)	Extra for every 50 ft (15 m) additional lead or part thereof: i) for earthwork soft, ordinary, hard and very hard. [Ch. 3, Item 16(i): Extra for additional lead of the new earth - two increments of 50 ft, as priced in the source estimate]	1000 Cft	780	74.25	Fifty Eight Rupees Only	58
78	Ch. 6 / Item 2	Dry rammed brick or stone ballast, 1-1/2" to 2" (40 mm to 50 mm) gauge. [Ch. 6, Item 2: Dry rammed brick / stone ballast 1-1/2" to 2" gauge under the floor]	100 Cft	50	14076.5	Seven Thousand Thirty Eight Rupees Only	7038

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
79	Ch. 6 / Item 5(f)	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (f) ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4]	100 Cft	1	49085.5	Four Hundred Ninety One Rupees Only	491
80	Ch. 6 / Item 5(i)	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (i) ratio 1:4:8. [Ch. 6, Item 5(i): Plain cement concrete 1:4:8 under the floor]	100 Cft	25	36029.5	Nine Thousand Seven Rupees Only	9007

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
81	Ch. 10 / Item 16(c)	Providing and laying topping of cement concrete 1:2:4, including surface finishing and dividing in panels: (c) 1-1/2" (40 mm) thick. [Ch. 10, Item 16(c): Cement concrete 1:2:4 floor topping, 1-1/2" thick, finished and divided in panels]	100 Sft	99	10169.6	Ten Thousand Sixty Eight Rupees Only	10068

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
82	Ch. 6 / Item 6(a)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): (a) reinforced cement concrete in roof slab, beams, columns, lintels, girders and other structural	Cft	126.07	853.15	One Lakh Seven Thousand Five Hundred Fifty Seven Rupees Only	107557

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
83	Ch. 6 / Item 6(c)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): (c) reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and	Cft	90.4	697.5	Sixty Three Thousand Fifty Four Rupees Only	63054

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
84	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): (b) deformed bars - (ii) Grade-60. [Ch. 6, Item 12(b)(ii): Fabrication of deformed bar reinforcement Grade-60, cut, bent, placed and bound]	100 Kg	540	30827.85	One Lakh Sixty Six Thousand Four Hundred Seventy Rupees Only	166470

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
85	Ch. 11 / Item 9(c)	Cement plaster 1:4 upto 20 ft (6.00 m) height: c) 3/4" (20 mm) thick. [Ch. 11, Item 9(c): Cement plaster 1:4, 3/4" thick, to the walls]	100 Sft	514	6641.3	Thirty Four Thousand One Hundred Thirty Six Rupees Only	34136
86	Ch. 11 / Item 18(a)	Cement pointing struck joints, on walls, upto 20 ft (6.00 m) height: a) ratio 1:2. [Ch. 11, Item 18(a): Cement pointing struck joints 1:2 to the external brick faces]	100 Sft	558	5418.05	Thirty Thousand Two Hundred Thirty Three Rupees Only	30233

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
87	Ch. 11 / Item 12(c)	Cement plaster 3/8" (10 mm) thick under soffit of R.C.C. roof slabs only, upto 20 ft height: c) 1:4. [Ch. 11, Item 12(c): Cement plaster 1:4, 3/8" thick, under the soffit of the roof slab]	100 Sft	216	5537.2	Eleven Thousand Nine Hundred Sixty Rupees Only	11960

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
88	Ch. 9 / Item 5	Single layer of tiles 9" x 4-1/2" x 1-1/2" (225 x 113 x 40 mm) laid over 4" (100 mm) earth and 1" (25 mm) mud plaster without bhoosa, grouted with cement sand 1:3 on top of RCC roof slab, provided with 34 lbs per 100 Sft or 1.72 kg/sq.m bitumen coating sand blinded. [Ch. 9, Item 5: Single layer of roof tiles over 4" earth and 1" mud plaster with bitumen coating]	100 Sft	201	14518.05	Twenty Nine Thousand One Hundred Eighty One Rupees Only	29181

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
89	Ch. 9 / Item 14	Khassi parnalas in cement, sand mortar 1:2, 12" (300 mm) outside width finished smooth with a floating coat of neat cement. [Ch. 9, Item 14: Khassi parnalas 12" wide in cement-sand mortar 1:2]	Rft	12.5	279.45	Three Thousand Four Hundred Ninety Three Rupees Only	3493
90	Ch. 9 / Item 15	Khuras on roof 2' x 2' x 6" (600 x 600 x 150 mm). [Ch. 9, Item 15: Khuras on roof 2 ft x 2 ft x 6 in]	Each	1	1240.85	One Thousand Two Hundred Forty One Rupees Only	1241

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
91	Ch. 9 / Item 16	Bottom khuras of brick masonry in cement mortar 1:6, 4' x 2' x 4-1/2" (1200 x 600 x 113 mm) over 3" (75 mm) cement concrete 1:4:8. [Ch. 9, Item 16: Bottom khuras of brick masonry 4 ft x 2 ft x 4-1/2 in]	Each	1	2399.3	Two Thousand Three Hundred Ninety Nine Rupees Only	2399
92	Ch. 11 / Item 26(a)(iii)	White washing: a) new surface - iii) three coats. [Ch. 11, Item 26(a)(iii): White washing three coats on new surfaces]	100 Sft	495	971.55	Four Thousand Eight Hundred Nine Rupees Only	4809

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
93	Ch. 25 / Item 61(ii)	P/F iron door comprising of specified leaves made of 1-1/4" x 1-1/4" x 3/16" MS angle iron for leaf frame, diagonal and horizontal braces duly welded with MS sheet 18-SWG i/c the cost of sliding bolt, tower bolt and painting 3-coats but excluding the cost of chowkat, complete in all respect as approved and directed by the Engineer Incharge: (ii) double leaf. [Ch. 25, Item 61(ii): Iron door, double leaf, of M.S. angle frame and 18 SWG sheet, painted, excluding chowkat]	Sft	28	1481.9	Forty One Thousand Four Hundred Ninety Three Rupees Only	41493

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
94	Ch. 12 / Item 17(ii)	Providing and fixing 2" wide MS / GI chowkat single / double rebate made of 16 SWG MS sheet pressed / welded / supported with M.S. flat 1-1/4" x 1/8" i/c 6" long M.S. flat 1" x 1/8" hold fasts (6 Nos) welded / screwed, punching of lock hole covered with MS box, coating with antirust paint including filling with cement sand mortar (1:8) and embedding hold fast in cement concrete (1:2:4), complete in all respect as approved and directed by the Engineer Incharge: (ii) 10.5" wide. [Ch. 12, Item 17(ii): M.S. / G.I. pressed-steel chowkat 10.5" wide for the door]	Sft	28	733.4	Twenty Thousand Five Hundred Thirty Five Rupees Only	20535

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
95	Ch. 25 / Item 45(a)	Providing and fixing steel windows using M.S. sheet (16 SWG) moulded tubular pipe 1-1/2" x 1-1/2" (40 x 40 mm) for frame and 1-1/4" x 1-1/4" (30 x 30 mm) for leaves including M.S. square bars 1/4" x 1/4" (6 x 6 mm) welded around each panel of frame, 5 mm thick glass panes fixed with double M.S. square tubular pipe 3/8" x 3/8" (10 x 10 mm) (22 SWG) beading with U-shaped rubber lining, brass fitting, holdfast, including painting three coats complete in all respects: a) for openable panels fixed with wire gauze 24 SWG, 12 x 12 mesh and glass panes 1/4" (6 mm) thick. [Ch. 25, Item 45(a): Steel	Sft	18	1345.65	Twenty Four Thousand Two Hundred Twenty Two Rupees Only	24222

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
96	Ch. 1 / Item 1	Carriage of 100 Cft (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the lead P_TWLEAD from the approved quarry (sum of the kilometre rates of the item: 1st to 10th km, then 69.30 per km). [Ch. 1, Item 1: Carriage of crushed stone aggregate and bajri for the concrete, from the approved quarry]	100 Cft	206	3425.2	Seven Thousand Fifty Six Rupees Only	7056

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
97	NSI / NB-3	Supply and erection of a green shade structure for the nursery - frame with green shade cover, anchored to the ground, complete.	Job	1	200000	Two Lakh Rupees Only	200000
98	NSI / NB-4	Supply and fixing of green jali (shade net) in rolls for the nursery beds and the shade structure.	Roll	5	15000	Seventy Five Thousand Rupees Only	75000
99	NSI / NB-5	Fencing of the nursery area with posts, wire mesh and an entrance gate, complete.	Job	1	300000	Three Lakh Rupees Only	300000
100	NSI / NB-6	Construction of a room / store for the nursery, complete with door, window, flooring and finishes.	No.	2	800000	Sixteen Lakh Rupees Only	1600000

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
101	NSI / NB-19	Water bore for the nursery with pump, pipework and electrical connection, complete.	Job	1	600000	Six Lakh Rupees Only	600000
102	NSI / EW-DL	Preparation of shrub / ground-cover beds over 20% of the net soft-landscape area, including forking, weeding, manuring and levelling.	100 Sft	321692.43242855	1650	Fifty Three Lakh Seven Thousand Nine Hundred Twenty Five Rupees Only	5307925

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
103	Ch. 3 / Item 53	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the site over the whole belt, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	1000 Sft	2262000	5292.2	One Crore Nineteen Lakh Seventy Thousand Nine Hundred Fifty Six Rupees Only	11970956
104	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Regular excavation (cutting) of the belt to formation level, dressed to designed section and levels]	1000 Cft	1537000	8385.7	One Crore Twenty Eight Lakh Eighty Eight Thousand Eight Hundred Twenty One Rupees Only	12888821

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
105	Ch. 3 / Item 5(ii)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 90% maximum modified AASHTO dry density. [Ch. 3, Item 5(ii): Earthwork in embankment / filling to formation level with suitable material from the belt cut, including ploughing, mixing, moisture conditioning, compaction to 90% modified AASHTO and dressing]	1000 Cft	1537000	10856.75	One Crore Sixty Six Lakh Eighty Six Thousand Eight Hundred Twenty Five Rupees Only	16686825

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
106	NSI / EW-BF	Filling to formation level with approved select material borrowed from outside, in layers, watered and compacted.	1000 Cft	700950	15386.45	One Crore Seven Lakh Eighty Five Thousand One Hundred Thirty Two Rupees Only	10785132

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
107	Ch. 3 / Item 17(a)	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of surplus cut material to approved dumping ground, upto 5 km lead]	1000 Cft		7190.5	Zero Rupees Only	
108	Ch. 3 / Item 54	Compaction of natural ground. [Ch. 3, Item 54: Compaction of natural ground over the belt prior to formation of landscape works]	1000 Sft	2262000	3479.6	Seventy Eight Lakh Seventy Thousand Eight Hundred Fifty Five Rupees Only	7870855

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
109	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the boundary wall, 4 ft wide x 3 ft deep, by excavator in ordinary soil, including dagbelling and dressing]	1000 Cft	5589.4980694981	11147.4	Sixty Two Thousand Three Hundred Eight Rupees Only	62308

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
110	Ch. 6 / Item 5(i)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick x 4 ft wide, as lean course under the wall footing]	100 Cft	621.05534105534	36029.5	Two Lakh Twenty Three Thousand Seven Hundred Sixty Three Rupees Only	223763

PROCUREMENT REGULATORY AUTHORITY PUBLIC (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
111	Ch. 6 / Item 6(c)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and	Cft	1048.0308880309	697.5	Seven Lakh Thirty One Thousand Two Rupees Only	731002

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
112	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing, including cutting, bending, laying and binding]	100 Kg	2305.667953668	30827.85	Seven Lakh Ten Thousand Seven Hundred Eighty Eight Rupees Only	710788

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
113	Ch. 8 / Item 2(d)(iii)	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in foundation and upto plinth of the boundary wall]	100 Cft	873.35907335907	35682.6	Three Lakh Eleven Thousand Six Hundred Thirty Seven Rupees Only	311637

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
114	Ch. 8 / Item 4(d)(iii)	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in the boundary wall above plinth, including scaffolding and curing]	100 Cft	1921.38996139	38677.7	Seven Lakh Forty Three Thousand One Hundred Forty Nine Rupees Only	743149

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
115	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on top of the boundary wall]	100 Cft	58.223938223938	49085.5	Twenty Eight Thousand Five Hundred Eighty Rupees Only	28580

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
116	Ch. 11 / Item 20(c)(ii)	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the stone-masonry boundary wall]	100 Sft	5123.7065637066	7231.25	Three Lakh Seventy Thousand Five Hundred Eight Rupees Only	370508

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
117	Ch. 3 / Item 5(i)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, in layers, watered and compacted]	1000 Cft	3047.0527670528	11261.3	Thirty Four Thousand Three Hundred Fourteen Rupees Only	34314

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
118	Ch. 25 / Item 34	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. railing 3 ft high, 76x76x3 mm hollow box main member, on top of the boundary wall]	Rft	465.79150579151	1587.5	Seven Lakh Thirty Nine Thousand Four Hundred Forty Four Rupees Only	739444

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
119	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of walkway sub-grade to designed level, in ordinary soil]	1000 Cft	34800	11147.4	Three Lakh Eighty Seven Thousand Nine Hundred Thirty Rupees Only	387930

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
120	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the walkway]	100 Cft	11600	10874.25	Twelve Lakh Sixty One Thousand Four Hundred Thirteen Rupees Only	1261413

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
121	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the tough pavers]	100 Cft	23200	3556.7	Eight Lakh Twenty Five Thousand One Hundred Fifty Four Rupees Only	825154

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
122	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi, 50% grey and 50% coloured, including grouting joints with sand]	Sft	69600	231.35	One Crore Sixty One Lakh One Thousand Nine Hundred Sixty Rupees Only	16101960

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
123	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone of 3500 psi to both edges of the walkway, laid in cement-sand mortar 1:3]	Rft	23200	573.35	One Crore Thirty Three Lakh One Thousand Seven Hundred Twenty Rupees Only	13301720

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
124	NSI / EW-DL	Preparation and compaction of the jogging-track formation to designed section - ploughing, moistening to optimum moisture content, levelling and compaction with power road roller.	100 Sft	46400	1650	Seven Lakh Sixty Five Thousand Six Hundred Rupees Only	765600

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
125	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying pan crush (crushed stone product of approved quality and grade), 3 in thick, on	100 Cft	11600	10874.25	Twelve Lakh Sixty One Thousand Four Hundred Thirteen Rupees Only	1261413

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
126	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the jogging track]	Rft	11600	573.35	Sixty Six Lakh Fifty Thousand Eight Hundred Sixty Rupees Only	6650860

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
127	COMP / CA-17	Construction of rain-water harvesting pit 12 ft x 12 ft x 6 ft deep, including excavation, stone-masonry stepped lining, filter media, geotextile, uPVC pipework, P.C.C. base and heavy-duty cover - complete.	Each	20	363141.15	Seventy Two Lakh Sixty Two Thousand Eight Hundred Twenty Three Rupees Only	7262823
128	NSI / EW-DL	Preparation of shrub / ground-cover beds over 20% of the net soft-landscape area, including forking, weeding, manuring and levelling.	100 Sft	422234.16679537	1650	Sixty Nine Lakh Sixty Six Thousand Eight Hundred Sixty Four Rupees Only	6966864

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
129	Ch. 3 / Item 53	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the site over the whole belt, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	1000 Sft	1131000	5292.2	Fifty Nine Lakh Eighty Five Thousand Four Hundred Seventy Eight Rupees Only	5985478
130	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Regular excavation (cutting) of the belt to formation level, dressed to designed section and levels]	1000 Cft	768500	8385.7	Sixty Four Lakh Forty Four Thousand Four Hundred Ten Rupees Only	6444410

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
131	Ch. 3 / Item 5(ii)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 90% maximum modified AASHTO dry density. [Ch. 3, Item 5(ii): Earthwork in embankment / filling to formation level with suitable material from the belt cut, including ploughing, mixing, moisture conditioning, compaction to 90% modified AASHTO and dressing]	1000 Cft	768500	10856.75	Eighty Three Lakh Forty Three Thousand Four Hundred Twelve Rupees Only	8343412

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
132	NSI / EW-BF	Filling to formation level with approved select material borrowed from outside, in layers, watered and compacted.	1000 Cft	350475	15386.45	Fifty Three Lakh Ninety Two Thousand Five Hundred Sixty Six Rupees Only	5392566

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
133	Ch. 3 / Item 17(a)	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of surplus cut material to approved dumping ground, upto 5 km lead]	1000 Cft		7190.5	Zero Rupees Only	

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
134	Ch. 3 / Item 54	Compaction of natural ground. [Ch. 3, Item 54: Compaction of natural ground over the belt prior to formation of landscape works]	1000 Sft	1131000	3479.6	Thirty Nine Lakh Thirty Five Thousand Four Hundred Twenty Eight Rupees Only	3935428

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
135	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the boundary wall, 4 ft wide x 3 ft deep, by excavator in ordinary soil, including dagbelling and dressing]	1000 Cft	5589.4980694981	11147.4	Sixty Two Thousand Three Hundred Eight Rupees Only	62308

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
136	Ch. 6 / Item 5(i)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick x 4 ft wide, as lean course under the wall footing]	100 Cft	621.05534105534	36029.5	Two Lakh Twenty Three Thousand Seven Hundred Sixty Three Rupees Only	223763

PROCUREMENT REGULATORY AUTHORITY PUBLIC (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
137	Ch. 6 / Item 6(c)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and	Cft	1048.0308880309	697.5	Seven Lakh Thirty One Thousand Two Rupees Only	731002

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
138	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing, including cutting, bending, laying and binding]	100 Kg	2305.667953668	30827.85	Seven Lakh Ten Thousand Seven Hundred Eighty Eight Rupees Only	710788

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
139	Ch. 8 / Item 2(d)(iii)	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in foundation and upto plinth of the boundary wall]	100 Cft	873.35907335907	35682.6	Three Lakh Eleven Thousand Six Hundred Thirty Seven Rupees Only	311637

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
140	Ch. 8 / Item 4(d)(iii)	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in the boundary wall above plinth, including scaffolding and curing]	100 Cft	1921.38996139	38677.7	Seven Lakh Forty Three Thousand One Hundred Forty Nine Rupees Only	743149

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
141	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on top of the boundary wall]	100 Cft	58.223938223938	49085.5	Twenty Eight Thousand Five Hundred Eighty Rupees Only	28580

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
142	Ch. 11 / Item 20(c)(ii)	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the stone-masonry boundary wall]	100 Sft	5123.7065637066	7231.25	Three Lakh Seventy Thousand Five Hundred Eight Rupees Only	370508

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
143	Ch. 3 / Item 5(i)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, in layers, watered and compacted]	1000 Cft	3047.0527670528	11261.3	Thirty Four Thousand Three Hundred Fourteen Rupees Only	34314

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
144	Ch. 25 / Item 34	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. railing 3 ft high, 76x76x3 mm hollow box main member, on top of the boundary wall]	Rft	465.79150579151	1587.5	Seven Lakh Thirty Nine Thousand Four Hundred Forty Four Rupees Only	739444

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
145	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of walkway sub-grade to designed level, in ordinary soil]	1000 Cft	34800	11147.4	Three Lakh Eighty Seven Thousand Nine Hundred Thirty Rupees Only	387930

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
146	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the walkway]	100 Cft	11600	10874.25	Twelve Lakh Sixty One Thousand Four Hundred Thirteen Rupees Only	1261413

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
147	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the tough pavers]	100 Cft	23200	3556.7	Eight Lakh Twenty Five Thousand One Hundred Fifty Four Rupees Only	825154

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
148	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi, 50% grey and 50% coloured, including grouting joints with sand]	Sft	69600	231.35	One Crore Sixty One Lakh One Thousand Nine Hundred Sixty Rupees Only	16101960

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
149	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone of 3500 psi to both edges of the walkway, laid in cement-sand mortar 1:3]	Rft	23200	573.35	One Crore Thirty Three Lakh One Thousand Seven Hundred Twenty Rupees Only	13301720

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
150	NSI / EW-DL	Preparation and compaction of the jogging-track formation to designed section - ploughing, moistening to optimum moisture content, levelling and compaction with power road roller.	100 Sft	46400	1650	Seven Lakh Sixty Five Thousand Six Hundred Rupees Only	765600

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
151	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying pan crush (crushed stone product of approved quality and grade), 3 in thick, on	100 Cft	11600	10874.25	Twelve Lakh Sixty One Thousand Four Hundred Thirteen Rupees Only	1261413

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
152	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the jogging track]	Rft	11600	573.35	Sixty Six Lakh Fifty Thousand Eight Hundred Sixty Rupees Only	6650860

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
153	COMP / CA-17	Construction of rain-water harvesting pit 12 ft x 12 ft x 6 ft deep, including excavation, stone-masonry stepped lining, filter media, geotextile, uPVC pipework, P.C.C. base and heavy-duty cover - complete.	Each	20	363141.15	Seventy Two Lakh Sixty Two Thousand Eight Hundred Twenty Three Rupees Only	7262823
154	NSI / EW-DL	Preparation of shrub / ground-cover beds over 20% of the net soft-landscape area, including forking, weeding, manuring and levelling.	100 Sft	196034.16679537	1650	Thirty Two Lakh Thirty Four Thousand Five Hundred Sixty Four Rupees Only	3234564

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
155	Ch. 3 / Item 53	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the site over the whole belt, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	1000 Sft	273000	5292.2	Fourteen Lakh Forty Four Thousand Seven Hundred Seventy One Rupees Only	1444771
156	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Regular excavation (cutting) of the belt to formation level, dressed to designed section and levels]	1000 Cft	185500	8385.7	Fifteen Lakh Fifty Five Thousand Five Hundred Forty Seven Rupees Only	1555547

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
157	Ch. 3 / Item 5(ii)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 90% maximum modified AASHTO dry density. [Ch. 3, Item 5(ii): Earthwork in embankment / filling to formation level with suitable material from the belt cut, including ploughing, mixing, moisture conditioning, compaction to 90% modified AASHTO and dressing]	1000 Cft	185500	10856.75	Twenty Lakh Thirteen Thousand Nine Hundred Twenty Seven Rupees Only	2013927

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
158	NSI / EW-BF	Filling to formation level with approved select material borrowed from outside, in layers, watered and compacted.	1000 Cft	84597.413793103	15386.45	Thirteen Lakh One Thousand Six Hundred Fifty Four Rupees Only	1301654
159	Ch. 3 / Item 17(a)	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of surplus cut material to approved dumping ground, upto 5 km lead]	1000 Cft		7190.5	Zero Rupees Only	

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
160	Ch. 3 / Item 54	Compaction of natural ground. [Ch. 3, Item 54: Compaction of natural ground over the belt prior to formation of landscape works]	1000 Sft	273000	3479.6	Nine Lakh Forty Nine Thousand Nine Hundred Thirty One Rupees Only	949931

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
161	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the boundary wall, 4 ft wide x 3 ft deep, by excavator in ordinary soil, including dagbelling and dressing]	1000 Cft	674.59459459459	11147.4	Seven Thousand Five Hundred Twenty Rupees Only	7520

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
162	Ch. 6 / Item 5(i)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick x 4 ft wide, as lean course under the wall footing]	100 Cft	74.954954954955	36029.5	Twenty Seven Thousand Six Rupees Only	27006

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
163	Ch. 6 / Item 6(c)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and	Cft	126.48648648649	697.5	Eighty Eight Thousand Two Hundred Twenty Four Rupees Only	88224

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
164	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing, including cutting, bending, laying and binding]	100 Kg	278.27027027027	30827.85	Eighty Five Thousand Seven Hundred Eighty Five Rupees Only	85785

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
165	Ch. 8 / Item 2(d)(iii)	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in foundation and upto plinth of the boundary wall]	100 Cft	105.40540540541	35682.6	Thirty Seven Thousand Six Hundred Eleven Rupees Only	37611

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
166	Ch. 8 / Item 4(d)(iii)	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in the boundary wall above plinth, including scaffolding and curing]	100 Cft	231.89189189189	38677.7	Eighty Nine Thousand Six Hundred Ninety Rupees Only	89690

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
167	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on top of the boundary wall]	100 Cft	7.027027027027	49085.5	Three Thousand Four Hundred Forty Nine Rupees Only	3449

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
168	Ch. 11 / Item 20(c)(ii)	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the stone-masonry boundary wall]	100 Sft	618.37837837838	7231.25	Forty Four Thousand Seven Hundred Sixteen Rupees Only	44716

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
169	Ch. 3 / Item 5(i)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, in layers, watered and compacted]	1000 Cft	367.74774774775	11261.3	Four Thousand One Hundred Forty One Rupees Only	4141

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
170	Ch. 25 / Item 34	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. railing 3 ft high, 76x76x3 mm hollow box main member, on top of the boundary wall]	Rft	56.216216216216	1587.5	Eighty Nine Thousand Two Hundred Forty Three Rupees Only	89243

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
171	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of walkway sub-grade to designed level, in ordinary soil]	1000 Cft	4200	11147.4	Forty Six Thousand Eight Hundred Nineteen Rupees Only	46819

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
172	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the walkway]	100 Cft	1400	10874.25	One Lakh Fifty Two Thousand Two Hundred Forty Rupees Only	152240

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
173	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the tough pavers]	100 Cft	2800	3556.7	Ninety Nine Thousand Five Hundred Eighty Eight Rupees Only	99588

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
174	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi, 50% grey and 50% coloured, including grouting joints with sand]	Sft	8400	231.35	Nineteen Lakh Forty Three Thousand Three Hundred Forty Rupees Only	1943340

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
175	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone of 3500 psi to both edges of the walkway, laid in cement-sand mortar 1:3]	Rft	2800	573.35	Sixteen Lakh Five Thousand Three Hundred Eighty Rupees Only	1605380

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
176	NSI / EW-DL	Preparation and compaction of the jogging-track formation to designed section - ploughing, moistening to optimum moisture content, levelling and compaction with power road roller.	100 Sft	5600	1650	Ninety Two Thousand Four Hundred Rupees Only	92400

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
177	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying pan crush (crushed stone product of approved quality and grade), 3 in thick, on	100 Cft	1400	10874.25	One Lakh Fifty Two Thousand Two Hundred Forty Rupees Only	152240

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
178	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the jogging track]	Rft	1400	573.35	Eight Lakh Two Thousand Six Hundred Ninety Rupees Only	802690

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
179	COMP / CA-17	Construction of rain-water harvesting pit 12 ft x 12 ft x 6 ft deep, including excavation, stone-masonry stepped lining, filter media, geotextile, uPVC pipework, P.C.C. base and heavy-duty cover - complete.	Each	20	363141.15	Seventy Two Lakh Sixty Two Thousand Eight Hundred Twenty Three Rupees Only	7262823
180	NSI / EW-DL	Preparation of shrub / ground-cover beds over 20% of the net soft-landscape area, including forking, weeding, manuring and levelling.	100 Sft	51412.827027027	1650	Eight Lakh Forty Eight Thousand Three Hundred Twelve Rupees Only	848312

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
181	Ch. 3 / Item 53	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the site over the whole belt, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	1000 Sft	1170000	5292.2	Sixty One Lakh Ninety One Thousand Eight Hundred Seventy Four Rupees Only	6191874
182	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Regular excavation (cutting) of the belt to formation level, dressed to designed section and levels]	1000 Cft	795000	8385.7	Sixty Six Lakh Sixty Six Thousand Six Hundred Thirty Two Rupees Only	6666632

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
183	Ch. 3 / Item 5(ii)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 90% maximum modified AASHTO dry density. [Ch. 3, Item 5(ii): Earthwork in embankment / filling to formation level with suitable material from the belt cut, including ploughing, mixing, moisture conditioning, compaction to 90% modified AASHTO and dressing]	1000 Cft	795000	10856.75	Eighty Six Lakh Thirty One Thousand One Hundred Sixteen Rupees Only	8631116

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
184	NSI / EW-BF	Filling to formation level with approved select material borrowed from outside, in layers, watered and compacted.	1000 Cft	362560.34482759	15386.45	Fifty Five Lakh Seventy Eight Thousand Five Hundred Seventeen Rupees Only	5578517

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
185	Ch. 3 / Item 17(a)	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of surplus cut material to approved dumping ground, upto 5 km lead]	1000 Cft		7190.5	Zero Rupees Only	
186	Ch. 3 / Item 54	Compaction of natural ground. [Ch. 3, Item 54: Compaction of natural ground over the belt prior to formation of landscape works]	1000 Sft	1170000	3479.6	Forty Lakh Seventy One Thousand One Hundred Thirty Two Rupees Only	4071132

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
187	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the boundary wall, 4 ft wide x 3 ft deep, by excavator in ordinary soil, including dagbelling and dressing]	1000 Cft	7516.9111969112	11147.4	Eighty Three Thousand Seven Hundred Ninety Four Rupees Only	83794

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
188	Ch. 6 / Item 5(i)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick x 4 ft wide, as lean course under the wall footing]	100 Cft	835.21235521236	36029.5	Three Lakh Nine Hundred Twenty Three Rupees Only	300923

PROCUREMENT REGULATORY AUTHORITY PUBLIC (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
189	Ch. 6 / Item 6(c)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and	Cft	1409.4208494208	697.5	Nine Lakh Eighty Three Thousand Seventy One Rupees Only	983071

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
190	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing, including cutting, bending, laying and binding]	100 Kg	3100.7258687259	30827.85	Nine Lakh Fifty Five Thousand Eight Hundred Eighty Seven Rupees Only	955887

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
191	Ch. 8 / Item 2(d)(iii)	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in foundation and upto plinth of the boundary wall]	100 Cft	1174.5173745174	35682.6	Four Lakh Nineteen Thousand Ninety Eight Rupees Only	419098

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
192	Ch. 8 / Item 4(d)(iii)	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in the boundary wall above plinth, including scaffolding and curing]	100 Cft	2583.9382239382	38677.7	Nine Lakh Ninety Nine Thousand Four Hundred Eight Rupees Only	999408

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
193	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on top of the boundary wall]	100 Cft	78.301158301158	49085.5	Thirty Eight Thousand Four Hundred Thirty Five Rupees Only	38435

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
194	Ch. 11 / Item 20(c)(ii)	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the stone-masonry boundary wall]	100 Sft	6890.5019305019	7231.25	Four Lakh Ninety Eight Thousand Two Hundred Sixty Nine Rupees Only	498269

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
195	Ch. 3 / Item 5(i)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, in layers, watered and compacted]	1000 Cft	4097.7606177606	11261.3	Forty Six Thousand One Hundred Forty Six Rupees Only	46146

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
196	Ch. 25 / Item 34	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. railing 3 ft high, 76x76x3 mm hollow box main member, on top of the boundary wall]	Rft	626.40926640927	1587.5	Nine Lakh Ninety Four Thousand Four Hundred Twenty Five Rupees Only	994425

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
197	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of walkway sub-grade to designed level, in ordinary soil]	1000 Cft	46800	11147.4	Five Lakh Twenty One Thousand Six Hundred Ninety Eight Rupees Only	521698

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
198	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the walkway]	100 Cft	15600	10874.25	Sixteen Lakh Ninety Six Thousand Three Hundred Eighty Three Rupees Only	1696383

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
199	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the tough pavers]	100 Cft	31200	3556.7	Eleven Lakh Nine Thousand Six Hundred Ninety Rupees Only	1109690

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
200	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi, 50% grey and 50% coloured, including grouting joints with sand]	Sft	93600	231.35	Two Crore Sixteen Lakh Fifty Four Thousand Three Hundred Sixty Rupees Only	21654360

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
201	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone of 3500 psi to both edges of the walkway, laid in cement-sand mortar 1:3]	Rft	31200	573.35	One Crore Seventy Eight Lakh Eighty Eight Thousand Five Hundred Twenty Rupees Only	17888520

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
202	NSI / EW-DL	Preparation and compaction of the jogging-track formation to designed section - ploughing, moistening to optimum moisture content, levelling and compaction with power road roller.	100 Sft	62400	1650	Ten Lakh Twenty Nine Thousand Six Hundred Rupees Only	1029600

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
203	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying pan crush (crushed stone product of approved quality and grade), 3 in thick, on	100 Cft	15600	10874.25	Sixteen Lakh Ninety Six Thousand Three Hundred Eighty Three Rupees Only	1696383

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
204	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the jogging track]	Rft	15600	573.35	Eighty Nine Lakh Forty Four Thousand Two Hundred Sixty Rupees Only	8944260

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
205	COMP / CA-17	Construction of rain-water harvesting pit 12 ft x 12 ft x 6 ft deep, including excavation, stone-masonry stepped lining, filter media, geotextile, uPVC pipework, P.C.C. base and heavy-duty cover - complete.	Each	20	363141.15	Seventy Two Lakh Sixty Two Thousand Eight Hundred Twenty Three Rupees Only	7262823
206	NSI / EW-DL	Preparation of shrub / ground-cover beds over 20% of the net soft-landscape area, including forking, weeding, manuring and levelling.	100 Sft	193751.27258687	1650	Thirty One Lakh Ninety Six Thousand Eight Hundred Ninety Six Rupees Only	3196896

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
207	Ch. 3 / Item 53	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the park site, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	1000 Sft	228690	5292.2	Twelve Lakh Ten Thousand Two Hundred Seventy Three Rupees Only	1210273
208	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Cutting down mounds and ridges inside the park to balance the filling areas, regular excavation dressed to designed section and levels, including haulage within the park]	1000 Cft	686070	8385.7	Fifty Seven Lakh Fifty Three Thousand One Hundred Seventy Seven Rupees Only	5753177

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
209	Ch. 3 / Item 5(i)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Earth filling to raise the park, average 3 ft depth over the whole park area, with the material obtained from the park cut, laid in layers, watered and compacted]	1000 Cft	686070	11261.3	Seventy Seven Lakh Twenty Six Thousand Forty Rupees Only	7726040

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
210	NSI / EW-BF	Earth filling with approved select material borrowed from outside - only the shortfall that the site cut cannot balance.	1000 Cft		15386.45	Zero Rupees Only	
211	NSI / EW-DL	Dressing and levelling of the finished fill surface to designed section, including compaction with power road roller.	100 Sft	228690	1650	Thirty Seven Lakh Seventy Three Thousand Three Hundred Eighty Five Rupees Only	3773385

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
212	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the park boundary wall, 3 ft wide x 2 ft 6 in deep, by excavator in ordinary soil]	1000 Cft	14550.689045936	11147.4	One Lakh Sixty Two Thousand Two Hundred Two Rupees Only	162202

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
213	Ch. 6 / Item 5(i)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick, as lean course under the wall footing]	100 Cft	1940.0918727915	36029.5	Six Lakh Ninety Nine Thousand Five Rupees Only	699005

PROCUREMENT REGULATORY AUTHORITY PUBLIC (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
214	Ch. 6 / Item 6(c)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and	Cft	3637.6722614841	697.5	Twenty Five Lakh Thirty Seven Thousand Two Hundred Seventy Six Rupees Only	2537276

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
215	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing]	100 Kg	8002.878975265	30827.85	Twenty Four Lakh Sixty Seven Thousand One Hundred Sixteen Rupees Only	2467116

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
216	Ch. 8 / Item 2(d)(iii)	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 18 in thick, in cement-sand mortar 1:6, in foundation and upto plinth]	100 Cft	4365.2067137809	35682.6	Fifteen Lakh Fifty Seven Thousand Six Hundred Nineteen Rupees Only	1557619

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
217	Ch. 8 / Item 4(d)(iii)	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 18 in thick, in cement-sand mortar 1:6, in the wall above plinth, 4 ft high]	100 Cft	11640.551236749	38677.7	Forty Five Lakh Two Thousand Two Hundred Ninety Seven Rupees Only	4502297

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
218	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on the boundary wall]	100 Cft	485.02296819788	49085.5	Two Lakh Thirty Eight Thousand Seventy Six Rupees Only	238076

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
219	Ch. 11 / Item 20(c)(ii)	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the boundary wall]	100 Sft	15520.734982332	7231.25	Eleven Lakh Twenty Two Thousand Three Hundred Forty Three Rupees Only	1122343

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
220	Ch. 3 / Item 5(i)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, watered and compacted]	1000 Cft	4607.7181978799	11261.3	Fifty One Thousand Eight Hundred Eighty Nine Rupees Only	51889

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
221	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of the perimeter walkway sub-grade to designed level]	1000 Cft	5820.2756183746	11147.4	Sixty Four Thousand Eight Hundred Eighty One Rupees Only	64881

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
222	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the perimeter walkway]	100 Cft	1940.0918727915	10874.25	Two Lakh Ten Thousand Nine Hundred Seventy Rupees Only	210970

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
223	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the walkway pavers]	100 Cft	3880.183745583	3556.7	One Lakh Thirty Eight Thousand Six Rupees Only	138006

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
224	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm precast concrete interlocking tuff pavers, 7000 psi, to the perimeter walkway 6 ft wide, including grouting joints]	Sft	11640.551236749	231.35	Twenty Six Lakh Ninety Three Thousand Forty Two Rupees Only	2693042

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
225	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the perimeter walkway]	Rft	3880.183745583	573.35	Twenty Two Lakh Twenty Four Thousand Seven Hundred Three Rupees Only	2224703

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
226	Ch. 10 / Item 4	Providing, laying, watering and ramming brick or stone ballast 1-1/2" to 2" (40 mm to 50 mm) gauge mixed with 25% sand, for foundation, complete in all respects. [Ch. 10, Item 4: Providing, laying, watering and ramming compacted granular fill 4 in thick to the internal footpath, 4 ft wide]	100 Cft	5523.9130434783	14479.4	Seven Lakh Ninety Nine Thousand Eight Hundred Twenty Nine Rupees Only	799829
227	COMP / CA-16	Providing and laying hand-packed rock-stone fill sub-walkway, 1 ft size stone, 3 ft wide, over compacted sub-grade.	Sft	7457.2826086957	153.68	Eleven Lakh Forty Six Thousand Thirty Five Rupees Only	1146035

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
228	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Excavation / trimming of the compacted park fill to the stair profile, dressed to designed section]	1000 Cft	205.05594679072	8385.7	One Thousand Seven Hundred Twenty Rupees Only	1720
229	Ch. 6 / Item 5(i)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 3 in thick, as blinding under the stair slab, landings and cheek walls]	100 Cft	42.348510750258	36029.5	Fifteen Thousand Two Hundred Fifty Eight Rupees Only	15258

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
230	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair waist slab and top / bottom landings, 6 in thick, including formwork and curing]	100 Cft	71.323807579381	49085.5	Thirty Five Thousand Ten Rupees Only	35010

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
231	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair steps (6 in risers x 12 in treads, 8 ft long), broom-finished treads and rounded nosings]	100 Cft	12	49085.5	Five Thousand Eight Hundred Ninety Rupees Only	5890

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
232	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair cheek walls, 9 in thick, both sides, including formwork and curing]	100 Cft	53.492855684536	49085.5	Twenty Six Thousand Two Hundred Fifty Seven Rupees Only	26257

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
233	Ch. 25 / Item 34	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing M.S. stair handrail (box section 1-1/2 in x 3 in with square-bar balusters), both sides, grouted into the cheek walls]	Rft	15.661903789691	1587.5	Twenty Four Thousand Eight Hundred Sixty Three Rupees Only	24863

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
234	Ch. 3 / Item 7, 1(A)(i)	Earthwork excavation in open cutting for storm water channels, drains, sullage drains in open areas, roads, streets, lanes, including under pinning of walls and shoring to protect existing works, shuttering and timbering the trenches, dressed to designed level and dimensions, trimming, removal of surface water from trenches, back filling and surplus excavated material disposed of and dressed within 50 ft. (15 m) lead: upto 5 ft. (1.5 m) depth, by manual, ordinary soil. [Ch. 3, Item 7, 1(A)(i): Earthwork excavation in open cutting upto 5 ft depth for the storm-water pipe trench, including shoring,	1000 Cft	9700.4593639576	14409.7	One Lakh Thirty Nine Thousand Seven Hundred Eighty One Rupees Only	139781

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
235	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand as bedding and surround to the storm-water pipe]	100 Cft	2425.1148409894	3556.7	Eighty Six Thousand Two Hundred Fifty Four Rupees Only	86254

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
236	Ch. 21 / Item 3(a)(i)	Providing and laying R.C.C. pipe sewers, moulded with cement concrete 4000 psi conforming to ASTM Specification C-76-20, specific class, Wall B, including carriage of pipe from factory to site of work, lowering in trenches to correct alignment and grade, jointing with rubber ring, cutting pipes where necessary, testing, etc., complete: Class-II, 310 mm (12") i/d. [Ch. 21, Item 3(a)(i): Providing and laying R.C.C. pipe sewer, 310 mm (12 in) internal diameter, Class-II to ASTM C-76, including carriage, lowering in trench to correct alignment and grade, jointing with rubber ring and testing]	Rft	970.04593639576	909.2	Eight Lakh Eighty One Thousand Nine Hundred Sixty Six Rupees Only	881966

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
237	COMP / CA-19	Constructing storm-water manhole 3 ft x 3 ft internal, average 5 ft deep, including excavation, P.C.C. base, brick-masonry chamber rendered inside, R.C.C. cover slab with 6 in R.C.C. cover and frame, steps and benching - complete.	Each	6	60761.75	Three Lakh Sixty Four Thousand Five Hundred Seventy One Rupees Only	364571

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
238	Ch. 21 / Item 6	Constructing standard gully grating chamber, 3' x 2-1/2' (900 x 750 mm), with chinaware trap as per PHED Drawing STD/PD No. 3 of 1977, complete in all respects. [Ch. 21, Item 6: Constructing standard gully grating chamber 3 ft x 2 ft 6 in with chinaware trap as per PHED standard drawing, complete in all respects]	Each	7	21861.6	One Lakh Fifty Three Thousand Thirty One Rupees Only	153031

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
239	Ch. 3 / Item 5(i)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling of the pipe trench with approved excavated material in layers not exceeding 6 in, watered and compacted]	1000 Cft	7275.3445229682	11261.3	Eighty One Thousand Nine Hundred Thirty Rupees Only	81930

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
240	NSI / EW-BF	Earth filling with approved select material borrowed from outside - only the shortfall that the site cut cannot balance.	1000 Cft	1002000	15386.45	One Crore Fifty Four Lakh Seventeen Thousand Two Hundred Twenty Three Rupees Only	15417223
241	NSI / EW-DL	Dressing and levelling of the finished fill surface to designed section, including compaction with power road roller.	100 Sft	334000	1650	Fifty Five Lakh Eleven Thousand Rupees Only	5511000

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
242	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the park boundary wall, 3 ft wide x 2 ft 6 in deep, by excavator in ordinary soil]	1000 Cft	17520	11147.4	One Lakh Ninety Five Thousand Three Hundred Two Rupees Only	195302

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
243	Ch. 6 / Item 5(i)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick, as lean course under the wall footing]	100 Cft	2336	36029.5	Eight Lakh Forty One Thousand Six Hundred Forty Nine Rupees Only	841649

PROCUREMENT REGULATORY AUTHORITY PUBLIC (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
244	Ch. 6 / Item 6(c)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and	Cft	4380	697.5	Thirty Lakh Fifty Five Thousand Fifty Rupees Only	3055050

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
245	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing]	100 Kg	9636	30827.85	Twenty Nine Lakh Seventy Thousand Five Hundred Seventy Two Rupees Only	2970572

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
246	Ch. 8 / Item 2(d)(iii)	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 18 in thick, in cement-sand mortar 1:6, in foundation and upto plinth]	100 Cft	5256	35682.6	Eighteen Lakh Seventy Five Thousand Four Hundred Seventy Seven Rupees Only	1875477

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
247	Ch. 8 / Item 4(d)(iii)	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 18 in thick, in cement-sand mortar 1:6, in the wall above plinth, 4 ft high]	100 Cft	14016	38677.7	Fifty Four Lakh Twenty One Thousand Sixty Six Rupees Only	5421066

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
248	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on the boundary wall]	100 Cft	584	49085.5	Two Lakh Eighty Six Thousand Six Hundred Fifty Nine Rupees Only	286659
249	Ch. 11 / Item 20(c)(ii)	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the boundary wall]	100 Sft	18688	7231.25	Thirteen Lakh Fifty One Thousand Three Hundred Seventy Six Rupees Only	1351376

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
250	Ch. 3 / Item 5(i)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, watered and compacted]	1000 Cft	5548	11261.3	Sixty Two Thousand Four Hundred Seventy Eight Rupees Only	62478

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
251	Ch. 3 / Item 21, 1(b)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of the perimeter walkway sub-grade to designed level]	1000 Cft	7008	11147.4	Seventy Eight Thousand One Hundred Twenty One Rupees Only	78121

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
252	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the perimeter walkway]	100 Cft	2336	10874.25	Two Lakh Fifty Four Thousand Twenty Two Rupees Only	254022

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
253	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the walkway pavers]	100 Cft	4672	3556.7	One Lakh Sixty Six Thousand One Hundred Sixty Nine Rupees Only	166169

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
254	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm precast concrete interlocking tuff pavers, 7000 psi, to the perimeter walkway 6 ft wide, including grouting joints]	Sft	14016	231.35	Thirty Two Lakh Forty Two Thousand Six Hundred Two Rupees Only	3242602

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
255	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the perimeter walkway]	Rft	4672	573.35	Twenty Six Lakh Seventy Eight Thousand Six Hundred Ninety One Rupees Only	2678691

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
256	Ch. 10 / Item 4	Providing, laying, watering and ramming brick or stone ballast 1-1/2" to 2" (40 mm to 50 mm) gauge mixed with 25% sand, for foundation, complete in all respects. [Ch. 10, Item 4: Providing, laying, watering and ramming compacted granular fill 4 in thick to the internal footpath, 4 ft wide]	100 Cft	8067.6328502415	14479.4	Eleven Lakh Sixty Eight Thousand One Hundred Forty Five Rupees Only	1168145

PROCUREMENT REGULATORY AUTHORITY PUBLIC (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
257	COMP / CA-16	Providing and laying hand-packed rock-stone fill sub-walkway, 1 ft size stone, 3 ft wide, over compacted sub-grade.	Sft	10891.304347826	153.68	Sixteen Lakh Seventy Three Thousand Seven Hundred Seventy Six Rupees Only	1673776
258	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Excavation / trimming of the compacted park fill to the stair profile, dressed to designed section]	1000 Cft	205.05594679072	8385.7	One Thousand Seven Hundred Twenty Rupees Only	1720

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
259	Ch. 6 / Item 5(i)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 3 in thick, as blinding under the stair slab, landings and cheek walls]	100 Cft	42.348510750258	36029.5	Fifteen Thousand Two Hundred Fifty Eight Rupees Only	15258

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
260	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair waist slab and top / bottom landings, 6 in thick, including formwork and curing]	100 Cft	71.323807579381	49085.5	Thirty Five Thousand Ten Rupees Only	35010

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
261	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair steps (6 in risers x 12 in treads, 8 ft long), broom-finished treads and rounded nosings]	100 Cft	12	49085.5	Five Thousand Eight Hundred Ninety Rupees Only	5890

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
262	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair cheek walls, 9 in thick, both sides, including formwork and curing]	100 Cft	53.492855684536	49085.5	Twenty Six Thousand Two Hundred Fifty Seven Rupees Only	26257

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
263	Ch. 25 / Item 34	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing M.S. stair handrail (box section 1-1/2 in x 3 in with square-bar balusters), both sides, grouted into the cheek walls]	Rft	15.661903789691	1587.5	Twenty Four Thousand Eight Hundred Sixty Three Rupees Only	24863

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
264	Ch. 3 / Item 7, 1(A)(i)	Earthwork excavation in open cutting for storm water channels, drains, sullage drains in open areas, roads, streets, lanes, including under pinning of walls and shoring to protect existing works, shuttering and timbering the trenches, dressed to designed level and dimensions, trimming, removal of surface water from trenches, back filling and surplus excavated material disposed of and dressed within 50 ft. (15 m) lead: upto 5 ft. (1.5 m) depth, by manual, ordinary soil. [Ch. 3, Item 7, 1(A)(i): Earthwork excavation in open cutting upto 5 ft depth for the storm-water pipe trench, including shoring,	1000 Cft	11680	14409.7	One Lakh Sixty Eight Thousand Three Hundred Five Rupees Only	168305

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
265	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand as bedding and surround to the storm-water pipe]	100 Cft	2920	3556.7	One Lakh Three Thousand Eight Hundred Fifty Six Rupees Only	103856

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
266	Ch. 21 / Item 3(a)(i)	Providing and laying R.C.C. pipe sewers, moulded with cement concrete 4000 psi conforming to ASTM Specification C-76-20, specific class, Wall B, including carriage of pipe from factory to site of work, lowering in trenches to correct alignment and grade, jointing with rubber ring, cutting pipes where necessary, testing, etc., complete: Class-II, 310 mm (12") i/d. [Ch. 21, Item 3(a)(i): Providing and laying R.C.C. pipe sewer, 310 mm (12 in) internal diameter, Class-II to ASTM C-76, including carriage, lowering in trench to correct alignment and grade, jointing with rubber ring and testing]	Rft	1168	909.2	Ten Lakh Sixty One Thousand Nine Hundred Forty Six Rupees Only	1061946

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
267	COMP / CA-19	Constructing storm-water manhole 3 ft x 3 ft internal, average 5 ft deep, including excavation, P.C.C. base, brick-masonry chamber rendered inside, R.C.C. cover slab with 6 in R.C.C. cover and frame, steps and benching - complete.	Each	7	60761.75	Four Lakh Twenty Five Thousand Three Hundred Thirty Two Rupees Only	425332

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
268	Ch. 21 / Item 6	Constructing standard gully grating chamber, 3' x 2-1/2' (900 x 750 mm), with chinaware trap as per PHED Drawing STD/PD No. 3 of 1977, complete in all respects. [Ch. 21, Item 6: Constructing standard gully grating chamber 3 ft x 2 ft 6 in with chinaware trap as per PHED standard drawing, complete in all respects]	Each	8	21861.6	One Lakh Seventy Four Thousand Eight Hundred Ninety Three Rupees Only	174893

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
269	Ch. 3 / Item 5(i)	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling of the pipe trench with approved excavated material in layers not exceeding 6 in, watered and compacted]	1000 Cft	8760	11261.3	Ninety Eight Thousand Six Hundred Forty Nine Rupees Only	98649

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
270	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the vehicle entrance apron at each entrance position of the belt]	Sft	10800	231.35	Twenty Four Lakh Ninety Eight Thousand Five Hundred Eighty Rupees Only	2498580

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
271	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the apron pavers]	100 Cft	3600	3556.7	One Lakh Twenty Eight Thousand Forty One Rupees Only	128041

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
272	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the vehicle entrance apron at each entrance position of the belt]	Sft	10800	231.35	Twenty Four Lakh Ninety Eight Thousand Five Hundred Eighty Rupees Only	2498580

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
273	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the apron pavers]	100 Cft	3600	3556.7	One Lakh Twenty Eight Thousand Forty One Rupees Only	128041

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
274	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the vehicle entrance apron at each entrance position of the belt]	Sft	10800	231.35	Twenty Four Lakh Ninety Eight Thousand Five Hundred Eighty Rupees Only	2498580

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
275	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the apron pavers]	100 Cft	3600	3556.7	One Lakh Twenty Eight Thousand Forty One Rupees Only	128041

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
276	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the vehicle entrance apron at each entrance position of the belt]	Sft	1350	231.35	Three Lakh Twelve Thousand Three Hundred Twenty Three Rupees Only	312323

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
277	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the apron pavers]	100 Cft	450	3556.7	Sixteen Thousand Five Rupees Only	16005

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
278	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the vehicle entrance apron at each entrance position of the belt]	Sft	14850	231.35	Thirty Four Lakh Thirty Five Thousand Five Hundred Forty Eight Rupees Only	3435548

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
279	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the apron pavers]	100 Cft	4950	3556.7	One Lakh Seventy Six Thousand Fifty Seven Rupees Only	176057

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
280	COMP / CA-21	Supply, fabrication and erection of wicket gate 12'-0" x 7'-0" in the park boundary wall, wide enough for a vehicle - double-leaf wrought-iron grill gate with a pedestrian door in one leaf, hot-dip galvanised and powder-coated, on 100x100x5 mm hollow-box posts in R.C.C. foundations, with lock set, hinges, drop bolts and stoppers - complete.	Each	1	160229.98	One Lakh Sixty Thousand Two Hundred Thirty Rupees Only	160230

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
281	COMP / CA-22	Supply, installation, testing and commissioning of revolving pedestrian entrance gate (full-height three-arm turnstile), hot-dip galvanised and powder-coated steel, on P.C.C. foundation with guide railings to the approach - complete and operational.	Each	1	596619.03	Five Lakh Ninety Six Thousand Six Hundred Nineteen Rupees Only	596619

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
282	COMP / CA-23	Forming vehicle crossing at the wicket gate, 12'-0" wide - mountable kerb and heavy-duty tuff-paver crossing on a granular base with edge beams, so that a fire tender or an ambulance can drive in through the wicket gate.	Each	1	89251.6	Eighty Nine Thousand Two Hundred Fifty Two Rupees Only	89252

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
283	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the entrance apron at each gate position]	Sft	800	231.35	One Lakh Eighty Five Thousand Eighty Rupees Only	185080

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
284	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the gate-apron pavers]	100 Cft	266.66666666667	3556.7	Nine Thousand Four Hundred Eighty Five Rupees Only	9485

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
285	COMP / CA-21	Supply, fabrication and erection of wicket gate 12'-0" x 7'-0" in the park boundary wall, wide enough for a vehicle - double-leaf wrought-iron grill gate with a pedestrian door in one leaf, hot-dip galvanised and powder-coated, on 100x100x5 mm hollow-box posts in R.C.C. foundations, with lock set, hinges, drop bolts and stoppers - complete.	Each	1	160229.98	One Lakh Sixty Thousand Two Hundred Thirty Rupees Only	160230

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
286	COMP / CA-22	Supply, installation, testing and commissioning of revolving pedestrian entrance gate (full-height three-arm turnstile), hot-dip galvanised and powder-coated steel, on P.C.C. foundation with guide railings to the approach - complete and operational.	Each	1	596619.03	Five Lakh Ninety Six Thousand Six Hundred Nineteen Rupees Only	596619

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
287	COMP / CA-23	Forming vehicle crossing at the wicket gate, 12'-0" wide - mountable kerb and heavy-duty tuff-paver crossing on a granular base with edge beams, so that a fire tender or an ambulance can drive in through the wicket gate.	Each	1	89251.6	Eighty Nine Thousand Two Hundred Fifty Two Rupees Only	89252

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
288	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the entrance apron at each gate position]	Sft	800	231.35	One Lakh Eighty Five Thousand Eighty Rupees Only	185080

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
289	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the gate-apron pavers]	100 Cft	266.66666666667	3556.7	Nine Thousand Four Hundred Eighty Five Rupees Only	9485
290	NSI / EW-DL	Dressing and levelling of the footpath sub-grade to designed section, including compaction and moistening to optimum moisture content.	100 Sft	36000	1650	Five Lakh Ninety Four Thousand Rupees Only	594000

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
291	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as bedding under the footpath]	100 Cft	12000	3556.7	Four Lakh Twenty Six Thousand Eight Hundred Four Rupees Only	426804

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
292	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete ratio 1:2:4, 4" thick, as the footpath slab, including placing, compacting, finishing and curing]	100 Cft	12000	49085.5	Fifty Eight Lakh Ninety Thousand Two Hundred Sixty Rupees Only	5890260

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
293	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi crushing strength, in approved pattern with 50% grey and 50% coloured, over sand cushion, including grouting of joints]	Sft	36000	231.35	Eighty Three Lakh Twenty Eight Thousand Six Hundred Rupees Only	8328600

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
294	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone (4" to 6" thick) of 3500 psi compressive strength to both edges of both footpaths, laid in cement-sand mortar 1:3, complete]	Rft	18000	573.35	One Crore Three Lakh Twenty Thousand Three Hundred Rupees Only	10320300

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
295	Ch. 25 / Item 34	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. safety railing 3'-0" high, main member 76x76x3 mm hollow box section, welded with intermediate members, ON THE TOP SECTION of both banks of the channel, complete in all respects]	Rft	9000	1587.5	One Crore Forty Two Lakh Eighty Seven Thousand Five Hundred Rupees Only	14287500

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
296	Ch. 6 / Item 6(c)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and	Cft	800	697.5	Five Lakh Fifty Eight Thousand Rupees Only	558000

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
297	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the access steps]	100 Kg	1760	30827.85	Five Lakh Forty Two Thousand Five Hundred Seventy Rupees Only	542570

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
298	NSI / EW-DL	Dressing and levelling of the footpath sub-grade to designed section, including compaction and moistening to optimum moisture content.	100 Sft	32000	1650	Five Lakh Twenty Eight Thousand Rupees Only	528000
299	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as bedding under the footpath]	100 Cft	10666.666666667	3556.7	Three Lakh Seventy Nine Thousand Three Hundred Eighty One Rupees Only	379381

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
300	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete ratio 1:2:4, 4" thick, as the footpath slab, including placing, compacting, finishing and curing]	100 Cft	10666.666666667	49085.5	Fifty Two Lakh Thirty Five Thousand Seven Hundred Eighty Seven Rupees Only	5235787

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
301	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi crushing strength, in approved pattern with 50% grey and 50% coloured, over sand cushion, including grouting of joints]	Sft	32000	231.35	Seventy Four Lakh Three Thousand Two Hundred Rupees Only	7403200

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
302	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone (4" to 6" thick) of 3500 psi compressive strength to both edges of both footpaths, laid in cement-sand mortar 1:3, complete]	Rft	16000	573.35	Ninety One Lakh Seventy Three Thousand Six Hundred Rupees Only	9173600

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
303	Ch. 25 / Item 34	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. safety railing 3'-0" high, main member 76x76x3 mm hollow box section, welded with intermediate members, ON THE TOP SECTION of both banks of the channel, complete in all respects]	Rft	8000	1587.5	One Crore Twenty Seven Lakh Rupees Only	12700000

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
304	Ch. 6 / Item 6(c)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and	Cft	640	697.5	Four Lakh Forty Six Thousand Four Hundred Rupees Only	446400

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
305	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the access steps]	100 Kg	1408	30827.85	Four Lakh Thirty Four Thousand Fifty Six Rupees Only	434056

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
306	Ch. 3 / Item 53	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the lake margin and of the corridor of the perimeter walkway, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	1000 Sft	17955	5292.2	Ninety Five Thousand Twenty One Rupees Only	95021
307	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Desilting and re-profiling of the bed of the existing lake, average 2'-0" deep, including dressing to the designed profile and disposal of the silt within the measured lead]	1000 Cft	141570	8385.7	Eleven Lakh Eighty Seven Thousand One Hundred Sixty Four Rupees Only	1187164

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
308	Ch. 3 / Item 6	Regular excavation dressed. [Ch. 3, Item 6: Excavation and trimming of the lake bank to the designed 1:2 batter, 12'-0" high, dressed to section and levels]	1000 Cft	34020	8385.7	Two Lakh Eighty Five Thousand Two Hundred Eighty Two Rupees Only	285282

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
309	Ch. 3 / Item 17(a)	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of silt and surplus excavated material of all types to approved dumping ground, total distance upto 5 km lead]	1000 Cft	175590	7190.5	Twelve Lakh Sixty Two Thousand Five Hundred Eighty Rupees Only	1262580

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
310	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 3" thick, as filter bedding under the stone pitching of the lake bank]	100 Cft	3169.626358106	3556.7	One Lakh Twelve Thousand Seven Hundred Thirty Four Rupees Only	112734

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
311	Ch. 16 / Item 28	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Providing and laying stone pitching, 1'-0" thick, with hammer-dressed stones laid in courses on the prepared 1:2 slope of the lake bank, complete in all respects]	100 Cft	12678.505432424	15198.5	Nineteen Lakh Twenty Six Thousand Nine Hundred Forty Three Rupees Only	1926943

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
312	Ch. 16 / Item 28	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Providing and laying stone pitching, 6" thick, to the 4'-0" wide toe apron at the bottom of the pitched slope]	100 Cft	1890	15198.5	Two Lakh Eighty Seven Thousand Two Hundred Fifty Two Rupees Only	287252

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
313	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete ratio 1:2:4 in the toe beam under the apron, 1'-6" x 1'-6", including formwork, compacting, finishing and curing]	100 Cft	2126.25	49085.5	Ten Lakh Forty Three Thousand Six Hundred Eighty Rupees Only	1043680
314	Ch. 16 / Item 34	Grouting stone filling or pitching, with bajri. [Ch. 16, Item 34: Grouting of the stone pitching and the toe apron with bajri]	100 Cft	14568.505432424	3905.7	Five Lakh Sixty Nine Thousand Two Rupees Only	569002

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
315	Ch. 1 / Item 1	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the lead from the approved source to site (composite of the chain and kilometre rates of the item). [Ch. 1, Item 1: Carriage of stone, aggregate, sand and other materials for the lake pitching, toe and walkway]	100 Cft	24904.38179053	4590	Eleven Lakh Forty Three Thousand One Hundred Eleven Rupees Only	1143111

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
316	NSI / EW-DL	Dressing and levelling of the walkway sub-grade to designed section, including compaction and moistening to optimum moisture content.	100 Sft	7560	1650	One Lakh Twenty Four Thousand Seven Hundred Forty Rupees Only	124740
317	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as bedding under the walkway]	100 Cft	2520	3556.7	Eighty Nine Thousand Six Hundred Twenty Nine Rupees Only	89629

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
318	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete ratio 1:2:4, 4" thick, as the walkway slab, including placing, compacting, finishing and curing]	100 Cft	2520	49085.5	Twelve Lakh Thirty Six Thousand Nine Hundred Fifty Five Rupees Only	1236955

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
319	Ch. 10 / Item 44	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi crushing strength, in approved pattern, over sand cushion, including grouting of joints]	Sft	7560	231.35	Seventeen Lakh Forty Nine Thousand Six Rupees Only	1749006

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
320	Ch. 10 / Item 45	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone (4" to 6" thick) of 3500 psi compressive strength to both edges of the walkway, laid in cement-sand mortar 1:3, complete]	Rft	1890	573.35	Ten Lakh Eighty Three Thousand Six Hundred Thirty Two Rupees Only	1083632

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
321	Ch. 3 / Item 21, 2(a)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth from 5.1 ft. (1.5 m) to 15 ft. (4.5 m), in ordinary soil. [Ch. 3, Item 21, 2(a)(ii): Excavation in foundation of the weir, its aprons and the stilling basin, from 5.1 ft to 15 ft depth, by excavator, in ordinary soil, including dagbelling, dressing and refilling around the structure]	1000 Cft	9256	13528.2	One Lakh Twenty Five Thousand Two Hundred Seventeen Rupees Only	125217

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
322	Ch. 18 / Item 3(a)(ii)	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying well-compacted granular fill of stone product of approved	100 Cft	4020	10874.25	Four Lakh Thirty Seven Thousand One Hundred Forty Five Rupees Only	437145

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
323	Ch. 6 / Item 6(a)(3)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in roof slab, beams, columns, lintels, girders and other structural	Cft	560	773.55	Four Lakh Thirty Three Thousand One Hundred Eighty Eight Rupees Only	433188

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
324	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-40 in the apron and base slab, including cutting, bending, laying in position and binding]	100 Kg	1232	30827.85	Three Lakh Seventy Nine Thousand Seven Hundred Ninety Nine Rupees Only	379799

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
325	Ch. 6 / Item 5(f)	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete ratio 1:2:4, 8" thick, in the downstream apron, including compacting, finishing and curing]	100 Cft	333.33333333333	49085.5	One Lakh Sixty Three Thousand Six Hundred Eighteen Rupees Only	163618

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
326	Ch. 16 / Item 28	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Providing and laying hand-placed angular hard stone of toughness more than 1,500 psi, set in mortar, forming the body of the stone-fill weir (crest 8'-0", base 27'-0", height 10'-0"), complete in all respects]	100 Cft	3500	15198.5	Five Lakh Thirty One Thousand Nine Hundred Forty Eight Rupees Only	531948

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
327	COMP / CA-20	Providing and applying 6" thick shotcrete (1:2:2) to both faces and the crest of the weir, including #1 stainless steel re-bars at 6" centres both ways, surface preparation, nozzle work, rebound allowance and curing, complete.	Sft	711.72456896535	1531.2	Ten Lakh Eighty Nine Thousand Seven Hundred Ninety Three Rupees Only	1089793

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
328	Ch. 16 / Item 27	Providing and laying stone pitching / filling, dry hand packed, as filling behind retaining walls or in pitching and aprons. [Ch. 16, Item 27: Providing and laying dry hand-packed stone fill, 3'-0" thick, in the stilling basin downstream of the apron, including 12" friction blocks at 5'-0" centres, complete]	100 Cft	1320	8234.15	One Lakh Eight Thousand Six Hundred Ninety One Rupees Only	108691

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
329	Ch. 1 / Item 1	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the shorter lead adopted for the nullah and lake works. [Ch. 1, Item 1: Carriage of stone, aggregate, sand and other materials for the weir, its aprons and the stilling basin]	100 Cft	9733.3333333333	3881.75	Three Lakh Seventy Seven Thousand Eight Hundred Twenty Four Rupees Only	377824

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
330	Ch. 3 / Item 2	Earthwork excavation in ashes, sand and soft soil or silt clearance, undressed lead upto 50 ft (15 metre) through mechanical means. [Ch. 3, Item 2: Earthwork excavation for the water storage pit 35 ft x 25 ft x 5 ft at each well, undressed, lead upto 50 ft]	1000 Cft	21875	8932.7	One Lakh Ninety Five Thousand Four Hundred Three Rupees Only	195403

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
331	Ch. 23 / Item 2(a)(i)	Direct Rotary / Reverse Rotary drilling of bore for tubewells, in all types of soil except shingle, gravel and rock: (a) from ground level to 250 ft (75 m) below ground level - (i) 15" to 18" (375 to 450 mm) i/d. [Ch. 23, Item 2(a)(i): Direct / reverse rotary drilling of the bore, 15" to 18" i/d, from ground level to 250 ft]	Rft	1250	956.3	Eleven Lakh Ninety Five Thousand Three Hundred Seventy Five Rupees Only	1195375

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
332	Ch. 23 / Item 2(b)(i)	Direct Rotary / Reverse Rotary drilling of bore for tubewells, in all types of soil except shingle, gravel and rock: (b) exceeding 250 ft (75 m) depth below ground level - (i) 15" to 18" (375 to 450 mm) i/d. [Ch. 23, Item 2(b)(i): Direct / reverse rotary drilling of the bore, 15" to 18" i/d, below 250 ft to the full depth]	Rft	1750	1050.55	Eighteen Lakh Thirty Eight Thousand Four Hundred Sixty Three Rupees Only	1838463

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
333	Ch. 23 / Item 12(g)	Providing and installing M.S. blind pipe socketed / welded joint, M.S. reducer (where necessary), in tubewell bore hole, including jointing / welding with strainer, etc. complete: (g) 8" i/d, 3/16" (200 mm i/d, 5 mm) thick. [Ch. 23, Item 12(g): M.S. blind pipe 8" i/d, 3/16" thick, socketed / welded, in the bore hole (replaces the FRP blank pipe of the source)]	Rft	2700	3537.8	Ninety Five Lakh Fifty Two Thousand Sixty Rupees Only	9552060

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
334	Ch. 23 / Item 9(v)	Providing and installing Fiberglass Reinforced Polypropelene (FRP) strainer of specified wall thickness having slot size of 0.9 mm to 1.10 mm in tubewell borehole i/c the cost of male / female coupling with nylone strip, studs complete in all respect as approved and directed by the Engineer Incharge: (v) 8" dia (5 mm thickness). [Ch. 23, Item 9(v): FRP strainer 8" dia, 5 mm wall, slot 0.9 - 1.10 mm, in the bore hole]	Rft	250	2650.4	Six Lakh Sixty Two Thousand Six Hundred Rupees Only	662600

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
335	Ch. 23 / Item 10(v)	Providing and installing Fiber glass Reinforced Polypropelene (FRP) bail plug of specified wall thickness in tubewell bore hole i/c the cost of male / female coupling with nylone strip, studs complete in all respect as approved and directed by the Engineer Incharge: (v) 8" dia (5 mm thickness). [Ch. 23, Item 10(v): FRP bail plug 8" dia, 5 mm wall, at the bottom of the assembly]	Rft	50	2495.4	One Lakh Twenty Four Thousand Seven Hundred Seventy Rupees Only	124770

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
336	Ch. 23 / Item 17	Shrouding with graded pea gravel 3/8" to 1/8" (10 to 3 mm), around tubewell in bore hole (including wastage etc.). [Ch. 23, Item 17: Shrouding with graded pea gravel 3/8" to 1/8" around the well assembly]	Cft	4140	189.3	Seven Lakh Eighty Three Thousand Seven Hundred Two Rupees Only	783702

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
337	Ch. 23 / Item 31	Providing & mixing bentonite clay / powder having swelling factor of 1200% for lining / seal and plug earthen bore holes / ponds in the specified ratio conforming to IS:6186 for stabilization of soil as specified by the designer etc. complete in all respect. [Ch. 23, Item 31: Bentonite clay / powder for the seal and plug of the bore hole]	Pound	5280	13.2	Sixty Nine Thousand Six Hundred Ninety Six Rupees Only	69696

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
338	Ch. 23 / Item 13(a)(i)	Providing and installing P.V.C. blind pipe, B.S.S., in tubewell bore hole, including sockets and solvents and jointing with strainer (PS-3051 = BS-3505), etc. complete: (a) Class-B (6 bar) - (i) 3" i/d (75 mm). [Ch. 23, Item 13(a)(i): P.V.C. blind pipe Class-B 3" i/d for gravel feeding]	Rft	150	401.5	Sixty Thousand Two Hundred Twenty Five Rupees Only	60225

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
339	Ch. 23 / Item 16(i)	Testing and developing of tubewell of size 6" (150 mm) i/d and above continuously: (i) upto 1.5 cs discharge. [Ch. 23, Item 16(i): Testing and developing of the tube well continuously (discharge upto 1.5 cusec), including the long-duration pumping test]	Hour	100	3195.35	Three Lakh Nineteen Thousand Five Hundred Thirty Five Rupees Only	319535
340	NSI / TW-N1	Taking samples of the strata at every 5 ft, with construction charts and analysis.	Each	600	202	One Lakh Twenty One Thousand Two Hundred Rupees Only	121200

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
341	NSI / TW-N2	Geophysical logging of the bore.	Job	5	63180	Three Lakh Fifteen Thousand Nine Hundred Rupees Only	315900
342	NSI / TW-N3	M.S. centralizers.	Each	75	2906	Two Lakh Seventeen Thousand Nine Hundred Fifty Rupees Only	217950

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
343	NSI / TW-N4	Chemical and physical analysis of water samples after every 24 hours of pumping.	Job	10	17021	One Lakh Seventy Thousand Two Hundred Ten Rupees Only	170210
344	NSI / TW-N5	M.S. cap 8" dia, 1/4" thick.	Each	5	2249	Eleven Thousand Two Hundred Forty Five Rupees Only	11245

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
345	NSI / TW-N6	Submersible pump set 0.25 cfs, head 250 ft, with motor, cable and motor control unit, installed, tested and commissioned.	Each	5	2039040	One Crore One Lakh Ninety Five Thousand Two Hundred Rupees Only	10195200
346	NSI / TW-N7	Hypo-chlorinator with dosing pump and controller.	Job	5	150841.2	Seven Lakh Fifty Four Thousand Two Hundred Six Rupees Only	754206

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
347	Ch. 3 / Item 2	Earthwork excavation in ashes, sand and soft soil or silt clearance, undressed lead upto 50 ft (15 metre) through mechanical means. [Ch. 3, Item 2: Earthwork excavation for the water pit 35 ft x 25 ft x 5 ft at each trial bore, undressed, lead upto 50 ft]	1000 Cft	43750	8932.7	Three Lakh Ninety Thousand Eight Hundred Six Rupees Only	390806

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
348	Ch. 23 / Item 2(a)(i)	Direct Rotary / Reverse Rotary drilling of bore for tubewells, in all types of soil except shingle, gravel and rock: (a) from ground level to 250 ft (75 m) below ground level - (i) 15" to 18" (375 to 450 mm) i/d. [Ch. 23, Item 2(a)(i): Direct / reverse rotary drilling of the trial bore, 15" to 18" i/d, from ground level to 250 ft]	Rft	2500	956.3	Twenty Three Lakh Ninety Thousand Seven Hundred Fifty Rupees Only	2390750

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
349	Ch. 23 / Item 2(b)(i)	Direct Rotary / Reverse Rotary drilling of bore for tubewells, in all types of soil except shingle, gravel and rock: (b) exceeding 250 ft (75 m) depth below ground level - (i) 15" to 18" (375 to 450 mm) i/d. [Ch. 23, Item 2(b)(i): Direct / reverse rotary drilling of the trial bore, 15" to 18" i/d, below 250 ft to the full depth]	Rft	3500	1050.55	Thirty Six Lakh Seventy Six Thousand Nine Hundred Twenty Five Rupees Only	3676925

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
350	Ch. 10 / Item 3	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling sand for plugging the trial bore after logging and sampling]	100 Cft	10620	3556.7	Three Lakh Seventy Seven Thousand Seven Hundred Twenty Two Rupees Only	377722
351	NSI / TW-N1	Taking samples of the strata at every 5 ft, with construction charts and analysis.	Each	1200	202	Two Lakh Forty Two Thousand Four Hundred Rupees Only	242400

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
352	NSI / TW-N2	Geophysical logging of the trial bore.	Job	10	63180	Six Lakh Thirty One Thousand Eight Hundred Rupees Only	631800
353	NSI / TW-N4	Chemical and physical analysis of the water sample.	Job	10	17021	One Lakh Seventy Thousand Two Hundred Ten Rupees Only	170210

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
354	Ch. 3 / Item 21, 1(a)(ii)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft (1.5 m): 1) depth upto 5 ft (1.5 m) - a) by manual - ii) ordinary soil. [Ch. 3, Item 21, 1(a)(ii): Excavation in foundation of the room, by manual means, in ordinary soil, including refilling, watering and ramming]	1000 Cft	9400	17088.2	One Lakh Sixty Thousand Six Hundred Twenty Nine Rupees Only	160629

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
355	Ch. 6 / Item 3(b)	Cement concrete brick or stone ballast 1-1/2" to 2" (40 mm to 50 mm) gauge, in foundation and plinth: (b) ratio 1:4:8. [Ch. 6, Item 3(b): Cement concrete brick / stone ballast 1:4:8 in foundation]	100 Cft	175	36435.6	Sixty Three Thousand Seven Hundred Sixty Two Rupees Only	63762
356	Ch. 7 / Item 4(i)	Pacca brick work in foundation and plinth in: i) cement, sand mortar - ratio 1:3. [Ch. 7, Item 4(i): Pacca brick work in foundation and plinth in cement-sand mortar 1:3]	100 Cft	820	44342.85	Three Lakh Sixty Three Thousand Six Hundred Eleven Rupees Only	363611

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
357	Ch. 6 / Item 37(b)(ii)	Providing and laying damp proof course of cement concrete 1:2:4 (using cement, sand and shingle), including bitumen coating: (b) with 2 coats of bitumen - ii) 2" thick (50 mm). [Ch. 6, Item 37(b)(ii): Damp proof course of cement concrete 1:2:4, 2" thick, with 2 coats of bitumen]	100 Sft	310	14064.3	Forty Three Thousand Five Hundred Ninety Nine Rupees Only	43599

PROCUREMENT REGULATORY AUTHORITY PUBLIC (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
358	Ch. 6 / Item 39(b)(2)(b)	Providing and laying vertical damp proof course with cement sand plaster and bitumen coating: (b) with 2 coats of bitumen - 2) ratio 1:3 - b) 3/4" thick (20 mm). [Ch. 6, Item 39(b)(2)(b): Vertical damp proof course of cement-sand plaster 1:3, 3/4" thick, with 2 coats of bitumen]	100 Sft	430	9434.5	Forty Thousand Five Hundred Sixty Eight Rupees Only	40568
359	Ch. 7 / Item 5(i)	Pacca brick work in ground floor: i) cement, sand mortar - ratio 1:4. [Ch. 7, Item 5(i): Pacca brick work in the superstructure (ground floor) in cement-sand mortar 1:4]	100 Cft	1920	43384.35	Eight Lakh Thirty Two Thousand Nine Hundred Eighty Rupees Only	832980

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
360	Ch. 3 / Item 15(i)	Filling, watering and ramming earth under floors: i) with surplus earth from foundation, etc. [Ch. 3, Item 15(i): Filling, watering and ramming earth under the floor with surplus earth from the foundation]	1000 Cft	5950	8155.5	Forty Eight Thousand Five Hundred Twenty Five Rupees Only	48525
361	Ch. 3 / Item 15(ii)	Filling, watering and ramming earth under floors: ii) with new earth excavated from outside, lead upto one chain (30 m). [Ch. 3, Item 15(ii): Filling, watering and ramming earth under the floor with new earth from outside, lead upto one chain]	1000 Cft	1950	17545.5	Thirty Four Thousand Two Hundred Fourteen Rupees Only	34214

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
362	Ch. 3 / Item 16(i)	Extra for every 50 ft (15 m) additional lead or part thereof: i) for earthwork soft, ordinary, hard and very hard. [Ch. 3, Item 16(i): Extra for additional lead of the new earth - two increments of 50 ft, as priced in the source estimate]	1000 Cft	3900	74.25	Two Hundred Ninety Rupees Only	290
363	Ch. 6 / Item 2	Dry rammed brick or stone ballast, 1-1/2" to 2" (40 mm to 50 mm) gauge. [Ch. 6, Item 2: Dry rammed brick / stone ballast 1-1/2" to 2" gauge under the floor]	100 Cft	250	14076.5	Thirty Five Thousand One Hundred Ninety One Rupees Only	35191

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
364	Ch. 6 / Item 5(f)	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (f) ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4]	100 Cft	5	49085.5	Two Thousand Four Hundred Fifty Four Rupees Only	2454
365	Ch. 6 / Item 5(i)	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (i) ratio 1:4:8. [Ch. 6, Item 5(i): Plain cement concrete 1:4:8 under the floor]	100 Cft	125	36029.5	Forty Five Thousand Thirty Seven Rupees Only	45037

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
366	Ch. 10 / Item 16(c)	Providing and laying topping of cement concrete 1:2:4, including surface finishing and dividing in panels: (c) 1-1/2" (40 mm) thick. [Ch. 10, Item 16(c): Cement concrete 1:2:4 floor topping, 1-1/2" thick, finished and divided in panels]	100 Sft	495	10169.6	Fifty Thousand Three Hundred Forty Rupees Only	50340

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
367	Ch. 6 / Item 6(a)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): (a) reinforced cement concrete in roof slab, beams, columns, lintels, girders and other structural	Cft	630.35	853.15	Five Lakh Thirty Seven Thousand Seven Hundred Eighty Three Rupees Only	537783

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
368	Ch. 6 / Item 6(c)(2)	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): (c) reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and	Cft	452	697.5	Three Lakh Fifteen Thousand Two Hundred Seventy Rupees Only	315270

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
369	Ch. 6 / Item 12(b)(ii)	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): (b) deformed bars - (ii) Grade-60. [Ch. 6, Item 12(b)(ii): Fabrication of deformed bar reinforcement Grade-60, cut, bent, placed and bound]	100 Kg	2700	30827.85	Eight Lakh Thirty Two Thousand Three Hundred Fifty Two Rupees Only	832352

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
370	Ch. 11 / Item 9(c)	Cement plaster 1:4 upto 20 ft (6.00 m) height: c) 3/4" (20 mm) thick. [Ch. 11, Item 9(c): Cement plaster 1:4, 3/4" thick, to the walls]	100 Sft	2570	6641.3	One Lakh Seventy Thousand Six Hundred Eighty One Rupees Only	170681
371	Ch. 11 / Item 18(a)	Cement pointing struck joints, on walls, upto 20 ft (6.00 m) height: a) ratio 1:2. [Ch. 11, Item 18(a): Cement pointing struck joints 1:2 to the external brick faces]	100 Sft	2790	5418.05	One Lakh Fifty One Thousand One Hundred Sixty Four Rupees Only	151164

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
372	Ch. 11 / Item 12(c)	Cement plaster 3/8" (10 mm) thick under soffit of R.C.C. roof slabs only, upto 20 ft height: c) 1:4. [Ch. 11, Item 12(c): Cement plaster 1:4, 3/8" thick, under the soffit of the roof slab]	100 Sft	1080	5537.2	Fifty Nine Thousand Eight Hundred Two Rupees Only	59802

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
373	Ch. 9 / Item 5	Single layer of tiles 9" x 4-1/2" x 1-1/2" (225 x 113 x 40 mm) laid over 4" (100 mm) earth and 1" (25 mm) mud plaster without bhoosa, grouted with cement sand 1:3 on top of RCC roof slab, provided with 34 lbs per 100 Sft or 1.72 kg/sq.m bitumen coating sand blinded. [Ch. 9, Item 5: Single layer of roof tiles over 4" earth and 1" mud plaster with bitumen coating]	100 Sft	1005	14518.05	One Lakh Forty Five Thousand Nine Hundred Six Rupees Only	145906

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
374	Ch. 9 / Item 14	Khassi parnalas in cement, sand mortar 1:2, 12" (300 mm) outside width finished smooth with a floating coat of neat cement. [Ch. 9, Item 14: Khassi parnalas 12" wide in cement-sand mortar 1:2]	Rft	62.5	279.45	Seventeen Thousand Four Hundred Sixty Six Rupees Only	17466
375	Ch. 9 / Item 15	Khuras on roof 2' x 2' x 6" (600 x 600 x 150 mm). [Ch. 9, Item 15: Khuras on roof 2 ft x 2 ft x 6 in]	Each	5	1240.85	Six Thousand Two Hundred Four Rupees Only	6204

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
376	Ch. 9 / Item 16	Bottom khuras of brick masonry in cement mortar 1:6, 4' x 2' x 4-1/2" (1200 x 600 x 113 mm) over 3" (75 mm) cement concrete 1:4:8. [Ch. 9, Item 16: Bottom khuras of brick masonry 4 ft x 2 ft x 4-1/2 in]	Each	5	2399.3	Eleven Thousand Nine Hundred Ninety Seven Rupees Only	11997
377	Ch. 11 / Item 26(a)(iii)	White washing: a) new surface - iii) three coats. [Ch. 11, Item 26(a)(iii): White washing three coats on new surfaces]	100 Sft	2475	971.55	Twenty Four Thousand Forty Six Rupees Only	24046

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
378	Ch. 25 / Item 61(ii)	P/F iron door comprising of specified leaves made of 1-1/4" x 1-1/4" x 3/16" MS angle iron for leaf frame, diagonal and horizontal braces duly welded with MS sheet 18-SWG i/c the cost of sliding bolt, tower bolt and painting 3-coats but excluding the cost of chowkat, complete in all respect as approved and directed by the Engineer Incharge: (ii) double leaf. [Ch. 25, Item 61(ii): Iron door, double leaf, of M.S. angle frame and 18 SWG sheet, painted, excluding chowkat]	Sft	140	1481.9	Two Lakh Seven Thousand Four Hundred Sixty Six Rupees Only	207466

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
379	Ch. 12 / Item 17(ii)	Providing and fixing 2" wide MS / GI chowkat single / double rebate made of 16 SWG MS sheet pressed / welded / supported with M.S. flat 1-1/4" x 1/8" i/c 6" long M.S. flat 1" x 1/8" hold fasts (6 Nos) welded / screwed, punching of lock hole covered with MS box, coating with antirust paint including filling with cement sand mortar (1:8) and embedding hold fast in cement concrete (1:2:4), complete in all respect as approved and directed by the Engineer Incharge: (ii) 10.5" wide. [Ch. 12, Item 17(ii): M.S. / G.I. pressed-steel chowkat 10.5" wide for the door]	Sft	140	733.4	One Lakh Two Thousand Six Hundred Seventy Six Rupees Only	102676

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
380	Ch. 25 / Item 45(a)	Providing and fixing steel windows using M.S. sheet (16 SWG) moulded tubular pipe 1-1/2" x 1-1/2" (40 x 40 mm) for frame and 1-1/4" x 1-1/4" (30 x 30 mm) for leaves including M.S. square bars 1/4" x 1/4" (6 x 6 mm) welded around each panel of frame, 5 mm thick glass panes fixed with double M.S. square tubular pipe 3/8" x 3/8" (10 x 10 mm) (22 SWG) beading with U-shaped rubber lining, brass fitting, holdfast, including painting three coats complete in all respects: a) for openable panels fixed with wire gauze 24 SWG, 12 x 12 mesh and glass panes 1/4" (6 mm) thick. [Ch. 25, Item 45(a): Steel	Sft	90	1345.65	One Lakh Twenty One Thousand One Hundred Nine Rupees Only	121109

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
381	Ch. 25 / Item 10	Fabrication of heavy steel / iron work, with angle, tees, flat iron, round iron and sheet iron for making trusses, girders, tanks, etc., including cutting, drilling, revitting, handling, assembling and fixing, but excluding erection in position. [Ch. 25, Item 10: Fabrication of heavy steel work for the well top cover, base plate and lifting girder]	100 Kg	1660	36401.6	Six Lakh Four Thousand Two Hundred Sixty Seven Rupees Only	604267

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
382	Ch. 25 / Item 11	Erection and fitting in position iron trusses, staging of water tanks, etc. [Ch. 25, Item 11: Erection and fitting in position of the steel work above]	100 Kg	1660	1535.9	Twenty Five Thousand Four Hundred Ninety Six Rupees Only	25496
383	Ch. 23 / Item 52	Providing and fixing chain pulley block of 5 ton capacity with 5 metre length of chain, as per required specifications complete in all respect and as approved by the Engineer Incharge. [Ch. 23, Item 52: Chain pulley block of 5 ton capacity with 5 m chain]	Each	5	53030	Two Lakh Sixty Five Thousand One Hundred Fifty Rupees Only	265150

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
384	Ch. 1 / Item 1	Carriage of 100 Cft (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the lead P_TWLEAD from the approved quarry (sum of the kilometre rates of the item: 1st to 10th km, then 69.30 per km). [Ch. 1, Item 1: Carriage of crushed stone aggregate and bajri for the concrete, from the approved quarry]	100 Cft	1030	3425.2	Thirty Five Thousand Two Hundred Eighty Rupees Only	35280

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
385	NSI / TE-C1	Wiring of light / fan points from the switch, in concealed PVC pipe, with switches and boxes.	Each	15	2720	Forty Thousand Eight Hundred Rupees Only	40800
386	NSI / TE-C2	Circuit wiring from the MCB board to the gang switch board, 3 x 2.5 sq.mm in PVC conduit.	Each	5	8871	Forty Four Thousand Three Hundred Fifty Five Rupees Only	44355
387	NSI / TE-C3	Wiring from one light point to another light point.	Each	10	2246	Twenty Two Thousand Four Hundred Sixty Rupees Only	22460

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
388	NSI / TE-C4	5 A switch socket unit wired with 3 x 4 sq.mm cable in concealed conduit.	Each	5	10838	Fifty Four Thousand One Hundred Ninety Rupees Only	54190
389	NSI / TE-C5	Wiring from one socket to another socket with 3 x 2.5 sq.mm cable.	Each	5	5914	Twenty Nine Thousand Five Hundred Seventy Rupees Only	29570

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
390	NSI / TE-C6	15/20 A switch socket unit wired with 3 x 6 sq.mm cable from the D.B.	Each	5	13463	Sixty Seven Thousand Three Hundred Fifteen Rupees Only	67315

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
391	Ch. 24 / Item 11(c)(vi)	Supply and erection of PVC insulated, PVC sheathed copper conductor cables for service connection, in prelaid pipe / G.I. wire / trenches, etc. (rate for cable only): c) four core, 600/1000 volt non armoured cable - vi) 10 mm (7/0.052"). [Ch. 24, Item 11(c)(vi): Four-core 10 sq.mm PVC/PVC copper cable 600/1000 V, non-armoured, for the service connection]	Rft	250	621.9	One Lakh Fifty Five Thousand Four Hundred Seventy Five Rupees Only	155475

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
392	Ch. 24 / Item 11(c)(viii)	Supply and erection of PVC insulated, PVC sheathed copper conductor cables for service connection, in prelaid pipe / G.I. wire / trenches, etc. (rate for cable only): c) four core, 600/1000 volt non armoured cable - viii) 25 mm (19/0.052"). [Ch. 24, Item 11(c)(viii): Four-core 25 sq.mm PVC/PVC copper cable 600/1000 V, non-armoured, for the service connection]	Rft	1000	1465	Fourteen Lakh Sixty Five Thousand Rupees Only	1465000

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
393	Ch. 24 / Item 8(c)(vi)	Supply and erection of single core PVC insulated copper conductor cables, in prelaid PVC pipe / M.S. conduit / G.I. pipe / wooden strip batten / wooden casing and capping / G.I. wire / trenches (rate for cables only): c) 450/750 volts, PVC insulated - vi) 10 mm sq (7/0.052"). [Ch. 24, Item 8(c)(vi): Single-core 10 sq.mm PVC insulated copper cable 450/750 V in prelaid pipe]	Rft	500	182.3	Ninety One Thousand One Hundred Fifty Rupees Only	91150

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
394	Ch. 24 / Item 8(c)(vii)	Supply and erection of single core PVC insulated copper conductor cables, in prelaid PVC pipe / M.S. conduit / G.I. pipe / wooden strip batten / wooden casing and capping / G.I. wire / trenches (rate for cables only): c) 450/750 volts, PVC insulated - vii) 16 mm sq (7/0.064"). [Ch. 24, Item 8(c)(vii): Single-core 16 sq.mm PVC insulated copper cable 450/750 V in prelaid pipe]	Rft	1500	274.6	Four Lakh Eleven Thousand Nine Hundred Rupees Only	411900

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
395	Ch. 24 / Item 99(i)	Providing and fixing 4" deep cable tray with straight flange fabricated with perforated G.I. sheet of specified gauge, size and depth duly supported on painted brackets of MS angle iron of 1-1/2" x 1-1/2" x 3/16" and MS patti of 1-1/2" x 3/16" size @ 3 ft c/c, hangers i/c the cost of hardwares as approved and directed by the Engineer Incharge: 14 SWG - (i) 12" x 4". [Ch. 24, Item 99(i): Perforated G.I. cable tray 12" x 4", 14 SWG, on M.S. angle brackets at 3 ft centres]	Rft	250	1307.35	Three Lakh Twenty Six Thousand Eight Hundred Thirty Eight Rupees Only	326838

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
396	Ch. 24 / Item 102(a)(ii)	Providing and fixing Pakistan Energy Label NEECA approved copper winded exhaust fan i/c the cost of necessary cable and hardware for connection from ceiling rose complete as approved and directed by Engineer Incharge: a) plastic body - (ii) 12" dia. [Ch. 24, Item 102(a)(ii): Exhaust fan 12" dia, plastic body, copper winding, with louver and shutter]	Each	5	5685.5	Twenty Eight Thousand Four Hundred Twenty Eight Rupees Only	28428
397	NSI / TE-N1	Two-core 10 sq.mm PVC/PVC copper cable 600/1000 V with glands and lugs.	Rft	250	360	Ninety Thousand Rupees Only	90000

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
398	NSI / TE-N2	LED batten light fixture 18 W.	Each	10	3284	Thirty Two Thousand Eight Hundred Forty Rupees Only	32840
399	NSI / TE-N3	Wall bracket LED light fixture 12 W.	Each	5	5065	Twenty Five Thousand Three Hundred Twenty Five Rupees Only	25325

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
400	Ch. 24 / Item 103(i)	Providing and fixing Pakistan Energy Label NEECA approved copper winded wall bracket fan i/c the cost of necessary cable and hardware for connection as approved and directed by Engineer Incharge: i) 18" sweep dia. [Ch. 24, Item 103(i): Wall bracket fan 18" sweep, copper winding]	Each	5	6861.15	Thirty Four Thousand Three Hundred Six Rupees Only	34306
401	NSI / TE-N4	uPVC conduit 100 mm dia, Class-B.	Rft	400	876	Three Lakh Fifty Thousand Four Hundred Rupees Only	350400

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
402	NSI / TE-N5	uPVC conduit 100 mm dia, Class-D.	Rft	250	1410	Three Lakh Fifty Two Thousand Five Hundred Rupees Only	352500
403	NSI / TE-N6	Distribution board for the tube-well room, complete as specified.	Each	5	59789	Two Lakh Ninety Eight Thousand Nine Hundred Forty Five Rupees Only	298945

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
404	NSI / TE-N7	LV switchgear panel / main panel board, complete as specified.	Each	5	397311	Nineteen Lakh Eighty Six Thousand Five Hundred Fifty Five Rupees Only	1986555

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
405	Ch. 24 / Item 118	Providing, making & testing / commissioning of rod type earth point comprising of 5/8" dia (16 mm dia) 10 ft long copper coated M.S. rod driven in ground duly fixed with clamp with tinned earth test link copper plate (300 x 50 x 10 mm), i/c the cost of brass nuts, spacers, bolts, washers, lugs etc. but excluding the cost of copper strand & manhole, as approved and directed by Engineer Incharge (rod type earthing). [Ch. 24, Item 118: Rod-type earth point, 10 ft x 5/8" copper-coated M.S. rod with test link]	Job	25	21210.95	Five Lakh Thirty Thousand Two Hundred Seventy Four Rupees Only	530274

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
406	NSI / TE-N8	Power factor improvement panel 10 kVAR, complete as specified.	Each	5	335073	Sixteen Lakh Seventy Five Thousand Three Hundred Sixty Five Rupees Only	1675365

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
407	COMP / CA-29	Design, supply, installation, testing and commissioning of a complete solar power system for the tube well and its pump room, comprising approximately 20 kWp capacity of Tier-1 N-type bifacial photovoltaic (PV) modules, terminated with MC4 connectors, complete with branded 6 mm² DC solar cables as required. The solar PV modules shall carry a minimum 15-year manufacturer's warranty. The system shall include a hot-dip galvanized/powder-coated 12 SWG solar panel mounting structure, including stainless-steel (SS) bolts, mid-clamps, end-clamps, accessories and 1 feet long J bolts	Set	5	9147312.07	Four Crore Fifty Seven Lakh Thirty Six Thousand Five Hundred Sixty Rupees Only	45736560

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
408	NSI / NB-1	Supply of indoor plants for the nursery stock - assorted species as approved by the Engineer, healthy and well rooted, in nursery bags, delivered to the nursery.	No.	3500	300	Ten Lakh Fifty Thousand Rupees Only	1050000
409	NSI / NB-2	Supply of outdoor plants for the nursery stock - assorted ornamental and landscape species as approved by the Engineer, healthy and well rooted, in nursery bags, delivered to the nursery.	No.	3000	300	Nine Lakh Rupees Only	900000
410	NSI / NB-7	Supply of grow bags for raising plants in the nursery.	No.	4000	300	Twelve Lakh Rupees Only	1200000

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
411	NSI / NB-8	Supply of plant pots for the nursery.	No.	1000	400	Four Lakh Rupees Only	400000
412	NSI / NB-9	Supply of polythene nursery bags, in bundles.	Bundle	7	5500	Thirty Eight Thousand Five Hundred Rupees Only	38500
413	NSI / NB-10	Supply of bhall (fine river silt) for the potting mixture, delivered to the nursery by trolley.	Trolley	10	12000	One Lakh Twenty Thousand Rupees Only	120000
414	NSI / NB-11	Labour for setting up the nursery - filling of bags and pots, bed preparation and shifting of plants.	Man-day	5	1500	Seven Thousand Five Hundred Rupees Only	7500

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
415	NSI / NB-12	Supply of plant and flower seed packs.	Pack	150	1200	One Lakh Eighty Thousand Rupees Only	180000
416	NSI / NB-13	Supply of plant cuttings for propagation in the nursery.	No.	2000	50	One Lakh Rupees Only	100000
417	NSI / NB-14	Supply of polythene sheet roll for the nursery beds and propagation.	Roll	1	10000	Ten Thousand Rupees Only	10000
418	NSI / NB-15	Supply of fertilizer for the nursery, in bags.	Bag	5	5000	Twenty Five Thousand Rupees Only	25000
419	NSI / NB-16	Supply of well-rotted cow dung (farmyard manure) for the potting mixture, delivered by trolley.	Trolley	3	3000	Nine Thousand Rupees Only	9000

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
420	NSI / NB-17	Supply of nursery hand tools - spades, khurpas, secateurs, rakes, watering cans and the like.	No.	20	1500	Thirty Thousand Rupees Only	30000
421	NSI / NB-18	Supply of bamboo sticks for staking the plants.	No.	300	100	Thirty Thousand Rupees Only	30000
422	NSI / NB-20	Supply of a hand cart (wheel barrow) for the nursery.	No.	1	8000	Eight Thousand Rupees Only	8000
423	NSI / NB-21	Supply of a loader rickshaw for the nursery.	No.	1	500000	Five Lakh Rupees Only	500000
424	NSI / NB-22	Supply of a lawn watering hose roll for the nursery.	Roll	1	17000	Seventeen Thousand Rupees Only	17000

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
425	NSI / LS-6	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the belt.	Sft	1608462.1621427	7.5	One Crore Twenty Lakh Sixty Three Thousand Four Hundred Sixty Six Rupees Only	12063466
426	COMP / CA-25	Providing and laying buried HDPE watering main, 2 in dia, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	Rft	7540	433.61	Thirty Two Lakh Sixty Nine Thousand Four Hundred Nineteen Rupees Only	3269419

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
427	COMP / CA-24	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	Each	40	22849.37	Nine Lakh Thirteen Thousand Nine Hundred Seventy Five Rupees Only	913975
428	Plant / SP-01	Supply and planting of Guava Mexican (Variety) (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	220	4754.41	Ten Lakh Forty Five Thousand Nine Hundred Seventy Rupees Only	1045970

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
429	Plant / SP-02	Supply and planting of Fig (Variety) (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	160	4754.41	Seven Lakh Sixty Thousand Seven Hundred Six Rupees Only	760706
430	Plant / SP-03	Supply and planting of Jamun (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	180	4754.41	Eight Lakh Fifty Five Thousand Seven Hundred Ninety Four Rupees Only	855794

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
431	Plant / SP-04	Supply and planting of Papaya (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	160	4754.41	Seven Lakh Sixty Thousand Seven Hundred Six Rupees Only	760706
432	Plant / SP-05	Supply and planting of Grapes (Variety) (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	90	4754.41	Four Lakh Twenty Seven Thousand Eight Hundred Ninety Seven Rupees Only	427897

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
433	Plant / SP-06	Supply and planting of Spineless Ber (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	120	4754.41	Five Lakh Seventy Thousand Five Hundred Twenty Nine Rupees Only	570529
434	Plant / SP-07	Supply and planting of Shahtoot (Variety) (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	130	4754.41	Six Lakh Eighteen Thousand Seventy Three Rupees Only	618073

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
435	Plant / SP-08	Supply and planting of Imli (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	140	4229.41	Five Lakh Ninety Two Thousand One Hundred Seventeen Rupees Only	592117
436	Plant / SP-09	Supply and planting of Falsa (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	130	4754.41	Six Lakh Eighteen Thousand Seventy Three Rupees Only	618073

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
437	Plant / SP-10	Supply and planting of Lichi (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	130	5804.41	Seven Lakh Fifty Four Thousand Five Hundred Seventy Three Rupees Only	754573
438	Plant / SP-11	Supply and planting of Pear (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	120	4754.41	Five Lakh Seventy Thousand Five Hundred Twenty Nine Rupees Only	570529

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
439	Plant / SP-12	Supply and planting of Louqat (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	120	3704.41	Four Lakh Forty Four Thousand Five Hundred Twenty Nine Rupees Only	444529
440	Plant / SP-13	Supply and planting of Amaltas (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	180	3914.41	Seven Lakh Four Thousand Five Hundred Ninety Four Rupees Only	704594

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
441	Plant / SP-14	Supply and planting of Kachnar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	80	3809.41	Three Lakh Four Thousand Seven Hundred Fifty Three Rupees Only	304753
442	Plant / SP-15	Supply and planting of Tabebuia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	130	3809.41	Four Lakh Ninety Five Thousand Two Hundred Twenty Three Rupees Only	495223

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
443	Plant / SP-16	Supply and planting of Alastonia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	180	3809.41	Six Lakh Eighty Five Thousand Six Hundred Ninety Four Rupees Only	685694
444	Plant / SP-17	Supply and planting of Chinar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	150	3914.41	Five Lakh Eighty Seven Thousand One Hundred Sixty Two Rupees Only	587162

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
445	Plant / SP-18	Supply and planting of Sukh Chyn (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	155	3809.41	Five Lakh Ninety Thousand Four Hundred Fifty Nine Rupees Only	590459
446	Plant / SP-19	Supply and planting of Terminalia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3809.41	Seven Lakh Sixty One Thousand Eight Hundred Eighty Two Rupees Only	761882

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
447	Plant / SP-20	Supply and planting of Bakain (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3704.41	Seven Lakh Forty Thousand Eight Hundred Eighty Two Rupees Only	740882
448	Plant / SP-21	Supply and planting of Pilkan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	185	3914.41	Seven Lakh Twenty Four Thousand One Hundred Sixty Six Rupees Only	724166

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
449	Plant / SP-22	Supply and planting of Neem (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	160	4754.41	Seven Lakh Sixty Thousand Seven Hundred Six Rupees Only	760706
450	Plant / SP-34	Supply and planting of Osmanthus (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	160	1904.29	Three Lakh Four Thousand Six Hundred Eighty Six Rupees Only	304686

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
451	Plant / SP-35	Supply and planting of Franciscia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	160	486.79	Seventy Seven Thousand Eight Hundred Eighty Six Rupees Only	77886
452	Plant / SP-36	Supply and planting of Marwi (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	160	434.29	Sixty Nine Thousand Four Hundred Eighty Six Rupees Only	69486

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
453	Plant / SP-37	Supply and planting of Raat ki Rani (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	160	413.29	Sixty Six Thousand One Hundred Twenty Six Rupees Only	66126
454	Plant / SP-38	Supply and planting of Din ka Raja (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	160	413.29	Sixty Six Thousand One Hundred Twenty Six Rupees Only	66126

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
455	Plant / SP-39	Supply and planting of HaarSinghar (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	160	465.79	Seventy Four Thousand Five Hundred Twenty Six Rupees Only	74526
456	Plant / SP-40	Supply and planting of Lagerstroemia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	160	413.29	Sixty Six Thousand One Hundred Twenty Six Rupees Only	66126

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
457	Plant / SP-41	Supply and planting of Motiya (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	180	381.79	Sixty Eight Thousand Seven Hundred Twenty Two Rupees Only	68722
458	Plant / SP-43	Supply and planting of Tacoma Grocha (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	190	486.79	Ninety Two Thousand Four Hundred Ninety Rupees Only	92490

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
459	Plant / SP-46	Supply and planting of Dwarf Burning Bush (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	190	434.29	Eighty Two Thousand Five Hundred Fifteen Rupees Only	82515
460	COMP / CA-27	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	14	9765.51	One Lakh Thirty Six Thousand Seven Hundred Seventeen Rupees Only	136717

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
461	COMP / CA-28	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	14	9590.51	One Lakh Thirty Four Thousand Two Hundred Sixty Seven Rupees Only	134267
462	COMP / CA-15	Landscape establishment and maintenance for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	Kanal	886.20504801252	51000	Four Crore Fifty One Lakh Ninety Six Thousand Four Hundred Fifty Seven Rupees Only	45196457

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
463	NSI / LS-6	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the belt.	Sft	2111170.8339768	7.5	One Crore Fifty Eight Lakh Thirty Three Thousand Seven Hundred Eighty One Rupees Only	15833781
464	COMP / CA-25	Providing and laying buried HDPE watering main, 2 in dia, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	Rft	7540	433.61	Thirty Two Lakh Sixty Nine Thousand Four Hundred Nineteen Rupees Only	3269419

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
465	COMP / CA-24	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	Each	40	22849.37	Nine Lakh Thirteen Thousand Nine Hundred Seventy Five Rupees Only	913975
466	Plant / SP-13	Supply and planting of Amaltas (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3914.41	Seven Lakh Eighty Two Thousand Eight Hundred Eighty Two Rupees Only	782882

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
467	Plant / SP-20	Supply and planting of Bakain (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3704.41	Seven Lakh Forty Thousand Eight Hundred Eighty Two Rupees Only	740882
468	Plant / SP-15	Supply and planting of Tabebuia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3809.41	Seven Lakh Sixty One Thousand Eight Hundred Eighty Two Rupees Only	761882

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
469	Plant / SP-16	Supply and planting of Alastonia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3809.41	Seven Lakh Sixty One Thousand Eight Hundred Eighty Two Rupees Only	761882
470	Plant / SP-17	Supply and planting of Chinar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3914.41	Seven Lakh Eighty Two Thousand Eight Hundred Eighty Two Rupees Only	782882

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
471	Plant / SP-18	Supply and planting of Sukh Chyn (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3809.41	Seven Lakh Sixty One Thousand Eight Hundred Eighty Two Rupees Only	761882
472	Plant / SP-19	Supply and planting of Terminalia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3809.41	Seven Lakh Sixty One Thousand Eight Hundred Eighty Two Rupees Only	761882

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
473	Plant / SP-22	Supply and planting of Neem (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	150	4754.41	Seven Lakh Thirteen Thousand One Hundred Sixty Two Rupees Only	713162
474	Plant / SP-21	Supply and planting of Pilkan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	150	3914.41	Five Lakh Eighty Seven Thousand One Hundred Sixty Two Rupees Only	587162

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
475	Plant / SP-23	Supply and planting of Kurrajong (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	4019.41	Eight Lakh Three Thousand Eight Hundred Eighty Two Rupees Only	803882
476	Plant / SP-24	Supply and planting of Soap Berry/Reetha (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3809.41	Seven Lakh Sixty One Thousand Eight Hundred Eighty Two Rupees Only	761882

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
477	Plant / SP-25	Supply and planting of Weeping Willow (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3809.41	Seven Lakh Sixty One Thousand Eight Hundred Eighty Two Rupees Only	761882
478	Plant / SP-26	Supply and planting of Gul-e-Nishtar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	4019.41	Eight Lakh Three Thousand Eight Hundred Eighty Two Rupees Only	803882

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
479	Plant / SP-27	Supply and planting of Bottle Brush (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	200	3777.91	Seven Lakh Fifty Five Thousand Five Hundred Eighty Two Rupees Only	755582
480	Plant / SP-34	Supply and planting of Osmanthus (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	200	1904.29	Three Lakh Eighty Thousand Eight Hundred Fifty Eight Rupees Only	380858

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
481	Plant / SP-35	Supply and planting of Franciscia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	200	486.79	Ninety Seven Thousand Three Hundred Fifty Eight Rupees Only	97358
482	Plant / SP-36	Supply and planting of Marwi (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	200	434.29	Eighty Six Thousand Eight Hundred Fifty Eight Rupees Only	86858

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
483	Plant / SP-37	Supply and planting of Raat ki Rani (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	150	413.29	Sixty One Thousand Nine Hundred Ninety Four Rupees Only	61994
484	Plant / SP-38	Supply and planting of Din ka Raja (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	200	413.29	Eighty Two Thousand Six Hundred Fifty Eight Rupees Only	82658

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
485	Plant / SP-39	Supply and planting of HaarSinghar (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	150	465.79	Sixty Nine Thousand Eight Hundred Sixty Nine Rupees Only	69869
486	Plant / SP-40	Supply and planting of Lagerstroemia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	200	413.29	Eighty Two Thousand Six Hundred Fifty Eight Rupees Only	82658

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
487	Plant / SP-41	Supply and planting of Motiya (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	200	381.79	Seventy Six Thousand Three Hundred Fifty Eight Rupees Only	76358
488	Plant / SP-42	Supply and planting of Rose (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	300	527.74	One Lakh Fifty Eight Thousand Three Hundred Twenty Two Rupees Only	158322

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
489	Plant / SP-44	Supply and planting of Tacoma Stance (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	150	455.29	Sixty Eight Thousand Two Hundred Ninety Four Rupees Only	68294
490	Plant / SP-43	Supply and planting of Tacoma Grocha (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	150	486.79	Seventy Three Thousand Nineteen Rupees Only	73019

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
491	Plant / SP-46	Supply and planting of Dwarf Burning Bush (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	200	434.29	Eighty Six Thousand Eight Hundred Fifty Eight Rupees Only	86858
492	COMP / CA-27	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	14	9765.51	One Lakh Thirty Six Thousand Seven Hundred Seventeen Rupees Only	136717

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
493	COMP / CA-28	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	14	9590.51	One Lakh Thirty Four Thousand Two Hundred Sixty Seven Rupees Only	134267
494	COMP / CA-15	Landscape establishment and maintenance for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	Kanal	1163.1795228523	51000	Five Crore Ninety Three Lakh Twenty Two Thousand One Hundred Fifty Six Rupees Only	59322156

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
495	NSI / LS-6	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the belt.	Sft	980170.83397683	7.5	Seventy Three Lakh Fifty One Thousand Two Hundred Eighty One Rupees Only	7351281
496	COMP / CA-25	Providing and laying buried HDPE watering main, 2 in dia, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	Rft	7540	433.61	Thirty Two Lakh Sixty Nine Thousand Four Hundred Nineteen Rupees Only	3269419

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
497	COMP / CA-24	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	Each	40	22849.37	Nine Lakh Thirteen Thousand Nine Hundred Seventy Five Rupees Only	913975
498	Plant / SP-13	Supply and planting of Amaltas (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	3914.41	Three Lakh Ninety One Thousand Four Hundred Forty One Rupees Only	391441

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
499	Plant / SP-20	Supply and planting of Bakain (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	3704.41	Three Lakh Seventy Thousand Four Hundred Forty One Rupees Only	370441
500	Plant / SP-28	Supply and planting of Putanjiva (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	4019.41	Four Lakh One Thousand Nine Hundred Forty One Rupees Only	401941

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
501	Plant / SP-16	Supply and planting of Alastonia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	3809.41	Three Lakh Eighty Thousand Nine Hundred Forty One Rupees Only	380941
502	Plant / SP-17	Supply and planting of Chinar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	3914.41	Three Lakh Ninety One Thousand Four Hundred Forty One Rupees Only	391441

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
503	Plant / SP-29	Supply and planting of Chestnut Tree/Shah Baloot (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	3977.41	Three Lakh Ninety Seven Thousand Seven Hundred Forty One Rupees Only	397741
504	Plant / SP-19	Supply and planting of Terminalia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	3809.41	Three Lakh Eighty Thousand Nine Hundred Forty One Rupees Only	380941

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
505	Plant / SP-22	Supply and planting of Neem (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	4754.41	Four Lakh Seventy Five Thousand Four Hundred Forty One Rupees Only	475441
506	Plant / SP-21	Supply and planting of Pilkan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	3914.41	Three Lakh Ninety One Thousand Four Hundred Forty One Rupees Only	391441

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
507	Plant / SP-30	Supply and planting of Sapium (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	3284.41	Three Lakh Twenty Eight Thousand Four Hundred Forty One Rupees Only	328441
508	Plant / SP-24	Supply and planting of Soap Berry/Reetha (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	3809.41	Three Lakh Eighty Thousand Nine Hundred Forty One Rupees Only	380941

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
509	Plant / SP-31	Supply and planting of Katsagan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	4754.41	Four Lakh Seventy Five Thousand Four Hundred Forty One Rupees Only	475441
510	Plant / SP-26	Supply and planting of Gul-e-Nishtar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	4019.41	Four Lakh One Thousand Nine Hundred Forty One Rupees Only	401941

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
511	Plant / SP-32	Supply and planting of Amla (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	100	4019.41	Four Lakh One Thousand Nine Hundred Forty One Rupees Only	401941
512	Plant / SP-34	Supply and planting of Osmanthus (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	1904.29	One Lakh Ninety Thousand Four Hundred Twenty Nine Rupees Only	190429

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
513	Plant / SP-35	Supply and planting of Franciscia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	486.79	Forty Eight Thousand Six Hundred Seventy Nine Rupees Only	48679
514	Plant / SP-36	Supply and planting of Marwi (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	434.29	Forty Three Thousand Four Hundred Twenty Nine Rupees Only	43429

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
515	Plant / SP-37	Supply and planting of Raat ki Rani (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	413.29	Forty One Thousand Three Hundred Twenty Nine Rupees Only	41329
516	Plant / SP-38	Supply and planting of Din ka Raja (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	413.29	Forty One Thousand Three Hundred Twenty Nine Rupees Only	41329

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
517	Plant / SP-39	Supply and planting of HaarSinghar (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	465.79	Forty Six Thousand Five Hundred Seventy Nine Rupees Only	46579
518	Plant / SP-40	Supply and planting of Lagerstroemia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	413.29	Forty One Thousand Three Hundred Twenty Nine Rupees Only	41329

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
519	Plant / SP-41	Supply and planting of Motiya (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	381.79	Thirty Eight Thousand One Hundred Seventy Nine Rupees Only	38179
520	Plant / SP-42	Supply and planting of Rose (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	527.74	Fifty Two Thousand Seven Hundred Seventy Four Rupees Only	52774

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
521	Plant / SP-44	Supply and planting of Tacoma Stance (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	455.29	Forty Five Thousand Five Hundred Twenty Nine Rupees Only	45529
522	Plant / SP-43	Supply and planting of Tacoma Grocha (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	486.79	Forty Eight Thousand Six Hundred Seventy Nine Rupees Only	48679

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
523	Plant / SP-46	Supply and planting of Dwarf Burning Bush (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	434.29	Forty Three Thousand Four Hundred Twenty Nine Rupees Only	43429
524	Plant / SP-47	Supply and planting of MorPunkh (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	100	434.29	Forty Three Thousand Four Hundred Twenty Nine Rupees Only	43429

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
525	COMP / CA-27	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	14	9765.51	One Lakh Thirty Six Thousand Seven Hundred Seventeen Rupees Only	136717
526	COMP / CA-28	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	14	9590.51	One Lakh Thirty Four Thousand Two Hundred Sixty Seven Rupees Only	134267

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
527	COMP / CA-15	Landscape establishment and maintenance for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	Kanal	540.03902698448	51000	Two Crore Seventy Five Lakh Forty One Thousand Nine Hundred Ninety Rupees Only	27541990
528	NSI / LS-6	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the belt.	Sft	257064.13513514	7.5	Nineteen Lakh Twenty Seven Thousand Nine Hundred Eighty One Rupees Only	1927981

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
529	COMP / CA-25	Providing and laying buried HDPE watering main, 2 in dia, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	Rft	910	433.61	Three Lakh Ninety Four Thousand Five Hundred Eighty Five Rupees Only	394585
530	COMP / CA-24	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	Each	6	22849.37	One Lakh Thirty Seven Thousand Ninety Six Rupees Only	137096

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
531	Plant / SP-13	Supply and planting of Amaltas (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	3914.41	Forty Six Thousand Nine Hundred Seventy Three Rupees Only	46973
532	Plant / SP-20	Supply and planting of Bakain (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	3704.41	Forty Four Thousand Four Hundred Fifty Three Rupees Only	44453

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
533	Plant / SP-15	Supply and planting of Tabebuia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	3809.41	Forty Five Thousand Seven Hundred Thirteen Rupees Only	45713
534	Plant / SP-16	Supply and planting of Alastonia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	3809.41	Forty Five Thousand Seven Hundred Thirteen Rupees Only	45713
535	Plant / SP-17	Supply and planting of Chinar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	3914.41	Forty Six Thousand Nine Hundred Seventy Three Rupees Only	46973

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
536	Plant / SP-18	Supply and planting of Sukh Chyn (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	3809.41	Forty Five Thousand Seven Hundred Thirteen Rupees Only	45713
537	Plant / SP-19	Supply and planting of Terminalia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	3809.41	Forty Five Thousand Seven Hundred Thirteen Rupees Only	45713
538	Plant / SP-22	Supply and planting of Neem (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	9	4754.41	Forty Two Thousand Seven Hundred Ninety Rupees Only	42790

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
539	Plant / SP-21	Supply and planting of Pilkan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	9	3914.41	Thirty Five Thousand Two Hundred Thirty Rupees Only	35230
540	Plant / SP-23	Supply and planting of Kurrajong (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	4019.41	Forty Eight Thousand Two Hundred Thirty Three Rupees Only	48233

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
541	Plant / SP-24	Supply and planting of Soap Berry/Reetha (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	3809.41	Forty Five Thousand Seven Hundred Thirteen Rupees Only	45713
542	Plant / SP-25	Supply and planting of Weeping Willow (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	3809.41	Forty Five Thousand Seven Hundred Thirteen Rupees Only	45713

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
543	Plant / SP-26	Supply and planting of Gul-e-Nishtar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	4019.41	Forty Eight Thousand Two Hundred Thirty Three Rupees Only	48233
544	Plant / SP-27	Supply and planting of Bottle Brush (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	12	3777.91	Forty Five Thousand Three Hundred Thirty Five Rupees Only	45335

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
545	Plant / SP-34	Supply and planting of Osmanthus (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	12	1904.29	Twenty Two Thousand Eight Hundred Fifty One Rupees Only	22851
546	Plant / SP-35	Supply and planting of Franciscia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	12	486.79	Five Thousand Eight Hundred Forty One Rupees Only	5841
547	Plant / SP-36	Supply and planting of Marwi (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	12	434.29	Five Thousand Two Hundred Eleven Rupees Only	5211

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
548	Plant / SP-37	Supply and planting of Raat ki Rani (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	9	413.29	Three Thousand Seven Hundred Twenty Rupees Only	3720
549	Plant / SP-38	Supply and planting of Din ka Raja (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	12	413.29	Four Thousand Nine Hundred Fifty Nine Rupees Only	4959
550	Plant / SP-39	Supply and planting of HaarSinghar (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	9	465.79	Four Thousand One Hundred Ninety Two Rupees Only	4192

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
551	Plant / SP-40	Supply and planting of Lagerstroemia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	12	413.29	Four Thousand Nine Hundred Fifty Nine Rupees Only	4959
552	Plant / SP-41	Supply and planting of Motiya (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	12	381.79	Four Thousand Five Hundred Eighty One Rupees Only	4581

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
553	Plant / SP-42	Supply and planting of Rose (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	18	527.74	Nine Thousand Four Hundred Ninety Nine Rupees Only	9499
554	Plant / SP-44	Supply and planting of Tacoma Stance (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	9	455.29	Four Thousand Ninety Eight Rupees Only	4098

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
555	Plant / SP-43	Supply and planting of Tacoma Grocha (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	9	486.79	Four Thousand Three Hundred Eighty One Rupees Only	4381
556	Plant / SP-46	Supply and planting of Dwarf Burning Bush (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	12	434.29	Five Thousand Two Hundred Eleven Rupees Only	5211

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
557	COMP / CA-27	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	2	9765.51	Nineteen Thousand Five Hundred Thirty One Rupees Only	19531
558	COMP / CA-28	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	2	9590.51	Nineteen Thousand One Hundred Eighty One Rupees Only	19181

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
559	COMP / CA-15	Landscape establishment and maintenance for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	Kanal	141.63313230586	51000	Seventy Two Lakh Twenty Three Thousand Two Hundred Ninety Rupees Only	7223290
560	NSI / LS-6	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the belt.	Sft	968756.36293436	7.5	Seventy Two Lakh Sixty Five Thousand Six Hundred Seventy Three Rupees Only	7265673

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
561	COMP / CA-25	Providing and laying buried HDPE watering main, 2 in dia, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	Rft	10140	433.61	Forty Three Lakh Ninety Six Thousand Eight Hundred Five Rupees Only	4396805
562	COMP / CA-24	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	Each	52	22849.37	Eleven Lakh Eighty Eight Thousand One Hundred Sixty Seven Rupees Only	1188167

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
563	Plant / SP-13	Supply and planting of Amaltas (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	3914.41	Five Lakh Twenty Four Thousand Five Hundred Thirty One Rupees Only	524531
564	Plant / SP-20	Supply and planting of Bakain (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	3704.41	Four Lakh Ninety Six Thousand Three Hundred Ninety One Rupees Only	496391

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
565	Plant / SP-15	Supply and planting of Tabebuia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	3809.41	Five Lakh Ten Thousand Four Hundred Sixty One Rupees Only	510461
566	Plant / SP-16	Supply and planting of Alastonia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	3809.41	Five Lakh Ten Thousand Four Hundred Sixty One Rupees Only	510461

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
567	Plant / SP-17	Supply and planting of Chinar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	3914.41	Five Lakh Twenty Four Thousand Five Hundred Thirty One Rupees Only	524531
568	Plant / SP-18	Supply and planting of Sukh Chyn (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	3809.41	Five Lakh Ten Thousand Four Hundred Sixty One Rupees Only	510461

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
569	Plant / SP-19	Supply and planting of Terminalia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	3809.41	Five Lakh Ten Thousand Four Hundred Sixty One Rupees Only	510461
570	Plant / SP-22	Supply and planting of Neem (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	101	4754.41	Four Lakh Eighty Thousand One Hundred Ninety Five Rupees Only	480195

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
571	Plant / SP-21	Supply and planting of Pilkan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	101	3914.41	Three Lakh Ninety Five Thousand Three Hundred Fifty Five Rupees Only	395355
572	Plant / SP-23	Supply and planting of Kurrajong (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	4019.41	Five Lakh Thirty Eight Thousand Six Hundred One Rupees Only	538601

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
573	Plant / SP-24	Supply and planting of Soap Berry/Reetha (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	3809.41	Five Lakh Ten Thousand Four Hundred Sixty One Rupees Only	510461
574	Plant / SP-25	Supply and planting of Weeping Willow (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	3809.41	Five Lakh Ten Thousand Four Hundred Sixty One Rupees Only	510461

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
575	Plant / SP-26	Supply and planting of Gul-e-Nishtar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	4019.41	Five Lakh Thirty Eight Thousand Six Hundred One Rupees Only	538601
576	Plant / SP-27	Supply and planting of Bottle Brush (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	No.	134	3777.91	Five Lakh Six Thousand Two Hundred Forty Rupees Only	506240

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
577	Plant / SP-34	Supply and planting of Osmanthus (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	134	1904.29	Two Lakh Fifty Five Thousand One Hundred Seventy Five Rupees Only	255175
578	Plant / SP-35	Supply and planting of Franciscia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	134	486.79	Sixty Five Thousand Two Hundred Thirty Rupees Only	65230

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
579	Plant / SP-36	Supply and planting of Marwi (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	134	434.29	Fifty Eight Thousand One Hundred Ninety Five Rupees Only	58195
580	Plant / SP-37	Supply and planting of Raat ki Rani (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	101	413.29	Forty One Thousand Seven Hundred Forty Two Rupees Only	41742

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
581	Plant / SP-38	Supply and planting of Din ka Raja (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	134	413.29	Fifty Five Thousand Three Hundred Eighty One Rupees Only	55381
582	Plant / SP-39	Supply and planting of HaarSinghar (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	101	465.79	Forty Seven Thousand Forty Five Rupees Only	47045

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
583	Plant / SP-40	Supply and planting of Lagerstroemia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	134	413.29	Fifty Five Thousand Three Hundred Eighty One Rupees Only	55381
584	Plant / SP-41	Supply and planting of Motiya (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	134	381.79	Fifty One Thousand One Hundred Sixty Rupees Only	51160

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
585	Plant / SP-42	Supply and planting of Rose (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	202	527.74	One Lakh Six Thousand Six Hundred Three Rupees Only	106603
586	Plant / SP-44	Supply and planting of Tacoma Stance (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	101	455.29	Forty Five Thousand Nine Hundred Eighty Four Rupees Only	45984

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
587	Plant / SP-43	Supply and planting of Tacoma Grocha (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	101	486.79	Forty Nine Thousand One Hundred Sixty Six Rupees Only	49166
588	Plant / SP-46	Supply and planting of Dwarf Burning Bush (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	No.	134	434.29	Fifty Eight Thousand One Hundred Ninety Five Rupees Only	58195

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
589	COMP / CA-27	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	19	9765.51	One Lakh Eighty Five Thousand Five Hundred Forty Five Rupees Only	185545
590	COMP / CA-28	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	19	9590.51	One Lakh Eighty Two Thousand Two Hundred Twenty Rupees Only	182220

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
591	COMP / CA-15	Landscape establishment and maintenance for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	Kanal	533.75006222279	51000	Two Crore Seventy Two Lakh Twenty One Thousand Two Hundred Fifty Three Rupees Only	27221253
592	NSI / LS-6	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the park.	Sft	178887.78921493	7.5	Thirteen Lakh Forty One Thousand Six Hundred Fifty Eight Rupees Only	1341658

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
593	COMP / CA-14	Turfing with Dhaka grass over 70% of the net soft-landscape area of the park.	Sft	125221.45245045	36	Forty Five Lakh Seven Thousand Nine Hundred Seventy Two Rupees Only	4507972
594	COMP / CA-25	Providing and laying buried HDPE watering main, 2 in dia, around the park, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	Rft	2328.1102473498	433.61	Ten Lakh Nine Thousand Four Hundred Ninety Two Rupees Only	1009492

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
595	COMP / CA-24	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	Each	7	22849.37	One Lakh Fifty Nine Thousand Nine Hundred Forty Six Rupees Only	159946
596	Plant / PK-MIX-T	Supply and planting of trees - mix of the 15 tree species on the Client park list in equal numbers (perimeter row and lawn trees).	No.	123	3922.81	Four Lakh Eighty Two Thousand Five Hundred Six Rupees Only	482506

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
597	Plant / PK-MIX-S	Supply and planting of shrubs / bushes - mix of the 12 shrub species on the Client park list in equal numbers (borders).	No.	1003	563.7	Five Lakh Sixty Five Thousand Three Hundred Ninety One Rupees Only	565391
598	COMP / CA-27	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	6	9765.51	Fifty Eight Thousand Five Hundred Ninety Three Rupees Only	58593

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
599	COMP / CA-28	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	6	9590.51	Fifty Seven Thousand Five Hundred Forty Three Rupees Only	57543
600	COMP / CA-15	Landscape establishment and maintenance of the park for three years - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	Kanal	98.560765407677	51000	Fifty Lakh Twenty Six Thousand Five Hundred Ninety Nine Rupees Only	5026599

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
601	NSI / LS-6	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the park.	Sft	270163.29710145	7.5	Twenty Lakh Twenty Six Thousand Two Hundred Twenty Five Rupees Only	2026225
602	COMP / CA-14	Turfing with Dhaka grass over 70% of the net soft-landscape area of the park.	Sft	189114.30797101	36	Sixty Eight Lakh Eight Thousand One Hundred Fifteen Rupees Only	6808115

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
603	COMP / CA-25	Providing and laying buried HDPE watering main, 2 in dia, around the park, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	Rft	2803.2	433.61	Twelve Lakh Fifteen Thousand Four Hundred Ninety Six Rupees Only	1215496
604	COMP / CA-24	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	Each	8	22849.37	One Lakh Eighty Two Thousand Seven Hundred Ninety Five Rupees Only	182795

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
605	Plant / PK-MIX-T	Supply and planting of trees - mix of the 15 tree species on the Client park list in equal numbers (perimeter row and lawn trees).	No.	162	3922.81	Six Lakh Thirty Five Thousand Four Hundred Ninety Five Rupees Only	635495
606	Plant / PK-MIX-S	Supply and planting of shrubs / bushes - mix of the 12 shrub species on the Client park list in equal numbers (borders).	No.	1341	563.7	Seven Lakh Fifty Five Thousand Nine Hundred Twenty Two Rupees Only	755922

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
607	COMP / CA-27	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	6	9765.51	Fifty Eight Thousand Five Hundred Ninety Three Rupees Only	58593
608	COMP / CA-28	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	Each	6	9590.51	Fifty Seven Thousand Five Hundred Forty Three Rupees Only	57543

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
609	COMP / CA-15	Landscape establishment and maintenance of the park for three years - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	Kanal	148.85030143331	51000	Seventy Five Lakh Ninety One Thousand Three Hundred Sixty Five Rupees Only	7591365
610	NSI / LS-6	Supply and spreading of sweet earth (imported fertile topsoil), 1'-0" thick, over the prepared formation of all central medians and roadside green strips.	Sft	1249978	7.5	Ninety Three Lakh Seventy Four Thousand Eight Hundred Thirty Five Rupees Only	9374835

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
611	COMP / CA-14	Turfing with Dhaka grass over 70% of the median and roadside soft area, including levelling, dressing, laying, rolling, first watering and maintenance until established.	Sft	874984.6	36	Three Crore Fourteen Lakh Ninety Nine Thousand Four Hundred Forty Six Rupees Only	31499446

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
612	COMP / CA-15	Landscape establishment and maintenance of the road central medians and roadside green strips for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	Kanal	688.69311294766	51000	Three Crore Fifty One Lakh Twenty Three Thousand Three Hundred Forty Nine Rupees Only	35123349
613	Plant / Q-T32	Supply and planting of AMALTAS (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	410	3914.41	Sixteen Lakh Four Thousand Nine Hundred Eight Rupees Only	1604908

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
614	Plant / Q-S01	Supply and planting of HAMELIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	324	434.29	One Lakh Forty Thousand Seven Hundred Ten Rupees Only	140710
615	Plant / Q-S02	Supply and planting of MARWA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	1228	434.29	Five Lakh Thirty Three Thousand Three Hundred Eight Rupees Only	533308

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
616	Plant / Q-S03	Supply and planting of ICE BERG (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	1228	486.79	Five Lakh Ninety Seven Thousand Seven Hundred Seventy Eight Rupees Only	597778
617	Plant / Q-S04	Supply and planting of HABISCUS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	275	413.29	One Lakh Thirteen Thousand Six Hundred Fifty Five Rupees Only	113655

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
618	Plant / Q-S05	Supply and planting of RAAT KI RANI (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	275	413.29	One Lakh Thirteen Thousand Six Hundred Fifty Five Rupees Only	113655
619	Plant / Q-S06	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	275	413.29	One Lakh Thirteen Thousand Six Hundred Fifty Five Rupees Only	113655

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
620	Plant / Q-T33	Supply and planting of KURRAJONG (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	269	4019.41	Ten Lakh Eighty One Thousand Two Hundred Twenty One Rupees Only	1081221
621	Plant / Q-S07	Supply and planting of POTATO TREE (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	215	591.79	One Lakh Twenty Seven Thousand Two Hundred Thirty Five Rupees Only	127235

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
622	Plant / Q-S08	Supply and planting of VINCA MINOR (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	1600	486.79	Seven Lakh Seventy Eight Thousand Eight Hundred Sixty Four Rupees Only	778864
623	Plant / Q-S09	Supply and planting of EUPHORBIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	1600	402.79	Six Lakh Forty Four Thousand Four Hundred Sixty Four Rupees Only	644464

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
624	Plant / Q-S10	Supply and planting of DIN KA RAJA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	90	413.29	Thirty Seven Thousand One Hundred Ninety Six Rupees Only	37196
625	Plant / Q-S11	Supply and planting of TECOMA GROCHA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	90	486.79	Forty Three Thousand Eight Hundred Eleven Rupees Only	43811

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
626	Plant / Q-S13	Supply and planting of BURNING BUSH (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	90	434.29	Thirty Nine Thousand Eighty Six Rupees Only	39086
627	Plant / Q-T34	Supply and planting of Chinar (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	268	3914.41	Ten Lakh Forty Nine Thousand Sixty Two Rupees Only	1049062

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
628	Plant / Q-S04	Supply and planting of HABISCUS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	90	413.29	Thirty Seven Thousand One Hundred Ninety Six Rupees Only	37196
629	Plant / Q-S06	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	90	413.29	Thirty Seven Thousand One Hundred Ninety Six Rupees Only	37196

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
630	Plant / Q-S14	Supply and planting of CASSIA GALAUCA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	215	434.29	Ninety Three Thousand Three Hundred Seventy Two Rupees Only	93372
631	Plant / Q-S15	Supply and planting of DESI GULAB (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	1200	392.29	Four Lakh Seventy Thousand Seven Hundred Forty Eight Rupees Only	470748

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
632	Plant / Q-S16	Supply and planting of MOTIYA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	1200	381.79	Four Lakh Fifty Eight Thousand One Hundred Forty Eight Rupees Only	458148
633	Plant / Q-S17	Supply and planting of HARSINGHAR (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	90	465.79	Forty One Thousand Nine Hundred Twenty One Rupees Only	41921

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
634	Plant / Q-T35	Supply and planting of Pine (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	125	4229.41	Five Lakh Twenty Eight Thousand Six Hundred Seventy Six Rupees Only	528676
635	Plant / Q-S03	Supply and planting of ICE BERG (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	200	486.79	Ninety Seven Thousand Three Hundred Fifty Eight Rupees Only	97358

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
636	Plant / Q-S06	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	65	413.29	Twenty Six Thousand Eight Hundred Sixty Four Rupees Only	26864
637	Plant / Q-S10	Supply and planting of DIN KA RAJA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	65	413.29	Twenty Six Thousand Eight Hundred Sixty Four Rupees Only	26864

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
638	Plant / Q-S18	Supply and planting of ARIZONA CYPRUS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	125	539.29	Sixty Seven Thousand Four Hundred Eleven Rupees Only	67411
639	Plant / Q-S19	Supply and planting of DAY LILLY (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	200	434.29	Eighty Six Thousand Eight Hundred Fifty Eight Rupees Only	86858

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
640	Plant / Q-T36	Supply and planting of BRACHYCHITON FLAME TREE (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	288	4754.41	Thirteen Lakh Sixty Nine Thousand Two Hundred Seventy Rupees Only	1369270
641	Plant / Q-S12	Supply and planting of TECOMA STANS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	72	455.29	Thirty Two Thousand Seven Hundred Eighty One Rupees Only	32781

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
642	Plant / Q-S17	Supply and planting of HARSINGHAR (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	144	465.79	Sixty Seven Thousand Seventy Four Rupees Only	67074
643	Plant / Q-S20	Supply and planting of JATROPHA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	72	434.29	Thirty One Thousand Two Hundred Sixty Nine Rupees Only	31269

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
644	Plant / Q-S21	Supply and planting of PLUMBAGO AURICULATA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	72	539.29	Thirty Eight Thousand Eight Hundred Twenty Nine Rupees Only	38829
645	Plant / Q-T37	Supply and planting of TERMINALIA (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	430	3809.41	Sixteen Lakh Thirty Eight Thousand Forty Six Rupees Only	1638046

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
646	Plant / Q-S05	Supply and planting of RAAT KI RANI (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	110	413.29	Forty Five Thousand Four Hundred Sixty Two Rupees Only	45462
647	Plant / Q-S13	Supply and planting of BURNING BUSH (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	110	434.29	Forty Seven Thousand Seven Hundred Seventy Two Rupees Only	47772

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
648	Plant / Q-S22	Supply and planting of PITTOSPORUM (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	250	486.79	One Lakh Twenty One Thousand Six Hundred Ninety Eight Rupees Only	121698
649	Plant / Q-S23	Supply and planting of BRUNFELSIA Punsilora (Franciscia) (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	250	486.79	One Lakh Twenty One Thousand Six Hundred Ninety Eight Rupees Only	121698

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
650	Plant / Q-T07	Supply and planting of Erithrina Subrosa/Gul-e- Nishtar (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	184	4019.41	Seven Lakh Thirty Nine Thousand Five Hundred Seventy One Rupees Only	739571
651	Plant / Q-S02	Supply and planting of MARWA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	103	434.29	Forty Four Thousand Seven Hundred Thirty Two Rupees Only	44732

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
652	Plant / Q-S05	Supply and planting of RAAT KI RANI (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	50	413.29	Twenty Thousand Six Hundred Sixty Five Rupees Only	20665
653	Plant / Q-S11	Supply and planting of TECOMA GROCHA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	50	486.79	Twenty Four Thousand Three Hundred Forty Rupees Only	24340

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
654	Plant / Q-S23	Supply and planting of BRUNFELSIA Punsilora (Franciscia) (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	103	486.79	Fifty Thousand One Hundred Thirty Nine Rupees Only	50139
655	Plant / Q-T38	Supply and planting of KACHNAR (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	287	3809.41	Ten Lakh Ninety Three Thousand Three Hundred One Rupees Only	1093301

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
656	Plant / Q-S02	Supply and planting of MARWA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	96	434.29	Forty One Thousand Six Hundred Ninety Two Rupees Only	41692
657	Plant / Q-S04	Supply and planting of HABISCUS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	96	413.29	Thirty Nine Thousand Six Hundred Seventy Six Rupees Only	39676

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
658	Plant / Q-S06	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	287	413.29	One Lakh Eighteen Thousand Six Hundred Fourteen Rupees Only	118614
659	Plant / Q-S13	Supply and planting of BURNING BUSH (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	96	434.29	Forty One Thousand Six Hundred Ninety Two Rupees Only	41692

PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
660	Plant / Q-S15	Supply and planting of DESI GULAB (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	1200	392.29	Four Lakh Seventy Thousand Seven Hundred Forty Eight Rupees Only	470748
661	Plant / Q-S24	Supply and planting of MORPUNKH (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	1200	434.29	Five Lakh Twenty One Thousand One Hundred Forty Eight Rupees Only	521148

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
662	Plant / Q-T39	Supply and planting of ALSTONIA (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	120	3809.41	Four Lakh Fifty Seven Thousand One Hundred Twenty Nine Rupees Only	457129
663	Plant / Q-T40	Supply and planting of FIDDLEWOOD (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	96	4439.41	Four Lakh Twenty Six Thousand One Hundred Eighty Three Rupees Only	426183

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
664	Plant / Q-S05	Supply and planting of RAAT KI RANI (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	60	413.29	Twenty Four Thousand Seven Hundred Ninety Seven Rupees Only	24797
665	Plant / Q-S06	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	60	413.29	Twenty Four Thousand Seven Hundred Ninety Seven Rupees Only	24797

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
666	Plant / Q-S16	Supply and planting of MOTIYA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	700	381.79	Two Lakh Sixty Seven Thousand Two Hundred Fifty Three Rupees Only	267253
667	Plant / Q-S08	Supply and planting of VINCA MINOR (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	700	486.79	Three Lakh Forty Thousand Seven Hundred Fifty Three Rupees Only	340753

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
668	Plant / Q-S25	Supply and planting of MELALEUCA (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	82	3305.41	Two Lakh Seventy One Thousand Forty Four Rupees Only	271044
669	Plant / Q-T41	Supply and planting of Bakain (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	102	3704.41	Three Lakh Seventy Seven Thousand Eight Hundred Fifty Rupees Only	377850

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
670	Plant / Q-S10	Supply and planting of DIN KA RAJA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	52	413.29	Twenty One Thousand Four Hundred Ninety One Rupees Only	21491
671	Plant / Q-S26	Supply and planting of ROSE (MULTICOLOR) (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	916	527.74	Four Lakh Eighty Three Thousand Four Hundred Ten Rupees Only	483410

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
672	Plant / Q-S27	Supply and planting of VITEX (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	52	486.79	Twenty Five Thousand Three Hundred Thirteen Rupees Only	25313
673	Plant / Q-S28	Supply and planting of SAPIUM (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	No.	164	3284.41	Five Lakh Thirty Eight Thousand Six Hundred Forty Three Rupees Only	538643

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
674	Plant / Q-S05	Supply and planting of RAAT KI RANI (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	35	413.29	Fourteen Thousand Four Hundred Sixty Five Rupees Only	14465
675	Plant / Q-S06	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	42	413.29	Seventeen Thousand Three Hundred Fifty Eight Rupees Only	17358

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
676	Plant / Q-S10	Supply and planting of DIN KA RAJA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	42	413.29	Seventeen Thousand Three Hundred Fifty Eight Rupees Only	17358
677	Plant / Q-S12	Supply and planting of TECOMA STANS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	No.	35	455.29	Fifteen Thousand Nine Hundred Thirty Five Rupees Only	15935

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
678	NSI / LS-6	Supply and spreading of sweet earth (imported fertile topsoil), 1'-0" thick, over the prepared sub-grade of the channel-side green buffer strip.	Sft	108000	7.5	Eight Lakh Ten Thousand Rupees Only	810000
679	COMP / CA-14	Turfing with Dhaka grass over the prepared bed of the channel-side green buffer, including levelling, dressing, laying, rolling and watering until established - 70% of the buffer area.	Sft	75600	36	Twenty Seven Lakh Twenty One Thousand Six Hundred Rupees Only	2721600

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
680	COMP / CA-26	Supply and planting of shade trees along the buffer strip at 30 ft centres on each bank, complete with pit excavation, sweet-earth and manure backfill, stake and guard, initial watering and first-season care.	Each	226	4603.01	Ten Lakh Forty Thousand Two Hundred Eighty Rupees Only	1040280
681	COMP / CA-25	Providing and laying buried HDPE watering main, 2" dia, along each bank, including trenching, bedding, specials, thrust blocks, backfilling and testing, complete.	Rft	9000	433.61	Thirty Nine Lakh Two Thousand Four Hundred Ninety Rupees Only	3902490

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
682	COMP / CA-24	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main, complete.	Each	30	22849.37	Six Lakh Eighty Five Thousand Four Hundred Eighty One Rupees Only	685481
683	COMP / CA-15	Landscape establishment and maintenance of the channel-side green buffer for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	Kanal	59.504132231405	51000	Thirty Lakh Thirty Four Thousand Seven Hundred Eleven Rupees Only	3034711

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
684	NSI / LS-6	Supply and spreading of sweet earth (imported fertile topsoil), 1'-0" thick, over the prepared sub-grade of the channel-side green buffer strip.	Sft	96000	7.5	Seven Lakh Twenty Thousand Rupees Only	720000
685	COMP / CA-14	Turfing with Dhaka grass over the prepared bed of the channel-side green buffer, including levelling, dressing, laying, rolling and watering until established - 70% of the buffer area.	Sft	67200	36	Twenty Four Lakh Nineteen Thousand Two Hundred Rupees Only	2419200

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
686	COMP / CA-26	Supply and planting of shade trees along the buffer strip at 30 ft centres on each bank, complete with pit excavation, sweet-earth and manure backfill, stake and guard, initial watering and first-season care.	Each	200	4603.01	Nine Lakh Twenty Thousand Six Hundred Two Rupees Only	920602
687	COMP / CA-25	Providing and laying buried HDPE watering main, 2" dia, along each bank, including trenching, bedding, specials, thrust blocks, backfilling and testing, complete.	Rft	8000	433.61	Thirty Four Lakh Sixty Eight Thousand Eight Hundred Eighty Rupees Only	3468880

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
688	COMP / CA-24	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main, complete.	Each	28	22849.37	Six Lakh Thirty Nine Thousand Seven Hundred Eighty Two Rupees Only	639782
689	COMP / CA-15	Landscape establishment and maintenance of the channel-side green buffer for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	Kanal	52.892561983471	51000	Twenty Six Lakh Ninety Seven Thousand Five Hundred Twenty One Rupees Only	2697521

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
690	COMP / CA-7	Providing and laying 2 in EPDM / rubber safety tiles to ASTM F1292 over 4 in P.C.C. base with kerb edge restraint, to the children's play area (100 ft x 50 ft).	Sft	5000	1134.27	Fifty Six Lakh Seventy One Thousand Three Hundred Fifty Rupees Only	5671350
691	COMP / CA-7	Providing and laying 2 in EPDM / rubber safety tiles over 4 in P.C.C. base to the open-air gym area (70 ft square).	Sft	4900	1134.27	Fifty Five Lakh Fifty Seven Thousand Nine Hundred Twenty Three Rupees Only	5557923

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
692	COMP / CA-11	Supply and installation of children's multi-play structure (tower, slide, climbing net and swings), complete with foundations.	Set	1	1330929.71	Thirteen Lakh Thirty Thousand Nine Hundred Thirty Rupees Only	1330930
693	COMP / CA-12	Supply and installation of outdoor open-air gym equipment station, galvanised / powder coated, complete with foundations.	Each	6	198115.4	Eleven Lakh Eighty Eight Thousand Six Hundred Ninety Two Rupees Only	1188692

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
694	COMP / CA-1	Supply, fabrication and erection of gazebo 19 ft x 19 ft, 14 ft clear height, complete as specified for the green-belt gazebos.	Each	1	1237233.88	Twelve Lakh Thirty Seven Thousand Two Hundred Thirty Four Rupees Only	1237234
695	COMP / CA-4	Supply and fixing of park bench with recycled plastic (HDPE) lumber slats on galvanised M.S. frame.	Each	44	65340.4	Twenty Eight Lakh Seventy Four Thousand Nine Hundred Seventy Eight Rupees Only	2874978

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
696	COMP / CA-5	Supply and fixing of 60-litre waste bin.	Each	22	17720.2	Three Lakh Eighty Nine Thousand Eight Hundred Forty Four Rupees Only	389844
697	MKT / SL-2	Solar flood light 2 x 60 W LED (two on each pole) on a hot-dip galvanized pole 4-6 m high, complete as specified - rest areas.	Each	28	450000	One Crore Twenty Six Lakh Rupees Only	12600000
698	MKT / SL-3	Solar post-top light 30-40 W LED on a hot-dip galvanized pole 3-4 m high, complete as specified - walkways.	Each	122	300000	Three Crore Sixty Six Lakh Rupees Only	36600000

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
699	COMP / CA-7	Providing and laying 2 in EPDM / rubber safety tiles to ASTM F1292 over 4 in P.C.C. base with kerb edge restraint, to the children's play area (100 ft x 50 ft).	Sft	5000	1134.27	Fifty Six Lakh Seventy One Thousand Three Hundred Fifty Rupees Only	5671350
700	COMP / CA-7	Providing and laying 2 in EPDM / rubber safety tiles over 4 in P.C.C. base to the open-air gym area (70 ft square).	Sft	4900	1134.27	Fifty Five Lakh Fifty Seven Thousand Nine Hundred Twenty Three Rupees Only	5557923

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
701	COMP / CA-11	Supply and installation of children's multi-play structure (tower, slide, climbing net and swings), complete with foundations.	Set	1	1330929.71	Thirteen Lakh Thirty Thousand Nine Hundred Thirty Rupees Only	1330930
702	COMP / CA-12	Supply and installation of outdoor open-air gym equipment station, galvanised / powder coated, complete with foundations.	Each	6	198115.4	Eleven Lakh Eighty Eight Thousand Six Hundred Ninety Two Rupees Only	1188692

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
703	COMP / CA-1	Supply, fabrication and erection of gazebo 19 ft x 19 ft, 14 ft clear height, complete as specified for the green-belt gazebos.	Each	1	1237233.88	Twelve Lakh Thirty Seven Thousand Two Hundred Thirty Four Rupees Only	1237234
704	COMP / CA-4	Supply and fixing of park bench with recycled plastic (HDPE) lumber slats on galvanised M.S. frame.	Each	65	65340.4	Forty Two Lakh Forty Seven Thousand One Hundred Twenty Six Rupees Only	4247126

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
705	COMP / CA-5	Supply and fixing of 60-litre waste bin.	Each	32	17720.2	Five Lakh Sixty Seven Thousand Forty Six Rupees Only	567046
706	MKT / SL-2	Solar flood light 2 x 60 W LED (two on each pole) on a hot-dip galvanized pole 4-6 m high, complete as specified - rest areas.	Each	42	450000	One Crore Eighty Nine Lakh Rupees Only	18900000
707	MKT / SL-3	Solar post-top light 30-40 W LED on a hot-dip galvanized pole 3-4 m high, complete as specified - walkways.	Each	178	300000	Five Crore Thirty Four Lakh Rupees Only	53400000

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
708	COMP / CA-4	Supply and fixing of bench with UV-stabilised outdoor-grade recycled plastic (HDPE) lumber slats on hot-dip galvanised M.S. frame, anchored on P.C.C. base - complete.	Each	7	65340.4	Four Lakh Fifty Seven Thousand Three Hundred Eighty Three Rupees Only	457383
709	COMP / CA-5	Supply and fixing of 60-litre waste bin, recycled plastic / HDPE body on galvanised M.S. frame, anchored on P.C.C. base - complete.	Each	4	17720.2	Seventy Thousand Eight Hundred Eighty One Rupees Only	70881

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Sr. No	Ref. No.	Description	Unit	Qty	Rate		Amount
710	COMP / CA-6	Supply, installation, testing and commissioning of decorative landscape lamp post / lantern 8'-0" high, hot-dip galvanised and black powder-coated M.S. with LED 3000 K lamp, on P.C.C. foundation with conduit and cabling - complete.	Each	25	66652.36	Sixteen Lakh Sixty Six Thousand Three Hundred Nine Rupees Only	1666309
						GRAND TOTAL:	Rs1,428,414,137.00

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Scope of Work

1. **Scope of work:**

The scope of work includes but not limited to the following:

- Green Belts
- Major/Main Roads
- Plantation, Railing and Footpathalong Nullahs
- Developments of Lakes and Wiers
- Model Park and Lake Park in F-14
- Trial Bore and Tube Wells
- Establishment of Nursery

1. **Terms & Conditions:**

1. The plant Size shall be supplied strictly according to the **Height, Girth/Stem, Diameter** and other Specification given in the BOQ. (Height > 12 Ft with strong stem, Pot Size > 24-30)

2. All plants supplied shall be healthy, vigorous, disease free, Pest free and should not carrying fungal infections.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

3. Plants shall have healthy and sufficiently grown roots and having sizeable Root-Ball, appropriate to their size. Root-Ball shall be intact during transportation.

4. The contractor shall supply the exactly approved species/variety mentioned in the BOQ. Substitution species shall not be permitted without the prior approval of competent authority.

5. Any plant that dies, severely diseased, dries out or fail to establish during the specified maintenance period shall be replaced by contractor with the healthy plant of the same specie or equal or better size at no additional cost.

6. The maintenance time for all the plants should be three (03) years and the time of each plant will be started to count when it will be planted.

7. All costs associated with the replacement including the plants, transportation, excavation, planting, staking watering and related operations shall be borne by the contractor.

8. The authorized representative shall have the right to inspect and approve plants at the site. Rejected plants shall be replaced by the contracted at no additional cost.

9. The contractor shall be responsible for complete maintenance and upkeep of all planted areas throughout the contract/maintenance period, including regular watering, hoeing, weeding, soil preparation, pruning, trimming, shaping and removal of dead/diseased branches, application of fertilizers, manures and plant nutrients, pest and diseased control, soil conditioning, mulching, staking and support of plants where required, replacement of dead damaged and diseased plants and all other necessary horticultural operation required to maintain a plant.

Brief Description

Landscaping and Horticulture Works in Sector F-14/15, Islamabad.

Price Schedule

For Individual Jobs

#	Job Title	Quantity	Unit Price (PKR)	Total Price (PKR)	Delivery Location	Delivery Period / Year	Country of Origin
1							
2							

For Lots

#	Lot Title	Total Lot Price (PKR)	Country of Origin
1	[Lot 1 Title]		

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PUBLIC PROCUREMENT REGULATORY AUTHORITY
(PPRA)
EPADS

General Conditions of Contract

Red Book:
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The Conditions of Contract are the “General Conditions” which form part of the “Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer (“Red book”) Second edition 2017” published by the Federation Internationale Des Ingenieurs – Conseils (FIDIC) and the following “Particular Conditions” which shall complement the General Conditions of the Contract.

The successful Bidder, upon contract award, shall be required to furnish two (02) copies of aforementioned “General Conditions” for incorporation in the Works Contract.

International Federation of Consulting Engineers (FIDIC) FIDIC
Bookshop – Box- 311 – CH – 1215 Geneva 15, Switzerland
Fax: +41 22 799 49 054
Telephone: **+41 22 568 0500**
E-mail: **fidic@fidic.org**
Website: www.fidic.org
FIDIC code: ISBN13: 978-2-88432-084-9

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Special Conditions of Contract

PARTICULAR CONDITIONS OF CONTRACT (PCC)

Particular Conditions
(Mandatory Provisions not to be amended/substituted)

The Particular Conditions (PCC) complement the General Conditions (GCC) to specify dates, contractual requirements, and special circumstances related to the Works. The PCC consists of two parts, Part A - Contract Data and Part B - Special Provisions. The provisions to be found in the Special Provisions (Particular Conditions - Part B) take precedence over the equivalent provisions found under the same Sub-Clause number(s) in the General Conditions, and the provisions of the Contract Data (Particular Conditions - Part A) take precedence over the Special Provisions (Particular Conditions - Part B).

PART A - Contract Data

Sub-Clause 1.1.27
Defects Notification Period (DNP): **1092** Days

Sub-Clause 1.1.31
Employer's name & address: **Federal Government Employees Housing Authority (Federal Government Employees Housing Authority-FGEHA), Director 10, Mauve Area, G-10/4, Islamabad Capital Territory**

Sub-Clause 1.1.35
Engineer's name & address: M/s Osmani & Company (Pvt.) Ltd

Site Camp Office F-14/15, Opposite to sector G-14/4, Islamabad.

Sub-Clause 1.1.84
Time for Completion: **728** days for whole of the works

Sub-Clause 1.3 (a)(ii)
Agreed method of electronic transmission: Not Agreed

Sub-Clause 1.3 (d)
Address of Empoyer for Communications: **10, Mauve Area, G-10/4, Islamabad Capital Territory**
Address of Engineer for Communications:

Site Camp Office F-14/15, Opposite to sector G-14/4, Islamabad.

Address of Contractor for Communications: ----------

Sub-Clause 1.4
Contract shall be governed by the law of: **Islamic Republic of Pakistan**
Ruling language: **English**
Language for communications: **English**

Sub-Clause 2.1
After receiving the Letter of Acceptance, the Contractor shall be given right of access to all or part of the Site within: **14** days after Commencement Date

Sub-Clause 2.4
Employer's financial arrangements:

Self Finance

Sub-Clause 3.2 (e)(ii)
Engineer's Duties and Authority: **Variation resulting in an increase of the Accepted Contract Amount in excess ofone percent (1%)subject to accumulative Variations not exceeding five percent (5%)of the Accepted Contract Amount**

Sub-Clause 4.2
Performance Security (as percentage of the Accepted Contract Amount in Currencies): 10.00%
Form of Performance Guarantee: **Bank Guarantee**

Sub-Clause 4.2.1
List of Insurance Companies:

N/A

Sub-Clause 4.7.2
period for notification of errors in the items of reference: **Twenty Eight (28) days**

Sub-Clause 4.19
Period of payment for temporary utilities: **Each Month**

Sub-Clause 5.1 (a)
Maximum allowable accumulated value of work subcontracted (as a percentage of the Accepted Contract Amount): **30** %

Sub-Clause 5.1 (b)
Parts of the Works for which subcontracting is not permitted: 70

Sub-Clause 6.5
Normal working hours on the Site: **8**

Sub-Clause 8.3
Number of additional paper copies of programmes: **6**

Sub-Clause 8.8 & 14.15(b)
Delay Damages payable for each day of delay **0.01**% of the Accepted Contract Amountfor delay in completion of whole of the Works

Sub-Clause 8.8
Maximum amount of Delay Damages **10.00 %** of the Accepted Contract Amount

Sub-Clause 8.14
Applicability of Incentives for Early Completion **No**

Sub-Clause 12.3
Percentage profit (Not more than 10%): **Nil**

Sub-Clause 13.4.(b)(ii)
Percentage rate to be applied to Provisional Sums for overhead charges and profit: **Twenty Five percent (25%)**

Sub-Clause 14.2
Total Advance Payment: **Fifteen percent (15%) of the Accepted Contract Amount excluding Provisional Sums payable in the currencies and proportions in which the Accepted Contract Amount is payable**

Sub-Clause 14.2.1
Advance Payment Insurance **Allowed**

The advance payment shall be released in two parts: the first installment after submission of the request letter and provision of unconditional and irrevocable Bank Guarantee within fifteen days of signing contract agreement and the remaining half after provision of facilities as prescribed in special provisions and achieving 04% of physical progress within 42 days of signing of contract agreement.

Sub-Clause 14.2.3
Percentage deductions for the repayment of the Advance Payment: Deduction shall be made at the amortization rate of 17.5 % of the value of the Works executed of each IPC as provided in paragraph (i) of Sub-Clause GCC 14.3, starting from 2nd IPC provided that the advance payment shall be completely repaid prior to the time when 90% of the Accepted Contract Amount less Provisional Sums has been certified for payment. It may be more than 17.5% in the last instalment to ensure full repayment.

Sub-Clause 14.3
Period of payment **One Month**

Sub-Clause 14.3(b)
Number of additional paper copies of Statements: **2**

Sub-Clause 14.3 (iii)
Percentage of retention: **Seven percent (7%)**

Sub-Clause 14.3 (iii)
Limit of Retention Money (as a percentage of the Accepted Contract Amount): **Five percent (5%)**

Sub-Clause 14.5(b)(i)
Plant and Materials for payment when shipped: **Plant and Materials under Bill of "Imported Plant and Materials"**

Sub-Clause 14.5(c)(i)
Plant and Materials for payment when delivered to the Site: Plant and Non Perishable Materials

Sub-Clause 14.6.2
Minimum amount of Interim Payment Certificate (IPC): **Yes**
The Minimum Amount IPC is 60 Million
[Employer to give value not exceeding one fifth of the average expected value of Interim Payment Certificate]

Sub-Clause 14.7(a)
Period of payment of Advance Payment to the Contractor**: 14 days**

Sub-Clause 14.7b(i)
Period for the Employer to make interim payments to the Contractor under Sub-Clause 14.6: **28** days

Sub-Clause 14.7b(ii)
Period for the Employer to make interim payments to the Contractor under Sub-Clause 14.13 (Final Payment)**: 56** days

Sub-Clause 14.7(c)
Period for the Employer to make final payment to the Contractor**: 56** days

Sub-Clause 14.8
Financing charges for delayed payment Local Currency (PKR):
6-Month KIBOR (Offer) +3% per annum.
Foreign Currency:
USD
6-Month SOFR (Secured Overnight Financing Rate for USD) +1% per annum.

EURO
6-Month EURIBOR (EURO Interbank Offered Rate for EURO) +1% per annum.

Others
Appropriate rates +1% (for other foreign currencies, Ref. Schedule-A, A-4 to Bid).

Sub-Clause 14.11.1(b)
Number of additional paper copies of draft Final Statements**: 6**
[insert number of copies say six (06)]

Sub-Clause 14.15
Currencies of payment of Contract Price: **as stated in the Table Schedule of Adjustment Data of Schedule A (if Given)**

Sub-Clause 14.15(a)(i)
Proportions or amounts of Local and Foreign currencies: **as stated in the Table Schedule of Adjustment Data of Schedule A (if Given)**

Sub-Clause 14.15(c)
Currencies and proportions for payment of Delay Damages: **as stated in the Table Schedule of Adjustment Data of Schedule A (if Given)**

Sub-Clause 14.15(f)
rates of exchange: **as stated in the Table IV of Schedule A (If Given)**

Sub-Clause 17.2(d)
Forces of nature, the risks of which are allocated to the Contractor: **Nil**

Sub-Clause 19.1
Permitted deductible limits:
i) insurance required for the Works: **Ten percent (10%) of loss amount on each & every loss**
ii) insurance required for Goods: **Nil**
iii) insurance required for liability for breach of professional duty: **Nil**
iv) insurance required against liability for fitness for purpose (if any is required): **Nil**
v) insurance required for injury to persons and damage to property: **Nil**
vi) insurance required for injury to employees: **Nil**
vii) other insurances required by Laws and by local practice : **Nil**

Periods for submission of insurance:
a) evidence of insurance: Not later than the Commencement Date
b) relevant policies: Within twenty eight (28) day from the Commencement Date

Sub-Clause 19.2.1(b)
Additional amount to be insured (as a percentage of the replacement value): 15% of the replacement value

(Accepted Contract Amount)

Sub-Clause 19.2.2

Extent of insurance required for Goods: From Ex-Works (i.e., works, factory, warehouse, etc) to delivery at the Site

Amount of insurance required for Goods: Full replacement value

Sub-Clause 19.2.3(a)

Amount of insurance required for liability for breach of professional duty: Full replacement value of the Works to be designed by the Contractor

Sub-Clause 19.2.3(b)

Insurance required against liability for fitness for purpose: **Yes**

Sub-Clause 19.2.3

Period of insurance required for liability for breach of professional duty: Until the date of issuance of Performance Certificate

Sub-Clause 19.2.4

Amount of insurance required for injury to persons and damage to property: Injury to person and Fatal case: in accordance with Workmen Compensation Act

Damage to Property: The Amount of Insurance Required for Person Injury is 500000

The Amount of Insurance Required for Damage to Property is 1000000 as per his assessment of the adjoining property(ies) other than the Works]

without limit to the number of incidents

Sub-Clause 19.2.6

Other insurances required by Laws and by local practice: All insurances as applicable, to the extent of execution of the project, under Federal and Provincial laws of Islamic Republic of Pakistan

Sub-Clause 21.1

Time for appointment of the DAAB: Within 28 days from the Commencement Date.

In case the Accepted Contract Amount is lesser than PKR one (01) billion, appointment of the DAAB shall be made when Dispute arises between the Parties.

Sub-Clause 21.1

The DAAB shall comprise 3

[insert either “a sole Member” or “Three Members”]

[For a Contract estimated to cost above PKR 2.5billion, the DAAB shall comprise of three members. For a Contract estimated to cost between PKR1billion and PKR2.5billion, the DAAB may comprise of three members or a sole member. For a Contract estimated to cost less than PKR1billion, a sole member is recommended.]

Sub-Clause 21.1

List of proposed members of DAAB

- proposed by Employer

Chief Engineer

Director Law

Director Finance

- proposed by Contractor

[to be inserted at the time of signing of the Contract]
1._____
2._____
3._____

Sub-Clause 21.2
Appointing entity (official) for DAAB members Managing Director Public Procurement Regulatory Authority (PPRA) or Chairman Pakistan Engineering Council (PEC) from the list of PEC approved arbitrators published at its website

Sub-Clause 21.6
Rules of Arbitration: PEC Rules of Conciliation and Arbitration or Pakistan Arbitration Act of 1940, if the former is inactive.
The place of Arbitration shall be in the Employer's country: **Islamabad**
[Insert name of city]

Particular Conditions

PartB - Special Provisions

1.1 Definitions

1.1.76 "Specification"
Following is added at the end:
"and consists of two parts i.e.,
i) "Part A - Specific Provisions"; and
ii) "Part B - Technical Provisions"."

1.2 Interpretation

"and" is deleted from the end of sub-paragraph (i) and added at the end of sub-paragraph (j).
Sub-paragraph (k) is added:
"(k) The word "tender" is synonymous with "bid" the word tenderer with "bidder", the words "tender documents" with "bidding documents" and "Schedule of Prices" with "Bill of Quantities", as applicable."

1.5 Priority of Documents

The documents listed at (a) through (k) of this Sub-Clause are deleted and substituted with the following:
(a) the Contract Agreement;
(b) the Letter of Acceptance;
(c) the Letter of Bid;
(d) the Particular Conditions Part A - Contract Data;
(e) the Particular Conditions Part B - SpecialProvisions;
(f) the General Conditions;
(g) the Specification Part A - SpecificProvisions;
(h) the Specification Part B- Technical Provisions;
(i) the Drawings;
(j) the completed Schedules to Bid includingBillof Quantities;
(k) the JV Undertaking (if the Contractor is a JV); and
(l) any other documents forming part of the Contract.

The addenda/corrigenda, if any, shall be deemed to have been incorporated at the appropriate places in the documents forming the Contract.

1.6 Contract Agreement

In the last line of the 1st paragraph the text “shall be borne by the Employer” is substituted by“ shall be reimbursed by the Employer to the Contractor”.

3.1 The Engineer

In sub-paragraph (a) the text “as defined in the Pakistan Engineering Council Act, 1975 (Act No.V of 1976)” are added after the words “professional engineer”.

3.2 Engineer’s Duties and Authority

The Engineer shall obtain the consent in writing of the Employer before taking action under the following Sub-Clauses of these Conditions:
(a) Consenting to the subcontracting of any part of the Works under Sub-Clause 5.1 [Subcontractors]
(b) Any action under Sub-Clauses 8.9 [Employer’s Suspension] and 8.12 [Prolonged Suspension]
(c) Issuance of “Taking Over Certificate” under Sub-Clause 10.1 [Taking Over the Works and Sections].
(d) Issuing the “Performance Certificate” under Sub-Clause 11.9 [Performance Certificate].
(e) Sub-Clause 13.1 [Right to Vary]: instructing a Variation, except;
(i) in an emergency situation as determined by the Engineer, or
(ii) if such a Variation would increase the Accepted Contract Amount by less than the percentage specified in the Contract Data.
(f) Sub-Clause 13.3 [Variation Procedure]: approving a proposal for Variation submitted by the Contractor in accordance with Sub-Clause 13.3.2 [Variation by Request for Proposal] or 13.2 [Value Engineering].
(g) Certifying release of second half of the Retention Money under Sub-Clause 14.9 [Release of Retention Money].
(h) Issuing Final Payment Certificate under Sub-Clause 14.13 [Issue of FPC].
(i)
*[insert Sub-Clause number (not Sub-Clause 3.7 [Agreement or Determination]
Any such requirement shall not be applied to any action by the Engineer under Sub-Clause 3.7 [Agreement or Determination], as stated in Sub-Clause 3.2 [Engineer’s Duties and Authority] of the General Conditions.
Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Employer.
Following is added after the words “the Employer’s consent is required” in 4th paragraph:
“stating that the Employer’s consent has been obtained for that specified authority”

4.2 Performance Security

4.2.1 Contractor’s Obligations
The entity issuing the Performance Security and its form shall be as under:
The Performance Security shall be, at the option of the Contractor,issuedin the prescribed form included in the Bidding Documents,by(a) a Scheduled Bank in Pakistan or (b) a foreign bank duly counter-guaranteed by a Scheduled Bank in Pakistan or (c)an Insurance Companylisted in the Contract Data and rated by PACRA/VIS ofratingas provided in Table below:
Accepted Contract Amount (In Eq. PKR million) Minimum Rating of Insurance Companies

Up to 1000 A (+)
1001 to no limit AA
In case of Joint Venture, the Performance Security shall be in the name of the Joint Venture or in the name of Lead/either firm of the JV or in ratio of shares of the individual JV partners.
Following paragraph is added at the end of this Sub-Clause:
“The amount of Performance Security shall be reducedto 50%following issue of the Taking-Over Certificate for the whole of the Works under Clause 10 of Conditions of Contract.”

4.3 Contractor’s Representative

In second paragraphthe text “professional engineer as defined in the Pakistan Engineering Council Act, 1975 (Act No. V of 1976) (having temporary licence in case of foreign engineer under Section 12 of the Pakistan Engineering Council Act, 1975 (Act No. V of 1976)” are added after the words “qualified, experienced”.
In the 3rd paragraph the words “28 days” are substituted by “14 days”. In 2nd line of 4thparagraph the text “or appoint a replacement” is substituted by “except appointment of a suitable temporary replacement is deployed at the Site”

4.4 Contractor’s Documents

4.4.2 As-Built Records
First paragraph is deleted and the text in the last paragraph is substituted with the following:
“The Contractor shall furnish to the Engineer 6 copies, one reproducible and one electronic copy(provided the Engineer has made available to the Contractor editable form of the Drawings)of all Drawings amended to conform to the Works as built.In case the Engineer does not make available to the Contractor editable form of the Drawings, the Contractor shall furnish to the Engineer as-built data for incorporation in the Drawings. Upon receipt of PDF versions of the as-built drawings prepared by the Engineer, the Contractor shall furnish to the Engineer 6copies and one reproducible of these Drawings.
The price of such Drawings shall be deemed to be included in the Contract Price.”
Following Sub-Clause is added:
4.4.4 ShopDrawings
The Contractor shall submit to the Engineer for review 3 copies of all shop and erection drawings applicable to this Contract as per provision of relevant Sub-Clause of the Contract.
Review and approval by the Engineer shall not exceed 21 days and be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory and the Engineer’s review or approval shall not relieve the Contractor of any of his responsibilities under the Contract.

4.8 Health and Safety Obligations

The following text is added at the end ofthis Sub-Clause:
In the event of work being carried out outside the normal working hours and in the event of work being carried out at night, the Contractor shall at his own cost, provide and maintain such good and sufficient light as will enable the work to proceed satisfactorily and without danger. The approaches to the Site and the Works where the night work is being carried out shall be sufficiently lighted. All arrangement adopted for such lighting shall be to the satisfaction of the Engineer.

4.20 Progress Reports

At the end of sub-paragraph (g) the word “and” is deleted and at the end of sub-paragraph (h) the full stop (.) is replaced with “;”, and the following new sub-paragraphs are added as:
(i) planned programme for the execution of the Works for next 56 days to enable the Engineer to determine its programme of inspection and testing;
(j) monthly summery of daily job record indicating weather conditions, deployment of Contractor’s Equipment, labour employment, local material procurement and material import, if any; and
(k) salient contractual and project information.

5.1 Subcontractors

Add the following text at the end of paragraph (ii):
“underSchedule to Bid”
The following is added at the end of the last paragraph of Sub-Clause 5.1:
“All subcontracts relating to the Works shall include provisions which entitle the Employer to require the subcontract to be assigned to the Employer under sub-paragraph (a) of Sub-Clause 15.2.3 [After Termination].
The Contractor shall give reasonable opportunity to contractors from Islamic Republic of Pakistan for subcontracts for the Works, and endeavour to employ such contractors as Subcontractors.”

5.2 Nominated Subcontractors

5.2.2 Objection to Nomination
In sub-paragraph (c), “and” is deleted from the end of (i);
“.” at the end of (ii) is replaced with: “, and”.
The following is then added as (iii):
“(iii) be paid only if and when the Contractor has received from the Employer payments for sums due under the Subcontract referred to under Sub-Clause 5.2.3 [Payment to nominated Subcontractors].”

6.1 Engagement of Staff and Labour

The following paragraph is added at the end of the Sub-Clause:
“The Contractor shall, to the extent practicable and reasonable, employ staff (not less than 50%) and labour (not less than 85%) with appropriate qualifications and experience from sources within the Islamic Republic of Pakistan.”

6.7 Health and Safety of Personnel

The existing text is substituted with the following:
“In order to provide for the safety, health and welfare of persons, and for prevention of damage of any kind, all operations for the purposes of or in connection with the Contract shall be carried out in compliance with the Safety Requirements of the Government of Pakistan with such modifications thereto as the Engineer may authorize or direct and the Contractor shall take or cause to be taken such further measures and comply with such further requirements as the Engineer may determine to be reasonably necessary for such purpose. The Contractor shall also provide all other medical services and appoint a health and safety officer at Site if stated in the Specifications. In case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer immediately by the quickest available means.”

6.8 Contractor’s Superintendence

Insert at the end of sub-paragraph (a) of this Sub-Clause:
"or, if not, the Contractor shall make competent interpreters available during all working hours, in a number sufficient for those persons to properly perform their superintendence duties"
The following text is added at the end of this Sub-Clause:
“The Contractor’s authorized representative and his other engineers working at site shall possess valid registration with the Pakistan Engineering Council.
The Contractor’s authorized representative at Site shall be authorized to exercise adequate administrative and financial powers on behalf of the Contractor so as to achieve completion of the Works as per the Contract.”

6.12 Key Personnel

The following is inserted at the end of the last paragraph:
“If any of the Key Personnel are not fluent in this language, the Contractor shall make competent interpreters

available during all working hours in a number deemed sufficient by the Engineer."
The following Sub-Clauses 6.13 to 6.26 are added at the end of Sub-Clause 6.12:

6.13 Foreign Personnel

The Contractor may bring in to the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, if requested by the Contractor, use all reasonable endeavours in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national, or government permission required for bringing in the Contractor's personnel.
The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.

6.14 Supply of Foodstuffs

The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.

6.15 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.

6.16 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce the danger to their health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

6.17 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal thereto by Contractor's Personnel.

6.18 Arms and Ammunition

The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.

6.19 Festivals and Religious Customs

The Contractor shall respect the Country's recognized festivals, days of rest and religious or other customs.

6.20 Funeral Arrangements

The Contractor shall be responsible, to the extent required by local regulations, for making any funeral arrangements for any of its local employees who may die while engaged upon the Works.

6.21 Forced Labour

The Contractor, including its Subcontractors, shall not employ or engage forced labour which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements.

6.22 Child Labour

The Contractor, including its Subcontractors, shall not employ or engage child labour in accordance with relevant law(s) in force in Islamic Republic of Pakistan.

6.23 Employment Records of Workers

The Contractor shall keep complete and accurate records of the employment of labour at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the Engineer. These records shall be included in the details to be submitted by the Contractor under Sub-Clause 6.10 [Contractor's Records].

6.24 Workers' Organizations

The Contractor shall comply with the relevant labour laws of Pakistan which recognize workers' rights to form and to join workers' organizations/Trade Union of their choosing and to bargain collectively without interference.

6.25 Non-Discrimination and Equal Opportunity

The Contractor shall not make decisions relating to the employment or treatment of Contractor's Personnel on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment of Contractor's Personnel on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to any aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices.
Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination. The Contractor shall provide protection and assistance as necessary to ensure nondiscrimination and equal opportunity, including for specific groups such as women, persons with disabilities, migrant workers and children (of working age in accordance with Sub-Clause 6.22).

6.26 Epidemics

In the event of any out-break of illness of epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government or the local medical or sanitary authorities for the purpose of overcoming the same.

7.7 Ownership of Plant and Materials

The following is added before the first paragraph:
"Except as otherwise provided in the Contract,"
The following is added at the end of the Sub-Clause:
"No Plant and/or Materials that is the property of the Employer shallbe removed from the Site. If it becomes necessary to:
(i) remove any item of such Plant from the Site for the purposesof repair, the Contractor shall give a Notice, with reasons, tothe Engineer requesting consent to remove the defective ordamaged item off the Site. This Notice shall clearly identifythe item of defective or damaged Plant, and shall give detailsof: the defect or damage to be repaired; the place to whichdefective or damaged item of Plant is to be taken for repair;the

transportation to be used (and insurance cover for suchtransportation); the proposed inspections and testing off theSite; and the planned duration required before the repaireditem of Plant shall be returned to the Site. The Contractorshall also provide any further details that the Employer mayreasonably require; or

(ii) replace any item(s) of such Plant and/or Materials, theContractor shall give a Notice, with reasons, to the Engineerclearly identifying the item(s) of Plant and/or Materials to bereplaced, and giving details of the due date of delivery tothe Site of the replacement item(s).

Where any item of Plant and/or Materials has become the propertyof the Employer under this Sub-Clause before it has been deliveredto the Site, the Contractor shall ensure that such an item is notmoved except for its delivery to the Site.

The Contractor shall indemnify and hold the Employer harmlessagainst and from the consequences of any defect in title orencumbrance or charge (except any reasonable restrictionarising from the intellectual property rights of the manufacturer orproducer) on any item of Plant and/or Materials that has becomethe property of the Employer under this Sub-Clause."

The following Sub-Clause7.9 is added after Sub Clause 7.8:

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 following is added before the first paragraph:

“After signing of the Contract Agreement by both Parties,” and thereafter the word “The” is replaced with the word “the”.

8.5 Extension of Time for Completion

The following is added after paragraph (c):

“for last five years”.

The following Sub-Clause 8.14 is added after Sub-Clause 8.13:

8.14 Incentives For Early Completion

If Contract Data does not state applicability of incentives for early completion, this Sub-Clause shall not apply.

The Contractor shall be entitled subject to Sub-Clause 20.2 [Claims for Payment and/or EOT] to bonus payment if the Works and/or each Section is completed earlier than the Time for Completion for the Works or Section (as the case may be). The amount of bonus for early completion of the Works and/or each Section shall be upto a limit and at a rate to 50% of the relevant limit and rate of delay damages prescribed in Contract Data and shall be paid for every day which shall elapse between the relevant Date of Completion of the Works or Section and the relevant Time for Completion.

For the purposes of calculating any bonus payment, the applicableTime for Completion stated in the Contract Data is fixed and noadjustments of this time by reason of granting an EOT will beallowed.

The following Sub-Clause 11.12 is added after Sub-Clause 11.11:

11.12 Supervisory Assistance During DNP

If provided under the Schedule of Prices, the Contractor shall provide supervisory assistance to the Employer during the DNP for the Works. Such supervisory assistance shall be as described in the Specification for the purpose of supporting the Employer's operation and maintenance of the Plant for the period specified in the Schedule of Prices after the Date of Completion.

12.2 Method of Measurement

The following paragraph is added at the end of the Sub-Clause:
“Summary of measured quantity for payment shall be delineated item-wise under four headsnamely; “Schedule of Prices Quantity”, “Quantity Executed To-date”, “Quantity Certified Previously” and “Net Quantity Executed under this Certificate”.

12.3 Valuation of the Works

The following text is added at the end of fifth paragraph of the Sub-Clause:
“Sum of overhead charges and profit for sub-paragraph (a) shall be Twenty Five percent (25%)”.

13.4 Provisional Sums

The following paragraph is inserted as the penultimate paragraph:
“The Provisional Sum shall be used to cover the Employer’s share of the DAAB members’ fees and expenses, in accordance with Clause 21. No prior instruction of the Engineer shall be required with respect to the work of the DAAB. The Contractor shall submit the DAAB members’ invoices and the satisfactory evidence of having paid 100% of such invoices as part of the substantiation of those Statements submitted under Sub-Clause 14.3.

13.6 Adjustments for Changes in Laws

The following paragraphsare added at the end of the Sub-Clause:
“Notwithstanding the foregoing, the Contractor shall not be entitled to an extension of time if the relevant delay has already been taken into account in the determination of a previous extension of time and such Cost shall not be separately paid if the same shall already have been taken into account in the indexing of any inputs to the Table of Adjustment Data in accordance with the provisions of Sub-Clause 13.7 [Adjustments for Changes in Cost].”

14.1 The Contract Price

The following is added at the end of the Sub-Clause:
“Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts, imported by the Contractor for the sole purpose of executing the Contract shall be temporarily exempt from the payment of import duties and taxes upon initial importation, provided the Contractor shall post with the customs authorities at the port of entry an approved re-export bond or bank guarantee, valid until the Time for Completion plus six months, in an amount equal to the full import duties and taxes which would be payable on the assessed imported value of such Contractor's Equipment and spare parts, and callable in the event the Contractor's Equipment is not re-exported from the Country on completion of the Contract. A copy of the bond or bank guarantee endorsed by the customs authorities shall be provided by the Contractor to the Employer upon the importation of individual items of Contractor's Equipment and spare parts. Upon re-export of individual items of Contractor's Equipment or spare parts, or upon the completion of the Contract, the Contractor shall prepare, for approval by the customs authorities, an assessment of the residual value of the Contractor's Equipment and spare part to be re-exported, based on the depreciation scale(s) and other criteria used by the customs authorities for such purposes under the provisions of the applicable Laws. Import duties and taxes shall be due and payable to the customs authorities by the Contractor on (a) the difference between the initial imported value and the residual value of the Contractor's Equipment and spare parts to re-exported; and (b) on the initial imported value of the Contractor's Equipment and spare parts remaining in the Country after completion of the Contract. Upon payment of such dues within 28 days of being invoiced, the bond or bank guarantee shall be reduced or released accordingly; otherwise the security shall be called in the full amount remaining.”
[The Employer may change or delete this Sub-Clause as per Project requirements]

14.2 Advance Payment

14.2.1 Advance Payment Guarantee
The entity issuing the Advance PaymentGuaranteeand its form shall be as under:
The Advance PaymentGuarantee shall be in the form of Guarantee issued by (a) a Scheduled Bank in Pakistan or (b) a foreign bank duly counter-guaranteed by a Scheduled Bank in Pakistanor (c)an Insurance Companylisted in the Contract Data and rated by PACRA/VIS ofrating as provided in Table below:
Accepted Contract Amount (In Eq. million PKR) Minimum Rating of Insurance Companies
Up to 1000 A (+)
1001 to no limit AA
In case of Joint Venture, the Advance PaymentGuarantee(s)shall be in the name of the Joint Venture or in the name of Lead/either firm of the JV or in ratio of shares of the individual JV partners.

14.6 Issue of IPC

14.6.1 The IPC
In the first line of the 1st paragraph the words “28 days” are substituted by “14 days”.

14.7 Payment

The words “or through crossed cheque in favour of the Contractor or JV partners. The Payment to JV partners shall be made at the request of the Joint Ventures in the ratio of their shares specified by them” are added at the end of the Sub-Clause.

14.8 Delayed Payment

In the first paragraph, third line, the words “compounded monthly” are deleted.
The text of 2nd paragraph is deleted and substituted with the following:
“The Employer shall pay to the Contractor compensation at the rate stated in the Contract Data.”

14.9 Release of Retention Money

The following is added at the end of Sub-Clause 14.9:
“Unless otherwise stated in the Contract, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment by the Engineer, the Contractor shall be entitled to substitute a guarantee, in the form annexed to the Particular Conditions or in another form approved by the Employer and issued by a schedule bank selected by the Contractor, for the second half of the Retention Money. The Contractor shall ensure that the guarantee is in the amounts and currencies of the second half of the Retention Money and is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects, as specified for the Performance Security. On receipt by the Employer of the required guarantee, the Engineer shall certify, and the Employer shall pay the second half of the Retention Money. The release of the second half of the Retention Money against a guarantee shall then be in lieu of the release after the latest of the expiry dates of the Defects Notification Periods. The Employer shall return the guarantee to the Contractor within 21 days after receiving a copy of the Performance Certificate.

If the Performance Security required under Sub-Clause 4.2 is in the form of a demand guarantee, and the amount guaranteed under them when the Taking-Over Certificate is issued is more than half of the Retention Money, then the Retention Money guarantee will not be required. If the amount guaranteed under the Performance Security when the Taking-Over Certificate is issued is less than half of the Retention Money, the Retention Money guarantee will only be required for the difference between half of the Retention Money and the amount guaranteed under the Performance Security.

15.2 Termination for Contractor’s Default

15.2.1 Notice
Following text is added at the end of sub-paragraph (h) of this Sub-Clause:
“For the purposes of this Contract, corrupt and fraudulent practices have been defined in Public Procurement Rules 2026.”
15.2.3 After Termination
The word “and” at the end of sub-paragraph (ii) of paragraph (b) is deleted the following paragraph is added after sub-paragraph (iii):
“(iv) all Employer-Supplied Materials and/or Employer's Equipment madeavailable to the Contractor in accordance with Sub-Clause 2.6 [Employer-Supplied Materials and Employer's Equipment], and”

15.4 Payment after Termination

The following text is added at the end of this Sub-Clause:
“The Employer shall be entitled to sell any of the Contractor’s Equipment, Temporary Works and unused materials and apply the proceeds of sale towards payment of any debt due from the Contractor to the Employer under this Clause including any outstanding payments to the Subcontractors.

16.2 Termination by Contractor

16.2.1 Notice
The sub-paragraph (j) is deleted in its entirety.
At the end of sub-paragraph (i) “; or” is replaced with “.” and at the end of sub-paragraph (h) “;” is replaced with “; or”.
In sub-paragraph (f) “84 days” are replaced with “180 days” and text “for reasons not attributable to the Contractor” is added at the end.

16.3 Contractor’s Obligations After Termination

Sub-paragraph (c) is deleted and replaced with:
"(c) deliver to the Engineer all Employer-Supplied Materials and/orEmployer's Equipment made available to the Contractor in accordance with Sub-Clause 2.6 [Employer-Supplied Materials and Employer’s Equipment]; and
(d) remove all other Goods from the Site, except as necessary for safety,and leave the Site."

17.1 Responsibility for Care of the Works

After the two instances of “Goods” in the last paragraph, the words “Employer-Supplied Materials and/orEmployer's Equipment” are added.
The following Sub-Clause 17.7 is added after Sub-Clause 17.6:

17.7 Use of Employer’s Accommodation/Facilities

The Contractor shall take full responsibility for the care of the items of the Employer’s facilities and/or accommodation, if any, as detailed in the Specification, from the date of use and/or occupation by the Contractor until the date on which such use and/or occupation is re-vested in the Employer.
If any loss or damage happens to any of the above items during a time while the Contractor is responsible for its care, arising from any cause other than a cause for which the Employer is responsible or liable, the Contractor shall promptly rectify the loss or damage at the Contractor’s risk and cost.

18.1 Exceptional Events

The words “or disorder” are replaced with “disorder or sabotage” in sub-paragraph (c) of the Clause.

18.4 Consequences of an Exceptional Event

The following is added at the end of sub-paragraph (b) after deleting the ".":
", including the costs of rectifying or replacing the Works and/or Goods damaged or destroyed by Exceptional Events, to the extent they are not indemnified through the insurance policy referred to in Sub-Clause 19.2 [Insurance to be provided by the Contractor]."

18.5 Optional Termination

In sub-paragraph (c), the words "and necessarily" areadded after the words "was reasonably".

19.1 General Requirements

Following text is added at the end of first paragraph:
"The Contractor shall immediately after the date of the Letter of Acceptance submit the draft of insurance policies for the Employer's consent."
Following text is added at the end of third paragraph:
"The Contractor shall, within the respective periods stated in the Contract Data submit to the Engineer and the Employer a) evidence that the insurances described in this Clause have been effected, and b) copies of policies of the insurances described in Sub-Clauses 19.2.1, 19.2.4 and 19.2.5."

19.2 Insurance to be provided by the Contractor

19.2.5 Injury to employees
The words "sickness, disease" are deleted in the third line of first paragraph.

The following Sub-Clause is added after Sub-Clause 19.2.6:
19.2.7 Insurance Company
"The Contractor shall be obliged to place all insurances described in this Clause with insurers listed in the Contract Data and rated byPACRA/VISofrating as provided in Table below:

Accepted Contract Amount (In Eq. million PKR) Minimum Rating of Insurance Companies
Up to 1000 A (+)
1001 to no limit AA

21.6 Arbitration

The word "international" is deleted in the sixth line of first paragraph. The text of sub-paragraph (a) is substituted with the following:
"the Dispute shall be finally settled under the Rules of Arbitration, specified in the Contract Data;"
The following Clauses are added after Clause 21

22 Custom Duty

[Employer may incorporate provisions where applicable. However, in order to make the bid more balanced, the payment of Customs Duties should be the responsibility of the Employer.]

23 Taxes

The Contractor, Subcontractors and their employees shall be liable to pay income tax, withholding tax, super tax and other taxes on income arising out of the Contract. The rates and prices as stated in the contract shall be deemed to cover all such taxes.

24 Integrity Part

If it is found and established at any stage that the Contractor or any of his Subcontractors, agents or servants have violated or involved in violation of the Integrity Pact signed by the Contractor then the Employer shall

be entitled to :

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

(b) terminate the Contract; and

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

The termination under sub-paragraph(b) of this Sub-Clause shall proceed in the manner prescribed under Sub-Clause 15.1 to 15.4 and the payment under Sub-Clause 15.4 shall be made after having deducted the amounts due to the Employer under sub-paragraph(a) and (c) of this Sub-Clause.

Appendix General Conditions of Dispute Avoidance/Adjudication Agreement

12 Disputes Under DAAB Agreement

In the first paragraph, third, fourth and fifth line, the text "under the Rules of Arbitration of the International Chamber of Commerce 2017……shall apply" is substituted with "under the Arbitration Act 1940 by sole arbitrator appointed by the Managing Director Public Procurement Regulatory Authority or Chairman Pakistan Engineering Council."

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Bid Securing Declaration

FORM OF BID SECURING DECLARATION

Date:
No.:
Alternative No.: ***P200199***

To: **Federal Government Employees Housing Authority (Federal Government Employees Housing Authority-FGEHA), Director 10, Mauve Area, G-10/4, Islamabad Capital Territory**

We, the undersigned, declare that:

We understand that, according to your conditions, Bids must be supported by a Bid-Securing Declaration.

We accept that we will be blacklisted and henceforth cross debarred for participating in respective category of public procurement proceedings for a period of (not more than) six months, if fail to abide with a bid securing declaration, however without indulging in corrupt and fraudulent practices, if we are in breach of our obligation(s) under the Bid conditions, because we:

(a) have withdrawn our Bid during the period of Bid validity specified in the Letter of Bid; or
(b) having been notified of the acceptance of our Bid by the Procuring agency/Employer during the period of Bid validity, (i) fail or refuse to sign the Contract; or (ii) fail or refuse to furnish the Performance Security (or guarantee), if required, in accordance with the ITB.

We understand this Bid Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of our Bid.

Name of the Bidder*
Name of the person duly authorized to sign the Bid on behalf of the Bidder** _____
Title of the person signing the Bid _____
Signature of the person named above _____
Date signed _____ day of _____, _____
*: In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder
**: Person signing the Bid shall have the power of attorney given by the Bidder attached to the Bid

[Note: In case of a Joint Venture, the Bid-Securing Declaration must be in the name of all members to the Joint Venture that submits the Bid.]

Contract Form

FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the _____ day of _____ (month) 20_____ between **Federal Government Employees Housing Authority (Federal Government Employees Housing Authority-FGEHA), Director 10, Mauve Area, G-10/4, Islamabad Capital Territory** (hereinafter called the "Employer") of the one part and _____ (hereinafter called the "Contractor") of the other part.

WHEREAS the Employer is desirous that certain Works, viz., **LANDSCAPING AND HORTICULTURE WORKS IN SECTOR F-14 & F-15, ISLAMABAD. (*P200199*)** should be executed by the Contractor and has accepted a Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

NOW this Agreement witnessed as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents, in the order of priority, 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:

a) This Contract Agreement;
b) The Letter of Acceptance;
c) The Letter of Bid;
d) The Particular Conditions Part A - Contract Data;
e) The Particular Conditions Part B - SpecialProvisions;
f) The General Conditions;
g) The Specifications Part A - SpecificProvisions;
h) The Specifications Part B- Technical Provisions;
i) The Drawings;
j) The Completed Schedules to Bid including Schedule of Prices;
k) the JV Undertaking (if the Contractor is a JV); and
l) [Employer to insert any other documents forming part of the Contract]

The addenda/corrigenda,if any, (Excluding part relating to Instructions to Bidders alongwith Bidding Data) shall be deemed to have been incorporated at the appropriate places in the "Documents forming the Contract".

3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy defects therein in conformity and in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of the Contract, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

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

Signature of the Contactor Signature of Employer

(Seal) (Seal)

Signed, Sealed and Delivered in the presence of:

Witness Witness

(Name, Title and Address) (Name, Title and Address)

DAAB Agreement

[All italicised text and any text within square brackets (except sub-clause headings) in this form of agreement is for use in preparing the form and should be deleted from the final product].

Name and details of the Contract LANDSCAPING AND HORTICULTURE WORKS IN SECTOR F-14 & F-15, ISLAMABAD.

_____

This Agreement made the _____day of _____ [month], _____ [year], between

Name and contact details of the Employer **Federal Government Employees Housing Authority (Federal Government Employees Housing Authority-FGEHA), Director**
10, Mauve Area, G-10/4, Islamabad Capital Territory
+92-321-538-5944
director.technical@fgeha.gov.pk

Name and contact details of the Contractor _____ (name)
_____ (address)
_____ (telephone)
_____(email / other contact details);

Name and contact details of the DAAB Member _____ (name)
_____ (address)
_____ (telephone)
_____(email / other contact details);

("DAAB Agreement")

Whereas:
A. the Employer and the Contractor have entered (or intend to enter) into the Contract;
B. under the Contract, the "DAAB" or "Dispute Avoidance/Adjudication Board" means the sole member or three members (as stated in the Contract Data of the Contract) so named in the Contract, or appointed under Sub-Clause 21.1 [Constitution of the DAAB] or Sub-Clause 21.2 [Failure to Appoint DAAB Members] of the Conditions of Contract;
C. the Employer and the Contractor desire jointly to appoint the above-named DAAB Member to act on the DAAB as:
a. the sole member of the DAAB, and where this is the case, all references to the "Other Members" do not apply; or
b. one of three members / chairman [delete the one which is not applicable] of the DAAB and, where this is the case, the other two persons are:

_____ (name) _____ (name)
_____ (address) _____ (address)
_____(telephone) _____(telephone)
_____(email/ other contact details) _____ (email/other contact details)

the "**Other Members**"; and
D. the DAAB Member accepts this appointment.

The Employer, Contractor and DAAB Member jointly agree as follows:

1. The conditions of this DAAB Agreement comprise:
(a) Clause 21 [Disputes and Arbitration] of the Conditions of Contract, and any other provisions of the Contract that are applicable to the DAAB's Activities; and
(b) the "General Conditions of Dispute Avoidance/Adjudication Agreement", which is appended to the General Conditions of the "Conditions of Contract for Construction" Second Edition 2017 published by FIDIC ("GCs"), as amended and/or added to by the following provisions.
2. [Details of amendments to the GCs, if any. For example:
In the procedural rules annexed to the GCs, Rule _ is deleted and replaced by: " … "]
3. The DAAB Member shall be paid in accordance with Clause 9 of the GCs. The currency of payment shall be _____.
In respect of Sub-Clauses 9.1 and 9.2 of the GCs, the amounts of the DAAB Member's monthly fee and daily fee shall be:
monthly fee_____ per month, and
daily fee of_____ per day
(or as otherwise set under Sub-Clause 9.3 of the GCs).
4. In consideration of the above fees, and other payments to be made to the DAAB Member in accordance with the GCs, the DAAB Member undertakes to act as DAAB Member in accordance with the terms of this DAAB Agreement.
5. The Employer and the Contractor shall be jointly and severally liable for the DAAB Member's fees and other payments to be made to the DAAB Member in accordance with the GCs.
6. This DAAB Agreement shall be governed by the law of _____ (if not stated, the law that governs the Contract under Sub-Clause 1.4 of the Conditions of Contract).

SIGNED by:_____	SIGNED by:_____	SIGNED by:_____
Print name:_____	Print name:_____	DAAB Member
Title: _____	Title:_____	Title:_____
for and on behalf of the Employer	for and on behalf of the Contractor	
in the presence of	in the presence of	in the presence of
Witness:_____	Witness:_____	Witness:_____
Name:_____	Name:_____	Name:_____
Address:_____	Address:_____	Address:_____
_____	_____	_____
Date:_____	Date:_____	Date:_____

FORM OF MOBILIZATION ADVANCE GUARANTEE/ BOND

Guarantee No._____ Date _____

WHEREAS _____ (hereinafter called the 'Employer')
has entered into a Contract for _____
(Particulars of Contract)
with _____ (hereinafter called the "Contractor').
AND WHEREAS, the Employer has agreed to advance to the Contractor, at the Contractor's request, an amount of Pak Rupees _____ (PKR _____) which amount shall be advanced to the Contractor as per provisions of the Contract.
AND WHEREAS, the Employer has asked the Contractor to furnish Guarantee to secure the mobilization advance for the performance of his obligations under the said Contract.
AND WHEREAS, _____

(hereinafter called the "Guarantor") at the request of the Contractor and in consideration of theEmployer agreeing to make the above advance to the Contractor, has agreed to furnish the said Guarantee.
NOW, THEREFORE, the Guarantor hereby guarantees that the Contractor shall use the advance for the purpose of above mentioned Contract and if he fails and commits default in fulfilment of any of his obligations for which the advance payment is made, the Guarantor shall be liable to the Employer for payment not exceeding the aforementioned amount.
Notice in writing of any default,on the part of the Contractor, of which the Employer at his discretion of making decision, shall be given by the Employer to the Guarantor, and on such first written demand, payment shall be made by the Guarantor of all sums then due under this Guarantee without any reference to the Contractor and without any objection.
This Guarantee shall 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
PKR _____ (PakRupees _____).
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 paymentsfrom Interim Payment Certificates of the Contractor provided that the Guarantor

agrees that the aforesaid period of validity shall be deemed to be extended if on the above mentioned date the advance payment is not fully adjusted.

Guarantor
(Scheduled Bank/ Insurance Company)

Signature _____
Name _____
Title _____

WITNESS:

1. _____
_____
Corporate Secretary (Seal) Corporate Guarantor (Seal)

2. _____
_____
Name, Title & Address

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Retention Money Security
Demand Guarantee

_____ [Guarantor letterhead or SWIFT identifier code]
Beneficiary: _____ [Insert name and Address of Employer]
Date: _____[Insert date of issue]
RETENTION MONEY GUARANTEE No.: [Insert guarantee reference number]
Guarantor: [Insert name and address of place of issue, unless indicated in the letterhead]

We have been informed that _____ [insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture] (hereinafter called "the Contractor") has entered into Contract No. _____ [insert reference number of the contract] dated _____ with the Employer, for the execution of _____ [insert name of contract and brief description of Works] (hereinafter called "the Contract").
Furthermore, we understand that, according to the conditions of the Contract, the Employer retains moneys up to the limit set forth in the Contract ("the Retention Money"), and that when the Taking-Over Certificate has been issued under the Contract and the first half of the Retention Money has been certified for payment, payment of [insert the second half of the Retention Money orifthe amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security and, if required, the ES Performance Security] is to be made against a Retention Money guarantee.
At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ [insert amount in figures] () [amount in words] upon receipt by us of the Employer's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without your needing to prove or show grounds for your demand or the sum specified therein.
A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Employer's bank stating that the second half of the Retention Money as referred to above has been credited to the contractor on its account number _____ at _____ [insert name and address of Contractor's bank].
This guarantee shall expire no later than the …. day of ……, 2…, and any demand for payment under it must be received by us at the office indicated above on or before that date.

_____
[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

Integrity Pact

Integrity Pact

DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC. PAYABLE BYTHE SUPPLIERS OF GOODS, SERVICES & WORKS IN CONTRACTS WORTH RS.10.00 MILLION OR MORE

Contract Number: Contract Value: Contract Title:

Dated:

[Name of Supplier] 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 Pakistan or any administrative subdivision or agency thereof or any other entity owned or controlled by it (GoP) through any corrupt business practice.

Without limiting the generality of the foregoing [Name of Supplier] represents and warrants that it has fully declared the brokerage, commission, fee 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 consultations fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP, except that which has been expressly declared pursuant hereto.

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

[Name of Supplier] accepts full responsibility and strict liability for making and false declaration, not making full disclosure, misrepresenting fact 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 right and remedies available to GoP under any law, contract or other instrument, be voidable at the option of GoP.

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

Name of Employer: ……
Signature: ……
[Seal]

Name of Bidder/Contractor: ……
Signature: …….
[Seal]

Performance Guarantee Form

FORM OF PERFORMANCE SECURITY

Guarantee No._____
Executed on _____
Expiry date _____

Name of Guarantor with address: _____

Name of Principal (Contractor) with address:_____

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

Letter of Acceptance No. _____Dated _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bidding Documents and above said Letter of Acceptance (hereinafter called the Documents) and at the request of the said Principal we, the Guarantor above named, are held and firmly bound unto the **Federal Government Employees Housing Authority (Federal Government Employees Housing Authority-FGEHA), Director 10, Mauve Area, G-10/4, Islamabad Capital Territory** (hereinafter called the Employer) in the penal sum of the amount stated above for the payment of which sum well and truly to be made to the said Employer, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has accepted the Employer's above said Letter of Acceptance for _____ _____

(Name of Contract) for the **LANDSCAPING AND HORTICULTURE WORKS IN SECTOR F-14 & F-15, ISLAMABAD.** (**P200199**)
_____ (Name of Project).

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the Employer, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract and of any and all modifications of said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause11, Defects After Taking Over, of Conditions of Contract are fulfilled.

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

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

above, against the Employer's written declaration that the Principal has refused or failed to perform the obligations under the Contract which payment will be effected by the Guarantor to Employer's designated Bank & Account Number.

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

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

Guarantor
(Schedule Bank/ Insurance Company)
Signature: _____
Name: _____
Title: _____

Corporate Guarantor (Seal)

WITNESS:

1.
_____
_____

2.

_____
_____
Name, Title & Address

Annexure

Adjustment Data

SBD Document (Read-Only)

See Form Under Additional Forms and Documents: **Adjustment Data** (page number: 574)

Bidding Documents Vol-I

Information (Read-Only)

See Form Under Additional Forms and Documents: **Bidding Documents Vol-I** (page number: 576)

Special Provisions

Information (Read-Only)

See Form Under Additional Forms and Documents: **Special Provisions** (page number: 667)

Specifications Volume-II

Information (Read-Only)

See Form Under Additional Forms and Documents: **Specifications Volume-II** (page number: 694)

BOQ Volume-III

Information (Read-Only)

See Form Under Additional Forms and Documents: **BOQ Volume-III** (page number: 943)

Tender Drawings Voulme-IV

Information (Read-Only)

See Form Under Additional Forms and Documents: **Tender Drawings Voulme-IV** (page number: 987)

Technical Specs for Solar System and Solar Lights

Information (Read-Only)

See Form Under Additional Forms and Documents: **Technical Specs for Solar System and Solar Lights** (page number: 1000)

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Procurement Forms

Past Construction Experiences

See Form Under Additional Forms and Documents: **Past Construction Experiences** (page number: 1002)

Contractor's Key Personnel Representative and Their Schedules

See Form Under Additional Forms and Documents: **Contractor's Key Personnel Representative and Their Schedules** (page number: 1008)

Financial Resources

See Form Under Additional Forms and Documents: **Financial Resources** (page number: 1012)

Past Experience and Completed Contracts

See Form Under Additional Forms and Documents: **Past Experience and Completed Contracts** (page number: 1013)

Historical Contract Non-Performance, and Pending Litigation and Litigation History

See Form Under Additional Forms and Documents: **Historical Contract Non-Performance, and Pending Litigation and Litigation History** (page number: 1014)

Current Contracts and Their Progress

See Form Under Additional Forms and Documents: **Current Contracts and Their Progress** (page number: 1016)

Financial Capacity and Net Worth Evaluation Form

See Form Under Additional Forms and Documents: **Financial Capacity and Net Worth Evaluation Form** (page number: 1017)

Average Annual Turnover

See Form Under Additional Forms and Documents: **Average Annual Turnover** (page number: 1019)

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

PUBLIC PROCUREMENT REGULATORY AUTHORITY
(PPRA)
EPADS

Additional Forms and Documents

PRICE ADJUSTMENT

The source of prices and the weightages for use in the adjustment formula under Clause 70 shall be as follows:

Cost Element	Description	Weightages	Applicable Price
(i)	**(ii)**	**(iii)**	**(iv)**
a	Fixed Portion	0.45	
b	Labour *(Labourer (un-skilled) per day, shall be taken as representative of all types of Labour (skilled/unskilled) deployed at site)*	0.24	Government of Pakistan (GP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin.
c	Cement *(OPC cement per bag shall be taken as representative of all types of cement used at the site)*	0.06	- do -
d	Reinforcing Steel *(½" Ø round M.S. Bars per tonne shall be taken as representative of all types and diameters of Steel Reinforcement)*	0.04	- do -
e	Crush/Bajri (rata) (per truck) (100 CFT) *(Bajri(rata) shall be taken as representative of all types of coarse aggregates, base course and sub base course)*	0.06	- do -
f	High Speed Diesel (HSD) *(HSD shall be taken as representative of all kind of fuels used in connection with the Contract)*	0.15	- do -
	Total	1.000	

Notes:

1) Prices for "(b)" to "(f)" shall be taken from the Government of Pakistan, Federal Bureau of Statistics. Monthly Statistical Bulletin. The base prices shall be those prevalent 28 days prior to the latest day for submission of Bids. Current date price of any element shall be those prevalent 28 days prior to the start of execution month to which a particular monthly statement is related.

2) If the Statistical Bulletin of the aforesaid month is not available at the time of Bid opening, then the Basic Prices of Specified Materials will be submitted by the Contractor at the time of their availability and shall be recommended by the Engineer and will be fixed as Basic Prices for Specified Materials for Price Adjustment.

3) The prices for the cost elements of (b) to (f) shall be used for Islamabad City.

4) Any fluctuation in the prices of materials other than those given above shall not be subject to adjustment of the Contract Price and shall be deemed to be included in the rates and prices quoted by the Bidders.

5) The prices of materials provided in this Appendix are for the purpose of price adjustment only. The Contractor shall base his rates entered in the Bill of Quantities on current market prices.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

FEDERAL GOVERNMENT EMPLOYEES HOUSING AUTHORITY

VOLUME-I

(INSTRUCTIONS TO BIDDERS, BIDDING DATA, FORM OF BID & APPENDICES TO BID, STANDARD FORMS, GENERAL CONDITIONS OF CONTRACT, PARTICULAR CONDITIONS OF CONTRACT)

LANDSCAPING AND HORTICULTURE WORKS IN SECTOR F-14 & F-15, ISLAMABAD.

INFRASTRUCTURE DEVELOPMENT WORKS OF SECTOR F-14 & F-15, ISLAMABAD

November, 2026

OSMANI & COMPANY PVT. LIMITED
245/2-k, Block 6, PECHS, Karachi -75400, Pakistan
Tel:(92-21) 34536007/08 Fax: (92-21) 34534691
Email: ocl-khi@osmani.com

PART-A

BIDDING PROCEDURE & REQUIREMENTS

SECTION I: INVITATION FOR BIDS

SECTION III: BID DATA SHEET

Bid Data Sheet (BDS)

The following specific data for the procurement of works shall complement, supplement, or amend the provisions in the Instructions to Bidders (ITBs). Whenever there is a conflict, the provisions herein shall prevail over those in ITBs.

BDS Clause Number	ITB Number	Amendments of, and Supplements to, Clauses in the Instruction to Bidders
A. Introduction		
1.	**1.1**	Name of Procuring agency/Employer: **Employer: Federal Government Employees Housing Authority (FGEHA)** **Employer's Representative: Project Director (F-14/15), Federal Government Employees Housing Authority (FGEHA)** The subject of procurement is: **Landscaping and Horticulture Works in Sector F-14 & F-15, Islamabad.** Period for completion of the works: **The project is expected to be completed within 24 months.** Commencement date execution of the works: **To be notified later (form the date as mentioned in the Letter of Commencement)** Type of Procurement: **National Competitive Bidding** (Open Competitive Bidding procedure under the Single Stage–Two Envelope method)
2.	**2.1**	Financial year for the operations of the Procuring agency/Employer: **Fiscal year 2026-2028** Name of Project: **Landscaping and Horticulture Works in Sector F-14 & F-15, Islamabad.** The funds will be collected by FGEHA from the project allottees to whom plots are being offered, in accordance with FGEHA's applicable rules and policies. (Self-Financing)
3.	**3.1**	Joint venture is not allowed.

B. Bidding Documents

4.	**7.2**	The Contractor shall upload its bid through EPADS and submit **two hard copies** of the Technical and Financial Bid in accordance with the instructions and requirements stipulated in the Bidding Documents. The Single Stage Two Envelope procedure will be adopted. The original Bid Security shall be enclosed in a sealed envelope along with the Technical Bid. Failure to submit the original Bid Security in the prescribed manner shall render the bid non-responsive.
5.	**8.1**	The address for clarification of Bidding Documents is **"Office of the Procurement Cell, Federal Government Employees Housing Authority (FGEHA), 10-Mauve Area Street No. 38, G-10/4, Islamabad"**

C. Preparation of Bids

6.	**10.1**	The Language of all correspondences and documents related to the Bid is: **English**
7.	**11.1 (i)**	Add as point "k" *Authorization letter issued by the bidder empowering its representative to sign and submit the bid*.
8.	**11.5**	The required documents and other accompanying documents must be in English. In case any other language than English is used the pertinent translation into English shall be attached to the original version.
9.	**15.5**	The bid price shall be adjusted in accordance with Appendix C– Formula for Price Adjustment.
10.	**15.6**	Name of the works: **Landscaping and Horticulture Works in Sector F-14 & F-15, Islamabad.**
11.	**16.1**	The currency of the Bid shall be **PKR***;*
12.	**18.1**	The Bid Validity period shall be **120** days.
13.	**19.1**	The currency of the Bid Security shall be: **PKR** Bid Securing Declaration not required.
14.	**19.3**	The Bid Security shall be in the form of an unconditional, irrevocable bank guarantee and shall be submitted in an amount/ currency PKR as a CDR. The original Bid security shall be submitted in original with Technical Bids.

15.	**19.3 (c)**	Other forms of security are: **N/A**
16.	**22.1**	The Bidder shall provide one original and two copies of the bids.
17.	**22.2**	An undertaking shall be provided by the bidder's representative confirming that he is an employee of the firm.

D. Submission of Bids

18.	**23.2**	The inner and outer envelopes shall: a) be addressed to Office of the Procurement Cell, Federal Government Employees Housing Authority (FGEHA), 10-Mauve Area Street No. 38, G-10/4, Islamabad" bear the title of the **"***Landscaping and Horticulture Works in Sector F-14 & F-15, Islamabad"* and a statement: **"DO NOT OPEN BEFORE",** to be completed with the time and the date specified in the Letter of Invitation to Bid.
19.	**24.1**	The deadline for Bid submission shall be as per the Letter of Invitation.

E. Opening and Evaluation of Bids

20.	**27.1**	The deadline for Bid submission shall be as per the Letter of Invitation.
21.	**33.2**	The currency that shall be used for Bid evaluation and comparison purposes to convert all Bid prices expressed in various currencies is: **PKR** The source of exchange rate shall be: **State Bank of Pakistan (if applicable)** The date of exchange rate shall be: **Last business day of the Calendar Year (if applicable).**
22.	**33.3**	The bids shall be quoted in **PKR** only
23.	**34**	**Evaluation Techniques** The Single Stage Two Envelope procedure will be adopted. Technical bids shall be opened and evaluated as per the

		qualification criteria. Financial bids of technically qualified bidders shall be opened subsequently. The most advantageous bidder, as determined by the Employer, shall be awarded the contract.
24.	**35**	Domestic preference **does not** apply. Preference to domestic or national suppliers or contractors shall be provided in accordance with policies of the Federal Government and/or in accordance with the regulations issued by the Authority.
F. Award of Contract		
25.	**48**	Performance security equal to 10% of the contract price shall be submitted within 28 days of issuance of the Letter of Award.
26.	**48**	An irrevocable, irreversible, and unconditional Performance Security in the form of a Bank Guarantee shall be accepted.
G. Review of Procurement Decisions		
27.	**53.6**	The Address of PPRA to submit a **copy** of appeal: Grievance Redressal Appellate Committee, Public Procurement Regulatory Authority 1st Floor, G-5/2, Islamabad, Pakistan Tel: +92-51-9202254

Section IV. Eligible Countries

All the bidders are allowed to participate in the subject procurement without regard to nationality, except bidders of some nationality, prohibited in accordance with policy of the Federal Government.

Following countries are ineligible to participate in the procurement process:

1. India
2. Israel

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Section V. Evaluation and Qualification Criteria

QUALIFICATION CRITERIA

Qualification of Bidders shall be evaluated on the basis of mentioned criteria regarding the Bidder's experience record, personnel capabilities, equipment capabilities and financial soundness in addition to fulfillment of mandatory requirements and collectively the bidder shall satisfied 75% of total marks for technical qualifications.

The Employer reserves the right to waive minor deviations, if they do not materially affect the capability of the Bidder to perform the Contract.

A. Mandatory Requirements:

i. Valid registration with PEC in category C-1 and above having CE-09, CE-10, CE-11(i), CE-11(vii), CE-11(ix), EE-04, EE-11(vi), EE-11(vv), EE-11(xvii) and EE-11(xxv) as codes of specialization.

ii. Affidavit of no blacklisting prepared within the current month of submission of bidding document.

iii. Information on any litigation or arbitration resulting from contracts completed or under execution by the Bidder. In case, the firm has never been involved in litigation, an affidavit to such effect should be provided

iv. Registration with income tax department (Valid NTN).

v. Registration with Sales Tax Department (GST/PST).

vi. On Active Tax Payer's List at the time of submission of Bid.

B. Detailed Requirements:

The detailed qualification evaluation shall be carried out in accordance with the prescribed criteria for each category, and a **minimum cumulative score of 75 % shall be required for qualification**.

Sr. No.	Category	Weightage / Marks
1.	Experience Record	40
2.	Personnel Capabilities	15
3.	Equipment Capabilities	15
4.	Financial Soundness	30

B.1. Experience:

Points for experience will be given on the basis of the following criteria:

Sr. No.	Sub-Category	Maximum Marks	Marks Allocation
a)	**Infrastructure Development Experience**	12	**Completed Projects**

Sr. No.	Sub-Category	Maximum Marks	Marks Allocation
	Experience as a Prime Contractor in the execution of projects of similar nature and complexity, such as **Roads, Earthworks, Area Development/ Area Grading, bridges etc**. completed during the last five (05) years or currently in-hand.		• 02 marks will be awarded for each completed project having cost > Rs. 1.0 billion maximum up to 04 marks. • 02 marks will be awarded for each completed project having cost from Rs. 700 million to 1.0 billion maximum up to 04 marks. • No marks will be given for projects having cost less than 700 million. **In-hand Projects** • 01 mark will be awarded for each in-hand project having cost > Rs. 1.0 billion maximum up to 02 marks. • 01 mark will be awarded for each in-hand project having cost from Rs. 700 million to Rs. 1.0 billion maximum up to 02 marks. • No marks will be given for projects having cost less than 700 million
b)	**Specialized Horticulture and Landscaping Experience** Experience as a Prime Contractor in the execution of projects of similar nature and complexity, such as **Parks, Green Belts, beautification, Green Up-gradation, etc.** completed during the last five (05) years or currently in-hand.	28	**Completed Projects** • 04 marks will be awarded for each completed project having cost > Rs. 1.0 billion maximum up to 08 marks • 04 marks will be awarded for each completed project having cost from Rs. 700 million to Rs. 1.0 billion maximum up to 08 marks • No marks will be given for projects having cost less than 700 million. **In-hand Projects** • 03 marks will be awarded for each in-hand project having cost > Rs. 1.0 billion maximum up to 06 marks • 03 marks will be awarded for each in-hand project having cost from Rs. 700 million to Rs. 1.0 billion maximum up to 06 marks. • No marks will be given for projects having cost less than 700 million.
	Total Marks Allocated	**40**	

Note:

i. The applicants must provide "Letter of Award" of in- hand projects and Taking Over/Completion Certificate of completed projects. No marks will be given to the projects for which above letter/certificate is not provided.

ii. Applicant shall provide complete information of the projects including scope, cost and covered area etc.

B.2. Personnel Capabilities:

Sr. No.	Personnel	Desired Minimum number available with the bidder	Marks Assigned	Required Minimum Qualification & Experience
i.	Project Manager/ Horticulturist	1	2	**PHD or M.Sc. (Hons) Horticulture** with minimum 10 years of relevant Experience to horticulture and landscaping works
ii.	Horticulturist	1	1	**B.Sc. (Hons) Horticulture (Landscaping)** with minimum 08 years of relevant Experience to horticulture and landscaping works
iii.	Civil Engineer	1	2	**B.Sc. Civil Engineering** registered with Pakistan Engineering Council (PEC) with minimum 06 years of relevant Experience to infrastructure works.
iv.	Electrical Engineer	1	1	**B.Sc. Electrical Engineering** registered with Pakistan Engineering Council (PEC) with minimum 06 years of relevant Experience to infrastructure works.
v.	Quantity Surveyor	1	1	**DAE (Civil**) with 05 years hands on experience of beautification/up-gradation of horticulture and landscaping works/ infrastructure works
vi.	Site Supervisor (Civil)	2	2	01 Personnel – 01 Mark **DAE (Civil)** with 05 years hands on experience of beautification/up-gradation of horticulture and landscaping works/ infrastructure works
vii.	Site Supervisor (Horticulture & Landscaping**)**	2	2	01 Personnel – 01 Mark **Diploma/ B.Sc. (Horticulture/ Landscaping**) with 03 years hands on experience of beautification/up-gradation of horticulture and landscaping works including gardening and preparation of soft landscaping/green areas.
iii.	Surveyor	1	1	**DAE (Civil)** with 05 years hands on experience of beautification/up-gradation of horticulture and landscaping works/ infrastructure works
ix.	Gardner/Mali	20	3	01 Personnel – 0.15 Mark **Preferably Literate** with 05 years' experience of gardening, horticulture and landscaping works.

Total Marks Allocated		**15**	

Note:

i. The applicant must provide verifiable proof of employment for the staff as appointment letters, salary slips for the latest months and attach detailed CVs & valid PEC Registration Certificates / Diploma / Certificates of the Engineer, DAEs staff.

B.3. Equipment Capabilities

Equipment's required for Development Works

Sr. No.	Equipment Type and Characteristics	Minimum Required	Maximum Marks
1.	Excavators	02 Nos.	01
2.	Bull dozer and Wheel/ Crawler Loader	02 Nos.	01
3.	Dump trucks & Compactor	03 Nos. & Plain 01 No.	01
4.	Survey Equipment's Total Station & Auto Level and Concrete mixer Machine , Min.(capacity 2 bag cement)	01 Each	01
5.	Tractor and trollies & Post Hole Digger	04 Nos. & 04 Nos.	01
6.	Water bowsers	04 Nos.	01
	Total Marks Allocated		**06**

Equipment's required for Operation & Maintenance

Sr. No.	Equipment Type and Characteristics	Minimum Required	Maximum Marks
1.	Large Capacity Lawn Movers with collector and sweeping attachments	08 Nos	01
2.	Electrical shrub cutters	04 Nos	01
3.	Edging shear	04 Nos	01
4.	Battery powered cordless hedge cutter	02 Nos	01
5.	Battery operated brush cutter	08 Nos	01
6.	Grass trimmer & Tree branch cutter	10 Nos & 08 Nos	01
7.	Water pipe, 0.75" dia & Movable sprinkler with stand (or rain guns)	200 meters &10 Nos	01
8.	Sprayer, separate for spraying insecticides and anti-termite & Large bins to pile garden debris before garden	04 Nos & 08 Nos	01
9.	Wheel barrows	40 Nos	01
	Total Marks Allocated		**09**

Note:

i. Proportionate marks will be awarded if minimum number of corresponding equipment is less than minimum required.

ii. Applicant must provide an undertaking to the effect that the aforementioned equipment is available with the firm.

B.4. Financial Capabilities

The Bidder shall submit copies of annual audit reports for the last three years duly certified by the Chartered Accounts and must indicate the soundness of the Applicants financial position.

Sr. No.	Description	Marks Assigned	Criteria for Marks Obtained
a)	**Average Annual Turn Over during the last (03) years.**	10	• Max Ten (10) marks shall be awarded if the average annual turnover for last three (03) years ≥ Rs. 01 billion. • Proportional Marks shall be awarded if the average annual turnover during the last three (03) years ≥ Rs. 700 million but < Rs. 01 billion, calculated as: Marks = (Actual Turnover/ Max. Cap) x Max. Marks • For limit less than Rs. 700 million no marks shall be awarded.
b)	**Working Capitals**	10	• Ten (10) Marks shall be awarded if the working capital for the last year ≥ Rs. 200 million. • Proportional Marks shall be awarded if the working capital for the last year is ≥ Rs. 100 million but < Rs. 200 million, calculated as: Marks = (Actual Working Capital/ Max. Cap) x Max. Marks • For limit less than Rs. 100 million no marks shall be awarded.
c)	**Bank Credit Line** (The bidder must provide an unconditional, project specific credit line commitment letter from a scheduled bank in Pakistan on its official letterhead)	10	• Ten (10) marks shall be awarded if the Bank Credit Line ≥ Rs. 250 million. • Proportional Marks shall be awarded if the Bank Credit Line ≥ Rs. 200 million but < Rs. 250 million, calculated as: Marks = (Actual Bank Credit Line/ Max. Cap) x Max. Marks • Zero marks shall be given in case Bank Credit Line is less than Rs. 200 million

Total marks allocated	30	

Authorized Signature and official Seal: _____

Name: _____

Date: _____

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Contractor's Representative and Key Personnel

The Bidder must demonstrate that it will have a suitably qualified Contractor's Representative and suitably qualified (and in adequate numbers) Key Personnel, as described in the Specification. The bidder must attach a list of relevant qualified personnel.

Authorized Signature and official Seal: _____

Name: _____

Date: _____

PROPOSED CONSTRUCTION SCHEDULE

(to be filled and signed by the Bidder)

The Bidder shall provide Construction Schedule in the bar chart (CPM or PERT) showing the sequence of work items and the period of time during which he proposes to complete each work item in such a manner that his proposed programme for completion of the whole of the works and parts of the works may meet Employer's completion targets in days noted below and counted from the date of receipt of Engineer's Notice to Commence. (Attach sheets as required for the specified form of Construction Schedule):

Description	**Time for Completion**
Landscaping and Horticulture Works in Sector F-14 & F-15, Islamabad.	24 months

Authorized Signature and official Seal: _____

Name: _____

Date: _____

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PRICE ADJUSTMENT

The source of prices and the weightages for use in the adjustment formula under Clause 70 shall be as follows:

Cost Element	Description	Weightages	Applicable Price
(i)	**(ii)**	**(iii)**	**(iv)**
a	Fixed Portion	0.45	
b	Labour *(Labourer (un-skilled) per day, shall be taken as representative of all types of Labour (skilled/unskilled) deployed at site)*	0.24	Government of Pakistan (GP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin.
c	Cement *(OPC cement per bag shall be taken as representative of all types of cement used at the site)*	0.06	- do -
d	Reinforcing Steel *(½" Ø round M.S. Bars per tonne shall be taken as representative of all types and diameters of Steel Reinforcement)*	0.04	- do -
e	Crush/Bajri (rata) (per truck) (100 CFT) *(Bajri(rata) shall be taken as representative of all types of coarse aggregates, base course and sub base course)*	0.06	- do -
f	High Speed Diesel (HSD) *(HSD shall be taken as representative of all kind of fuels used in connection with the Contract)*	0.15	- do -
	Total	1.000	

Notes:

1) Prices for "(b)" to "(f)" shall be taken from the Government of Pakistan, Federal Bureau of Statistics. Monthly Statistical Bulletin. The base prices shall be those prevalent 28 days prior to the latest day for submission of Bids. Current date price of any element shall be those prevalent 28 days prior to the start of execution month to which a particular monthly statement is related.

2) If the Statistical Bulletin of the aforesaid month is not available at the time of Bid opening, then the Basic Prices of Specified Materials will be submitted by the Contractor at the time of their availability and shall be recommended by the Engineer and will be fixed as Basic Prices for Specified Materials for Price Adjustment.

3) The prices for the cost elements of (b) to (f) shall be used for Islamabad City.

4) Any fluctuation in the prices of materials other than those given above shall not be subject to adjustment of the Contract Price and shall be deemed to be included in the rates and prices quoted by the Bidders.

5) The prices of materials provided in this Appendix are for the purpose of price adjustment only. The Contractor shall base his rates entered in the Bill of Quantities on current market prices.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

METHOD OF PERFORMING THE WORK

(to be filled and signed by the Bidder)

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, the type of facilities, 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 and providing all services including but not limited to supply of power, water, maintenance of facilities, safety and security and all what is required for completion of works in accordance with the Contract.

4. Quality control / Quality assurance measures to be adopted including procedures to be followed for carrying out all tests required under specifications.

5. The Bidder while preparing his methodology for performing and executing the works shall also consider the following:

a) The timely completion of the Project as per the time stated in the bid,

b) The Contractor while filling out the list of major equipment required at site, shall ensure that the equipment requirement is in consonance with the construction requirement.

c) The Contractor is not restricted to carry out the work in single shift. The Contractor should note that if he plans to execute the work in more than single shift than all costs related to the additional superintendence to be provided by the Engineer will be borne by the Contractor. Procedure for such additional costs will be worked out and finalized between the Contractor and Engineer with the consent of the Employer.

d) The portions of the Site shall be made available to the Contractor in coordination with other Contractors working at site. The Contractor shall prepare the work programme accordingly.

Authorized Signature and official Seal: _____

Name: _____

Date: _____

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

LIST OF MAJOR EQUIPMENT – RELATED ITEMS

(to be filled and signed by the Bidder)

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.

Note:

The bidder while preparing his methodology for performing and executing the works and listing out Major Equipment (required to complete the Works in the specified Time Schedule) in this Appendix shall consider the above mentioned minimum requirement of Construction Equipment to be brought/installed/erected at site.

Authorized Signature and official Seal: _____

Name: _____

Date: _____

LIST OF MAJOR EQUIPMENT

(to be filled and signed by the Bidder)

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						

Authorized Signature and official Seal: _____

Name: _____

Date: _____

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

CONSTRUCTION CAMP AND HOUSING FACILITIES

(to be filled and signed by the Bidder)

The Contractor in accordance with Clause 34 of the Special Conditions of Contract shall provide description of his construction camp's facilities and staff housing requirements.

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

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

1. Site Preparation (clearing, land preparation, etc.).

2. Provision of Services.

    a) Power (expected power load, etc.).
    b) Water (required amount and system proposed).
    c) Sanitation (sewage disposal system, etc.).

3. Construction of Facilities

    a) Contractor's Office. Workshop and Work Areas (areas required and proposed layout, type of construction of buildings, etc.).
    b) Warehouses and Storage Areas (area required, type of construction and layout).
    c) Housing and Staff Facilities (Plans for housing for proposed staff, layout, type of construction, etc.)

4. Construction Equipment Assembly and Preparation (detailed plans for carrying out this activity).

5. Other Items Proposed (Security services, etc.).

Authorized Signature and official Seal: _____

Name: _____

Date: _____

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

LIST OF SUBCONTRACTORS

(to be filled and signed by the Bidder)

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**

Authorized Signature and official Seal: _____

Name: _____

Date: _____

ESTIMATED PROGRESS PAYMENTS

(to be filled and signed by the Bidder)

Bidderer'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 Estimate, expressed in percentage of Bided Price (excluding Provisional Lump Sum Amount, if any):

Months	% of Bid Price
(a)	**(b)**
1st Quarter	
2nd Quarter	
3rd Quarter	
4th Quarter	
5th Quarter	
6th Quarter	
7th Quarter	
8th Quarter till completion of Project	
Total	

Authorized Signature and official Seal: _____

Name: _____

Date: _____

ORGANIZATIONAL CHART FOR THE SUPERVISORY STAFF AND LABOUR

(to be filled and signed by the Bidder)

MINIMUM MANDATORY STAFF REQUIREMENT:

The Contractor shall arrange the following staff at site immediately upon commencement of works:

Sr. No.	Personnel	Desired Minimum number available with the bidder	Required Minimum Qualification & Experience
i.	Project Manager/ Horticulturist	1	**PHD or M.Sc. (Hons) Horticulture** with minimum 10 years of relevant Experience to horticulture and landscaping works
ii.	Horticulturist	1	**B.Sc. (Hons) Horticulture (Landscaping)** with minimum 08 years of relevant Experience to horticulture and landscaping works
iii.	Civil Engineer	1	**B.Sc. Civil Engineering** registered with Pakistan Engineering Council (PEC) with minimum 06 years of relevant Experience to infrastructure works.
iv.	Electrical Engineer	1	**B.Sc. Electrical Engineering** registered with Pakistan Engineering Council (PEC) with minimum 06 years of relevant Experience to infrastructure works.
v.	Quantity Surveyor	1	**DAE (Civil**) with 05 years hands on experience of beautification/up-gradation of horticulture and landscaping works/ infrastructure works
vi.	Site Supervisor (Civil)	2	**DAE (Civil)** with 05 years hands on experience of beautification/up-gradation of horticulture and landscaping works/ infrastructure works
vii.	Site Supervisor (Horticulture & Landscaping**)**	2	**Diploma/ B.Sc. (Horticulture/ Landscaping**) with 03 years hands on experience of beautification/up-gradation of horticulture and landscaping works including gardening and preparation of soft landscaping/green areas.
iii.	Surveyor	1	**DAE (Civil)** with 05 years hands on experience of beautification/up-gradation of horticulture and landscaping works/ infrastructure works
ix.	Gardner/Mali	20	**Preferably Literate** with 05 years' experience of gardening, horticulture and landscaping works.

Note: The contractor shall increase site staff as directed by the Engineer/Employer, based on the quantum of work, without any additional cost.

Authorized Signature and official Seal: _____

Name: _____

Date: _____

SECTION VI: WORKS REQUIREMENT, TECHNICAL SPECIFICATIONS, DRAWINGS, SUPPLEMENTARY INFORMATION AND BILL OF QUANTITIES

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Scope of Works

LANDSCAPING AND HORTICULTURE WORKS IN SECTOR F-14 & F-15, ISLAMABAD.

a. Scope of work:

The scope of work includes but not limited to the following:

- Green Belts
- Major/Main Roads
- Plantation and Railing along Nullah
- Developments of Lakes
- Model Park and Lake Park in F-14

b. Terms & Conditions:

1. The plant Size shall be supplied strictly according to the **Height, Girth/Stem, Diameter** and other Specification given in the BOQ. (Height > 12 Ft with strong stem, Pot Size > 24-30)
2. All plants supplied shall be healthy, vigorous, disease free, Pest free and should not carrying fungal infections.
3. Plants shall have healthy and sufficiently grown roots and having sizeable Root-Ball, appropriate to their size. Root-Ball shall be intact during transportation.
4. The contractor shall supply the exactly approved species/variety mentioned in the BOQ. Substitution species shall not be permitted without the prior approval of competent authority.
5. Any plant that dies, severely diseased, dries out or fail to establish during the specified maintenance period shall be replaced by contractor with the healthy plant of the same specie or equal or better size at no additional cost.
6. The maintenance time for all the plants should be three (03) years and the time of each plant will be started to count when it will be planted.
7. All costs associated with the replacement including the plants, transportation, excavation, planting, staking watering and related operations shall be borne by the contractor.

8. The authorized representative shall have the right to inspect and approve plants at the site. Rejected plants shall be replaced by the contracted at no additional cost.

9. The contractor shall be responsible for complete maintenance and upkeep of all planted areas throughout the contract/maintenance period, including regular watering, hoeing, weeding, soil preparation, pruning, trimming, shaping and removal of dead/diseased branches, application of fertilizers, manures and plant nutrients, pest and diseased control, soil conditioning, mulching, staking and support of plants where required, replacement of dead damaged and diseased plants and all other necessary horticultural operation required to maintain a plant

Authorized Signature and official Seal: _____

Name: _____

Date: _____

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Technical Specifications

Specifications are attached as Volume-II of the bidding documents.

Authorized Signature and official Seal: _____

Name: _____

Date: _____

Drawings

Drawings are attached as Volume-IV of the bidding documents.

Authorized Signature and official Seal: _____

Name: _____

Date: _____

Supplementary Information

(If required, to be discussed and recorded in the pre-bid meeting.)

Authorized Signature and official Seal: _____

Name: _____

Date: _____

Bill of Quantities

Specifications are attached as Volume-III of the bidding documents.

Technical Proposal

- **Site Organization**
- **Method Statement**
- **Mobilization Schedule**
- **Construction Schedule**
- **Equipment**

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Site Organization
(To be provided by the bidder)

Authorized Signature and official Seal: _____

Name: _____

Date: _____

.

Method Statement

(To be provided by the Bidder)

Authorized Signature and official Seal: _____

Name: _____

Date: _____

Mobilization Schedule

(To be provided by the Bidder)

The Contractor shall not carry out mobilization to Site unless the Engineer gives consent.

Authorized Signature and official Seal: _____

Name: _____

Date: _____

Construction Schedule

(To be provided by the Bidders)

Authorized Signature and official Seal: _____

Name: _____

Date: _____

Form EQU: Equipment

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section III, Evaluation and Qualification Criteria. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.

Item of equipment		
Equipment information	Name of manufacturer	Model and power rating
	Capacity	Year of manufacture
Current status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment ☐ Owned ☐ Rented ☐ Leased ☐ Specially manufactured	

Omit the following information for equipment owned by the Bidder.

Owner	Name of owner	
	Address of owner	
	Telephone	Contact name and title
	Fax	Telex
Agreements	Details of rental / lease / manufacture agreements specific to the project	

SECTION VII: STANDARD BIDDING FORMS

Table of Forms

Letter of Bid – Technical Proposal
Letter of Bid - Financial Proposal
Bidder Information Form
Bidder's JV Members Information Form
Personnel
Financial Situation
EXPERIENCE
Form of Bid Security
Form of Bid-Securing Declaration

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Letter of Bid – Technical Proposal

INSTRUCTIONS TO BIDDERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE DOCUMENT

Place this Letter of Bid in the first envelope "TECHNICAL PROPOSAL".

The Bidder must prepare the Letter of Bid on stationery with its letterhead clearly showing the Bidder's complete name and business address.

Note: All italicized text in black font is to help Bidders in preparing this form and Bidders shall delete it from the final document.

Date of this Bid submission: [insert date (as day, month and year) of Bid submission]

RFB No.: [insert number of Bidding process]

Alternative No.: [insert identification No if this is a Bid for an alternative]

To: **[insert complete name of Procuring agency/Employer]**

We, the undersigned Bidder, hereby submit the first part of our Bid, the Technical Proposal

In submitting our Bid we make the following declarations:

(a) **No reservations:** We have examined and have no reservations to the bidding document, including addenda issued in accordance with Instructions to Bidders **(ITB 9);**

(b) **Eligibility**: We meet the eligibility requirements and have no conflict of interest in accordance with ITB 3;

(c) **Bid/Proposal-Securing Declaration**: We have not been suspended nor declared ineligible by the Procuring agency/Employer based on execution of a Bid Securing Declaration or Bid Securing Declaration in the Procuring agency/Employer's country in accordance with **ITB 3;**

(d) **Conformity:** We offer to execute works in conformity with the bidding document and in accordance with the works requirements: [insert a brief description of the WORKS];

(e) **Bid Validity Period**: Our Bid shall be valid for the period specified in **BDS 18.1** (as amended, if applicable) from the date fixed for the Bid submission deadline specified in **BDS 24.1** (as amended, if applicable), and it shall remain binding upon us, and may be accepted at any time before the expiration of that period;

(f) **Performance Security**: If our Bid is accepted, we commit to obtain a performance security in accordance with the bidding document;

(g) One Bid per Bidder: We are not submitting any other Bid(s) as an individual Bidder, and we are not participating in any other bid(s) as a Joint Venture member or as a subcontractor, and meet the requirements, other than Alternative Bids submitted in accordance with **ITB 20;**

(h) **Suspension and Debarment**: We, along with any of our subcontractors, suppliers, consultants, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Procuring agency/Employer. Further, we are not ineligible under Pakistan laws;

(i) **State-owned enterprise or institution**: [select the appropriate option and delete the other] [We are not a state-owned enterprise or institution] / [We are a state-owned enterprise or institution];

(j) **Binding Contract**: We understand that this Bid, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed;

(k) **Not Bound to Accept**: We understand that you are not bound to accept the Most Advantageous Bid or any other Bid that you may receive; and

(l) **Fraud and Corruption**: We hereby certify that we have taken steps to ensure that no person acting for us, or on our behalf, engages in any type of Fraud and Corruption.

Name of the Bidder: *[insert complete name of Bidder]

Country of Origin of the Bidder: [insert country of origin, in case of JV country of origin of lead member]

Name of the person duly authorized to sign the Bid on behalf of the Bidder: ** [insert complete name of person duly authorized to sign the Bid]

Title of the person signing the Bid: [insert complete title of the person signing the Bid]

Signature of the person named above: [insert signature of person whose name and capacity are shown above]

Date signed [insert date of signing] **day of** [insert month], [insert year]

*****: In the case of the Bid submitted by a Joint Venture specify the name of the Joint Venture as Bidder.

**: Person signing the Bid shall have the power of attorney given by the Bidder. The power of attorney shall be attached with the Bid Schedules.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Letter of Bid - Financial Proposal

INSTRUCTIONS TO BIDDERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE DOCUMENT

Place this Letter of Bid - Financial Proposal in the second envelope marked "FINANCIAL PROPOSAL".

The Bidder must prepare the Letter of Bid - Financial Proposal on stationery with its letterhead clearly showing the Bidder's complete name and business address.

Note: All italicized text is to help Bidders in preparing this form.

Date of this Bid submission: [insert date (as day, month and year) of Bid submission]

Request for Bid No.: [insert number of bidding process]

Name of Project.: [insert identification]

Alternative No.: [insert identification No if this is a Bid for an alternative]

To: [insert complete name of Procuring agency/Employer]

We, the undersigned Bidder, hereby submit the second part of our Bid, the Financial Proposal

In submitting our Financial Proposal we make the following additional declarations:

(a) **Bid Validity Period**: Our Bid shall be valid for the period specified in **BDS 18.1** (as amended, if applicable) from the date fixed for the bid submission deadline specified in **BDS 24.1** (as amended, if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(b) **Total Price:** The total price of our Bid is:

In case of only one lot, the total price of the Bid is [insert the total price of the bid in words and figures, indicating the various amounts and the respective currencies];

In case of multiple lots, the total price of each lot is [insert the total price of each lot in words and figures, indicating the various amounts and the respective currencies];

In case of multiple lots, total price of all lots (sum of all lots) [insert the total price of all lots in words and figures, indicating the various amounts and the respective currencies];

(c) **Commissions, gratuities and fees:** We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract: [insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity].

Name of Recipient	Address	Reason	Amount

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

(d) **Binding Contract:** We understand that this Bid, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed.

Name of the Bidder:*[insert complete name of the Bidder]

Name of the person duly authorized to sign the Bid on behalf of the Bidder: ** [insert complete name of person duly authorized to sign the Bid]

Title of the person signing the Bid: [insert complete title of the person signing the Bid]

Signature of the person named above: [insert signature of person whose name and capacity are shown above]

Date signed [insert date of signing] **day of** [insert month], [insert year]

*****: In the case of the Bid submitted by a Joint Venture specify the name of the Joint Venture as Bidder.

**: Person signing the Bid shall have the power of attorney given by the Bidder. The power of attorney shall be attached with the Bid Schedules.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

FORM ELI 1

Bidder Information Form
[The Bidder shall fill in this Form in accordance with the instructions indicated below. No alterations to its format shall be permitted and no substitutions shall be accepted.]

Date: [insert date (as day, month and year) of Bid submission]
RFB No.: [insert number of Bidding process]
Alternative No.: [insert identification No if this is a Bid for an alternative]

Page _____ of_ _____ pages

1. Bidder's Name [insert Bidder's legal name]
2. In case of JV, legal name of each member : [insert legal name of each member in JV]
3. Bidder's actual or intended country of registration: [insert actual or intended country of registration]
4. Bidder's year of registration: [insert Bidder's year of registration]
5. Bidder's Address in country of registration: [insert Bidder's legal address in country of registration]
6. Bidder's Authorized Representative Information Name: [insert Authorized Representative's name] Address: [insert Authorized Representative's Address] Telephone/Fax numbers: [insert Authorized Representative's telephone/fax numbers] Email Address: [insert Authorized Representative's email address]
7. Attached are copies of original documents of [check the box(es) of the attached original documents] ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above. ☐ In case of JV, JV agreement, in accordance with ITB 3.3. ☐ Establishing that the Bidder is not under the supervision of the Procuring agency/Employer[in case of subsidiaries] 8. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

ELI2

Bidder's JV Members Information Form

[The Bidder shall fill in this Form in accordance with the instructions indicated below. The following table shall be filled in for the Bidder and for each member of a Joint Venture]].

Date: [insert date (as day, month and year) of Bid submission]

RFB No.: [insert number of RFB process]

Alternative No.: [insert identification No if this is a Bid for an alternative]

Page _____ of_ _____ pages

1. Bidder's Name: [insert Bidder's legal name]
2. Bidder's JV Member's name: [insert JV's Member legal name]
3. Bidder's JV Member's country of registration: [insert JV's Member country of registration]
4. Bidder's JV Member's year of registration: [insert JV's Member year of registration]
5. Bidder's JV Member's legal address in country of registration: [insert JV's Member legal address in country of registration]
6. Bidder's JV Member's authorized representative information Name: [insert name of JV's Member authorized representative] Address: [insert address of JV's Member authorized representative] Telephone/Fax numbers: [insert telephone/fax numbers of JV's Member authorized representative] Email Address: [insert email address of JV's Member authorized representative]
7. Attached are copies of original documents of [check the box(es) of the attached original documents] ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above.

8. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Personnel

Form PER -1

Contractor's Representative and Key Personnel Schedule

Bidders should provide the names and details of the suitably qualified Contractor's Representative and Key Personnel to perform the Contract. The data on their experience should be supplied using the Form PER-2 below for each candidate.

Contractor' Representative and Key Personnel

1.	**Title of position:**	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
2.	**Title of position:**	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
3.	**Title of position:**	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]

	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
4.	**Title of position:**	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
5.	**Title of position:**	
	Name of candidate	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
6.	**Title of position:** *[insert title]*	
	Name of candidate	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]

Form PER-2:
Resume and Declaration
Contractor's Representative and Key Personnel

Name of Bidder

Position [*#1*]: [*title of position from Form PER-1*]		
Personnel information	**Name:**	**Date of birth:**
	Address:	**E-mail:**
	Professional qualifications:	
	Academic qualifications:	
	Language proficiency:*[language and levels of speaking, reading and writing skills]*	
details		
	Address of Procuring agency/Employer:	
	Telephone:	**Contact (manager / personnel officer):**
	Fax:	
	Job title:	**Years with present Procuring agency/Employer:**

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

Project	**Role**	**Duration of involvement**	**Relevant experience**
[main project details]	*[role and responsibilities on the project]*	*[time in role]*	*[describe the experience relevant to this position]*

Declaration

I, the undersigned *[insert either "Contractor's Representative" or "Key Personnel" as applicable]* , certify that to the best of my knowledge and belief, the information contained in this Form PER-2 correctly describes myself, my qualifications and my experience.

I confirm that I am available as certified in the following table and throughout the expected time schedule for this position as provided in the Bid:

Commitment	**Details**
Commitment to duration of contract:	*[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]*
Time commitment:	*[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]*

I understand that any misrepresentation or omission in this Form may:

(a) be taken into consideration during Bid evaluation;

(b) result in my disqualification from participating in the Bid;

(c) result in my dismissal from the contract.

Name of Contractor's Representative or **Key Personnel: [*insert name*]**

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Bidder:

Signature: _____

Date: (day month year): _____

Form CON – 2

Historical Contract Non-Performance, Pending Litigation and Litigation History

Bidder's Name: _____
Date: _____
JV Member Name_____
ICB/NCB No. and title: _____
Page _____of _____pages

Non-Performed Contracts in accordance with Qualification Criteria			
☐ Contract non-performance did not occur January *[insert year]* ☐ Contract(s) not performed since [*insert year]*			
Year	**Non-performed portion of contract**	**Contract Identification**	**Total Contract Amount (current value, currency, exchange rate and PKR equivalent)**
		Contract Identification: Name of Procuring agency/Employer(PA): Address of PA: Reason(s) for nonperformance:	
Pending Litigation, in accordance with Qualification Criteria			
☐ No pending litigation ☐ Pending litigation			

Year of dispute	Amount in dispute (currency)	Contract Identification	Total Contract Amount
		Contract Identification: _____ Name of PA: _____ Address of PA: _____ Matter in dispute: _____ Party who initiated the dispute: ____ Status of dispute: _____	
Litigation History in accordance with Section III, Evaluation and Qualification Criteria of the Prequalification document			
☐ No Litigation History ☐ Litigation History			
Year of award	**Outcome as percentage of Net Worth**	**Contract Identification**	**Total Contract Amount (currency), PKR Equivalent (exchange rate)**
[insert year]	*[insert percentage]*	Contract Identification: *[indicate complete contract name, number, and any other identification]* Name of PA: *[insert full name]* Address of PA: *[insert street/city/country]* Matter in dispute: *[indicate main issues in dispute]* Party who initiated the dispute: *[indicate "Procuring agency/Employer" or "Contractor"]* Reason(s) for Litigation and award decision *[indicate main reason(s)]*	*[insert amount]*

Financial Situation

Form FIN – 3.1:

Financial Situation and Performance

Bidder's Name: _____
Date: _____
JV Member's Name_____
ICB No. and title: _____
Page _____of _____pages

1. Financial data

Type of Financial information in (currency)	**Historic information for previous _____*years*, _____ (amount in currency, currency, exchange rate*, PKR equivalent)**				
	Year 1	Year 2	Year 3	Year4	Year 5
Statement of Financial Position (Information from Balance Sheet)					
Total Assets (TA)					
Total Liabilities (TL)					
Total Equity/Net Worth (NW)					
Current Assets (CA)					
Current Liabilities (CL)					
Working Capital (WC)					
Information from Income Statement					
Total Revenue (TR)					
Profits Before Taxes (PBT)					
Cash Flow Information					
Cash Flow from Operating Activities					

*Refer to ITB 16 for the exchange rate

2. Sources of Finance

Specify sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments.

No.	Source of finance	Amount (PKR)
1		
2		
3		

2. Financial documents

The Bidder and its parties shall provide copies of financial statements for _____years pursuant to Evaluation and Qualifications Criteria, Sub-factor 3.1. The financial statements shall:

(a) reflect the financial situation of the Bidder or in case of JV member, and not an affiliated entity (such as parent company or group member).

(b) be independently audited or certified in accordance with local legislation.

(c) be complete, including all notes to the financial statements.

(d) correspond to accounting periods already completed and audited.

☐ Attached are copies of financial statements for the _____years required above; and complying with the requirements

Form FIN – 3.2:

Average Annual Construction Turnover

Bidder's Name: _____
Date: _____
JV Member's Name_____
ICB/NCB No. and title: _____
Page _____of _____pages

	Annual turnover data (construction only)		
Year	**Amount** **Currency**	**Exchange rate**	**PKR equivalent**
[indicate year]	*[insert amount and indicate currency]*		
Average Annual Construction Turnover *			

* See Section III, Evaluation and Qualification Criteria.

Form FIN – 3.3:

Financial Resources

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

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

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Form FIN – 3.4:

Current Contract Commitments / Works in Progress

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

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

Form FIN - 5:

Self-Assessment Tool for Bidder's Compliance to Financial Resources (Criterion 2.1 of Section 3)

This form requires the same information submitted in Forms FIN – 3.3 and FIN -3.4. All conditions of "Available Financial Resources Net of CCC ≥ Requirement for the Subject Contract" must be satisfied to qualify.

Form FIN - 5A: For Single Entities

For Single Entities: (A)	Total Available Financial Resources from FIN – 3.3 (B)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN – 3.4 (C)	Available Financial Resources Net of CCC D = (B - C)	Requirement for the Subject Contract (E)	Results: Yes or No [*D must be greater than or equal to E*] (F)
_____ (Name of Bidder)				. . . . _	

Form FIN - 5B: For Joint Ventures

For Joint Ventures: (A)	Total Available Financial Resources from FIN – 3.3 (B)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN – 3.4 (C)	Available Financial Resources Net of CCC D = (B - C)	Requirement for the Subject Contract (E)	Results: Yes or No [*D must be greater than or equal to E*] (F)
One Partner:					
_____ (Name of Partner)				. . . .	
Each Partner:					

_____ _ (Name of Partner 1)				. . . .	
_____ _ (Name of Partner 2)				. . . .	
_____ _ (Name of Partner 3)				. . . .	
All partners combined	∑ D = Sum of available financial resources net of current contract commitments for all partners		∑ D = _____	. . . .	

- Note -

Form FIN – 5 is made available for use by the bidder as a self-assessment tool, and by the employer as an evaluation work sheet, to determine compliance with the financial resources requirement as stated in 2.3.3. Failure to submit Form FIN - 5 by the Bidder shall not lead to bid rejection.

EXPERIENCE

Form EXP - 4.1

General Construction Experience

Bidder's Name: _____
Date: _____
JV Member's Name_____
ICB/NCB No. and title: _____
Page _____of _____pages

Starting Year	Ending Year	Contract Identification	Role of Bidder
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of PA: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of PA: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of PA: _____ Address: _____	

Form EXP - 4.2(a)

Specific Construction and Contract Management Experience

Bidder's Name: _____
Date: _____
JV Member's Name_____
ICB/NCB No. and title: _____
Page _____of _____pages

Similar Contract No.	**Information**			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Sub-contractor ☐
Total Contract Amount			PKR equivalent	
If member in a JV or sub-contractor, specify participation in total Contract amount				
PA's Name:				
Address: Telephone/fax number E-mail:				

Form EXP - 4.2(a) (cont.)
Specific Construction and Contract Management Experience (cont.)

Similar Contract No.	Information
Description of the similarity in accordance with Sub-Factor 4.2(a) of Section III:	
1. Amount	
2. Physical size of required works items	
3. Complexity	
4. Methods/Technology	
5. Construction rate for key activities	
6. Other Characteristics	

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Form EXP - 4.2(b)

Construction Experience in Key Activities

Bidder's Name: _____
Date: _____
Bidder's JV Member Name: _____
Sub-contractor's Name[1] (as per ITB 34.2 and 34.3): _____
ICB/NCB No. and title: _____

Page _____of _____pages

All Sub-contractors for key activities must complete the information in this form as per ITB 38 and Qualification Criteria and Requirements, Sub-Factor 4.2.

1. Key Activity No One: _____

	Information			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Sub-contractor ☐
Total Contract Amount			PKR equivalent	
Quantity (Volume, number or rate of production, as applicable) performed under the contract per year or part of the year	Total quantity in the contract (i)	Percentage participation (ii)		Actual Quantity Performed (i) x (ii)
Year 1				
Year 2				
Year 3				
Year 4				

[1] If applicable

	Information
PA's Name:	
Address: Telephone/fax number E-mail:	

2. Activity No. Two

3. ……

	Information
Description of the key activities in accordance with Section III:	

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Form EXP - 4.2 (c)

Specific Experience in Managing ES aspects

[The following table shall be filled in for contracts performed by the Bidder, and each member of a Joint Venture]

Bidder's Name: *[insert full name]*
Date: *[insert day, month, year]*
Joint Venture Member Name: *[insert full name]*
ICB/NCB No. and title: *[insert ICB/NCB number and title]*
Page *[insert page number]* of *[insert total number]* pages

1. Key Requirement no 1 in accordance with 4.2 (c): _____

Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Subcontractor ☐
Total Contract Amount			PKR	
Details of relevant experience				

2. Key Requirement no 2 in accordance with 4.2 (c): _____
3. Key Requirement no 3 in accordance with 4.2 (c): _____
4. …

Section VIII. General Conditions (GC)

Red Book:

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The Conditions of Contract are the "General Conditions" which form part of the "Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer ("Red book") Second edition 2017" published by the Federation Internationale Des Ingenieurs – Conseils (FIDIC) and the following "Particular Conditions" which shall complement the General Conditions of the Contract.

An original copy of the above FIDIC publication i.e. "Conditions of Contract for Building and Engineering Works Designed by the Employer" must be obtained from FIDIC. A copy of this publication shall also be provided by the Contractor to the Employer at the Contractor's own cost.

International Federation of Consulting Engineers (FIDIC)

FIDIC Bookshop – Box- 311 – CH – 1215 Geneva 15 Switzerland

Fax: +41 22 799 49 054

Telephone: +41 22 799 49 01

E-mail: fidic@fidic.org

www.fidic.org

FIDIC code: ISBN13: 978-2-88432-084-9

Section IX. Particular Conditions of the Contract – Part A

Particular Conditions of the Contract

The Particular Conditions of Contract (PCC) complement the General Conditions of Contract (GCC) to specify data and contractual requirements of the Procuring agency/Employer/ Employer, the engineer, the sector, the overall project, and the works. In the event of a conflict, the provisions herein shall prevail over those in the GCC.

Part A – Contract Data

Contract data of the SCC, includes data to complement the GCC in a manner similar to the way in which the Bid Data Sheet complements the Instructions to Bidders. These clauses shall serve as additions or deletions to the General Conditions of the Contract. The Employer Representative reserves the right to declare any such additions, deletions or amendments, which the bidder is required to accept in all cases.

SCC Clause Number	GCC Clause Number	Amendments of, and Supplements to, Clauses in the GCC
General Provision (GCC 1)		
1.	1.1.27	**Defects Notification Period (DNP):** 365 days for Civil & E/M Works **Maintenance Period for Plants:** The maintenance period for all plants shall be **three (03) years (36 months)**, commencing separately for each plant from the date of its planting. The Contractor shall be responsible for the proper maintenance, care, and healthy growth of each plant throughout its respective maintenance period.
2.	1.1.84	**Time for Completion:** 728 days for whole of the works
3.	1.3	**For notices** 1. **Employer:** Director General, Federal Government Employees Housing Authority (FGEHA) 2. **Employer's Representative:** Project Director (F-14/15) 3. **Engineer:** M/s Osmani & Company Limited (OCL) 4. **Contractor:** To be provided by the Contractor
4.	1.4	**Governing Law;** The Applicable Law shall be the Laws of the Islamic Republic of Pakistan
3.	1.4	**Communication Language:**

		The Communication Language shall be English.
4.	1.5	**Documents forming the contract listed:** The documents listed at (a) through (k) of this Sub-Clause arestated in the order of Priority: (a) the Contract Agreement; (b) the Letter of Acceptance; (c) the Letter of Bid; (d) the Particular Conditions Part A - Contract Data; (e) the General Conditions; (f) Technical Specifications; (g) Special Conditions; (h) the Drawings; (i) the completed Schedules to Bid including Bill of Quantities; ~~(j) the JV Undertaking (if the Contractor is a JV); and~~ (k) any other documents forming part of the Contract. The addenda/corrigenda, if any, shall be deemed to have been incorporated at the appropriate places in the documents forming the Contract on the discretion of the Employer Representative.
The Employer/ Procuring agency/Employer (GCC Clause 2)		
5.	2.1	Access to the site shall be commensurate with the approved Work Schedule. In case the Employer fails to provide access or possession of the site within the prescribed time due to land disputes, the Contractor shall not be entitled to any claim on this account.
The Engineer (GCC Clause 3)		
6.	3.1	The Engineer is M/s Osmani & Company Limited (OCL).
7.	3.2	Engineer's Duties and Authority: Variations resulting in an increase of the Accepted Contract Amount in excess of **2 %** shall require approval of the Procuring agency/Employer.
The Contractor (GCC Clause 4)		
8.	4.2	A Performance Security equal to ten percent (10%) of the Contract Price shall be submitted within twenty-eight (28) days of issuance of the Letter of Award. An irrevocable, irreversible, and unconditional Performance Security in the form of a Bank Guarantee shall be acceptable.
9.	4.7.2(a)	**Clause 4.7 Setting out** Period for notification of errors in the items of reference: 28 days

10.	4.22	**Contractor's Operations on site** Landscaping and Horticulture works in Sector F-14 & F-15. The approved Master Plan/Layout Plan (LOP) of Sectors F-14 and F-15 shall be strictly followed in the development of parks, green belts, and all other designated open spaces.
Sub-Contracting (GCC Clause 5)		
11.	5.1	In addition to 5.1, The following text is added: Notwithstanding any provision to the contrary in the Contract, the Contractor shall ensure that the cumulative total value of all works assigned, sublet, or awarded to Nominated Subcontractors does not exceed forty percent (40%) of the Accepted Contract Amount. The Contractor shall not enlist, appoint, or award any work to a Nominated Subcontractor without obtaining the prior written approval of the Engineer and the Employer. To obtain approval, the Contractor must submit a formal request to the Engineer, accompanied by the subcontractor's profile, technical qualifications, and a detailed financial breakdown of the proposed subcontract value for verification.
Staff and Labour (GCC Clause 6)		
12.	6.5	Normal working hours: ***8 am – 5 pm (Monday to Saturday)***
Plant, Material and Workmanship (GCC Clause 7)		
13.	7.2	Samples *: As instructed by The Engineer*
Commencement, Delays and Suspension (GCC Clause 8)		
14.	8.3	Number of additional paper copies of program: ***4 including 1 soft***
15.	8.8	Delay damages shall be payable for each day of delay shall be ***0.01%*** of the Contract Price per day, in the currency and proportions in which the Contract Price is payable. Maximum amount of delay damages is **10%** of the Contract Price
Contract Price and Payment (GCC Clause 14)		
16.	14.2	An advance payment in the form of mobilization advance up to 5% of the Contract Amount may be provided by the Employer to the Contractor upon submission of an irreversible, irrevocable, and unconditional Bank Guarantee of the full amount. The advance payment shall be released in two parts: the first installment after submission of the request letter and provision of unconditional and irrevocable Bank Guarantee within fifteen days of signing contract agreement and the remaining half after provision of facilities as prescribed in special provisions and achieving 04% of physical progress within 42 days of signing of contract agreement.
17.	14.2.3	Repayment of Advance payment: At the rate of 15% of each IPC. All balance amount shall be recovered upon reaching 80% Physical Progress.

18.	14.3(iii)	Percentage of retention: **10% of the amount of Interim Payment Certificate.** Limit of Retention Money **5% of the amount of contract amount.**
19.	14.5(b)(i)	Plant and Materials: If Sub-Clause 14.5 applies: Plant and Materials for payment when shipped**: N/A**
20.	14.5(c)(i)	Plant and Materials: N/A
21.	14.6.2	Withholding (amounts in) an IPC **1%** of the Accepted Contract Amount. The minimum amount of IPC shall be 90 million PKR.
22.	14.7(a)	Period of payment of Advance Payment to the Contractor **As per clause 14.2 of PCC**
23.	14.7b(i)	Period for the Procuring agency/Employer to make interim payments to the Contractor under Sub-Clause 14.6 (interim Payment) **28 days**
24.	14.7b(ii)	Period for the Procuring agency/Employer to make interim payments to the Contractor under Sub-Clause 14.13 (Final Payment) **60 days**
25.	14.7(c)	Period for the Procuring agency/Employer to make final payment to the Contractor **60 days**
26.	14.8	Not applicable
27.	14.11.1(b)	Number of additional paper copies of draft Final Statement: **4**
28.	14.15	**Currencies of Payment** PKR is the only currency of payment
29.	14.15 (a)(i)	Not applicable
30.	14.15 (c)	Payable only in PKR
31.	14.15 (f)	Payments only in PKR.

32.	17.2 (d)	**Liability for Care of the Works** Any operation of the forces of nature (other than those allocated to the Contractor in the Contract Data) which is Unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate preventative precautions.
Insurance (GCC Clause 19)		
33.	19.1	Contractor to take out Contractor's All Risk (CAR) Policy to the extent of 10% of the cost of works.
34.	19.2.4	Amount of insurance required for injury to persons and damage to property **2 % of Contract Amount if not covered in CAR**
35.	19.2.6	**Insurance** <u>Other insurances required by Laws and by local practice</u> The contractor shall provide all other insurances required by the Laws of the countries where (any part of) the Works are being carried out, at the Contractor's own cost. Other insurances required by local practice (if any) shall be detailed in the Contract Data and the Contractor shall provide such insurances in compliance with the details given, at the Contractor's own cost.
Dispute Avoidance/ Adjudication Board (GCC Clause 21)		
36.	21.1	Time for appointment of DAAB *: within 28 days of Signing of Contract*
37.	21.1	The DAAB shall comprises of following members : i. three from employers ii. three from contractors
38.	21.1	List of proposed members of DAAB From Employer: 1) Chief Engineer, FGEHA 2) Director Law, FGEHA 3) Director Finance, FGEHA From Contractor: To be provided by the Contractor within 28 days of signing
39.	21.2	Appointing entity (official) for DAAB members: With the mutual Consent of Employer and Contractor

SECTION X: CONTRACT FORMS

Form of Contract

THIS AGREEMENT made the _____ day of _____ 20_____ between *[name and address of Procuring agency/Employer]* of Pakistan (hereinafter called "the Procuring agency/Employer") of the one part and *[name of Contractor]* of *[city and country of Contractor]* (hereinafter called "the ") of Contractor other part:

WHEREAS the Procuring agency/Employer desired that the works *[brief description of works]* should be executed by the contractor, and has accepted a Bid by the contractor for the execution and completion of these works and remedying of any defects therein, in the sum of *[contract price in words and figures]* (hereinafter called "the Contract Price").

NOW THIS CONTRACT WITNESSETH AS FOLLOWS:

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

2. The following documents shall be deemed to form and be read and construed as part of this Contract, In the event of any ambiguity or conflict between the Contract Documents listed below, the order of precedence shall be the order in which the Contract Documents are listed below:-

   (As mentioned in Particular Conditions of Contract)

3. In consideration of the payments to be made by the Procuring agency/Employer to the contractor as mentioned in this contract, the contractor hereby covenants with Procuring agency/Employer to execute the works to remedy defects therein in conformity in all respects with the provisions of the Contract.

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

IN WITNESS whereof the parties hereto have caused this Contract to be executed in accordance with their respective laws the day and year first above written.

Signed, sealed, delivered by _____the _____ (for the Procuring agency/Employer)	Signed, sealed, delivered by _____the _____ (for the Contractor)
Witness to the signatures of the Procuring agency/Employer …… …	Witness to the signatures of the Contractor …… ……

Integrity Pact

DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC. PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES & WORKS IN CONTRACTS WORTH RS.10.00 MILLION OR MORE

Contract Number: _____ Dated: _____
Contract Value: _____
Contract Title: _____

[Name of Contractor] hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Pakistan or any administrative subdivision or agency thereof or any other entity owned or controlled by it (GoP) 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, fee 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 consultations fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP, except that which has been expressly declared pursuant hereto.

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

[Name of Contractor] accepts full responsibility and strict liability for making and false declaration, not making full disclosure, misrepresenting fact 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 right and remedies available to GoP under any law, contract or other instrument, be voidable at the option of GoP.

Notwithstanding any rights and remedies exercised by GoP in this regard, [Name of Contractor] agrees to indemnify GoP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoP in an amount equivalent to ten time the sum of any commission, gratification, bribe, finder's fee or kickback given by [Name of 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 GoP.

_____ _____

[Procuring agency/Employer] [Contractor]

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

FORM OF BID SECURITY
(BANK GUARANTEE)

Security Executed on _____
(Date)

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

Name of Principal (Bidder) with Address _____

_____

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

Bid Reference No: _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at the request of the said Principal (Bidder) we, the Surety above named, are held and firmly bound unto _____
(hereinafter called the 'Employer') in the sum stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Bidder has submitted the accompanying Bid dated _____ for _____
_____ to the said Employer; and

(Particulars of Bid)

WHEREAS, the Employer has required as a condition for considering said Bid that the Bidder furnishes a Bid Security in the above said sum from a Scheduled Bank in Pakistan or from a foreign bank duly counter-guaranteed by a Scheduled Bank in Pakistan, to the Employer, conditioned as under:

(1) that the Bid Security shall remain in force upto and including the date 28 days after the deadline for validity of Bids as stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Surety is hereby waived.

(2) that the Bid Security of unsuccessful Bidders will be returned by the Employer after expiry of its validity or upon signing of the Contract Agreement; and

(3) that in the event of failure of the successful Bidder to execute the proposed Contract Agreement for such work and furnish the required Performance Security, the entire said sum be paid immediately to the said Employer pursuant to Clause-15.6 of the Instructions 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 Employer in accordance with

his Bid as accepted and furnish within fourteen(14) days of his being requested to do so, a Performance Security with good and sufficient surety, as may be required, upon the form

prescribed by the said Employer for the faithful performance and proper fulfilment of the said Contract or in the event of non-withdrawal of the said Bid within the time specified for its validity then this obligation shall be void and of no effect, but otherwise to remain in full force and effect.

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

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

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

SURETY

1. Signature _____

2. Name _____

3. Title _____

WITNESS

1. _____

_____
Corporate Secretary (Seal)

2. _____
(Name, Title & Address)
(Seal)

Corporate Guarantor (Seal)

FORM OF PERFORMANCE SECURITY
(UNCONDITIONAL)

Guarantee No._____
Executed on _____
Expiry date _____

Name of Guarantor (Bank) with address: _____

Name of Principal (Contractor) with address: _____

_____

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

_____

Letter of Acceptance No:- _____Dated _____

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

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

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the Employer, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract and of any and all modifications of said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause 49, Defects Liability, of Conditions of Contract are fulfilled.

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

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

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

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

_____
Guarantor (Bank)

Witness:

1. _____ Signature _____

_____ Name _____

Corporate Secretary (Seal)

Title _____

2. _____

_____ _____

Name, Title & Address Corporate Guarantor (Seal)

FORM OF BANK GUARANTEE FOR MOBILIZATION ADVANCE

Guarantee No._____ Date _____

WHEREAS _____(hereinafter called the 'Employer') has entered into a Contract for _____
__

(Particulars of Contract)

with _____ (hereinafter called the "Contractor').

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

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

AND WHEREAS, _____

(Scheduled Bank in Pakistan/Insurance Company)

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

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

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

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

(Date)

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

This Guarantee shall remain valid up to the aforesaid date and shall be null and void after the aforesaid date or earlier if the advance made to the Contractor is fully adjusted against payments from Interim Payment Certificates of the Contractor provided that the Guarantor agrees that the

aforesaid period of validity shall be deemed to be extended if on the above mentioned date the advance payment is not fully adjusted.

GUARANTOR

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

WITNESS

1. _____

_____
Corporate Secretary (Seal)

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

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Advance Payment Security

Demand Guarantee

_____

Beneficiary: _____

Date: _____

ADVANCE PAYMENT GUARANTEE No.: _____

Guarantor: _____

We have been informed that [Inset name of the Contractor] (hereinafter called “the Contractor”) has entered into Contract No. _____ dated _____ with the [insert name of the Procuring agency/Employer] (hereinafter called “the Procuring agency/Employer”) for the execution of _____ (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum _____ (_____) is to be made against an advance payment guarantee.

At the request of the Contractor, we as Guarantor, hereby irrevocably undertake to pay the Procuring agency/Employer any sum or sums not exceeding in total an amount of _____ upon receipt by us of the Procuring agency/Employer’s complying demand supported by the Procuring agency/Employer’s statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:

(a) has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or

(b) has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Contractor has failed to repay.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Procuring agency/Employer’s bank stating that the advance payment referred to above has been credited to the Contractor on its account number _____ at _____..

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as specified in copies of interim statements or payment certificates which shall be presented to us.

The 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.

_____

[signature(s)]

Note: All italicized text is for use in preparing this form and shall be deleted from the final product.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Retention Money Security
Demand Guarantee

_____ *[Guarantor letterhead or SWIFT identifier code]*

Beneficiary: _____ *[Insert name and Address of Procuring agency/Employer]*

Date: _____*[Insert date of issue]*

RETENTION MONEY GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that _____ *[insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Contractor") has entered into Contract No. _____ *[insert reference number of the contract]* dated _____ with the Procuring agency/Employer, for the execution of _____ *[insert name of contract and brief description of* Works*]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, the Procuring agency/Employer retains moneys up to the limit set forth in the Contract ("the Retention Money"), and that when the Taking-Over Certificate has been issued under the Contract and the first half of the Retention Money has been certified for payment, payment of *[*insert the second half of the Retention Money *or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money,* the difference between half of the Retention Money and the amount guaranteed under the Performance Security and, if required, the ES Performance Security*]* is to be made against a Retention Money guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ *[insert amount in figures]* (_____) *[amount in words]* upon receipt by us of the Procuring agency/Employer's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without your needing to prove or show grounds for your demand or the sum specified therein.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Procuring agency/Employer's bank stating that the second half of the Retention Money as referred to above has been credited to the contractor on its account number _____ at _____ *[insert name and address of Contractor's bank]*.

This guarantee shall expire no later than the …. day of ……, 2…, and any demand for payment under it must be received by us at the office indicated above on or before that date.

_____

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

Special Provision of the Project

1. GENERAL

1.1 Specifications – Special Provisions shall form an integral part of Bid and the Contract documents.

1.2 The Contractor shall notify all sub-contractors of the provisions of these Special Provisions.

2. DESCRIPTION OF PROJECT, WORKS INVOLVED AND SITE

Federal Government Employees Housing Authority, Islamabad intends to construct/develop landscaping and horticulture Works in sector F-14 and F-15, Islamabad.

The scope of works mainly comprises of landscaping and horticulture works including all green belts, parks & playgrounds, plantation along the nullah channelization, existing lake, road medians & green verges etc. within the boundaries and limits shown on the Drawings and any such additional areas adjacent thereto as may be designated by the Engineer from time to time for the construction to be performed under the Contract, and all such areas and additional areas shall comprise the Site.

3. CODES, STANDARDS AND CERTIFICATES

A. Applicable Standards

Except as otherwise provided by these Specifications or the Drawings, all materials, equipment and fabrication and testing thereof shall conform to the latest applicable standards and codes referred in the Specifications by use of the abbreviations explained below:

ASCE		American Society of Civil Engineers
ASA		American Standard Association
ACI	-	American Concrete Institute (USA)
AISI	-	American Iron and Steel Institute (USA)
AISC	-	American Institute of Steel Construction (USA)
ANSI	-	American National Standard Institute (USA)
ASTM	-	American Society for Testing and Materials (USA)
AASHTO	-	American Association of State Highway & Transportation Officials.
AWS	-	American Welding Society (USA)
BS	-	British Standards (UK)
CP	-	Codes of Practice (UK)
ICAO		International Civil Aviation Organization
BSICP		British Standard Institute Code of Practice
PS	-	Pakistan Standards (Pak)
PCA		Portland Cement Association
PSI		Pakistan Standard Institute

SSPC - Steel Structures Painting Council (USA)
UBC - Uniform Building Code (USA)
USBR - United States Bureau of Reclamation (USA)

If the Contractor, at any time and for any reason, wishes to deviate from the above standards or desires to use material or equipment not covered by the above standards, he shall state the exact nature of the changes, the reason for making the change and shall submit complete specifications of the materials and equipment to the Engineer for approval.

B. Standards other than those Specified

Where requirements for materials or equipment are specified by reference to a standard which has its origin in one country, it is not the intention to restrict the requirements solely to that standard and that country. Other standards, including standards of other countries, will be accepted provided the requirements thereof, in the sole opinion of the Engineer, are at least equal to the requirements of the standard specified. The Contractor may propose to the Engineer an equivalent standard other than that specified, in which case he shall submit the proposed standard and all other information required and shall submit written proof that his proposed standard is equivalent in all significant respects to the standard specified. All submissions must be made in the English language.

C. Codes and Standards at Site

The Contractor shall supply and have at his site office:-

a) Copies of all latest editions of codes and standards referred to in these Specifications or equivalent codes and standards as approved by the Engineer.

b) Catalogues and published recommendations from manufacturers supplying products and materials for the project.

c) The Contractor shall provide manufacturer's or supplier's materials which must meet the requirements of a specific code or standard as stated in these Specifications.

4. MANUFACTURER'S RECOMMENDATIONS

Installation of manufactured items shall be in accordance with procedures recommended by the manufacturer or as approved by the Engineer.

5. UNITS OF MEASUREMENTS

The FPS System of Units shall be used throughout the Project.

6. EXISTING CONDITION AT SITE

Drawings and information pertaining to existing project conditions are furnished for reference.

Neither the Employer nor the Engineer warrants the adequacy or correctness of these. The Contractor's are encouraged to visit the project site to assess the existing site conditions.

7. PROTECTION AND PRECAUTIONS

The Contractor and his sub-contractors shall afford all necessary protection to existing structures and will be required to make good at his own expense any damage done to such structures through his own or his representatives or subcontractors' fault and negligence.

The Contractor and his sub-contractors shall afford all necessary protection to existing roads in the area . He will clear and make good at his own expense any damage to or debris on these roads through his own fault and negligence. He must at all time ensure the free and normal flow of traffic and shall not cause obstruction to the traffic system. The Contractor and his sub-contractors shall provide and maintain necessary protection an precautionary measures such as warning signs, warning lamps and barricades etc. to prevent accidents.

The Contractor shall promptly correct all such damage to original condition at no additional expense to the Employer.

The Contractor shall cooperate with trades performing work under other Contracts as necessary for completion.

8. SEQUENCE OF CONSTRUCTION

The Contractor shall submit his proposal for approval of the Engineer the sequence of Construction, prior to starting the works. The works shall be executed as per approved sequence of construction

9. LINES AND LEVELS

Survey control points will be established by the Engineer. The Contractor shall be responsible for verifying these and shall be responsible for all requirements necessary for the execution of any work to the locations, lines, and levels specified or shown on the drawings, subject to such modifications as the Engineer may require as work progresses.

10. PLANT, EQUIPMENT AND TOOLS

The Contractor shall provide at his cost modern plant, equipment and tools, adequate and

befitting to the nature, magnitude and size of this Contract, in strict compliance with the requirements of the General Conditions of Contract, Conditions of Particular Applications and Technical Specifications.

11. PARTIAL POSSESSION

Whenever, as determined by the Employer any portion of work performed by the Contractor is in a condition suitable for use, the Employer may take possession of or use such portion.

Such use by the Employer shall in no instance be construed as constituting final acceptance, and shall neither relieve the Contractor of any of his responsibilities under the Contract, nor acts a waiver by the Employer of any of the conditions thereof, provided that the Contractor shall not be liable for the cost of repairs, re-work, or renewals which may be required due to ordinary wear and tear resulting from such use. However, if such use increase the cost or delays to the completion of remaining portions of work, the Contractor will be entitled to an equitable adjustment.

If, as a result of the Contractor's failure to comply with the provision of the Contract, such use proves to be unsatisfactory, the Employer will have the right to continue such use until such portion of the work can, without injury to the Employer, be taken out of service for correction of defects, errors, omissions, or replacement of unsatisfactory materials or equipment, as necessary for such work to comply with the Contract; provided that the period of such operation or use pending completion of appropriate remedial action shall not exceed twelve months unless otherwise mutually agreed upon in writing between the parties.

12. EXISTING SERVICES

The Contractor shall search for, find, locate and protect any wiring, cable, duct, pipework, etc., within or immediately adjoining the site area.

The Contractor shall take full responsibly for safety of existing service lines, utilities and utility structures uncovered or encountered during excavation and construction operations.

The Contractor shall take full responsibility for damaging any such service lines, utility/utility structure and any cost and/or expense that arises or issues from any such damage shall be borne directly by himself. Should any damage to any such service occur the Contractor shall forthwith take remedial action, initiate safety precautions, install temporary services and carryout repair all at his own cost and expense and inform the Engineer and notify all relevant authorities.

Existing utilities which are to remain in service for or after the works are to be determined by the Contractor. If any existing service lines, utilities and utility structures which are to remain in service are uncovered or encountered during these operations, they shall be safeguarded, protected from damage, and supported. The Contractor shall preserve, maintain and keep in perfect working conditions, any existing facilities required to be preserved by the Employer/the Engineer.

13. CONSTRUCTION AREA AND ACCESS

The Employer will provide the Contractor possible space within or nearby the area of site of works for the storage of plant, equipment and materials and for Contractor's temporary office, during the currency of the Contract. In case the adjacent area as required by the Contractor is not available within the Project boundary for storage of plant, equipment and machines then the Contractor shall arrange at his own expense possible space for storage of plant, equipment and machines at his own cost and expense. On no account shall such temporary installations conflict/interfere with any of the permanent installations, services and any operational function of Employer. The handling and storage of all plants, equipment and materials at site shall be the sole responsibility of the Contractor and at no risk and cost to the Employer.

The Contractor shall protect all material against corrosion, mechanical damage or deterioration during storage and erection on site. The protection methods shall be to the approval of the Engineer

14. CONSTRUCTION & CHECKING AT SITE

The Contractor shall submit to the Engineer in due time for approval and discussion, his proposals and plans as to the method and procedure to be adopted for the temporary and permanent works involved.

The submitting to these suggestions and arrangements, and the approval thereof by the Engineer shall not relieve the Contractor of his responsibilities and duties under the Contract.

The carrying out of all work included in the Contract is to be supervised by a sufficient number of qualified representatives of the Contractor and full facilities and assistance are to be afforded by the Contractor for the Engineer or his Representative to check & examine the execution of the work.

The Engineer reserves the right to inspect all parts of the works but may at his discretion waive inspection on certain items. This shall in no way absolve the Contractor from his responsibilities. This particularly applies to the checking of materials, the accurate setting out of foundations, and to the leveling, setting and aligning of the various parts, and to the

proper fitting and adjustment of manufactured and finished materials and fixtures in position.

If the Engineer or his Representative find that the work progress is slow in such a way that the works or parts thereof will not be completed in the time specified, then he shall order the Contractor to work overtime or in shifts and the Contractor shall comply. These arrangements will be free of all financial encumbrances and at no additional costs to the Employer.

In the event of night work, the Contractor shall provide sufficient and adequate lighting to the satisfaction of the Engineer or his Representative and shall supply the necessary manpower for satisfactory continuation of the work after normal hours.

15. STORAGE & HANDLING FACILITIES

The Contractor shall make his own arrangements for providing the necessary space for the storage of plant, equipment and materials and for Contractor's temporary office, in and around the site of works, during the currency of the Contract.

16. PRODUCT DATA

Manufacture's standard schematic drawings shall be modified or deleted to indicate only information which is applicable to the project. Such standard information shall be supplemented to provide all additional applicable information.

Manufacturer's catalogue sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive literature shall be clearly marked to identify pertinent materials products or models. Dimensions and required clearances shall be indicated. Shop performance characteristics and capacities shall be noted.

17. PRODUCT QUALITY AND HANDLING

Suppliers of local and foreign products and installations specified shall have been regularly engaged in the business of manufacturing, fabricating, installing and / or servicing work required for a period not less than 5 years. In addition, the Engineer may request as appropriate a:

- list of similar installations that describes project, scope and date of completion.
- complete literature, performance data, and technical data.
- list of services record within Pakistan.
- location of service office from which this installation could be maintained.

For the actual fabrication, installation and testingof the specified work use only thoroughly trained and experienced workmen completely familiar with the items required and with the manufacturers recommended methods of installation. In acceptance or rejection, no allowance will be made for the lack of skill on the part of workmen.

Use all means necessary to protect materials before, during and after installation and to protect the installed work and materials of all other trades. In the event of damage, immediately make all repairs and replacement necessary for approval and at no additional cost to the Employer.

18. INSPECTION & TESTS REPORTS

All equipment and materials furnished under these specifications and all work performed in connection therewith will be subject to rigid inspection by the Engineer or the Engineer's Representative. Acceptance of equipment and material or the waiving off inspection thereof shall in no way relieve the Contractor of his responsibility for meeting the requirements of the Contract.

The Contractor shall furnish the Engineer with certified true copies of test reports of all materials used in the manufacture and fabrication of all equipment and material including metal work, steel pipes, fire bricks etc. The result of these test shall be in such form as to show compliance with the applicable Specifications, standards and codes for the material used.

19. FIELD LABORATORY AND TESTING

19.1 General

The Contractor shall provide and maintain a field laboratory equipped with approved equipment to perform all the tests required by the Engineer. The quality control testing shall be performed by the Contractor's competent personnel in accordance with a site testing and quality control programme to be established by the Contractor and approved by the Engineer. The Engineer may however, require certain tests to be performed in any other laboratory designated by him.

The Contractor shall provide laboratory helpers to the Engineer for testing. The laboratory shall be run by a qualified material Engineer and Laboratory Technician to be employed by the Contractor.

The Field Laboratory, including all equipment and staff shall be placed at the disposal and direction of the Engineer during the Contract.

The Contractor shall keep a complete record of all quality tests performed on site.

All quality control and tests shall be carried out in accordance with applicable standards and codes. In addition to routine field testing, the contractor shall

undertake soil studies as directed by the engineer, and furnish a report for evaluation of structural designs of hydraulic and retaining structures where applicable with no additional payment to contractor.

19.2. Field Laboratory Equipment Requirements

The Laboratory shall be equipped with new unused and latest Equipment to perform tests as per Technical Specifications and General Conditions of Contract. Additional equipment/materials shall be supplied by the Contractor as and when required by the Engineer to perform any specified test, at no additional cost to the Employer.

The laboratory shall also be equipped with new unused furniture, fittings and fixtures. If any equipment, furniture, fitting or fixture becomes unserviceable for any reason what so ever, the Contractor shall promptly replace the same as and when directed by the Engineer.

19.3. Testing Laboratory Certificates

The Engineer may accept a certificate from a commercial testing laboratory, satisfactory to him, certifying that the product has been tested within a period acceptable to the Engineer and that it conforms to the requirements of these specifications.

19.4. Method of Payment

The cost of providing running and maintenance of the laboratory, equipment, materials and staff, testing charges for materials supplied by the Employer and all other tests to be performed in any other laboratory designated by the Engineer shall be deemed to be included in the price quoted by the Contractor and no separate claim for payment on this account shall be entertained by the Engineer. Furthermore, the cost of any additional laboratory, field and shop tests required through the resubmission of samples because of failure of compliance with Specifications shall be borne by the Contractor.

In case the Contractor does not provide the specified equipment and testing facility, cost of testing plus 100 percent overheads shall be recovered from his bills.

20. SURVEYING INSTRUMENTS

20.1 General

The minimum quantity of survey equipment is stated below which shall be available with the Contractor at site of Works along with qualified Surveyors and Survey Helpers. The equipment shall be maintained throughout the Contract Period

and replaced by the Contractor in case of damage or loss. The survey equipment shall be made available to the Engineer when requested. All surveying equipment shall be in good working condition.

20.2 Surveying Equipment Required

The Contractor shall provide and maintain the following surveying equipment at site.

a) Total Station with staff 03 No.
b) Automatic Levels with tripods & staff 03 No.
c) GPS 02 No.
c) All other miscellaneous tools, equipment and materials required in surveying.

21. APPROVAL OF MATERIALS AND PLANT

21.1 Quality of Materials

All materials, fixtures, fittings, supplies and plant furnished under the Contract shall be new and unused, standard first grade quality and of the best workmanship and design. No inferior or low-grade materials, supplies or articles will be either approved or accepted, and all work of assembly and construction shall be done in a first-class and workmanlike manner. In asking for prices for materials intended for delivery to the Site and incorporation in the Works under any portion of these Specifications, the Contractor shall provide the manufacturer or supplier with complete information as may be necessary to secure compliance to this Clause and, in every case, he shall quote this Clause in full to each such manufacturer or supplier.

21.2 Submission of Samples and Data

21.2.1 The Contractor shall furnish for approval of the Engineer with reasonable promptness all samples as directed by the Engineer or specifically called for in the Specifications and in accordance with the time schedule provided in the schedule of submittals. The Engineer shall check and approve such samples with reasonable promptness only for conformance with the design concept of the Works and for compliance with the information given in the Contract Documents. All work shall be in accordance with approved samples.

21.2.2 Samples shall be furnished so as not to delay fabrication, allowing the Engineer reasonable time for consideration of the sample submitted.

21.2.3 Each sample shall be properly labeled with the name and quality of the material, manufacturer's name, name of the project, the Contractor's name and the date of submission, and the Specifications Article number to which the sample refers.

21.2.4 The manufacturer's installation directions shall be provided with each sample. The Contractor shall pay all transportation costs and deliver samples to the Engineer's office, Site or testing laboratory as directed by the Engineer.

21.2.5 Samples shall be of adequate size to permit proper evaluation of the material by the Engineer. Where variations in colour, texture, dimensions or other characteristics are to be expected, the Contractor shall submit samples showing the maximum range of variation. Materials exceeding the range of variation of the approved samples shall not be used on the Work.

21.2.6 In order to permit coordinated selection of colours and finishes, the Contractor shall deliver samples of all related items to the Engineer at one time. Samples of such materials will not be approved until all related samples have been submitted.

21.2.7 If both Shop Drawings and samples are required for the same item, the Engineer may require both to be submitted before approving either.

21.2.8 The Contractor shall erect Mock-up samples of finished items where specifically called for in the documents or as directed by the Engineer.

The Mock-up samples shall be preserved/protected by the Contractor till the end of the project or as directed by the Engineer.

21.2.9 No acceptance or approval of any Shop Drawings or sample, or any indication or request by the Engineer on any Shop Drawings shall constitute an authorization for any increase in the Contract Sum.

21.3 Inspection

All material and Plant furnished and all work performed under this Contract will be subject to inspection by the Engineer at all times and in all states of completion both off-Site and on-Site. The Contractor shall furnish promptly without additional charge, all facilities, labour and materials reasonably needed for performing such inspection and testing as may be required by the Engineer.

21.4 Approved Sample at Site

The Contractor shall, at all times, keep on the Site approved samples. All such samples shall be made available to the Engineer as and when required.

22. BAR BENDING SCHEDULE

Bar bending (reinforcement bars) schedule of all structural drawings shall be prepared by the Contractor and submitted in triplicate to the Engineer for approval.

23. DRAWINGS

23.1 Bid Drawings

Bid Drawings issued with the Bid Documents, called the Bid Drawings, show scope of the work to be performed by the Contractor. The Drawings are generally in sufficient detail so as to be used as a basis for construction, fabrication and for placing orders for materials subject to corrections based on the future issue of supplementary Drawings as provided under Sub-Clause 12.2 hereof.

23.2 Construction Drawings, Supplementary Drawings

Upon commencement of the works and furnishing by the Contractor stake out survey plan& natural ground levels, the Engineer shall issue Construction Drawings to the Contractor. The Construction drawings may be issued in stages, where necessary.

The Engineer shall have authority to issue to the Contractor, from time to time, such supplementary Drawings and instructions as shall be necessary for the purpose of the proper and adequate execution and completion of the Works and the remedying of any defects therein. The Contractor shall follow these drawings.

When additional information regarding the geological formations or other conditions becomes available, the Engineer may find it desirable to change dimensions or design of one or more of the features of the Works to conform to the newly disclosed conditions. The Engineer reserves the right to make such reasonable changes, and the Contractor's operations shall be conducted so as to accommodate any such reasonable changes in the Works.

23.3 Definition of Term Drawings

The term Drawings as used in the Specifications means the Drawings referred in Clauses 12.1 and 12.2 above.

23.4 Checking of Drawings

The Contractor shall check all Drawings carefully as soon as practicable after receipt thereof, and shall promptly notify the Engineer of any errors discovered.

23.5 Copies of Drawings

Drawings will be issued to the Contractor as described below:

23.5.1 Construction Drawings

Two (2) sets of the Construction Drawings will be issued to the Contractor as stated above, free of charge. Additional sets will be provided at cost of reproduction upon written request of the Contractor.

23.5.2 Supplementary Drawings

Two (2) prints of each supplementary Drawing will be issued to the Contractor free of charge. Additional sets will be provided at cost of reproduction upon written request of the Contractor.

23.6 Drawings to Be Furnished By the Contractor

The Contractor shall submit to the Engineer for review, such drawings as are required under the Contract, sufficiently in advance of the work intended to be executed.

23.6.1 Reinforcement Drawings

Reinforcement placement drawings and bar bending schedules (to be provided by the Contractor as per clause 11 above) of all RCC work shall be prepared by the Contractor and submitted in triplicate to the Engineer for approval, sufficiently in advance of the works in which they are intended to be used.

23.6.2 Shop Drawings

(a) The Contractor shall submit to the Engineer for review three (3) copies of all drawings to be issued for setting out, fabrication, supply order and construction; based on data, requirements, dimensions, details, codes, standards and design provided in the drawings issued by the Engineer. Such drawings shall be submitted at least twenty-eight (28) days before they are required for use. If within a period of fourteen (14) days after submission, the Engineer notifies the Contractor that a drawing fails to comply with the relevant requirement of the Contract, it shall be rectified and resubmitted for approval at the Contractor's cost. Fabrication or construction shall not commence on any part of the Works until the shop drawings or construction drawings for that part of the Works have been approved by the Engineer.

The Works shall be executed in accordance with the drawings as approved by the Engineer. If the Contractor wishes to modify any approved drawings, he shall immediately notify the Engineer and submit revised drawings for approval. If the Engineer instructs that further drawings are necessary for executing the Works, the Contractor shall prepare such drawings and submit them for approval.

The Contractor at his cost shall rectify errors, omission, ambiguities, inadequacies and other defects.

Approval by the Engineer, in accordance with this paragraph, shall not relieve the Contractor of any of his responsibilities under the Contract.

(b) The shop drawings shall be properly identified indicating the part of the Works, the name of the contractor / supplier etc., the date of preparation and the dates of all revisions. The Shop Drawings shall be complete and shall show the design dimensions, proposed materials to be used, finishes, type of shop paint and all other details in connection thereto.

(c) Where adjoining work requires shop drawings, the Contractor shall prepare and submit composite shop drawings, which shall show and define the work under all affected trades. If the Contractor executes work before coordinating with other trades so as to cause interference with work of those trades, he shall make changes necessary to correct the conditions without extra cost to the Employer.

(d) No changes shall be made by the Contractor in the resubmitted shop drawings in excess of the corrections spelled out by the Engineer and in a separate note on the shop drawings.

(e) No work in the shop shall be started and no material or plant ordered until the Engineer has approved the shop drawings. It shall be the responsibility of the Contractor to submit the shop drawings on a schedule that allows reasonable time for checking and approval and subsequent fabrication. Failure to submit shop drawings in ample time for checking, correcting, and rechecking will not justify extension of time for completion of the Works.

(f) The Contractor shall also check and verify all site measurements whenever requested by other Specialist Contractors or by other Sub-Contractors to enable them to prepare their own shop drawings and pass on the information with sufficient promptness, so as not to

delay the work in any way. A copy of all such information passed on shall be given to the Engineer.

23.6.3 As-Built Drawings

The Contractor shall, at all times, keep on Site a separate set of prints of all drawings on which all significant changes between the work shown on the Drawings and that which is actually constructed, shall be noted neatly, accurately and promptly as the work progresses. The Subcontractor(s) for plumbing, mechanical and electrical shall, at all times, keep on Site, a separate set of prints of the drawings (showing their parts of the Works) on which all significant changes between the work shown on the Drawings and that which is actually constructed, shall be noted neatly, accurately and promptly as the work progresses. Such drawings shall show the exact physical location and configuration of the works as actually installed.

The Contractor shall, within fourteen (14) days of issuance of Taking-Over Certificate for whole of the Works, furnish to the Engineer for his approval two (2) copies of such marked up drawings. One (1) copy of each of the marked up drawings approved by the Engineer shall be returned to the Contractor by the Engineer and these shall be used for the preparation of the As - Built Drawings.

The Contractor shall furnish to the Engineer six (6) complete sets and one reproducible copy of all As -Built Drawings within twenty eight (28) days of receipt of drawings stated above, from the Engineer.

24. PROTECTION OF THE WORKS

The Contractor shall whenever necessary cover up and protect the works from weather and damage by his own or other workmen performing subsequent operation. The Contractor shall provide all necessary dustsheets, barriers and guard rails and clear away the same at completion.

25. RESTORATION AND CLEANING

Upon completion of the works the Contractor shall restore all items covered by the Contract to the satisfaction of the Engineer.

The Contractor shall do regular cleaning and clear away all rubbish and excess materials that may accumulate from time to time on completion and before handing over. Upon completion of the works he shall obliterate all signs of temporary construction facilities such as work areas, structures, foundations of temporary structures, stock piles of excess or waste materials, or any other vestiges of construction, as directed by the Engineer. All buildings shall be cleaned; floors and paving scrubbed and the works and site shall be left in a clean and

satisfactory state for immediate use and occupation. Care shall be taken not to use any cleaning materials, which may cause damage to the surface to be cleaned.

The Contractor shall also take all necessary precautions to keep the works and site free from vermin during construction and he shall leave the works vermin free on completion. Application of pest control agents shall not commence until the specific product, name, method and extent of application have been submitted to and approved of by the Engineer.

26. SITE OFFICE AND TEMPORARY FACILITIES TO BE PROVIDED BY THE CONTRACTOR

26.1 Contractor's Office, Facilities Etc.

The Contractor shall establish and maintain a Site office. The Contractor shall provide all facilities in connection with the execution, completion, of the Works, remedying defects therein and maintenance of the utilities services. The facilities shall not be limited to the Contractor's Site Office, labour camps, work yard and storage areas, temporary water supply, waste water disposal, temporary electricity, medical unit, temporary roads, fire protection and firefighting equipment etc. The Contractor shall be solely responsible for arranging all utilities and the Contractor shall setup, maintain and operate an architectural and engineering facility at site with adequate number of technical and support staff as well as equipment required for particular nature of job covered under the Contract to prepare drawings/shop drawings for approval of the Engineer.

The Contractor shall arrange his labour camp, work yard, storage area and site office.

26.2 Temporary Roads

The Contractor shall prepare and maintain such temporary roads as may be necessary, from the site to the nearest road and also within the plot. Such roads shall be positioned strictly in accordance with the Engineer's instructions and the Contractor shall reduce or control any dust nuisance by regularly spraying water and compaction as directed.

26.3 Temporary Services

26.3.1 Temporary Water Supply

The Contractor shall supply in sufficient quantity all necessary potable and other water for construction purposes for all trades at points within a reasonable distance of any building being constructed. The Contractor shall make arrangements and pay charges for water service installation, maintenance and removal thereof, and pay the costs of water for all trades.

At completion of the work, the temporary water services equipment and piping shall be removed by the Contractor at his own expense.

26.3.2 Temporary Electricity

The Contractor shall make all the necessary arrangements for a temporary electricity service, pay all expense in connection with the installation, operation and removal thereof and pay the costs of electricity consumed by all trades. The Contractor shall arrange and furnish an Electric Power Generating set at site and maintain the generating set in perfect working condition through-out the duration of Contract. The generating power of the set shall be sufficient to operate all plant and equipment as well as the camps and offices of the Contractor and the offices of the Engineer/Employer, during construction at site. Should the set fail to meet the required demand at site or fail to function or operate, the Contractor shall immediately replace the same with other generating set/sets to the satisfaction of the Employer as well as the Engineer.

A temporary lighting system shall be furnished, installed and maintained by the Contractor as required to satisfy the minimum requirements for safety and security and to the satisfaction of the Engineer.

When the permanent electrical power and lighting systems are in an operating condition, they may be used for temporary power and lighting for construction purposes provided that the Contractor obtains the written approval of the Engineer and the Employer and assumes full responsibility for the entire power and lighting system and pays all costs for operation and maintenance of the system.

At completion of construction work, or at such time as the Contractor makes use of permanent electrical equipment and devices, temporary electricity services shall be removed by the Contractor at his own expense.

26.3.3 Waste Disposal

The Contractor shall make such temporary provisions as may be required in order to dispose of any chemicals, fuels, oils, grease, bituminous materials, waste and soil waste and the like without causing pollution to either the site or the environment. Disposal of any materials, wastes, effluent, garbage, oil, grease, chemicals and the like shall be in areas specified by the concerned local authority proposed by the Contractor and subject to the approval of the Engineer. If any waste material is dumped in unauthorized areas the Contractor shall remove the material and restore the area to the condition of the adjacent undisturbed area. If necessary, contaminated ground shall be excavated, disposed off as directed by the Engineer and replaced with suitable

fill material compacted and finished with topsoil all at the expense of the Contractor.

26.3.4 Fire Protection

The Contractor shall provide and maintain adequate fire protection in the form of barrels of water with buckets, fire bucket tanks, fire extinguisher, or other effective means ready for instant use, distributed around the project and in and about temporary inflammable structures during construction of the works.

Gasoline and other flammable liquids shall be stored in and dispensed from safety containers approved by the Engineer and storage shall not be within building.

Torch-cutting and welding operations performed by the Contractor shall have the approval of the Engineer before such work is started and a chemical extinguisher is to be available at the location where such work is in progress.

The Contractor shall follow the instructions and specifications of the Civil Defense Department or any other local department concerned with such activities.

27 CONSTRUCTION SCHEDULE

A Construction schedule shall be maintained in accordance with the provisions of the General Conditions of Contract.

The schedule shall be accompanied with sufficient data and information including all necessary particulars of constructional plant, equipment machinery, temporary Works, arrival of plant, equipment at site and their installation, method of operation, work forces employed, etc., for an activities of the Works.

Should the Engineer consider any alteration or addition in the programme and time schedule, the Contractor shall conform thereto without any cost to the Employer.

Whenever necessary and wherever the progress of the actual work shows departure,the programme and time schedule shall be undated and submitted to the Engineer for his approval.

28 SUBMISSION REQUIREMENTS

28.1 Schedule submission at least sixty days before the dates when reviewed submittals will be needed.

28.2 Submit Shop Drawings as per provision given in Sub-Clause 19.5 (a) and number of copies of Product Data which the Contractor requires for distribution plus four copies which will be retained by the Engineer.

28.3 Submit three samples unless otherwise specified.

28.4 Accompany submittals with transmittal letter, in duplicate, containing:

- Date
- Project title and number
- Contractor's name and address
- The number of each Shop Drawing, Product Data and the Sample submitted.
- Notification of deviations from Contract Documents.
- Other pertinent data.

29 RESUBMISSION REQUIREMENTS

Shop Drawings:

- Revise initial drawings as required and resubmit as specified for initial submittal.
- Indicate on drawings any changes which have been made by the Engineer.
- Product Data and Samples: Submit new data and samples as required for initial submittal.

30 MONTHLYPROGRESS REPORT AND PHTOGRAPHS

30.1 During the continuance of the Contract, the Contractor shall submit monthly progress on forms as approved by the Engineer.

Such monthly reports shall show the actual progress completed as of date of the report plotted against the schedule as given by the Contractor at the start of work and shall be broken down so as to indicate status of all activities associated with mobilization design, material procurement, manufacture, surveys works, tests with regard to the agreed contract programme.

30.2 The Employer and the Engineer reserve the right to coordinate the schedules of this Contractor and other Contractors working at the Site, and to adjust and/or change any and all such schedules as required during the course of construction in order to achieve a coordinated project in harmony with the Employer's completion date.

30.3 Commencing after the first month of construction, and continuing every month until completion, the Contractor shall take and submit photographs to the Engineer's Representative, to show progress of his work and completion of each structure or major feature.

31 CONTRACTOR TO NOTIFY DELAYS ETC.

Any delay which will affect the completion of Works shall be detailed by the Contractor who shall state the action he is taking for effective completion of the Contract programme.

The Contractor shall submit a report in respect of the various sections of the Works, the equipment in use or held in readiness, a return of labour and supervisory staff, and details of any matters arising which may generally affect the progress of the work.

The Contractor shall give a summary of the detailed progress report giving the position with regard to the agreed Contract programme.

The progress reports shall be set out in a format to the approval of the Engineer, and forwarded promptly so that on receipt the information contained therein is not more than 21 days out of date.

If during execution of the Contract, the Employer considers the progress position of any section of the work to be unsatisfactory, or for any other reason relating to the Contract, he will be at liberty to convene a meeting and the Contractor's Representatives are to attend such meeting.

The Contractor's Site Office shall prepare and submit 6 copies of a weekly progress report to the Employer and Engineer's Site Office. This report shall summarize site activities and record and details where difficulties in maintaining the agreed programme are being experienced or are likely to cause subsequent delay.

The Contractor's Site Office shall also prepare and submit to the Engineer's Site Office 2 copies of Daily Activity Report summarizing the main activities to be undertaken each day, noting special activities such a tests, alignment checks, etc. The Contractor shall be responsible for expediting the delivery of all material and equipment to be provided by him and his subcontractors.

32 PHOTOGRAPHS

As soon as work commences on Site, the Contractor shall provide at least 10 to 12 photographs (along with soft copy) of the works from positions to be selected by the Engineer. Each photographic print shall not be less than 297mm x 210mm and shall bear a printed description, a serial number and the date when taken.

The negatives/soft copy of all photographs shall be held at the Contractor's Site Office, numbered and handed over to the Employer at the completion of the Contract.

33 SIGN BOARD

The Contractor shall erect and maintain at the Site in a location to be approved by the Engineer two (2) Sign Boards of dimensions approved by the Engineer. The Sign Boards shall be made of metal. It shall be mounted on steel posts securely anchored and braced.

The Contractor shall paint on the Sign Boards, the name of the Works, and the names of the Employer, Engineer and the Contractor both in English and Urdu Language.

34 SITE OFFICE FOR ENGINEER/ENGINEER'S STAFF

The Contractor shall construct, provide, furnish and maintain for Employer/Engineer, following site offices along with stabilized access road:

Employer office:

One separate room for Project Director with attach toilet facility

One separate room for Assistant Director (Horticulture) with attach toilet facility

One separate room for Project Engineer (Civil & E/M) with attach toilet facility

One room for Employer's staff with attach bath facility

Conference Room

Kitchen

The Contractor shall provide office furniture including chairs, tables, sofas, air-conditioners, refrigerator, UPS, Steel Almirah/ Iron Cupboard for record keeping and stabilizers and any other necessary feels appropriate to Contractor.

The Contractor shall provide for The Employer at site two (02) Laptops and one desktop with internet facility (Desktop: Dell Precision Workstation or equivalent, Processor: Intel Core i7, 14th Generation or newer, Ram: 32 GB DDR5, expandable to 64 GB, Storage: 1 TB NVMe SSD, Graphic Card: NVIDIA GeForce RTX 5070 Ti or higher with 16 GB VRAM or more, Monitor: 27-inch QHD IPS LED Monitor, Keyboard & Mouse: Dell USB Keyboard & Mouse, Operating System: Windows 11 Pro, 64-bit, Warranty: Minimum 03 years), Internet devices (02 Nos.), and Colour Printers A3 & A4 size (01 No each), as specified by Employer and all stationery items.

Engineer's office:

Three rooms with attach toilets for the Engineer and Engineer's staff

Kitchen

Display room for equipment / samples etc.

The Contractor shall provide office furniture including chairs, tables, sofas, air-conditioners, refrigerator, UPS and stabilizers and any other necessary feels appropriate to Contractor.

The Contractor shall provide one-time mess/meal to the employer and consultant staff and also responsible to manage office staff. The site offices shall be connected to the electrical system, potable water supply system and sewage disposal system. Moreover, the Contractor shall provide a one-time meal daily to the Employer's and Engineer's staff residing at site at its own cost.

The Contractor shall provide replacement of the equipment(s), if any of the above mentioned equipment(s) is temporarily or permanently rendered unserviceable for any

reason(s) or declared to be beyond repair by the Employer / Engineer/Engineer's staff at no additional cost to the Employer.

The said offices shall be provided by the Contractor within twenty eight (28) days of the receipt by the Contractor of Engineer's Notice to Commence.

The site offices shall be maintained by the Contractor up to a period of three hundred sixty four (364) days after the Issuance of Taking Over Certificate (DLP Period) by the Engineer.

The site offices along with all fittings, fixtures and gadgets shall become property of the Employer after the completion of the project and shall be handed over to the Employer along with list of all items given for the use of Engineer. The site office shall be removed /dismantled if directed by the Engineer/Employer. In such case, the area shall be developed in accordance with the drawings or to its natural state and as per the instructions of the Engineer.

No payment shall be made to the Contractor for the works involved under this Sub Clause.

35 TRANSPORT FOR THE EMPLOYER / ENGINEER

The Contractor shall provide, operate and maintain 01 No. (1000 CC) brand new latest model air-conditioned Suzuki Cultus along with driver and fuel 200 liters per month and additional fuel of 200 liters per month for other project team using their own vehicles and 03 Nos. brand new Motor Cycle 125CC with fuel of 75 liters for each per month for exclusive use of the Project Team to meet the transportation needs in connection with the project.

The Contractor shall provide, operate and maintain 01 No. (1000 CC) brand new latest model air-conditioned Suzuki Cultus along with driver and fuel 200 liters per month and additional fuel of 200 liters per month for other project team using their own vehicles and 02 Nos. brand new Motor Cycle 125CC with fuel of 75 liters for each per month for exclusive use of the Engineer/ Engineer's staff to meet the transportation needs in connection with the project.

The Contractor shall furnish supply and provide, as may be necessary without specific direction of the Engineer / Engineer's staff, all fuels, lubricants, tyres and other supplies, all maintenance, repairs, comprehensive insurance cover and running costs and suitability qualified driver at all times and will provide a substitute vehicle in case of any break down.

The Contractor shall provide replacement vehicle(s), if the vehicle is temporarily or permanently rendered unserviceable for any reason(s) or declared to be beyond repair by the Employer/ Employer's representative at no additional cost to the Employer.

The Contractor shall maintain the vehicles till issuance of Defects Liability Certificate by The Engineer.

No separate payment shall be made to the Contractor for the facilities involved under this clause. The cost thereof shall be deemed to have been included in the price quoted by the Contractor for the works. All the vehicles shall become property of the Employer after completion of the Project.

36 COORDINATION OF WORK AT SITE

The Contractor shall take cognizance that during the execution of the project, other Contractor will be working concurrently on this site.

All works of his responsibility shall be coordinated by the Contractor so as to give the necessary facilities to other Contractor or their workman or any other employ, who execute or supervise any work on the site.

The Contractor shall ensure that the necessary safety precaution will be observed and interferences shall be avoided specially for the works executed side by side by different Contractors.

Due consideration must be given to permit access to sections of the work as required by other Contractors for the extension of their works. With a view to coordinate the works, the Engineer may from time to time direct the order of the works to be carried out.

No payment shall be made to the Contractor for the works involved under this sub clause.

37 SITE FACILITIES TO BE PROVIDED BY THE CONTRACTOR

37.6.1 General

Without prejudice to the generality of the various clauses of the Contract, particular attention is drawn to the obligation of the Contractor to make his own arrangement at his own expense for the following.

37.6.2 Labour Camps and Staff Residences

The Contractor shall provide, operate and maintain labour camps and staff residences and are required for the proper and efficient progress of the work to house his own employees. For the purposes of operation and maintenance of the Camps and Residences, the Contractor shall comply with the rules of Pakistan Labour Camp Rules 1960 and all other applicable provisions of the Pakistan Labour Laws.

37.6.3 Administrative and Field Office

The Contractor shall provide, operate and maintain administrative and field offices required for his staff and would be responsible for Operation and Maintenance, furniture, equipment, appliances, janitor services and security of the same.

37.6.4 Work yards and Storage Areas

The Contractor shall provide, operate and maintain all sheds, fencing, foundations and all above ground structures required to store material or equipment brought on to the site by him. The Contractor shall be responsible for the security of his entire camps, residence, site and field offices work yard and storage area.

37.6.5 Water Supply, Sewerage System and Electricity

The Contractor shall make his own arrangement, at his own expense for provision, operation and maintenance of electric supply, reasonable supplies of raw and potable water and sewerage system at the site of works and his labour camps, staff residences and offices. The Contractor shall pay all fees, and charges (including bills) of whatsoever nature to the concerned departments (if any) in order to procure connections of the above facilities and thereafter using these facilities.

37.6.6 Medical Care

The Contractor shall arrange provision of adequate medical facilities for his employees.

Adequately equipped and properly staffed first aid stations or dispensaries shall be provided by the Contractor at camps and other strategic locations, to administer first aid treatment at all times free of charge to all persons on the Site, including personnel of the Engineer and the Employer. The nature, number and location of facilities furnished and the Contractor's staff for administering first-aid treatment shall meet the requirements of the Health Services of the Government of Pakistan and of Section III of the Manual "Safety Requirements for Construction by Contract", published by the Employer, and shall be subject to approval by the Engineer.

37.6.7 Other Facilities

The Contractor shall also be responsible for providing at his own cost other facilities for his own staff and labour such as educational, recreational, transport, telephone and catering if required.

38. CONSTRUCTION PROCEDURES

The Contractor shall advise the Engineer of proposed construction procedures in accordance with the General Conditions of Contract.

If the Engineer shall see that the work progress is slow in such a way that the work will not be completed in the time specified, then he shall order the Contractor to work overtime or in

more shifts and the Contractor shall obey these orders without any additional payments and without any objections or request for compensation.

39. NOTIFICATION TO ENGINEER

The Engineer shall be notified daily in writing of the nature and location of the Works the Contractor intends to perform the next day so as to enable necessary inspection and measurement to be carried out. The Engineer may, if necessary, direct that longer notice be given of certain operations.

40. NIGHT WORK

When work is done at night the Contractor shall maintain from sunset to sunrise such lights on or about his work and plant as the Engineer may deem necessary for the proper observations of the work and the efficient execution thereof.

41. WEATHER

No work is to be undertaken when, in the opinion of the Engineer, the weather is so unsuitable that proper protection of the work cannot be ensured.

42. CO-ORDINATION WITH OTHER CONTRACTORS

It shall be the responsibility of the Contractor to keep-up good relations with other Contractors employed on site by the Employer.The Contractor shall cooperate and coordinate his work with that of the other Contractors working at the Site, to whatever extent may be necessary to complete the Project in accordance with the approved programme of the Works and in accordance with the Engineer's instructions. Should a disagreement or dispute arise between the Contractor and other contractors, the same shall be referred without delay to the Engineer for his decision. Upon such decision, the Contractor shall proceed with the work in accordance therewith. In case the access to the works of other contractors is through the Site area of the Contractor, the Contractor shall coordinate with and permit all reasonable access to other Contractors.

43. ACCIDENT PREVENTION, SAFETY MEASURES AND PROTECTIVE EQUIPMENT

The Contractor shall comply and enforce compliance by all his sub- contractors with the highest standards of safety and accident prevention in accordance with international standards and in compliance with all applicable laws, ordinances and statutory provisions.

All requisite barriers, fences, warning signs, lights and other safety precautions as required for the protection of persons and property on or adjacent to the site shall be provided at the Contractor's cost.

All false work, scaffolding and handrails shall be well constructed and secured at all times. Where overhead work is being carried out, warning signs shall be installed at ground level clearly warning of the overhead work.

All warning signs shall be in two languages, English and Urdu, and shall at all times be maintained in a clean and legible condition, to the satisfaction of the Engineer.

Trash shall be removed at frequent intervals to the satisfaction of the Engineer.

Netting shall be provided at all levels where work is in progress, all around the building.

44. SETTING OUT OF WORK AND SURVEY

44.1 Reference Points, Lines

The Contractor shall establish benchmarks and / or reference line at the Site in accordance with the instructions of the Engineer. The Contractor shall set out its work from these benchmarks and lines. The Contractor shall supply plant, equipment, materials and labour for checking if required of the survey control by the Engineer. Slope stakes will be set by the Contractor before commencement of excavation and will be re-established as required during progress of work using established bench-marks and reference points.

44.2 Verification

The Engineer may make checks as the work progress to verify lines and grades established by the Contractor and to determine the conformance of the work as it progresses with the requirements of the Drawings and Specifications. Such checking by the Engineer shall not relieve the Contractor of his responsibility to perform all work in accordance with the Drawings and Specifications and the lines and grades given therein.

Based upon the basic control, the Contractor shall provide his own primary control points, as needed for the Works, and shall preserve and maintain them until otherwise authorized.

The Contractor shall be responsible for maintaining all survey markers/monuments, and property corners. If any markers/monuments are destroyed by the Contractor, the Contractor shall arrange, at his own cost, to retrace and replace them to the entire satisfaction of the Engineer. If a monument cannot be replaced in its original position, the Contractor shall install a witness corner. The Contractor shall complete and file monument reference cards on all monuments as per instructions of the Engineer.

The Contractor shall provide experienced construction surveyors with adequate experience in the construction surveys similar in nature as required by this Contract.

Based upon established basic control monuments the Contractor shall establish all lines and grades necessary to control the Works, and shall be responsible for all measurements that may be required for execution of the Works to the tolerance prescribed below.

The Contractor shall perform such surveys and computations as are necessary to determine quantities of work performed or placed during each progress payment period, and shall also perform all surveys necessary for the Engineer to determine final quantities of work in place. The Engineer will determine final quantities based on original ground levels determined by the Contractor and agreed by the Engineer.

The Contractor shall notify the Engineer at least 24 hours before performing a quantity survey and, unless specifically waived, quantity surveys shall be performed in the presence of an authorized representative of the Engineer.

Degree of accuracy for the survey works shall satisfy the following specified tolerances:

(a) Structure points shall be set within 0.01 foot accuracy from point to point, except where tighter tolerances are required.

(b) Cross-section points shall be located within 0.10 foot, horizontally and 0.01 foot vertically.

(c) Permissible closing error for a levelling line meant for establishing Temporary Bench Mark (TBMs) shall not exceed $0.045 \times \sqrt{M}$ foot, where M is in miles. The permissible closing error shall be duly adjusted.

The Contractor shall provide all materials, equipment and labour required for surveying work, including, but not limited to, instruments, stakes, spikes, steel pins, templates, platforms, and tools, and except as required to be incorporated in the work or left in place, all such materials and equipment, shall remain the property of the Contractor. Surveying instruments shall be in perfect working condition and shall be subject to rigid inspection for proper operation at least after every two weeks of use. Defective instruments shall be promptly replaced or repaired and adjusted to the satisfaction of the Engineer.

Survey data shall be recorded in accordance with recognized professional surveying standards. Original field notes, computations, and other surveying data shall be recorded in the Contractor furnished field books. Notes or data not in accordance with standard formats will be rejected. Illegible notes or data, or use of erasures on any page of a field book will be considered sufficient cause for rejection of part or the entire field book. Copied notes or data will not be permitted; therefore, rejection

of part or all of a field book may necessitate re-surveying. Corrections by ruling or lining out errors will be satisfactory.

45. PAYMENT OF WORK

Payment shall be made for the works involved within the scope of this section of specification unless otherwise specifically stated in the Bills of Quantities or herein as per the Bill "General Items" as illustrated in Estimate.

46. ENVIRONMENTAL PROTECTION

The Contractor shall exercise care to protect the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of works. Except where clearing is required for the Permanent works, approved construction roads and the Temporary Works, and for excavation operations, all trees and native vegetation shall be preserved and shall be protected from damage which may be caused by the Contractor's construction operations and equipment. On completion of the works, all work areas shall be smoothed and graded in a manner to confirm to the natural appearance of the landscape. Where unnecessary destruction, scarring, damage or defacing may occur as a result of the Contractor's operations, it shall be repaired, replanted, or otherwise corrected as directed by the Engineer at no additional cost to the Employer.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

FEDERAL GOVERNMENT EMPLOYEES HOUSING AUTHORITY

NAME OF PROJECT: LANDSCAPING AND HORTICULTURE WORKS OF SECTOR F-14 & F-15, ISLAMABAD

VOLUME II
(Project Specifications)

OCTOBER, 2026

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PAKISTAN DEFENCE OFFICERS' HOUSING AUTHORITY

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PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

SPECIFICATIONS - TECHNICAL PROVISIONS

All items to conform with National Highway Authority (NHA) Specifications for road works and Military Engineering Services (MES) Specifications for all other works (with their sub-sequent amendments) except where additional specifications are provided in this section and BOQ, with the following additional stipulations:-

i) No payment for extra lead and lift will be made.

ii) The rates being quoted by the Contractor shall include dewatering if required.

iii) Not with-standing any item of BOQ, **NO LEAD** or **LIFT** for supply of any material/ disposal of any item/ execution of any work would be given to the Contractor. The Contractor is supposed to investigates the source of all materials and ascertain their cost of cartage (including all incidental costs) which would be considered incorporated in the items rates.

iv) RCC pipes in items to conform to ASTM Specifications C-76.

v) Sea sand shall be used only for bedding and backfilling under PE Pipe and will not be allowed in any other activity.

vi) Sea water/ brackish water shall not be used in any construction activity including road construction.

vii) Any item (i) described in the Bill of Quantities or relevant Specifications but not shown on the Drawings, or (ii) shown on the Drawings but nor described in the Bill of Quantities or relevant Specifications, shall be of like effect as it has been shown and mentioned in both. Similarly, if any item which is neither shown on the drawing not mentioned in the Bill of Quantities or Specification but is a pre-condition to carryout any item of the contract, it shall be considered to be included in the contract price, distributed among the rates and prices entered for the related items of works. The decision of the Engineer shall be final and binding on the Contractor, unless before the deadline for submission of Bids, such discrepancies are clarified by the Design Consultant as a result of an inquiry from bidders or on the initiative of the Design Consultant/ Employer. The clarification in either case would be sent to all bidders as an Addendum. However it shall be clearly understood that no extra cost whatsoever shall be paid in case such discrepancies if any, exist in the Bid documents.

viii) All diameters of pipes and fittings (MS, uPVC, RCC, FC etc.) as mentioned in BOQs shall be minimum clear inner diameters.

ix) In case of PE Pipe the diameter given in the BOQ shall refer to outer diameter.

x) Not withstanding anything contained in the Contract Documents, Employer/ Engineer reserves the right to ask for justification/ rate analysis from the contractor of any rate which in the opinion of the Employer/ Engineer is abnormally high or low. Furthermore, the quoted rates, once accepted will be valid only for the quantities mentioned in the BOQ with a variation of ± 15%. For any further variation, the Employer/ Engineer reserves the rights to reduce any abnormally high rate quoted by the contractor as per Clause 52.2 of the contract.

xi) Notwithstanding anything contained in the Contract, all structural concrete shall be through approved Batching Plant/ Transit Mixers, as per approved design mix.

xii) The Contractor shall maintain the following facilities for the Engineer:

a) 4 nos. JAC T9 Hunter 4x4 Brand New with Driver, POL and 500 litres Diesel / Month each.
b) 4 nos. Changan Karavan Brand New With Driver, POL and 300 litres Diesel / Month each.
c) Office located in the G-14 area. Atleast 500 square yards including all utilities, furnishing and IT facilities. Must have a backup generator.
d) Accomodation for the resident supervision staff. Atleast 500 square yards with 8 rooms, all air conditioned / heated including all furnishing and back up generator.

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PLAIN & REINFORCED CONCRETE

1. SCOPE OF WORK

The work to be done under this section of the specifications shall consist of furnishing all plant, labour, equipment, appliances and materials and in performing all operations in connection with providing and placing plain and reinforced cement concrete, in position as shown on the drawings including furnishing formwork, batching, mixing, finishing and curing as per drawings or as directed by the Engineer.

2. CLASSES OF CONCRETE

The classes of concrete recognized in these specifications shall be designated as per Table -1. The concrete of the various classes shall satisfy the requirements shown in Table - 1.

The class of concrete to be used shall be as designated on the Drawings or as directed by the Engineer or specified in the special provisions. The following requirements shall govern unless otherwise shown on the Drawings.

Class A1 concrete shall be used everywhere, for non-reinforced and reinforced concrete structures, except as-noted below or directed by the Engineer. Concrete placed underwater shall be Class A2. Concrete placed for piles shall be Class A3. Water retaining structures shall be Class A4.

Class B Concretes shall be used only where specified.

Class C concretes shall be used for cribbing, or as otherwise directed by the Engineer or specified in the Special Provision or on the Drawing.

Class D1, D2, D3, or D4 concrete shall be used for reinforced, pre-stressed and post-tensioned members (elements), as indicated on drawings.

Class Y concrete shall be used as a filler in steel grid bridge floors, in thin reinforced sections or as otherwise specified in the Special Provisions.

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

Table – 1 ** - Requirements of concrete of various classes

CLASS	MIN. CEMENT VOLUME	MAX. COARSE AGGREGATE SIZE	28 DAY COMPRESSIVE STRENGTH (fc')	CONSISTENCY (RANGE IN SLUMP) VIBRATED	MAX. WATER CEMENT (w/c) RATIO
	kg/m3 (lbs/ft3)	mm (in)	kg/cm2 (psi)	mm (in)	
A1	300 kg/m3 (18.72 lb/ft3)	20 mm (0.8 inch)	210 kg/cm2 (3000 psi)	25-75 (1-3)	0.58
A2	350 kg/m3 (21.84 lb/ft3)	25 mm (1 inch)	245 kg/cm2 (3500 psi)	100-150 (4-6)	0.58
A3	400 kg/m3 (24.96 lb/ft3)	38 mm (1.5 inch)	280 kg/cm2 (4000 psi)	100-150 (4-6)	0.58
A4	425 kg/m3 (26.53 lb/ft3)	38 mm (1.5 inch)	316 kg/cm2 (4500 psi)	25-75 (1-3)	0.55
B	250 kg/m3 (15.6 lb/ft3)	51 mm (2 inch)	170 kg/cm2 (2500 psi)	25-75 (1-3)	0.65
C	275 kg/m3 (17.16 lb/ft3)	38 mm (1.5 inch)	210 kg/cm2 (3000 psi)	25-75 (1-3)	0.58
D1	450 kg/m3 (28.8 lb/ft3)	25 mm (1 inch)	350 kg/cm2 (5000 psi)	50-100 (2-4)	0.40
D2	500 kg/m3 (31.20 lb/ft3)	25 mm (1 inch)	425 kg/cm2 (6000 psi)	50-100 (2-4)	0.40
D3	550 kg/m3 (34.32 lb/ft3)	20 mm (3/4 inch)	490 kg/cm2 (7000 psi)	50-100 (2-4)	0.40
D4	600 kg/m3 (37.44 lb/ft3)	20 mm (3/4 inch)	560 kg/cm2 (8000 psi)	50-100 (2-4)	0.40
Y	400 kg/m3 (24.96 lb/ft3)	13 mm (0.5 inch)	210 kg/cm2 (3000 psi)	25-75 (1-3)	0.58
LEAN	175 kg/m3 (10.92 lb/ft3)	51 mm (2 inch)	100 kg/cm2 (1500 psi)	-	-

** Note: - For all concrete works the above mentioned table shall govern.

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2.1. Types of Concrete Works

2.1.1 Underground Concrete

Concrete poured below Natural Surface Level with or without shuttering and shoring.

2.1.2 On-ground Concrete

Concrete poured by exiting formwork with necessary bracings on ground.

2.1.3 Elevated Concrete

Concrete poured by existing props, bracing and towers to support the formwork at higher levels.

3. EFFECT OF MATERIALS STRENGTH

The cement and aggregate used have significant influence on strength properties. The use of unsound aggregates will produce large variations in the strength of concrete. In general, however, a good aggregate will develop the full strength of the cementing matrix and therefore should cause little variation in the product. Strength is increases slightly with larger size coarse aggregates.

4. MATERIALS

4.1 Cement

i). The cement shall be fresh and of approved origin and manufacture, it shall be one of the following as may be specified by the Engineer.
   a). Ordinary Portland Cement (OPC) shall comply with ASTM C150, Standard Specification for Portland Cement.

   b). Rapid Hardening Hydraulic Cement (RHHC) shall comply with ASTM C1600, Standard Specification for Rapid Hardening Hydraulic Cement.

   c). Sulphate-resisting Portland Cement (SRPC) shall comply with ASTM C150, Standard Specification for Portland Cement.

ii). Mill Certificates shall accompany delivery of the material to the work.

iii). There shall be sufficient cement on site to ensure that each section of work is completed without interruption. If the cement is supplied by the Employer, the contractors should inform the Employer of his requirements much before its use in construction.

iv). Cement reclaimed from cleaning of bags or from leaky containers shall not be used.

v). The Contractor shall provide and erect (at his cost) in a suitable place dry, well ventilated, weather-proof and waterproof shed of sufficient capacity to store the cement.

vi). The cement shall be used as soon as possible after delivery and cement which has become stale or unsuitable through absorption of moisture from the atmosphere or otherwise shall be rejected and removed immediately from the site at the Contractor's expense. Any cement in containers damaged so as to allow the contents to spill or access of the atmosphere to the cement prior to opening at the time of concrete mixing shall be rejected and removed immediately from the site at the Contractor's expenses.

vii). Cement stored through a monsoon or for more than six months should not be used in reinforced concrete.

viii). Different brand or different types of cement from the same mill, or the same brand or type from differing mills shall not be mixed or used alternately in the same item of construction unless authorized by the Engineer, after preparing new mix designation.

4.2 Water

Water shall comply with ASTM C1602 - Standard Specification for Mixing Water Used in Production of Hydraulic Cement Concrete.

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The water for curing, for washing aggregates and for mixing shall be fresh, clean, clear, potable and free from impurities & deleterious matter. Water containing less than 2000 parts per million (ppm) of total dissolved solids with following limits on contaminants, recommended to be used for concrete.

Contaminants	Conventional Reinforced Concrete	Pre-stressed Concrete	Non-reinforced Concrete
OIL	None	None	None
CHLORIDES, ppm	1,000	650	2,000
SULPHATES, ppm	1,000	800	1,500

In no case shall the water contain an amount of imparities that will cause arrange in the setting time of Portland cement of 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 addition to the above requirements, water for curing concrete shall not be contain any impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

When required by the Engineer, the quality of the mixing water shall be processed by the standard method of test for quality of water to be used in concrete.

5. AGGREGATES

a) The quality and sources of all aggregates for concrete shall be approved by the Engineer before the materials are delivered to the site. Aggregates shall be obtained from a source known to produce aggregates satisfactory for concrete and shall be chemically inert, strong, hard, durable of limited porosity and free from adhering coatings, clay lumps, coal and coal residues, and organic or other impurities that may cause corrosion of the reinforcement or may impair the strength or durability of the concrete.

b) Wherever feasible the nominal maximum size of aggregate for cast-in-place reinforced concrete slabs and other thin members shall also be 20mm (¾"). If there are difficulties in placing such a concrete the maximum size may be restricted to 12mm (½") provided the requirements for strength are satisfied.

c) The nominal maximum size of the aggregate for precise concrete shall not be large than one-fifth of the narrowest dimension between sides of forms, one-third of the depth of slabs, nor three-fourths of the minimum clear distance between reinforcing bars or between bars and forms, whichever is least. In precast columns the nominal maximum size of the aggregate shall be limited as above but shall not be larger than two-thirds of the minimum clear distance between bars.

d) Storage

All aggregates shall be stored on properly constructed paving and bins or as directed by the Engineer. There shall be a physical partition between the stockpiles of coarse and fine aggregates. If required aggregates shall be washed and screened to the satisfaction of the Engineer.

e) Sieve Analysis

Sieve analysis of all the aggregates to be used in the works shall be carried out as and when required by the Engineer. All aggregates shall be subject to the approval of the Engineer.

f) Rejected Aggregates

Any aggregates not found to be of the specified standard shall be rejected by the Engineer and all such rejected material shall have to be removed from site without delay.

Concrete structures constructed with rejected aggregates shall be dismantled and rebuilt at the Contractor's expense.

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5.1 Fine Aggregates

The Fine Aggregates shall comply with ASTMC-033 – Standard Specifications for Concrete Aggregates and AASHTO M-6.

Fine-Aggregate Grading Limits - (ASTM C 33/AASHTO M 6)

Sieve size	Percent passing by mass
9.5 mm (3⁄8 in.)	100
4.75 mm (No. 4, 3/16 in.)	95 to 100
2.36 mm (No. 8)	80 to 100
1.18 mm (No. 16)	50 to 85
600 µm (No. 30)	25 to 60
300 µm (No. 50)	5 to 30 (AASHTO 10 to 30)
150 µm (No. 100)	0 to 10 (AASHTO 2 to 10)

Other requirements of ASTM C 33 (AASTHO M 6) are:

1. The fine aggregate must not have more than 45% retained between any two consecutive standard sieves.

2. The fineness modulus must be not less than 2.3 nor more than 3.1, nor vary more than 0.2 from the typical value of the aggregate source. If this value is exceeded, the fine aggregate should be rejected unless suitable adjustments are made in proportions of fine and coarse aggregate.

5.2 Coarse Aggregate

The Coarse Aggregates shall comply with ASTMC-033 – Standard Specifications for Concrete Aggregates and AASHTO M-80.

The coarse aggregate grading requirements of ASTM C 33 (AASHTO M 80) permit a wide range in grading and a variety of grading sizes as shown in the Table below.

Table - Grading Requirements for Coarse Aggregates (ASTM C 33 and AASHTO M 80)

Size number	Nominal size, sieves with square openings	Amounts finer than each laboratory sieve, mass percent passing				
		100 mm (4 in.)	90 mm (3 ½ in.)	75 mm (3 in.)	63 mm (2 ½ in.)	50 mm (2 in.)
1	90 to 37.5mm (3½ to 1½ in.)	100	90 to 100	-	25 to 60	-
2	63 to 37.5mm (2½ to 1½ in.)	-	-	100	90 to 100	35 to 70
3	50 to 25.0mm (2 to 1 in.)	-	-	-	100	90 to 100
357	50 to 4.75mm (2 in. to No. 4)	-	-	-	100	90 to 100
4	37.5 to 19.0mm (1½ to ¾ in.)	-	-	-	-	100
467	37.5 to 4.75mm (1½ in. to No. 4)	-	-	-	-	100
5	25.0 to 12.5mm (1 to ½ in.)	-	-	-	-	-
56	25.0 to 9.5mm (1 to 3/8 in.)	-	-	-	-	-
57	25.0 to 4.75mm (1 in. to No. 4)	-	-	-	-	-
6	19.0 to 9.5mm (¾ to 3/8 in.)	-	-	-	-	-
67	19.0 to 4.75mm (¾ in. to No. 4)	-	-	-	-	-
7	12.5 to 4.75mm (½ in. to No. 4)	-	-	-	-	-
8	9.5 to 2.36mm (3/8 in. to No.8)	-	-	-	-	-

The maximum size of aggregate that can be used generally depends on the size and shape of the concrete member and the amount and distribution of reinforcing steel. The maximum size of aggregate particles generally should not exceed the values shown in the Table below.

Size number	Nominal size, sieves with square openings	37.5mm (1½ in.)	25.0mm (1 in.)	19.0mm (¾ in.)	12.5mm (½ in.)	9.5mm (¾ in.)	4.75mm (No. 4)	2.36mm (No. 8)	1.18mm (No. 16)
1	90 to 37.5 mm (3½ to 1½ in.)	0 to 15	-	0 to 5	-	-	-	-	-
2	63 to 37.5 mm (2½ to 1½ in.)	0 to 15	-	0 to 5	-	-	-	-	-
3	50 to 25.0mm (2 to 1 in.)	35 to 70	0 to 15	-	0 to 5	-	-	-	-
357	50 to 4.75mm (2 in. to No.4)	-	35 to 70	-	10 to 30	-	0 to 5	-	-
467	37.5 to 4.75mm (1 ½ in. to No. 4)	95 to 100	-	35 to 70	-	10 to 30	0 to 5	-	-

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Size number	Nominal size, sieves with square openings	37.5mm (1½ in.)	25.0mm (1 in.)	19.0mm (¾ in.)	12.5mm (½ in.)	9.5mm (¾ in.)	4.75mm (No. 4)	2.36mm (No. 8)	1.18mm (No. 16)
5	25.0 to 12.5mm (1 to ½ in.)	100	90 to 100	20 to 55	0 to 10	0 to 5	-	-	-
56	25.0 to 9.5mm (1 to 3/8 in.)	100	90 to 100	40 to 85	10 to 40	0 to 5	0 to 5	-	-
57	25.0 to 4.75mm (1 in. to No.4)	100	95 to 100	-	25 to 60	-	0 to 10	0 to 5	-
6	19.0 to 9.5mm (¾ to 3/8 in.)	-	100	90 to 100	20 to 55	0 to 15	0 to 5	-	-
67	19.0 to 4.75 mm (¾ in. to No.4)	-	100	90 to 100	-	25 to 55	0 to 10	0 to 5	-
7	12.5 to 4.75mm (½ in. to No.4)	-	-	100	90 to 100	40 to 70	0 to 15	0 to 5	-
8	9.5 to 2.36mm (3/8 in. to No. 8)	-	-	-	100	85 to 100	10 to 30	0 to 10	0 to 5

6. COMPOSITION OF CONCRETE

a) Cement and Aggregates

The fine aggregate and the coarse aggregates shall be measured separately by weight. The proportions weight of cement to fine aggregate and coarse aggregate shall be determined by mix design approved by the Engineer. The Contractor shall propose mix designs duly supported by cube tests for each grade of concrete for the approval of the Engineer.

b) Water Cement ratio

The quality of water used shall be just sufficient to produce a dense concrete of adequate strength and workability for its purpose. For all external if work and foundations the water / cement (W/C) ratio shall not exceed **0.55**.

c) Workability

The workability shall be controlled by direct measurement of the water content, allowance being made for any water in the fine and coarse aggregates. The concrete shall be just sufficiently workable to be placed and compacted, without difficulty, by the means available.

The workability shall be determined by either the slump tests as directed by the Engineer and these shall be performed in accordance with the methods given in **ASTM C143** ***"Standard Test Method for Slump of Hydraulic-Cement Concrete****".* The slump for each grade of concrete shall be determined during the Preliminary Test mixes and the value obtained shall not be modified without the written consent of the Engineer. Unless otherwise permitted or specified, the concrete shall be pro- portioned and produced to have a slump of 75 mm or less if consolidation is to be done by vibration, and 125mm or less if consolidation is to be by methods other than vibration. A tolerance of upto 25mm above the indicated maximum shall be allowed for individual batches provided the average for all batches or the most recent 10 batches tested, whichever is fewer, does not exceed the maximum limit, Concrete of lower than usual slump may be used provided it is properly placed and consolidated.

7. ADMIXTURES/ PLASTICIZERS/FIBERS

Admixtures shall only be allowed to be used with written permission of the Engineer. If air-entraining agents, water reducing agents, set retarders or strength accelerators are permitted, the dosage of fiber shall be determined after consideration of the dosage recommended by the manufacturer.

Polypropylene Fibers (PPF) shall be allowed to be used with written permission of the Engineer. The dosage of fiber shall be determined after consideration of the dosage recommended by the manufacturer.

For water proofing (mitigation of water penetration) of concrete, admixtures may be used. These additives shall be lingosulphonate polymer based water proofing cum plasticizing admixtures. The product must be free of chlorides and shall have a specific gravity not less than 1.17 and shall comply with **ASTM C-494 Type A & D.**

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The Contractor shall submit concrete mix design for approval, prior to the commencement of work. No work shall be carried out without getting written approval of concrete Design Mix from the Engineer.

8. FORMWORK

a). General

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

- Earth cuts shall not be used as forms for vertical surface of reinforced concrete work unless required or permitted.

- Mud centering shall not be permitted.

- Formwork shall be of wrought timber, steel, plywood, proprietary building boards which gives the required finish to the surface of concrete. Wooden formwork shall be free from loose knots and shall be well seasoned.

- The formwork shall conform to the shape, line and dimension as shown on the plans and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete and shall be sufficiently tight to prevent loss of liquid from the concrete.

  The design and engineering of the formwork as well as its construction shall be the responsibility of the contractor. Where necessary to maintain the specified tolerances the formwork shall be cambered to compensate for anticipated deflections in the formwork due to the weight and pressure of the fresh concrete and due to construction loads. Design of formwork shall, in general, conform to ACI 347-68.

  In normal circumstances (General where temperatures are above 20^{o}C (68^{o}F)) and where ordinary cement is used forms may be struck after expiry of the following periods:

Concrete work	**Period**
Walls, columns and vertical sides of beams	48 hours or as may be decided by the Engineer.
Slabs (shores or props left under)	6 days
Beams soffits (shores or pros left under)	12 days
Removal of shores or props to slabs: i). Spanning upto 14 ft ii). Spanning above 14 ft.	 10 days 16 days
Removal of shores or props to beams: i). Spanning upto 20 ft ii). Spanning above 20 ft.	 18 days 25 days

  For rapid hardening cement 3/7 of the above period will be sufficient in all cases except vertical sides of slabs beams and columns which should be retained for minimum 24 hours.

b). Making Forms

The form work for all concrete work to be cast in situ shall be made of sound and properly seasoned timber or other approved material for all works above ground water table. For all works below ground water table form work of steel shall be used. These forms work shall be properly jointed and erected with packing material to provide water tight forms. These forms shall be properly cleaned to give a smooth finished surface and shall be rigidly formed and designed by the Contractor to the shapes and forms as per drawings in accordance with the best existing practices so as to be able to withstand, without displacement, deflection or deformation movements of any kind, the pressure of the moist concrete and all other loads.

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c). Rigid with Allowance for Camber and Bulges

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

d). Materials and Labour

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

e). Form work not to interfere or injure work

The form work shall be so designed and arranged as not to unduly interfere with concrete, during its placing and easy to be removed without injuring the finished concrete.

Wedges, clamps, bolts and the rods shall be used, when permitted and where practicable, in making the form work rigid and in holding it to true position.

f). Joints in Formwork

All joints in the form work shall be sufficiently closed to prevent undue leakage of mortar from concrete or show any appearance of leaking mortar on concrete surface.

g). Treatment and Inspection of Forms

All rubbish particularly chipping, shavings and saw dust etc. shall be removed from the interior of the forms, immediately before placing concrete. Forms shall be coated with approved mould oil before reinforcement is placed. Surplus oil on forms and any oil on reinforcing steel shall be removed.

h). Removal of Shuttering

No struts or timbering which serve the purpose of supporting the shuttering or centering shall be struck and removed before the minimum periods for the main classes of work given as under:

Removal of Shuttering	Cold Weather Days	Normal Weather Days
Beams sides, walls and Columns (unloaded)	5	3
Slabs soffits (Props left under)	10	7
Removal of props to slabs	18	14
Beams soffits (Props left under)	13	10

Struts or other timbers or supports, the removal of which may cause the transference of load to the finished work, shall be kept in place for three weeks after the placing of the concrete.

i). Injury or damage

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

j). Treatment after Removal of Forms

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

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with carborundum stone and cement wash and bring the whole to a smooth and pleasing finish and uniform colour.

k). Form work shall not be measured or paid for separately and shall be deemed to be included in the unit price of concrete whether cast-in-situ or precast and subsequently fixed in position.

9. CONCRETE BATCHING PLANT

The contractor shall install a Concrete Batching Plant. The concrete Batching plant shall be a Central mix facility that mixes the ingredients internally before being loaded into the truck. The facility should be a stationary facility; the structure can be either a solid building or an open framework.

The contractor shall install:

i. Contractor's site laboratory for testing of concrete
ii. Chiller plant
iii. Loader for blowing of aggregates

10. BATCHING OF CONCRETE

The Contractor shall provide such means and equipment as are required to determine accurately control the amount of each separate ingredient entering the concrete. Such means, the equipment and its operation shall at all times be subject to approval by the Engineer. The amount of cement, water, sand and each size of coarse aggregate entering each batch of concrete shall be determined by weighing or by volumetric measurement if permitted by the Engineer.

11. MIXING CONCRETE

11.1. Mixings 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 do not effect 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,

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one and half (1½) percent for any size of aggregate or one (1) percent for the total aggregates in any batch. Where volumetric measurements are authorized by the Engineer the weight proportion 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.

11.2. 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 thirty two (32) degree C**. 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 (1½) 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.

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.

11.3. 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

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drum. The mixing time shall neither be less than fifty (50) second, nor more than ninety (90) seconds.

The plasticizer, accelerator or retarder or water reducing admixture, if required, shall be fed separately at the rate recommended by the manufacturer, as established by laboratory trials.

11.4. 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 in to 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.

11.5. Partial Mixing at the Central Plan

When a truck mixer, or an agitator provided with adequate mixing blades, is used for transportation the mixing time at the stationary plant mixer may be reduced to thirty (30) seconds and the mixing completed in a truck mixer/agitator. The mixing time in the truck mixer or agitator equipped with adequate mixing blades shall be as specified for truck mixing.

11.6. Stiff Concrete Mix

For mixing concrete of zero slump to be laid by pavers, gravity mixer shall not be used. Only force mixer of moving blades shall be allowed to ensure homogenous mix.

11.7. Hand Mixing

Hand mixing of materials shall not be allowed in any case.

12. CONSOLIDATION

a). All concrete shall be consolidated by vibration, spading, rodding or forking so that the concrete is thoroughly worked around the reinforcement, around embedded items and into corners of forms, eliminating all air or stone packets which may cause honey-combing, pitting or planes of weakness. Internal vibrators shall have a minimum frequency of 8000 vibrations per min. and sufficient amplitude to consolidate the concrete effectively. They shall be operated by competent workmen, use of vibrators to transport concrete with forms shall not be allowed. Vibrators shall be inserted and withdrawn at points approximately 450mm (18”) apart. At each insertion, the duration shall be sufficient to consolidate the concrete but not sufficient to cause segregation, generally from 5 to 15 seconds. A spare vibrator shall be kept on the job site during all concrete placing operations.

b). Over-vibration or vibration of very wet mixes is harmful and should be avoided.

13. HAULING & DELIVERY OF MIXED CONCRETE

13.1. 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

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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 equipments hall 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 be laid be 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 in to 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 (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 thirty (30) degree C or above, the time between the introduction of cement to the aggregates and discharge shall not exceed forty five (45) minutes.

13.2. Delivery

The organization supplying concrete shall have sufficient plant capacity and Transportation vehicles to ensure continuous delivery at the rate required. The rate of the delivery of concrete during concreting operations shall be such as to provide for the proper handling, placing, and finishing of the concrete. The rate shall be such that the interval between batches shall not exceed twenty (20) minutes. The methods of delivering and handling the concrete shall be such as will facilitate placing with the minimum re-handling and without damage to the structure of the concrete.

13.3. Re-tempering

The concrete shall be mixed only in such quantities as are required for immediate use and any concrete that has developed initial set shall not be used. Concrete that has partially hardened shall not be re-tempered or remixed.

14. HANDLING AND PLACINE CONCRET

14.1. General

In preparation for the placing of concrete all saw dust, 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 time stipulated above under item "Hauling and Delivery of Mixed Concrete".

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

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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 (1½) 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.

14.2. Pneumatic Placing

Pneumatic placing of concrete will be permitted only if authorized by the Engineer. The equipments hall be so arranged that no vibration will occur that might damage freshly placed concrete.

Where concrete is conveyed and placed by pneumatic means, the equipment shall be suitable in kind and adequate in capacity for the work.

The machines hall be located as close as practicable to the work. The discharge lines shall be horizontal or inclined upwards from the machine. At the conclusion of placing the concrete, the entire equipment shall be thoroughly cleaned.

14.3. 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.

14.4. Placing Concrete Under Water

Concretes hall 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.

Concrete deposited under water shall be Class A concrete with a minimum cement content of three hundred fifty (350) Kg per cubic meter of concrete.

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, 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.

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.

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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 induced 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.

14.5. 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 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 neither in the forms nor 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.

14.6. Concrete in Hot & Cold Weather

a) Concrete in hot weather

Concerting shall be avoided in timely hot weather and shall be done only in better part of the day. It should be particularly avoided in dry, hot and windy weather for member with large surface areas exposed to the weather. Aggregate shall be carefully stored under shelter and shall be sprinkled with cold water from time to time to check high temperature.

Water, to be used for concreting, shall be carefully used and, if necessary, crashed ice shall be added to bring the temperature as low as 70^{O} F (21.1^{O} C) in order to at resulting temperature of concrete is not above 90^{O} F (32^{O} C). Execs of water shall not be added and the specified water of cement ratio shall be maintained.

b) Concert In Cold Weather

When depositing concert is unavoidable at a temperature below 36^{O} F (2.2^{O} C), precaution shall be taken to ensure that the concert shall have a temperature of at least 40^{O} F (4.4^{O} C), at the

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time of placing of concert. The temperature of concert shall be maintained at not less than 40^{O} F (4.4^{O} C) until it is thoroughly hardened. Sand or other material shall not be used in the prevention of freezing and no frozen materials or material containing ice or snow shall be used.

14.7. Surface finishes/ rendering

a) General

Concrete surface finishes shall be classified as follows:-

Bridge Deck Surface Finish
Sidewalk Surface Finish
Ordinary Surface Form Finish
Class 1 Surface Form Finish

The bridge deck surface finish shall be given to the surface of the bottom Slabs of all box type underpass structures.

The requirements for sidewalk surface finish apply to the surface of the bottoms labs in box culverts, except that the acceptable variation from a three-meter straightedge shall be 10 mm, and brooming shall be omitted.

The ordinary surface form finish shall be the final finish applied to all Surfaces after removal of forms, unless otherwise specified or called for on the drawings.

The Class 1 surface form finish shall be applied only where specified or as required by the Engineer when the ordinary surface finish did not produce the required smooth, even surface of uniform texture and appearances.

b) 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 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 strike-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.

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 discounted 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 (03) meters ahead of strick 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 strick 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.

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 pervious 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) meter long, ribbed and trussed as necessary to provide a rigid float and shall be equipped with an adjustable handle each end. The float shall be wood, not less than two and half (2.5) cms thick and from ten (10) cm to twenty (20) cm wide. Adjusting screws spaced as not to exceed 60 cms on centers shall be provided between the float and the rib. The float board shall be maintained free of twist and true at all time.

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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 as specified in item 401.3.8 “Curing Concrete” hereinafter.

The finished surface of the concrete shall be tested by means of a straightedge three (3.0) meter 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.

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 surface 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.

c) Sidewalk Surface Finish

After the concrete has been placed it shall be compacted and the concrete shall be struck off by means of a strike board, floated with a wooden or cork floating and finish with a broom. An approved edging tool shall be used on all edges and at all expansion joints. Brooming shall be transverse to the line of traffic and if water is necessary, it shall be applied to the surface immediately in advance of brooming. The surface shall not vary more than six (6) mm under a three-meter straightedge, and the finished surface shall be free of blemishes.

d) Ordinary Surface from Finish

Ordinary surface finish shall consist of filling holes or depressions in the surface of the concrete, repairing all rock pockets, removing stains and discoloration visible from traveled ways. Ordinary surface finish shall be applied to all concrete surfaces either as a final finish or preparatory to the Class 1 finish. On surfaces, which are to be buried underground or surface, which are enclosed, such as the cells of box girders; the removal of fins will not be required.

Except as provided herein, all from bolts and any metal placed for the convenience of the Contractor shall be removed to a depth of at-least two and half (2.5) cms below the surface of the concrete. All rock pockets and other unsound concrete shall be removed. The resulting holes or depression shall be cleaned and filled with mortar. From bolts projecting into the cells of box girders need not be removed unless permanent access is provided into the cells, in which case such bolts shall be removed flush with the surface of the concrete. Mortar used to fill bolt holes shall consist of one part cement and two parts sand. Other depressions and pockets shall be filled with either packed mortar or air blown mortar as directed by the Engineer. Mortar shall be cured in conformance with the requirements in item 401:3.8 (c) “Curing Structures”

If rock pockets or holes in the opinion of the Engineer, are of such an extent or character as to affect the strength of the structure materially or to endanger the life of the steel reinforcement, he may declare the concrete defective and require the removal and replacement of the portions of the structure affected.

e) Class 1 Surface from Finish

Class 1 surface finish shall consist of finishing the surfaces of the structure as necessary to produce even surfaces of uniform texture and appearance, free of unsightly bulges, depression and other imperfections. The degree of care in building forms and character of materials used in form work will be a contributing factor in the amount of additional finishing required to produce

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even surfaces of uniform texture and appearance, free of unsightly bulges, depressions and other imperfections, and the Engineer shall be the sole judge in this respect.

After completion of the ordinary surface finish, areas which do not exhibit the required smooth, even surface of uniform texture and appearance shall be sanded with power sanders or other approved abrasive means until smooth, even surfaces of uniform texture and appearance are obtained. The use of power carborundum stones or disks will be required to remove bulges and other imperfections.

Class 1 surface finish shall not be applied until a uniform appearance can be obtained.

Class 1 surface finish may be required to be applied as the final finish for the following surfaces, unless otherwise directed by the Engineer.

i. All form finish surfaces of bridge super-structures except the under surfaces between girders and the inside vertical surfaces of T girders.

ii. All surfaces of bridge piers, columns and abutments, and retaining walls above finished ground and to at least three tenth (0.3) meter below finished ground.

iii. All surfaces of open spandrel arch rings, spandrel columns and abutment walls.

iv. All surfaces of pedestrian undercrossing, except floors and surfaces to be covered with earth.

v. Surface above finished ground of culvert headwalls, end walls and retaining walls.

vi. Surface inside of culvert barrels having a height of one and half (1.5) meters or more for a distance inside the barrel at least equal to the height of the culvert.

vii. All surface of railings.

f) Surface Rendering

All faces of concrete which are to come in contact with backfill or pavement materials shall be applied two coats of hot bitumen of approved quality, before placing any material around concrete.

15. FINISHING

a). Finishing of concrete surfaces shall be performed only by skilled workmen and as directed by the Engineer. Formed surfaces upon or against which backfill or concrete is to be placed will require no treatment after form removal except for the removal and repair of defective concrete and for the specified curing. Unformed surfaces that will be covered by backfill or by concrete shall be finished by sufficient leveling and screeding to produce an even uniform surface.

b). A hard steel trowel finish shall be applied to unformed surfaces that will be exposed or subjected to the action of flowing later. Floating and trowelling shall be started as soon as the screeded surface has stiffened sufficiently, and shall be the minimum necessary to produce a surface that is free from screed marks and is uniform in texture.

16. CURING AND PROTECTION

a). The concrete shall be kept continuously wet by the application of water for a minimum period of Seven (07) days after the concrete has been placed. Beginning immediately after placement, concrete shall be protected from premature drying, excessively hot or cold temperatures and mechanical injury and shall be maintained with minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete. Cotton mats, burlaps, rugs, carpets or earth or sand blanket, 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.

At the expiration of the curing period the concrete surface shall be cleared of all curing mediums.

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b). Surface exposed to the air may be cured by the application of an imperious membrane (i.e. curing compound) with prior written approval from the Engineer.

c). For concrete surfaces not in contact with forms, one of the following procedures shall be applied immediately after completion of placement and finishing:
- Ponding or continuous sprinkling.
- Application of absorptive mats or fabric kept continuously wet.
- Application of sand kept continuously wet.

d). Curing shall be continued minimum Seven (07) days in the case of all concrete except concrete with Rapid-hardening Portland Cement for which the minimum period shall be three (03) days.

17. TEST OF CONCRETE QUALITY

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 obtain the necessary samples and submit them for testing at least thirty (30) days before actual concreting operations are to being.

Samples of aggregates shall be obtained and tested in accordance with the following standard **AASHTO methods and ASTM standards.**

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-11
v)	Mortar Strength	T-71
vi)	Sodium sulphate soundness	T-104
vii)	Friable particles	T-112
viii)	Abrasion loss	T-96
ix)	Specific Gravity	T-84
x)	Absorption	T-85
xi)	Production of Plastic Fines	T-210
xii)	Fineness Modulus	T-27
xiii)	Sand Equivalent	T-17
xiv)	Potential Reactivity of Carbonate Rocks for Concrete Aggregate (Rock Cylinder Method)	ASTM C 586
xv)	Potential Alkali Reactivity of Cement Aggregate Combinations (Mortar-Bar Method)	ASTM C 227
xvi)	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 materials involved in making concrete.

18. MEASUREMENT AND PAYMENT

18.1. General

Except otherwise specified herein or elsewhere in the Contract Documents no separate measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bills of Quantities but shall not be limited to the following. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bills of Quantities.

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18.2. Plain and Reinforced Concrete

a) Measurement

Concrete shall be measured as executed but no deduction shall be made for the following:-

- Volume of any steel embedded in the concrete
- Volume occupied by water pipes, conduits etc. not exceeding 25 sq.cm. each in cross sectional area.
- Voids not exceeding 0.10 Sq.M. in work given in Sq.M. If any void exceeds 0.10 Sq.M. total void shall be deducted.
- Void, which are not to be deducted as specified above, refer only to opening or vents which are wholly within the boundary of measured areas. Openings or vents which are at the boundary, measured areas shall always be subject to deductions irrespective of size.

Concrete work shall be classified and measured separately as listed under items of Bills of Quantities.

Measurement of acceptably completed works of plain and reinforced cement concrete will be made on the basis of concrete placed and compacted in position within the neat lines of the structure as shown on the drawings or as directed by the Engineer.

b) Payment

Payment will be made for the acceptable measured quantity of plain and reinforced cement concrete on the basis of unit rate quoted in the Bill of Quantities and shall constitute full compensation for all the works related to the items.

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STEEL REINFORCEMENT

1. SCOPE

The work under this section of specifications consists of furnishing, cutting, fabricating, bending and placing steel reinforcement and Welded wire, fabric of the type, size, shape and grade required in accordance with these specifications, in concrete structures or elsewhere as shown on the drawings and special provisions or as directed by the Engineer.

2. APPLICABLE STANDARDS

Latest editions of the following ASTM Standards shall be applicable and used. In lieu of ASTM standards, Pakistan Standards/Specifications may be used where applicable.

ASTM Standards

ASTM A 615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A 706 Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
ASTM A 305 Minimum Requirement for the deformations of deformed steel bars for concrete reinforcement.
ASTM E290 Standard Test Method for Bend Testing of Material for Ductility
ASTM A1034 Standard Test Methods for Mechanical Splices for Steel Reinforcing Bars
ASTM C876-09 Standard Test Method for Corrosion Potentials of Uncoated Reinforcing Steel in Concrete
ASTM A185 Standard Specification for Steel Welded Wire Reinforcement
ASTM A1022 Standard Specification for Deformed and Plain Stainless Steel Wire and Welded Wire for Concrete Reinforcement
ASTM A884 Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A775 Standard Specification for Epoxy-Coated Steel Reinforcing Bars

Pakistan Standards

PS 241 Tensile Testing of Steel
PS 244 Bend test for Steel
PS 580 Rolled deformed Steel bars (intermediate grade) for concrete reinforcement.
PS 605 Rolled deformed steel bars (hard grade) for concrete reinforcement.
PS 606 Rolled formed Steel bars (structural grade) for concrete reinforcement.
PS 607 General technical delivery requirement for steel

In addition to the above, other standards of ASTM may be specified by the Engineer.

3. MATERIAL AND SIZE OF BARS

a). Reinforcement for concrete shall conform to the respective ASTM Standards as specified in the Drawings and in the Contract Documents or as may be specified by the Engineer.

Unless otherwise specified, all plain reinforcing bars shall comply with the requirements of ASTM A 615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement and ASTM A 706 Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement and shall have a minimum yield strength of 40,000 psi (280 MPa).

b). Unless otherwise specified, all deformed reinforcing bars shall comply with the requirements of ASTM A 615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement and ASTM A 706 Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement and shall have a minimum yield strength of 60,000 psi (420 MPa)

c). If the reinforcement is supplied by the Employer, the Contractor should inform the Employer of his requirements much before its use in construction.

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d). Reinforcement of all types is to be stored at on site in an approved manner so as to avoid damage.

e). If the reinforcement is supplied by the Employer, the Contractor should report immediately on receipt of any consignment, any deviation from the standard of three enforcement bars beyond those allowed in respective standards. If the Engineer directs, the Contractor shall test the samples of reinforcement at his cost and submit to him the test report.

f). Steel wire mesh reinforcement shall conform to requirements of ASTM Designation A185 - Standard Specifications for Welded Steel Wire Fabric for concrete reinforcement. It shall be used where shown on the Drawings.

g). 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 bend. Reduced sections steel reinforcement shall not be used.

4. DELIVERY & STORAGE

Steel reinforcement bars shall be kept in bundles firmly secured and tagged. Each bar or bundle of bars shall be identified by marks stamped on hot or cold or painted on or by any other means, The identifying marks shall contain the following information:

- Name of the producer or his trade.
- Standard to which the bars have been manufactured.
- The class type and strength
- The diameter
- The number of the test certificate

The method of storage shall be approved by the Engineer. Reinforcing bars shall be stored in racks or platforms above the surface of ground and shall be protected free from scaling, rusting, oiling, coatings, damage, contamination and structural defects prior to placement in works. Bars of different diameters and grades of steel reinforcement shall be kept separately.

5. BAR BENDING SCHEDULES

The Contractor shall prepare bar bending schedules of all the reinforcing steel bars and these bar bending schedules shall be submitted to the Engineer for his approval. The Contractor shall obtain approval of the bar bending schedules atleast one month prior to the actual execution of the works at site.

6. FABRICATING, BENDING & PLACING

a). All metal reinforcement shall be free from loose mill scale, loose rust, mud, oil, grease, or other harmful matter immediately before the concrete is placed.

b). Reinforcement is to be accurately placed as shown in the drawings, and secured against displacement by using 16 gauges GI wire ties or suitable slips at intersections and supported from the formwork by using concrete, metal or plastic chairs and spacers or hangers of an approved pattern. Where concrete blocks are used for ensuring the cover, they shall be made of mortar not leaner than 1 part of cement to 2 parts of sand.

c). Bars used for concrete reinforcement shall be fabricated in accordance with the dimensions shown in the bar bending schedule approved by the Engineer.

d). The cutting tolerance for all bars shall be **± 1 inch** (25 mm).

e). Where an overall or an internal dimension of a bent bar is specified in the schedule, the bending tolerance, unless otherwise stated, shall be as in **Table - 1**.

f). Bent bar reinforcement shall cold bent to the shapes shown on the drawings bars shall be bent around a pin having the following diameters (D) in relation to the diameter of the bar (d):

Strips & columns tie bars	D = 4 x d	
Other bars having	D = 5 x d	D = 10 x d

d < 3.5 cm (1-3/8") (No. 11 bars)
d > 3.5 cm (1-3/8")

Table -1
Bending Tolerances

Dimensions of bent bars		Tolerance	
Over	**Up to & including**	**Plus**	**Minus**
Inch	Inch	Inch	Inch
--	36	2	2
36	72	2	4
72	--	2	10

g). Vertical bars in columns shall be offset at least one bar diameter at lapped splices. To ensure proper placement, templates shall be furnished for all column dowels.

h). Reinforcement shall not be bent or straightened in a manner that will injure the material.

i). No bars shall be bent twice in the same place, nor shall they be straightened after bending.

j). Unless permitted, by Engineer, reinforcement shall not be bent after being partially embedded in hardened concrete.

k). Bars which depend for their strength on cold working shall not be heated for any reason. Other kinds of reinforcement larger than 40 mm in diameter may be bent by the use of heat at cherry - red heat (not exceeding 840 Bars) bent shall not be cooled by quenching.

l). No splice of reinforcement shall be made except as shown on the working drawings.

m). Welding shall be permitted for bars only under suitable conditions and with suitable safeguards in accordance with AWS D1.4-79. All welded splices shall be in conformance to "Structural Welding Code – Reinforcing Steel - AWS D1.4-79. Welding is allowed for bars provided the type of reinforcement bar has the required welding properties. Tack welding may be used to fix in position bars that cross each other, only with prior approval of the Engineer.

n). Exposed reinforcement intended for bonding with future extensions is to be effectively protected from corrosion. Protection is also to be provided to reinforcement partly built into concrete where the exposed pat is to be built into later concrete.

o). No concreting is to be carried out until the reinforcement has been checked and approved by the Engineer.

p). All detailing shall be done as per ACI standards **ACI - 315 and ACI - 318**.

q). Minimum Concrete clear cover for reinforcing steel shall be as follows:

Structural Members	Minimum Cover (inch)	Minimum Cover (mm)
a) Concrete cast against and Permanently exposed to earth	3.0	75
b) Concrete exposed to earth or weather		
Bar Dia > 20 mm	2.0	50
Bar Dia > 16 mm	1.6	40
c) Concrete not exposed to weather or in contact with ground		
Slabs, Walls	0.8	20
Beams, Columns (Primary Reinforcement)	1.6	40

All reinforcing steel shall be held firmly in place before and during the placing of concrete by means of wires and supports adequate to prevent displacement during the course of construction.

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7. MEASUREMENT & PAYMENT

7.1 General

Except otherwise specified herein or elsewhere in the Contract Documents, no separate measurement and payment will be made for providing and installing chairs, supports, hooks, spacers, binding wires and laps not shown on Drawings including wastage and rolling margin, the cost of which shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of quantities.

7.2 Measurement

All measurements of acceptably completed works of reinforcement shall be made in linear dimensions end to end according to the cut lengths shown in bar bending schedules approved by the Engineer and converted into theoretical weight as per schedules.

7.3 Payment

Payment will be made for acceptable measured quantity of reinforcement on the basis of unit rate per kg quoted in the Bills of Quantities and shall constitute full compensation for all the works related to the item.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

EXCAVATION, TRENCHING AND BACKFILLING

1. SCOPE

The work covered by this section of the specifications consists of furnishing all plant, labour, equipment, appliances, and materials and performing all operations in connection with excavation, trenching and back-filling for sewer and water supply lines and all other structures including all incidental works necessary for excavation to the required depth and dimensions in accordance with the applicable drawings, or as directed by the Engineer. The work shall be carried out in complete conformity with the specifications, set forth hereunder.

2. SETTING OUT

Lines and levels will be-set out by the Contractor who shall be responsible for maintaining all stakes and witness points set-up by-the Engineer for the execution of work in strict accordance with them.

3. CLEARING AND GRUBBING

The sites of all excavations shall be cleared of all shrubs, plants, bushes, large roots, rubbish and other objectionable materials. All such materials shall be removed from site of work or otherwise disposed off at no extra cost in a manner satisfactory to the Engineer. All trees and shrubbery that are designated by the Engineer to remain shall be adequately protected and preserved in an approved manner.

4. EXCAVATION

4.1. General

All excavation of whatever substance encountered shall be performed to the depths indicated or as otherwise specified. During excavation, material suitable for backfilling shall be stockpiled in an orderly manner at a sufficient distance from the banks of the excavation to avoid overloading and to prevent sides from caving.

All excavated material unsuitable are not required for backfill shall be removed and disposed at a location approved by the Engineer. Grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavations, and any water accumulated therein shall be removed by pumping or by other approved methods. Unless otherwise indicated or approved by the Engineer, excavation shall be open cut.

The contractor shall remove the whole of the vegetation, top soil, concrete, flagging, paving, curbing, road metalling and other materials from the site of any excavation and shall keep separately and preserve the same for re-use where applicable. The ground shall be excavated for the permanent and temporary works to the required depths, width and levels so that the dimensions of the permanent work shall not be less than as shown on the Drawings, or as may be directed. All rubbish, filth and matter of an offensive nature taken out of any excavation shall be disposed off at once and not left on the surface within the site.

The quantity of excavation shall be the volume of materials removed from below the original surface of the ground to the limits of excavation specified or shown on the drawings. Useful excavated material to be used in roadway embankment (as per NHA Specifications of road embankment). The material used for embankment is required to be dressed & compacted to specified degree of compaction at optimum moisture content. The rate of items deemed to include carriage, spreading, watering & compaction as per NHA specifications of Road Embankment. Item includes all cost whether backfilling due for trenches, road embankment and/or under floor (as per NHA specifications of Road Embankment).

4.2. For sewer lines

i). The excavation shall be carried out to the required alignment, levels, slopes or gradients as per drawings or described in the specifications and bill of quantities taking into account bedding required below pipes or to such other dimensions and slopes as the Engineer may direct in writing to facilitate laying of pipes for sewerage network (both shallow and deep). The Contractor shall provide masonry pillars of suitable size and fix temporary benchmarks at intervals to be determined by the Engineer or his representative(s). No trench excavations shall be commenced without prior approval of the Engineer. Excavation shall proceed at the same rate as laying, jointing, testing and backfilling.

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ii). The quantity of excavation shall be the volume of materials removed from below the original surface of the ground to the limits of excavation specified or shown on the drawings. For soft and unstable soils, the Contractor shall provide all necessary site supports including timbering or sheet piling to support the sides of trenches. The cost of supply of all material, plant and labour that may be necessary for site clearance, excavation, over break, timbering, sheet piling, shoring, strutting, refilling, watering and ramming, etc., shall be included in the Contract Rates for excavation. In all cases, the quantity of excavation measured shall be the in- site volume of the undisturbed material with in allowable limits mentioned in the specification. In case sides or ends of any excavation collapse under self-weight or due to any other reason, the contractor shall at his own cost remove all disturbed material. Should sides or ends of any excavation give way, the contractor shall at his own cost remove all disturbed material. No additional payment due to side slopes of pipe trenches if carried out by Contractor shall be allowable.

iii). Where the Contractor has excavated to depths in excess of the requirements, he shall refill and compact the excess excavation with 1:4:8 cement concrete upto the correct level at his own expense. Any excavation done in excess of specified width due to any reason, what so ever shall not be payable.

iv). For excavation above ground water table, the width of the trench shall be equal to the external diameter of the pipe plus 18''dia. not exceeding 12'' dia. For sewers of internal diameter exceeding 12'' dia. the width of trench payable shall be equal to external diameter of pipe plus 30''dia. The depth shall be as per longitudinal section of sewers and shall include for sewer bedding, to give minimum 30''of the earth cushion over the pipe or to the depth of existing pipe where required to be connected.

v). For excavation below ground water table up to a depth of 10ft, the width of trench allowable for payment shall be the external diameter of pipes plus 24'' for pipes up to 12'' diameter. For diameters exceeding 12'', the width of trenches shall be external diameter plus 3ft.

vi). For excavation below ground water table and depths exceeding 10ft, the width of trench allowable for payment shall be the external diameter of pipe plus 3'-6''.

vii). Additional excavation will be necessary at all manholes, valve chambers and pipe joints to facilitate the making of joint. Additional excavation for construction of manholes, valve chambers and joint holes shall be of such dimensions, so as to give clear working space. The Contractor shall make allowance for the additional excavation required for the manholes and valve chambers in the price tendered for trench excavation. These shall not be separately measured or paid.

viii). The length of the trench shall be measured along the center line of the trench and the depth shall be measured vertically from original ground levels to the average bed level.

ix). The maximum length of trench to be left open shall be the length between manholes or not more than 160ft of jointed pipe line, whichever is the lesser, and shall remain visible for the purpose of inspection and testing. In exceptional circumstances where the nature of the ground or locality renders it necessary to reduce this distance, the contractor shall inform the Engineer, immediately. In the case of pressure pipelines, partial backfilling shall be carried out before testing.

x). Where pipes are laid through rock or extra hard strata, the trench shall be excavated to depths below the barrel of the pipes specified in "Schedule for pipe bedding & surrounds". The space below the pipe barrel shall be refilled with specified granular bedding material.

xi). Embankment shall be prepared upto the full height of subgrade level (full ROW) then the excavation shall be made for water/ sewer line. After excavation, laying of water & sewer line be made then backfill with the suitable excavated material and re-compact through the Plate Compactor.

xii). The compacted layers shall be made in accordance with AASHTO T-191 or other approved methods. For all soils, with the exception of rock fill materials, containing more than 10% oversize particles (retained on ¾" /19 mm sieve), the in-place density thus obtained shall be adjusted to account for such oversize particles or as directed by the Engineer. Subsequent layers shall not be placed and compacted unless the previous layer has been properly compacted and accepted by the Engineer.

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xiii). Each layer shall be bladed or leveled with motor grader, bulldozer or similar equipment capable of shifting and forming the layer into a near and orderly condition. No rock larger than eight (08) centimeters in any dimension shall be placed in the embankment unless otherwise allowed by the Engineer.

4.3. Excavation in Trenches

Unless otherwise directed or permitted by the Engineer not more than 100 ft of any trench in advance of the end of the pipeline already laid shall be opened at any time. Trenches shall be excavated to the dimensions and depths shown on the drawings or ordered by the Engineer or in such a position or to such dimensions and depths as shall allow for the relevant operation.

Excavation shall be carried out to give ample space for making joints and, where necessary, for concrete bedding or surround. For trench width, the dimension (12 inches + 1.5 dia of pile (inch) will be followed, but in no case shall be less than 18". The banks of the pipe trench shall be as nearly vertical as practicable. Bell holes and depressions for joints shall be dug after the trench bottom has been prepared.

The pipe, except for joints, shall rest on the prepared bottom for its full length. Bell holes and depressions shall be only of such length, depth, and width as required for properly making the particular type of joints. Stones shall be removed to avoid point bearing. Whenever wet or otherwise unstable material that is incapable of properly supporting the pipe as determined by the Engineer is encountered in the bottom of the trench, such material shall be removed to the depth required and the trench backfilled to the proper grade with coarse sand, or other suitable approved granular material. Such replacement of unsuitable material will be paid for at the contract unit price for that item of work as shall be agreed upon, before execution of this work, with the Owner.

Where the Contractor has excavated to depths in excess of the requirements, due to negligence or from causes within his control, he shall refill and compact the excess excavation with suitable material approved by the Engineer, upto corrected level, at his own expense.

Excavation for appurtenances shall be sufficient to leave at least 12 inches but not more than 24 inches between the outer surface and the embankment or timber that may be used to hold and protect the banks. Any over-depth excavation below such appurtenances that has not been directed by the Engineer will be considered un-authorised and shall be refilled with compacted sand, gravel or concrete, as directed by the Engineer and at no additional cost to the Employer.

4.4. Excavation for Structures

All excavation under this contract, which is not included under the classification of excavation in Trenches shall be classified and paid for as excavation for structures.

The Contractor shall provide adequate timbering or shoring for excavations. Should the sides and ends of any excavations give way the contractor shall, at no extra cost, removal all disturbed ground. Any excavation carried outside the limits shown on drawings and specified herein as the payment limits, shall not be treated as excavated and shall not be paid for.

When foundation level is reached, the Engineer's Representative will inspect the exposed ground and give directions as to what further excavation if any, he considers necessary. The excavation should be done in such a manner, as to ensure that the work rests on a solid and perfectly clean foundation. If the Contractor allows any portion of such foundations to deteriorate due to exposure, he shall make good the foundations to the satisfaction of the Engineer without extra cost.

4.5. Rock

'Rock' means a natural aggregate of mineral crystals which for its excavation would normally require the use of explosive and/or heavy pneumatic / hydraulic breaker and/or cutting equipment. The term shall exclude any material that can be removed by normal excavating machinery and which in any individual mass has a volume not exceeding 1 cu.m or 0.25 cu.m where the net width of excavation is less than 2 meter.

Before classification of mineral as rock the Contractor shall demonstrate to the satisfaction of the Engineer his inability to excavate it without resort to heavy percussion tools complete with rock bits, hydraulic wedges or blasting.

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Material shall not be classified as rock unless the Engineer has agreed to such classification on the basis of such a demonstration before its excavation. The Engineer's agreement shall be subject to reservations on the extent of rock so classified and the extent of rock excavation shall be determined after examination of the excavated faces. Excavation where rock has been encountered and classified as such shall not be backfilled before examination of the excavated faces by the Engineer to enable the extent of the rock excavation to be demonstrated. The rock will be further classified as Soft or disintegrated rock, medium rock and hard rock for payment purpose.

4.6. Hardcore Filling

Hardcore shall be clean, broken stone, brick or concrete that will pass in all directions through a 100mm ring. Hardcore shall be well packed and compacted to 90 percent of the maximum dry density as measured in accordance with BS EN 1344 and BS EN 13163. Sand may be added to the hardcore to achieve this degree of compaction.

4.7. Trial / Test Pits

The Contractor may be required to excavate trial pits and trial trenches upto about 10% of the total quantity of excavation specified in the contract at appropriate locations to determine the actual level of the existing water table, and position of existing conduits, water mains, gas mains, cable ducts and sewers etc. This excavation work shall be done carefully with due precaution, so as not to damage any existing services. The Contractor may be precluded from carrying out any permanent work until this information is obtained and may have to adopt his programme in accordance with the information so obtained by the Contractor.

Trial test pits will be required to be dug before or during the execution of work at locations directed by the Engineer for determining the condition of soil, checking the location of utility services water levels etc. The size of individual trial pits may be kept 5ft x 5ft up to the required depth. The dimensions may be varied depending upon the site condition and as per instruction of the Engineer. The Contractor shall obtain prior permission from Engineer in writing before start of work on trial pits. No separate payment shall be made for trail pits required to be dug by the Contractor. The cost incurred by the Contractor on the trial / test pits shall be deemed to be included by the Contractor in his rates for excavation.

4.8. Classification of Soils

Excavation shall include the removal of all materials in all kinds of soils or stratas of every name and nature. The sub- soil in the project area mostly comprises of clay with fine sand, silt and lime stone formations. However the Contractor shall make his own assessment after detailed study of the area and digging the required trial / test pits as required in this regard. No claim shall be allowed on account of any omission or error in such data trial / test pits.

If rock is encountered it shall be removed carefully and without excessive noise and vibration. Blasting shall not be allowable. The quantities of earthwork for each category of excavation i.e. soil, and rocks are provisional. The Engineer shall do the classification of soil during actual excavation. In case the Contractor meets rock during the excavation, the contractor shall request the Engineer in writing for a joint inspection for classification of soil. The Engineer shall visit the site during excavation and give his opinion in writing about classification of soil for the particular site or alignment.

The excavation payable shall be limited to the dimensions and elevations as indicated on the drawings. Foundations on made up ground shall be taken down to nascent soil as per direction and approval of the Engineer. Excavation shall extend to a sufficient distance away from walls and footings to allow for placing and removal of forms, installation of services and for inspection. No payment shall be made for this extra excavation. The Contractor's rate for excavation shall be deemed to include for such extra excavation.

In the event of any excavation being carried out deeper than specified, the same shall be filled in by the Contractor at his own cost to the required level with lean concrete if beneath footing or with proper compacted local river sand if beneath slab.

4.9. Mechanical Diggers and Other Appliances

The Contractor shall not use mechanical excavation in gardens or plantation areas unless approval in writing has been obtained from owners and tenants.

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In addition to the above, if the Engineer shall reasonable consider it unsuitable that any excavator, mechanical digger or other machine or appliances employed, or proposed to be employed by the contractor should not be used or that any such machine or appliance as aforesaid is unsuitable for use on the works or on any part of the works, the Engineer may order the Contractor not to use and / or to immediately remove from the works such machine or appliance.

5. PRECAUTIONARY AND REMEDIAL MEASURES

5.1 Protection of Existing Facilities and Structures

The Contractor shall take every necessary precaution not to endanger the safety, occupation or operation of any property, structures, installations or services in the vicinity of his operations and shall observe any restrictions imposed by authority concerned/Engineer to this end. Should any such property, structures, installations or services be endangered or damaged as a result of the Contractor's operations, he shall immediately report any such danger or damage to the Engineer's Representative and any authority concerned and shall forthwith undertake remedial measures to the satisfaction of the Engineer or the appropriate authority.

5.2 Planking and strutting

The Contractor shall provide, if required, at his own expense to the satisfaction of the Engineer all timbering, poling, shoring, strutting and other approved supports to the sides of all excavations, trenches and all other works in such a way as will be sufficient to secure them from falling and to prevent any movement. All responsibilities connected with this part of the work shall rest with contractor.

In removing timbering, shoring and strutting and all other support from excavation and trenches etc., special care shall be taken to avoid bringing pressure to beat on any concrete or other work until it has hardened sufficiently to resist such pressure.

5.3 Removal of Water

The Contractor shall build all drains and do ditching, pumping and all other work necessary to keep the excavation clear of sewage and storm water during the progress of the work and until the finished work is safe from injury. All water pumped or drained from the work shall be disposed of in a manner satisfactory to the Engineer and necessary precautions against flooding shall be taken.

5.4 Maintenance of Excavation

All excavation shall be properly maintained with while they are opened-and exposed. Sufficient suitable barricades, warning lights, flood lights, signs, and similar items shall be provided by the contractor. The Contractor shall be responsible for any damage due to his negligence.

5.5 Surplus Materials

All surplus materials shall be disposed of at locations approved by the Engineer. The disposal of surplus material shall not interfere with other works and shall not damage or spoil other material. When it is necessary to haul earth or rock material over street or pavement, the Contractor shall prevent such materials from falling on the street or pavement.

5.6 Cutting Pavement

In cutting or breaking street surfacing, the Contractor shall not use equipment which will damage the adjacent pavement. Existing paved surface shall be cut back beyond the edge of trenches to form neat square cuts. The road ballast and other materials shall be placed on one side and shall be preserved for re-installment when the trench is filled. Wherever necessary or required for the convenience of the public or individual residents, at street crossings and at private driveways, the Contractor shall provide suitable temporary bridges over unfilled excavations. All such bridges shall be maintained in service until backfilling has been completed. The Contractor shall keep the road crossings manned 24 hours per day. During night time, enough red lights shall be provided to warn traffic. If detour is necessary, the Contractor shall make proper detour for the traffic and shall install signs 3 ft x 4 ft in size indicating the detour.

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6. TIMBERING SHORING & BRACING

6.1 General

As the sub-soil stratas are mostly clayey silt and fine sand with high ground water table, slush is likely to be formed if adequate dewatering is not done, and the sides are likely to collapse if not adequately supported. The Contractor shall provide where required all shoring, supports etc., to the sides of excavation to prevent sliding or any movement. The timbering, shoring and bracing shall be of adequate strength to with stand the pressure encountered and the Contractor shall be solely responsible for the losses due to collapse or failure of shuttering, bracing, shoring etc. Where formation of slush is unavoidable, the Contractor shall provide steel piling of adequate size and strength. The driving of sheet piling shall continue simultaneously as the work of excavation proceeds. No payment for side support including shoring, shuttering or bracing or sheet piling shall be made. The Contractor's rate for excavation shall be deemed to include the cost of providing and removing side supports timbering, sheet piling, shoring, strutting and bracing with all connected operations.

When directed by the Engineer, the contractor shall produce the calculations for the structural stability of any temporary works and method statement of proposed construction, but approval shall not relieve the contractor of his responsibility for adequately supporting the sides of any excavation.

In Subsoil conditions comprising sands, gravels, silts and soft clay materials full close sheeting of steel or timber shall be provided. Excavation support must be considered for depths of vertical sides exceeding 1200 mm. Half sheeting or quarter sheeting spacing shall be used only with the specific agreement of the Engineer. The contractor's Method statement shall detail such proposal in order that the Engineer may signify his approval or otherwise advise the contractor before construction commences.

6.2 For Pipe Line Trenches

A considerable amount of side supports is expected to be required in view of the unstable sub-soil strata likely to be met with. The clayey silt and fine sand with sub-soil water will have tendency to form slush which will need special measures including sheet pile. The work of driving sheet piling where required will continue simultaneously with excavation.

The Contractor shall at all times support effectively the sides of the pipe trenches and other excavation by suitable timbering, sheet piling, sheeting, bracing, strutting etc. Where required the contractor shall use close timbering in all loose or sandy or unstable strata’s either above or below ground level, if found necessary by the Engineer and accord approval. It is intended that all timbering and side supports for sewer trenches shall be removed as the work proceeds. The Contractor shall ensure that the removal of timbering and side supports is done gradually and carefully to avoid any damage to existing or new structures, roads, pavements or any other private or public property. All timbering, sheeting and their supports shall be of adequate strength and dimension and fully braced and strutted so that no collapse, subsidence or any damage to public or private property shall take place. The Contractor shall be solely responsible for the sufficiency of all timbering, sheet piling and their supports to be used and all damages to persons or property resulting from the improper quality, strength, placing, maintaining or removal of the same shall be payable by him under all circumstances.

7. TRANSPORTATION OF MATERIAL

All cars, trucks or other vehicles used by the Contractor for transportation of the material shall be suitably constructed or lined not to permit any leakage of soil while the vehicles are on the move. These would be so loaded and arranged as not to spill on the site and public roads. Whenever any vehicle so used is found leaking and unsuitable it shall be immediately withdrawn from the work on notification by the Engineer.

8. PUMPING, BAILING AND DEWATERING

The work covered by this section of Specifications consists of furnishing all plants, labour, materials, equipments and appliances for performing all operations for Pumping, Bailing, Dewatering and Draining water from the areas, excavated for trenches for sewers and construction of manholes, and all other works in this contract in accordance with this section of Specifications, and subject to terms and conditions of the contract.

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8.1. The Contractor shall at all times during the progress of work remove any water which may accumulate, inflow or be found in the trenches and other excavations made under the contract, and shall keep them entirely free from water at all times while excavating, providing sewer bedding, laying of sewers or construction of manholes etc.

8.2. The water table shall be established through trial pits and joint inspection of Engineer in-charge and Contractor. In case of any dispute the Engineer shall decide the issue in writing which shall be final and binding upon the contractor. The earthwork below water table shall be considered as wet. The methods employed in all cases shall be agreed and approved by the Engineer. If any slush is formed this shall be removed and the space filled with lean concrete to the satisfaction of the Engineer at Contractor's own cost.

8.3. The Contractor shall keep excavations free from water at all time and provide adequate pumping plant including special dewatering equipment and means of disposing off the pumped water. The Contractor shall ensure to keep away un-desired water clear of excavation for permanent works and provide all necessary plant and equipment for dealing with any subsoil condition that may be encountered.

8.4. If necessary for the construction of the works, the contractor shall lay sub drain where directed to convey the water to pumping sumps. The sub drains shall be laid un-jointed with the invert not less than 300 mm below formation level of the permanent works and shall be covered with gravel to formation level.

8.5. The Contractor shall be required to arrange well point equipment and / or adequate number of tube wells or both and pumping machinery for dewatering and lowering the existing water table for construction purposes in the areas where sub- soil water or any sewage and water from any other sources are encountered. The system shall be capable of working non-stop 24 hours a day for the entire duration of the work without break during excavation, and for laying of sewer pipes and sewer bedding, construction of manhole, testing of sewers and backfilling. The system of dewatering proposed to be adopted shall be submitted by the contractor with sufficient details along with the tender for approval of the Engineer. The Contractor is required to visit the site before submitting his tender and investigate the available mean of disposal of pumped water including laying of temporary pipeline for transmission of water during the period of excavation providing bedding, laying and jointing of sewer pipes. The cost of all such works required for pumping and disposal of water from trenches shall be considered to be included in the BOQ rates for bailing and pumping of subsoil water or any other water from trenches. No extra cost whatsoever shall be payable to the Contractor.

8.6. Water pumped from the trenches shall be disposed off by the Contractor in a manner that will neither cause injury to the public health nor damage to the existing structures or the works completed or in progress or to the surface of any roads or streets, nor cause any interference with the use of the same by the public.

8.7. The Contractor shall be held fully and wholly responsible for all damages done to building and other structures or property resulting from his dewatering, pumping and all other connected operations. If he fails to make good or to pay the expenses of making good damages with all practicable dispatch, the Engineer shall be at liberty to get the work done by other means or to pay the cost of the said damages by deducting the amount from any money that may be or become due to the Contractor or may recover the same from the Contractor from his dues, as decided and found feasible by Engineer, the decision of Engineer will be final.

8.8. The Contractor shall be paid on the basis of item rate quoted by him for pumping, Bailing and dewatering required during all underground works of, laying of sewer pipes, sewer bedding, construction of manholes etc. The payment shall be made on the basis of volume of earth excavated below ground water table in two parts as under.

a). One-half payment for dewatering shall be made after satisfactory completion of excavation works upto required depth, width below subsoil water level.

Next one-half payment will be payable after the satisfactory completion of the work of, laying of sewer pipes, sewer bedding and construction of manholes and backfilling of sewer trenches

9. FILL, BACKFILLING AND RESTORING OF GROUND TO ORIGINAL CONDITION

9.1. General

After the completion of pipe lines, foundations, walls and other structures below the elevation of the final grade, all voids shall be backfilled with suitable materials.

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Fill, where required to raise the sub-grade for concrete slabs, shall be clean, unadulterated local river sand and shall be free from wood, stones and other debris. Excavated material shall only be used for fill if approved by the Engineer or his representative.

All fill backfilling or earthwork in embankment shall be compacted by mechanical (using plate compactor) rammer, or other approved equipment in layers not more than 150 mm thick. Each layer shall be uniformly spread and fully compacted and shall have proper moisture content for the required degree of compaction which shall be done by mechanical (using plate compactor) tampers as approved by Engineer.

After completion and final approval of the work of sewers and other construction as shown on drawings and prior to backfilling, forms shall be removed carefully and excavation shall be cleaned of stones and debris. Backfill shall be brought to a suitable elevation above ground to provide for anticipated settlement and shrinkage thereof.

Backfill shall not be placed against walls etc., prior to the water proofing treatment if provided and approved by the Engineer. Backfill shall be brought up evenly on each side of walls as far as practicable. Heavy equipment for spreading and compacting backfill shall not be operated closer to the wall than distance equal to the height of the backfill above the top of base slab footing. No back filling shall be done before the new structure has been cured for at-least two weeks.

9.2. Backfilling and Restoring of Ground to Original Condition

The back filling of the trench shall be allowed after the sewer pipe has been laid and jointed over the specified bed, inspected, checked, tested and approved by the Engineer. Backfilling of the trenches shall be carried out by filling to depth up to half pipe level. The filling shall then be thoroughly rammed; more filling shall be carried out and rammed again until the consolidated filling reaches pipe top level. Only selected, dry materials free from stones or debris shall be used for backfilling, which shall be spread and rammed evenly across the trench. Thereafter, the trench shall be filled in layers not exceeding 150 mm in depth, each layer being properly rammed before the next layer is placed so that 95-100% compaction is obtained as per AASHTO Standard.

On completion of backfilling, the Contractor shall level all grounds disturbed by him in the course of the work, spread topsoil where necessary as directed by the Engineer.

9.3. BORROW

In case of non-sufficiency of excavated material and un-suitability of earth for backfilling, conforming to the above specifications, such material shall be brought from the approved source, by the Contractor.

9.4. Backfilling for Structures

Backfilling operations for structures shall be performed as part of the Contractor's work under the payment items for earth excavation and at no cost to the Employer. It would comprise returning and filling the selected excavated material around foundations, and at back of walls etc., upto finished levels shown on the Drawings or as required in layers not exceeding 6 inches, carefully rammed and consolidated (With addition of water if required so as to achieve a minimum relative density of 85 or 90 as directed by the Engineer. No filling shall be made until the concrete foundations and footings etc., have been inspected and approved by the Engineer. Earth to be used for filling must be free of all the organic impurities, debris or any other foreign matter. Earth which contains more than 1% of salts particularly sulphates, will not be used in filling.

Backfill around structure specially abutments, culverts, drainage structures, retaining wall etc.
Backfill around structure shall be made with the following material.

(a) Granular backfill and / or sand or a selected material as specified here under and duly approved by the Engineer (only for abutments).

(b) Borrow material and / or sand duly approved by the Engineer for culverts, drainage structures, retaining walls etc.

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(c) Common backfill shall be carried out from excavated material except rock / boulder approved by the Engineer.

- **Granular backfill**
  Granular backfill material shall meet the following requirements.

  (a) Grading Requirement

mm	Inch	A	B
25	1"	100	100
19	¾"	60-100	75-100
4.75	No. 4	50-85	55-100
2.0	No. 10	40-70	40-100
0.425	No. 40	25-45	20-50
0.075	No. 200	0-15	5-15

  (b) Material satisfying the requirements of coarse sand falling under soil classification A-3 (AASHTO). In case, coarse sand is utilized for granular fill it shall be ensured that the same is confined properly with approved material,

  (c) The material shall have a Plasticity index of not more than size (6) as determined by AASHTO T-89 and T-90.

- **Common backfill**

  Use of excavated material as backfill may be allowed under this item. Use of borrow material for common backfill shall be allowed subject to approval of borrow material by the Engineer.

9.5. Backfilling of Trenches

The trenches shall not be completely backfilled until all required pressure tests are performed and until the lines as installed conform to the requirements of specifications. Where in the opinion of the Engineer, damage is likely to result from withdrawing sheeting, shoring, the same shall be left in place and cut off at a level 1 ft. below ground surface. Sheeting left in place shall be paid for at the approved rate for the item of Trenches shall be backfilled to the ground surface with selected excavated material or other material that is suitable for proper compaction. Trenches improperly backfilled shall be reopened to the depth required for proper compaction, then refilled and compacted to the specified density. The surface shall be restored to its original or better condition. Pavement and base course disturbed by trenching operations shall be replaced.

9.6. Lower Portion of Trench

Backfill material shall be deposited in 6 inch maximum thickness layers and compacted with suitable hand tampers to ninety five percent of maximum density until there is a cover of not less than 1 ft. over the pipe. The backfill material in this portion of trench shall consist of sandy clay or other approved materials free from stones and humps.

9.7. Remainder of Trench

The remainder of the trench shall be backfilled with material that is free from stones in any dimension. Backfill material shall be compacted to 90 percent of maximum density for cohesive soils and 95 percent of maximum density for others.

10. BORROW

In case of non-sufficiency of excavated material and un-suitability for backfilling, conforming to the above specifications, such material shall be brought from the approved source, by the Contractor.

11. GRADING

After the completion of all backfilling operations, the Contractor shall grade the work areas to the lines, grades and elevations shown on the drawings or as directed by the Engineer. Finished grading shall not be done until the installation of all utilities of appurtenances has been completed

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and tested. Prior to final acceptance, all damage due to settlement shall be repaired by an at the expense of the Contractor.

12. TESTING OF SOIL IN PLACE

The Engineer will make tests using the calibrated sand cone method/core cutter method to determine the density of soil in place. If soil in place fails to meet the specified degree of compaction the areas represented by the failing tests shall be removed, replaced and compacted to the specified density in the manner directed by the Engineer and at no additional cost to the Owner.

13. REMOVAL OF EXCESS AND UNDESIRABLE MATERIALS

13.1. Excess and undesirable material from excavation not required for fill or backfill shall be disposed off, removed and / or deposited and leveled on the site where directed by the Engineer. Earth suitable and meant for backfill shall be stored at site in a manner not to interfere with the progress of construction works in progress.

13.2. The Contractor shall keep all excavated soil sprinkled with water during the excavation work so as to prevent any dust nuisance.

13.3. Surplus Excavation Debris etc.

All surplus soil arising out of the work shall be carried away to approved site, within a week, deposited and spread as directed by the Engineer.

The Contractor shall carry out the cutting of existing bituminous road as required for excavation for carrying out the work, to the full depth of hard crest of any existing thickness. The stone metal soling etc. shall be separately stacked along the side of excavation for possible reuse.

14. PROTECTION OF UTILITY SERVICES

14.1. Utility Lines

The Contractor shall take every necessary precaution not to endanger the safety, occupation or operation of any property, structures, installations or services in the vicinity of his operations and shall observe any restrictions imposed by authority concerned/Engineer to this end. Should any such property, structures, installations or services be endangered or damaged as a result of the Contractor's operations, he shall immediately report any such danger or damage to the Engineer's Representative and any authority concerned and shall forthwith undertake remedial measures to the satisfaction of the Engineer or the appropriate authority.

When any existing utility lines (S) are encountered within the area of operations, the contractor shall take all necessary measures so that these are neither disturbed nor damaged. The Contractor shall be fully and solely responsible for any damage occurring due to non-providing of adequate measures for the protection of such services. The Contractor shall be required to obtain all necessary permissions from different departments / agencies in writing prior to start of work and maintain the affective liaison for trouble free progress of work(s). The contractor shall pay all fees, charges officially levied by such department / agencies while issuing required permission. The Contractor shall furnish originals of payment receipts along with his written request for allowing payments by the Engineer accordingly. In case of restoration to unavoidable damage to any utility service, line or by passing such line the procedure as detailed shall be followed in accordance with rules, regulation, specification or practice as preferred by the concerned department / agency.

14.2. Damage to Surface

If carriage ways, verges or footways in roads, whether paved or unpaved, or gardens, plantations or other surfaces are damaged outside the limits of the excavations due to lack of proper traffic control or moving plant and equipment or other operations of the contractor then such surfaces shall be reinstated by the contractor at his own expenses. The surfaces shall be restored to their original condition using such materials as may be required whether obtained from the excavated materials or not.

14.3. Maintenance of Traffic

The Contractor shall keep the road crossings manned 24 hours per day. During night time, enough red lights shall be provided to warn traffic. If detour is necessary, the Contractor shall make proper detour for the traffic and shall install- signs 3 ft x 4 ft in size indicating the detour.

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When the excavation is in roads, care shall be taken to cause the least inconvenience to traffic. When directed or necessary for the maintenance of traffic, the contractor shall remove from the site all materials as excavated from the trenches and return the same as necessary for refilling after the structures have been completed or the pipes tested and approved.

14.4. Control of Traffic on Roads

The Contractor shall ensure that the flow of traffic over the existing roads and access to properties is maintained at all times during the contract. The flow of traffic is to take place at all time over a reasonable surface, which is to be segregated as far as possible from areas where work is in progress. The contractor shall provide flagmen and signaling equipment as may be necessary to control the traffic to the satisfaction of the Engineer and the appropriate controlling Authority. In the planning and execution of any temporary or permanent works, which may affect the traffic flow and / or access to properties, the contractor shall co-operate closely with the Engineer and the appropriate controlling Authority.

15. MEASUREMENT AND PAYMENT

The measurement and payment for the earth excavation inclusive useful excavated material, to be used in roadway embankment and disposal of un-useful excavated material up-to any lead or lift shall be done in accordance with BOQ rates.

15.1. Excavation shall be measured according to the net volume within the outlines as shown on the drawing. The rate for excavation entered in the Bill of Quantities shall include back filling of pits and trenches with the excavated stuff or selected fill.

All timbering, steel sheet piling, shoring, bracing etc. required for supporting the sides of excavation to prevent sliding or movement of soil shall be deemed to be included in the tendered rate of excavation.

15.2. Payment for excavation shall be made as per approved tendered rates. The ground water table level shall be determined by the joint inspection of the Engineer or his authorized representative and the Contractor, when the excavation reach one foot below ground water table level, the depth of this water table shall be recorded in the measurement book and signed both by the Engineer or his authorized representative and the Contractor. Payment for dewatering shall be made separately as per specification and terms of payment mentioned under section Pumping, Bailing and Dewatering.

15.3. Excavation work for digging trial pits / trial holes shall not be paid separately. Payment for excavation in trenches for laying sewers shall be made only after the Contractor had carried out the required digging of pits / trial holes and submitted a detailed report indicating the location of each trial pit, its dimension, water level and details of strata encountered duly counter singed by the Engineer or his authorized representative.

a) Method of Measurement

The measurement shall be made of the number of cubic feet of acceptably excavated stuff for trenches and structures within the lines and grades shown on the drawing or as directed by the Engineer.

b) Basis of Payment

Payment for excavations for trenches and structures will be made at unit price per cubic ft. stated in Bid Schedule of this contract or in applicable Variation Orders.

Sr. No.	Description	Unit of Measurement
1	(a) Excavation in trenches and compacted backfill	Cft.
	(b) Excavation for structures and compacted backfill	Cft.

16. MEASUREMENT AND PAYMENT

No payment shall be made for the Works involved within the scope of this Section of Specifications unless otherwise specifically stated in the Bill of Quantities or herein. The cost thereof shall be deemed to have been included in the quoted unit rate of other items of the Bills of Quantities.

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CLEARING AND GRUBBING

1. DESCRIPTION

This work shall consist of removal to the specified depth, grubbing and disposal of all surface objects, as and where directed in writing by the Engineer, stumps, roots, bushes and trees with upto 300mm girth, vegetation, logs, rubbish and other objectionable material except such objects as are designated to remain or are to be removed in accordance with other section of specification.

2. CONSTRUCTION REQUIREMENTS

2.1. Clearing/Grubbing

In roadway cut areas, all surface objects or any object to the depth of 30 cm, below subgrade level such as stumps, roots, vegetation, bushes, logs, rubbish shall be cleared and/or grubbed as directed by the Engineer. In roadway fill areas where clearing and grubbing is required, same shall be carried out to the depth of 30 cm below natural surface level as described above. Operation of clearing and grubbing shall in no way be deemed to effect any level or volume change of the area.

After clearing and grubbing, the compaction of the area will be restored to its original value without any extra payment. However Engineer may direct in writing to the Contractor for stripping (if so required), if the original compaction is less than the required for respective zone. Payment of these items will be made separately under the relative items used for such purpose.

Before bottom layer of embankment is placed, contractor will grub up and remove without extra payment, any vegetation that may, in the meantime have grown on surface previously cleared and grubbed.

All trees having girth upto 300mm measured at 600mm above ground and falling within the construction limits shall be felled & removed by the contractor. The excavation and removal of trees, roots and stumps including backfilling and compacting of holes and restoring the natural ground to the original condition shall be responsibility of the contractor for which no extra payment shall be made to him. The trees, stumps & roots remains the property of the Employer, which shall be delivered at designated place as directed by the Engineer.

2.2. Protection and Restoration

The Contractor shall prevent damage to all pipes, conduits, wires, cables or structure above or below ground. No land monuments, property markers or official datum points shall be damaged or removed until the Employer/Engineer has witnessed or otherwise referenced their locations and approved their removal. The Contractor shall so control his operations as to prevent damage to shrubs, which are to be preserved. Protection may include fences and boards latched to shrubs, to prevent damage from machine operations. Any damage as a result of contractor's operation shall immediately be rectified by him at his own expense.

3. MEASUREMENT AND PAYMENT

3.1. Measurement

Clearing and grubbing will be measured for payment only on areas so designated in writing by the Engineer or shown on the drawings. The quantity to be paid for shall be satisfactorily cleared and grubbed. Any tree having girth of upto 300 mm (measured 600 mm above ground level) shall be measured under this item. Engineer shall ensure that a minimum of 500 SM area is designated for clearing and grubbing in any stretch of roadway for the sake of ease to construction activities.

Clearing and grubbing carried out by the Contractor in roadway cut areas and borrow pits shall not be measured for payment.

3.2. Payment

The quantities determined as provided above will be paid for at the contract unit price for the pay item shown in the Bill of Quantities, which price and payment shall be full compensation for clearing and grubbing and restoration of area, to its original condition.

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NATURAL GROUND COMPACTION

1. DESCRIPTION

The natural ground or surface ready for construction purposes after clearing and grubbing or stripping (if required) will be considered as (natural) ground for the purpose of this item.

The compaction of natural ground shall be carried out through a written order by the Engineer.

2. CONSTRUCTION REQUIREMENTS

Up to a depth of twenty (20) cm below the natural ground, all sods and vegetable matters shall be removed and clear surface shall be broken up by ploughing and scarifying to compact to a degree as defined below:

Depth below sub grade level.	**Percent of Maximum Dry Density as determined by AASHTO T -180.***
0 to 30 cm	95
30 to 75 cm	93
Over 75 cm	90
Below the foundation of structures	95

2.1. Compaction of original ground surface in areas of high water levels and salinity

Compaction of the natural ground surface in such areas will be difficult if not impossible for construction requirements under these conditions, where compaction of Natural Ground shall not be required.

3. MEASUREMENT AND PAYMENT

3.1 Measurement

The measurement shall be made by multiplying the length and breadth of the area approved in writing by the Engineer to be paid under this item. The measurement of the item shall be as per BOQ item.

Any subsidence of levels of Natural Ground due to compaction under this item shall not be measured for payment, the contractor is expected to take care of such factors while bidding.

3.2 Payment

The payment under this item shall be made at the contract unit price as per BOQ item and shall be deemed to include cost of scarification, ploughing, watering, mixing, leveling, rolling, labour, equipment, tools, and incidentals necessary to complete this item.

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STRIPPING

1. DESCRIPTION

This work shall consist of removing unsuitable topsoil, transporting and depositing in stockpiles or spreading where indicated on the Drawings or as directed by the Engineer. Engineer shall give instruction in writing, stating area and depth to be stripped.

2. CONSTRUCTIONR EQUI REMENT

The areas from which stripping of topsoil is required shall be as indicated on the Drawings or as directed by the Engineer. The Contractor shall remove topsoil from these areas to depth as directed by Engineer. Stripping of topsoil in any case shall be not less than 10 cm. in depth. The removed topsoil shall be transported, deposited in stock piles at locations designated by the Engineer and/or spread where indicated on the drawings or as directed by the Engineer. Engineer shall, however identify the soil as unsuitable through laboratory tests.

The top soil shall be placed separately from other excavated materials and be completely removed to the required depth from the area prior to the beginning of regular excavation or embankment work in that area. No payment will be made for topsoil removed from places other than that directed by the Engineer. Engineer shall, however identify the soil as unsuitable through laboratory tests, before such a decision.

3. MEASUREMENT AND PAYMENT

3.1. Measurement

Measurement shall be made by multiplying the length, breadth and depth of layer approved by the Engineer in cubic meter of material removed and disposed as directed by the Engineer. However space thus created shall be filled by the material as directed by the Engineer and paid separately under relative item.

3.2. Payment

The payment under this item shall be made for at the contract unit price of stripping measured as above, for removal of material to a depth approved by the Engineer including its disposal at designated place and in the manner as directed by the Engineer.

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EXCAVATION OF UNSUITABLE OR SURPLUS MATERIAL

1. DESCRIPTION

The work shall consist of excavation and disposal of unsuitable or surplus material arising from roadway excavation, which is declared in writing by the Engineer to be unsuitable for use or surplus to the requirements of the project. When excavation of unsuitable material requires special attention for a known condition on a specific project, construction requirements and payment shall be covered under relevant provision.

2. CONSTRUCTION REQUIREMENT

All suitable material excavated within the limits and scope of the project shall be used in the most effective manner for the formation of the embankment for widening of roadway for backfill or for other work included in the contract.

Any material surplus to these requirements or any material declared in writing by the Engineer to be unsuitable shall be disposed of and leveled in thin layers by the contractor outside the right of way within 7 Km of excavation.

The Engineers hall decide regarding the unsuitability of the material by Conducting appropriate laboratory tests when unsuitable materials are ordered to be removed and replaced the soil left in place shall be compacted to a depth of twenty (20) cm to the density prescribed under item 108.3.1 of NHA Specification. Payment for such compaction shall be included in the contract prices for the excavation materials.

If the unsuitable material which is to be removed, is below standing water level and the replacement material is gravel or a similar self-draining material of at least thirty (30) cm in depth, the compaction may be dispensed with if approved by the Engineer.

3. MEASUREMENT AND PAYMENT

3.1. Measurement

When the contractor is directed to excavate unsuitable material below the surface of original ground in fill areas, the depth to which these unsuitable materials are to be removed will be determined by the Engineer. The contractor shall schedule his work in a such a way that authorized cross sections can be taken before and after the material has been removed. Only material which is surplus to the requirements of the project or is declared in writing by the Engineer to be unsuitable will qualify for payments under pay Item mentioned in BOQ as the case may be.

The cost of excavation of material which is used anywhere in the project shall be deemed to be included in the pay item relating to the part of the work where the material is used.

The pay items mentioned in BOQ shall include the cost of obtaining the consent of the owner or tenant of the land where the disposal of surplus or unsuitable material is made.

Unsuitable or surplus material shall be measured in its original position and its volume shall be calculated in cubic meters using end area method.

3.2. Payment

The quantities determined as provided above shall be paid for at the Contract unit price for each of the particular pay items shown in the Bill of Quantities which prices and payment shall constitute full compensation for all costs involved in the proper completion of the work prescribed in this item.

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ROADWAY AND BORROW EXCAVATION FOR EMBANKMENT

1. DESCRIPTION

The work shall consist of excavating the roadway and borrowpits, removal and satisfactory disposal of all materials taken from within the limits of the work, also such excavation as is necessary for inlet and outlet ditches of structures and shall include all excavation, shaping and sloping for the construction, preparation of all embankment, subgrade, shoulders, intersections and approaches as directed and in conformity to the alignment, grade, level and cross-sections shown on the plans or established by the Engineer.

2 CLASSIFICATION OF EXCAVATION

2.1 Road Way Excavation

Roadway Excavation shall comprise of all excavation that is not classified as structural excavation carried out within the limits of roadway including permanent drainage ditches and side slopes in cut.

Roadway Excavation shall further, be classified as either "Common Excavation", or "Rock Excavation", which are defined in para ‘a’ and ‘b’ of this clause.

a) Common Excavation

Common excavation shall consist of the removal and satisfactory disposal of all eolian, alluvial and residual materials, in place unaltered and un-weathered strata, which are not firm or rigid enough to possess all the characteristics of "Rock Excavation". Boulders of less than one quarter (¼) cubic meter volume shall also be classified as "Common Excavation". Eolian and alluvial materials consist of gravel, shale, volcanic ash, loess, dunes and, loams, sands and clays or any combination of these materials.

b) Rock Excavation

This includes all hard and rigid igneous, metamorphic and sedimentary rocks. Boulders larger than quarter (1/4) cubic meter in volume will also be considered as "Rock Excavation", provided these are firm and stable lying in continuous bed and constitute more than 50% by volume as compared to other type of material in the total mass.

2.2 Borrow Excavation

Borrow Excavation shall comprise all excavation taken from borrow pits. Material from borrow pits shall normally be used for the construction of embankment or for the backfill when there is no material available from roadway excavation or structural excavation. Permission to use material from borrow pit shall first be obtained in writing from the Engineer. Nevertheless the total quantity of material from roadway excavation and structural excavation after deduction of the material declared unsuitable by the Engineer, shall be considered available for use in the work and any material used from borrow pits for formation of embankment in lieu thereof shall not be measured for payment.

In making his bid, the Contractor shall inspect the site and prepare his estimate of the haulage cost on the basis of his own survey of the possible nature and locations of the borrow pits. Their distance from the work sites shall not be grounds for extra payment or revision of the contract price.

The consent of the landowner or tenant for excavating the borrow material and hauling along private access roads shall be secured by the Contractor who shall, if required, pay for such concession. Borrow pits shall be left in a condition acceptable to the landowner and/or tenant and the Engineer.

The borrow pits must not become a source of water stagnation. Closure and landscaping of borrow pits would be carried out upon completion of the road before demobilization by the Contractor. If the borrow pits are away from populated areas, and are left open, then the site must be fenced with adequate sign postings by the Contractor at no additional cost to the project. Under no circumstances such borrow pits would be permitted to become a health or safety hazard, or become visual eyesores.

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2.3 Structural Excavation

The description method of measurement and payment of this section shall conform to as specified in item covering Structural Excavation and Backfill.

3 CONSTRUCTION REQUIREMENTS

3.1 General

All material removed from excavation shall be used in the formation of embankment, subgrade, shoulders, and at such other places as directed, unless it is declared unsuitable and ordered to waste by the Engineer. No excavated material shall be wasted without written permission from the Engineer, and when such material is to be wasted, it shall be so placed that it will present a neat appearance and not offer any danger to abutting property.

The material shall be declared unsuitable if the soaked CBR (96 hours) is less than Five (05) percent, or if falls under A-5, A-6 or A-7 of AASHTO soil classification for which Engineer may ask for further testing at contractor's cost to arrive at a conclusion.

During construction of the roadway, the roadbed shall be maintained in such a condition that it will be well drained at all times.

All slopes, except in solid rock or other material shall be trimmed precisely as per cross-sections, and care must be exercised that no material shall be loosened beyond the required slopes. In blasting rock slopes, a reasonably uniform face shall be left, regardless of whether or not the excavation is carried beyond the specified side slope. All breakage and slides shall be removed by the contractor and disposed of as directed by the Engineer.

Rock, shale and other unsuitable roadbed material encountered in cuts shall be excavated to required width and depth indicated on the plans or as otherwise directed. Any over breakage below the depth shown on the plans will not be paid for. Backfill of the over cut shall be of approved earth material and shall have the same density requirements as specified on the plans and shall be at the expense of contractor.

Borrow pits shall be located so that the nearest edge of the pit is at least thirty (30) meters from the roadway toe of slope unless otherwise directed by the Engineer.

Permission to use any borrow material, including its suitability, shall be obtained in writing from the Engineer before execution of work. It is responsibility of the contractor to submit a request for test at least fifteen (15) working days prior to the day the contractor intends to begin taking material from the borrow area.

In no case shall borrow material be obtained from downstream of any hydraulic structure. However the borrow pit may be established at five hundred (500) meters upstream of the hydraulic structure, The side slopes of the pits or channels shall be constructed as shown on the plans or directed by the Engineer. In no case the side slopes of borrow pit be steeper than a slope; 1:5 (V:H).

Upon abandonment of borrow pit or quarry area, the contractor shall, at his own expense, clean and trim the borrow pit or quarry area, the right of way, and adjoining properties which were occupied during execution of work, all to the satisfaction of the Engineer.

All drilling and blasting shall be done in such a manner as will most nearly complete the excavation to the required grade line, and produce the least disturbance of the material to be left in place. Blasting by means of drill holes or any other methods shall be performed at the entire risk and responsibility of the Contractor. Care shall be taken to ensure that no injury be done to persons or properties or to the finished work. Blasting shall be restricted to the hours prescribed by the local authorities or the Engineer.

Where between two successive cross-sections of the roads, the properties of rock boulder, in sizes larger than one quarter (¼) of a cubic meter to earth is more than 50%, the excavation will be considered wholly as rock.

Rock material above ground level such as stones, boulders, piles of stone, and dry stones walling whose individual sizes are greater than one quarter of a cubic meter shall be removed and disposed

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of if directed in writing by the Engineer and shall be paid under relevant item of work in the Bill of Quantities.

When the contractor is directed to excavate unsuitable material below the surface of original ground in fill areas other than required for clearing and grubbing the depth to which these unsuitable materials are to be removed will be determined by the Engineer.

The contractor shall schedule his work in such a way that authorized cross section can be taken jointly with the Engineer or his representative before and after such excavation of the unsuitable material removed.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

When the Bill of Quantities specifies for "Common Excavation", "Rock Excavation" and "Borrow Excavation" the quantities of the different classes of excavation shall be computed as follows:

a) Common Excavation

The unit of measurement for common excavation shall be in cubic meter and be computed by average end area method based on cross-sections duly approved by the Engineer prior to commencement and completion of required excavation.

The excavated material approved for fill under any item of the Bill of Quantities shall be used in the manner as described under the relevant item of work, irrespective of haulage distance.

b) Rock Excavation

Authorized "Rock Excavation" to be measured in cubic meters shall consist of area that is necessary to provide the design section and grade or as directed by the Engineer. Any over breakage beyond the lines shown on the plans and outside of the tolerances set for subgrade in cuts shall not be paid for. The Engineer shall define the beginning and end points of areas classified as "Rock Excavation". Any area over excavated in the subgrade shall be reinstated at the cost of contractor and as directed by the Engineer.

The pay quantity for "Rock Excavation" shall be computed by means of average end area method from approved cross-sections based on original ground elevations after the authorized removal of unsuitable or overburden materials, if required.

For disposal of excavated rock material, same procedure shall be followed as described above for the "Common Excavation" specified in sub item No. 4.1 (a).

c) Borrow Excavation

No measurement shall be made for any Borrow Excavation, however this material if used in any of the Bill item(s), shall be measured and paid as provided under that relative item(s) of work.

4.2 Payment

No payment for Roadway or Borrow Excavation shall be made under this item as the same is deemed to be included under item of Formation of Embankment.

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FORMATION OF EMBANKMENT

1. DESCRIPTION

This work shall consist of formation of embankment, including preparation of area for placing and compaction of embankment material in layers and in holes, pits and other depressions within the roadway area in accordance with the specifications and in conformity with the lines, grades, thickness and typical cross-section shown on the plans or established by the Engineer.

2. MATERIAL REQUIREMENTS

Material for embankment shall consist of suitable material excavated from borrow, roadway excavation or structural excavation and shall include all lead and lift. Borrow material will be used only when material obtained from roadway or structural excavation is not suitable or is deficient for embankment formation and shall include all lead and lift.

The material under this item shall conform to the following specification.

a). Contractor shall use AASHTO Class A-1, A-2, A-3 or A-4 soil as specified in AASHTO M-145 as per approval of the Engineer.

b). CBR of the material shall not be less than Five (05) percent or as stated on the drawings and determined in accordance with AASHTO T-193. CBR value shall be obtained at a density corresponding to the degree of compaction required for the corresponding layer. The swell value of the material for embankment formation shall not exceed five tenth (0.5) percent. However, while establishing the swell value, surcharge weights representing the overburden will be used.

c). In case sandy material is used for embankment formation, it shall be properly confined at no extra payment with a material and to the extent as approved by the Engineer and sandy material shall not be used on slopes of embankment.

d). In areas subject to flood and prolonged inundation of the embankment, such as at bridge sites and other roadway areas or lengths, the material used in embankment, unless rock, shall be AASHTO Class (a) A-1, (b) A-3 and (c) A-2-4 soils. Other soils may be used only with the written consent of Engineer.

3. CONSTRUCTION REQUIREMENTS

3.1. Formation of Embankment with Borrow Common Material

Material for embankment obtained and approved as provided above, shall be placed in horizontal layers of uniform thickness and in conformity with the lines, grades, sections and dimensions shown on the Drawings or as required by the Engineer. The layers of loose material other than rock shall be not more than 20 cm. thick, unless otherwise allowed by the Engineer after a trial section is prepared and approved.

The material placed in layers and that scarified to the designated depth for formation of embankment shall be compacted to the density specified below:

Depth in centimeters below subgrade level	**Percent of Maximum Dry Density as determined by AASHTO T-180.***
0 to 30	95
30 to 75	93
Over 75	90

* Method 'B' or 'D' whichever is applicable or corresponding Relative Density in case of sand fill.

In-place density determinations of the compacted layers shall be made in accordance with AASHTO T -191 or other approved methods. For all soils, with the exception of rock fill materials, containing more than 10% oversize particles (retained on ¾" /19 mm sieve), the in-place density thus obtained shall be adjusted to account for such oversize particles or as directed by the Engineer. Subsequent layers shall not be placed and compacted unless the previous layer has been properly compacted and accepted by the Engineer.

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Material for embankment at locations inaccessible to normal compacting equipment shall be placed in horizontal layers of loose material not more than 15 centimeters thick and compacted to the densities specified above by the use of mechanical tempers, or other appropriate equipment.

The compaction of the embankment shall be carried out at the designated moisture content consistent with the available compacting equipment.

Embankment material that does not contain sufficient moisture to obtain the required compaction shall be given additional moisture by means of approved sprinklers and mixing. Material containing more than the optimum moisture may not, without written approval of the Engineer, be incorporated in the embankment until it has been sufficiently dried out. The drying up of wet material may be expedited by scarification, disking or other approved methods.

When materials of widely divergent characteristics, such as clay and chalk or sand, drawn from different sources, are to be used in the embankment they shall be deposited in alternate layers of the same material over the full width of the embankment to depths approved by the Engineer. Rock, clay or other material shall be broken up and no accumulation of lumps or boulders in the embankment will be permitted. No surplus material shall be permitted to be left at the toe of embankment or at the top of cut sections.

Side slopes shall be neatly trimmed to the lines and slopes shown on the drawings or as directed by the Engineer, and the finished work shall be left in a neat and acceptable condition.

3.2. Formation of Embankment with Rock Material

Embankment formed of material consisting predominantly of rock fragment of such size that the material cannot be placed in layers of the thickness prescribed without crushing, pulverizing or further breaking down the pieces using mobile crusher, such material may be placed in layers with maximum size of the rocks / boulders 30cm and no layer shall exceed eighty (80) centimeters of loose measurement and compacted by a vibratory roller with the minimum mass as shown in the following table.

Mass per meter width of vibrating roller (Kg/M)	Depth of fill layer (mm)	Number of passes of the roller on each layer
2300-2900	400	5
2900-3600	500	5
3600-4300	600	5
4300-5000	700	5
>5000	800	5

No rock / boulder material shall be considered as unsuitable because of its size. Mechanical means or mobile crushers may be used to reduce the size of the rock/boulder to 30 cm max. to make it useable / workable. Payment is deemed to be included in the BOQ price of the item.

The material shall be carefully placed in layers, so that all larger stones will be well distributed and voids completely filled with smaller stones, clean small spells, shale, earth, sand, gravel, to form a solid mass. After placing rock material, surface shall be covered with a layer of fine material having thickness less than twenty (20) centimeters.

Such fine material shall be reserved from roadway excavation by the Contractor. Should such material be available but not reserved, Contractor will supply and place borrow material for forming smooth grade without extra payment.

Each layer shall be bladed or leveled with motor grader, bulldozer or similar equipment capable of shifting and forming the layer into a neat and orderly condition. No rock larger than eight (8) centimeters in any dimension shall be placed in the top fifteen (15) centimeters of embankment unless otherwise allowed by the Engineer.

Material for each layer should be consolidated with heavy weight vibratory roller until settlement as checked between two consecutive passes of roller is less than one (1) percent of the layer thickness. In evaluation of settlement, survey points should be established and rolling continued until difference of levels as checked after two consecutive passes is less than one (1) percent of the total layer thickness. Moreover initial rolling of overlaid fine material shall be done without watering to ensure their intrusion in voids of rock layer beneath. Watering shall be done when voids are properly filled.

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Embankments, which are formed of material that contain rock but also contain sufficient compactable material other than rock or other hard material to make rolling feasible, shall be placed and compacted in the manner prescribed above and to the point when settlement is within above mentioned requirement. Compaction test will be made whenever the Engineer determines they are feasible and necessary. The Engineer must approve each layer before the next layer is placed.

When rock to be incorporated in fill is composed largely of weak or friable material, the rock/ boulder shall be reduced to a maximum size of 15cm.

3.3. Formation of Embankment on Steep Slopes

Where embankments are to be constructed on steep slope, hill sides or where new fill is to be placed and compacted against existing pavement or where embankment is to be built along one half the width at a time, the original slope of the hill side, of existing pavement or adjacent to half width of embankment shall be cut in steps of twenty (20) centimeters depth.

Benching shall be of sufficient width to permit operation of equipment possible during placing and compaction of material.

Cut material shall be incorporated with the new embankment material and compacted in horizontal layers. No extra payment will be allowed for such an operation.

3.4. Formation of Embankment on Existing Roads

Before fill is placed and compacted on an existing roadway, the existing embankment and/or pavement may be leveled by cutting, rooting or scarifying by approved mechanical means to a level to be determined by the Engineer. The earth, old asphalt or other material arising as a result of this operation will be declared either suitable or unsuitable, for use in the embankment or other items by the Engineer. If the material is declared suitable it will be measured under relative item and if it is declared unsuitable, it will be measured separately.

3.5. Formation of Embankment in Water Logged Areas

Where embankments are to be placed in water logged areas and which are inaccessible to heavy construction equipment, a special working platform shall be first established, consisting of a blanket of fill material placed on top of the soft layer. The material of the working table shall consist of normal or processed granular fill, obtained from borrow excavation. This material shall conform to the following specifications:

Percentage of Sieve Description	**Weight Passing Mesh Sieve. AASHTO T -27**
3 inch (75 mm)	100

The remaining grading shall be such as to avoid intrusion into the working platform material of subgrade or natural ground surface material. For this condition to be met it will be required that the ratio.

$$\frac{D_{15}\text{ (Working Platform Material)}}{D_{85}\text{ (Natural Ground Material)}} \text{ is less than 5.}$$

D_{85} and D_{15} mean the particle diameters corresponding to 85% and 15%, respectively, passing (by weight) in a grain size analysis. Construction of this working table shall proceed from one edge of the soft area by using the fill as a ramp for further material transport.

The thickness of the working table as prescribed above shall be approximately 0.5 meter unless directed otherwise by the Engineer, and the width shall be that of the embankment. The placement and compaction of the working table shall be carried out by use of light equipment or as directed by the Engineer.

No density requirements are specified for the working platform, however, subsequent layers above shall be compacted to the specified densities.

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No additional cost shall be made against this work, cost of this work is deemed to be included in formation of embankment.

3.6. General Requirements

To avoid interference with the construction of bridge abutments and wing walls, the Contractor shall at points determined by the Engineer, suspend work on embankments and/or in cuts forming the approaches to any such structure until such time as the construction of the later is sufficiently advanced to permit the completion of the approaches without the risk of interference or damage to the bridge works. The cost of such suspension of work shall be included in the contract unit prices for embankment. In carrying embankments up to or over bridges, culverts or pipe drainage, care shall be taken by the Contractor to have the embankments brought to equally on both sides and over the top of any such structure. Contractor shall make special arrangements to ensure proper compaction in restricted spaces and around structures. No compensation shall be made to the Contractor for working in narrow or otherwise restricted areas.

When as a result of settlement, an embankment requires the addition of material up to 30 cm in thickness to bring it up to the required grade level, the top of the embankment shall be thoroughly scarified before the additional material is being placed without extra payment to Contractor for the scarification.

The Contractor shall be responsible for the stability of all embankments and shall replace any portions that in the opinion of the Engineer have been damaged or displaced due to carelessness or neglect on the part of the Contractor. Embankment material which may be lost or displaced as a result of natural causes such as storms, cloud-burst or as a result of unavoidable movement or settlement of the ground or foundation upon which the embankment is constructed shall be replaced by the Contractor with acceptable material from excavation or borrow. No additional compensation will be allowed for the replacement.

During construction, the roadway shall be kept in shape and drained out at all times. When unsuitable material has been placed in the embankment by the Contractor, he shall remove it without extra payment.

4. MEASUREMENT AND PAYMENT

4.1. Measurement

The quantities to be paid for shall as per BOQ, calculated on theoretical designed lines and grades and the original ground levels as defined in item and as established using Average End Area Method compacted in place, accepted by the Engineer formed with material resulting from:

a). Formation of Embankment from Borrow Excavation

Measurement shall be made as under:-

Formation from Borrow	=	Total Embankment Quantity (Calculated with reference to original ground level by Average End Area Method) (Minus) Roadway Excavation Quantity (Minus) Structural Excavation Quantity

b). Formation from Structural Excavation

This quantity shall be the same as calculated for structural excavation irrespective of its haulage distance except that declared unsuitable by the Engineer, which shall not be placed in Embankment and shall be disposed off as per the direction of Engineer.

c). Formation from Roadway Excavation

This quantity shall be the same as calculated for Roadway Excavation except that declared unsuitable by the Engineer which shall not be placed in embankment and shall be disposed off as directed by the Engineer. The contractor will be supposed to use only declared suitable material from Roadway Excavation irrespective of haulage distance. However if contractor, for his own convenience, uses the material from borrow, the payment will still be made under this item.

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In the measurement of "Formation of Embankment on steep slopes" no allowance will be made for the benching or volume of material cut out from the hill side or from the first half width fill to accommodate the compacting equipment but will be calculated only on the net volume of fill placed against the original hill sides, the old embankment or the first half width fill.

4.2. Payment

a) Formation from Borrow Excavation

The quantity to be paid for shall as per BOQ, placed in embankment, measured as provided above for material from borrow excavation and such a payment will be deemed to include cost of excavation, payment of royalty, levies and taxes of Local, Provincial and Federal Government, cost of hauling including all lead and lift, spreading, watering, rolling, labour, equipment, tools and incidental necessary to complete this item.

b) Formation from Structural Excavation

The quantity to be paid for shall be as per BOQ, placed in embankment irrespective of the haulage distance and measured as provided above for suitable material from structural excavation and such payment will be deemed to include cost of excavation, hauling, dumping, spreading, watering, rolling, labour, equipment, tools and incidentals necessary to complete this item.

c) Formation from Roadway Excavation

The quantity to be paid for shall be as per BOQ, placed in embankment irrespective of the haulage distance and measured as provided above for suitable material from roadway excavation and such payment will be deemed to include cost of excavation, hauling, dumping, spreading, watering, rolling, labour, equipment, tools and incidental necessary to complete this item.

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GRANULAR SUBBASE

1. DESCRIPTION

This item shall consist of furnishing, spreading in one or more layers and compacting granular subbase according to the specifications and drawings and/or as directed by the Engineer.

2. MATERIAL REQUIREMENTS

Granular subbase material shall consist of natural or processed aggregates such as gravel, sand or stone fragment and shall be clean and free from dirt, organic matter and other deleterious substances, and shall be of such nature that it can be compacted readily under watering and rolling to form a firm, stable subbase. The material shall comply to the following grading and quality requirements:

a). The subbase material shall have a gradation curve within the limits of grading given below:

Grading Requirements for Subbase Material			
Sieve Designation		Mass Percent Passing Grading	
mm	**inch**	**A**	**B**
60.0	(2-½)	100	--
50.0	(2)	90-100	100
25.0	(1)	50-80	55-85
9.5	(3/8)	42-75	40-70
4.75	No.4	35-70	30-60
2.0	No.10	15-40	20-50
0.425	No.40	8-20	10-30
0.075	No.200	2-8	5-15

The Coefficient of Uniformity D60/D10 shall be not less than 3, where D60 and D10 are the particle diameters corresponding to 60% and 10%, respectively, passing (by weight) in a grain size analysis, curve.

b). The Material shall have a CBR value of at least 50%, determined according to AASHTO T -193. The CBR value shall be obtained at a density corresponding to Ninety eight (98) percent of the maximum dry density determined according to AASHTO T –180 Method-D.

c). The coarse aggregate material retained on sieve No.4 shall have a percentage of wear by the Los Angeles Abrasion (AASHTO T-96) of not more than 40%.

d). In order to avoid intrusion of silty and clayey material from the subgrade in the subbase, the ratio D15 (Subbase)/D85 (Subgrade) should be less than 5.

Where D85 and D15 are the particle diameters corresponding to eighty five (85) % and fifteen (15) %, respectively passing (by weight) in a grain size analysis curve.

e). The fraction passing the 0.075 mm (No.200) sieve shall not be greater than two third of the fraction passing the 0.425 mm (No. 40) sieve. The fraction passing the 0.425 mm sieve shall have a liquid limit of not greater than 25 and a plasticity index of 6 or less.

f). If over-size is encountered, screening of material at source shall invariably be done, no hand picking shall be allowed, however hand picking may be allowed by the Engineer, if over-size quantity is less than 5% of the total mass.

g). Sand equivalent for all classes shall be 25 min.

3. CONSTRUCTION REQUIREMENTS

3.1 Spreading

Granular subbase shall be spread on approved subgrade layer as a uniform mixture. Segregation shall be avoided during spreading and the final compacted layer shall be free from concentration of coarse or fine materials.

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Granular subbase shall be deposited on the roadbed or shoulders in a quantity which will provide the required compacted thickness without resorting to spotting, picking up or otherwise shifting the subbase material. In case any material is to be added to compensate for levels, the same shall be done after scarifying the existing material, to ensure proper bonding of additional material.

Where the required thickness is fifteen (15) cm or less, the aggregates may be spread and compacted as one layer, but in no case shall a layer be less than seven and one half (7.5) centimeters thick. Where the required thickness is more than 15 cm, the aggregates shall be spread and compacted in 2 or more layers of approximately equal thickness, but in any case the maximum compacted thickness of one layer shall not exceed 15 cm. All subsequent layers shall be spread and compacted in a similar manner.

Granular subbase shall be spread with equipment that will provide a uniform layer conforming to the specified item both transversely and longitudinally within the tolerances as specified in "Table for Allowable Tolerances" in NHA specifications. No hauling or placement of material will be permitted when, in the judgment of the Engineer, the weather or road conditions are such that the hauling operation will cause cutting or rutting of subgrade or contamination of sub base material.

3.2 Compaction Trials

Prior to commencement of granular subbase operation, contractor shall construct a trial length, not to exceed, five hundred (500) meters and not less than two hundred (200) meters with the approved subbase material as will be used during construction to determine the adequacy of the contractor's equipment, loose depth measurement necessary to result in the specified compacted layer depths, the field moisture content, and the relationship between the number of compaction passes and the resulting density of the material.

3.3 Compaction

The moisture content of subbase material shall be adjusted prior to compaction, by watering with approved sprinklers mounted on trucks or by drying out, as required, in order to obtain the specified compaction.

The subbase material shall be compacted by means of approved vibrating rollers or steel wheel rollers (rubber type rollers may be used as a supplement), progressing gradually from the outside towards the centre, except on super elevated curves, where the rolling shall begin at the low side and progress to the high side. Each succeeding pass shall overlap the previous pass by at least one third of the roller width. While the rolling progresses, the entire surface of each layer shall be properly shaped and dressed with a motor grader, to attain a smooth surface free from ruts or ridges and having proper section and crown. Rolling shall continue until entire thickness of each layer is thoroughly and uniformly compacted to the specified density.

Any area inaccessible to rolling equipment shall be compacted by means of hand guided rollers, plate compactors or mechanical tampers, where the thickness in loose layer shall not be more than 10 cm.

If the layer of subbase material or part thereof does not conform to the required finish, the Contractor shall, at his own expense, rework, water and recompact the material before succeeding layer of the pavement structure is constructed.

Immediately prior to the placing of first layer of base course the subbase layer (both under the travelled way and the shoulders) shall conform to the required level and shape. Prior to placing the succeeding layers of the material, the top surface of each layer shall be made sufficiently moist to ensure bond between the layers. The edges or edge slopes shall be bladed or otherwise dressed to conform to the lines and dimensions shown on the plans.

No material for construction of the base shall be placed until the subbase has been approved by the Engineer.

3.4 Compaction requirements

The relative compaction of each layer of the compacted subbase shall not be less than Ninety Eight (98) percent of the maximum dry density determined according to AASHTO T -180 Method-D. The field density shall be determined according to AASHTO T -191 or other approved method. For all

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materials, the field density thus obtained shall be adjusted to account for oversize particles (retained on 19 mm sieve) as directed by the Engineer. Also for adjustment of any material retained on 4.75 mm sieve, AASHTO Method T -224 shall be used.

3.5 Moisture Content Determination

As It is customary in the project laboratories that small samples of materials are placed in ovens for moisture determination for proctor, following precautions are necessary to ensure proper compaction results.

a). Same size of sample is placed in oven for moisture determination in case of laboratory density (modified proctor) and field density.

b). Moisture content for calculation of field density and proctor shall be observed on material passing 4.75 mm sieve.

3.6 Tolerance

The subbase shall be compacted to the desired level and cross slopes as shown on the drawings. The allowable tolerance shall be according to the "Table for Allowable Tolerances" in NHA specifications.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

The quantity of subbase to be paid for shall be measured by the theoretical volume in place as shown on the drawings or as directed and approved for construction by the Engineer, placed and accepted in the completed granular subbase course. No allowance will be given for materials placed outside the theoretical limits as shown on the cross-sections.

4.2 Payment

The accepted quantities measured as provided above shall be for the Pay Item shown in the Bill of Quantities, which price and payment shall constitute full compensation for furnishing all materials, hauling, placing, watering, rolling, labour, equipment, tools and incidentals necessary to complete the item.

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AGGREGATE BASE COURSE

1. DESCRIPTION

This item shall consist of furnishing, spreading and compacting one (1) or more layers of aggregate base on a prepared sub-grade, sub-base or existing road surface, in accordance with the specifications and to the lines, elevations and thicknesses shown on drawings and/or as directed by the Engineer.

2. MATERIAL REQUIREMENTS

Aggregates used for aggregate base shall be hard durable particles or fragments free from vegetation matter and other deleterious substances and, when compacted under watering and rolling, form a firm, stable base. Aggregate shall consist of crushed stone, crushed slag, or crushed gravel.

Crushed stone aggregate shall contain not more than eight (8) percent, by weight, flat, elongated, soft, or disintegrated pieces. Aggregate retained on the 2.36 mm (No. 8) sieve shall consist of stone particles of which at least ninety percent (90%), by weight, shall have at least two (2) mechanically fractured faces.

The specified gradation shall be obtained by crushing, screening and blending processes, as necessary. The Contractor shall furnish, produce stockpile, blend and mix all necessary materials using such equipment and procedures as will produce the specified aggregate base.

If additional fine material, in excess of that already present in the base course material, is necessary for correcting the gradation properties, for satisfactory bonding of the base material, or for adjusting the material characteristics of the fraction passing the 0.425 mm (No. 40) sieve, it shall be uniformly blended and mixed with the crushed aggregates. Such mixing shall take place at the crusher, at an approved stationary proportioning and mixing plant or on a traveling plant. Reworking of the base course material in place to obtain the specified requirements shall not be permitted. The additional fine material, if any, shall be obtained from crushing stones, gravel, or slag, and shall be of a gradation as required to accomplish the specified gradation of the final mixture.

Aggregate shall conform to one of the following grading and quality requirements on the road bed after all blending and mixing and spreading and before compacting:

a). The gradation curve of the material shall be smooth and within the envelope limits for Type A, B or C given below.

AGGREGATE BASE GRADING REQUIREMENTS

	PERCENTAGE PASSING		
SIEVE SIZES	**Type A**	**Type B**	**Type C**
50 mm (2 inch)	100	-	-
37.5 mm (11/2 inch)	-	100	-
25 mm (1 inch)	55-85	70-95	100
19 mm (3/4 inch)	50-80	55-85	70-100
4.75 mm (No. 4)	30-60	30-60	35-65
0.425 mm (No. 40)	10-25	10-25	15-25
0.075 mm (No. 200)	3-10	3-10	3-10
The fraction passing the No. 200 sieve shall not exceed the fraction passing the 0.425 mm (No. 40) sieve.			

The material shall be well graded such that the coefficient of Uniformity D60/D10 shall be greater than four (4).

b). The Coarse aggregate shall have a percentage of wear by the Loss Angeles Abrasion test (AASHTO T-96) of not more than forty (40).

c). The material shall have a loss of less than twelve (12) percent when subjected to five cycles of the Sodium Sulphate Soundness test according to AASHTO T -104.

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d). The sand equivalent determined according to AASHTO T -176 shall not be less than 45 and the material shall have a Liquid limit of not more than twenty five (25) and a plasticity Index of not more than 6 as determined by AASHTO T-89 and T-90.

e). The material passing the 19 mm sieve shall have a CBR value of minimum hundred (100) percent for Type A, eighty (80) percent for Type B and sixty five (65) for Type C, tested according to the AASHTO T193. The CBR value shall be obtained at the maximum dry density determined according to AASHTO T 180, Method D.

f). Laminated material shall not exceed 15% of total volume of Aggregate Base Course.

3. PROPORTIONING AGGREGATE BASE MIXES

3.1. Job Mix Design Proposal

A proposed Job Mix Formula (JMF) shall be formulated by the Contractor and submitted to the Engineer for approval. The JMF shall be prepared by the Contractor in precise compliance with procedures and requirements set forth in the Materials as per AASHTO.

The Contractor shall select his sources of aggregate and, after sufficient quantities have been stockpiled or are available for use, obtain representative samples of the materials and test to determine if they conform to the requirements of these specifications. At least thirty (30) days before producing aggregate base mixtures, the Contractor shall submit in writing to the Engineer detailed information for each mix which he proposes to furnish. The information shall include, but not be limited to the following:

a) The source and gradation of the aggregate for each mix to be furnished. If the aggregate (coarse, fine, supplemental fine) is separated into two (2) or more sizes, the information provided shall consist of gradations for all individual sizes, the proportions of each individual size to be used, and the mathematically combined gradation for each mix to be furnished. Such combined gradation shall meet the applicable grading requirements shown in Subsection 2 "Materials" in these General Specifications and show the percentage passing each of the specified sieve sizes.

b) Pertinent test data and a written certification that the aggregates to be furnished conform to all quality requirements shown in Subsection 2,"Materials" in these General Specifications.

c) The type of plant to be used for mixing each mix to be furnished.

d) The beginning date for producing aggregate base mixtures.

e) The Engineer shall be provided access to the materials sampling and testing operations at all times. The combined aggregate, including mineral additives, shall conform to the approved JMF grading within the following tolerances:

9.75 mm (3/8") and larger sieves,	9 percentage points
4.75 mm (No. 4) sieve,	8 percentage points
2.36 mm (No. 8) sieve,	7 percentage points
0.300 mm (No. 50 sieve,	6 percentage points
0.075 mm (No. 200) sieve,	4 percentage points

At the same time the above information is provided, the Contractor shall supply to the Engineer fifty (50) kilogram samples of each individual aggregate size, when used, ten (10) kilogram samples of mineral filler and chemical admixture, all representing the materials which the Contractor proposes to furnish.

3.2 Acceptance of Job Mix Formula

The Engineer shall review the JMF to determine that it contains all required information. If it does not contain all required information, it shall be returned within seven (7) days to the Contractor for further action and re-submission by the Contractor.

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If the proposed JMF contains all required information but fails to meet all the requirements specified, it shall not be accepted by the Engineer and will be returned to the Contractor within fourteen (14) days. The Contractor shall prepare and submit to the Engineer a new JMF conforming to the requirements specified and propose a new date for beginning production.

When the Engineer is satisfied that the JMF proposed by the Contractor conforms to all the requirements of the specifications, he shall order the Contractor to construct a minimum two hundred (200) meter long field control strip. The Engineer shall evaluate the control strip as to its constructability and compact ability and conformance to the laboratory tested JMF. Split samples of the aggregate base mix for and components raw material along with the field laboratory test results are to be sent to the Central Laboratory for a one (1) point check and documentation. If the Engineer is not satisfied with the results of the control strip, he shall state his objections in writing and request a revised JMF and a new control strip.

When the Engineer is satisfied that the JMF proposed by the Contractor conforms to all requirements of the specifications and the control strip results are acceptable, he will issue written acceptance to the Contractor to begin producing the mixes proposed.

Production of aggregate base mixes shall not begin until the Engineer has given written acceptance of the Job Mix Formula.

Acceptance of the JMF by the Engineer does not relieve the Contractor of his obligation to produce aggregate base mixes conforming to all specified requirements.

3.3 Job Mix Formula Revisions

The Contractor shall not alter his methods of crushing, screening, blending, or stockpiling from that used to produce materials for the approved JMF. Changes to the JMF will not be permitted without retesting and resubmission of a proposed (revised) JMF in accordance with all the steps in Subsection 3.1, "Job Mix Design Proposal" in these General Specifications. Significant changes may include, but not be limited to, changes in the amount or type of materials rejected or wasted, changes in the amount of materials crushed, reductions in the amount of crushed fines, changes in the amount and type of mineral filler.

Should the Contractor change his source of aggregate, he shall furnish a new job mix design proposal and samples of materials, as described in Subsection 3.1, "Job Mix Design Proposal" in these General Specifications as determined by the Engineer to be necessary, at least twenty-one (21) days before their intended use.

4. EQUIPMENT

The Contractor shall furnish all necessary equipment for producing, stockpiling, moisture conditioning, and hauling aggregate, preparing the surface on which the aggregate base will be placed, and placing, spreading, compacting, finishing and maintaining the aggregate base in accordance with the minimum type and number outlined in the Contractor's Program of Work as approved by the Engineer. Blending and mixing aggregates and adjusting the moisture content as required for compaction shall be performed in a **central mixing plant.**

The blended and mixed aggregates shall be placed and spread to the width and thickness specified using approved mechanical spreading equipment. Motor graders shall not be used for spreading.

5. CONSTRUCTION.

5.1 Contractor Quality Control Procedures

Testing to control the quality of aggregate base furnished shall be the responsibility of the Contractor. Copies of all test results shall be forwarded to the Engineer at the end of each working day. The Engineer shall have access to the Contractor's testing laboratory at all times and reserves the right to obtain samples of the materials at any point during construction. When requested by the Engineer, the Contractor shall sample aggregate base materials and prepare duplicate samples, by quartering. One (1) sample shall be delivered to the Engineer and the duplicate sample shall be tested by the Contractor.

The Contractor shall perform the following minimum types and number of tests:

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a) Gradation, sand equivalent and plasticity index - One (1) test each per one thousand (1000) cubic meters of aggregates produced but not less than one (1) per production day.

b) Abrasion Loss - One (1) test for first, second and third five hundred (500) cubic meters of aggregate produced and one (1) test for each twenty-five hundred (2500) cubic meters thereafter.

c) Percent Crushed Faces - One (1) test for each five hundred (500) meters of aggregate produced.

d) CBR Value - One (1) test for each five thousand (5000) cubic meters.

When test data indicate that the aggregate base does not conform to specified requirements, the Contractor shall take effective action to correct his production methods to assure that the materials produced will conform to all specified requirements. Such action shall include halting production, changing the source of aggregate supply, altering amount of aggregate scalped and rejected, increasing degree of crushing, and revising blending and handling methods.

5.2 Preparation and Maintenance

After the sub-grade or sub-base surface has been prepared, the Contractor shall maintain it true to cross section, grade and density. The surface of the sub-grade or sub-base, immediately prior to receiving the aggregate base shall conform to the specified cross section, grade and density and shall be free of any loose or extraneous material. All sub-grade or sub-base protection, maintenance or repair work is considered subsidiary to items in the Bill of Quantities.

5.3 Mixing

The aggregate and the water shall be thoroughly mixed in a **twin shaft pug-mill type mixer**, unless another type of mixer is approved. The amount of water added to the aggregate shall be an amount which will provide the mixture with a satisfactory moisture content for compaction to the specified in-place density. The rate of flow of the water to the pug-mill shall be controlled by valves or other devices which can be easily reset when a change in the rate of flow is desirable. The water supply system shall be equipped with a positive cut-off control which will stop the flow of water simultaneously with any stoppage in the flow of aggregate into the pug-mill.

5.4 Transporting

The plant-mixed material shall be transported in such manner as to deliver the mix to the project without loss or segregation. Each truck load shall be covered with a heavy canvas sheet to reduce the loss of moisture in transit whenever the time between loading the work and spreading the moisture exceeds thirty (30) minutes.

5.5 Placing and Spreading

The mixture shall be placed on the existing roadway, approved sub-grade or approved sub-base, as the case may be, in a uniform layer or layers not exceeding fifteen (15) centimeters in compacted depth. Where the required thickness is greater than fifteen (15) centimeters, the material shall be placed in layers of equal thickness. However, if heavy duty vibratory compaction equipment approved by the Engineer is used, the maximum compacted layer thickness may be increased to twenty (20) centimeters provided test trial compaction tests indicate compliance with these General Specifications including the following:

a) Compaction samples are taken from the entire layer including the lower part of the increased thickness.

b) The coarse aggregates on the top of the Aggregate Base layers are not damaged or crushed.

c) The increased thickness approval will be rescinded by the Engineer if more than fifteen percent (15%) of the subsequent field density tests taken on the thicker layer initially fail, necessitating retesting after additional compaction.

d) The mixture course shall be placed on the roadbed to the required width and un-compacted thickness as follows:

e) Through an approved self-propelled spreading machine.

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f) In a sized windrow from which a paving machine or travel plant will pickup and spread the aggregate base.

g) To protect the under layer and to allow proper drainage, the spreading of the base course material shall begin along the centerline on stretches with a crowned section or on the high side of stretches with a one-way slope.

The approved spreader shall deliver the mixture in such a condition that the material will be ready for compaction without further shaping. Unless otherwise permitted by the Engineer, the aggregate shall be spread not more than two thousand (.2000) square meters ahead of the rollers. Any necessary sprinkling shall be kept within this limit.

The material shall be handled so as to avoid segregation. If the approved spreader causes segregation in the material, or leaves ridges or other objectionable marks on the surface which cannot be eliminated easily or prevented by adjustment to the spreading operation, the use of such approved spreader shall be discontinued, and it shall be replaced. All segregated material shall be removed and replaced with well-graded material. No "skin" patching shall be permitted. Only minor surface manipulation and watering to achieve the required surface tolerances shall be permitted during the compaction process.

No hauling or placement of material will be permitted when, in the judgment of the Engineer, the weather or road conditions are such that hauling operations will cause rutting of the road surface or cause contamination of the sub-base or base course material. Before placing the mixture, the sub-grade or previous layer shall be wetted to insure bond between the layers. The mixture shall be placed and shaped by power equipment to the lines, elevations, cross sections, depths and density specified in the following subsections.

5.6 Compacting

Each layer of aggregate base material, after being shaped to the required lines and cross section, shall be compacted to a uniform density with no individual test being less than ninety-five percent (95%) of the maximum dry unit weight determined according to AASHTO T-180, Method D (Modified). Each lot of base material as described in Subsection 3.6, "Quality Assurance Procedures" in these General Specifications shall have a percent relative compaction of no less than one hundred percent (100%) of the maximum dry unit weight determined according to AASHTO T-180, Method D (Modified). The aggregate base shall be watered or dried as may be necessary to obtain a moisture content suitable for compaction. Material which has dried prior to final compaction or which has dried and de-compacted subsequent to final compaction shall be watered and re-compacted using equipment and procedures approved by the Engineer. Should the Contractor be unable to return the material to its original or specified condition with respect to compaction, thickness, and surface tolerances, the Contractor shall remove the material and reconstruct the course on a reapproved sub-grade.

When there are delays in constructing the remaining pavement structure over a granular course, the compaction of the granular course shall be re-verified and deficient areas corrected or replaced to the satisfaction of the Engineer. Such corrections or replacement shall be at the Contractor's expense.

The Contractor shall plan the work and handle the various operations so that the least amount of water will be lost by evaporation from uncompleted surfaces. If the Contractor delays placing or succeeding layers of material to the extent that additional water must be applied to prevent raveling or excessive drying, the application of such water shall be at the Contractor's expense and will not be considered as the basis for a claim for additional compensation.

The material shall be compacted by means of approved compaction equipment, progressing gradually from the outside towards the center, with each succeeding pass uniformly overlapping the previous pass. Rolling shall continue until the entire thickness of each layer is thoroughly and uniformly compacted to the specified density. The base course shall not be rolled when the under-layer is soft or yielding or when rolling causes undulation of the base course. The final rolling of the completed course shall be done with a self-propelled roller as approved by the Engineer. Rolling shall be accompanied by sufficient blading, in a manner approved by the Engineer, to insure a smooth surface, free from ruts or ridges and having the proper section and crown. When additional water is required, it shall be added in the amount and manner approved by the Engineer. Initial

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layers of material must be constructed to a uniform grade and cross section and compacted by the Contractor and approved by the Engineer prior to the delivery of materials for a succeeding layer.

Prior to placing a succeeding layer of granular material, the surface of the under-layer shall be made sufficiently moist, to insure bond between the layers. The edges and edge slopes of the base course shall be bladed or otherwise dressed to conform to the lines and dimensions shown on the plans, and present straight, neat and workmanlike lines and slopes as free of loose material as practicable.

Any areas inaccessible to normal compaction equipment shall be compacted by means of portable mechanical tampers until satisfactory compaction is obtained. When the final layer is to be trimmed to final grade by an automatic grading machine, this layer shall be constructed approximately one (1) to three (3) centimeters above grade, so that the grading machine cuts continually. After the final pass of the grading machine, the base shall be wetted and rolled. Excess material removed by the grading machine shall be re-used in shoulders, islands, or other areas for which Aggregate Base is specified, but not under roadway pavement. Material wasted and not re-used will be deducted from the final pay quantities.

5.7 Finishing

All aggregate base material shall be placed, trimmed and finished in a neat and workmanlike manner in compliance with the lines, grades and typical cross sections shown on the plans or staked by the Engineer.

Grade control shall be accomplished by means of grade stakes, steel pins or forms, placed in lanes parallel to the centerline of the road and at intervals sufficiently close to permit placing of string lines or straightedges for checking purposes.

5.8 Maintenance and Protection

Following construction of the aggregate base course, the compacted course shall be maintained by the Contractor at his expense. The Contractor shall blade, broom, and otherwise maintain the course, keeping it free from raveling and other defects that result in lost density until such time as the next element of the pavement structure is placed. Water shall be applied at such times and in such quantities as directed by the Engineer and the Engineer shall have full authority to require the suspension of all other work on the project to insure the proper maintenance of previously compacted material.

Any damage to the base course, or any layer thereof, caused from routing of construction or other equipment over completed stretches shall be repaired by the Contractor at his expense and as approved by the Engineer.

The Engineer shall determine when the surface of the base course is in the proper condition to permit the bituminous prime and/or surfacing to be applied. The Contractor must continue to maintain the surface of the base course, including the application of necessary water, at his expense until such time as the bituminous prime and/or surfacing is applied. Any additional expense incurred by the Contractor because of delay in applying the bituminous prime and/or surfacing when so permitted by the Engineer will not be considered as the basis for a claim for additional compensation.

5.9 Compaction Test Trials

If directed by the Engineer, or requested by the Contractor, prior to the commencement of his aggregate base compaction operations, the Contractor shall construct compaction test trial lengths, not to exceed one (1) kilometer. The materials used in the trials shall be that approved for use as aggregate base and the equipment used shall be that according to the Contractor's approved detailed Program of Work.

The object of these trials is to determine the adequacy of the Contractor's equipment, the loose depth measurements necessary to result in the specified compacted layer depths, the field moisture content and the relationship between the number of compaction passes and the resulting density of the material.

The Contractor may proceed with aggregate base Work only after the methods and procedures established in the compaction trial has been approved by the Engineer.

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6. QUALITY ASSURANCE PROCEDURES

Aggregate base shall be accepted by lot. Unless otherwise stated in the Special Specifications, the lot size shall be ten thousand (10,000) square meters for each layer constructed. The Engineer may, during the beginning of placement of aggregate base, at times when test results indicate erratic characteristics and at any other time, reduce the lot size to sections of aggregate base with similar quality characteristics. This should facilitate the isolation and modification or replacement of low-quality materials with materials of acceptable quality to maintain the overall strength of the pavement structure.

The Engineer shall perform or supervise the performance of all quality assurance sampling and testing. The location of all samples and tests shall be recorded by roadway, lane and centerline station (kilometer). Quality assurance sampling and testing for each lot shall include:

1. Compaction
2. Thickness
3. Aggregate Gradation, Sand Equivalent and Plasticity Index
4. California Bearing Ratio and Abrasion
5. Surface Tolerances

6.1 Compaction

The compacted density for each layer of aggregate base shall be determined by the sand cone method, or by nuclear method, using full depth penetration, at the option of the Engineer.

When the sand cone method is used, unless otherwise stated in the Special Specifications, the tests shall be made at a minimum of five (5) randomly selected locations in each lot.

When the nuclear method is used, unless otherwise stated in the Special Specifications, the tests shall be made at a minimum of eight (8) randomly selected locations in each lot. Three nuclear gauge readings shall be made at each test location within a radius of two (2) meters. The three (3) readings shall be averaged and the average considered the density for that test location.

Percent relative compaction shall be computed by comparing the average actual in-place compacted density from the nuclear gauge or sand cone test results with the maximum density. For example, maximum density shall be determined from samples of aggregate base obtained from the roadbed at a sampling frequency of one (1) test per three (3) lots. The maximum density used for determining percent relative compaction shall be the running average for three (3) consecutive tests.

Any lot of aggregate base that has a percent relative compaction below the minimum percent compaction specified in Subsection 5.6, "Compacting," in these General Specifications, shall be removed and replaced by the Contractor at his expense.

6.2 Thickness

The thickness of each course of aggregate base complete as placed and compacted, shall be measured from test holes obtained at a minimum of five (5) random locations within the lot. The thickness of each hole shall be determined after it is determined that the compacted density is acceptable. The average of the test hole thicknesses shall be reported as the thickness of the lot.

A lot shall be accepted when the average total thickness is not less than the design thickness.

6.3 Aggregate Gradation, Sand Equivalent and Plasticity Index

Aggregate base gradation, sand equivalent and plasticity index will be sampled, tested and evaluated based on the average of a minimum of five (5) test results per lot in accordance with the Job Mix Formula Tolerances listed in subsection 3.1, "Job Mix Design Proposal".

Every sample of aggregate base shall be taken on a random time basis from each un-compacted lot during each one-half (1/2) day of work, or portion thereof. The initial sample shall be randomly

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selected from within one and one-half (1 1/2) meters either side of the centerline of and weigh at least twenty-five (25) kilograms. The initial sample shall be thoroughly mixed and quartered to obtain a test sample weighing at least six (6) kilograms. The test sample shall be forwarded to the project laboratory and the aggregate gradation, sand equivalent and plasticity index determined.

6.4 California Bearing Ratio and Abrasion

Random samples shall be taken and tested for California Bearing Ratio and Los Angeles Abrasion from a minimum of the first three (3) lots and every fifth lot thereafter unless test results indicate failure to conform to the quality requirements specified in Subsection 2 "Materials" in these General Specifications. In such a case, increased sampling and testing shall be performed.

6.5 Surface Tolerances

The surface layer of the aggregate base shall be evaluated for compliance with the following surface tolerances:

a) The cross section of the finished aggregate base surface shall be checked by the Contractor in the presence of the Engineer at maximum intervals of twenty-five (25) meters and at intermediate points as directed by the Engineer. The deviation of the elevation of the surface above the design elevation shall be not more than ten (10) millimeters. Deviations above the design elevation shall not result in the diminished thickness of any subsequent pavement course. The deviation of the elevation below the design elevation shall not be more than ten (10) millimeters. Isolated deviations below the design elevation shall be compensated by additional thickness of the subsequent pavement layer. Additional cost and materials resulting from deviations from the design elevation shall be borne by the Contractor.

b) The surface shall also be checked with a four (4) meter straightedge in all areas of apparent roughness as directed by the Engineer. The finished surface of the base course shall not deviate from the straightedge between any two (2) contact points more than ten (10) millimeters when the straightedge is placed parallel to centerline or twelve (12) millimeters when the straightedge is placed perpendicular to centerline. The Contractor shall furnish all devices necessary to check the surface, such as string lines, straightedges, etc., and the labor necessary to handle the task.

7. METHOD OF MEASUREMENT

The quantity of aggregate base to be paid for shall be measured by the theoretical volume after placement and compaction to the required density and thickness measurements determined as specified in this specification, as shown on the drawings or as directed and approved for construction by the Engineer. No allowance will be given for materials placed outside the theoretical limits as shown on the cross sections. No allowance for over depth shall be permitted except as approved in writing by the Engineer prior to spreading the aggregate base.

8. PAYMENT

The accepted quantities measured as above shall be paid for at the contract unit price, for the item shown in the Bill of Quantities, which price and payment shall constitute full compensation for furnishing all materials, hauling, placing, watering, rolling, labour, equipment, tools and incidentals necessary to complete this item.

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BITUMINOUS PRIME COAT

1. DESCRIPTION

This work shall consist of furnishing all plant, labour, equipment, material and performing all operations in applying a liquid asphalt prime coat on a previously prepared and untreated earth sub grade, water-bound macadam base course, crushed aggregate base course, tops of roadway shoulders and as otherwise shown on the plans in strict accordance with the specification and in conformity with the lines shown on the drawings.

2. MATERIAL REQUIREMENTS

Asphaltic material shall conform to the requirements of asphalt cement, cutback or emulsified asphalt, which ever is specified in the Bill of Quantities.

3. CONSTRUCTION REQUIREMENTS

Prime coat shall be applied when the surface to be treated is dry except that when emulsified asphalt is used, the surface may be reasonably moist. The application is prohibited when the weather is foggy or rainy, or when the atmospheric temperature is below fifteen (15) degree C unless otherwise directed by the Engineer. Prior to the application of the prime coat, all loose materials shall be removed from the surface and the same shall be cleaned by means of approved mechanical sweepers or blowers and/or hand brooms, until it is as free from dust as is deemed practicable. No traffic shall be permitted on the surface after it has been prepared to receive the bituminous material. Prior to the application of prime coat on bridge decks and concrete pavements, the surfaces shall be cleaned of all loose material. All expansion joints shall be cleaned and filled with bituminous material as directed by the Engineer. Areas to be primed will be classified as under:

a). The top of earth surface or water bound macadam base courses from a point twenty (20) centimeters outside the edge of the pavement line to 20 cm outside the line on the opposite side of the roadway.

b). The top of the shoulders from the inter-section of embankment slope and top of subgrade to the edge of the pavement line.

c). The bridge wearing surface from curb to curb and end to end of bridge wearing surface.

d). Other surfaces as shown on the drawings or ordered by the Engineer.

Primed surface shall be kept undisturbed for at least 24 hours, so that the bituminous material travels beneath and leaves the top surface in non tacky condition. No further asphaltic operations shall start on a tacky condition.

3.1 Equipment

The liquid asphaltic material shall be sprayed by means of a pressure distributor of not less than 1000 liter capacity, mounted on pneumatic tyres of such width and number that the load produced on the road surface will not exceed hundred (100) Kg per cm width of tyre. It shall be of recognized manufacturer.

The tank shall have a heating device able to heat a complete charge of asphaltic liquid up to one hundred eighty (180) degree C. The heating device shall be so that overheating will not occur. Consequently, the flames must not touch directly on the casting of the tank containing the asphaltic liquid or gases there-from. The Contractor will be responsible for any fire or accident resulting from heating of bituminous materials. The liquid shall be circulated or stirred during the heating. The tank shall be insulated in such a way that the drop in temperature when the tank is filled and not heated, will be less than two (2) degree C per hour. A thermometer shall be fixed to the tank in order to be able to control continuously the temperature of the liquid. The thermometer shall be placed in such a way that the highest temperature in the tank is measured. The tank shall be furnished with a device that indicates the contents. The pipes for filling the tank shall be furnished with an easily interchangeable filter.

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The distributor shall be able to vary the spray width of the asphaltic liquid in steps of maximum 10 cm, to a total width of four (4) M. The spraying bar shall have nozzles from which the liquid is sprayed fan-shaped on the road surface equally distributed over the total spraying width.

The distributor shall have a pump for spraying the liquid driven by a separate motor, or the speed of the pump shall be synchronized with the speed of the distributor. The pump shall be furnished with an indicator showing the performance in litres per minute. At the suction side the pump shall have a filter easily exchangeable. A thermometer shall be fixed, which indicates the temperature of the liquid immediately before it leaves the spraying bar.

The distributor shall be furnished with a tachometer indicating the speed in meter per minute. The tachometer shall be visible from the driver's seat. The function of the distributor shall be so exact that the deviation from the prescribed quantity to be spread on any square meter does not exceed 10%. The distributor shall be equipped with a device for hand spraying of the bituminous liquid, to cover any irregular area or covering the area improperly sprayed.

3.2 Application of Asphaltic Material

Immediately before applying prime coat, the full area of surface to be treated shall be swept with a power broom to remove all dirt and other objectionable material. If required by the Engineer, the surface shall be made moist but not saturated. Asphaltic Materials shall be applied at specified temperature by approved pressure distributors operated by skilled workmen. The spray nozzles and spray bars shall be adjusted and frequently checked so as to ensure uniform distribution. Spraying shall cease immediately upon any clogging or interference of any nozzle and remedial measures taken before spraying is resumed. The rate for application of asphaltic material (cut back/emulsified) shall be as under: -

	TYPE OF SURFACE	**LITRES PER SQUARE METER**	
		Minimum	**Maximum**
1.	Subgrade, Subbase, Water bound macadam base courses, and aggregate base course.	0.65	1.75
2.	Bridge, Wearing Surfaces, Concrete Pavement	0.15	0.4

However, the exact rate shall be specified by the Engineer determined from field trials.

The test methods shall be determined by the Engineer and performed by the Contractor in the presence of Engineer.

The prime coat shall be left undisturbed for a period of at least 24 hours, and shall not be opened to traffic until it has penetrated and cured sufficiently so that it will not be picked up by the wheels of passing vehicles. The Contractor shall maintain the prime coat until the next course is applied. Care shall be taken that the application of bituminous material is not in excess of the specified amounts; any excess shall be blotted with sand or similar treatment. All areas inaccessible by the distributor shall be sprayed manually using the device for hand spraying from the distributor.

The surface of structures and trees adjacent to the area being treated shall be protected in such a manner as to prevent their being spattered or marred.

Where no convenient detour is available for traffic, operations shall be confined to one-half the roadway width at a time. The Contractor shall provide proper traffic control so that vehicles may proceed without damage to the primed area. Work shall not be started on the portion of the road not covered by previous application until the surface previously covered has dried.

Any area which gets damaged by traffic or otherwise due to the negligence of the contractor shall be re-primed by the contractor at his own cost.

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4. MEASUREMENT AND PAYMENT

4.1 Measurement

The unit of measurement shall be for the area as actually covered by prime coat in accordance with these specifications. No measurement or payment will be made for the areas primed outside the limits, specified herein, shown on the Drawings or designated by the Engineer. Blotting material will not be measured for payment and shall be considered subsidiary to the prime coat.

4.2 Payment

The payment for area primed measured as stated above, shall be made for the contract unit price as shown in BOQ item, which payment shall be full compensation for furnishing all labour, material, tools, equipment and incidentals and for performing all the work involved in applying prime coat, complete in place in accordance with these specifications.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

PRE-MIX CARPET 1" THICK

1 PREPARATION OF THE SURFACE

The surface on which the carpet is to be laid should be thoroughly cleaned of all dirt and dust, etc.

2 PRIME COAT

The prime coat of hot bitumen of the grade 60/70 or 80/100 and at the specified temperature shall then be applied to the surface evenly and uniformly at 20 lbs. per 100 sft.

3 PRE-MIXING

A layer of pre-mixed crushed stone of ½" & down (i.e., passing a square mesh of ¾" and retained on a square mesh 3/8") coated with hot bitumen of the grade and at the specified temperature at 4 lbs. per cft. of crush shall be spread uniformly over the tack coat at 10 cft. Per 100 sft.

The bitumen shall be heated to the specified temperature and mixed with the crushed stone in paddle mixers preferably or another type of mixer as directed by the Engineer.

4 LAYING AND ROLLING

The coated crushed should then be spread with rakes evenly and uniformly over the surface and rolled with tandem roller of 8 tons to full consolidation. While the initial rolling in progress the surface should be brought to correct levels and camber by the addition of pre-coated crushed carefully raked into position.

5 SEAL-COAT

The surface should then be given a seal of pre-mixed sand (passing a sq. mesh of 1/10" and retained on 200 meshes per sq. ft.) at 2-1/2 cft. Per 100 sft. The sand should be of approved quality and shall be mixed with bitumen of the grade and at the specified temperature at 8 lbs. per cft. of sand and carefully spread over the pre-mixed crushed so as to fill the voids.

6 FINAL ROLLING

The seal coat should be rolled with 8 ton tandem roller. The road/track may be opened to traffic 24 hours after the application of the pre-mixed seal or as directed by the Engineer.

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ASPHALT CONCRETE WEARING COURSE - PLANT MIX

1. DESCRIPTION

This work shall consist of furnishing aggregates and asphalt binder at a central mixing plant, to a specified mixing temperature, transporting, spreading and compacting the mixture in an approved manner on primed on tacked base, sub base. Subgrade, bridge deck or concrete pavement in accordance with these specifications and in conformity with the lines, grades and typical cross-sections shown in the drawings or as directed by the Engineer.

2. MATERIAL REQUIREMENT

2.1 Mineral Aggregates

The Aggregates shall consist of coarse aggregates, fine aggregates and filler material, if required and shall be clean, hard, tough, durable and sound particles of uniform quality, geology, petrology and free from decomposed material, vegetable matter, soil, clay, lumps and other deleterious substances.

Coarse aggregate which is the material retained on an AASHTO No. 4 Sieve, shall consist of one hundred (100) % crushed rock or crushed gravel having two (2) faces mechanically crushed. The type of source shall be uniform throughout the quarry location from where such a material is obtained. The coarse aggregates shall be free from an excess of flat or/and elongated particles.

Fine aggregate which is the material passing from AASHTO No. 4 sieve, shall consist of 100% crushed material from rock or boulder. Fine aggregate shall be stored separately, and no natural sand will be allowed in the mix.

When the combined grading of the coarse and fine aggregates is deficient in material passing the AASHTO No. 200 sieve, mineral filler material shall be added as approved by the Engineer. The filler shall consist of finely divided mineral matter such as rock dust, hydrated lime, hydraulic calcined dust cement or other suitable mineral matter free from lumps, balls or other deleterious material and shall conform to the following gradation.

Sieve Designation		Percent Passing by Weight
mm	inch	
0.600	No. 30	100
0.300	No. 50	95 - 100
0.075	No. 200	70 - 100

The coarse and fine aggregates shall meet the following requirements:

a). The percent of Wear by the Los Angeles Abrasion test (AASHTO T 96) shall not be more than thirty (30).

b). The loss when subjected to five cycles of the Sodium Sulphate Soundness test (AASHTO T 104) shall be less than twelve (12) percent.

c). The Sand Equivalent (AASHTO T 176) determined after all processing except for addition of asphalt cement shall not be less than 45.

d). All aggregates shall have a liquid limit of not more than twenty five (25) and a Plasticity Index of not more than four (4) as determined by AASHTO T-89 and T-90.

e). The portion of aggregates retained on the 9.5 mm (3/8 inch) sieve shall not contain more than 10 percent by weight of flat and/or elongated particles (ratio of maximum to minimum dimension = 2.5:1)

f). Stripping test shall be performed on crush aggregates as described under AASHTO-182 and only that material shall be allowed which qualifies the test.

g). The coarse aggregates shall be checked if desired by the Engineer for cationic and anionic behavior so that their affinity with the bitumen to be used is verified.

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h). Petro-graphic examination of the coarse aggregate shall be conducted if so directed by the Engineer.

The percentage of particles having certain, proportions between their largest and smallest dimensions (i.e. between the largest distance the particles can fill out between two parallel planes that will permit the particle to pass), shall be determined in the following way:

i. Form a sample of coarse aggregates, all particles passing No. 4 sieve are eliminated. The sample shall be of sufficient quantity that at least 100 particles remain.

ii. By means of a sliding caliper, the largest and smallest dimensions, as defined above, are determined for each particle and its proportion calculated (with one decimal).

iii. The total weights of particles having the proportions two and a half (2-½) or less and three (3) or less, are determined and their percentage in relation to the total sample are calculated.

2.2 Asphaltic Material

Asphaltic binder to be mixed with the aggregate to produce asphaltic base shall be asphalt cement penetration grade 40-50, 60-70 or 80-100 as specified by the Engineer. Generally it will meet the requirement of AASHTO M-20.

2.3 Asphalt Concrete Wearing Course Mixture

The composition of the asphaltic concrete paving mixture for wearing course shall conform to Class A and/or Class B shown in the following table:

Asphalt Concrete Wearing Course Requirements

Mix Designation	Class A	Class B
Compacted Thickness	50 - 80 mm	35 - 60 mm

Combined Aggregate Grading Requirements:

Sieve Designation		Percent Passing by Weight	
mm	Inch		
25	1	100	-
19	¾	90 - 100	100
12.5	½	-	75 - 90
9.5	3/8	56 - 70	60 - 80
4.75	No. 4	35 - 50	40 - 60
2.38	No. 8	23 - 35	20 - 40
1.18	No. 16	5 - 12	5 - 15
0.075	No. 200	2 - 8	3 - 8
Asphalt Content weight percent of total mix		3.5 (Min.)	3.5 (Min.)

The asphalt concrete wearing course mixture shall meet the following Marshal Test Criteria:-

Compaction, number of blows at each end of specimen	75
Stability	1000 Kg (Min)
Flow, 0.25 mm (0.01 inch)	8-14
Percent air voids in mix	4-7
Percent voids in mineral aggregates	According to Table 5.3 MS-2 (Asphalt Institute - USA), sixth addition, 1993
Loss of Stability	20% (Max)

2.4 Job-Mix Formula

At least one week prior to production, a Job-Mix Formula (JMF) for the asphaltic wearing course mixture or mixtures to be used for the project, shall be established jointly by the Engineer and the Contractor.

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The JMF shall be established by Marshall Method of Mix Design according to the procedure prescribed in the Asphalt Institute Manual Series No. 2 (MS-2), sixth edition 1993 or the latest Edition.

The JMF, with the allowable tolerances, shall be within the master range specified in above Table "Asphalt Concrete Wearing Course Requirements". Each JMF shall indicate a single percentage of aggregate passing each required sieve and a single percentage of bitumen to be added to the aggregates.

The ratio of weight of filler (passing No. 200) to that of asphalt shall range between 1 - 1.5 for hot climate areas with temperature more than 40° centigrade.

After the JMF is established, all mixtures furnished for the project represented by samples taken from the asphalt plant during operation, shall conform thereto with the following ranges of tolerances:

Combined aggregates gradation:

Retained No. 4 and larger sieves	± 7.0%
Passing No. 4 to No. 100 sieves	± 4.0%
Passing No. 200	± 1.0%

Asphalt Content:

Weight percent of total mix	± 0.3%

In addition to meeting the requirements specified in the preceding items, the mixture as established by the JMF shall also satisfy the following physical property.

Loss of Marshall Stability by immersion of specimen in water at sixty (60) degree centigrade for twenty four (24) hours as compared with the stability measured after immersion in water at sixty (60) degree centigrade for twenty (20) minutes shall not exceed twenty (20) percent. If the mixture fails to meet this criterion, the JMF shall be modified or an anti-stripping agent shall be used.

Should a change of sources of materials be made a new Job Mix Formula shall be established before the new material is used. When unsatisfactory results or other conditions make it necessary, a new Job Mix Formula will be required.

3. CONSTRUCTION REQUIREMENT

3.1. Bituminous Mixing Plant

Plants used for the preparation of bituminous mixtures shall be "Batching Plants" conforming to AASHTO M 156, and of adequate capacity, coordinated and operated to produce a mixture within the limits of these specifications. Plant shall have minimum three cold bins and at least 3.5 decks of hot sieves.

3.2. Preparation of Aggregates

Before being fed to the dryer, aggregates for the asphaltic base or wearing courses shall be separated into three or more sizes and stored separately in cold bins. One bin shall contain aggregate of such size that eighty (80) percent will pass sieve No. 4, and the other two bins shall contain aggregate of such sizes that eighty [80] percent will be retained on sieve No. 4. Should fine material, be incorporated in the mix, separate bin shall be provided in addition to the three bins mentioned above. If filler is used as a separate component it will also be stored and measured separately and accurately before being fed into the mixer through filler screw mechanism.
Asphalt cement shall be heated within a temperature range of hundred and thirty five to hundred and sixty three (135-163) degrees centigrade at the time of mixing. Asphalt cement heated above maximum shown shall be considered overheated and shall be rejected and removed from job site.

Dried aggregate weighed and drawn to pugmill shall be combined with proportionate quantity of asphalt cement according to the job mix formula. Temperature of asphalt, except for temporary fluctuations, shall not be lower than fifteen (15) degrees centigrade below the temperature of the aggregate, at the time, the two materials enter into the pugmill.

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For placing the materials in bins or in moving them from bins to the dryer any method which causes segregation or uncontrolled combination of materials of different grading, shall be discontinued and the segregated or degraded materials shall be prescreened for reuse.

Each aggregate ingredient shall be heated and dried at temperature not to exceed hundred and sixty three (163) degrees centigrade. If aggregate contain sufficient moisture to cause foaming in the mixture or their temperature is in excess of hundred and sixty three (163) degrees centigrade, they shall be removed from the bins and returned to their respective stock piles. In no case shall the temperature of asphaltic mix exceed 163 degree centigrade when discharged from the pugmill.

Immediately after heating, the aggregates shall be screened to required sizes and stored in separate hot bins for batching and mixing with bituminous material.

Asphalt plant shall have minimum three and half (3-½) sieve decks to effectively control the gradation of hot bins.

3.3. Hauling Equipment

Dump truck used for hauling bituminous mixtures shall have tight, clean, smooth metal beds which have been thinly coated with an approved material to prevent adhering of material to the beds. Each truck shall have a cover of canvas or of other suitable material of sufficient size as to protect the mixture from the weather. The mixture will be delivered on the road at a temperature not less than hundred and thirty (130) degree C. Drivers of dump trucks will ensure that while reversing the vehicles, paver is not pushed back producing a hump.

3.4. Bituminous Pavers

Bituminous pavers shall be self contained, power propelled unit, provided with an automatically controlled activated screed or strike-off assembly, heated if necessary, capable of spreading and finishing courses of bituminous plant mix material in lane widths applicable to the specified typical cross section and layer thickness shown on the drawings. Pavers used for shoulders and similar construction shall be capable of spreading and finishing course of bituminous plant mix material in widths shown on the drawings.

The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The paver shall be equipped with automatic feed controls properly adjusted to maintain a uniform depth of material ahead of the screed.

The screed or strike-off assembly shall be capable of producing a finished surface of the required evenness and texture without tearing, shoving or gouging the mixture.

When laying the mixtures, the paver shall be capable of being operated at forward speeds consistent with satisfactory laying of the mixture. The paver shall be operated at speeds which will give the best result for the type of power being used.

The mixed material shall be delivered to paver in time to permit completion of spreading, finishing and compaction of mixture during day light hours.

The paver shall be equipped with automatic screed controls with sensors for either one or both sides of the paver, capable of sensing grade from an outside reference line, sensing the transverse slope of the screed and providing the automatic signals which operates the screed to maintain the desired grade and transverse slope. The sensor shall be so constructed that it will operate from a reference line or a ski-like arrangement.
The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent variation.

Manual operation will only be permitted in the construction of irregularly shaped and minor areas.

Whenever a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods in order to allow the contractor to use the asphalt already produced at the plant or in transit, provided this method of operation will produce results otherwise meeting the specifications.

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Reference lines will be required for both outer edges of the traveled way for each main line roadway for vertical control. Horizontal control utilizing the reference line will be permitted. The grade and slope for intermediate lanes shall be controlled automatically from reference lines or by means of a ski and a slope control device or a dual ski arrangement. When the finish of the grade prepared for paving is superior to the established tolerance and, when in the opinion of the Engineer, further improvement to the line, grade, cross sections and smoothness can best be achieved without the use of the reference line, a ski-like arrangement may be substituted subject to the approval of the Engineer. The use of the reference lines shall be reinstated immediately whenever the Contractor fails to maintain a superior pavement. The Contractor shall furnish and install all pins, brackets, tensioning devices, wire and accessories necessary for satisfactory operation of the automatic control equipment.

3.5. Rollers

Rollers shall be steel wheel, pneumatic tyre and vibratory, or a combination thereof. The roller(s) shall be in good condition, capable of reversing without backlash, and shall be operated at speeds slow enough to avoid displacement of the bituminous mixture. The number and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition. Vibratory rollers shall be acceptable for bituminous mixture compaction. The use of equipment, which results in excessive crushing of the aggregate will not be permitted.

3.6. Preparation of Base Course Surface

Before spreading materials, the surface of the previously constructed and accepted base course on which the mix is to be placed shall be conditioned by application of a prime or tack coat, as directed by the Engineer.

After a prime coat is applied, it shall be left undisturbed for not less than twenty four (24) hours. The Contractor shall maintain the primed surface until the mix material has been placed. This maintenance shall include the spreading of sand or other approved material, if necessary to prevent adherence of the prime coat to the tyres of vehicles using the primed surface, and patching any breaks in the primed surface with additional bituminous material. Any area of primed surface that has become damaged shall be repaired before the mix is placed, to the satisfaction of Engineer. It shall be ensured that primed surface is not in tacky condition, when wearing course is laid.

A thin coating of bituminous material shall be sprayed on contact surface of curbing, gutters, manholes and other structures, prior to the bituminous mixture being placed against them.

3.7. Spreading and Finishing

The mixture shall be laid upon an approved surface, spread and struck off to the section and elevation established. Bituminous pavers shall be used to distribute the mixture either over the entire width or over such partial width as may be practicable.

The longitudinal joint in one layer shall offset to that in the layer immediately below, by approximately 15.0 cm. However, the joint in the top layer shall be at the centerline of the pavement if the roadway comprises two lanes of width or at lane lines if the roadway is more than 2 lanes in width.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the mixture shall be spread, raked and luted by hand tools. For such areas the mixture shall be dumped, spread and screeded to give the required compacted thickness, ensuring even distribution of coarse and fine material.
When production of the mixture can be maintained and wherever practical pavers shall be used in echelon to place the wearing course in adjacent lanes and compacted to form a surface without lateral joint.

All mixtures shall be spread at a temperature of not less than hundred and thirty (130) degree C and all initial rolling or tamping shall be performed when the temperature of the mixture is such that the sum of the air temperature plus the temperature of the mixture is between 165 degree C and 190 degree C. The mixture shall not be placed on any wet surface or when weather conditions will otherwise prevent its proper handling or finishing.

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3.8. Compaction

After spreading and strike off and as soon as the mix condition permits the rolling to be performed without excessive shoving or tearing, the mixture shall be thoroughly and uniformly compacted. Rolling shall not be prolonged when cracks appear on the surface.

Initial or breakdown rolling shall be done by means of either a tandem steel roller or three wheeled steel roller. Rolling shall begin as soon as the mixture will bear the roller without undue displacement.

The number and weight of rollers shall be sufficient to obtain the required compaction while the mixture is still in workable condition. The sequence of rolling and the selection of roller types shall provide the specified pavement density. Initial rolling with a tandem steel roller shall follow the paver as closely as possible.

Unless otherwise directed, rolling shall begin at the lower side and proceed longitudinally, parallel to the road centerline, each trip overlapping one-half of the roller width, gradually progressing to the crown of the road. When paving in echelon or abutting a previously placed lane, the longitudinal joint should be rolled first followed by the regular rolling procedure. On super elevated curves the rolling shall begin at the low side and progress to the high side by overlapping of longitudinal trips parallel to the centerline. Intermediate rolling with a pneumatic tyred roller shall be done behind the initial rolling. Final rolling shall eliminate marks from previous rolling. In no case shall the temperature be less than hundred and twenty (120) degree C for initial break down rolling while all other compaction operations shall be completed before the temperature drops down to hundred and ten (110) degree C.

Rollers shall move at a slow but uniform speed with the drive roll or wheels nearest the paver. Roiling shall be continued until all roller marks are eliminated and a minimum density of Ninety seven (97) percent of a laboratory compacted specimen made from asphaltic material obtained for daily Marshall Density is achieved.

Any displacement resulting while reversing the direction of a roller, or from other causes, shall be corrected at once by the use of rakes and addition of fresh mixture when required. Care shall be exercised in rolling not to displace the line and grade of the edges of the bituminous mixture.

To prevent adhesion of the mixture to the rollers, wheels of rollers shall be kept properly moistened with water or water mixed with very small quantities of detergent or other approved material. Excess liquid will not be permitted.

Along forms, curbs, headers, walls and other places not accessible to the roller, the mixture shall be thoroughly compacted with hot hand tampers, smoothing irons or with mechanical tampers. On depressed areas, tempers be used or cleated compression strips may be used under the roller to transmit compression to the depressed area.

Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective in finish or density shall be removed and replaced with fresh hot mixture, which shall be compacted to conform with the surrounding area. Any area showing an excess or deficiency of bituminous material shall be removed and replaced.

Sequence of laying and compaction of premix shall be so managed, that a long time does not elapse between successive dump trucks, which may cool down the uncompacted premix, between paver and compacted asphalt below 120° C.

3.9. Frequency of Testing for Cores

One core shall be taken for each 100 linear meter of each lane of Asphaltic Base or Wearing Course, or fraction thereof, in special cases. If the core so taken is failed against the specified 97% density, then two (2) additional cores shall be taken in the longitudinal alignment of the road at an interval of three (3) meters on either side with respect to the failing core and shall be tested against field density. If all the three cores give an average of 97% compaction, and the individual compaction of the core is not less than ninety five (95) percent, then the compaction is acceptable. If average of the cores further fails against compaction, then retake the cores at a distance of fifteen (15) meters on either side and compaction shall be checked for all the five cores in the same fashion. If average of five cores is 97%, the area will be accepted. In case average is ninety six 96%

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or more, then Engineer may withhold the payment in full or partly and observe behavior during maintenance period for the release of payment or otherwise. In case of failure of the average of these five cores giving average compaction of less than 96% the failed area shall be removed and subsequently be replaced by specified mix in an approved manner at the expense of contractor.

3.10. Pavement Thickness and Tolerance

The asphalt concrete wearing course shall be compacted to the desired level and cross slope as shown on the drawing or as directed by the Engineer.

The tolerances in compacted thickness of the wearing course shall be ± 3mm from the desired thickness shown on the drawings. For determination of thickness one (1) core per hundred meters of each lane will be taken. If the thickness so determined is deficient by more than three (3) mm, but not more than ten (10) mm, payment will be made at an adjusted price as specified in table, Clause 4.2 (b) of this specification.

The surface of the wearing course shall be tested by the Engineer using a 5 meters straightedge at selected locations. The variation of the surface from the testing edge of the straightedge between any two contacts, longitudinal or transverse with the surface shall at no point exceed five (5) millimeters. The cross fall (camber) shall be within ± 0.2 percent of that specified, and the level at any point shall be within ± three (3) mm of the level shown on the Drawings. All humps or depressions exceeding the specified tolerance shall be corrected by removing the defective work and replacing it with new material, by overlaying, or by other means satisfactory to the Engineer.

3.11. Acceptance Sampling and Testing

Acceptance of sampling and testing for this item with respect to materials and construction requirements, not specified herein, shall be in accordance with the relevant, "Tables for Sampling and Testing Frequency" in NHA specifications.

3.12. Weather Limitations

Hot asphaltic mixtures shall be placed only when the air temperature is four (4) degrees centigrade or above and no asphalt shall be laid under foggy or rainy weather or over moist surface.

3.13. Trial Section

Contractor shall prepare a trial section before the start of work in light of procedure given in General Clause 1.20 of NHA Specifications.

4 MEASUREMENT AND PAYMENT

4.1 Measurement

The quantities of Asphaltic wearing course shall be measured by volume laid and compacted in place. Measurements shall he based on the dimension as shown on plans or as otherwise directed or authorized by the Engineer. A tolerance of ± three (3) mm shall be allowed in compacted thickness of wearing course. However, any asphalt in excess of 3 mm shall not be paid and any layer deficient by more than 3 mm but not exceeding 10 mm shall be paid as per Clause 4.2 (b) of this specification.

The quantity of bitumen material used is included in the asphalt concrete mixture and will not be measured separately.

Quantities of bitumen or asphaltic concrete, wasted or remaining on hand after completion of the work shall not be measured or paid for.

4.2 Payment

a). The quantities measured as determined above shall be paid for at the contract unit price for the pay items as shown in the Bill of Quantities, which price and payment shall be full compensation for the furnishing all labour, materials, tools, equipment, and for excavation, concreting, backfilling and erection of posts, installation of sign panels and all incidental costs necessary to complete the work as prescribed in this item. Asphalt additive or antistripping agent, if allowed

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and used to meet the JMF requirement shall not be paid directly, payment shall be deemed to be included in the respective pay items of Asphaltic Wearing Course.

b). Price adjustment

If the thickness determined as per this specification is deficient by more than three (3) mm, but not more than ten (10) mm, payment will be made at an adjusted price as specified below: -

Deficiency in thickness as determined by cores	Proportional rate of contract price allowed
0.0 mm to 3.0 mm	100%
3.1 mm to 5.0 mm	90%
5.1 mm to 10.0 mm	80%

When wearing course is more than ten (10) mm deficient in thickness, the contractor shall remove such deficient areas and replace them with wearing course of an approved quality and thickness or the contractor may opt to place an additional layer of wearing course asphalt, grading with a minimum thickness of 35 mm. The contractor will receive no compensation for the above additional work.

Alternately, the contractor may choose to overlay the area in a thickness of 30 mm (min.) with smooth transition as approved by the Engineer on either side with no extra compensation.

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RIPRAP AND REINFORCED CONCRETE SLOPE PROTECTION

1. DESCRIPTION

This work consists of furnishing and placing a protective covering of erosion resistant material as riprap or reinforced concrete slope protection on the locations shown on the drawings for slopes or pier foundation protection. The work shall be done in accordance with the specifications and conformity with the lines, grades, thickness and typical cross-sections shown on the drawings.

The areas to receive riprap or slope protection of any kind shall be dressed smooth to the slopes or shapes called for on the drawings and shall be free from stumps, organic matter, or waste material. A filter blanket should be provided where it is anticipated that there may be migration of fines through the riprap. Toe trench and/or filter blanket is to be constructed, as directed by the Engineer.

All materials, regardless of type or kind, shall be placed as per lines and levels called for on the Drawings.

2. MATERIAL REQUIREMENTS

2.1. Stones

Stone for riprap shall consist of field stone or rough unhewn quarry stone as nearly rectangular in section as is practical, except that riprap of Class A shall consist of round natural stones. The stones shall be sound, tough, durable, dense, resistant to the action of air and water, and suitable in all respects for the purpose intended. Samples of the stone to be used shall be submitted to and approved by the Engineer before any stone is placed. The minimum apparent specific gravity shall be two and half (2.5) and water absorption shall not exceed six (6) percent for stones to be used in riprap. The stone shall not have an abrasion loss greater than forty five (45) percent when subjected to five hundred (500) revolutions in a Loss Angeles Abrasion test.

Stones for riprap shall be one of the following classes as shown on the Drawings or determined by the Engineer.

Class A: Stones ranging in weight from a minimum of fifteen (15) kg to a maximum of twenty five (25) kg, with at least Fifty (50) percent by weight of the stones weighing more than twenty (20) kg.

Class B: Stones ranging in weight from a minimum of thirty (30) kg to a maximum of seventy (70) kg, with at least 50 percent by weight of the stones weighing more than fifty (50) kg.

Class C: Stones ranging in weight from a minimum sixty (60) kg to a maximum of one hundred (100) kg, with at least 50 percent by weight of the stones weighing more than eighty (80) kg.

Sound pieces of broken concrete obtained from the removal of bridges, culverts, and other structures may be substituted for stone upon approval by the Engineer.

2.2. Filter Material

The grading of the filter material shall be as specified on the drawings or in the Special Provisions. If not otherwise specified, it will be required that D15 of the filter is at least 4 times as large as D15 for the underlying embankment materials and not more than 4 times the D85 for the embankment material.

Where: D15 and D85 are the particle diameters corresponding to fifteen (15) percent and eighty five (85) percent respectively, passing (by weight) in a grain size analysis.

2.3. Portland Cement

Portland cement shall conform to the requirements of AASHTO M 85.

2.4. Fine Aggregates

Fine aggregates for mortar shall conform to the requirements of AASHTO M 45.

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2.5. Steel Reinforcement

Steel reinforcement shall be furnished, bent and fixed where shown on the drawings. Furnishing, bending and fixing shall be in accordance with the item of “Steel Reinforcement” of these specifications.

2.6. Concrete

Concrete of specified class shown on the drawings shall be supplied, placed, finished and used as indicated in “Plain & Reinforced Concrete” of these specifications.

2.7. Water

Water for concrete and mortar of ratio 1:3 shall conform to item 4.2 of “Plain & Reinforced Concrete” of these specifications.

3. CONSTRUCTION REQUIREMENTS

3.1. Excavation

The bed for the riprap shall be excavated to the required depths and compacted, trimmed and shaped to the entire satisfaction of the Engineer or as shown on the drawings.

The riprap shall be set in a toe trench as shown on the drawings. The toe trench shall be filled with stone of the same class as the one specified for the riprap, unless otherwise specified. All toe trenches and excavations shall be approved by the Engineer with firm sub-grade or base prior to placement of stones. Stones shall be placed so as to provide minimum of voids. Larger stones shall be placed in the toe trench and on the outside surface of the slope.

3.2. Placing

Stones placed below water line shall be distributed so that the minimum thickness of the riprap is not less than that specified.

Stones above the water line shall be placed by hand. They shall be laid with close, broken joints and shall be firmly bedded into the slope and against the adjoining stones. The stones shall be laid perpendicular to the slope with ends in contact. The riprap shall be thoroughly compacted as construction progresses and the finished surface shall present an even, tight surface. Interstices between stones shall be chinked with spalls firmly rammed into place.

Unless otherwise provided, riprap shall have the following minimum thickness, measured perpendicular to the slope.

Class A:	20 cm
Class B:	45 cm
Class C:	60 cm

The surface of riprap placed above the water line shall not vary form the theoretical surface by more than 8 cm at any point.

3.3. Loose Riprap

The loose riprap shall be placed in layers manually or other methods approved by the Engineer, all to secure a stable mass. Surface irregularities of the slope shall not vary more than eight (8) centimeters along the intended slope. After the completion and approval of the riprap placement, the surface voids of the riprap in the footing trench and on the lower portions of the slope shall be filled with excavated material and dressed to the satisfaction of the Engineer.

3.4. Grouted Riprap

Stone for this purpose shall, as far as practicable, be selected of the size and shape so as to secure fairly large, flat-surfaced stone which will lay up with a true and even surface and a minimum of voids. The stones shall be placed first and roughly arranged in close contact, the larger stones being placed near the base of the slope. The spaces between the larger stones shall be filled with stones of suitable size, leaving the surface smooth, reasonably tight, and conforming to the contour

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required. In general, the stone shall be laid with a degree of care that will ensure for plane surfaces a maximum variation from a true plane of not more than three (3) percent. Warped and curved surfaces shall have the same general degree of accuracy as specified above for plane surface.

As each of the larger stones is placed, it shall be surrounded by fresh mortar and adjacent stones shall be shoved into contact. After the larger stones are in place, all of the spaces or openings between them shall be filled with grout consisting of one (1) part of Portland Cement and three (3) parts of fine aggregates, and one-fifth (1/5) part of hydrated lime with sufficient water to produce a plastic mix and the smaller stones then placed by shoving them into position, forcing excess mortar to the surface, and ensuring that each stone is carefully and firmly bedded laterally. Mortar shall not be placed in temperature lower than five (5) degree centigrade. During hot, dry weather the work shall be protected from the sun and kept moist for a minimum of 3 days after placement. Stones shall be kept wet during placing of the mortar.

After the work has been completed as above described, all excess mortar forced up shall be spread uniformly to completely fill all surface voids. All surface joints shall then be roughly pointed up either with flush joints with shallow, smooth raked joints.

Weep holes shall be provided through the riprap cover as shown on the drawings or directed by the Engineer. The Contractor shall keep a provision of providing such weep holes in his bid rate of respective pay items, as no separate payment for providing weep holes as mentioned herein shall be made.

3.5. Reinforced concrete slope protection

The slopes with suitable material shall be prepared with appropriate compaction to form a sub-grade approved by the Engineer and formwork shall be completed accordingly.

After furnishing and fixing the steel reinforcement, reinforced concrete slope protection shall be constructed after light spray of water at the locations shown on the drawings or where directed by the Engineer. Placing and finishing of concrete shall conform to the requirements specified in “Plain & Reinforced Concrete” of these specifications.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

The quantities to be measured for payment shall be the volume as per BOQ of completed and accepted work placed to the designated dimensions including the toe-walls as shown on the Drawings.

A filter layer of granular material, when required, shall be measured separately as per BOQ, in place and accepted.

The computation of the quantities will be based on the volume within the theoretical limiting dimensions designated on the Drawings.

These items shall include the furnishing of all material, placing and grouting stone riprap providing weep holes as directed by Engineer or shown on Drawings, mixing and placing concrete including reinforcement. Excavation, backfilling and slope preparation shall not be measured for payment but will be considered subsidiary to the items of “Riprap” or “Slope” Protection”.

4.2 Payment

The quantities, measured as provided above shall be paid for at the contract unit price, for each of the pay items shown in the Bill of Quantities. Payment shall be full compensation for furnishing all materials, labour, equipment, tools supplies and all other costs related to completion of the work.

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TRAFFIC ROAD SIGNS AND SAFETY DEVICES

1. DESCRIPTION

This work shall comprise of furnishing and installing traffic signs, permanent safety devices and post assemblies in accordance with these specifications and to the details shown on the Drawings. All sign faces and lettering shall be in accordance with the latest NTRC sign standards or as shown on the drawings. Prior to manufacture and fabrication of the signs the contractor shall submit to the Engineer for approval detailed drawings showing letter sizes, traffic symbols and sign layout. The permanent safety devices shall consist of road posts and hazard markers and will be provided as per specifications, drawings or as directed by the Engineer.

2. MATERIAL REQUIREMENTS

2.1 Sign Panels

Sign panels for regulatory, warning and informatory signs shall be manufactured from aluminum alloy conforming to ASTM B 209, alloy 6061-T6 or 5052 - H38 plates of three (3) mm thickness as shown on the drawings. Alternatively, Polyvinyl panels can also be used as per direction of the Engineer.

The blank sheets of panels shall be free from laminations, blisters, open seams, pits, holes or other defects that may affect their appearance or use. The thickness shall be uniform and the blank commercially flat. Perform shearing, cutting and punching before preparing the blanks for application of reflective material.

The blanks shall be cleaned, degreased and chromate or otherwise properly prepared according to methods recommended by the sheeting manufacturer.

2.2 Reflective Sheeting

Reflective sheeting used on road sign made of flexible white or colored, wide angle retro-reflective sheeting (herein after called sheeting), and related processing materials designed to enhance nighttime visibility. The sheeting shall consist of optical elements adhered to a synthetic resin and encapsulated by a flexible transparent plastic that has a smooth outer surface.

The sheeting shall have either a precoated pressure sensitive adhesive or a tack-free adhesive activated by heat applied in a heat vacuum applicator in a manner recommended by the sheeting manufacturer. Both adhesive classes shall be protected by an easily removable liner.

The manufacturer of the sheeting being offered shall furnish the process inks, clears and thinners produced by the sheeting manufacturer recommended for and compatible with the sheeting to meet the performance requirements of this specification and shall further be responsible for technical assistance in the use for these inks or alternatively sheeting can be used on sheeting.

The sheeting manufacturer must provide documented evidence to the satisfaction of the Engineer that representative production materials of the type to be supplied has been used successfully in a substantial traffic signing program in similar climatic conditions for at least three years.

a) Color Requirements

Color shall be specified and conform to the requirements of the following Table I.

Table I
Color Specification Limits * and Reference Standards

									Reflectance Limit (Y) Munsell **		
Color	**X**	**Y**	**X**	**Y**	**X**	**Y**	**X**	**Y**	**Min**	**Max**	**Paper**
White	.303	.287	.368	.353	.340	.380	.274	.316	27.0		5PB 7/1
Yellow	.498	.412	.557	.442	.479	.520	.438	.472	15.0	40.0	1.25Y 6/12
Red	.613	.297	.708	.292	.636	.364	.558	.352	2.5	11.0	7.5R 3/12
Blue	.144	.030	.244	.202	.190	.247	.066	.208	1.0	10.0	5.8PB 1.32/6.8
Orange	.550	.360	.630	.370	.581	.418	.516	.394	14.0	30.0	2.5YR 5.5/14
Brown	.430	.340	.430	.390	.550	.450	.610	.390	3.0	9.0	5YR 3.6
Green	.300	.380	.166	.346	.286	.4288	.201	.776	3.0	8.0	10G 3/8

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***** The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 standard colormeteric system measured with standard illumination source C.

****** Available from Munsell Color Company, 2441 Calvert Street, Baltimore, Maryland 21218. Catalog No. MCP-90040.

b) Coefficient of Retro reflection

The coefficient of retro reflection shall conform to the minimum requirements of the following Table II.

Table II

Minimum Coefficient of Retro Reflection
(Candelas per foot Candle per square foot)

Observation Angle (°)	Entrance Angle (°)	White	Red	Yellow	Green	Blue	Brown	Orange
0.2	-4	250	45	170	45	20.0	12.0	100.0
0.2	+30	150	25	100	25	11.0	8.5	60.0
0.5	-4	95	15	62	15	7.5	5.0	30.0
0.5	+30	65	10	45	10	5.0	3.5	25.0

For screen printed transparent coloured areas on white sheeting, the coefficients of retro reflection shall not be less than 70% of the values for corresponding colour in the above table.

Upon demand from the Engineer the sheeting manufacturer shall provide a test report from British Standards Institution (BSI) or any internationally recognized laboratory stating that the sheeting meets the requirements according to BSI 873 Part 6 or FP 92 of FHWA.

The brightness of the reflective sheeting totally wet by rain, shall be at least ninety (90)% of the above values.

The reflective sheeting shall be sufficiently flexible as to permit application over and adhesion to a moderately embossed surface. It shall not show damage when bent (90) degree over a fifty (50) mm diameter mandrill.

The sheeting shall show no cracking or reduction in reflection after being subjected to the dropping of a twenty five (25) mm diameter steel ball from a height of two (2) meters onto its surface.

For heat activated material the adhesive shall permit the reflective sheeting to adhere securely forty eight (48) hours after application at temperatures of up to ninety (90) degree centigrade.

The reflective material shall be weather-resistant and following cleaning, shall show no definite fading, darkening, cracking, blistering or peeling and not less than seventy five (75) % of the specified wet or dry minimum brightness values when exposed to weathering for five (5) years.

c) Performance requirements and obligations.

On demand from the Engineer the sign manufacturer shall submit a certificate from the sheeting manufacturer stating that the sheeting used for finished retroreflective signs meets all requirements listed herein.

Sheeting processed and applied to sign blank materials in accordance with sheeting manufacturer's recommendation, shall perform effectively for the number of years stated in Table-III of this specification. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions: or (2) the coefficient of retroreflection is less than the minimum specified for that sheeting during that period listed in following Table III:

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Table III

Minimum Coefficient of Retroreflection Candelas per foot Candle per square foot (.2^0 obs, and –4^o entrance)*

Sheeting colour	Minimum Coefficient of Retroreflection (7 years)	Minimum Coefficient of Retroreflection (10 years)
White	212	200
Yellow	144	136
Green	38	36
Red	38	36
Blue	17	16
Brown	10	9

***** For screen printed transparent coloured areas on white sheeting, the coefficients of retro reflection shall not be less than 50% of the values for the corresponding colour in the above table.

All measurements shall be made after sign cleaning according to sheeting manufacturer's recommendations.

Where it can be shown that retroreflective traffic signs supplied and used according to the sheeting manufacturer's recommendations have not met the performance requirements above, the sheeting manufacturer shall cover restoration costs as follows for sheeting shown to be unsatisfactory during:-

a) The entire seven years the sign manufacturer and sheeting manufacturer will replace the sheeting required to restore the sign surface to its original effectiveness.

b) In addition, during the first five years sign manufacturer and sheeting manufacturer will cover the cost of restoring the sign surface to its original effectiveness at no cost to the employer for materials and labor.

Samples of the reflective sheeting shall be approved by the Engineer prior to the Contractor placing his order.

2.3 Metal Posts

Wide flange of 10 x 10 centimeters metal posts shall be fabricated from structural steel conforming to the specifications of ASTM A 283 Grade D.

In lieu of wide flange steel posts the contractor may use tubular GI or Black Steel MS posts of minimum internal diameter of sixty five (65) mm with 4.8 mm wall thickness conforming to the specifications of ASTM A 501.

All posts shall be thoroughly cleaned, free from grease, scale and rust, and shall be given one coat of anti-corrosive priming paint and two coats of grey paint. Length of the posts shall be such that their top flushes with the top of the sign panel, where as bottom of sign panel is at least hundred and eighty (180) centimeters above shoulder/footpath level.

2.4 Plates

a). Plates shall be non-porous, smooth, flat, rigid, weather proof and shall not rust or deteriorate otherwise.

It shall be so cut that there are no sharp edges and that the corners are rounded off to a radius of thirty seven and half (37.5) mm. Any trade mark or other printing shall be carefully removed with liquid thinner.

b). The High Intensity Grade sheeting for the background should cover the whole area of the sign plate.

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c). Prior to application of the High Intensity Grade reflective sheeting, the sign plate shall be cleaned and shall be wax-free. They shall be degreased by vapour or by alkaline immersion and etched by scrubbing with abrasive cleaner. The plate shall be rinsed thoroughly and dried with hot air before applying the sheets.

d). The sheeting after application to the sign base shall not come off the edges, which shall be sealed, nor shall it peel off nor warp. The surface shall be smooth and free from any bubbles, pimples, edge chipping or edge shattering. It shall be washable and weather-proof.

2.5 Nuts and bolts

All Nuts and bolts and metal washers shall be of heavily galvanized quality ten (10) mm dia of G.I or aluminum alloy. The bolt heads to be such that they do not protrude out too much nor show very much on the front face of the plate. The heads should be flush with the plate face and covered with sheeting galvanized according to ASTM A 153.

2.6 Rubber Washer

All rubber washers shall have thick walls and shall not get dry and brittle when exposed to weather at the site after they are in position during the life of the sign.

2.7 Caps over the pipes

These can be of heavy plastic or of aluminum well fitted so that they cannot be removed; any good adhesive can be used.

2.8 General

a). Very large signs need not be made of one piece; in that case extended panels shall be used or the various pieces of sheet shall be joined by angle-irons in anticorodal materials, and, if necessary, with connecting cross pieces in order to ensure the solidity of the joint and with slanting struts embedded in the concrete as directed by the Engineer.

b). All the nuts and bolts and metal washers must be heavily galvanized, or may be of stainless steel of high quality.

c). Relevant holes to receive ten (10) mm bolts shall be drilled into the pipes and the plates and not punched. These are to be drilled through the plates before the application of scotchlite.

d). After the plates are fixed with nuts and bolts, the nuts shall be TACK WELDED to the bolts against pilferage.

2.9 Concrete Foundation Blocks

The concrete for the foundation blocks shall be in situ Class A and shall of the size 450 x 450 x 650 mm for category 1 & 2 and variable for category 3 as per sizes shown in the drawings.

2.10 Road Posts and Hazard Markers

The road posts and hazard markers used as permanent safety devices shall conform fully with the requirements of the statutory instruments, current British standards and relevant section of the traffic signs manual. The safety devices shall consist of delineators and detours of verge master, flex master, edge master, passing place post, chevroflex etc. and will be manufactured from highly durable tough plastic material withstanding vehicular impact. These shall be of high intensity grade reflective sheeting for maximum visibility during both day and night and consequently be resistant to impact, damage and vandalism.

3. CONSTRUCTION REQUIREMENTS

3.1 Excavation and Backfilling

Holes shall be excavated to the required depth of the bottom of the concrete foundation as shown on the drawing.

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Backfilling shall be carried out by using the surplus excavated material if approved by the engineer and shall be compacted in layers not exceeding fifteen (15) cm in depth. Surplus excavated material shall be disposed of by the contractor as directed by Engineer.

3.2 Erection of Posts / Anchor Bolts

The posts/anchor bolts shall be erected vertically in position inside the formwork of the foundation block prior to the placing of the concrete and shall be adequately supported by bracing to prevent movement of the post/anchor bolts during the setting process of the concrete. The posts /anchor bolts shall be located at the positions shown on the Drawings, or as directed by the Engineer. The post shall be covered from the top by plastic cover in order to stop the rainwater from entering the pipes and to protect the pipe from rusting.

3.3 Sign Panel Installation

Sign panels shall be installed by the Contractor in accordance with the details shown on the Drawings. Any chipping or bending of the sign panels shall be considered as sufficient cause to require replacement of the panels at the Contractor's expense.

The exposed portion of the fastening hardware on the face of the sign shall be painted with enamels matching the background colour.

All newly erected traffic road signs shall be covered with burlap or other material until their uncovering is ordered by the Engineer.

3.4 Categories of signs

Traffic road signs shall be of three categories according to type of construction.

a). Warning signs

Constructed with single post and sign of equilateral triangle shape, as shown in drawings Category 1.

b). Regulatory Signs

Constructed with single post and sign of circular shape, as shown in the drawings Category 2.

c). Informatory Signs

These signs shall be rectangular in shape and constructed with one, two or three numbers of posts or as shown on the drawings. Dimensions may vary according to the requirements, however total area of sign shall be as under.

Category 3 a	=	One Sq. meter
Category 3 b	=	Two Sq. meter
Category 3 c	=	as shown on drawings

d). Additional Panel

If any panel is required to be installed, it shall be of the sizes 60 x 30 cm or 90 x 30 cm.

3.5 Installation of Safety Devices

Safety devices comprising of road posts, delineators of various types, fixed/portable safety barriers and hazard markers e.g. verge-master, flex-master chevroflex, bigmax, edge master and passing place post and others, shall be installed in accordance with the techniques and methods laid down in the manufacturer's manual or guide and in conformity to the line and level and locations shown on the drawings or as directed by the Engineer to ensure maximum visibility and safety, even in adverse weather conditions. These shall be constructed strictly with the specifications and full assistance by the manufacturer for installation with precision. These safety devices shall be used as delineators at sharp curves of highways verges, high embankments, culverts, bridges, as a visual

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and physical deterrent for a prohibiting car parking on grass verges and protecting kerb-side areas on public and private roads.

3.6 Sign Faces

a). Design

All sign faces shall be of the type, colour, design and size as shown in the drawings. Size and spacing of letters shall be as under.

i). The Urdu writing shall be in “Persian” Character.
ii). The Urdu and English writing shall be about the same in length, width and spacing.
iii). English letters are to be in italics except the first letter of the word, which is to be in capital.

iv).	Height of Capital letters	21 cm
v).	Height of italics letters	17 cm
vi).	Stroke width and width of border	3.5 cm
vii).	Space between words and borders (at least)	5 cm
viii).	Space between words	5 cm
ix).	Space one line will occupy	4 cm
x).	Space between digits of numerals	4 cm
xi).	Height of numerals same as capital letters	23 cm
xii).	Space between lines (at least)	5 cm
xiii).	Size of letter for km. Height	K-23 cm m-8 cm
xiv).	Width of letters for km including spacing	K-8 cm m-9.6 cm
xv).	Width of dividing line	2.0 cm

xvi). The size and spacing for Urdu letter and words will generally conform to the dimensions shown above for English letters.
xvii). The spelling of place names in Urdu and in English shall be as written in the Survey of Pakistan maps.

b). Shop Drawings

The contractor shall submit to the Engineer for approval, three (3) copies of drawings for all special sign faces and all sign faces bearing messages, showing the design and/or arrangement and spacing of both the Urdu and English sign messages. Official town names and their spelling shall be as provided by the Engineer. Size and style of lettering shall be as shown on the drawings or as other wise approved by the Engineer.

3.7 Storage of Signs

Signs delivered for use on a project shall be stored off ground and under cover in a manner approved by the Engineer. Any signs damaged, discolored or defaced during transportation, storage or erection shall be rejected.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

The quantities of traffic road signs and safety devices to be paid for shall be measured as per unit shown in BOQ item, each category of sign supplied and installed at site as per drawings or as directed by the Engineer.

4.2 Payment

The quantities measured as determined above shall be paid for at the contract unit price for the pay items shown in the Bill of Quantities which price and payment shall be full compensation for furnishing all labour, materials, tools, equipment, and for excavation, concreting, backfilling and erection of posts, installation of sign panels and all incidental costs including sheeting/painting necessary to complete the work as prescribed in this item.

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PRE CAST CEMENT CONCRETE ROAD KERB BLOCK

1. DESCRIPTION

This work shall consist of cement concrete pre cast kerb block constructed of the following materials and in accordance with the specifications, dimensions and designs shown on the drawings or as approved by Engineer.

2. MATERIAL REQUIREMENTS

Pre cast concrete kerbing units industrial made shall consist of cement concrete 1:1½:3 having cylindrical strength of 3000 psi, hydraulically compressed, steam cured & to the lengths, shapes and other details shown on the drawing. Kerbing which shows surface irregularities of more than 5 mm when checked with 3 meter straight edge or surface pits more then fifteen (15) mm in diameter will be rejected.

3. CONSTRUCTION REQUIREMENTS

3.1. Excavation and Bedding

Excavation shall be made to the required depth as shown on the Drawings. All soft and unsuitable material shall be removed and replaced with a suitable material acceptable to the Engineer. Bedding shall consist of Class B Concrete and shall be to the section and dimension shown on the drawings.

3.2. Placing

Pre cast concrete kerbs shall be set in 1:3 of cement sand mortar to the line, level and grade as shown on the Drawing or as directed by the Engineer.

3.3. Slip form

Kerb blocks may be executed using slip form method as per approval of the Engineer.

4. JOINTS

Joints between consecutive kerbs shall be three (3) to five (5) mm wide and filled with cement mortar to the full section of the kerb.

5. BACK FILLING

After concrete has been cured as specified, excavation of kerb, shall be back filled with suitable earth or granular material tamped into place in layers of not more than fifteen (15) cm each until firm and solid.

6. MEASURMENT AND PAYMENT

The unit of measurement for pre cast concrete kerb shall be measured by the linear foot along the front face of the section at the finished grade elevation. Deduction in length will be made for drainage structure installed in the kerbings such as catch basins and drop lintels etc. measurement will not include any area in excess of those shown on the drawing except for any area authorized by the Engineer in writing. Bed course material shall be measured by the cubic foot of material compacted in place.

6.1. Payment

Measurement and excepted quantities shall be paid for at the contract unit price, showing in Bill of Quantities. Payment shall constitute full compensation for furnishing and placing all materials for concrete, drainage opening, excavation, backfilling and dumping and disposal of surplus material and for all labour, equipment tool and incidental necessary to complete the item.

Payment for expansion joint filler material used in transverse expansion and contraction joint in kerb shall be understood to be included in the price tendered for the kerbs.

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Mortar required for bedding and jointing of pre cast concrete kerbs as shown on the drawing shall not be paid for as separate item, but the cost shall be included in the contract price for pre cast concrete kerb.

No extra payment will be made if slip form method is approved by the Engineer for construction of Kerb blocks.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

MATERIALS

1. INTRODUCTION

General

i) Plain Cement Concrete and RCC specification will be dealt as mentioned in General Specification.

ii) Reinforcement specification will be dealt as mentioned in General Specification.

iii) All materials used in the works shall be of the best quality as specified or described in the specification, Drawings and Bills of Quantities and shall be obtained from approved manufacturers or suppliers.

iv) The DHA reserve the right to supply R.C.C pipe from their own factory or from specified manufacturer.

v) The Contractor shall comply with the instructions of manufacturers / suppliers in respect of use, application or installation of any materials, goods etc. required to complete the Contract. The instructions shall be relevant to the prevailing climate and environment.

vi) As soon as possible after the Contract has been awarded the Contractor shall submit to the Engineer a list of suppliers from whom he proposes to purchase the material required for the works. Each supplier must be responsible to admit the Engineer, or his representative, to his premises during ordinary working hours or even in odd hours if the contract work is in progress for the purpose of obtaining samples and inspecting the works and processes. In addition, if required by the Engineer, the Contractor shall deliver samples of the materials to the office of the Engineer, or his Representative, nominated testing laboratories, or the site of the works.

vii) Samples shall be taken in accordance with the relevant British Standard and ASTM or any other whichever applicable or otherwise as directed by the Engineer. Materials subsequently supplied shall at least be equal to the approved sample in all respects. No source of supply shall be changed without prior written approval from the Engineer. Any samples not approved shall immediately be removed from the site of the works.

viii) All approvals of materials shall be obtained in writing from the Engineer. The Contractor shall not use any material in construction and installation until the Engineer has given such written approval.

2. RCC PIPES AND FITTINGS

Pipes for sewers shall be of RCC manufactured in ordinary Portland cement from approved pipe factory. The pipes shall conform in all respects to ASTM C-76 Class-II wall B for pipe sizes 12” and greater otherwise specified in BOQ. The thickness of barrel of sewer pipe shall be 30% more than the thickness proposed in ASTM C-76 for the same internal diameter of pipe. The pipes shall be socketed for push on rubber joints. The Contractor shall submit with his tender a detailed sketch of R.C.C. pipe with statement indicating details of socketed joints and also details of reinforcement including numbers and diameter of horizontal and spiral bars for each diameter of pipe. Also conforming, the requirements as per details given in schedule of construction or drawings if any.

Pipes less than 12” in diameter shall conform to BSS 785 and 1144 or ASTM-C-14-Class-III.

The Contractor shall supply the required number of rubber rings of size and dimension suitable for the diameter of pipe provided for making a fully watertight joint. The rubber ring shall comply in all respect with ASTM C1869 or equivalent, approved by the engineer.

3. BASIS OF ACCEPTANCE

Acceptance of reinforced cement concrete pipes will be on the basis of three edges bearing and material tests as per ASTM-C-76-79 or latest revision and inspection of manufactured pipes for defects and imperfections. The Contractor shall bear the cost of such tests and pay fees etc. and also pay for the carriage of such samples and all other expenses contingent to tests.

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4. SHORT PIPE LENGTHS

i) Short pipes shall be supplied in specific lengths according to pipe diameter and as detailed on the Drawings and in the Bill of Quantities.

ii) Additional random short lengths of PVC lined concrete pipes of diameter less than 600mm will be necessary for completion of pipeline gaps between manholes where no cutting of pipes is permitted under normal circumstances.

5. MANHOLE COVER

i. Mild steel frame and R.C.C. cover shall be made as per drawings.

ii. Cover shall be fitted to matching frames and tested at the manufacturer's working. Each set (cover and frame) shall be similarly numbered in a legible and permanent manner. The marked position is not to be visible when fitted in place.

iii. The Contractor shall ensure that the covers are fitted to the appropriately numbered frames after the frames have been fitted.

iv. Covers shall have the letters “DHA CITY” clearly casted in the upper side of the covers in letters approximately 75 mm high.

v. Covers shall be lockable to the frame by means of a inside catch which is key operated.

6. PAINTS

i. The Engineer shall approve all brands of paint, under coat and other finishing material. Different brands of paint shall not be intermixed or interchanged on any surface.

ii. All coating materials shall be supplied in container not greater than 5 liters capacity and labeled with the type of material manufacturer's batch number, date of manufacture and manufacturer's name brand name, formula and shall be mixed and applied in accordance with directions of the manufacturer.

iii. Batch deliveries of coating material shall be dated for use in order of delivery, shall be stored in a dry area, protected from extreme temperature and shall not be used if more than 18 months old from date of manufacture.

iv. All material shall be acceptable, proven top grade products and shall meet or exceed the minimum standards of reputable manufacturer as approved by the Engineer.

v. Colours shall be pure, non-fading pigments mildew proof, finely ground in approved medium. Colours used on plaster and concrete surfaces shall be lime proof. All materials shall be subject to Engineer's approval.

vi. All emulsion paints and primers for metal work and walls will be the best available of its type. The Engineer prior to its procurement shall be approved the make and shade.

vii. Approved quality of Cement wash paint shall be used for painting the exteriors of the structures or other surfaces as directed by the Engineer.

viii. The plastic emulsion paint or similar as approved by the Engineer shall be used for interior surface.

ix. Unslaked lime, gun and marine blue shall be used for white washing.

x. All material for bitumen painting shall consist of Bitumen PB-4 Grade 10 / 20. It shall be used for foundation or wherever recommended by the Engineer.

xi. Approved quality, Epilac enamel paint shall be used for chemicals and water resistance where specified.

xii. DUROCEM a cement base heavy-duty waterproof coating manufactured by ICI or any

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equivalent approved by the Engineer shall be used for painting on the surface specified. The cement base water proof coating for concrete shall conform to ASTM C-109, C-67, D-822 and G-23 Solvent for cleaning metal work prior to application of metallic lead primers to ASTM D 16 shall be as recommended by manufacturer.

7. WATER PROOFING

i) Cement, aggregate and coarse sand shall be in accordance with the Specifications for "Concrete". Bitumen used for this purpose shall be as per European or P.S Standards.

ii) Samples of all materials proposed for use under this section shall be submitted to the Engineer for his approval.

iii) Water Proof Building paper shall comply with BS EN 13984: 2001.

8. LADDERS - RUNG TYPE

i) Steel ladder shall consist of specified size of C.I /G.I Plates in strings and 1" (25mm) dia. C.I / G.I Steel bars in rungs. The G.I Rungs shall be riveted and welded in 25mm dia. holes in Plates. The end of each climb of the ladder shall be embedded in the concrete.

ii) Ladder shall be fixed using M 16 stainless steel bolts unless otherwise detailed.

iii) Ladder shall be of integral or welded construction and shall comply with the requirements of BS EN 795 Class A1 for the spacing of stringers, rungs, safety hoops and hand holds unless otherwise detailed.

iv) Ladders shall be made of mild steel and be hot dipped galvanized after manufacture.

v) The materials of ladder grating covers are also specified in BOQ.

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LAYING, JOINTING AND TESTING OF SEWER PIPES

1. SCOPE OF WORK

This Section covers transportation of pipes and accessories to site of work, handling, cleaning, lowering in trenches, making alignment, cutting, jointing, fittings, sewer pipes mains including testing and commissioning and handing over / taking over in strict accordance with specifications and condition of the contract or as directed by the Engineer.

2. ALIGNMENT AND GRADE

The Engineer or his representative(s) shall lay the pipes in trench to the required levels slopes, lines, alignment and grades at the required location, as shown in the drawings or as directed.

3. CLEANING AND CHECKING OF PIPE AND FITTINGS

All pipes shall be brushed and wiped clean before the pipe is laid. Before laying, all pipes shall be inspected for defects and when required by the Engineer shall be tapped with a light hammer to detect cracks. The pipes and fittings if found containing any defects shall be removed from the site to be replaced with defect free items which shall be got inspected in the same way as described above and so on so forth.

4. BEDDING - MATERIALS FOR PIPES

i) The pipe bedding material will be according to specified in BOQ or on drawings.
ii) The bedding material is classified as sand or granular material applied according to the design and instructions of engineer incharge.
iii) Granular bedding material for pipes shall be free draining, broken stone or gravel mixed with free draining coarse sand. It shall be free from organic matter, clay, silt and building rubbish. Bedding material shall be capable of producing a stable formation for pipe laying and shall not be subject to bulking or settlement due to changing weather or ground water conditions after placing and consolidation.
iv) Granular bedding material shall have a compaction fraction value not exceeding 0.2 when tested as described below.

a) For testing pipe-bedding material, a representative sample of about 40 kg shall be heaped onto a clean surface and quartered to obtain approximately 10 kg. The moisture content of the sample should not differ from that of the main body of material, at the time of use in the trench.
b) A 150 mm internal diameter open-ended cylinder, 250 mm high, shall be placed on a firm, flat surface and loosely filled, without tamping, from the 10 kg sample. Any surplus material shall be struck off level with the top of the cylinder. The area around the filled cylinder shall be cleaned of all surplus material and then lifted clear of its contents and placed alongside the material.
c) Approximately the one-quarter of the material shall then be replaced into the cylinder and compacted by tamping vigorously with a 40 mm diameter metal rammer weighing about 1 kg until no further compaction can be obtained. This operation shall then be repeated for each of the remaining quarters, tamping the final surface as level as possible.
d) The distance from the top of the cylinder to the surface of the final layer shall then be measured and this value divided by the height of the cylinder, shall be taken as the compaction fraction.

The sewers shall be laid on proper bedding as specified below.

a) In all types of soils above water table and hard soils, which can stand vertical without, support, the sewers shall be laid on approved granular bedding. This bedding material shall consist of broken stone or gravel mixed with coarse sand. The materials grading shall be in accordance with BS EN 1295-1: 1998, and as described item 2 of Section II. The material should be free from dust, plants or any organic compound etc. The thickness of bedding material below the pipe shall be upto full width of trench and shall be thoroughly compacted upto 95-100 % as per AASHTO Standards after laying pipes, further granular bedding shall be laid and compacted in a similar manner to fill the entire space between the pipes and un-disturbed sides of trench upto a depth equal of half (1 / 2) of the outer diameter of pipe. Adequate space as prescribed by the Engineer shall however be provided for pipe sockets at required points.

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If the granular bedding material is contaminated by water, sewage or soil materials due to the collapse of the sides of the trenches it shall be removed from the trench and replaced with new material before any of the pipes are laid or re-laid.

b) Sewer in Soft-Soil below ground water table

In case the invert of pipes is below ground water table or stable strata is not available at the pipes invert level, the same shall be supported on the following bedding.

i) Concrete bedding:

In case the pipe is required to be laid below ground water table where the subsoil is unstable and may cause formation of slush during the excavation and dewatering, a bed of concrete of 1:2:4 shall be provided for laying pipes in the trenches. The thickness of this concrete bed shall be as under:

- 12'' for all sewer pipes.

This concrete bed shall be laid over a stone soling 12'' thick or as per instruction of the Engineer.

The concrete bed shall be laid in full width of trench and adequately vibrated as per direction of the Engineer / Engineers representative present at site. Space shall however be provided for pipe sockets at required places.

After laying pipe sewer, further cement concrete of mix 1:2:4 shall be placed and vibrated in a similar manner to fill the entire space between the pipe and the undisturbed sides of trench upto depth equal to 1 / 4 of the outer diameter of the pipe or as directed by the Engineer in writing depending upon the stability of the strata encountered at each individual location.

The Engineer can however reduce or increase to any required extent the thickness or width of concrete or granular bedding below pipe or depth of granular bedding or concrete on the sides of pipes through instructions in writing and the Contractor shall be paid accordingly.

In case of excessive slush formation in the bed of trench for which the Engineer, who shall be the sole judge, may instruct in writing to lay gravel or stone soling below the bed of concrete. The Engineer shall do this after detailed inspection of excavated trench. The Engineer shall instruct the depth of such bed of gravel or soling in writing before laying the bedding. No payment of bedding shall be made if no such written instruction specifying depth, the Engineer specifies width and length of bedding and its location.

ii) Concrete encasing for pipes

When directed by the Engineer in writing, the contractor shall encase (surround) pipe with concrete. The concrete for surrounding the pipes shall be 1:2:4 ratio (grade 30) to the dimensions given in the drawings. As directed by the Engineer, cradle supports shall be provided as under:

- The cradles shall be 300 mm wide, and a depth minimum of 200 mm. For a length of full width of trenches.

- Neither trench sides nor trench timber or sheeting is to be used in lieu of proper formwork to concrete surrounds. All spaces at the sides or in other places shall be filled up with selected fine material and the ground made solid as the work advances. No extra payment will be made for the concrete in excess than as provided.

- Concrete shall be placed evenly over the entire width and to within 25 mm of the bottom of the pipe then, without stopping, it shall be placed gently on one side of the pipeline only and carefully worked under the pipe, ensuring that no voids are left under the pipe. The concrete shall be brought up equally on each side of the pipe to the required finished height.

- Horizontal construction joints will not be permitted in the concrete surround below half

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pipe height Vertical construction joints shall be formed only at each pipe joint and must extend through the blinding where appropriate. Diaphragm of approved compressible expansion jointing material cut to the exact shape of the outside face of the pipe and the bedding or surround shall be positioned and supported in contact with the end face of each socket. The contractor shall take precautions to ensure that a firm seat exists between the diaphragm and the end face of the socket and that no concrete intrudes into the joint. Flexible joint at the pipe joint should be provided all along the concrete encasing and concrete bedding as specified by Engineer.

5. PLACING AND LAYING

Pipes, specials and fittings where applicable shall be carefully lowered into the trench by means of derrick, rope, slings, or other suitable equipment. Under no circumstances shall any of the pipeline or any materials be dropped, dragged or dumped into the trench. The full length of each section of pipe shall completely rest upon the pipe bed, with recesses excavated to accommodate joints. Pipe that has the grade or joints disturbed after laying shall be taken up and relaid. Pipe shall not be laid in water or when trench conditions are unsuitable for the work. The sewer pipes shall be correctly laid in correct position, alignment, level and grade and checked so that the invert of the sewer conform to that shown on the drawings and sockets are placed on the place provided for them in the excavation and the complete sewer will have a smooth and uniform inverts. Each pipe shall be inspected for defects before being put in place.

a) In laying out pipes, fittings and specials they shall not be allowed to impede or harm traffic pedestrians or animals or to obstruct paths and access to private other property. Pipes shall not be laid out in beds of watercourses and every precaution shall be taken to preserve their sound and perfect condition before laying.

b) Trench excavation and pipe laying shall proceed in an orderly and continuous fashion working from one end of the pipeline to the other. Piecemeal excavation and pipe laying of isolated lengths will not be permitted prior to written approval of the Engineer. Similarly manhole / chamber foundation bases shall be correctly proposed to avoid cutting of pipes wherever possible.

c) Laying Pipes alongside existing pipes, service etc.

Where new pipes are to be laid alongside, over or under existing sewer, surface water drains, nullahs, water or gas mains, conduit electric cables or telephone cables, the contractor shall take care to interfere as little as possible with the existing services and connections thereto and the Contractor shall repair, or arrange for the repair of any damage at his own cost to the satisfaction of the utilities owner and the Engineer.

The contractor shall make all arrangements for supporting existing services and for temporarily dealing with the flow from any pipe, drain, nullah, channel, etc. and shall provide all troughs, pumps, plant and material necessary for this purpose without any additional cost.

d) Laying pipe under hedges, fences, walls and near trees

Where hedges are damaged or destroyed, the whole shall be restored and reinstated with two rows of the same kind as the hedges, planted in due season in topsoil 300 mm deep and fenced on each side with post and wire. Stock proof fences finished on top with one strand of galvanized barbed wire, or otherwise protected as required by the owners or occupiers and the Engineer without extra cost.

Where fences or walls are damaged or destroyed, the whole shall be restored and reinstated with like materials to the satisfaction of the owners or occupiers and the Engineer without any additional cost.

e) Laying pipes across railways

Where any pipe crosses a railway or work is carried out within railway property, the work shall be carried out in an approved manner and to the requirements and satisfaction of Pakistan Railways and their Engineer.

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Details of the method of working and any particulars that Pakistan Railways may request, shall be furnished to their Engineers, and approved by them before work commences. After approval has been received, the contractor shall give written notice to Pakistan Railways of at least one month, or longer if required, of his proposed date of commencing work on any crossing.

6. JOINTING

After a length of pipeline is laid in trench, the pipes, specials, and fittings, shall be jointed in accordance with the recommendation of the manufacturer of pipes.

Both sewer pipes and socketed or collared pipes shall be jointed with rubber ring. Rubber ring shall be mounted on the spigot end, socket of pipe or collar as required and pipe be pushed into socket / collar after lubrication of approved quality as approved by the Engineer in writing, to form a water tight joint. For cut pipes of RCC for sewers the contractor may provide a collar joint for connecting the cut pipes only on written approval of Engineer. The adjacent ends of cut pipes shall be butted together concentrically so that a dowel is left between the two ends. Jute or hemp yarn soaked in cement or molten bitumen shall be wound in the dowel space and joint smoothed with cement mortar (one part of cement and 1-1/½ parts of fine aggregate). The RCC collar shall be carefully pushed in position and the space between the pipe and the collar shall be filled and adequately caulked with cement mortar 1:1½ so that even space appears all round the external diameter of pipe. The work of jointing / working joints shall be done only in the presence of Engineer's representative(s). Any joint not made in presence of Engineer's representative shall be rejected and will have to be dismantled and remade on the Contractor's risk and cost.

The open ends of pipes being laid for sewers after the Contractor shall not leave a day work open. These open ends shall be carefully closed adequately by wooden plug of appropriate size to stop any sand, garbage, debris, insects, animals or water entering into the pipe. No payment shall be made for such plug, which shall be watertight. The cost of providing and dismantling of such plugs shall be deemed to be included in Contractor's rate of laying and jointing of pipes or sewers.

On completion of joints in a section or whole of pipe line, backfilling shall be done for the length of pipes except joints which shall be kept open till the pipes or sewer line is pressure tested and approved. Unless otherwise detailed, all pipelines shall have approved flexible joints.

All joints shall be sound and watertight when subjected to pressure test and under all working conditions. Before any pipe joint is made, the ends of the pipes to be jointed shall be thoroughly cleaned. Care shall be taken to ensure that the rubber rings, when finally fixed, shall be concentric with the pipe.

Care shall be exercised to ensure that, with flexible rubber ring joints of all types, the pipe spigots are not driven tight home. The correct space as recommended by the manufacturer, between the spigot end and socket shoulder shall be maintained.

7. CUTTING OF PIPE

The cutting of pipe shall be done neatly without damage to the pipe so as to leave smooth end at right angles to the axis of pipes.

Pipe ends shall be properly shaped for the required joints. The contractor shall fix all manholes, junctions, in the positions as per drawing or as directed by the Engineer and shall as far as possible select the lengths of pipes to avoid cutting to waste.

8. TESTING OF SEWER LINES

8.1. General

All sewers built under this contract shall be tested for infiltration or exfiltration as specified below. The tests shall be made at time selected or approved by the Engineer. Sections of the completed sewer shall be isolated and measurements of the infiltration or exfiltration shall be made by approved methods.

8.2. Infiltration Tests

The sewers which are constructed with the ground water level above the crown of the pipe shall be tested for infiltration after the sewers have been installed and backfilling has been substantially

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completed. The tests and measurement shall be performed by the Contractor in the presence of and in a manner approved by the Engineer. The duration of the tests shall be only long enough to establish the true rate of infiltration. The amount of leakage over a 24 hour period will then be calculated from the result of the measured true rate of infiltration.

8.3. Exfiltration Tests

The sewers which are constructed with the ground water level below the crown of the pipe shall be tested for exfiltration by isolating a section of sewers between manholes by means of approved temporary type of water tight bulk heads. The method of testing for exfiltration shall be generally as follows:

i). After isolation of sewer section, it shall be filled with water to a level which is 3 ft. minimum above the crown of the sewer at the higher end of the isolated section under test.

ii). The duration of the exfiltration test shall be one hour after the filling with water has been completed.

iii). Determination of the amount of exfiltration shall be made by measuring the total loss of volume of water in the manholes.

iv). The amount of exfiltration over a 24 hour period will then be calculated from the measured logs of volume during the test observation period.

8.4. Allowable Infiltration or Exfiltration

The calculated amount of infiltration or exfiltration over a 24 hour period shall not exceed 500 gallons per inch of pipe diameter per mile of sewer which rate shall be applied to the actual sewer size and length tested to determine the allowable infiltration or exfiltration over the 24 hour period.

If the measured infiltration or exfiltration exceeds the specified allowable limit, then the Contractor shall locate the points of leakage and make necessary repairs as to reduce the leakage to less than the permissible maximum stated above.

8.5. Cleaning of Sewer Lines

The contractor shall clean all the sewer lines at no extra cost with the method approved by the site Engineer prior to handing it over to the Owner.

9. CLEANING OF EXISTING SEWERS

The Contractor is first required to check the completion of the following works before taking in hand the work of cleaning of existing branch sewers:

a) Laying, jointing and testing of new sewers.
b) Construction of sewage pumping station.
c) Providing, installing and commissioning pumping machinery, valves, special and manifold.
d) Laying and jointing of rising main.
e) Testing of pumping machinery and rising or pressure main.

On completion of work of testing of new sewers and issue of certificate of the Engineer for satisfactory completion of the work of laying of new sewers, the Contractor shall start the work of cleaning of existing branch sewers before making connection with the new sewers. The Contractor shall undertake the following steps:

i) Each branch sewer shall be cleaned one by one.

ii) Portable dewatering / sewage pumps of adequate capacity with stand-by shall be installed at the last manhole of the branch sewer connecting with existing trunk sewer and pumping of sewage shall be done by the Contractor continuously.

iii) As the sewage level in the manhole goes down, cleaning of the manholes shall be done manually to avoid damage. The manholes shall be cleaned of all debris, sludge and any other matter lying inside while continuous pumping of sewage is done to avoid rising of sewage level. The Contractor shall provide adequate safety equipment and light for the safety of his labour and staff. The Contractor shall be fully and solely responsible for the safety of his labour and

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staff and shall be wholly responsible for any mishap, damage or loss for any reason whatsoever.

iv) The Contractor shall carry out rodding of the sewers after the manholes on the branch lines are cleaned. The Contractor shall provide all rodding equipment for cleaning of sewers.

v) The Contractor shall arrange for disposal of pumped sewage into the existing trunk sewer or new main sewers. The disposal of this pumped sewage into new sewers shall be done only after testing of the whole new system and electric connection is obtained and new pumping station, sewers and rising main are in full operation.

vi) The Contractor will however be allowed to obtain if possible mechanical sewer cleaning equipment from LDA on payment of hire charges to be determined by MD KWSB for pumping sewage or removal of sludge but the debris from manholes will have to be removed manually. The availability of such equipment cannot be guaranteed by LDA.

vii) The Contractor shall carry out all necessary and miscellaneous repairs to the existing manholes including replacement of manhole covers as instructed by the Engineer.

viii) On satisfactory completion of cleaning each branch sewer and written approval by the Engineer, the Contractor shall connect this cleaned branch sewer to the new main sewer through additional length of sewer. The payment for this additional sewer including excavation, dewatering laying and jointing of sewer pipes will be done on the rate applied for laying new sewers as per BOQ.

ix) In case of serious clogging of branch sewers, the Contractor shall locate the damaged part of sewer and replace this sewer on written authority of the Engineer and lay the required portion of the damage sewer as new sewer on the basis of rates provided in the BOQ and get it tested as per specification.

x) On completion of cleaning of one branch sewer, the Contractor shall start work on other branch sewers utilizing the experience gained on previous sewers till all the branch sewers are completely cleaned, repaired and connected to the new main sewers.

10. CONSTRUCTION OF MANHOLES AND VENT SHAFTS

Contractor shall construct the manholes and vent shafts in positions as shown in drawings or where otherwise directed by the Engineer. The work of construction of manholes and vent shafts shall proceed along with the work of laying of sewer pipes. The timbering steel sheet piling and other side supports of trenches shall not be removed, dewatering for trenches shall not be stopped and backfilling of trenches over laid sewers shall not be allowed until the manholes are fully constructed at the required places, checked, tested and approved by the Engineer.

Manholes shall be constructed concurrently with the adjacent pipe lengths. The contractor shall build in pipes and for grades as directed. Short length pipes with flexible joints shall be used immediately adjacent to manholes as detailed. Benching shall be left completely smooth to the satisfaction of the Engineer.

Manholes and vent shafts shall be constructed of cast-in-situ vibrated concrete. Dimensions and mix of concrete shall be as shown in drawings. All channels and benching shall be finished smooth and accurately shaped in accordance with the drawings.

The manhole walls shall be constructed of fair face steel forms and no plaster will be required. However in case smooth surface is not attained inside and outside of manholes shall be plastered smoothly with 19 mm thick cement sand mortar of 1:3 using S.R. cement and the manhole shall be absolutely water tight. Two coats of hot bitumen at the rate of 7 Kg per 10 Sq.m shall be applied on external surfaces. No extra payment shall be paid for this work.

11. NEW MANHOLES ON EXISTING SEWER

In case new manholes are to be constructed on existing sewers either for replacement of damaged manholes or additional manholes. The Contractor shall construct these manholes as per written instructions of Engineer. The shape and size of these manholes shall be the same as the existing manholes on the existing line. Payment shall be made on the basis of actual quantity of items of

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work carried out by Contractor for excavation, stone soling, dewatering, reinforcement and concreting paid for such items available in BOQ.

12. MAKING CONNECTION WITH EXISTING SEWERS

After the whole work of laying, jointing and testing of new sewers, manholes, vent shafts pumping station pumping machinery and rising or pumping main is completed, tested satisfactorily and certified in writing by the Engineer, the Contractor shall start the work of making connection for the following:

i) Connecting the main sewers with the sump (wet well) of pumping Station.
ii) Connecting the existing sewers with the manholes on the new sewers if existing or required.

This work shall include laying the required connecting length of the diameter of existing sewer with the new manholes including all operations of excavations, timbering bracing dewatering, making holes in new manholes, or pumping station, laying and jointing of sewer pipes, repairing of cut portions, backfilling, testing and all other operation for a complete job of making connection of sewers with pumping station or as required.

Payment shall be made for excavation, laying sewer pipes, bedding etc. for connecting sewers on the basis of general items of work in the BOQ. The item for making connection shall include for cutting of walls for making connection, repairs of cut portions and all other miscellaneous item not covered by description of items in BOQ. After making connection and completion of repair, manholes should be water tight.

The contractor shall reinstate the surfaces over all trenches except where otherwise described. Reinstatement shall be carried out as soon as trenches or other excavations have been backfilled and thoroughly compacted as specified.

13. PAYMENT

Rate shall include for supplying, laying, jointing and testing of sewers as per rates quoted in the BOQ. The rate shall include the cost of the pipes, rubber rings, sockets, collars and all other material, equipment, plant and labour required for laying, jointing and testing of pipes or sewers for a complete job. No deduction shall be made for the manholes in the measurement for the length of sewers, of the pipe laid in continuation.

Payment for manholes and vent shafts shall be made for complete work of manholes or vent shafts as per drawings and specifications.

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RCC PIPE

1. SCOPE

The work covered by this section of the specifications consists in furnishing all reinforced and non-reinforced concrete pipes, plant, labour, equipment, appliances and materials and in performing all operations required for installing and testing the sewer pipes in strict accordance with the specifications of this section and the applicable drawings and subject to the terms and conditions of the contract.

2. MATERIALS

All materials used in the manufacture of reinforced cement concrete pipes for use under this contract shall conform to ASTM Designation C-76-79 and C-14 latest revision and also with the following specifications.

2.1. Cement

The Portland cement to be used in the manufacture of reinforced concrete pipe shall conform to the requirement of ASTM Designation C 150 (latest revision).

2.2. Aggregates

The coarse/fine aggregate to be used in the manufacture of concrete pipes to be furnished and installed under this contract shall be generally in accordance with the provisions of section of these specifications.

2.3. Water

Water to be used in the manufacture of pipes shall be approved by the Engineer.

2.4. Steel Reinforcement

The material will conform to the specifications contained in section of these specifications.

3. CLASSES OF SEWER PIPE

The reinforced and non reinforced cement concrete pipes to be furnished and installed under this contract shall conform to ASTM-C-14-Class-III for pipe sizes 8" and 10" and ASTM C-76 Class-II, wall 'B' for pipe sizes greater than 10".

4. BASIS OF ACCEPTANCE

Acceptance of reinforced cement concrete pipes will be on the basis of three edge bearing and material tests as per ASTM Designation C-76-79 or latest revision and inspection of manufactured pipes for defects and imperfections. The Contractor shall bear the cost of such tests and pay fees etc., and also pay for the carriage of such samples and all other expenses contingent to tests.

5. JOINTS FOR CONCRETE PIPE SEWERS

Rubber gasket joints shall be used for either tongue and groove or bell and spigot pipes.

Rubber gasket joints shall be made using specially designed rubber gasket, made to fit the applicable tongue and groove or bell and spigot pipes and adequately tested under opera- ting conditions. Special care must be taken in the selection and handling of the concrete pipes for use with rubber gasket joints, to ensure that pipe ends shall be smooth and concentric with tolerance which closely conforms to the requirements of the manufacturer of the rubber gaskets. The tongue or spigot end of each pipe shall be specially designed to perform groove or offsets to fit the manufacturer's rubber gaskets design.

The rubber gasket joints shall conform to all applicable requirements of the latest revision of ASTM Designation C443, entitled "Joints for Circular Concrete Sewer and Culvert pipe, using Flexible Watertight Rubber Type Gaskets" except that the test pressure and not exceed 10 feet of head at which the completed sewers shall meet the in- filtration or ex-filtration limits set forth hereinafter. The

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groove end of tongue and groove pipes shall have atleast one line of wire reinforcement of 8 gauge size placed in the centre of the groove.

The rubber gasket shall be installed on the pipe in accordance with the instructions of the gasket manufacturer. In general the gaskets shall be pre-assembled to the pipe at the pipe manufacturing plant. The pipes shall be handled with special care at all times to prevent damage to the ~i pipe ends. A lubricant shall be used for jointing the pipes as recommended by the rubber gasket manufacturer.

Care shall be taken to avoid contamination of the gasket and lubricates surfaces with earth or other undesirable material during installation.

For either tongue and groove or bell and spigot pipes, I mechanical means shall be used to pull the pipe home for all sizes of 8" or larger diameter in accordance with the recommendations of the rubber gasket manufacturer.

6. INSTALLATION

6.1 Handling of Pipes

Concrete sewer pipes shall be handled with special care at all times during the manufacture, while transporting to the site of work, and while installing. Each pipe shall be carefully inspected before being laid and no cracked, broken or defective pipe shall be used in the work. Chipping of the tongue and groove or bell and spigot pipe ends, which in the Engineer's opinion may cause defective joints, shall be sufficient cause for the rejection or any concrete pipe.

6.2 Excavation and Backfill

The excavation and backfill for sewer installations shall be as specified in applicable provisions of these technical specifications and will be paid for under separate contract items as classified or and as per applicable Variation Order.

6.3 Placing of Bedding

Crush stone of size 1" down shall be evenly spreaded over the full width of the formation in 4 inches loose layers and compacted with hand or mechanical rammers until the full thickness as shown on the drawing for the particular pipe size has been built-up and finished not more than 1/2" below level required. The Contractor should note that it is essential that the material at the sides of the pipes is adequately compacted. Before the subsequent placing of pipe surround material pipe joints shall be protected, protection may take the form of a twist of yarn lightly pressed into the annular joints space or other equal protection approved by the Engineer's Representative.

6.4 Laying of Sewers

Neither any sewer pipe nor the bedding shall be laid or placed till the alignment of the sewer and its levels and gradients have been carefully checked and tested with the trench excavation and found correct.

Each length of sewer pipe shall be checked for cracks and defects before placing in the line. Defects which in the opinion of the Engineer indicate imperfect placing, shall make the pipe liable to rejection. Each pipe shall be placed carefully to line and grade and in close contact with adjoining pipe. These specifications require rejection of the work if the sewer invert varies as much as much from the proper elevation. As shown on Drawings, the bottom of the trench must be shaped to fit the pipe barrel, with holes left for the bells. If excavation has been carried below the correct grade, refilling must be done with satisfactory materials as approved by the Engineer at no extra cost.

The concrete pipe joints shall be of the types designated above and shall be made in accordance with the aforesaid specifications. When laying progress, the open pipe shall be closed with wooden plug to keep out foreign matter.

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7. TESTING OF SEWER LINES

7.1. General

All sewers built under this contract shall be tested for infiltration or exfiltration as specified below. The tests shall be made at time selected or approved by the Engineer. Sections of the completed sewer shall be isolated and measurements of the infiltration or exfiltration shall be made by approved methods.

7.2. Infiltration Tests

The sewers which are constructed with the ground water level above the crown of the pipe shall be tested for infiltration after the sewers have been installed and backfilling has been substantially completed. The tests and measurement shall be performed by the Contractor in the presence of and in a manner approved by the Engineer. The duration of the tests shall be only long enough to establish the true rate of infiltration. The amount of leakage over a 24 hour period will then be calculated from the result of the measured true rate of infiltration.

7.3. Exfiltration Tests

The sewers which are constructed with the ground water level below the crown of the pipe shall be tested for exfiltration by isolating a section of sewers between manholes by means of approved temporary type of water tight bulk heads. The method of testing for exfiltration shall be generally as follows:

v). After isolation of sewer section, it shall be filled with water to a level which is 3 ft. minimum above the crown of the sewer at the higher end of the isolated section under test.

vi). The duration of the exfiltration test shall be one hour after the filling with water has been completed.

vii). Determination of the amount of exfiltration shall be made by measuring the total loss of volume of water in the manholes.

viii). The amount of exfiltration over a 24 hour period will then be calculated from the measured logs of volume during the test observation period.

7.4. Allowable Infiltration or Exfiltration

The calculated amount of infiltration or exfiltration over a 24 hour period shall not exceed 500 gallons per inch of pipe diameter per mile of sewer which rate shall be applied to the actual sewer size and length tested to determine the allowable infiltration or exfiltration over the 24 hour period.

If the measured infiltration or exfiltration exceeds the specified allowable limit, then the Contractor shall locate the points of leakage and make necessary repairs as to reduce the leakage to less than the permissible maximum stated above.

7.5. Cleaning of Sewer Lines

The contractor shall clean all the sewer lines at no extra cost with the method approved by the site Engineer prior to handing it over to the Owner.

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POLYETHYLENE (PE) PIPES AND PIPE FITTINGS

1. SCOPE

The work under this section of the specifications includes furnishing all plant, labour, equipment, appliances, materials and in performing all operations required in connection with providing and laying of Polyethylene Pipes and Pipe fittings, in accordance with the Contract or as directed by the Engineer and the manufacturer's recommendations.

2. GENERAL REQUIREMENTS

Pipes and fittings shall be new and unused.

Where manufacturers of pipes and fittings are specified, they shall be of the same manufacturers unless otherwise approved by the Engineer.

Where more than one similar item of pipes and fittings are specified, they shall be of the same manufacturer.

The Contractor shall submit to the Engineer for approval the following information regarding the specified /proposed items of pipes and fittings.

a). Name and address of the manufacturers
b). Country of origin, make and model
c). Dimensions and wall thicknesses of pipes and fittings
d). MTC - mill test certificate from the manufacturers
e). Method of jointing, testing and commissioning
f). Manufacturer has the following Accreditations:
- ISO 9001 and 14001
- Third Party International Inspection Certificate.
- Manufacturer's Submittal of QA/QC Document.

Approval by the Engineer shall not be construed as authorizing any deviation(s) from the specifications unless they are specifically brought to notice of the Engineer.

Approval by the Engineer shall not relieve the Contractor from any of his contractual responsibility regarding satisfactory performance and other requirements of the works.

3. SPECIAL REQUIREMENTS

a). Pipes and fittings shall be suitable for the intended use.

b). Every pipe shall be tested at the manufacturer's works to specified hydraulic test pressure. The test pressure shall be maintained for sufficiently long time for proof and inspection.

c). Each pipe and fitting shall be permanently marked or engraved giving the following information:
i). Manufacturers Name or Trademark
ii). Manufacturing date
iii). Manufacturing number
iv). Nominal diameter in mm
v). Class or pressure rating
vi). Manufacturers Inspection mark
vii). Standards according to which the pipes and fittings have been manufactured.

d). Unless otherwise specified, diameters of pipes and fittings shall be nominal. Actual inside and outside diameters and tolerances in diameters of pipes and fittings shall be according to, the specified standards, a copy of which shall be submitted alongwith.

e). Unless otherwise specified, service ratings of pipes and fittings shall not be less than the maximum pressure to which they will be subjected to.

f). Unless otherwise specified, wall thicknesses of the pipes shall be according to the class, schedule or duty of the pipes. The wall thicknesses shall be measured at locations excluding the jointing ends. The tolerances in wall thicknesses shall be according to the specified standards.

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Wall thicknesses of fittings shall not be less than those of corresponding pipes to which they are joined together.

g). Pipes and fittings ends shall be matching and compatible with each other and with the ends of valves and appurtenances to which they are joined.

h). Unless otherwise approved by the Engineer, pipes and fittings, jointing materials etc. shall be of the same manufacturers as those of the pipes and fittings.

4. MATERIALS

5.1. General

Materials shall conform to the latest referenced specifications and/or other provisions specified herein. Materials shall be new and unused. In cases where manufacturers are specified, materials shall be of the same manufacturers. In all other cases, the Contractor shall submit the names of the manufacturer from whom he intends to buy. Other information such as diagrams, drawings and descriptive data shall be supplied as desired by the Engineer. Approval of materials under this provision shall not be construed as authorizing any deviations from specifications.

5.2. Manufacturing

The material from which the pipe is produced shall consist substantially of polyethylene, to which may be added only those additives that are needed to facilitate the manufacture of the polymer, and production of sound, durable pipe of good surface finish, mechanical strength. None of these additives shall be used separately or together in quantities sufficient to constitute a toxic hazard, or to impair the fabrication of welding properties of the pipe, or to impair its chemical and physical properties.

5.3. Pipe

Pipes shall conform to International Standards Organization (ISO) recommendations, IS0 4427 : and shall be of specified class capable of withstanding the specified working pressure and test pressure.

5.4. Quality

The pipe shall not have any detrimental effect on composition of the water flowing through them. The quantities of any toxic substances extracted from the internal wall, of the pipes shall not exceed the values specified in ISO 4427:1966(E).

5.5. Fittings

Compatible fittings and specials for use with polyethylene Pressure Pipes shall be of the appropriate class and shall conform to ISO 3458, 3459, 3501, 3503 or ISO 14236 and ISO 13460.

5. TESTING REQUIREMENT

7.1. Pipe Testing Requirements

Pipe manufactured in each of the size shall be evaluated and tested. The pipe shall conform to the minimum requirement of the following tests and the test report submitted with each lot:-

a). Elevated temperature sustained pressure test
b). Thermal stability
c). Workmanship
d). Dimensions & tolerances
e). Bend-back test
f). Elongation-at-break test
g). Ring-tensile strength test
h). Quick burst test
i). Carbon block content
j). Five-second pressure test
k). Melt flow index
l). Density

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7.2. Fittings Test Requirements

a). Workmanship
b). Five-second pressure test
c). Bend-back test

6. HANDLING AND STORAGE

6.1. General

The Contractor shall be responsible for proper handling, as per manufacturers recommendations, of pipes and pipe fittings etc. All the material shall be stacked in accordance with the manufacturer's recommendations at approved places as directed by the Engineer.

6.2. Transport

Transportation of pipes shall be done in such a way that they are secure and that no more than an absolute minimum of movement can take place on the vehicle during transit. The same care is needed if pipes are to be transferred from one vehicle to another, how short the final journey may be.

6.3. Off-loading

Cranes shall be used for off-loading. Whole sequence of operations shall be carried out smoothly and without snatch. Rope or nylon slings, lifting beams with flattened hooks or scissor-dog shall be used. Hooks and dogs shall be well padded to prevent the pipe being damaged and shall be fitted with locking device. Steadying ropes are essential.

6.4. Storage

Pipes, and fittings damaged during handling, transporting or lowering shall be rejected and replaced at the contractor's expense. Storage shall be under shade so that all polyethylene pipes & fittings are not exposed to sunlight and extreme heat.

6.5. Stringing and Inspection

Stringing, consists of placing pipes on the ground in line ready for laying. Care is again needed to prevent damage during this operation.

The turned ends of all pipes shall be inspected to ensure that they are free from any local irregularities which could affect the water tightness of the joint. All pipes shall also be visually inspected for evidence of impact damage. When such damage is detected, a thorough examination of internal surface in region of the pipe ends shall be made for sign of hair cracks. Damaged pipes, joints, and fittings shall be rejected and replaced at the expense of the Contractor

7. JOINTING

Jointing shall be made by butt fusion or electro-fusion, socket fusion using plain/socket ended polyethylene fittings except for joining of valves and appurtenances.

7.1. Flanged Jointing

Polyethylene flange assembly shall consist of a material backup flange or ring and a polyethylene stub-end or flange adapter. The backup flange shall be placed over the pipe profile and the stub-end or flange adapter is then fused into the plain and pipe.

Flanged jointing method shall be used to made connections to polyethylene pipe, alternate pipe materials, to pumps, valves and other appurtenances.

8. HYDRAULIC TESTING REQUIREMENTS

Expect where otherwise specified pipelines and pipework shall be subjected to hydraulic pressure tests in the presence of the Engineer which shall comply with ASTM F 2164, CP 312 or relevant AWWA Standard.

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8.1. General

Testing shall be carried out in two stages:

a). Test of sections as construction proceeds.
b). A final test of whole of the pipework or pipeline on completion.

The Contractor shall supply all plant, equipment, fittings etc. including gauges, necessary for the hydraulic tests. He shall submit to the Engineer, well in advance of the time for tests, details of his proposals for transporting the test water from the point of supply at the inlet works to the pipeline to be tested. No. connections to the pipeline or pipework, which would involve cutting, tapping or otherwise permanently altering the Permanent Works, will be allowed.

Test gauges shall be of approved manufacture having dials at least 200mm diameter, graduated such that the test pressure is at least 75% of the gauge reading. If necessary different gauges shall be supplied for different pipeline sections. Two gauges of each type shall be provided for the sole use of the Engineer and shall remain in the Engineer's possession for the duration of the Contract.

All gauges shall be dead weight tested and proved at the commencement of use and at regular intervals thereafter as required by the Engineer.

The Contractor's arrangements for testing shall include a suitable means of quick installation and removal of the Engineer's gauges during testing.

8.2. Procedure

Each section of the pipeline or pipe work to be tested shall be capped or blanked off at each end and securely strutted or restrained to withstand the considerable forces, which will be exerted when the test pressure is applied. Testing against closed valves will not be permitted. Hydrants, washout valves and isolation valves shall be fitted with blank flanges and these together with in-line valves shall be left open. Air valves already fitted shall be permitted to function during the test. The air valve manufacturer's confirmation shall be obtained that the valves are capable of withstanding the test pressure involved.

Proposal for testing where thrusts on structures are involved, even where thrust collars on the piping are installed, shall be submitted, with the calculations of the forces to be carried, to the Engineer for approval.

The Engineer shall approve the method of filling the pipeline or pipework with water. The section under test shall be filled making certain that all air is displaced through an air valve installed at the high end of the line. The section shall then remain under constraint moderate pressure – 10 to 20 m head of water – of a period of several hours until the pressure can be maintained without additional pumping. Pipes of materials liable to absorb water, e.g. concrete and asbestos cement shall be allowed to become saturated under this moderate pressure for 24 hours.

The pressure shall then be slowly increased to the full test pressure and pumping discontinued for 3 hours or until the pressure has dropped by 10 m, whichever occurs earlier. Thereafter pumping shall be resumed and continued until the test pressure has been restored. The quantity of water pumped to restore the pressure shall be the measure of leakage from discontinuation of pumping until its resumption.

The pipe section shall be considered as having passed the test if the leakage is not more than 0.365 1/mm of pipe diameter per kilometer per 24 hours for each 100 m head of water. Notwithstanding the satisfactory completion of the hydraulic test, if there is any discernible leakage of water from any pipe or joint the Contractor shall at his own cost, replace the pipe, repair the pipe or re-make the joint and repeat the hydraulic test.

No line shall be accepted until and unless the leakage of any section of the lines tested is not more than the rate of leakage specified above.

Pipelines shall be tested as above except where the Engineer issues such instructions as are necessary for testing parts of the Works that have been designed for stresses limited by consideration other than those applying to the pipeline system.

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8.3. Test Pressure

Test pressure is to be measured in bars at the center of the blank flange situated at the lowest end of the pipeline under test. Unless otherwise specified or shown on the drawings all pipelines and pipework shall be tested at a pressure 5-m above the sustained working pressure as determined by the Engineer.

The contractor shall submit a schedule of pipeline test pressure to the Engineer for approval prior to commencing testing.

8.4. Sectional Hydraulic Test

The Sectional Hydraulic Test shall be carried out after the pipeline or pipework section to be tested has been laid, jointed and backfilled to a depth sufficient to prevent flotation of the pipeline, but leaving the joint exposed. The sections to be tested shall be to the approval of the Engineer and shall be not longer than 2,000 m and less than 500 m when either the pipeline is laid adjacent to or underneath the carriageway. The joints between each tested section shall be left exposed until the pipeline has passed the Test on Completion.

In addition to the above requirement the Contractor shall perform a hydraulic test on the first 200-m length of pipeline to be laid under the Contract. This test shall be undertaken within one month of the Contractor commencing the laying of pipes. Should the pipeline fail the test or the Contractor fails to undertake the test, all laying and jointing work shall come to halt until that section of pipeline pass the hydraulic test.

8.5. Hydraulic Test on Completion

The test on completion shall be carried out after the entire pipeline or pipe valve sections have been jointed together on completion of sectional testing. The joints between sections shall be backfilled once the test is satisfactory completed.

9. PIPELINE DISINFECTION

9.1. General

The internal surfaces of all pipeline and pipe work including all equipment incorporated in a pipeline or pipe work through which water will pass shall be disinfected after they have been cleaned to the satisfaction of the Engineer.

The disinfection shall be carried out in accordance with AWWA C601.

9.2. Disinfection Process

Disinfection shall be effected by filling the pipeline with water heavily dosed with chlorine, and shall be arrived out when filling the pipeline with water for carrying out the hydraulic test on completion. Alternative methods may be adopted with the approval of the Engineer.

The level of the chlorine dosing shall be such as to make available 50 mg/l of free chlorine throughout the pipeline.

The water, heavily dosed with chlorine, shall stand in the pipeline for a period of 24 hours or for such longer period as the Engineer shall require and all valves in the system shall be operated at least during this period.

At the termination of the required period, chlorine residual test shall be taken at the end of the pipeline farthest from the point of injection and the test shall be repeated if necessary until the residual is not less than 10 mg/l. The system shall then be flushed with clean water.

The Contractor shall obtain the Engineer’s approval to the method to be adopted for disposing of the chlorinated water and the time when such disposal shall take place on completion of disinfection. The Contractor shall neutralize the chlorine by the use of sodium thiosulphate prior to disposal.

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10. MEASUREMENT AND PAYMENT

10.1. General

Except otherwise specified herein or elsewhere in the Contract Documents no separate measurement and payment will be made for the under mentioned works related to the relevant items of the Bills of Quantities but shall not be limited to the following. The cost thereof shall be deemed to have been including in the quoted unit rate of the respective items of Bills of Quantities.

a). Submission of sample
b). Transportation
c). Stacking and stringing
d). Joining/ welding
e). Cutting, turning and jointing of pipes
f). Pipe fitting (tee, bend, flanges, adopters, blank flanges etc.)
g). Flushing, testing and disinfection and commissioning of pipeline

10.2. Measurement of Polyethylene Pipe

Measurement of acceptable completed works of supply, erection and installation of pipes including fittings will be made on basis of actual length in running meter of pipes provided and installed in position as shown on the drawings or as directed by the Engineer.

10.3. Payment

Payment will be made for acceptable measured quantity of supply, erection and installation of polyethylene pipes including fittings on the basis of unit rate per running meter quoted in the bills of quantities and shall constitute full compensation for all the works related to the item.

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MS PIPE

1 APPLICATION

'Pressure pipelines' shall mean pipelines in which the nominal internal working pressure exceeds 3.0 meter of water and such other pipe work as may be so designated.

2 PIPE MATERIAL

Unless otherwise specified or shown in the drawings, pipelines will be of Mild Steel.

3 MILD STEEL PIPE AND SPECIALS

3.1 Pipes

Steel pipes for the pipeline shall be of or welded construction complying with API Std 5LX, specification for High Pressure Pipe Line, having a wall thickness as shown on Drawings and the BOQ.

Pipeline	Steel grade
Mains	X42, X52

The process of manufacturer shall be as stated by the Contractor in Appendix to the Tender at the time of tender. Pipes shall be manufactured at a reputed and recognized factory approved by the Engineer.

Full length pipes shall be supplied in uniform effective length of 8 m each.

'Half-length' and 'quarter-length' pipes shall be supplied in random effective lengths of not less than 4m and not less 2m respectively.

Tests and test certificates will be required for the pipes and specials supplied under this Contract.

In accordance with Clause 3.3 and 3.5 of API Std 5LX Specification for high test line pipe including ladle and check analyses of the steel.

The pipe manufacturer shall carry out fracture toughness tests in accordance with API Std 5LX Specification and shall provide test certificate to show that the pipe is suitable for use under the operating conditions specified herein operating temperatures between -5 °C and 40 °C.

3.2 Truly Circular Pipes

Pipes intended for fabrication at Site by welding and for cutting into closing lengths shall be referred to as 'truly circular pipes and shall be truly circular and sized uniform throughout their length, within the tolerance applicable to their outside diameter in accordance with API specification 5L enabling them to be suitable for use with collars and couplings.

They shall be marked 'truly circular' and identified by painting a 25mm wide red stripe along each two diametrically opposite locations throughout the external surface of the pipe length.

3.3 Special

Steel special for butt-welding shall comply with AWWA C200 and AWWA C208. All specials shall have the same strength and be compatible in all other respects with the line pipe with which they are to be used.
Flat tapers shall have one side of the taper at right angles to the ends so that they may be laid with level invert or level crown as required.

Collars shall comply with AWWA C200.

Bends shall be of even curvature type only unless otherwise approved by the Engineer.

Specials shall be hydraulically tested in accordance with AWWA C200, Part 3.

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3.4 Marking

The marking of pipes and fittings specified in section 11 of API Specification 5L shall be given in metric units. Suitable marks indicating lateral symmetry of flat tapers shall be scribed at the larger end.

3.5 Preparation of Pipe Ends

The preparation of pipe ends for slip on type joints shall be in accordance with the requirements of and to the tolerances specified by the joints manufacturer.

3.6 Welded Joints

Welded joints in the pipeline shall generally be Butt welded but between two fixed pipes / fittings these shall be lap welded slip type joints welded inside and outside the pipe or as shown on Drawing. All welding in joints shall comply with BS, AWWA C200 or ANSI B16.25.

All parts to be welded shall have loose scale, slag, rust, paint and other foreign matter removed by means of a wire brush and shall be left clean and dry. All scale and slag shall be removed from each weld run when it is completed. Pipes manufactured with longitudinal or spiral welds shall be lined up before jointing so that these welds are at least 15° apart around the joint circumference.

For MS pipes, butt welds shall comprise of a root pass and double run welds.

For pipes a double run convex fillet weld shall be used. The minimum leg length of the fillet as deposited is to be equal to the full thickness of the pipe wall. The actual throat depth shall not be greater than 9/10th and not less than 7/10th of the minimum leg length as deposited.

The depositing of the weld metal shall be carried out in such a manner as to ensure that all the welds have adequate root fusion and are of good clean metal free from crack, gas holes, slag inclusions and all other impurities. The surfaces of the weld shall have and even contour with regular finish and shall indicated proper fusion with the parent material. All slag shall be thoroughly removed after depositing each run of welding by light hammering with a chipping hammer followed by wire brushing. Any welds showing cracks or other cavities or in which the weld metal tends to overlap into the parent metal without proper fusion or containing any other defects whatsoever shall be cut out and re-welded to the satisfaction of the Engineer at the contractors expense.

No weld or adjacent parts of the pipe shall be painted prior to inspection by the Engineer.

The Contractor shall submit his proposals and welding procedures giving details of equipment, electrodes, welder qualification and detailed methods for Engineer’s approval before commencing the jointing work.

3.7 Welding

The metal arc process shall be employed for the welding of joints to pipes and specials and shall comply with AWWA C206 or API 1104.

Before commencing any welding on Site the Contractor shall submit to the Engineer for approval details of the plant materials and the method he proposes to employ. When required by the Engineer, the Contractor shall carry out Site trials in demonstration of his method, to prove the suitability of material and the adequacy of his plant.

The work shall be carried out manually by welders qualified for all position welding to AWWA C206 and the Contractor shall submit to the Engineer details of all welders whom he proposes to employ. The Engineer’s approval for any welder will only be given after the welder has satisfied the requirements of welder tests prescribed by AWWA C206 or API 1104 and the welders employed at site must have passed all the test under AWWA procedure as X-ray, Tensile test & charpyizod test etc.

The Contractor shall furnish each of his welders with indelible crayons for marking the pipe with his unique identification number, adjacent to each weld run by him. No marking made by indenting with a steel stamp will be permitted.

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The approval of a welder may be revoked by the Engineer at any time if he considers the welder's workmanship is inconsistent or below a reasonable standard.

The throat thickness of full fillet welds shall be not less than 0.7 times the pipe wall thickness and the throat thickness of butt welds shall not be less than the pipe wall thickness. All the single & double V-Butt weld joints will be as per AWS & AWWA standard.

Seamed or spiral welded pipes shall be laid such that the manufacturer's longitudinal seams or spiral welds shall not coincide at the ends of the adjacent pipes but shall be opposed by at least 45 degrees.

No welding shall be carried out until the portion of the pipeline to be jointed has been properly prepared and setup, and inspected and approved by the Engineer.

Welded joints shall be welded on site by the metal arc process, using portable welding sets of 300/400 A, 30/35 V capacity. The type of welding electrodes to be adopted on Site and the site welding procedure shall be as stated in Appendix to the form of Bid and approved by the Engineer.

3.8 Weld Inspection

All welding and in particular the deposition of the root run, will be subject to stringent examination by the Engineer. The Contractor shall give adequate advance advice of welding operation and provide test equipment for the welds. Radiographic inspection of welds shall be made by the Contractor in the presence of the Engineer in accordance with AWWA C206 or API 1104 to a maximum of 10% of the total run of weld. Each joint to be radio-graphed shall be cleaned, and weld spatter removed. Any defective weld shall be repaired by approved means or cut out if necessary the radiographic inspection may be increased beyond 10% of the total run of the weld.

3.9 Internal Pipe Protection

Internally the pipe shall be provided with cement mortar lining, 10mm thick conforming to AWWA C205.

3.10 External Pipe Protection

External pipe protection to the MS pipeline shall comprise of 3-layer polyethylene coating system. This system shall comprise of 100 microns fusion bonded Epoxy, 250 microns copolymer Adhesive and balance 1850 microns High Density Polyethylene making up a total thickness of 2200 microns (2.2 mm) upto 450 mm dia pipes and total thickness of 2500 microns (2.5 mm) for 500 mm dia pipes. Holiday detection, inspection and tests shall be carried out as per DN 30670 or other equivalent standard specifications.

Affidavit of compliance: the Contractor shall submit an affidavit that all materials and work furnished in connection with the external coating complies with the requirements of AWWA or other relevant standard.

The coating shall be stopped 200 mm from the ends of all pipes to be field welded in accordance with AWWA C203 (section 2.3.19) and completed to cover this section after welding of joint.

3.11 External Tape Coating

The external pipe protection for steel water pipelines with Tape coating should be done as per AWWA C 214 Standards.

3.11.1 Coating system

The prefabricated polyolefin tape coating system shall have at least three layers consisting of the following:

1. A liquid adhesive layer.
2. An inner-layer tape for corrosion protection.
3. An outer-layer tape for mechanical protection.

The inner-layer tape and out-layer tape shall be made of prefabricated tapes in rolls.The properties of the entire coating system should confirm to the appropriate values listed in tables I,2,3&4 below:

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3.11.2 Liquid Adhesive

The liquid adhesive shall consist of a mixture of suitable rubber and synthetic compounds and a solvent. The liquid adhesive shall be applied to the properly prepared pipe surface before application of the inner-layer tape.

3.11.3 Inner Layer Tape

The inner-layer tape shall be a two-layer tape consisting of a polyolefin (only) backing layer with a laminated butyl-based adhesive layer. The inner tape shall be compatible with the liquid adhesive. The manufacturer shall certify that the backing material is polyolefin only, containing not less than 1.0 percent nor more than 3.5 percent, by weight, of non-polyolefinic material consisting of carbon black and antioxidants. The inner-layer tape shall be applied after the liquid adhesive and before the outer-layer tape. The primary purpose of the inner-layer tape is to provide corrosion protection.

3.11.4 Outer Layer Tape

The outer-layer tape shall be a two-layer tape consisting of a polyolefin-only backing layer with a laminated butyl adhesive layer. The manufacturer shall certify that the backing material is polyolefin only, containing not less than 3.0 percent nor more than 7.0 percent, by weight, of non-polyolefinic material consisting of pigments, antioxidants, and stabilizers. The outer-layer tape shall be compatible with the inner-layer tape. The primary function of the outer-layer is to provide mechanical and outdoor weathering protection to the tape system.

Table - 1 Physical Properties of Liquid Adhesive

Color	Property		
	Base	Weight	Flash point
Black	Rubber and synthetic resins	Flamable-6-8 lb/gal Non Flamable-10-12 lb/gal	-10 degree F or greater None

Table - 2 Physical Properties of Inner layer Tape

Property	Requirement		
	Minimum	Maximum	Test Method
Width deviation	-5% or -1/4in. (-6 mm) Whichever is smaller	+5%	Sec. 5.3.1
Nominal 20 mil (508µm) thickness	19 mil (483 µm)	22 mil (559 µm)	Sec. 5.3.2
Ratio of adhesive to toal inner-layer tape thickness, t	40% of total t	60% of total t	Sec. 5.3.2
Adhesion to prepared steel	200 oz/in. width (2,190 N/m width)	-	Sec. 5.3.3
Water absorption (24hr)	-	0.2% by wt.	Sec. 5.3.4
Water-vapor transmission		0.2 perns [1.15 x 10^{11} kg (pa·s·m^2)]	Sec. 5.3.5
Di-electric strength	6,000 V/single thickness		Sec. 5.3.6
Insulation resistance	500,00 megohms		Sec. 5.3.7
Tensile strength	20 lb/in. width (3,500 N/m width)		Sec. 5.3.8
Elongation	100%		Sec. 5.3.9
Nonpolyolefinic material, percent by weight	1.0%	3.5%	Sec. 5.3.12

Table - 3 Physical Properties of Outer layer Tape

Property	Requirement		
	Minimum	Maximum	Test Method
Width deviation	-5% or -1/4in. (-6 mm) Whichever is smaller	+5%	Sec. 5.3.1
Nominal 30 mil (762 µm) thickness	27 mil (686 µm)	33 mil (838 µm)	Sec. 5.3.2

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Adhesion to inner layer	20 oz/in. width (200 N/m width)		Sec. 5.3.3
Tensile strength	40 lb/in. width (7,000 N/m width)		Sec. 5.3.8
Elongation	100%		Sec. 5.3.9
Nonpolyolefinic material, percent by weight	3.0%	7.0%	Sec. 5.3.12

Table 4 Physical properties of total systems

Property	Requirement		
	Minimum	Maximum	Test Method AWWA C 214-07
Thickness			
50 mil, nominal	46 mil (1,168 µm)	55 mil (1,397 µm)	Sec. 5.3.2
80 mil, nominal	73 mil (1,854 µm)	88 mil (2,235 µm)	Sec. 5.3.2
Dielectric Strength	12,00 V		Sec. 5.3.6
Impact Resistance	25 lb in. (2.8 Nm)		Sec. 5.3.10
Penetration/deformation resitance		25% with no holiday at 72°F (22°C)	Sec. 5.3.11

Table 5 Dimensions of inner-layer and outer-layer tape

Nominal Pipe Diameter	Recommended Tape Width
4 in. (100 mm) and under	4 in. (100 mm)
6 – 12 in. (150 – 300 mm)	9 in. (230 mm)
14 in. (350 mm) and over	12 in. (300 mm) and up

3.11.5 Coating Application

The coating application shall be a continuous operation starting with a properly prepared pipe surface. Three steps, which shall be performed consecutively, shall consist of (1) liquid adhesive application, (2) application of the inner-layer tape directly onto the prepared pipe surface, and (3) application of the outer-layer tape directly on top of the inner-layer tape. The coating materials shall be stored in a clean, dry area.

a. Surface before blasting

Bare pipe shall be free from mud, mill scale, mill lacquer, wax, coal tar, asphalt, oil, grease, and other foreign material. Before blast cleaning, surface shall be inspired and, if required, pre-cleaned according to SSPC-SP 1 to removal oil, grease, and loosely adhering deposit.

b. Abrasive blast cleaning

The pipe surface shall be abrasive blast cleaned with mineral abrasives, slag abrasives, steel shot, or steel grit (reference SSPC-AB1, and SSPC-AB-3) in accordance with SSPC-SP 6/NACE No.3. The blast anchor pattern of profile depth shall be 1 mil to 3 mil (25 µm to 75 µm) measured in accordance with ASTM D4417.

c. Visual comparative standards

The constructor shall prepare a representative area of abrasive-blast-cleaned surface on an actual work surface, as well as visual standards on panels that are a minimum of 6 in. x 6 in x ¼ in. (150 mm x 150mm x 6 mm).

d. Surface inspection

The cleaned exterior pipe surface shall be inspected for adequate surface preparation. Surface imperfections, such as silvers, scabs, burrs, weld spatter, and gouges, shall be removed by handling filing or grinding if necessary to prevent holidays.

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e. Protection from moisture

Blast-cleaned pipe surfaces shall be protected from conditions of high humidity, rainfall, or surface moisture. No pipe shall be allowed to flash rust before coating. To ensure a dry pipe surface at the time of liquid adhesive application, the minimum steel substrate temperature shall be 45oF (7oC) and at least 5oF (3oC) above the dew point.

3.11.6 Testing of Materials

All the coating systems Test as per AWWA C214-07 Sec 5.3 shall be conducted.

3.11.7 Coated-Pipe Tests

a. Thickness

The thickness of the coating system shall be checked in accordance with SSPC-PA 2. The thickness shall be within the limits given in Table 4 and shall be checked at a frequency specified by the purchaser.

b. Electrical inspection for continuity.

Each coated pipe section shall be electrically tested for flaws in the coating using a suitable holiday detector approved by the purchaser. The detector shall impress a minimum of 6,000 V. Reference should be made to NACE RP-02-74. The electrical inspection shall take place on the inner-layer tape before outer-layer tape is applied. Of a holiday is detected, it shall be repaired according to sec 4.4.4 of AWWA C-214-07 standard.

3.11.8 Nonconformance

a. Surface

The purchaser may reject pipe of the surface condition does not comply with the requirements of Sec. 4.4.2.2 of AWWA C-214-07 standard. Pipe rejected because of inadequate cleaning shall be re-cleaned and re-inspected.

b. Coating materials

If any sample of coating material is found not to conform to this standard, the coating material represented by that sample shall be rejected. If samples of the constructor's coating materials that have been previously approved are found not to conform to the standard, all the coating material shall be rejected.

4 LIQUID EPOXY COATING

For internal and external protection of the steel water pipes where ever requiring Epoxy coating the coating should be done as per AWWA C-210-07 Standard be used.

The coating and lining system may consist of any of the following three types:

1. A two part, chemically cured epoxy primer and one or more coats of a different two-part, chemically cured epoxy top coat;

2. Two or more coats of the same two-part, chemically cured epoxy coating, in which case the first coat shell be considered as the prime coat, or

3. a single coat of a two-part, chemically cured epoxy coating.

4.1 Coating System

i. Liquid-epoxy coatings.
The coatings used in this standard shall be based on liquid chemically cured epoxies. The curing agent may be an amine, amine-adduct, phenalkamine, polyamide, or other epoxy curing agents; the epoxy may be modified with coal tar, phenolic, or other modifiers. Materials used in both the primer and finish coat(s) shall be products of one manufacturer.

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ii. Shelf life

The component parts shall be stored in unopened original containers at temperatures not to exceed the manufacturer's recommendation. There shall show no instability or settling beyond a state permitting easy, m complete re-dispersion to a smooth, homogeneous consistency. When properly mixed and applied, acceptable drying and curing will result. Stored material that has exceeded the manufacturer's stated shelf life shall not be used.

iii. Coating thickness

The minimum and maximum dry film thickness (DFT) of the lining and external coating shall be specified by the purchaser. Dry film thickness shall conform to the manufacturer's printed data and shall be tested in accordance with SSPC-PA 2.

iv. Minimum thickness

Unless otherwise specified by the purchaser, the minimum DFT provided shall be at least 16 mils (406 pm), as shown in Table 1.

Table -1 Coated Pipe Inspection Tests

Test	Minimum Requirement	Method
Electrical inspection (holidays) Adhesion		
a) ASTM D3359(Method A) b) ASTM D4541 psi (kPa)	4A 800 psi (5,515 kPa)	Sec.5.1.6 Sec.5.1.6
Thickness, dry film, mils (µm)	16 mils (406 µm)	Sec.4.3.2.1 Sec.5.1.4

Table-2 Qualification Requirements of Laboratory Epoxy Coating System

Test	Minimum	Maximum	Method
Immersion and vapor phase, 30 days			Sec.5.2.1.1
a) Deionized Water b) Sulfuric Acid,1 percent by wt c) Sodium Hydroxide, 1 percent by wt	Pass Pass Pass		
Cathodic Disbondment		9.53 mm (0.38in.) radius	Sec.5.2.1.2

v. Applied, cured coating requirements

After curing but prior to burial, the coating system shall be a continuous film, free of thin spots and other imperfections as defined in Sec., and shall pass electrical inspection for continuity defined in Sec.

vi. Coated pipe inspection tests

The inspection test requirements for shop or field-applied epoxy coating systems are stated in Table 1.

vii. Qualification requirements

Minimum cured film requirements for laboratory-applied epoxy coating systems are stated in Table 2.

Performance Testing Of Laboratory-Applied Epoxy Coating System

4.2 Coating material tests

Prior to acceptance and application of the coating material, samples of material requested by the purchaser and submitted by the constructor may be tested by the purchaser in the purchaser's laboratory or in an independent commercial laboratory designated by the purchaser.

4.3 Immersion

Steel panels of dimension 2 in. x 6 in. x 1/4 in. (50 mm x 150 mm x 3.2 mm) shall be prepared, coated, and cured in accordance with Sec. 4.4.2.

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4.4 Rejection

1. Pipe
The purchaser may reject pipe if the surface condition does not comply with the requirements of Sec. 4.4.2.2 and 4.4.2.3. Pipe rejected because of inadequate cleaning shall be re-cleaned.

2. Coating materials
If any sample of coating material does not comply with this standard, the coating material represented by such a sample shall be rejected.

3. Affidavit Of Compliance
The purchaser may require an affidavit from the manufacture or supplier that the material provided complies with applicable requirements of this standard. The purchaser may also require an affidavit that the coating material supplied is of the same formulation(s) that was laboratory tested by the manufacturer and found to meet or exceed the performance requirements of this standard (Table 2 and Sec. 5.2).

5 FLANGED JOINTS

All flanges shall comply with AWWA C207. The nominal pressure rating for particular flanges shall be at least equal to the highest pressure rating of the pipes or fittings to which they are attached, but with a minimum nominal pressure of PN 10. All flanges shall be provided with all necessary nuts, bolts, washers and gaskets, as specified herein. The Contractor shall also supply in suitable containers sufficient graphite grease for application to the bolt threads when joints are made.

5.1 Bolts, Nuts, Washers and Fastenings

Bolts, nuts, washers, straps etc shall be of stainless steel except where otherwise specifically required. The heads and nuts of bolts shall comply with BS 4190. The ends of the bolts nuts shall be cleanly cut with standard threads and the nuts must fit with bolts accurately and so tightly that they can just be screwed down by hand. Washers of approved shapes and sizes are to be provided when required.

Machinery and stanchions shall be held in position with stainless steel foundation bolts suitable for the purpose with a minimum embedded length of 200 mm. Rag bolts and self tapping bolts will not be acceptable in these conditions.

5.2 Field Weld Joints

All the field weld joints shall be protected with WPC coating joint sleeve as per the recommendations of MS Pipe manufacturers after approval of the Engineer.

5.3 Joint Rings / Gaskets

Joint rings shall be manufactured to conform with BS 2494 and shall be of chloroprene rubber or other approved synthetic material suitable for temperatures up to 80 °C.

Gaskets may be inside the bolt circle type and shall comply with AWWA C207. Alternatively the gasket shall be to the full diameter of the flange, drilled to suit the appropriate bolt provisions.
Joints shall be made in accordance with manufacturer's instructions or as specified.

6 SLIP-ON TYPE COUPLINGS

Slip-on type couplings shall include the following couplings:
a. Straight flexible couplings;
b. Stepped flexible couplings;
c. Flange adaptors.

Slip-on type couplings shall be from the Viking Johnson System manufactured by the Victaulic Company or similar approved.

The preparation of pipe ends for slip-on type couplings shall be in accordance with the requirements of and the tolerances specified by the joint manufacturer. Couplings shall be installed fully in accordance with the manufacturer's recommendations.

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7 PUDDLE AND THRUST FLANGES

Puddle and thrust flanges shall comply with Clause 5.0 but remain undrilled.

8 TRANSPORT OF PIPES AND FITTINGS

Any vehicle on which pipes are transported shall have a body of such length that the pipes do not overhang. Large pipes shall be placed on cradles and the loads properly secured during transit. The pipes shall be handled in accordance with the manufacturer's recommendations.

Wide non-abrasive or other approved slings shall be used and all hooks and dogs and other metal devices shall be well padded. Hooks engaged on the inner wall surface at pipe ends shall not be used. Steadying ropes shall be employed. The positions of lifting slings shall ensure that stresses and tendency towards deformation in the pipes are kept at a minimum.

Under no circumstances shall pipes be dropped, be allowed to strike one another, be rolled freely or dragged along the ground.

9 STORAGE OF PIPELINE MATERIAL

Pipes and fittings shall be stored raised off the ground, and shall be carefully supported, cushioned and wedged. Pipes shall not rest directly on one another and shall not be stacked more than four pipes high. Special care shall be taken to ensure that flexible pipes are cradled and supported in a manner that prevents any distortion of the pipes.

Couplings and joints (and all components thereof) and other similar items shall be stored in dry conditions, raised off the ground in sheds or covered areas.

Where items to be stored have a limited shelf life or require special storage arrangements, the method of storage shall be to the approval of the Engineer-in-charge and in accordance with the manufacturer's instructions.

End covers and protection shall not be removed until incorporation of the pipes and fittings into the Works.

10 MAKING JOINTS

Joints shall be made in accordance with manufacturers' instructions or as specified herein.

Until required for incorporation in a joint, each rubber ring or gasket shall be stored in the dark, free from the deleterious, effects of heat or cold, and kept flat so as to prevent any part of the rubber being in tension.

All pipe ends and flanges shall be cleaned free from grit or other extraneous material before jointing. For push-fit joints only lubricants recommended by the manufacturer shall be used in connection with rubber rings and these lubricants shall not contain any constituent soluble in water conveyed in the pipe. They shall be suitable for the climatic conditions at the Site and shall contain an approved bactericide.

For flanged joints the gasket shall be fitted smoothly to the flange and the joint made by tightening the nuts to finger pressure first. Thereafter the final tightening of the nuts shall be made by gradually and evenly tightening bolts in diametrically opposite positions using only standard spanners of a type approved by the Engineer-in-charge. Graphite grease shall be applied to the threads of bolts before joints are made.

11 CUTTING OF PIPES

Pipes shall be cut by a method which provides a clean square cut of the pipe and of the lining, if any, without damage to pipe or lining. All cut or trimmed ends and the parts of any pipe on which the coating may have suffered damage shall be recoated as specified before the pipes are laid.

The external area at cut ends of asbestos cement pipes shall be turned using approved equipment before jointing in accordance with the manufacturer's recommendations.

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12 PIPELAYING

Pipes shall be laid in accordance with CP 312 and BS 8010 unless otherwise specified herein. No metal tools or heavy objects shall be permitted to come into contact with the pipes or fittings.

Every precaution shall be taken to prevent foreign material from entering the pipes or fittings. During laying operations, no debris, tools, cloth or other material shall be placed in the pipe. Pipes and fittings, and shall be carefully cleaned before jointing.

Pipes shall be laid accurately to the lines and levels shown on the Drawings, within a tolerance of ¼ inch. Pipe alignments shall be straight between bends or curves. Length laid to curves shall only be allowed where shown on Drawings or in accordance with detailed proposals approved by the Engineer-in-charge.

The jointing of pipes shall be made in accordance with the requirements of the relevant Specification. The Contractor shall obtain from the manufacturer all special information regarding the handling of the pipes and the formation of the joints and he will be deemed to have made himself thoroughly conversant with all phases of laying the pipes before submitting his tender. The Contractor shall provide his supervisory staff with the manufacturer's jointing instructions.

A 'badger' or 'bung' about ¼ inch smaller than internal diameter of the pipe shall be kept in the pipe at all times pulled forward as the work progresses. When pipe laying is not in progress, including overnight, the open ends of the pipeline shall be blanked off with a temporary watertight fitting approved by the Engineer-in-charge. The pipe shall suitably held down so that the pipe does not become buoyant in the event of the trench becoming flooded.

13 DEPTH OF COVER AND MINIMUM GRADIENT

The cover above the crown of the pipe shall be as shown on the drawings but in no event shall be less than 1.0 meter.

At anchor blocks the depth of pipe shall be increased, if necessary, so that the top of the anchor block does not project above ground level. The minimum upward gradient shall be 1 in 500 in the direction of flow, or 1 in 300 against the flow.

14 ANCHOR BLOCKS/ THRUST BLOCK

Pipe work without ties shall have anchor blocks provided at bends, tees, tapers, dead ends and, where pipelines have gradients in excess of I in 6, at intervals as shown on the Drawings. The anchor block locations shall be as shown on the Drawings, and at other locations as ordered by the Engineer-in-charge.

Anchor blocks shall be made from concrete Class B and constructed to the dimensions shown on the Drawings. Where faces of anchor blocks are shown to bear against undisturbed ground, the Contractor shall take all necessary measures to ensure that such bearing is given over the full dimension shown.

Anchor blocks shall not be required on curved pipe work formed by joining straight pipe of standard lengths, except at locations ordered by the Engineer-in-charge.

15 WASHOUTS

The design and locations of washouts are shown on the Drawings. Exact positioning shall be determined with regard to topography and be to the approval of the Engineer-in-charge. At least 10 feet of the washout pipe work, inclusive of the isolating valve, measured from the centre line of the pipeline shall be laid at the same time as the pipeline and suitably capped to prevent ingress of foreign material.

16 FLEXIBLE JOINTS AT CONCRETE STRUCTURES

Pipelines entering and leaving concrete structures shall include two flexible joints, at distances from the face of the chamber or structure as shown on the Drawings.

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17 PIPELINES UNDER EXISTING ROADS

The Contractor shall programme the works to reduce disruption to road traffic to a minimum, and before any work commences in existing roads shall:

(i) obtain the full permission and approval of all authorities concerned serving notices of intent to start work as may be necessary and observing all the local Laws and Regulations;

(ii) submit details of his proposals, and obtain approval from the Engineer-in-charge. Pipelines shall cross roads at the angles shown on the Drawings.

Excavations in roads shall be backfilled, above the level of any pipe surround, with granular bedding material, deposited in layers not exceeding 4 inches unconsolidated thickness, fully compacted and brought up to the level of the underside of the sub-base.

Where the pipe cover is less than 3 feet or where directed by the Engineer-in-charge the pipe shall be further protected by a reinforced concrete slab as shown in the drawings.

The roadway shall be reinstated using the form of construction and materials specified by the relevant authority or as directed by the Engineer-in-charge.

18 FLUSHING, FIELD TESTING, AND DISINFECTION OF PRESSURE PIPELINE

18.1 Flushing

Foreign material left in the pipelines during installation often results in valve or hydrant seat leakage during pressure tests. Every effort should be made to keep lines clean during installation. Through flushing is recommended prior to a pressure test.

To reduce the probability of damaging the hydrant sealing surfaces as a result of debris trapped in the hydrant valve during the flushing of a newly installed line, it is important to make sure the hydrant is fully open. After flushing and prior to closing the hydrant, slowly close the gate valve in front of the hydrant to reduce the likelihood of any remaining rocks and debris being trapped in the hydrant seat.

18.2 Hydrostatic Testing

The testing methods described in the following section are specifically for water pressure testing. Hydrostatic pressure and testing allowance checks should be performed at the same time, that is, while pressure is maintained within 5 psi (34.5 kpa) of the test pressure for at least 2 hr. Testing allowance is determined by measuring the quantity of make-up water required to maintain the required pressure level. All newly laid pipe or any valved section thereof should be subjected to a hydrostatic pressure test.

Test pressures should meet the following criteria:

- Not less than 1.25 times the system working pressure at the highest elevation along the test section.
- No less than 1.5 times the system working pressure at the lowest elevation of testing.
- No exceed 1.5 times the pressure rating of the pipe, joint, or thrust-restraint design pressure whichever is less.
- Be at least 2 hr in duration
- Vary by no more than ±5 psi (34.5 kPa) for the duration of the test.
- Not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves, or rubber-seated butterfly valves.

Valves should not be operated in either direction at different pressure exceeding the rated valve working pressure.

Hydrants in a test section should only be tested with the main valve of the hydrant closed.

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Each valved section of pipe should be slowly filled. The specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, is applied by means of a pump connected to the pipe. Valves should not be operated in either the opening or closing direction at differential pressure above the rated pressure. It is good practice to allow the system to stabilize at the test pressure before conducting the hydrostatic test.

Before applying the specified test pressure, air must be completely expelled from the section of the piping being tested. If permanent air vents are not located at all high points, corporation cocks shall be installed at such points so that the air can be expelled as the system is filled with water. After all the air has been expelled, the corporation cocks are closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks should be removed and plugged or left in place as required by the specifications.

Any exposed pipe, fittings, valves, hydrants, and joints should be carefully examined during the pressure test. Any damaged or defective pipe, fittings, valves, hydrants, or joints discovered as the result of the pressure test should be repaired with sound material and the test repeated until satisfactory results are obtained.

18.3 Testing Allowance

Testing allowance is defined as the quantity of make-up water that must be supplied into any newly laid pipe, or valved section thereof, to maintain pressure within 5 psi (34.5 kpa) of the specified test pressure after the pipeline has been filled with water and the air has been expelled. Testing allowance is not measured by a drop in pressure in a test section over a period of time. No pipe installation should be accepted if the amount of make-up water is greater than determined using the following formula:

In inch-pound units,

$$L = \frac{SD\sqrt{P}}{133{,}200}$$

Where:

L = testing allowance (make-up water), gph
S = length of pipe tested, ft
D = nominal diameter of pipe, in.
P = average test pressure during the hydrostatic test, psi (gauge)

In metric units,

$$L_m = \frac{SD\sqrt{P}}{715{,}317}$$

Where:

L_m = testing allowance (make-up water), Lph
L = length of pipe tested, m
D = nominal diameter of the pipe, mm
P = average test pressure during the hydrostatic test, kPa

This formula is based on a testing allowance of 11.65 gpd/mi/in. (1.079 L/day/km/mm) of nominal diameter of pipe at a pressure of 150 psi (1,034 kPa).

When testing against closed metal-seated valves, an additional testing allowance per closed valve of 0.0078 gph/in. (1.2 ml/hr/mm) of nominal valve size is allowed. When hydrants are in the test section, the test should be made against the main valve in the hydrant. Acceptance of an installation is determined on the basis of testing allowance. If any test of laid pipe disclosed a testing allowance greater than that allowed, repairs or replacement shall be accomplished as necessary, until it is within the specified allowance. All visible leaks must be repaired regardless of the allowance used for testing.

18.4 Disinfection

Newly installed water pipelines require disinfection in accordance with ANSI/AWWA C651 and ANSI/AWWA C600. Following chlorination, the main should be flushed as soon as possible (within 24 hr) because prolonged exposure to high concentrations of chlorine may damage the asphaltic

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seal coat. It is important to note that provisions should be made to avoid contamination of existing mains by cross connection during flushing, testing, and disinfection of newly installed mains.

19 MEASUREMENT AND PAYMENT

Measurement and payment of pipe work fittings, specials and appurtenances will be made in accordance with the provisions of this clause specified hereinafter.

19.1 Pipe Work

a) Method of Measurement

Measurement will be made for the number of linear feet/ meter of pipes, acceptably installed complete in all respects as per relevant Drawings or as directed by the Engineer.

b) Basis of Payment

Payment will be made for the number of linear feet/ meter of pipe work as measured above at the Contract Unit Price of each unit and shall constitute full compensation to provide, handle, laying, jointing, testing to required pressure head, disinfecting, final flushing and all other work related to the item.

19.2 Pipe Fittings and Specials

a) Method of Measurement

Measurement will be made for the number of fittings and specials acceptably installed in pipe work complete in all respects as per relevant drawings or as directed by the Engineer.

b) Basis of Payment

Payment will be made for the number of fittings/specials as provided above at the Contract Unit Price and shall constitute full compensation for the cost of providing, handling, fixing and jointing, disinfecting, respective type of fitting/special, and all other work related to the item.

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UNPLASTICISED POLYVINAYLE CHLORIDE (uPVC) PIPES AND PIPE FITTINGS

1. SCOPE

The work under this section of the specifications includes furnishing all plant, labour, equipment, appliances, materials and in performing all operations required in connection with supply, Installation Testing and Commissioning of Unplasticised Polyvinayle Chloride (uPVC) Pipes and Pipe fittings as specified herein, in bill of quantities, and as shown on the drawings and/or as directed by the Engineer.

2. GENERAL REQUIREMENTS

a). Pipes and fittings shall be new and unused.

b). Where manufacturers of pipes and fittings are specified, they shall be of the same manufacturers unless otherwise approved by the Engineer.

c). Where more than one similar items of pipes and fittings are specified, they shall be of the same manufacturer.

d). The Contractor shall submit to the Engineer for approval the following information regarding, the specified/proposed items of pipes and fittings.

i). Name and address of the manufacturers
ii). Country of origin, make and model
iii). Dimensions and wall thicknesses of pipes and fittings
iv). Factory test certificate from the manufacturers
v). Warranty if so provided by the manufacturers
vi). Method of jointing, testing and commissioning

e). Approval by the Engineer shall not be construed as authorizing any deviation(s) from the specifications unless they are specifically brought to notice of the Engineer.

f). Approval by the Engineer shall not relieve the Contractor from any of his contractual responsibility regarding satisfactory performance and other requirements of the pipes and fittings.

3. APPLICABLE CODES AND STANDARDS

All works and materials under this section shall conform to the latest edition of the following applicable codes and standards. When the requirements of these specifications or the drawings exceed the code requirements, the Contractor shall be bound by the specifications and/or drawings for that requirements.

EN 1401
ISO 21138-1

Other authoritative codes and standards which ensure equal or higher quality then those references may also be acceptable subject to satisfaction and approval of the Engineer.

Any conflict between requirements of this specification and those on the figures herein or in the codes, standards and specifications referred to herein shall be brought to the attention of the Engineer for resolution whose decision will be final and binding.

4. SPECIAL REQUIREMENTS

a). Pipes and fittings shall be suitable for the intended use.

b). Every pipe shall be tested at the manufacturer's works to specified hydraulic test pressure. The test pressure shall be maintained for sufficiently long time for proof and inspection.

c). Each pipe and fitting shall be permanently marked or engraved giving the following information:

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i). Manufacturers Name and Trade mark
ii). Manufacturing date
iii). Manufacturing No.
iv). Nominal diameter in mm
v). Class or pressure rating
vi). Manufacturers Inspection mark
vii). Standards according to which the pipe and fitting have been manufactured
viii). Heat number should be embossed on all pipes, fittings and flanges

d). Unless otherwise specified diameters of pipes and fittings shall be nominal. Actual inside and outside diameters and tolerances in diameters of pipes and fittings shall be according to the specified standards.

e). Unless otherwise specified, service ratings of pipes and fittings shall not be less than the maximum pressure to which they will be subjected to.

f). Unless otherwise specified, wall thicknesses of the pipes shall be according to the class, schedule or duty of the pipes. The wall thicknesses shall be measured at locations excluding the jointing ends. The tolerances in wall thicknesses shall be according to the specified standards.

Wall thicknesses of fittings shall not be less than those of corresponding pipes to which they are joined together.

g). Pipes and fittings ends shall be matching and compatible with each other and with the ends of valves and appurtenances to which they are joined.

h). Unless otherwise approved by the Engineer, pipes and fittings, jointing materials such as rubber rings, gaskets, nuts & bolts and jointing compound, etc. shall be of the same manufacturers as those of the pipes and fittings.

5. MATERIALS

5.1. Pipe

uPVC Pipes shall conform to specified or appropriate class of BS 3505 & AWWA Standards.

5.2. Fittings

uPVC fittings and specials shall be of injection moulded of specified appropriate class and shall conform to AWWA Standards. Fittings and specials shall have the required shapes, and dimensions to be joined with the uPVC pipes.

5.3. Material

The material from which the pipe is produced shall consist substantially of polyvinyl chloride, to which may be added only those additives that are needed to facilitate the manufacture of the polymer, and production of sound, durable pipe of good surface finish, mechanical strength and opacity. None of these additives shall be used separately or together in quantities sufficient to constitute a toxic hazard or to impair the fabrication of welding properties of the pipe or to impair its chemical and physical properties.

The pipe material shall not have any detrimental effect on composition of the water flowing through them. The quantities of lead, dialectal tin C4 and higher homologues and any other toxic substances extracted from the internal wall of the pipes shall not exceed the values specified in BS 3505 and AWWA Code/ Manual.

5.4. Joints

uPVC pipes and fittings shall be joined with elastomeric rubber ring (gasket) or shall be solvent welded as specified herein, in bill of quantities or as shown on the drawings and/or as directed by the Engineer. The elastomeric rubber rings shall conform to AWWA Code.

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6. TRENCHING

Pipe trenches shall be excavated upto required depth as indicated in the drawing. The bottom shall be carefully leveled. In-situ field density of trench bottom shall be determined. The bottom shall be compacted if in-situ density is less than 60% of relative density as determined by ASTM D 2043 and AWWA manual M23 or other authorities code. The test shall generally be carried out at spacing of 200 meters. If in some portion soft clayey material or loose material is encountered 300mm of this material shall be replaced by specified bedding material in that reach. If excavation is carried below required depth, the excess excavated part shall be refilled with bedding material at no extra cost to the owner. No bedding material shall be placed nor any permanent work commenced until the trench has been inspected by the Engineer and his permission to proceed to the work is given.

7. INSTALLATION

7.1. Transportation, Handling and Storage

The Contractor shall be responsible for proper transportation, handling (loading and unloading) and storage of pipes and fittings as per the manufacturer's recommendations and direction of the Engineer.

Crane, rope or nylon slings, lifting beams with flattened hooks or scissor-dog shall be used for loading and unloading of pipes and fittings. Hooks and dogs shall be well padded to prevent the pipe being damaged and shall be fitted with locking device. Steadying ropes are essential.

Pipes and fittings damaged during transportation, handling or storage or lowering shall be rejected and replaced at the Contractor's expense. Storage of uPVC pipes, fittings, rubber rings, jointing compound shall be under shade to prevent damage by sunlight and extreme heat.

7.2. Inspection

Pipe and fittings shall be visually inspected for any evidence of damage or hair cracks. The turned ends of pipes and fittings shall be inspected for any local irregularities which could affect the water tightness of the joint. Damaged pipes and fittings shall be rejected and replaced at the Contractor's expense.

7.3. Laying and Jointing

a). Above Ground (Unburied)

Pipelines shall be erected true to the location, alignment and grade as shown on the drawings and/or as directed by the Engineer. All vertical pipelines shall be erected plumb and shall be parallel to wall and other pipelines. All horizontal pipelines shall be kept close to walls and shall be parallel to floor, ceiling or roof and other pipelines. If any deviation is required from the route and arrangement as shown on the drawings, the Contractor shall obtain approval from the Engineer before installation.

Solvent welded joints shall be made water tight with use of jointing compound. The jointing compound shall be spread liberally over the external surface of the spigot end and the internal surface of the socket end. The sockets and spigots shall be joined as quickly as possible after application of jointing compound. The joints shall not be disturbed for at least 30 minutes and the pipeline shall not be subjected to testing at least for 24 hours. Elastomeric joints shall be made with rubber ring. The ring shall be inserted in the groove of the socket end and then the spigot end shall be pushed into the socket. Flanged joints shall be made water tight with gasket, nuts and bolts.

Pipelines passing through wall, floor or roof shall be provided with black steel pipe sleeve. The annular space between the pipe sleeve and the outside diameter of the pipe shall not be less than 12mm. The space shall be filled with approved packing and sealant. Pipelines passing through water retaining structure shall be provided with black steel puddle (anchor) flange. The Contractor shall submit to the Engineer for approval of shop drawings showing the dimensions and thicknesses of the sleeves and puddle (anchor) flanges before installation.

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b). Below Ground (Buried)

Pipelines shall be laid in accordance with the British Code of Practice CP 2010 (Part 2) or American Water Works Association Manual M23 in trenches on a bed of well compacted graded material as specified on the drawings, as specified in the bill of quantities or as directed by the Engineer true to the location, alignment and grade as shown on the drawings and/or as directed by the Engineer.

Backfilling shall be carried out in the specified sequence. Recesses shall be excavated in the bottom and sides of the trench to accommodate fittings and appurtenances. These recesses shall be filled with specified selected bedding material and shall be well compacted manually. Great care shall be taken to avoid abrasion with the pipes. Pipelines that have grades or joints disturbed or dislocated after laying shall be removed and re-laid to the satisfaction of the Engineer.

Pipes fittings and specials shall be lowered into the trench with great care with tackle, shear legs, mobile crane or by methods approved by the Engineer. When lifting gear is used positioning of sling to ensure a proper balance shall be checked when the pipe is just clear of the ground.

All construction debris shall be removed from the inside of the pipe before a joint is made. When the laying is not in progress the open end of the pipeline shall be fitted with a temporary end closure, as approved by the Engineer.

Small changes in direction may be made by deflecting the last laid pipe after the joint has been made. If the alignment requires deflections in excess of specified limit, bends or a number of short lengths of pipes shall be used.

8. TESTING

8.1. General

All sewers built under this contract shall be tested for infiltration or exfiltration as specified below. The tests shall be made at time selected or approved by the Engineer. Sections of the completed sewer shall be isolated and measurements of the infiltration or exfiltration shall be made by approved methods.

8.2. Infiltration Tests

The sewers which are constructed with the ground water level above the crown of the pipe shall be tested for infiltration after the sewers have been installed and backfilling has been substantially completed. The tests and measurement shall be performed by the Contractor in the presence of and in a manner approved by the Engineer. The duration of the tests shall be only long enough to establish the true rate of infiltration. The amount of leakage over a 24 hour period will then be calculated from the result of the measured true rate of infiltration.

8.3. Exfiltration Tests

The sewers which are constructed with the ground water level below the crown of the pipe shall be tested for exfiltration by isolating a section of sewers between manholes by means of approved temporary type of water tight bulk heads. The method of testing for exfiltration shall be generally as follows:

i). After isolation of sewer section, it shall be filled with water to a level which is 3 ft. minimum above the crown of the sewer at the higher end of the isolated section under test.

ii). The duration of the exfiltration test shall be one hour after the filling with water has been completed.

iii). Determination of the amount of exfiltration shall be made by measuring the total loss of volume of water in the manholes.

iv). The amount of exfiltration over a 24 hour period will then be calculated from the measured logs of volume during the test observation period.

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8.4. Allowable Infiltration or Exfiltration

The calculated amount of infiltration or exfiltration over a 24 hour period shall not exceed 500 gallons per inch of pipe diameter per mile of sewer which rate shall be applied to the actual sewer size and length tested to determine the allowable infiltration or exfiltration over the 24 hour period.

If the measured infiltration or exfiltration exceeds the specified allowable limit, then the Contractor shall locate the points of leakage and make necessary repairs as to reduce the leakage to less than the permissible maximum stated above.

8.5. Cleaning of Sewer Lines

The contractor shall clean all the sewer lines at no extra cost with the method approved by the site Engineer prior to handing it over to the Owner.

9. MEASUREMENT OF POLYETHYLENE PIPE

Measurement of acceptable completed works of uPVC pipes and pipe strainer including fittings will be made on the basis of actual length in meter of pipes provided, installed in position, tested, and commissioned as specified herein, in bill of quantities, as shown on the drawings, and/or as directed by the Engineer.

Payment

Payment will be made for the acceptable measured quantity of uPVC pipes and including fittings at the unit rate per meter quoted in the Bills of Quantities and shall constitute full compensation for all the works related to the item.

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VALVES

1. SLUICE VALVE

The gate face rings shall be securely pegged over their full circumference. Valves of 450 mm and above shall be provided with a thrust bearing arrangement for ease of operation. They shall also have renewable channel and shoe linings. The gap between the shoe and channel shall be limited to 1.5 mm. Alternatively, valve of diameter 450 mm and above may be provided with a gear arrangement for ease of operation. The operation gear of all valves shall be such that they can be opened and closed by one man against an unbalanced head 15 % in excess of the maximum specified rating. Valve and gearing shall be such as to permit manual operation in a reasonable time and not to exceed a required rim pull of 400 N. All hand wheels shall be arranged to turn in a clock wise direction for opening and counter clockwise for closing. These directions shall be indicated on the hand wheels. All valves shall be rated for not less than PN 10.

Material of Construction

Body, Bone, Wedge	:	CI conform to ASTM A48/A48M
Spindle	:	SS AISI 431
Seat Ring, Wedge Ring	:	SS AISI 431
Back seat Bush	:	Bronze Confirming to international standard

Parameters

Type	:	Non-rising spindle
Nominal pressure	:	2 times working pressure in pipeline
Nature of operation	:	Horizontal/vertical
Applicable code	:	As per international codes
Tests	:	Acceptance tests as per international codes

2. FIRE HYDRANT

The metal of the fire hydrant shall conform to ASTM Standard and shall be of screw down streamline pattern. The body shall be best quality, closed grain, grey cast iron with spindle of magnese bronze having tensile strength of not less than 11.0 tons per square in machined from solid rolled bars, the seating valves and other parts shall be of best quality gun metal with Brinell Hardness No. 80. The direction of closing shall be by clockwise rotation and outlet shall have screwed joint for accommodating 2" dia hose connection. Inter flanges of hydrant shall be suitable for jointing with flanges of hydrant bends and test. All fire hydrants shall be coated with three coats of solution from an approved manufacturer to give a ~ uniform protective coating on cast iron.

Fittings

Injection moulded & fittings shall be fabricated, compatible with dimensions pipes and conform to the following operating pressures:-

Class “C” pipes upto 9 bars (max, working pressure)

Field Test Pressure

1.5 times the working pressure of pipes.

3. AUTOMATIC AIR RELIEF VALVES

Air Relief Valve shall be designed to meet the following conditions:

a). Discharge air during charging of the pipeline
b). Admit air during emptying of the pipeline
c). Discharge air accumulated at local peaks along the pipeline under normal operating conditions.

Conditions (a) and (b) shall be met by the employment of a large orifice capable of handling large volumes of air at a high flow rate and condition (c) by a small orifice capable of discharging small quantities of air as they accumulate.

Valves with air intake or exhaust facilities shall have approved screening arrangements to prevent the ingress of air borne sand.

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a). Double Acting Air Valves

These shall combine both large and small orifices within one valve. The large orifice shall be sealed by a buoyant rigid ball and the chamber housing shall be designed to avoid premature closing of the valve by the air whilst being discharged. The small orifice shall be sealed by a buoyant ball at all pressures above atmospheric except when air accumulates in the valve chamber.

b). Single Air Valves

These include a small orifice only, operating in a manner identical with the small orifice to a double acting valve. The nominal pressure range shall be PN 16 or as indicated on Drawings.

Body ends shall be flanged with raised faces and drilled to ANSI B 16.1 for the nominal pressure specified or indicated on the Drawings or shall be screwed 25 mm BSPTc male as indicated on the drawings.

The materials for the valves shall be as follows:

Body cover and cowl	:	Cast iron
Small orifice	:	Cast iron with gunmetal seat
Small orifice ball	:	Rubber covered or other approved
Large orifice	:	Cast iron with rubber seat
Large ball	:	Vulcanite covered or other approved

Each valve shall be provided with its own isolating gate valve, or cock, which will permit the removal of the entire valve whilst the pipeline is live.

Valves shall be factory finished with a two-pack epoxy paint system to the approval of the Engineer.

4. PRESSURE REDUCING VALVE

4.1. General

The Pressure - Reducing valve shall reduce higher upstream pressure to lower preset pressure regardless of fluctuating demand or varying upstream pressure.

4.2. Main Valve

The main valve shall be a center – guided, diaphragm actuated, globe valve of either oblique (Y) or angle pattern design. The body shall have a replaceable, raised, stainless steel seat ring. The valve shall have an unobstructed flow path, with no stem guides, bearings, or supporting ribs. The body and cover shall be Cast iron. All external bolts, nuts and studs shall be Duplex coated. All valve components shall be accessible and serviceable without removing the valve from the pipeline.

4.3. Actuator

The actuator assembly shall be double chambered with an inherent separating partition between the lower surface of the diaphragm and main valve. The entire actuator assembly (seal disk to top cover) shall be removable from the valve as an integral unit. The stainless steel valve shaft shall be center guided by a bearing in the separating partition. The replaceable radial seal disk shall include a resilient seal and shall be capable of accepting a V-Port Throttling Plug by bolting.

4.4. Control System

The control system shall be consist of a two - way adjustable, direct acting, pressure reducing pilot valve, a needle valve, isolating check valves, and a filter. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested and factory adjusted.

4.5. Quality Assurance

The valve manufacturer shall be certified according to the ISO 9001 Quality Assurance Standard. The valve shall be complete drinking water valve according to recognized standards.

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PIPELAYING

1. PIPELAYING

Pipes shall be laid in accordance with CP 312 and BS 8010 or relevant European Standards unless otherwise specified herein. No metal tools or heavy objects shall be permitted to come into contact with the pipes or fittings.

Every precaution shall be taken to prevent foreign material from entering the pipes or fittings. During laying operations, no debris, tools, cloth or other material shall be placed in the pipe. Pipes and fittings, and shall be carefully cleaned before jointing.

Pipes shall be laid accurately to the lines and levels shown on the Drawings, within a tolerance of ¼ inch.

Pipe alignments shall be straight between bends or curves. Length laid to curves shall only be allowed where shown on Drawings or in accordance with detailed proposals approved by the Engineer-in-charge.

The jointing of pipes shall be made in accordance with the requirements of the relevant Specification. The Contractor shall obtain from the manufacturer all special information regarding the handling of the pipes and the formation of the joints and he will be deemed to have made himself thoroughly conversant with all phases of laying the pipes before submitting his tender. The Contractor shall provide his supervisory staff with the manufacturer's jointing instructions.

A 'badger' or 'bung' about ¼ inch smaller than internal diameter of the pipe shall be kept in the pipe at all times pulled forward as the work progresses. When pipe laying is not in progress, including overnight, the open ends of the pipeline shall be blanked off with a temporary watertight fitting approved by the Engineer-in-charge. The pipe shall suitably held down so that the pipe does not become buoyant in the event of the trench becoming flooded.

2. DEPTH OF COVER AND MINIMUM GRADIENT

The cover above the crown of the pipe shall be as shown on the drawings but in no event shall be less than 1.0 meter.

At anchor blocks the depth of pipe shall be increased, if necessary, so that the top of the anchor block does not project above ground level. The minimum upward gradient shall be 1 in 500 in the direction of flow, or 1 in 300 against the flow.

3. ANCHOR BLOCKS/ THRUST BLOCK

Pipework without ties shall have anchor blocks provided at bends, tees, tapers, dead ends and, where pipelines have gradients in excess of I in 6, at intervals as shown on the Drawings. The anchor block locations shall be as shown on the Drawings, and at other locations as ordered by the Engineer-in-charge.

Anchor blocks shall be made from concrete (as per BOQ) and constructed to the dimensions shown on the Drawings. Where faces of anchor blocks are shown to bear against undisturbed ground, the Contractor shall take all necessary measures to ensure that such bearing is given over the full dimension shown.

Anchor blocks shall not be required on curved pipework formed by joining straight pipe of standard lengths, except at locations ordered by the Engineer-in-charge.

4. WASHOUTS

The design and locations of washouts are shown on the Drawings. Exact positioning shall be determined with regard to topography and be to the approval of the Engineer-in-charge. At least 10 feet of the washout pipework, inclusive of the isolating valve, measured from the centre line of the pipeline shall be laid at the same time as the pipeline and suitably capped to prevent ingress of foreign material.

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5. FLEXIBLE JOINTS AT CONCRETE STRUCTURES

Pipelines entering and leaving concrete structures shall include two flexible joints, at distances from the face of the chamber or structure as shown on the Drawings.

6. PIPELINES UNDER EXISTING ROADS

The Contractor shall programme the works to reduce disruption to road traffic to a minimum, and before any work commences in existing roads shall:

(i) obtain the full permission and approval of all authorities concerned serving notices of intent to start work as may be necessary and observing all the local Laws and Regulations;

(ii) submit details of his proposals, and obtain approval from the Engineer-in-charge.

Pipelines shall cross roads at the angles shown on the Drawings.

Excavations in roads shall be backfilled, above the level of any pipe surround, with granular bedding material, deposited in layers not exceeding 4 inches unconsolidated thickness, fully compacted and brought up to the level of the underside of the sub-base.

Where the pipe cover is less than 3 feet or where directed by the Engineer-in-charge the pipe shall be further protected by a reinforced concrete slab as shown in the drawings.

The roadway shall be reinstated using the form of construction and materials specified by the relevant authority or as directed by the Engineer-in-charge.

7. PHOTOGRAPHIC RECORD

The Contractor shall submit with the progress report to the Engineer three (03) sets of the Photographic Record containing first quality color photographs of all significant aspects of construction works / activities.

This Photograph Record shall contain approximately (20) color with brief explanation of aspects, sites and date.

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EXPANSION JOINTS

1 DESCRIPTION

The work covered in this Section shall consist of furnishing all plant, equipment, materials and labour and in performing all operations in connection with furnishing and placing in concrete structures all expansion and construction joints for drains, complete and in accordance with the following Specifications, the applicable Drawings, and or as required by the Engineer.

2 MATERIAL REQUIREMENTS

2.1 Preformed Expansion Joint Filler

Unless otherwise directed by the Engineer, preformed joint filler shall conform to the requirement of AASHTO M-213.

2.2 PVC Water Stops

Unless otherwise directed by the Engineer, PVC water stops shall comply with the requirements of BS 2571.

Tensile strength, kg/cm^2	:	140 (minimum)
Elongation, at break, percent	:	300
B.S. Softness	:	45
Specific gravity	:	1.3

3 CONSTRUCTION REQUIREMENTS

3.1 Filled Joints

When joints of the preformed type is required on the Drawings or by the Engineer, the filler shall be placed in the correct position before concrete is placed against the filler. Holes and joints in the filler shall be caused for their being rejected.

3.2 PVC Water Stops

Waterstops shall be furnished and installed in accordance with the details shown on the Drawings or where required by the Engineer and in accordance with the provisions in these Specifications.

Waterstops shall be furnished in full strength for each straight portion of the joint, without field splices. Manufacturer's shop splices shall be fully vulcanised.

Reinforcing bars provided to support the waterstops as required by the Engineer shall be securely held in position by the use of spacers, supporting wires, or other approved devices. Such reinforcing bars used to securely fasten the water stop in position shall not be payable separately such cost shall be deemed to have been included in the unit rate of relative item. If, after placing concrete, waterstops are materially out of position or shape, the surrounding concrete shall be removed, the waterstops reset, and the concrete replaced, all at the Contractor's expense.

Field splices for polyvinyl chloride waterstops shall be performed by heat-sealing the adjacent surfaces in accordance with the manufacturer's recommendations. A thermostatically controlled electric source of heat shall be used to make all splices. The heat shall be sufficient to melt but not char the plastic.
Waterstops when being installed shall be cut and spliced at changes in direction, as may be necessary to avoid buckling or distortion of the web or flange.

Care should be taken so that the PVC water stop does not get punctured during installation, any length damaged or punctured shall immediately be replaced by the Contractor, without any extra cost to the project.

3.3 PVC Installation - Slab Joints

The PVC Waterstop is supported in the horizontal plane so that half of its width shall be cast into concrete approximately half way through the thickness of the slab.

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Care shall be taken to ensure that the waterstop is retained in the horizontal plane and that adequate compaction of concrete takes place below the web of the waterstop so as to avoid honeycombing of the concrete. The second half of the waterstop shall be cast into the adjoining slab, with similar precautions being taken with regard to honeycombing of the concrete.

3.4 Installations - Vertical Joints

The waterstop shall be supported in a similar manner as described for slab joints with great care taken to ensure that the waterstop does not fold over under the weight of poured concrete.

4 MEASUREMENT AND PAYMENT

4.1 Measurement

The quantities to be paid for shall be the number of linear metres of expansion and construction joints placed and completed as per the specification, drawings and to the satisfaction and acceptance by Engineer.

4.2 Payment

The quantities shall be paid for at the Contract unit price for the particular pay item mentioned in BOQ. Payment shall be full compensation for furnishing and placing all materials including preformed joint filler, thermopore and PVC waterstops (fixing the same in position) and for all other costs necessary or usual to the proper completion of the work.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

CEMENT PLASTER

1. SCOPE

The work under this section of the Specification consists of furnishing all plant, labour, equipment, appliances and materials and in performing all operations in connection with providing and installation of cement plaster, and specified external rendering complete in strict accordance with this section of the Specifications and the applicable drawings and subject to the terms and condition of the Contract. The scope of this section of Specification is covered with detailed Specifications as laid down herein.

2. APPLICABLE STANDARDS

Latest editions of following Pakistan, British & ASTM standards are relevant to these specifications wherever applicable.

Pakistan Standard

PS 232 Ordinary Portland Cement

ISO (International Organization for Standardization)

R 597 Definitions and terminology of cement
R 679 Method of testing strength of cements, Compressive and flexural strength of plastic mortar (Rilem - (embureau method)
R 680 Chemical analysis of cement & main constituents of Portland cement
R 681 Chemical analysis of cement - mixer Constituents of Portland cement
R 682 Chemical analysis of cements - determination of sulphur as sulphide

ASTM (American Society for testing and Material)

C 144 Aggregate for Masonry mortar
C 631 Bonding compounds for interior plastering

BSI (British Standards Institution)

BS 812 Methods for sampling and testing of mineral aggregates, sands and fillers
BS 1199 Sands for external renderings internal plastering with lime and Portland cement and floor screeds.
BS 1369 Metal lathing (steel) for plastering
BS 5262 External rendered finishes
BS 5492 Internal plastering

3. GENERAL

a). Except as may be otherwise shown on surfaces specified, all plaster work, both internal and external shall be Sulphate resisting cement plaster of the require d thickness as shown on the drawings.

b). Plastering shall not commence unit all sanitary pipes, rackets, frames and all sorts of inserts and embedded items are fixed in position. It shall be the responsibility of the Contractor to make sure that all such wok is carried out before starting of plaster work. Chiseling and repairing of cement plaster shall not be permitted without the approval of the Engineer.

c). Sample of materials shall be submitted to the Engineer for his approval prior to use in the works.

4. MATERIAL

a). Cement for plaster shall be Sulphate resisting cement (BS 4027 or PS 612) as specified and shall conform to requirements specified in the section “Plain and Reinforced Concrete".

b). Sand for plaster shall comply with the requirements of BS 1199, BS 1200 or the draft Pakistan Standard "Sand for Plaster' as directed by the Engineer.

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c). Water for plaster shall conform to requirements specified in the section for "Plain and reinforced concrete".

d). All materials and workmanship for plaster, not explained in these Specifications, shall comply with the requirements of relevant BS CP 211 and CP 221 as directed by the Engineer.

e). All plaster works shall be water proof with 1:4 cement mixed with approved water proofing agent.

5. PROPORTIONING AND MIXING

a). Measurement of materials by volume shall be by containers of known capacity to maintain consistent proportions. No lumpy or caked material shall be used. Mixing equipment boxes and tools shall be clean. Materials shall be proportioned as specified on the Drawings, in the Bill of Quantities or as directed by the Engineer. Mixing shall be continuous until all ingredients are evenly distributed and thoroughly mixed.

b). Only limited water shall be added for proper workability and such quantity of mortar shall be prepared which can be consumed in thirty minutes after preparation. Preparation of mortar in bulk quantity for use during the entire day or for any other time more than that stipulated above is expressly prohibited. Remembering shall not be permitted and all mortar which has begun to stiffen shall be discarded.

6. PREPARATION OF SURFACE TO BE PLASTERED

Concrete surface to be plastered shall be cleaned to remove all grease, form oil and other surface impurities which will otherwise adversely affect the adhesion of plaster to the surface concerned. The surface of all concrete shall be lightly hacked by approved means to give the required key for plastering.

7. APPLICATION OF PLASTER

a). The plaster of thickness less than the specified thickness shall be rejected. If the plaster is to be more than 13 mm thick, it shall be done in two coats. The surface of first coat shall be made rough before the second coat is applied. The plaster shall not have wavy surface and shall be perfectly in plumb. The edges and corners shall represent a straight line. The plaster shall be kept wet continuously for at least ten (10) days. No extra payment shall be allowed for jambs, junctions, corners, edges, round surfaces or for more than one layer of plaster required due to any unevenness in the work done by the Contractor.

b). Plaster containing cracks, blisters, pits, discoloration or any defects shall not be acceptable. Any such plaster or loose plaster shall be removed and replaced with plaster in conformity with these specifications and as additionally directed by the Engineer.

Contractor shall cut out and patch all defective work at his own cost. All damaged plaster shall be patched as directed by the Engineer. Patching plaster shall match appearance of and shall be finished level with adjoining plaster.

8. MEASUREMENT & PAYMENT

Plaster shall be measured as executed in number or square meters/ feet as shown on drawings and as directed by the Engineer. Payment shall be made for the accepted measured quantity on the basis of unit rate quoted in the Bills of Quantities and shall constitute full compensation for all the works related to the item.

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PRECAST CONCRETE

A) GENERAL NOTES

1. GENERAL

1. Precast concrete units shall be designed and fabricated by an experienced and approved precast concrete manufacturer. The manufacturer shall have been regularly and continuously engaged in the manufacture of precast concrete units similar to that indicated in the project specifications or drawings for at least 10 years.

2. The contractor shall be responsible for providing adequate access to the site to facilitate hauling, storage and proper handling of the precast concrete units

3. Precast concrete units shall be installed to the lines and grades shown in the contract documents or otherwise specified.

4. Precast concrete units shall be lifted by suitable lifting devices at points provided by the precast concrete producer.

5. Field modifications to the product shall not relieve the precast producer of liability regardless if such modifications result in the failure of the precast concrete unit.

2. SUBMITTALS

The following items may be submitted by the contractor to the Engineer-in-charge for approval;

1. Preconstruction Submittals - Submit quality control procedures established by the precast manufacturer.

2. Shop Drawings for Standard Precast Concrete Units for approval by the Engineer-in-charge.

3. Installation and construction information shall be included on shop Drawings.

4. Details of steel reinforcement size and placement as well as supporting design calculations shall be included in the submittals.

3. DESIGN / DESIGN DATA

1. Design standard precast concrete units to withstand indicated design load conditions in accordance with applicable industry design standards [ACI 318, ACI 350, ASTM and AASHTO].

2. Design must also consider stresses induced during handling, transportation and installation in order to avoid product cracking or other handling damage. Design loads for precast concrete units shall be indicated on the shop drawings.

3. The precast concrete producer shall supply precast concrete unit design calculations and concrete mix design proportions and appropriate mix design test data. Structural design calculations shall be signed by a licensed professional Engineer.

4. DURABILITY

1. Precast concrete units shall have a 28-day Cylinder compressive strength as follows,

    a) Precast prestressed column 4500 psi
    b) Precast wall panel 3000 psi
    c) Pedestal Column & footing 3000 psi
    d) R.C.C. wall / beam 3000 psi

2. REINFORCEMENT- All non prestressed reinforcement steel shall be deformed bars conforming to ASTM-A615, Grade 60 having minimum yield strength of 60,000 psi.

3. All prestressed steel / wire strands shall conform to ASTM-A416 of Grade 250.

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5. ANCHORAGE, LIFTING INSERTS AND DEVICES

For anchors, lifting inserts and other devices, the precast concrete producer shall provide product data sheets and proper installation instructions.

The Precast concrete unit dimensions and safe working load shall be clearly indicated.

6. JOINTS AND SEALANTS

Joints and sealants between adjacent units shall be of the type and configuration indicated on shop drawings meeting specified design and performance requirements

7. CONCRETE MIX DESIGN

The precast concrete producer shall submit a mix design for each strength and type of concrete that will be used. Submitted mix designs shall include the specification details.

8. TEST REPORTS

1. The precast concrete producer shall supply copies of material certifications and/or laboratory test reports, including mill tests and all other test data, for portland cement, blended cement, pozzolans, ground granulated blast-furnace slag, silica fume, aggregate, admixtures, and curing compound proposed for use on this project.

2. The precast concrete producer shall submit copies of test reports showing that the mix has been successfully tested to produce concrete with the properties specified and will be suitable for the project conditions. Such tests may include compressive strength, flexural strength, plastic or hardened air content, freeze-thaw durability, abrasion and absorption. Special tests for precast concrete items shall be clearly detailed in the specifications.

B) GENERAL DESCRIPTION

1. MANUFACTURE

1.1. Forms

Manufacturing precast concrete units shall be of the type and design consistent with industry standards and practices. They should be capable of consistently providing uniform products and dimensions. Forms shall be constructed so that the forces and vibrations to which the forms will be subjected cause no damage to the precast concrete unit. Forms shall be cleaned of concrete build-up after each use.

Form release agents shall be applied according to the manufacturer’s recommendations and shall not be allowed to build up on the form casting surfaces.

1.2. Reinforcement

Applicable ASTM International and/or ACI 318 standards for placement and splicing

Cages of reinforcement shall be fabricated either by tying the bars, wires or welded wire reinforcement into rigid assemblies or by welding, where permissible, in accordance with AWS D1.4. Reinforcing shall be positioned as specified by the design and so that the concrete cover conforms to requirements. The tolerance on concrete cover shall be one-third of that specified but not more than 1/2 in. Concrete cover shall not be less than 1/2 in., unless otherwise specified. Positive means shall be taken to assure that the reinforcement does not move significantly during the casting operations.

1.3. Embedded Items

Embedded items shall be positioned at locations specified in the design documents. Welding shall be performed in accordance with AWS D1.1 when necessary. Inserts, plates, weldments, lifting devices and other items to be embedded in precast concrete units shall be held rigidly in place so that they do not move significantly during casting operations.

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1.4. Concrete

1.4.1 Concrete Mixing

Mixing operations shall produce batch-to-batch uniformity of strength, consistency, and appearance.

1.4.2 Concrete Placing

Conventional concrete shall be deposited into forms as near to its final location as practical. Self-consolidating concrete shall be placed in a manner in which it flows and consolidates without segregation or air entrapment. The free fall of the concrete shall be kept to a minimum. Concrete shall be consolidated in such a manner that segregation of the concrete is minimized and honeycombed areas are kept to a minimum. Consolidation efforts are often not required when using self-consolidating concrete. Vibrators used to consolidate concrete shall have frequencies and amplitudes sufficient to produce well-consolidated concrete.

1.4.3 Cold Weather Concreting

Recommendations for cold weather concreting are given in detail ACI 306 R. Adequate equipment shall be provided for heating concrete materials and protecting concrete during freezing or near-freezing weather. All concrete materials and all reinforcement, forms, fillers, and ground with which concrete is to come in contact shall be free from frost. Frozen materials or materials containing ice shall not be used. In cold weather the temperature of concrete at the time of placing shall not be below 45°F. Concrete that freezes before its compressive strength reaches 500 psi shall be discarded.

1.4.4 Hot Weather Concreting

Recommendations for hot weather concreting are given in ACI 305 R. During hot weather, proper attention shall be given to constituents, production methods, handling, placing, protection, and curing to prevent excessive concrete temperatures or water evaporation that could impair required strength or serviceability of the member or structure. The temperature of concrete at the time of placing shall not exceed 90° F.

1.4.5 Concrete Curing

Commence curing operations immediately following the initial set of the concrete and completion of surface finishing.

1.4.6 Curing by Moisture Retention

Moisture shall be prevented from evaporating from exposed surfaces until adequate strength for stripping the precast concrete unit from the forms is reached by one of the following methods:

Cover with polyethylene sheets a minimum of 6 mils thick (ASTM C 171) _Cover with burlap or other absorptive material and keep continually moist _Use of a membrane-curing compound applied at a rate not to exceed 200 sq. ft. per gallon, or per manufacturers' recommendations (ASTM C 309) [Surfaces that will be exposed to weather during service shall be cured as above a minimum of [ ] days. Forms shall be considered effective in preventing evaporation from the contact surfaces. If air temperature is below 50°F the curing period shall be extended.

1.4.7 Curing with Heat and Moisture

Concrete shall not be subjected to steam or hot air until after the concrete has attained its initial set. Steam, if used, shall be applied within a suitable enclosure, which permits free circulation of the steam in accordance with ACI 517.2R. If hot air is used for curing, precautions shall be taken to prevent moisture loss from the concrete. The temperature of the concrete shall not be permitted to exceed 150° F. These requirements do not apply to products cured with steam under pressure in an autoclave.

1.4.8 Surface Finish

Unformed surfaces of wet-cast precast concrete products shall be finished as specified. If no finishing procedure is specified, such surfaces shall be finished using a strike-off to level the concrete with the top of the form.

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C) QUALITY ASSURANCE

1. Qualifications of Manufacturer

Manufacturer shall have a minimum of Ten (10) years of production experience in architectural precast concrete work of the quality and scope required on this project.

2. Qualifications of Erector

Erection of precast concrete panels shall be performed by an established firm regularly engaged for at least two (2) years in the erection of precast concrete panels of sizes similar to those required on this project.

Perform inspection of panels under the supervision of a foreman employed by the erection firm for this type of work.

3. Testing

All testing shall be performed by the manufacturer's in-house quality control inspectors and in accordance with all provisions, Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products as published by PCI.

D) QUALITY CONTROL

The precast concrete producer shall show that the following quality control tests are performed as required and in accordance with the ASTM International standards indicated.

Slump: A slump test shall be performed for each 150 cu yd of concrete produced per mix design, or once a day, whichever comes first. Slump tests shall be performed in accordance with ASTM C 143. Slump flow tests on self-consolidating concrete mixes shall be performed in accordance with ASTM C 1611.

Temperature: The temperature of fresh concrete shall be measured when slump or air content tests are made and when compressive test specimens are made in accordance with ASTM C 1064

Compressive Strength: At least four compressive strength specimens shall be made for each 150 cubic yards of concrete of each mix design in accordance with the following applicable ASTM standards; C 31, C 39, C 192, C 497 [no-slump concrete].

Air Content: Tests for air content shall be made on air-entrained, wet-cast concrete for each 150 cu yd of concrete, per mix design, but not less often than once each day when air-entrained concrete is used. The air content shall be determined in accordance with either ASTM C 231 or ASTM C 173 for normal weight aggregates and ASTM C 173 for lightweight aggregates.

Density (Unit Weight): Tests for density shall be performed a minimum of once per week to verify the yield of batch mixes. Density tests shall be performed for each 100 cu yd of lightweight concrete in accordance with ASTM C 138. Density tests shall be performed for each 100 cu yd of concrete per mix design, but not less often than once per day when volumetric batch equipment is used.

E) INSPECTION

The customer or customer's agent (specifier) may place an inspector in the plant when the units covered by this specification are being manufactured. The precast concrete producer shall give notice of days prior to the time the precast concrete units will be available for plant inspection.

F) SUBMITTALS

1. Samples

a). Before starting the manufacture of precast concrete panels, submit for review to the Architect/Engineer one (1) sample which represents the finished product and which clearly indicates the color and texture of the panels.

b). Samples are to be 12" x 12" face size by 1-½" thick.

c). Label each sample to indicate name of manufacturer and finish code.

d). After standard samples are accepted for color and texture, submit three (3) mock-up panels at least 4'-0" x 5'-0" for review of the Architect/Engineer to show the extreme maximum variations which may occur in the color and texture of the production pieces.

e). The mock-up panels are to be the standard of quality for precast concrete panel work, when they are accepted by the Architect/ Engineer.

f). The Architect/Engineer should visit the precast plant shortly after the start-up of production in order to inspect actual production pieces.

2. Shop Drawings General Contractor shall expedite the submittal with the Architect to conform with allotted shop drawing approval time, shown on the precast concrete supplier's order acknowledgment.

The content shall be as follows:
Unit shapes (elevations and sections) and dimensions.
Finishes
Joint and connection details.
Lifting and erection inserts.
Location, dimensional tolerances and details of anchorage devices that are embedded in or attached to structure or other construction.
Other items cast into panels.
Handling procedures, plans and/or elevations showing panel location and sequence of erection for special conditions.
Relationship to adjacent material
Show location of unit by same identification mark placed on panel.
Individual panel details may be submitted at the request of the Architect/Engineer. It is recognized that a review of the panel details prior to actual release for production will greatly impact the construction schedule.

3. Test Reports

Submit, upon request, reports on materials, compressive strength tests on concrete and water absorption test on units.

4. Design Calculations

Submit upon request structural design calculations.

5. Design Modifications

Submit design modifications necessary to meet performance requirements and field coordination. Variations in details or materials shall not adversely affect the appearance, durability or strength of the units.

Maintain general design concept without altering the size of members, profiles and alignment.

PART II - PRODUCTS

A. MATERIALS

1. Portland Cement

a). ASTM C150, Type I or III cement. White or gray.

b). Use same brand, type and source of supply of cement for all exposed precast concrete.

2. Air Entraining Agent ASTM C979

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3. Aggregates

a). Facing and Backing Aggregates

ASTM C33 and ASTM C330
Provide fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for the entire job. They shall be clean, hard, strong, durable and inert, free of staining or deleterious material.

4. Water

a). Free from foreign materials in amounts harmful to concrete. Potable water is ordinarily acceptable.

5. Reinforcing Steel

a). Reinforcing bars

New billet deformed steel, grade 40 or grade 60, as per ASTM A615.
Weldable deformed steel, as per ASTM A706.
Galvanized reinforcing bars, as per ASTM A775.
Epoxy coated reinforcing bars, as per ASTM A775.

b). Welded wire fabric

Welded steel, as per ASTM A185
Welded deformed steel, as per ASTM A497
Epoxy coated welded wire fabric, as per ASTM A884.
Fabricated steel bar or rod mats, as per ASTM A184
Prestressing strand, as per ASTM A416, grade 270.

6. Cast-in Anchors

a). Materials

Structural steel, as per ASTM A36
Stainless steel, as per ASTM A666, type 304, grade
Carbon Steel plate, as per ASTM A283, grade
Malleable iron castings, as per ASTM A47, grade
Carbon steel castings, as per ASTM A27, grade 60 - 30
Bolts, as per ASTM A307 or A325
Welded headed studs, as per AWS D1.1, Chapter 4, Part F

b). Finish

Shop primer: FS TT-P-86, oil base paint, type I or SSPC-paint 14, or manufacturer's standard.
Galvanized: hot dip galvanized (ASTM A153), electroplated or metallized.
Cadmium coating, as per ASTM A165.
Zinc rich coating: MIL-P-21035, self curing, one (1) component, sacrificial organic coating.

7. Grout

Cement grout: Portland cement, sand and water sufficient for placement and hydration.
Non-shrink grout: Premixed, packaged ferrous and non-ferrous aggregate shrink resistant grout.

B. MIXES

a). Water-Cement Ratio

Maximum of five (5) gallons of water per 94 lbs. of cement.

b). Air Entrainment

Minimum 3% not more than 6% when concrete is placed.

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c). Salt

Calcium Chloride and other ionic compounds which are electrolytic will not be permitted in concrete mix.

d). Super Plasticizer

Can be used at manufacturer's option.

e). Concrete Proportions

Selection of proportions for concrete shall be based on the methodology presented in ACI 211.1 for normal weight concrete, ACI 211.2 for lightweight concrete and ACI 211.3 for no-slump concrete. The concrete proportions shall be developed using the same type and brand of cement, the same type and brand of pozzolan, the same type and gradation of aggregates, and the same type and brand of admixture that will be used in the manufacture of precast concrete units for the project. Accelerators containing calcium chloride shall not be used in precast concrete containing reinforcing steel or other embedded metal items.

Upon request, the precast concrete producer shall submit a mix design for each strength and type of concrete that will be used. Submitted mix designs shall include the quantity, type, brand and applicable data sheets for all mix design constituents as well as documentation indicating conformance with applicable reference specifications.

The use of self-consolidating concrete is permitted provided that mix design proportions and constituents meet the requirements of this specification.

f). Water-Cement Ratio

Concrete that will be exposed to freezing and thawing shall contain entrained air and shall have water-cement ratios of 0.45 or less. Concrete which will not be exposed to freezing, but which is required to be watertight, shall have a water-cement ratio of 0.48 or less if the concrete is exposed to fresh water or 0.45 or less if exposed to brackish water or sea water. For corrosion protection, reinforced concrete exposed to deicer salts, brackish water or seawater shall have a water-cement ratio of 0.40 or less.

g). Air Content

The air content of concrete that will be exposed to freezing conditions shall be within the limits given below.

Nominal Maximum Aggregate Size (in)	**Air Content %**	
	Severe Exposure	**Moderate Exposure**
3/8	6.0 to 9.0	4.5 to 7.5
1/2	5.5 to 8.5	4.0 to 7.0
3/4	4.5 to 7.5	3.5 to 6.5
1	4.5 to 7.5	3.0 to 6.0
1-1/2	4.5 to 7.0	3.0 to 6.0
* For specified compressive strengths greater than 5000 psi, air content may be reduced 1%		

C. MANUFACTURING

Minimum ultimate compressive strength of precast concrete after 28 days shall be a minimum of as shown in the General Notes of Tender Drawing & BOQ.

Water absorption of architectural precast concrete panels shall not exceed a maximum of 6% by weight.

Compression test for precast concrete

Number of tests: Make compression test for each day's production of each type of concrete. Two test cylinders should be made for each load of concrete delivered to the casting bed.

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Specimens

Provide test specimens for compression test at 7 and 28 days.
Obtain concrete for specimens from the actual production batch they will represent.
6" x 12" (or 4" x 8") molded concrete cylinder meeting applicable requirements of ASTM C31.
2" x 2" molded or sawed cubes. Test results will be reduced by 20%.

Finishes

Exposed face surfaces of precast concrete panels: Finished to match the approved sample panel.
Back surfaces of precast concrete panels: Should match approved sample panel.

Curing (Wet Cast)

Form cure precast units until a sufficient stripping strength has developed.
Maintain precast units at a minimum temperature of 33° F until 50% of the design strength has been reached.

Panel Identification

Mark each precast concrete panel to correspond to the code markings appearing on the shop drawings for panel location. Do not mark on the finish surfaces.
Maintain a record of casting date.

PART III - EXECUTION

A. JOBSITE CONDITIONS

Before starting to erect the precast concrete panels, the General Contractor shall verify that the structure and anchorage inserts not within the tolerances required to erect the panels have been corrected.

Determine field conditions before commencing erection.

B. PRODUCT DELIVERY, HANDLING AND STORAGE

Delivery and Handling

Deliver all architectural precast concrete units to project site in such quantities and at such times as to assure the continuation of erection.
Handle and transport units in a position consistent with their shape and design in order to avoid stresses which would cause cracking or damage.

Lift or support units only at the points shown on the shop drawings.

Place non-staining resilient spacers of even thickness between each unit.

Support units during shipment on non-staining shock-absorbing material.

Do not place units directly on the ground.

Storage at Jobsite

Store and protect units to prevent contact with soil, staining and physical damage.

Store units, unless otherwise specified, with non-staining resilient supports located in the same positions as when transported.

Store units on firm, level and smooth surfaces to prevent cracking, distortion, warping or other physical damage.

Place stored units so that identification marks are discernible and so that product can be inspected.

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C. ERECTION

Clear, well-drained unloading areas and road access around and in the structure shall be provided and maintained by the Contractor, to include providing and maintaining accessible roadways in which cranes and trucks can maneuver under their own power.

Contractor shall erect adequate barricades, warning lights or signs to safeguard traffic in the immediate area of hoisting and handling operations. Any overhead obstructions interfering with the erection must be removed by others and any underground equipment installed where cranes and trucks must maneuver is installed at the risk of the trade requiring them and be protected by that contractor.

Set precast concrete units level, plumb, square and true within the allowable tolerances. The General Contractor shall provide true, level bearing surfaces on all fields placed concrete which are to receive precast concrete units. The General Contractor shall be responsible for providing offset lines and elevations in sufficient detail to allow installation.

Provide temporary supports and bracing, as required, to maintain position, stability and alignment as units are being permanently connected.

Non-cumulative tolerances for location of precast concrete units shall be as follows:

Plan location from building grid datum	± ½”
Plan location from centerline of steel	± ½”
Top elevation for nominal top elevation	
Exposed individual panel	± ¼”
Non-exposed individual panel	± ½”.
Exposed relative to adjacent panel	¼”
Non-exposed relative to adjacent panel	½”
Support elevation from nominal elevation	
Maximum low	½”
Maximum high	¼”
Maximum plumb variation over height of structure or 100 ft. whichever is less	1”
Plumb in any 10 ft. of element height	¼”
Maximum job in alignment of matching edges	¼”
Joint width (governs over joint taper)	± ¼”
Joint taper maximum	⅜”
Joint taper over 10 ft. in length	¼”
Maximum jog in alignment of matching faces	¼”
Differential bowing or camber as erected between adjacent members of the same design	¼”

Set non-load bearing units dry without mortar, attaining specified joint dimension with, steel or plastic cement spacing shims.

Fasten precast concrete units in place by bolting and/or welding, completing dry packed joints, grouting sleeves and pockets and/or placing cast-in-place concrete joints, as indicated on approved erection drawings.

Temporary lifting and handling devices cast into the precast concrete units shall be completely removed or if protectively treated remove only where they interfere with the work of any other trade.

D. REPAIR

Repair exposed exterior surface to match color and texture of surrounding concrete.
Adhere large patch to hardened concrete with bonding agent.

E. CLEANING

Precast concrete panels will be clean upon completion of erection and leaving the job site.

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After installation and joint treatment the General Contractor should protect the architectural precast concrete panels against damage and maintain the cleanliness of the panels. Any final wash-down of the precast architectural panels should be the responsibility of the General Contractor.

F. PROTECTION

All work and materials of other trades shall be adequately protected by the Erector at all times.
A fire extinguisher, of an approved type and in operating condition, shall be located within reach of all burning and welding operations at all times.

G. WARRANTY

The Precast Concrete Manufacturer shall guarantee the precast concrete products against defects in material and workmanship, for a period of minimum one (1) year, after acceptance of the units by the owner.

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

PRECAST MANHOLES

1. General

a) Precast concrete units shall be designed and fabricated by an experienced and approved precast concrete manufacturer. The manufacturer shall have been regularly and continuously engaged in the manufacture of precast concrete units similar to that indicated in the project specifications or drawings for at least 10 years. Contractor should submit list of manufacturer for approval from the Engineer in Charge.

b) The Contractor shall be responsible for providing adequate access to the site to facilitate hauling, storage and proper handling of the precast concrete units.

c) Precast concrete units shall be installed to the lines, level and grades shown in drawings and specified here.

d) Precast concrete units shall be lifted by suitable lifting devices at point provided by the precast concrete producer.

e) Field modification to the product shall not relieve the precast producer of liability regardless if such modifications result in the failure of the precast concrete unit.

Note.

i). All manhole steps shall be installed in line with the vertical side of the cone.
ii). The lift inserts and holes shall be completely filled with non shrink grout after manhole installation.
iii). All pipe entrances and connections shall conform to the specification for roads and structures.
iv). All pipe openings shall be cast to elevations specified on sewer plans or to meet job requirements.
v). All concrete surfaces shall be internally and externally sides should be absolute fair finished.
vi). All external and internal concrete surface shall be treated with two coats of hot bituminous emulsion of grade 60/70 at manufacturer's plant / casting yard before placement to the specified locations,.

2. Submittals

Preconstruction submittals-submit quality control procedures established by the precast manufacturer.

Shop drawings for standard precast concrete units for approval by the Engineer in Charge.
Installation and construction information shall be included on shop drawings.

Details of steel reinforcement size and placement as well as supporting design calculations shall be included in the submittal.

3. Design / Design Criteria

Design standard precast concrete units to withstand indicated design load conditions in accordance with applicable industry design standards (ACI 318, ACI 350 ASTM & AASHTO).
Design must also consider stresses induced during handling, transportation and installation in order to avoid product cracking or other handling damage. Design loads for precast concrete units shall be indicated on the shop drawings.

The precast concrete procedure shall supply precast concrete unit design calculations and concrete mix design proportions and appropriate mix design test data. Structural design calculations shall be signed by a licensed professional Engineer.

4. Durability

Characteristics compressive cylindrical strength (fc') of precast & reinforcement concrete at 28 days shall be a minimum of 4000 Psi.

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Reinforcement – all non Pre-stressed reinforcement steel shall be deformed bars conforming to ASTM A 615, Grade 60 having minimum yield strength of 60,000 Psi.

5. Anchorage, lifting inserts and devices

For anchors, lifting inserts and other devices, the precast concrete producer shall provide product data sheets and proper installation instructions.
The Precast concrete unit dimensions and safe working load shall be clearly indicated.
The lift inserts and holes shall be completely filled with non shrink grout after manhole installation.

6. Joints and Sealants

Joints and sealants between adjacent units shall be of the type and configuration indicated on shop drawings meeting specified design and performance requirements.
The manhole joint shall be sealed by approved butyl rubber sealant. The butyl rubber sealant shall be 1'' square and shall conform to ASTM C – 990 and AASHTO M – 198.

7. Test Reports

The precast concrete producer shall supply copies of material certifications and / or laboratory test reports, including mill tests and all other test data, for Portland cement, blended cement, pozzolans, ground granulated blast furnace slag, silica fume, aggregate, admixtures, and curing compound proposed for use on the project.

The precast concrete producer shall submit copies of test reports showing that the mix has been successfully tested to produce concrete with the properties specified and will be suitable for the project conditions. Such tests may include compressive strength, flexural strength, plastic or hardened air content, freeze thaw durability, abrasion and absorption. Special tests for precast concrete items shall be clearly detailed in the specification.

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MANHOLES AND MANHOLE COVER & FRAME

1. SCOPE

The work to be done under this section of the specifications includes furnishing all plant, labour, equipment, application, materials and performing all operations required in connections with construction of manholes complete as specified herein, in accordance with the contract documents, as shown on the drawings or as directed by the Engineer.

2. CONSTRUCTION

All concrete work, steel reinforcement, pipe and pipe fitting, etc. shall be provided and constructed/installed in accordance with the relevant sections of the contract documents. Galvanized ladder rungs, heard duty C.I. cover (under traffic area) and concrete cover (under non traffic area) with C.I. frames to resist 10 Ton wheel load, making of concrete chambers and concrete benching in manholes, complete as specified in the contract documents shall be included in work to be done under this section of the specifications. Depth of manholes shall be considered as difference in elevations of top of cover and invert level of pipe.

3. MEASUREMENT AND PAYMENT

a) Measurement for payment of Manholes shall be made on the basis of actual number provided and constructed. The Contractor's bid against this items shall include construction of complete structures with all installations of pipe, pipe fittings, ladder rungs, cover and frames, reinforcement, concrete, steel work complete in accordance with the contract documents.

b) Payment of manholes shall be made at the applicable unit price per number bid as provided in the Bill of Quantities. The bid amount shall be full payment for the work specified herein.

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INTERLOCKING CONCRETE PAVING BLOCKS

1. DESCRIPTION

The work shall consist of precast concrete paving blocks intended for the construction of low speed roads, parking areas, lay byes, sidewalks, footpath, cycle tracks, industrial and other paved surfaces subjected to all categories of static and vehicular loading and pedestrian traffic. Paving blocks covered by these specifications are designed to form a structural element and the surfacing of pavements, having the block to block joints filled, so as to develop frictional interlock and placed in conformity with the lines, grades, thicknesses and typical cross section shown on the drawings or as directed by the Engineer.

2. MATERIAL REOUIREMENTS

For execution of this item provisions made in BS 6717 shall be applicable.

2.1. Binders and Binder Constituents

Paving blocks shall be made using one or more of the following binders or binder constituents complying with the requirements of the relevant standards.

Ordinary Portland Cement	BS 12
Portland Blast Furnace Cement	BS 146 : Part 2
Portland Pulverized Fuel Ash Cement	BS 6588
Pulverized Fuel Ash	BS 3892 : Part 1
Ground Granulated Blast Furnace Slag	BS 6699

Where pulverized fuel ash is used, the proportions and properties of the combination with Portland Cement shall comply with BS 6588.

Where ground granulated blast-furnace slag is used, the proportions and properties of the combination with Portland Cement shall comply with BS 146 : Part 2.

2.2. Aggregates

Paving blocks shall be made using one or more of the following aggregates complying with the relevant standards:

Natural Aggregates (Crushed or Uncrushed)	BS 882: 1983 (except grading requirements in clause 5
Air Cooled Blast Furnace Slag	BS 1047 : 1083 (except grading requirements in 4.8)
Pulverized Fuel Ash	BS 3892 : Part-1 or Part-2
Ground Granulated Blast Furnace Slag	BS 6699

2.2.1 Acid Soluble Material (Fine Aggregate)

When tested as described in BS 812 : Part 119, the fine aggregate (material passing a 5 mm sieve complying with BS 410) shall contain not more than 25% by mass of acid soluble material either in the fraction retained on, or in the fraction passing, a 600 µm sieve.

2.3. Water

The water shall be of drinking quality or in accordance with the recommendations of Appendix-A of BS 3148: 1980.

2.4. Admixtures and Pigments

Proprietary accelerating, retarding and water reducing agents shall comply with BS 5075: Part 1.
Pigments shall comply with BS 1014.
Calcium chloride shall comply with BS 3587.

2.5. Finishes

The finish should be agreed between the manufacturer and the Engineer.

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Concrete described as "natural colour" shall contain no pigment.
In composite paving blocks the surface layer shall be formed as an integral part of the block and shall be not less than 5 mm thick.

2.6. Binder Content

The cement content of the compacted concrete shall be not less than 380 kg/m^3. For equivalent durability, paving blocks made with binder constituents other than ordinary Portland cement shall have a higher binder content than paving blocks made in a similar way using only Portland Cement. The Engineer will decide the additional binder content. The compressive strength test will be the only guide to the amount of additional binder needed.

2.7. Sizes and Tolerances

2.7.1. Sizes

Paving blocks shall have a work size thickness of not less than 60 mm. Type-R blocks shall be rectangular with a work size length of 200 mm and a work size width of 100 mm. Type-S blocks shall be of any shape fitting within a 295 mm square coordinating space and shall have a work size width not less than 80 mm. The preferred work size thicknesses are 60 mm, 65 mm, 80 mm & 100 mm. The paving blocks sizes and thicknesses may vary as per approved manufacturer and decision of the Engineer.

A chamfer around the wearing surface with a work size not exceeding 7 mm in width or depth shall be permitted. All arises shall be of uniform shape.

2.7.2. Tolerances

The maximum dimensional deviations from the stated work sizes for paving blocks shall be as follows:

Length	± 2 mm
Width	± 2 mm
Thickness	± 3 mm

Where a paving block includes profiled sides, the profile shall deviate not from the manufacturer's specification by more than 2 mm.

2.8. Compressive Strength

The compressive strength of paving blocks shall be not less than 49 N/mm^2 and the crushing strength of any individual block shall be not less than 40 N/mm^2.

2.9. Sampling

The following sampling procedure shall be used for the compressive strength test:

a) Before laying paving blocks, divide each designated section, comprising not more than 5000 blocks, in a consignment into eight approximately equal groups, clearly mark all samples at the time of sampling in such a way that the designated section or part thereof and the consignment represented by the sample are clearly defined. Take two (2) blocks from each group.

b) Dispatch the sample to the test laboratory, taking precautions to avoid damage to the paving blocks in transit. Each sample shall be accompanied by a certificate from the person responsible for taking the sample, stating that sampling was carried out in accordance with this Part of BS 6717.

c) Protect the paving blocks from damage and contamination until they have been tested. Carry out any tests as soon as possible after the sample has been taken.

2.10. Marking

The following particulars relating to paving blocks made in accordance with this standard shall be indicated clearly on the delivery note invoice, manufacturer's or supplier's certificate or brochure supplied with the consignment of blocks:

a) The name, trade mark or other means of identification of the manufacturer.

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b) The number and date of this British Standard, i.e. BS 6717 : Part 1: 1986; or latest revision.

3. CONSTRUCTION REQUIREMENTS

3.1. Laying the Concrete Blocks

The total area to be covered with paving block shall be prepared by:

a) Compaction of subgrade
b) Laying of subbase in a thickness specified
c) Laying of crushed aggregate base or lean concrete in thickness as per typical section

3.2. Tolerance

Tolerance of these layers shall be as per applicable requirement of each item of this specifications.

Payment for each of the above item shall be made under the relative item of work.

The total area will thereby be divided with nylon strings into sectors of not more than 1.5 square meters. This shall be done to control the alignment of paving blocks and to avoid multiplication of deviation in sizes of paving blocks.

4. MEASUREMENT AND PAYMENT

4.1. Measurement

The area to be measured shall be bound by lines shown on the drawings or as directed by the Engineer. Unit of measurement shall be as per Bill of Quantities, measured in horizontal plane.

4.2. Payment

The quantity determined as provided above shall be paid for the unit price of contract shown in Bill of Quantities of paving blocks installed including sand cushion and sand filling in joints and all other work related for installing paving blocks. Cost shall include all labour, materials and equipment for proper completion of work.

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STONE PITCHING

1. DESCRIPTION

Where shown on the Drawings, this work shall consist of furnishing hand-set pitching laid dry or grouted to stabilize slopes or as a protection against water or other erosion to form a flat or cured surface as directed by the Engineer. All materials regardless of type or kinds hall be placed as per the lines and levels called for on the plans.

2. MATERIAL REQUIREMENTS

2.1. Stones

The stones shall comprise good, hard and durable broken boulders or pieces of rock. These shall be sound, dense, resistant to the action of air and water and suitable in all respects for the purpose intended. Stones of Class I or ll shall be used in pitching shall conform to the following specifications. The depth of the stones and their weight shall be as under:-

Class I

Stones ranging in weight from a minimum of fifteen (15) Kg to a maximum of twenty five (25) Kg with at least fifty (50) percent by weight of the stones weighing more than twenty (20) Kg. The depth of the stones shall generally be from twenty (20) cm to twenty five (25) cm and shall be used for heavy pitching to culvert or bridge ends and approaches, wadi diversions, protection for structures, retaining walls, revetment to slopes and where directed.

Class II

Stones ranging in weight from a minimum of ten (10) Kg to a maximum of fifteen (15) Kg with at least fifty (50) percent by weight of the stones weighing more than twelve (12) Kg. The depth of the stones shall vary from fifteen (15) cm to twenty (20) cm and shall be used for lighter pitching where directed to ditches, drains, beams, dykes etc.

2.2. Portland Cement

Portland cement shall conform to the requirements of AASHTO M 85.

2.3. Fine Aggregates

Fine aggregates for mortar shall conform to the requirements of AASHTO M-45.

2.4. Water

Water for cement sand mortar shall be as specified in section 4.2 of “Plain & Reinforced Concrete” in these specifications.

3. CONSTRUCTION REQUIREMENTS

3.1. Dry Pitching

The bed upon which pitching shall be laid, shall be firm or compacted of approved granular material of specified thickness and to the required grades and lines as shown on the plans or as directed and approved by the Engineer. The stones shall comprise roughly dressed and shaped, set on their edges with their longest dimension at right angles to the flow of water.

These shall be securely bedded, breaking bond closely packed with any interstices locked and filled by selected stone spalls hammered in. The loose pitching specified in plans shall be placed by dumping and spreading in layers by hand or other methods approved by the Engineer all to secure a stable mass. The ends of pitched areas shall be protected from undermining by the use of edge stones at least twice the general size and weight set on end. In large or slope areas of pitching, key stones shall be provided at the rate of one per square meter, at least one and a half times the general size and weight, set on end.

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The pitching to the batters of the earth works and diversions of waterways shall be carried down in trench to such a depth as will ensure a sound footing for the lowest course. Subsequent to pitching the trench shall be backfilled to normal ground level with approved, well compacted suitable material.

3.2. Grouted Pitching

Specified stones shall be arranged in such a way that the largest stones are at the base of the slope. The surfaces of the rock shall be cleaned of adhering dirt and clay and shall be moistened. Stone in the bottom courses and to a vertical height and thickness as per plans shall be carefully arranged by hand to inter lock and so as to yield true and even surface with minimum voids and conforming to the contour required. Pitching laid in cement mortars of 1:3 shall be furnished in panels with weep holes, the joints between panels being approximately two (2) cm in thickness and extending the full depth of the pitching the joints shall be filled with sand bitumen mixture consisting of approximately one part by weight of bitumen heated as necessary to two parts by weight of a clean sharp sand. The dimensions of the panels shall be approximately two meters square but the precise dimensions in any instance and the spacing of the weep holes shall be as required by the Engineer. In laying the pitching the lines of the panel joints shall be picked out with a straight fillet laid on the face of the earth works and the stones set up carefully to the edge of the fillet. Subsequent to laying the pitching the fillet shall be removed and the joint caulked with the sand bitumen mixture as above. The exposed surface of the stones shall project not less than four (4) centimeters and not more than eight (8) centimeters of the grout surface. The grouted stone pitching shall be cured by an approved method for a minimum period of four (4) days and after expiration of the curing period, the exposed surfaces shall be cleared of all curing mediums.

4. MEASUREMENT AND PAYMENT

4.1. Measurement

The quantities shall be measured by the square meter of completed and accepted work placed to the designated thickness of slopes including the toe walls as shown on drawing. Toe walls shall be measured by the height times the length, and no additional payment will be made for the additional thickness of the toe walls when compared to the slope thickness.

Measurement shall be based on the dimensions shown on the drawings or as otherwise authorized by the Engineer. These items shall include the furnishing of all material, placing and grouting stone pitching. Excavation, backfilling and slope preparation shall not be measured for payment, but will be considered subsidiary to the item of "Stone Pitching".

4.2. Payment

The amount of completed and accepted work as measured above shall be paid for at the contract unit price for each of the pay items specified in the Bill of Quantities, which price shall be full compensation for furnishing all materials, for all labour, equipment, tools, supplies, and all other item necessary for the completion of the work.

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CEMENT CONCRETE SOLID BLOCK MASONRY

MATERIAL

1 COARSE AGGREGATE

The coarse aggregate for the cement concrete shall be gravel obtained by screening usual mixture of gravel and sand locally known as bajri. The contractor shall screen the bajri through ¾" and 3/16" sieves as many times as may be necessary to obtain such material as shall pass 100% through ¾" sieve and shall all be retained on the 3/196" sieve. If compact block moulding and vibrating machines are used the grading of material shall be specified by the makers if not specified by the maker as found satisfactory by the Engineer in-charge for the particular type of machine in use. The Engineer in-charge shall test a representative sample for the aggregate collected by the contractor at the site from time to time and if this sample dose not conform with the above grading the entire gravel collected by the contractor will be liable to be rejected.

The gravel shall be free from soft, friable, porous flaky, elongated or laminated pieces. The gravel must also be free from dirt, silt, clay shale, alkali, or organic matter. It shall be sufficiently strong to utilize the full strength of cementing material.

2 FINE AGGREGATE / SAND

The fine aggregate shall be non plastic material and shall consist of sand, stone screenings or other approved inert materials with similar characteristics or a combination thereof and shall not contain more than 3% of material passing sieve # 200 by washing and not more than 1% of clay lumps or shale. The fine aggregate / sand shall be uniformly graded and when tested as per ASTM C-117 & C-136, shall meet gradation requirements given in Table 3-3.

3 CEMENT

The cement shall be fresh and of approved origin and manufacture, it shall be one of the following as may be specified by the Engineer. Ordinary or Rapid Hardening Portland Cement complying whit the requirement of P.S 232 or B.S 12. Sulphate-Resisting Portland Cement complying with requirement of P.S 612 or B.S 4027. Unless otherwise specified, ordinary Portland cement complying with the requirement of B.S 12 shall be used.

There shall be sufficient cement on site to ensure that each section of work is completed without interruption. If the cement is supplied by the Employer, the contractors shall inform the Employer of his requirements much before its use in construction. Cement reclaimed from cleaning of bags or from leaky containers shall not be used.

The contractor shall provide and erect (at the cost) in a suitable place dry, well ventilated, weather-proof and waterproof shed of sufficient capacity to store the cement. The cement shall be used as soon as possible after delivery and cement which has become stale or unsuitable through absorption of moisture from the atmosphere or otherwise shall be reject and remove immediately from the site at the contractor's expense. Any cement in containers damaged so as to allow the contents to spill or access of the atmosphere to the cement prior to opening at the time of concrete mixing shall be reject and removed immediately from the site at the contractor's expense.

No cement stored through a monsoon or for more than six months should be used in reinforced concrete unless the test specified have been applied and cement found up to the requisite standard. The mixing together of different types of cement will not be permitted.

4 PROPORTIONING

The unit of measure shall be one bag of cement, the standard proportioning for block of 1:3:6 cement concrete, if a bag of one Cft. is used shall be:-

Cement – 1 part (1 Cft); Sand – 3 parts (3 Cft); Gravel-6 parts (6-Cft).

If a bag of 1.2 Cft. is used the standard proportioning shall be:-

Cement 1 part (1.2 Cft.)
Sand 3 part (3.5 Cft.)
Gravel aggregate 6 parts (7.2 Cft.)

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The cement must on no account be measured volumetrically. The water will be measure in four gallon kerosene oil tin which should have sub-divisions reading up to ½ gallon clearly marked on its inside with paint. The slump will be specified and intimated to the contractor by the Engineer and the contractor will have to maintain the specified slump throughout.

5 MIXING

The mixing shall be done in approved mechanical mixers of which the rates capacity for this class of concrete shall not be less than 10/7 cubic feet (10 Cft) total dry material, i.e., sum of volumes of aggregates and cement and Cft. mixed concrete for 1 cubic foot bag batch, and 14/10 for 1.2 cubic feet bag match.

After all the material is loaded into the drum, the concrete shall be mixed until it is uniform in colour and consistency but for not less than 1-1/2 minutes. Every effort shall be made to control the speed of rotation, to conform to the manufacturer's recommendations. No more concrete shall be mixed than can be used before the initial set has been commenced.

BLOCK MOULDING

The forms shall be of steel fabricated. These should be true to dimension. The internal dimensions of these forms for the various sizes of blocks shall be such that the finished blocks can be conveniently handled by a labour and also such that header and stretcher courses similar to brick work can be laid for all walls of greater than 6 inches thickness and the height of any coarse (for any thickness of wall) does not exceed 6 inches. The forms shall be so fabricated that they retain their true shape throughout the period of their use.

The finished block shall be true to shape, i.e., every face shall be a perfect rectangle exactly parallel to the opposite face and exactly perpendicular to the adjoining faces. Blocks with broken edges or which are skew will not be allowed to be used on the work and must be removed from the site of work within 24 hour of their being rejected.

After 2 days in the case of machine moulded blocks and 3 days in the case of manually moulded blocks they may be removed and stacked to not more than 3 feet height. The block stacks are to be kept wet for a period of 10 days. The blocks will be allowed to dry for 10 days after curing before being used on the work. The blocks cast on different dates must be separately stacked; the date of casting proportion and number of block in each stack being clearly indicated by writing on a "T" to be erected in the ground near the stack.

6 PROPORTION OF MORTAR

The sand for the mortar shall be that obtained from Malir or other approved quarries. The material passing 3/16 inch sieve shall be used as sand. The mortar shall be mixed in the proportion specified in the schedule of quantities. The required quantity of sand (for one bag of cement only) will be measured and shall be mixed dry by turning over and over till all particles of sand are well coated with cement. Minimum quantity of water to ensure work-ability will be added and then mortar turned over and over until homogeneous. The mixing be done on water tight platforms as specified for cement concrete. Only sufficient mixture will be wetted as can be used within half an hour of mixing.

7 WORKMANSHIP

The block masonry is to be English bond and no more bats shall be used than are necessary to complete the bond. The height of any course shall not exceed 6 inches. Special care shall be exercised in selecting the block face which will be pointed. The better face being on the side of pointing and inferior face being on the side of plaster. For walls of greater than 6 inches thickness header and stretcher courses similar to brickwork must be used.

In laying each course must be truly level and in perfect bound. All blocks being thoroughly bedded and finished with mortar. The thickness of joints shall not exceed ½ inch. The walls must be carried up regularly and no portion of the work be left more than 3 feet lower than any other. Temporary steps during the construction must be raked according to the bound and not toothed so that when the work is contained the new blocks will be laid over those previously laid and no between them. All masonry work will be kept wet for at least 10 days after it is laid.

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PRESTRESSING REINFORCEMENT STEEL

1. DESCRIPTION

Prestressing steel shall be high tensile wire conforming to ASTM Specification 4-421 or AASHTO Designation M-204; strand or rope conforming to ASTM specification A-416 or AASHTO Designation M-203 or high tensile alloy bars as follows:

High tensile-strength alloy bars shall be stress relieved and cold stretched to a minimum of 9,100 Kg/sq.cm. After cold stretching the physical properties shall, be as follows:

i)	Minimum Ultimate tensile strength	16,570 Kg/sq.cm
ii)	Minimum yield strength measured by the 0.7 percent extension under load method shall be not less than	9,100 Kg/sq.cm
iii)	Minimum modulus of elasticity	1.75x 10 Kg/sq.cm
iv)	Minimum elongation in 20 bar dia meter	4 percent
v)	Diameters after rupture	- 0.75 mm
vi)	Diameters tolerance	- 0.25 mm

The steel shall be free from injurious defects and shall have a smooth surface. Material, which shows injuries defects during or prior to its installation in the work, shall be rejected. Wire and strand shall be supplied in coils of sufficient diameter to ensure that they lie out straight.

The Engineer may call for a relaxation test on prestressing steel in case, he is not satisfied with the source of manufacture. Relaxation for prestressing steel shall be measured over a period of thousand (1000) hours stressed at seventy (70) percent of its ultimate tensile strength giving less than six (6) percent elongation.

a) Testing

All wires, strands, or bards to be shipped to the site shall be assigned a lot number and tagged for identification purposes. Anchorage assemblies to be shipped shall be likewise identified.

All samples submitted shall be representative of the lot to be furnished.

All of the materials specified for testing shall be furnished free of cost and shall be delivered in time for tests to be made well in advance of anticipated time of use.

The contractor shall furnish for testing the following samples selected from each lot as ordered by the Engineer. The selection of samples shall be made at the manufacturer's plant by the Engineer or his representative.

Pretensioning Method Samples at least 2.10 M long shall be furnished of each wire or strand size. A sample shall be taken from each and every coil.

Post-Tensioning Method Samples of the following lengths shall be furnished:

For wires, sufficient length to make up one parallel-lay cable one and half (1.5) M long consisting of the same number of wires as the cable to be furnished. For strands, one and half (1.5) M length shall be furnished.

For bars to be furnished with threaded ends and nuts, one and half (1.5) M between threads at ends.

Anchorage Assemblies Two anchorage assemblies of each size of anchorage to be used shall be furnished, complete with distribution plates.

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COMMON BACKFILL

Common backfill shall consist of earth free from large lumps, wood and other organic materials and of a quality acceptable to the Engineer. It shall be placed in the position and to the required depths shown on the Drawings and/or as required in writing by the Engineer and it shall be well compacted in layers not to exceed twenty (20) cms in depth to the density, 95 percent of maximum dry density, as per AASHTO T -180 (D).

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

CONCRETE PAVEMENT

1. DESCRIPTION

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

2. MATERIAL REQUIREMENTS

2.1 Concrete

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

2.2 Reinforcing Steel

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

2.3 Polythene Sheeting

Polythene sheeting for placing immediately below concrete slabs shall be 0.065mm thick or having a minimum weight of fifty (501 grams per square meter (whichever is greater) made from polythene or other approved hydrocarbon thermoplastic resin (produced by the polymerization of ethylene under high pressure and density) and given an anti-static treatment to reduce dust attraction and reduce friction. The sheeting shall have the minimum mechanical properties shown in table as under:

PROPERTIES OF POLYTHENE SHEETING

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

2.4 Joint Filler

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

2.5 Joint Sealing Compound

Joint sealing compound is to be as BS 2499(1973) type A1 or A2, or as approved by the Engineer.

The compound is to be impermeable, is to withstand all weather conditions and is to be capable of adhering to the concrete without cracking, spalling or disintegrating and will not require an impracticable condition of dryness or cleanliness of the concrete slabs.

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

2.6 Dowel Bars

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

2.7 Expansion Caps

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

2.8 Darkening Agent

Darkening agent for the top course of concrete pavements if ordered and specified shall be a carbon black; either as an aqueous dispersion containing at least 25% of solids, to be added to the mixing water, or as a self-dispersing powder to be added to aggregate and cement. It shall be approved by the Engineer as non-deleterious and as giving a grey colour and shall be added at the rate of 0.1 % by weight of the mixed concrete if it is aqueous dispersion. The minimum quantity of self-dispersing powder' shall be 0.025% by weight of the concrete aggregate.

The darkening agent shall be free from sulphur trioxide and from any other matter deleterious to concrete.

2.9 Crack Inducing Battens

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

2.10 Sampling and Testing

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

3. CONSTRUCTION REQUIREMENTS

3.1 Pavement Base

The base upon which the concrete pavement is laid shall be leveled compacted and true to the grades and cross-sections shown on the plans and shall-be so maintained, as provided under such other items throughout the period of placing concrete pavement.

To ensure the proper depth and section, a scratch template true to depth and section and resting on accurately set side forms shall be moved over the surface immediately before placing concrete; and any irregularities shall be immediately corrected. High spots shall be planed down and the Contractor shall have the option of either filling low spots to the proper elevation with approved material, which shall be watered compacted and struck off to the required grade or of placing additional concrete. No measurement or payment will be made for such additional concrete.

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Until the subgrade has been checked and approved, no material shall be deposited thereon. Storing or stock piling of materials on the subgrade and placing of surfacing material or laying of pavement on muddy or frozen subgrade will not be permitted.

3.2 Forms

Side forms shall be made of metal of an approved section and construction provided with adequate devices for secure setting so that when in place, they shall withstand the impact and vibration of the compacting and finishing equipment with settlement not exceeding 1.5 mm in three (3) meters form a true plane surface on the top of the form and inside face shall not vary more than six (6) millimeters from a plane surface. The width of the bases of steel forms shall be not less than their height except that the forms having a base not less than two-third(2/3) of their height and meeting all other requirements herein may be used for manual laying of non rectangular bays

The depth shall be equal to the thickness of the pavement at the edge or as shown on the plans. The forms sections shall be tightly joined by each joint free from play in any direction. These forms shall be stacked with steel stakes and shall be of a length approved by the Engineer. Each section of forms shall have stake pocket at each end and at intervals of not more than one and one-half (1:5) meters between ends.

Each section of forms shall be straight and free form bends and warps at all times

Side forms for machine placing Shall have rolled section steel rails which shall be of adequate stiffness to carry the laying, compaction and finishing machines.

These machines shall not run on folded sheet metal form tops. The top faces of the forms are to be carefully cleaned and maintained. The forms shall be without horizontal joints and with flange braces extending outward on the base not less than two-thirds the height of the forms. Each stack pocket shall be equipped with a positive non-detachable wedge. These forms shall be placed by using at least three steel pins of the size and length approved by the Engineer or as shown on the plans. They shall be equipped with positive locking devices which will permit neat tight joints and do not deform under impact vibration by thrust Pins for stacking forms in place shall be made of steel at least two(2) centimeters in diameter as directed by the Engineer in case of impractical use.

Wooden forms may be used for curves having a radius of less than fifty (50) meters. They shall be made of two and half (2.5) centimeters well seasoned surfaced planks fastened together and shall be attached securely to a wooden base in width. All wooden forms shall be braced at least every sixty(60) centimeters with steel pins of the size and length here in specified. Straight forms shall be set out as chords to convex edges and as tangents to concave edges, but payment will not be made for concrete outside the curved edges shown on the Drawings

Before placing forms the underlying material shall be excavated to the required grade, and shall be firm and compact. The forms shall have full bearings upon the foundation throughout their length and shall be placed with exactness to the required grade and alignment of the edge of the finished pavement.

Forms shall be set to the required lines and grades well in advance of placing concrete, preferably not less than two hundred (200) meters. Forms shall not be removed for at least twelve (12) hours after the concrete has been placed. Forms shall be carefully removed in a manner to avoid damage to the pavement. Under no circumstances will the use of pry bars between the forms and the pavement be permitted. Pavement which in the opinion of the Engineer is damaged due to the careless removal of forms shall be repaved by the Contractor as directed by the Engineer at the Contractor's own expense.

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

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

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3.3 Composition and Compressive Strength of Concrete

1. Composition

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

i). Compressive Strength, 28 days minimum	250 kg/sq. cm.
ii). Cement content, sacks (50 Kg)	7.5 (min.)
iii). Water cement ratio, maximum	0.45
iv). Slump	25-75 mm
v). Entrained air, percent	3+0.6
vi). Nominal size of aggregate	1 ½" Max

Admixtures/ Plasticizers/ Fibers

Admixtures shall only be allowed to be used with written permission of the Engineer. If air-entraining agents, water reducing agents, set retarders or strength accelerators are permitted, the dosage of fiber shall be determined after consideration of the dosage recommended by the manufacturer.

Polypropylene Fibers (PPF) shall be allowed to be used with written permission of the Engineer. The dosage of fiber shall be determined after consideration of the dosage recommended by the manufacturer.

For water proofing (mitigation of water penetration) of concrete, admixtures may be used. These additives shall be lingosulphonate polymer based water proofing cum plasticizing admixtures. The product must be free of chlorides and shall have a specific gravity not less than 1.17 and shall comply with ASTM C-494 Type A & D.

The Contractor shall submit concrete mix design for approval, prior to the commencement of work. No work shall be carried out without getting written approval of concrete Design Mix from the Engineer.

b). At least 35 days prior to the start of paving operations and after approval of all materials to be used in the concrete, the contractor shall submit for approval, the mix design he intends to use based on proportioned weights of cement, air entrainment agent, saturated surface dry aggregates and water. This mix design will be tested by the Engineer and approval will not be granted unless the average twenty eight (28) days compressive strength exceeds the minimum strength requirement by at least 15 percent. However the Engineer may allow paving operation on the basis of seven (7) days strength if he is satisfied with the results of seven (7) days strength.

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

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

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

2. Consistency

The required consistency of the concrete mixture shall be such that the mixture will be cohesive, uniform and plastic, permitting proper handling and finish. When deposited it shall not flow, but shall remain in a conical pile. There shall be minimum of segregation and surplus water during the process of handling and finishing. The slump shall be determined by AASHTO T119-74 except that during the course of construction control of concrete may be accomplished by the

ball penetration as outlined in AASHTO T183-72. Two and a half (2.5) centimeter ball penetration is considered equivalent to a slump of five (5) centimeters.

The cement content shall be determined by means of a yield test in accordance with AASHTO T121-74.

3.4 Batching and Mixing

Concrete shall either be batched and mixed at a central batching and mixing plant or batched at a central batching plant for either mixing in field mixers adjacent to the forms for slabs, or mixed in a truck mixer. When cement is supplied in bags, each batch of concrete shall contain a whole number of bags of cement.

i). Batching Equipment

All aggregates and bulk cement for use in pavement shall be batched by weight by means of automatic devices, of approved type conforming to the requirements specified below.

The batching shall consist of dividing- the aggregates into three sizes, each stored in a separate bin, of placing the cement in another bin, and of recombining these ingredients as herein provided.

Material discharged from the several bins shall be controlled by gates or bar mechanical conveyors. The means of withdrawal from the several bins and of discharge from the weigh box shall be so interlocked that not more than one bin can discharge at a time; that the order of discharge can be changed as desired by the Engineer.; and that the weigh box cannot be tripped until the required quantity from each of the several bins has been deposited therein. Should a separate weigh box be used for each size of aggregate, all bins may be operated and discharged simultaneously. The discharge shall be so regulated that the amount of material discharged into the weigh hopper from any bin, with weighing devices at rest, will be within two (2) kg of the weight called for by the scale setting for the bin.

When the discharge from the several bins is controlled by gates, each gate shall automatically lock in an Open or partially open position until the required weight is discharged into the weigh box, after which the gate shall automatically close and lock.

Scales utilised in the batching device may be of the springless dial type or of the multiple beam type.

If they are the dial type, the dial shall be of such size and so arranged that it may be easily read from the ground. The automatic weighing device of the dial scale shall be so marked that the number of proportions required may be set on the dial at the same time and that proportions may be changed without delay

If they are the multiple beam type, the separate beams shall be automatically connected to the hopper or weigh box in sequence. Multiple beam scales shall be provided with an indicator operated by the main beam which will give positive visible evidence of over or under weight. The indicator shall be so designed that it will be operated during the addition of the last seventy kilograms of any weighing. The overtravel of the indicator hand shall be at. least one-third of the loading travel. Indicators shall be enclosed against moisture and dust

The beams or dial of automatic scales shall be so arranged that the weighing units will be in a compartment that may be locked at the requirement of the Engineer

It is the intention of this Specification that the device shall be automatic to the extent that the only manual operation required for combining the ingredients for one batch shall be a single operation of a switch or a starter.

All receptacles used for. weighing materials, together with the scales of any kind used in batching materials, shall be so insulated against the vibration or movement of the rest of the plant due to any operating equipment, that the error in weighing with the entire plant running will not exceed two per cent of any setting nor exceed one and a half per cent of any batch.

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Should separate supplies of aggregate materials of the same size group, but of different moisture content, be available at the batching plant, withdrawals shall be made from one supply exclusively and the material therein completely exhausted before starting on another.

The moisture content of the aggregate shall be such that no visible separation of moisture and aggregate will take place during transportation from the batching plant to the point of mixing. Aggregates containing excess moisture shall be stockpiled prior to use until sufficiently dry to meet the above requirement

Except where small quantities of concrete only are to be used., when the Engineer may permit otherwise, the equipment for batching of concrete materials shall conform to the following requirements

The batching equipment shall be substantially constructed on a firm foundation, high enough above trucks being loaded to function properly. It shall have three (3) bins and a weighing hopper. The bins shall have a total capacity of not less than 100 tons, and the partitions between them shall extend not less than one(1) meter above the bins. The bins shall be equipped with baffle boards so as to assist drainage of the aggregates and prevent the drained out water from passing through the outlet gate. AI platform shall extend around the weighing hopper for easy means of inspection, adjustment and weighing

The weighing hopper shall have a single compartment with arrangements for ready removal of excess material, and with a discharge gate opening parallel to the portion. of receiving trucks. The amount of opening of the discharge gate shall be readily controlled. There shall be sufficient clearance at all points for the weighing hopper to function properly. The weighing scale shall be of the beam or springless dial type of standard design and make, and shall be able to record the true weight within two (2) kg at maximum load. The beam type shall have separate beams for each size of aggregate, and each beam shall have an easily operated locking device. A dial which will show the weight when the load is within forty five (45) kg of that required and an approved signal device shall be provided.

The weighing scales shall be arranged for ready standardization, and with each scale shall be furnished a set of standard weights including seven 25 kg, two 10 kg, two 5kg and two (2) kg weights. For batchers of capacity of half (112) cubic meter or less, the standard weight to be furnished shall be as approved by the Engineer. The tolerance to these scales shall be within those listed in table 3 of the US national bureau of standard NBS handbook 44. The standard weights shall be protected against the defacement and injury, and shall be easily to handle and attached. All parts of the weighing devices and appurtenance of the batching equipment shall be substantially made and shall be maintained in proper operating condition. If in the opinion of the Engineer, any part or all of the weighing devices or other appurtenances are not satisfactory, they shall be replaced in satisfactory at the Contractor's expense.

In lieu of the automatic devices for controlling the weighing of the aggregates and bulk cement as described in the forgoing specification for batching equipment, the Contractor may be permitted to substitute manually controlled devices, provided approval for such devices is granted by the Engineer.

ii). Unloading and Hauling Equipment

Aggregate shall be transported from the batching plant to field paver mixers in batch boxes, vehicle bodies or other containers of adequate capacity and construction to carry the volume required, properly.

Partitions separating batches shall be adequate and effected to prevent spilling from one compartment to another while transit or being dumped. Where-cement-is stored in bulk, the contractor shall use a suitable method of handling the cement from weighing hopper to transporting container or into the batch itself for transportation to mixer, with chute, boot or other approved device, to prevent loss of cement and arranged to provide positive assurance of the actual presence in each batch of the entire cement specified

Loose cement shall be transported to the mixer in waterproof compartments carrying the full amount of the cement required for the batch or it may be carried in compartments covered by the aggregate. Batches where cement is placed in contact with the aggregates may be rejected unless mixed within one and a half hours of such contact. Cement in originally shipping

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packages may be transported on top of the aggregates, each containing the number of bags required by the job mix

Batches shall be delivered to mixer separate and intact. Each batch shall be dumped cleanly into the mixer without loss of cement, and when more than one batch is carried on the truck without spilling of material from one batch compartment into another.

iii). Batching to Central Mixing Plant

At a central mixing plant, batches shall be discharged from the weighing, hopper into the mixer either directly by gravity or by elevating container, large enough to contain the batch. The plant shall be arranged to ensure that there is no loss of cement during transfer frdm the weighing hopper to mixer drum

iv). Field Mixing Equipment

The concrete mixer shall be a batch mixer so designed as to ensure positive, uniform distribution of materials throughout the mass. The size and type of mixer used on various classes of work shall be as specified below and shall be approved by the Engineer. For all work, where the volume of concrete to be placed justifies it, the mixer shall have a capacity of not less than one cubic meter, shall be of approved make and acceptable to the Engineer, and shall comply with the following requirements.

Mixers shall have a locking device preventing the mixture from being discharged before the expiration of the specified mixing time; an automatic locking device preventing materials being placed in the mixer before discharge gate is closed; a regulator that will maintain the rate of speed for which the mixer has been designed; a signal device that will function when water is added; a vertical water tank with an automatic device that will measure and discharge the required volume of water; valves to prevent overflow into the mixing chamber or on to the ground when the discharge valve is closed and into the tank when open; and valves and piping in proper order to prevent any leakage. The automatic device for measuring and discharging the required volume of water shall be arranged to discharge a predetermined volume, to be easily adjusted to discharge a larger or smaller volume, and to register the volume discharged accurately on a gauge or dial which shall be calibrated before the mixer is used and shall be kept properly calibrated. A by-pass valve shall permit the discharge of all the water into a measuring can for the purpose of calibration. The measuring of the volume of water required shall be done by means of adjustable discharge device only.

The loading skip of the mixer shall be substantially made and shaped so that wet sand and other materials will not remain in it when it is being discharged. The mixer shall not be used when any of the devices above stated are not functioning properly, or when the blades of the mixer have worn down to ninety (90) per cent of their original width. The Contractor shall furnish a certified statement from the manufacturer as to their original width. The mixer shall be kept clean and free from hardened mortar.

v). Truck Mixers

Truck mixers shall be used only when permitted by the Engineer in writing. Each transit mixer shall have a watertight drum, suitable mounted and fitted with adequate blades capable of properly combing the mixture. A batch meter and locking device to prevent discharge prior to completion of mixing shall be provided on each unit. Measuring tanks, equipped with outside taps and valves to facilitate checking their calibration, shall be provided for the mixing water. All water added to the mixer shall be passed through an approved water meter, located between the water tank and mixer drum, equipped with indicating dials and totaliser, and capable of measuring and discharging a specified amount of water within an accuracy of one per cent. The device shall provide means of readily verifying the amount of water added to mixing shall be provided on each mixer. An inspection opening shall be provided on each mixer, to permit ready determination of the consistency of the concrete being placed in the forms. When pick-up and throw over blades are worn down two(2) centimeter or more in depth, they shall be replaced with new blades. The Contractor shall furnish a certified statement from the manufacturer as to the original depth of the blades.

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3.5 Placing Concrete

i). General

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

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

Concrete mixed in central plant shall be transported without delay from the mixing plant to the position for laying and any concrete which in the opinion of Engineer has been mixed too long before reaching, the work will be rejected and shall be removed from the site. The concrete shall be deposited on the subgrade in successive batches for the full width between forms and in a manner which will require as little rehandling as possible. Spreading shall be done by an approved mechanical spreader in a manner that will prevent segregation and separation of the materials. Necessary hand spreading shall be done with shovels, not rakes. Workmen shall not be allowed to walk in the freshly mixed concrete with boots or shoes coated with earth or foreign substances. The amount of material deposited shall be sufficiently in excess of that required to form the pavement to the requiredcross-section after consolidation in order to provide a roll of concrete ahead of the front screed of the finishing machine for the full length of the screed.

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

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

Placement of concrete ahead of the initial spreader strike off shall not be more than fifteen(15) minutes ahead of final spreader strike-off. If concrete is placed in one(1) layer only, the placement of concrete shall not be more than twenty(20) minutes ahead of the spreader strike off.

In order to secure adequate compaction, the concrete is to be spread with a surcharge above the finished level of the layer. Spreading, compacting and finishing operations are to be completed without delay.

The total time taken from the addition of the water to the mix until the completion of the surface finishing operations shall not exceed thirty (30) minutes when the shade or mix temperature exceeds twenty seven (27) degree C or forty (40) minutes when less than twenty seven (27) degree C. The mixing and placing of the concrete shall progress only at such a rate as to permit proper finishing, protecting and curing of the pavement.

The additives shall be added to the concrete mix so as to ensure more setting time. The top of the forms shall be kept free from accumulation of concrete or foreign material. The Contractor shall not permit the accumulation of laitance along the edge of a slab poured adjacent to one previously placed. Any accumulation of laitance shall be removed and replaced with fresh concrete. As soon as the side forms are removed, the edges of the slab shall first be inspected by the Engineer and any minor honey combed areas shall then be filled in with mortar composed of one part of cement to two parts of fine aggregate under the supervision of the Engineer.

ii). Weather Conditions

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

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3.6 Placing Reinforcement

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

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

Where two (2) layers of wire mesh reinforcement are required as at bridge approaches, the bottom layer shall be supported in the required position with bar chairs. Separators shall be used for the top layer if the strike off cannot be properly used for the operation. Laps in adjustment sheets or mats of reinforcement shall be as shown on the plans. Laps parallel to the centerline of the pavement will not be permitted except for unusual widths of pavement lanes or for irregular areas. If the plans do not show dimensions for laps, the minimum lap either perpendicular or parallel of the centerline of the pavement shall be fifteen (15) centimeters. The adjacent sheets shall be fastened or tied together to hold all parts of the sheets in the same plane.

Reinforcing steel shall be free from detrimental amounts of dirt, oil, paint, grease, loose mill scale, and loose or thick rust which could impair bond of the steel with the concrete.

3.7 Joints

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

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

i). Expansion joints

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

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

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

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

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

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

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

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

ii). Contraction Joints

Contraction joints shall be of the type and dimensions and at the spacing shown on the plans. Sawed contraction joints shall be cut by means of an approved concrete saw. The joints shall not be sawed until the concrete has hardened to the extent that tearing and reveling is precluded. All joints shall be sawed during the initial curing period and the sawing shall begin before the pavement starts shrinking and before uncontrolled cracking takes place. Any procedure which results in premature and uncontrolled cracking shall be revised immediately by adjusting the sequence of cutting the joints or the time interval involved between the placing of the concrete or the removal of the curing media and the cutting of the joints. In no case shall the pavement be left overnight without having the joints sawed. The joints shall be sawed at the depth, spacing, and lines shown on the plans. Guidelines or devices approved by the Engineer shall be provided to ensure cutting the joint in a straight line and perpendicular to the centerline of the pavement. The dust resulting from sawing shall be completely removed from the joint and adjacent areas by means of an air jet or a combination of air and water applied under pressure immediately after the joint has been cut, and before filling with joint compound. When the plans specify that dowels be installed through contraction joints, the subgrade at the contraction joints shall be accurately trimmed to the required cross section and to the proper depth of the pavement. A string line shall be stretched between the pavement forms along the center line of the joint. Each dowel shall be painted and thoroughly coated with hard grease or lubricant, in accordance with the direction shown on the plans or as approved by the Engineer, to prevent the concrete from bonding to that portion of the dowel. The entire joint assembly shall be of the type designated on the plans and shall be installed in such a position that the centerline of the joint assembly is perpendicular to the center line of the slab and the dowels lie parallel to the slab surface and parallel to the centerline of the slab. The greased ends of the dowels shall be placed in the direction as indicated on the plans and shall be free to slide in the dowel holder. Any excess hard grease on the dowel holder shall be removed.

iii). Longitudinal Joints

Longitudinal joints shall be constructed in conformance with the details shown on the plans. When the fabricated steel strip is specified, it shall be held rigidly in place with an adequate number of pins driven into the subgrade to ensure that it will remain true to line and grade during concreting and finishing operations. On multiple lane pavement where longitudinal joints are constructed at the form line, an approved recessed form and tie bars will be required. The full depth fabricated steel strip designated for other longitudinal joints will not be permitted. When sawed joints are specified or used, suitable guidelines or devices shall be furnished to ensure cutting the longitudinal joint on the true lines as shown on the plans. The sawing of longitudinal joints shall be performed at a time that will preclude erratic or uncontrolled cracking. Sawed joints shall be filled with the type of joint compound indicated on the plans. The dust resulting from sawing shall be completely removed from the joint and adjacent areas by means of air jet

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or a combination of air and water applied under pressure immediately after the joint has been cut and before filling with joint compound.

iv). Construction Joints

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

The top surface of the header shall be protected with steel as approved by the Engineer. On the face along with the center of the header there shall be fastened a trapezoidal piece of metal or wood the full length of the header, five (5) centimeters wide and at least twenty five (25) millimeters in depth to form a grooved joint. The header shall have drilled holes to accommodate the dowel or tie bars hereinafter specified. Upon resumption of Work any surplus concrete remaining upon the subgrade shall be removed. The header shall then be carefully removed and fresh concrete deposited against the old in such a manner as to avoid injury to the edge of the old concrete. The fresh concrete shall be vibrated into the groove in a manner to ensure an interlocking joint.

Dowel bars or load transfer devices shall be used in all construction joints in accordance with the details shown on the plans. If no such details are shown on the plans, tie bars as provided for the longitudinal joint, and spaced at forty-five (45) centimeter centers, shall be placed across the joint in a plane parallel to the surface of the pavement approximately midway between the top and bottom surfaces of the pavement. The edges of the joint shall be grooved, edged, and sealed with the material used for sealing expansion and contraction joints.

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

v). Sealing Joints

a) Materials

Joints shall be sealed with material of the type designated on the plans.

b) Hot Poured Joints

The joints shall be sawed as provided in sub item 3.7(ii) and covered as provided in sub item 3.7(c). After the fourteen (14) or seventeen (17) day curing period for the pavement has elapsed, the jute or other protective covering shall be removed from the joint and the joint thoroughly cleaned of all loose scale, saw dust, dirt, laitance or other matter. Cleaning may be accomplished with a compressed air jet, air and water under pressure, wire brushes or in extreme cases the joint shall, when directed by the Engineer, be re-sawed to ensure a completely clean joint. The joint surfaces and adjacent areas of the slab shall' be thoroughly clean.

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

c) Cold Poured Joints

The joints shall be sawed as provided in sub item 3.7(b) & 3.7(c) and cleaned of all loose saw dust, laitance, dirt, other foreign matter and free water.

The joints shall be filled immediately after cleaning. The nozzle used must be so designed that the joint is filled completely from bottom to top. The joint shall be filled so it is rounded on top about six (6) millimeters above the pavement surface. Immediately after the joints

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have been filled, they shall be covered with strip of non-absorptive paper at least four (4) centimeters wide. Eleven (11) kilogram glassline or heavy craft is suitable. The paper shall remain on the joint until it weathers or wears off.

vi). Permanent Header Board

Immediately after the forms are removed from the ends of concrete pavement that will be exposed to other than permanent type surfacing and temporary and permanent traffic, a header board having dimensions of not less than eight (8) centimeters (nominal) by twenty (20) centimeters shall be bolted securely to the end of the pavement in a manner to protect the edge of the pavement from damage. The header board shall extend the full roadway width, but may be in two (2) sections. At the time of placing the concrete, six (6) (three for each lane), thirteen (13) millimeters by twenty (20) centimeters bolts shall be embedded in the end of the pavement in a manner that will hold the header board securely. The header board shall be shaped to conform to the crown of the pavement and shall be installed flush with the concrete pavement surface. The finishing and installing of the header board shall be considered subsidiary Work pertaining to the other items in the Bill of Quantities and will not be paid for directly.

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

3.8 Consolidating and Finishing

After being spread and struck-off as provided in sub-item 3.5 "Placing Concrete," the concrete shall be further struck-off and consolidated with an approved finishing machine to such an elevation that when finishing operations are completed, the surface will conform to the required grade and crown. The finishing machine shall operate over the entire surface at least twice, the first time with the finishing machine tamper and both screeds in operation. A uniform roll of concrete approximately fifteen (15) centimeters above the pavement grade shall be maintained ahead of the front screed for its entire length during the first trip over with the finishing machine. Excessive tamping or finishing resulting in bringing an excess of mortar to the surface will not be permitted.

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

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

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

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

When the longitudinal finishing has been completed, the entire surface shall be tested with straightedges not less than three (3) meters in length. The straightedges shall be operated parallel to the pavement centerline starting at the center and progressing toward the forms. Advance along the pavement shall be in successive stages of not more than one half (1/2) the length of the straightedges. All laitance, surplus water, and inert material shall be removed from the surface. All high places shall be worked down and all low places filled by combined operations of floats and straight edges until no irregularities exist. The proper crown of the pavement shall be maintained throughout the operations.

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After floating and straightening has been completed, the concrete shall be finished by using a belt made of canvas, rubber, or other approved belting not less than fifteen (15) centimeters in width, nor less than sixty (60) centimeters longer than the width of the pavement. This belt shall be worked with a longitudinal and crosswise motion. Care shall be exercised in the use of the belt to ensure that the edges of the belt do not dig into the surface of the concrete or work the crown out of the pavement. Either machine belting or hand belting will be permitted.

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

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

a). Hand Finishing

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

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

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

iii). Short lengths of pavement, such as bridge approach pavement, where the operation of mechanical equipment is impractical may be- finished by approved hand methods.

Concrete, as soon as placed, shall be struck-off and screeded. An approved portable screed shall be used. A second screed shall be provided for striking off the bottom layer of concrete if reinforcement is used.

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

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

In operation the screed shall be moved forward on the forms with a combined longitudinal and transverse shearing motion, moving always in the direction in which the work is progressing and so manipulated that neither end is raised from the side forms during the striking off process. If necessary, this shall be repeated until the surface is of uniform texture, true to grade and cross section, and free from porous areas.

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

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be in successive advances of not more than one half (1/2) the length of the float. Any excess water or soupy material shall be wasted over the side forms on each pass.

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

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

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

3.9 Removing Forms

Unless otherwise provided, forms shall not be removed from freshly placed concrete until it has set for at least twelve (12) hours, except auxiliary forms used temporarily in widened areas. Forms shall be removed carefully so as to avoid damage to the pavement. After the forms have been removed, the sides of the slab shall be cured as specified for the surface. Major honeycombed areas will be considered as defective work and shall be removed and replaced at the Contractor's expense, as directed by the Engineer. Any area or section so removed shall not be less than three (3) meters in length nor less than the full width of the lane involved. When it is necessary to remove and replace a section of pavement, any remaining portion of the slab adjacent to the joints that is less than three (3) meters in length, shall also be removed and replaced.

3.10 Protecting and Curing of Concrete Pavement

a). Initial Curing

As the surface of the newly-laid pavement is progressively finished, the initial curing and protection operations shall be started.

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

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

Unless otherwise directed by the Engineer, immediately following the application of the curing membrane, an approved shade-canvas shall be placed approximately thirty (30) centimeters above the pavement surface. The shade-canvas shall be constructed of materials and in a manner approved by the Engineer. In no case shall any portion of the shade-canvas come in

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contact with the pavement. The initial curing shall be continued for a period of twenty four (24) hours from the time the curing membrane is applied.

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

The curing membrane may be applied to the vertical edges of the pavement by means of hand sprays or by nozzles attached to the mechanical distributor, but the edges of the pavement shall be covered with curing membrane at the rate specified within thirty (30) minutes after removal of the forms.

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

When hot poured joint compound is used, the joints shall be sawed, cleaned, and filled with jute or other acceptable protective material in the same time sequence as for cold-poured joints.

In no case shall any portion of the concrete pavement be exposed to the direct rays of the sun for more than one (1) hour.

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

b). Final Curing

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

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

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

3.11 Surface Tolerance

As soon as the concrete has hardened sufficiently, the pavement surface shall be tested with a three (3) meter straightedge or other specified devices. Areas showing high spots of more than three (3) millimeters, but not exceeding twelve (12) millimeters in three (3) meters between any two contact points, shall be marked and immediately ground down with an approved grinding tool to a tolerance of less than three (3) mm as described above. Where the departure from correct cross section exceeds twelve (12) millimeters, the pavement shall be removed and replaced by and at the expense of the Contractor.

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Any area or section so removed shall be not less than three (3) meters in length nor less than the full width of the lane involved. When it is necessary to remove and replace a section of pavement, any remaining portion of the slab adjacent to the joints that is less than three (3) meters in length, shall also be removed and replaced at the Contractor's expense.

3.12 Tests for Thickness of Pavement and Degree of Compaction

a). Thickness of Pavement

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

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

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

ii). If any core measurement is deficient more than 6.5 mm from the required thickness a core measurement shall be taken at each 30m interval in both directions longitudinal from the first deficient core in the same lane, as defined herein, until the thickness of the pavement is found to be not more than 6.5 mm deficient from the required thickness. Each deficient core shall be considered as representing the condition in the same lane or longitudinal section, as above defined, for a distance of 15m, in each direction longitudinally from the core.

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

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

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

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

Deficiency in thickness as determined from cores

Thickness	Proportional Part of Contract of Contract Price to be allowed
3.00 mm to 6.5 mm	95%
6.5 mm to13 mm	75%

b). Degree of Compaction

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

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

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

The Engineer reserves the right to carry out crushing tests on any or all of the concrete cores taken in accordance with this clause, and should these tests show that any area of pavement concrete has failed to meet the strength requirements of the specification, then such areas of concrete shall be removed and replaced with new concrete, mixed, laid, compacted and finished to the requirements of this section at contractor's own expense.

c). Refilling of Holes

Holes in the pavement created by the cutting of cores shall be thoroughly coated on the inside with a neat cement grout and shall then be filled with concrete of the same mix as shown in the pavement. The filling shall be in two equal layers and each shall be rodded 25 times to its full depth. The surface shall be finished flush and broomed. The surface shall be kept thoroughly wet for 72 hours thereafter.

3.13 Replacement of Defective Concrete

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

3.14 Concrete Lug Anchors

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

4. MEASUREMENT AND PAYMENT

4.1 Measurement

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

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

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

4.2 Payment

The Portland Cement Concrete Pavement, measured as specified in sub-item 4.1 above, will be paid for, at the price tendered specified in the Bill of Quantities, adjusted as specified for deficiency in thickness, which price shall include the cost of constructing, finishing, curing, protecting and cleaning the pavement as above described; the preparation of subgrade to receive the pavement; the construction of all joints of whatever type; cutting of cores and filling of holes, all materials, including joint filler and other material, equipment, labour and all else necessary therefore and all

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other work in connection therewith and incidental there to in accordance with the specification and Drawings. Reinforcing steel shall be measured separately under relative items of work.

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

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

PAVEMENT MARKING

1. DESCRIPTION

This work shall consist of furnishing reflective thermoplastic paint material shown in the Bill of Quantities for sampling and packing, for the preparation of the surface and for the application of the paint to the pavement surface all in accordance with these Specifications.

The paint shall be applied in conformance to the size, shape and location of the markings as shown in the Drawings.

2. HOT APPLIED THERMOPLASTIC ROAD PAINTS

2.1 Material Requirements

2.1.1 Aggregate

The aggregate shall consist of light coloured silica sand, calcite, quartz, calcined flint, or other material approved by the Engineer.

2.1.2 Pigment and extender

a). White material

The pigment shall be titanium dioxide complying with the requirements of Type A (anatase) or Type R (rutile) of BS 1851.

b). Yellow materials

Sufficient suitable yellow pigment shall be substituted for all or part of the titanium dioxide to comply with the other requirements of this specification.

c). All materials

The extender shall normally be whiting (i.e. calcium carbonate prepared from natural chalk) complying with the requirements of BS 1795. The manufacturer may substitute lithopone complying with the requirement of BS 296 for any or all of the whiting.

d). Binder

The binder shall consist of synthetic hydrocarbon resin, or, with the approval of the Engineer, gun or wood resin, plasticized with mineral oil.

e). Composition of mixture

Thu proportions of the constituents of the mixed material as found on analysis shall comply with the requirements of the following table;

PROPORTIONS OF CONSTITUENTS OF MIXTURE

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

***** For titanium dioxide only. No minimum is specified for yellow material.

Where specified, 10% in the case of material to which surface ballotini is to be applied by pressure application.

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

GRADING OF COMBINED AGGREGATE, PIGMENT, EXTENDER AND BALLOTINI

Sieve	Percentage by mass passing Sprayed
2.80 mm	100
600 µm	75 - 95

2.2 Sampling and Testing

2.2.1 Sampling

For the purpose of carrying out the testing, it is essential that adequate and representative samples be taken in the manner prescribed in specification BS-3262 at following stages.

a) At the manufacturer's plant.
b) After it has been re-melted by the road application contractor.

2.2.2 Testing

The samples shall be prepared and tested in accordance with BS Specification 3262 (1976) Appendix-A to H. The test results shall conform the following properties.

- **Softening Point**

  The softening point measured in accordance with Appendix-C shall be not less than 65^{o} centigrade.

- **Color and luminance**

  a) White Material

  The luminance factor of white material as delivered by the manufacturer shall be measured in accordance with Appendix-D and shall not be less than 70 whereas the luminance factor of material obtained from an applicator or melter on site after re-melting measured in accordance with Appendix-D, shall not be less than 65.

  b) Yellow Material

  The color of yellow material shall be approximately BS 381C Color No. 355, Lemon. The luminance factor of yellow material as delivered by the manufacturer shall not be less than 60 whereas the luminance factor of material obtained from an applicator or melter on site after re-melting measured in accordance with Appendix-D shall not be less than 55.

- **Heat Stability**

  a) White Material

  When tested in accordance with Appendix-E, the luminance factor of white material as measured in accordance with Appendix-D shall be not less than 65.

  b) Yellow Material

  When tested in accordance with appendix-E the luminance factor of yellow material as measured in accordance with Appendix-D shall be not less than 55.

- **Flow resistance**

  In testing the flow resistance, a cone made and tested in accordance with Appendix-F, shall not slump by more than 25%.

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- **Skid resistance**

  When tested in accordance with Appendix-G, the skid resistance of a newly laid marking prepared under the stated conditions shall be not less than 45.

2.3 Manufacturing, Packing and Storing of Paint

2.3.1 Manufacturing

The paint shall be produced in a plant owned and operated by the manufacturer following a process which has been used by the manufacturer for at least five (05) years to produce paint. The equipment for mixing and grinding shall be clean, modern and in good condition.

2.3.2 Packing

a). The material shall be supplied in sealed containers which do not contaminate the contents and which protect them from contamination.

b). Each container shall be clearly and indelibly marked with the manufacturer's name, Batch number, date of manufacture, Reflectorization (if applicable), color, chemical type of binder and maximum safe heating temperature.

2.3.3 Storing

The material shall be stored in accordance with the manufacturer's instructions and any material that is in damaged containers of which the seal has been broken, shall not be used.

2.4 Certification

The Contractor shall furnish a certificate from manufacturer that the material he proposes to use has the required properties, stating the maximum and minimum proportions and grading of the constituents, the acid value of the binder, the setting time, the maximum safe heating temperature, the temperature range of the apparatus and the proposed method of laying.

2.5 Application of Material to the Road

a) Preparation of site

The thermoplastic paint shall only be applied to surfaces, which are clean and dry. Immediately before the application of paint, the surface shall be cleaned with mechanical broom, compressed air or other approved means to remove surplus asphalt, oils, mud, dust and other loose or adhered material. The material shall not be applied if the road surface is at a temperature of less than 5^{o} centigrade.

b) Preparation of material on site

- The material shall be melted in accordance with the manufacturer's instruction in a heater fitted with a mechanical stirrer to give a smooth consistency to the thermoplastic material and such that local overheating will be avoided. The temperature of the mass shall be within the range specified by the manufacture, and shall on no account be allowed to exceed the maximum temperature stated by the manufacturer. The molten material shall be used as expeditiously as possible, and for thermoplastic material, which has natural resin binders or is otherwise sensitive to prolonged heating, the material shall not be maintained in a molten condition for more than 4 hours.

- After transfer to the laying apparatus, the material shall be maintained within the temperature range specified by the manufacturer and stirred to maintain the right consistency for laying.

- On concrete carriageway, a tack coat compatible with the marking material shall be applied in accordance with the manufacturer's instructions prior to the application of thermoplastic material.

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c) Laying

Carriageway centre lines, lane lines and edge lines shall be laid to a regular alignment by self propelled machine. Other markings may be laid by hand, hand propelled machine or self propelled machine as approved by the engineer. The surface produced shall be uniform in texture and thickness and appreciably free from blisters and streaks.

d) Reflectorization by surface application

When surface application of ballotini is required, additional ballotini (400 g/m^2 to 500 g/m^2 from the machine) shall be applied by pressure concurrently with the laying of the line with sufficient velocity to ensure retention in the surface of the line. The ballotini so sprayed shall give uniform cover and immediate reflectivity over the whole surface of the marking. Ballotini dispensed on the surface of the markings shall conform to the following grading:

Sieve	Percentage by mass passing
1.7 mm	100
600 µ	80-100
425 µ	45-100
300 µ	10-45
212 µ	0-25
75 µ	0-5

Not less than 90% by mass of the ballotini shall be of transparent glass, spherical in shape and not more then ten (10) percent shall be ovate in shape or have other flaws. The ballotini shall be made of soda glass.

e) Thickness

Unless otherwise approved by the Engineer, the material shall be laid to the following thicknesses:

a). Sprayed lines other than yellow not less than 1.5 mm.
b). Sprayed yellow edge lines not less than 0.8 mm.

The minimum thicknesses specified are exclusive of surface applied ballotini. The method of thickness measurement shall be in accordance with Appendix-H of BS 3262 (1976).

2.6 Trail Section

In no case shall the contractor proceed with the work until the equipment, method of application and rate of application conforming the required thickness (as established by a test section) have been approved by the Engineer.

3. MEASUREMENT AND PAYMENT

3.1 Measurement

The quantity of reflective thermoplastic pavement marking paint for the specified width shall be as indicated in BOQ. The arrows shall be measured in number.

The measurement shall be made of painted areas, completed and accepted. No measurement shall be made of unauthorized areas. Paint that is applied in un-authorized areas shall be completely removed from the surface of the road to the satisfaction of the Engineer and at Contractor's expense.

3.2 Payment

The quantities measured as determined above shall be paid for at the contract unit price respectively for the pay items shown in BOQ, which price and payment shall constitute full compensation for furnishing and placing all materials including sampling, packing and testing at approved laboratory. The cost shall also include the preparation of the surface and for all other costs necessary to complete the work as prescribed in this item.

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REFLECTORIZED PAVEMENT STUDS

1. DESCRIPTION

This item shall consist of furnishing and installing reflectorized pavement studs set into the traveled way of the type in accordance with the specifications and at the locations shown on the Drawings or as directed by the Engineer.

2. MATERIAL REQUIREMENTS

2.1. Reflectorized Studs

Reflectorized Studs shall be “cat-eyes” with `Raised Profile' type having the following characteristics.

a). Raised Profile Type

The `Raised Profile' reflectors shall consist of metallic or acrylic plastic shell filled with an adherent epoxy compound molded from methyl methacylate into the shape of a shallow frustum of a pyramid having base dimension of approximately 10 cm x 10 cm or variable and thickness not more than two (2) cm or as shown on the drawings. A written approval is required from the Engineer regarding selection of reflectorized pavement studs especially with respect to material and size prior to execution of works.

The shell shall contain one or two prismatic reflector each inclined at an angle of thirty (30) degree to the horizontal and having an area not less than twenty (20) square cm or as indicated on the drawings.

The reflectors shall attain the following standards for their photometric and physical qualities.

i) Photometric Requirements

The reflectors shall have the following minimum Specific Intensity (S.*I*) values expressed as candle power per foot candle of illumination at the reflector on a plane perpendicular to the incident light.

	Colour		
	Crystal	**Yellow**	**Red**
Divergence Angle (in Degree)	0.20 S.I	0.20 S.I	0.20 S.I
Incidence Angle			
0	3.00	1.80	0.75
20	1.20	0.72	0.30

The reflector for testing shall be located with the centre of the reflecting face at a distance of one and half (1.5) meter from a uniformly bright light source having an effective diameter of half (0.5) centimeter.

The width of the photocell shall be 1.27 cms and shall be shielded from stray light. The distance from the centres of the light source and photocell shall be 0.53 cms.

Failure of more than four (4) % of the reflecting faces shall be cause for rejection of the lot.

ii) Strength Requirement

The reflectors shall support a vertical load of 1,000 kg when tested in the following manner.

A reflector shall be centered horizontally over the open end of a vertically positioned hollow metal cylinder seventy five (75) mm internal diameter, twenty five (25) mm high and wall thickness of six (6) mm. The load shall be applied to the top of the reflector through a six (6) mm diameter by six (6) mm high metal plug centered on top of the reflector.

Failure shall constitute either breakage or significant deformation of the marker at any load less than one thousand (1000) kg.

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2.2. Adhesive

When “Raised Profile” type of reflectors are used, a two-part adhesive having the following ingredients shall be applied to the stud for bonding to the pavement surface.

Package A	**Kg/Liter**
Epoxy Resin	0.94
Titaniurn Dioxide	0.07
Colloidal Silica	0.05
Talc	0.345

Package B	**Kg/Liter**
Modified Asphaltic Amine Hardener (Reinchold 2611)	0.24
Modified Asphaltic Amine Hardener (Reinchold 2613)	0.472
Carbon Black	0.0022
Colloidal Silica	0.04
Talc	0.650

Equal volumes of Package A & B should be mixed together until a uniform colour is obtained. No more than one quart of adhesive shall be prepared at one time.

2.3. Cement Mortar

Cement mortar shall consist of one (1) part Portland cement to three (3) parts of fine aggregates.

3. CONSTRUCTION REQUIREMENTS

3.1 Raised Profile Type

The stud shall be installed into the pavement in accordance with the manufacturer's instructions but shall also comply with the following requirements:

Cavities in the pavement shall be clearly cut to the dimension of the pavement stud and shall allow a clearance of one (1) cm around the stud base. The longitudinal center line axis of the cavity shall be the same as that required for the pavement stud when laid to correct line and direction. The walls of the cavity shall be splayed back at an angle of approximately thirty (30) degree to the vertical to facilitate a "dove-tail" joint after the mortar has set.

The bottom of the cavity shall be leveled with asphalt concrete prior to placing the stud base, which shall be pounded into position with pounder foot attached to a pneumatic drill. The depth of the cavity shall be such that when the stud base and reflectors have been installed the elevation of the floor of the lens socket shall not be greater than two (2) mm or less than one (1) mm above the pavement surface. The stud shall be grouted into position with asphalt concrete containing fine aggregate only or with a cement mortar as described in para 2.3 above when the studs are installed into a cement concrete pavement.

4. MEASUREMENT AND PAYMENT

4.1. Measurement

The quantity of reflectorized pavement studs to be paid for shall be the number of ‘Raised Profile’ type provided and installed as mentioned above.

4.2. Payment

The quantities measured as described above shall be paid for at the contract unit price for the pay items shown in the Bill of Quantities, which payment shall constitute full compensation for furnishing and placing all materials, excavating cavities, preparation of surfaces, applying adhesive and mortar, for all labour, equipment, tools and incidentals necessary to complete the item.

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LIST OF APPROVED MANUFACTURERS / SUPPLIERS

IMPORTANT NOTE:- Engineer has the right to select any material from the list of approved materials / suppliers.

S. #	MATERIALS	APPROVED MANUFACTURERS / SUPPLIERS							REMARKS
		BRAND 1	BRAND 2	BRAND 3	BRAND 4	BRAND 5	BRAND 6	BRAND 7	
1	**CIVIL WORKS**								
1	CEMENT (O.P.C / S.R)	FALCON	LUCKY CEMENT	MAPLE LEAF	PAK CEMENT	FAUJI	POWER CEMENT	D.G KHAN	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
2	STEEL (RE-BAR)	AMERELLI	NAWAB	AGHA	MUGHAL	METROPOLITAN	DOST STEEL LTD.	RAZAQUE	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
3	SAND	HUB	THATTA	NOORIABAD	MALIR RIVER	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
4	CRUSH	HUB	THATTA	NOORIABAD	MALIR RIVER	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
5	COARSE AGGREGATE MATERIAL	HUB	THATTA	NOORIABAD	MALIR RIVER	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
6	ADMIXTURES	BASF	SIKA	ULTRA CHEMICALS	FOSPAK	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
7	FIBERS (POLYPROPYLENE)	DURACRETE	-	-	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
8	SUB BASE MATERIAL	HUB	THATTA	NOORIABAD	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
9	PRECAST CONCRETE MEMBERS	IZHAR	BANU MUKHTAR	-	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
10	KERB BLOCKS	ENVICRETE	MAGNACRETE.	HUBCRETE	BANU MUKHTAR	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
11	BLOCKS (MACHINE MADE)	ENVICRETE	MAGNACRETE.	HUBCRETE	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
12	CEMENT BOARD	ENVICRETE	FI BUILDING SYSTEMS						
13	BITUMEN	FOSPAK	ULTRA CHEMICALS	NANO VISION	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
14	BITUMEN 10/20	ATTOCK OIL	-	-	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
2	**WS, SEWERAGE AND DRAINAGE**								
1	HDPE, UPVC	DADEX	VESPO	HI-TECH PIPE & ENG. LTD.	EURO-GULF INDUSTRIES	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
2	PVC & HDPE PIPE	DADEX	ILL	EURO-GULF INDUSTRIES	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
3	RCC PIPES	RAZIA PIPES (KARACHI)	MUSTAFA PIPE (HYDERABAD)	-	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
4	MS PIPES	HUFFAZ	-	-	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
5	POLYPROPYLENE PIPE FITTINGS (WATER)	POLYDEX	VESBO	HEPWORTH	-	-	-	-	-
6	UPVC PIPE (CLASS "B" DRAINAGE)	AGM	NEPRO	PAK ARAB	-	-	-	-	-
7	UPVC PIPE FITTINGS (INTERNAL)	AGM	NEPRO	PAK ARAB	-	-	-	-	-
8	ANCHOR / FASTENERS	IMPORTED (JAPAN OR USA)							-
9	VALVES	ECONOSTO	KITZ	IMPORTED (JAPAN)					-
10	GULLY TRAP CAST IRON COVER	AGM	NEPRO	PAK ARAB	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
11	VENT COWL	AGM	NEPRO	PAK ARAB	-	-	-	-	-
12	G.I PIPES	IIL	STEELEX MAKE	-	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
13	G.I FITTINGS	JAPAN MAKE	-	-	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
14	UPVC PRESSURE PIPES & FITTINGS	AGM	NEPRO	PAK ARAB	-	-	-	-	-
15	AIR VALVE	ECONOSTO	WATTS	-	-	-	-	-	-
16	RUBBER FOAM INSULATION	AEROFLEX		-	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
17	FIRE HOSE REEL	NEFCO	SAFECO	ARMOR	VIKING	-	-	-	-
18	FIRE EXTINGUISHER	NEFCO	SAFECO	ARMOR	VIKING	-	-	-	-
19	MS PIPES	HUFFAZ	-	-	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER
20	MS FITTINGS	JAPAN MAKE	-	-	-	-	-	-	OR ANY OTHER EQUIVALENT AS APPROVED BY THE ENGINEER

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01 SCOPE

Specification covers non-directional over current & earth fault relay suitable to protect MV system & initiate breaker trip in the event of any abnormality and fault in the system.

The relay (s) shall be of numeric design rated at 5 Amps 50 Hz, CT operated

02 CONSTRUCTION & DESIGN DETAILS

2.1 General

2.1.1 The Over current & Earth Fault Relay shall be in the form of single unit containing three over current elements for phases and one for earth fault protection. The relay shall have drawn-out feature for its active part from the enclosure. The front of the relay shall be covered with suitable transparent plastic material fastened to the enclosure so that the relay is adequately secured and cannot be removed from the front side.

2.1.2 The relay shall be numeric type with non-directional features. The relay shall have multiple time/ current characteristics.

2.1.3 The relay shall be dual powered. They shall be operable from both the fault current supplied through secondary's of current transformers and from 48 V DC supply. The relay contacts shall be capable of making and breaking trip coil currents upto 150 Amperes.

2.1.4 The relay shall be smart in size & of flush mounted housing type and shall be suitable for both series and shunt trip.

2.2 Settings

The contractor shall be responsible for relays settings and coordination. Relay setting calculations to be submitted for approval before implementation.

2.2.1 Over-current Relay

Current Range

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The settings shall start from at-least minimum of 50% to 200% expressed as a percentage of rated current (In) of relay/CT i.e. 5 A. The setting range shall be step-less or in the form of steps at-least 25% expressed as a percentage of rated (In).

Short Circuit Range

It shall be in the range of (2 x In) to (30 x In) & infinity.

2.2.2 Earth Fault Relay

Over Current Range

It should at-least start from 30% to 80% expressed in term of In.

Short Circuit Range

It shall be in the range of 2 to 30 times expressed against the basic rating of 1.0 ampere of earth fault relay.

2.3 Indication

Indication for the relay shall be in the form of LED. There shall be separate indication for over current and instantaneous elements. The indication shall not be self-reset. A knob or push button shall be provided in front for manual reset.

2.4 Data Recording/ Processing

2.4.1 Event Record

At least 100 events should be recorded in the relay.

2.4.2 Oscillographic Record

NOT REQUIRED

2.5 Battery Backup Unit

In case of failure of auxiliary supply to ensure the relay functionality each relay shall be provided with 9 V Battery backup including DC voltage regulator and USB lead.

2.6 Digital Inputs/ Outputs

At least 4 Digital inputs + 4 Digital outputs should be programmable as desired and have latching facility.

2.7 Self-Supervision/ Diagnostic

Relay should be equipped with this feature along-with watch dog contact.

2.8 Breaker Failure Protection

Should be provided

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2.9 LEDs

At least 4 LEDs programmable and 1 LED of Healthiness.

03 Auxiliary Relays

All auxiliary relays shall be of plug-in type. The coupling necessary for the remote operation of the circuit breaker shall be installed in the instrument equipment.

3.1 Operating Language

English

3.2 Serial Communication

3.2.1 RS-232 and RS-485 ports

3.2.2 Potential free NO & NC contact for remote indication & control through SCADA

3.3 International Certification

The supplier shall submit the applicable compliance in accordance with IEC standards.

3.4 Software/ Accessories and literature

The supplier shall provide the following with the relay:-

i. Licensed relay software (latest version)

ii. Relay communication lead with USB to serial converter i.e. ATEN

iii. Four (4) nos. of original specified relay literature.

iv. Performance Report.

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01 SCOPE

Specification covers MV/LV Type programmable Electronic multi – function AMR Energy Meters with GSM/GPRS modem for installation at distribution transformer in Pad Mounted Unit (PMU) and in LV Feeder Pillar Box for energy accounting and monitoring.

The MV meter(s) shall be of 110 volts, 5 (10) Amps, 50 Hz, Accuracy class 0.5s CT & PT operated while the LV meter(s) shall be suitable for 3-Phase, 4- Wire system, 420 volts, 5 Amps, 50 Hz, Accuracy class 0.5s, only CT operated.

The Energy Measurement & Management shall be compliant to following standards:

I. IEC 62052-11
II. IEC 62053-21
III. EN 50470-3
IV. IEC 62053-22
V. IEC 62053-23

02 CONSTRUCTION & DESIGN DETAILS

2.1 General

The HV meter shall consist of one 3-Phase, 4-Wire CT & PT operated- multi- tariff TOU kWh + MDI & kVArh meter. The LV meter shall consist of one 3-phase, 4-wire, and CT operated multi-tariff TOU meters suitable for unbalanced load. Further, the meter shall calculate and display the network power factor.

The meters shall provide immunity to the following levels as stated in test procedure under IEC 61036 & IEC 60687 where appropriate.

The meter shall be able to fulfil the following minimum requirements:

- Impulse Voltage test 10 kV
- AC Voltage test 4 kV
- Electrostatic Discharge (cover Shut) 20 kV
- Electrostatic Discharge (cover open) 15 kV

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- Rapid transient 4 kV
- Electromagnetic H/F fields 30 V/m
- Current Overload (1 second) 20 Imax
- Current Overload (permanent) 200% Imax

The meters shall be capable of maintaining desired accuracy with the following operating temperature range.

- Normal -10 deg C to +55 deg C
- Short duration 20 deg C to +60 deg C

The meters shall also meet IP 51 degree of protection Specification.

Line voltage variation tolerance shall be within the limits of -20% to +15% of nominal value

2.2 Internal registers

The meter shall contain at-least 4 meter register blocks, and at-least 3 Maximum Demand Indicator (MDI) register blocks, containing at least 8 time-of-use tariff registers each. The MDI shall be capable of completely independent operation. The meter shall consist of an integral interval load curve recorder which allows up-to 4 demand quantities to be stored with time intervals ranging from 1 to 60 minutes,

The meter shall provide distinct tariff rates that dictate which of the tariff registers shall be used It shall be possible to use more than one tariff register at any one time both for the energy meter and for the MDI's It shall be possible to control these tariff with external switching.

The register blocks for the meters, MDI's and the demand recorders shall be able to take their inputs from the following list of measured functions:

I. Import kWh
II. Export kWh
III. Import kVArh

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IV. Export kVArh

V. kVAh

VI. Two external pulse inputs

2.3 Measurement Phase by Phase

When used in 4 wire configurations, the meter shall provide cumulative energy measurement on a phase by phase basis, in both import and export directions measured separately.

Each MDI shall have its own integration period chosen from a wide range of possibilities from 1 to 60 minutes. The MDI's shall be able to measure any parameter chosen from import kVA, or from external pulse inputs.

The MDI's shall be capable of automatic reset by Calendar/ Time switch, of manual reset via an external button, or of reset by a hardware input.

An excess demand function shall indicate the consumer by means of an indicator and an output contact when he has, or is about 'to, exceeding his contracted energy demand for the current integration period. This excess demand function shall operate either in Threshold mode or 'Predictive' mode selectable at configuration time. In 'Threshold mode, the output to be closed when a predetermined threshold is exceeded in any integration period. In "Predictive" mode, the output to be closed when at any time, the present consumption will result in an excess demand being incurred.

2.4 Summation capability

The meter shall be capable of performing summation of up to two external pulse inputs to its similar energy types measured internally.

2.5 Coincident Maximum Demand

During the occurrence of a maximum demand vent, all the other coincident values of demand and power factor are recorded as well.

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In the same context, all the other coincident values of demand and power factor are recorded during the occurrence of a minimum power factor.

03 REGISTERS

It shall have minimum 5 digits indication total energy consumption, electronic registers with display facilities shall be provided to store and indicate the following

I. Cumulative Active Energy-1
II. Cumulative Active Energy-2
III. Maximum Demand-1
IV. Cumulative Max Demand-1
V. Max. Demand-2
VI. Cumulative Max Demand-2
VII. Reset Counter
VIII. Cumulative Reactive Energy-1
IX. Cumulative Reactive Energy-2

The electronic register shall have non-volatile memory to retain data during power outage for several years. The operation of electronic module and contents of the registers shall not be affected by external magnetic field/electromagnetic pulses and radio frequency signals

The electronic register display shall be liquid crystal type. The figure shall be of sufficient size to facilitate reading from distance of at least 4 ft. Necessary push buttons shall be provided to display the contents of measured and stored values. The sequence of display shall be clearly indicated on name/ rating plate of meter.

The meter shall perform self diagnostic operation continuously to identify errors automatically about low battery voltage, loss of program and data errors, etc

The meter shall show the following information on a clearly visible display:

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- An indication of consumption on each phase to show on the front panel, (flashing indicator, etc) the absence of consumption to be indicated by static indicator, and absence of voltage on any phase to be shown by the indicator being switched off.
- In case of automatic MDI reset operation, the meter shall give an indication of whether the meter cover has been opened.

04 DATA PROCESSING

4.1 Historical Data Retention

At the end of each billing period, all of the energy and MDI registers shall be read and stored in historical registers. The meter shall store all of the energy meters data and all of the MDIs' data for previous billing periods. This data shall be recorded for all tariff registers.

All data shall be stored in non volatile memory requiring no auxiliary power supply. This shall be the case for normal operation data and for demand recorded data.

4.2 Battery

The time switch battery shall be guaranteed for 3 years continuous operation. After 10 years in service, (not active), the battery shall be guaranteed for a further 1 year of operation.

An indication is to be made on the front panel in the event of battery failure. The duration of operation of the battery shall be recorded.

05 COMMUNICATION

5.1 Customer Data Bus

The meter shall be equipped with a consumer interface which sends data in format allowing intelligent load control by suitable equipment. The interface shall be READ ONLY i e it must NOT allow data in the meter to be changed.

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5.2 Relay Outputs

The meter shall be capable of providing relay outputs (depending upon hardware configuration) and/or pulse outputs indicating:

I. Excess demand alarm.
II. Tariff state outputs
III. DIN type SO Pulse Outputs.

5.3 Miscellaneous Data Storage

The meter shall store and be able to report the following parameters to central computer.

I. The time and date of at-least the last 8-10 power failures with an indication of which phases were affected.
II. Whether a week has elapsed without power being presented on the voltage inputs.
III. Whether a week has elapsed without power being consumed on any phase.
IV. An indication of the time that the battery has been active since installation.
V. An indication of battery failure.

06 TAMPERING

The meter shall provide the following anti-tampering features:

I. Lead seals on all access screws and fasteners.
II. A 'Lock-out" feature of up-to 256 days after authorized manual MDI reset to prevent further unauthorized reset.
III. An indication of whether the cover has been opened to be available.
IV. The last 10 MDI reset to be "date stamped' and retrievable by reading tool for future analysis.
V. The last 10 programming or re-configuration operations to be "date stamped" for future analysis.

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VI. Any front panel programming buttons to be optionally inhibited by configuration software.

VII. It must be possible upon analysis of the metering data to determine whether the current transformer inputs have been reversed at one of the phases.

VIII. All software must have a multiple-level password access system to prevent unauthorized use and abuse of the system.

IX. All software must require the fitting of a “dongle” to prevent the software being run on unauthorized machine.

X. The customer bus to be “READ ONLY” i.e.it must not be possible to re-program the meter using this bus.

XI. It must be possible to program the meter such that an indication is given if the cover has been opened This must only be resettable upon use of a programming tool, or a password sequence on the front panel.

07 PAINTING

A rust resistant paint shall be applied to all steel parts, and surfaces in contact with oil shall be specially treated and painted with two coats of oil-proof paints.

08 NAME PLATE DATA

Following minimum information shall be engraved on a name plate of stainless steel or brass fitted in a visible position

I. Manufacturer’s name

II. Type designation.

III. Year of manufacture

IV. Serial number.

V. Power supply voltage, Volts

VI. Power supply frequency, Hz

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09 TEST

The meter(s) shall be tested as per relevant IEC publications or other internationally accepted standards.

10 SPECIAL TOOLS

Special tools shall be supplied which shall be required for the purpose of maintenance and overhauling a complete list of such tools shall be provided.

11 INFORMATION TO BE FURNISHED WITH THE BID

I. Name of manufacturer.
II. Year of first-time production of meters offered.
III. Detailed technical catalogue, dimensional drawing and wiring diagram.
IV. Copies of test reports.

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01 SCOPE

This specification covers supply of three core cross linked polyethylene insulated steel wire armoured PVC sheathed aluminium conductor underground cable for use in 11 kV distribution network. These cables shall be capable of operating continuously at a conductor temperature of less than 90°C and shall be suitable for three phase grounded system accordance with IEC 60502.

02 DESIGN, CONSTRUCTION AND MATERIAL REQUIREMENT

2.1 Insulated conductor

I. Conductor:

The conductor shall be EC grade aluminium as per IEC-60228

The conductor shall be as follows:

Item no	Size mm^2	Min. no. of wires in the conductor
1	400	53
2	300	30

II. Conductor shield:

The stranded conductor shall be shielded with an extruded semi conducting layer before insulating

III. Insulation:

The insulation shall be cross linked polyethylene. The average thickness of the insulation shall be 4.5 mm, which should not be less than 3.95 mm at any one point.

2.2 Shielding:

I. The cables core shall he shielded in accordance with the shielding recommendation of IEC 60502.

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II. The non-metallic layer shall be extruded directly upon the insulation of each core and consist of either a bonded or strippable semi-conducting compound

III. The semi conducting insulation shield shall be covered by a bare copper shielding tape applied with an overlap of 15 % (width of the tape).

IV. Phase identification shall be obtained by using either coloured Tapes (Red Yellow, Blue) which shall be applied over semi-conductor tape longitudinally or numerically 1, 2, 3 printed on semi-conducting tape in Red, Yellow Blue colours.

V. The insulation shall be easy to strip and individual conductors of multi conductor cables shall be easy to separate for termination purpose.

2.3 Assembly

I. Three insulated cores shall then be laid with jute or synthetic fibre filters and bound with a cable tape binder.

II. The cable tape shall then be covered with a PVC jacket; PVC compound should be compatible with the conductor operating temperature of 90 ˚C. PVC jacket should have the following nominal radial thickness, subject to required tolerance of 20% +0.2 mm.

400 mm^2	2.1 mm
300 mm^2	2.0 mm

2.4 Armour:

Armouring shall be provided with steel wire. The thickness of each shall be 3.15 mm for sizes 300 mm^2 and 400 mm^2 Applied helically over the PVC bedding, covering the surface of the bedding.

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2.5 Overall jacket

The entire cable assembly shall then be covered with PVC outer jacket suitable for the operating temperature of the cable. Nominal radial thickness shall be as given below and subject to a required tolerance of 20% + 0.2 mm

400 mm^2	4.2 mm
300 mm^2	3.8 mm

03 TESTING AND INSPECTION

Electrical and non electrical acceptance tests shall be conducted at the works in accordance with IEC-60502. The Type Tests shall be from independent accredited laboratory. Following clauses of IEC quoted standard shall be followed in compliance of following different tests:

3.1 Routine Tests Clause 15

Following routine Test are required to be carried out on each manufactured length of the cable to check that each length meets the specified requirements.

i. Measurement of electrical resistance of conductors.
ii. Partial discharge test.
iii. Voltage test.

Any other tests as per requirement of IEC-60502

3.2 Sample tests Clause 16

i. Conductor examination
ii. Check of dimensions
iii. Voltage test
iv. Hot set test

Any other test as per requirement of IEC-60502

3.3 Type tests electrical Clause 17

i. Bending test followed by partial discharge test.
ii. Tan ¥ measurement.

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iii. Heating cycle test followed by partial discharge test.

iv. Impulse test, followed by power frequency voltage test.

v. Power frequency voltage test for 4 hours.

Any other test as per requirement of IEC 60502

3.4 Type test non electrical **Clause 18**

Following non electrical type tests shall be conducted as mentioned below:

i. Measure of thickness of insulation.

ii. Measurement of thickness of non-metallic sheaths (including extruded separation sheaths but excluding inner coverings)

iii. Test of determining the mechanical properties of insulation before and after aging.

iv. Test for determination of mechanical properties of non-metallic sheaths before and after aging.

v. Aging test on-pieces of completed cables

vi. Loss of mass test on PVC sheaths.

vii. Pressure test at high temperature on insulations and non-metallic sheaths.

viii. Test on PVC insulation & sheaths at low temperatures.

xi. Heat shock test (Test for resistance of PVC insulation and sheaths to cracking)

x. Hot set test for XLPE insulation.

xi. Water absorption test on insulation

xii. Flame spread test

xiii. Shrinkage test for XLPE insulation

xiv. Stability test for insulation screen.

xv. Water penetration test

Any other tests as per requirement of IEC-60502.

04 TECHNICAL DETAILS AND SAMPLES

The bidder shall submit detailed technical particulars and manufacturing data of the cables offered accompanied by a type test report in accordance with IEC-60502

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(Latest publication) standard. Complete illustration literature including instruction of jointing material shall be furnished together with description.

05 MARKING AND PACKING

5.1 Packing

The tables shall be supplied wound in lengths as given below on non returnable drums which shall be strong enough to withstand transport from the factory and handling on site when laying the cables. Covering, strong enough to withstand the handling shall be put around the circumference of the drum to protect the cable from damage. Relevant brief particulars of the cables shall be painted on the side of the drums as well the identification

Standard cable size	lengths to be wound on Drums
400 mm^2	350 metres ±5%
300 mm^2	500 metres ±5%

5.2 Embossing

Following shall be embossed at every metre of the cable.

- DCK Property “not for sale”
- Cable size & voltage grade
- Purchase Order Number with date
- Name of Manufacturer
- Item code No
- Length identification on each metre.

06 IMFORMATION TO BE SUPPLIED WITH THE BID

The Bidder shall also furnish the following information with the Bid.

1. Name and address of the Manufacturer.
2. Experience (years) in manufacturing of the specified equipment.

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3. Supplying the 300 mm^2 and 400 mm^2 cable to clients including local & national electrical utility for how many years (attach list of clients with length of cable supplied)
4. Type test report.
5. The bidder shall furnish specifically any deviation from the specification

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DATA TO BE FILLED BY THE BIDDER - TO BE SIGNED & STAMPED

GENERAL				
1	Supplier's Name			
2	Manufacturer			
	Correspondence Address			
3	Country of Origin			
4	Quantity Offered (metres)			
ELECTRICAL/MECHANICAL PROPERTIES				
Serial	**Parameter**		**Unit**	**Value**
1.	Nominal Cross Sectional Area of Conductor		mm^2	
2.	Number of strands		nos.	
3.	Diameter of each strand		mm	
4.	Thickness of Insulation		mm	
5.	Thickness of semi conducting layer		mm	
6.	Thickness of copper tape		mm	
7.	Copper tape shielding overlap		percent	
8.	Thickness of copper screen tape		mm	
9.	Thickness of extruded bedding		mm	
10.	Thickness of inner PVC sheath		mm	
11.	Thickness of outer PVC sheath		mm	
12.	Armour wire diameter		mm	
13.	Tensile strength steel armour wire		N/mm^2	
14.	Overall diameter		mm	
15.	Cable weight		kg/km	
16.	Min. bending radius		mm	
17.	Armour resistance max. at 20 ^oC		ohm/km	
18.	Conductor resistance max. DC at 20 ^oC		ohm/km	
19.	Conductor resistance max. AC at 90 ^oC		ohm/km	
20.	Reactance at 50 Hz		ohm/km	
21.	Capacitance maximum		µF/km	
22.	Current rating	(i) laid direct with temp.	Amps	
		(ii) in air with temp.		
		(iii) in ducts with temp.		
23.	Short circuit rating	01 sec	kA	
		03 sec		
PACKING				
24.	Dimension of drum		mm	
25.	Empty weight of drum		kg	
26.	Weight of drum including cable		kg	
27.	Cable length		metres	

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01 SCOPE

The PVC 4 core cables shall be required for power distribution system suitable for indoor/ outdoor underground use.

02 DESIGN

Four core cables shall be of 600/1000 Volts grade in conformity with British Standard Specification No. BS 5467 (latest publications). The cable conductors shall be of high conductivity plain annealed aluminium stranded wires in shaped/ circular round formation, installed with PVC compound. Two or more cores shall be laid up together in PVC compound bedding, armoured with single layer of galvanized steel wire and shall be finished by overall sheathing of PVC compound. The insulation and sheath shall be applied by extrusion process. The cores of the four-core cables shall be red, yellow, blue and black in colour.

03 STANDARD CABLE SIZE

3.1 The standard colour for outer PVC sheath of the following sizes of 600/1000 Volts grade cables shall be black:

3.1.1 4 core, 600/1000 Volts, 50 cycles

i. 10 mm square
ii. 16 mm square
iii. 25 mm square
iv. 35 mm square
v. 50 mm square
vi. 70 mm square
vii. 95 mm square

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viii. 120 mm square

ix. 150 mm square

x. 185 mm square

xi. 240 mm square

xii. 300 mm square

3.2 The purity of aluminium shall be as:

3.2.1 Aluminium = 99.5 %

04 STANDARD PACKING

The cables shall be supplied wound on suitable fully lagged wooden drums in lengths of 500 for 4 core cables. The tolerance ± 5 percent is permitted on the cable length.

05 EMBOSSING

Following shall be embossed at every metre of the cable:

- DCK property “Not for Sale”.
- Cable size and voltage grade.
- Purchase Order Number with date.
- Name of Manufacturer.
- Item Code No.
- Length identification on each metre shall be embossed /printed.

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06 TESTS

6.1 Type tests

Bidder/ manufacturer shall provide the type test reports conforming to BS 6346 (latest applicable) for the offered type/ rating cable (not older than five years) or same shall be type tested at HV & SC PEPCO Laboratory Rawat, Islamabad/ any independent laboratory of international repute in presence of Owner/ Owner's engineer, all expense in this regard shall be borne by the bidder.

6.2 Acceptance tests

All finished cables shall be subjected to successful performance of the acceptance test at manufacturer works in the presence of Owner/ Owner' engineer in accordance with BS 6346 (latest publication) all expense in this regard shall be borne by the bidder.

07 TECHNICAL PARTICULARS

7.1 Bidder shall submit full technical particulars with illustration specially indicating the following characteristics:

a. Current carrying capacity in air in conducts and directly lay in underground.

b. Electrical Parameters i.e. Resistance, Reactance, Impedance etc.

c. Variation in current carrying capacity due to temperature rise.

d. Weight per 100 metres.

e. Mechanical strengths.

f. Thickness of sheath

g. Thickness of insulation.

7.2 Bidder shall also supply complete literature on jointing of PVC cables.

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01 SCOPE

This Specification covers the performance, design, material, construction and testing requirements of heat shrink, cold shrink, pre-moulded straight through joints.

The cables for which the joints covered herein are to be used shall be of 3 core, aluminium or copper conductor, 8.7/15 (17.5) kV XLPE insulated, copper tape screened, steel wire armoured, PVC jacketed cable varying in size from 70 mm^2 to 185 mm^2 for copper and 95 mm^2 to 400 mm^2 for aluminium and conforming to IEC 60502 (Latest Edition).

The joints shall be of well proven design conforming to international standard and suitable in all respects for system and climatic conditions given in general specification.

02 GENERAL REQUIREMENT

2.1 Common for all methods of joints

2.1.1 The jointing methods shall meet all the requirements of IEC 60060, 60230 & 60270 (latest applicable).

2.1.2 The cable joint shall reinstate, as close as possible, the original properties of the cable.

2.1.3 The joints shall provide water proofing, mechanical and electrical protection and be completely sealed against soil water from cable jacket to cable jacket.

2.1.4 Joints shall be supplied in kit form complete with all materials and components required to complete the installation.

2.1.5 All components of jointing kit shall perform their intended functions without distress under normal conditions, cyclic loading and fault conditions.

2.1.6 The kit shall contain additional items for transitional joints i.e. between XLPE cables or between copper and aluminium cables if bid is called for such joints.

2.1.7 All components shall be capable of being stored without deterioration up-to 50 ˚C. Components or materials, if subjected to shelf life limitation, shall have the final date of use prominently and clearly shown on all packages. In case of pre-moulded joints

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shall have a shelf life of at least one and half (1½) year from the date of supply at climatic conditions as specified.

2.2 Heat Shrink Joints

The adhesive shall have a softening temperature not less than 90 °C in accordance with ASTM -E28, be compatible with other components of joints and cables and after curing shall not flow at the temperature range of normal service.

The diameter of heat shrink materials shall reduce to a Pre-determined size upon application of heat in excess of 120 °C yielding a minimum shrink ratio of 3 to 1 and a maximum longitudinal shrinkage of 10%.

The recovered wall thickness of the dual layer insulating/ Screened tubing over the stress control tubing shall be uniform and equal to or greater than the cable insulation thickness as per IEC - 60502 (latest publication) and shall have at least equal or higher insulation properties than the cable insulation.

2.3 Cold Shrink Joints

The cold shrink joints shall resemble in material requirements to heat shrink type except that they shall be fitted on cable joint by removing the supporting former (by pulling its tape gradually) without the application of heat.

When supporting former of cold shrink tube is removed, it shall reduce to predetermined size so that both core ends of cables are completely sealed.

2.4 Pre-Moulded Joints

Pre-moulded power cable joints are factory moulded and tested, after assembly provide permanent, fully submersible cable joints.

Pre-moulded stress control configuration offers excellent stress management through the use of unique conductive insert design technique.

Use of cloverleaf design benefits positive heat transfer interface and also reduces assembly forces by allowing the housing wall section to flex rather than stretch during assembly.

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03 DESIGN, CONSTRUCTION AND MATERIAL REQUIREMENTS

3.1 General

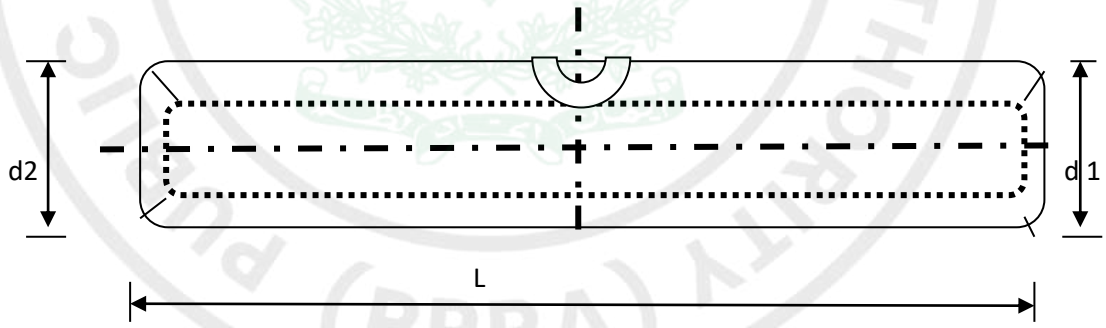
The joints of types covered in this Specification shall be designed and constructed to give highly reliable performance from the combination of components and jointing methods described herein.

The following items of jointing are common for all types of joints.

3.1.1 Compression Connector Ferrules

After careful preparation of cable splices, the compression type aluminium or copper connector ferrules having bore hole, length and other dimensions as per DIN standard 46267 (latest publication) shall be attached to the ends of both cables and clamped.

There should be grease inside the ferrules supplied and the same shall be capped at both ends. The dimensions of the Ferrules shall be in accordance as per diagram and Table mentioned below



Section mm^2		Nominal Dimensions mm		
Aluminium	Aluminium	d 1	d 2	L
400	400	26.8	35.5	110
300	300	23.8	31	96
185	185	18.4	24	72
95	95	13.2	17.4	58

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3.1.2 Copper Mesh Shield

The copper tape screen of each core shall be reinstated by covering with a flexible tinned copper mesh shield tape of adequate size overlapping it on both sides of cable.

The copper mesh shield shall be capable of handling at least the earth fault current which the copper screen of the cable can handle.

3.1.3 Constant Force Roll Springs

Electrical connection of copper braids/ mesh to copper tape screen of cable shall be achieved by the use of constant force roll springs. Soldering shall not be required for this purpose.

3.1.4 Armour Support Ring and Armour Clamps

An armour support ring shall be installed below the armour wires on each side of the joint to prevent biting of armour wires into insulation of cores. Armour wires shall be clamped by using worm drive armour clamps of adequate size so that armour is tied with the copper earthing lead to transfer effectively the fault current of the system.

3.1.5 Cleaning Fluid

Cleaning fluid shall be supplied with a jointing kit in a packing suitable to avoid spill over and the quantity of fluid shall be sufficient to clean all the cores for making a proper joint.

3.1.6 Earthing

To connect steel wire armour on both sides of cable galvanized iron armour case of sufficient size to allow for maximum earth fault current shall be used. The minimum size of Copper earthing lead for 70 mm^2 copper and 95mm^2 aluminium conductor cables shall be 35 mm^2 and for all other higher sizes of cables, it shall be 50 mm^2.

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3.1.7 Outer Casing

a) For heat shrinkable types of joints the galvanized steel armour case used for mechanical protection shall be wrapped in a thick wall, weather, corrosion and impact resistant heat shrinkable electricity insulated tubing or wrap around sleeve internally coated with adhesive sealant.

The casing shall be such that at the site conditions, no chemical action occurs. Outer mould case shall allow enough space from cable jacket to cable jacket for easy jointing and crossing of cores if required. As a minimum the length of outer casing from one inner jacket to the other inner jacket in the joint will be as given in Table below.

Table - I

Cable Size, Sq mm		Jacket-Jacket Distance, mm
Copper	Aluminium	
	400	1200
-	300	1100
120 & 185	185	1000
70	95	900

b) The bidder/ manufacturer shall demonstrate that all jointing work can be carried out easily between spread cores to user after successful award of contract.

c) The outer casing shall furthermore, have the characteristics :

I. It shall have sufficient strength to withstand the impact of physical load above it without any damage to itself or the cable.

II. It shall be highly resistant to ultraviolet radiations, termites and solutions of acidic nature in soil.

III. It shall have proper sealing contact on both sides of cable jacket.

IV. It shall have a shelf life not less than 2 years from the date of delivery.

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3.2 Heat shrink and cold shrink joints

3.2.1 Stress relieving/ void filling compound

The space around the connectors and the semi-conducting screen of the cable at the cut back shall be filled with a stress relieving/ void- filling compound which ensures that corona activity is prevented.

3.2.2 Stress Control

a) For heat shrink joints electrical stress at the screen cut back of each core of the cable shall be relieved by the use of a flexible heat shrinkable semi-conducting stress control tubing that has defined impedance.

b) For cold shrink joints where joints stress relieving provisions are not already incorporated into the tubing, stress relief shall be provided by semi-conducting tape wrapped around the cut back and ferrule portion of the joint.

c) The impedance of the stress control tubing or wraparound tape shall be adequate to provide stress relief up to voltages which are two times the normal working voltage and shall be stable over time, temperature and stress variations.

3.2.3 Dual Layer Insulating/ Screened Tubing

Cable core insulation shall be reinstated over the connector area by means of heat shrinkable or cold shrinkable dual layer insulating/ screened tubing installed over the stress control tubing. The inner layer shall be of insulating material which does not contain carbon black particles. The outer layer shall be of a black conducting material which performs the screening function. The insulating screened tube when shrunk down, the recovered wall thickness of tubing shall be at least of the same thickness as that of the original cable insulation as defined by IEC-605O2 (latest publication).

3.3 Pre-Moulded Joints

The pre-moulded power cable straight through joints is permanent fully screened and submersible joints employing three pre-moulded housing of EPDM rubber, which provide optimum electrical stress relief. The joint housings with integral

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internal and external stress control layers are slided over each individual core after crimping the ferrules on respective cores. The joint is rated for the voltage class indicated on the joint housing and having current carrying capacity equal to that of the cable. These joint housings are factory moulded and tested.

Complete cable construction is restored through employment of inner jacket, armour and other jacket restoration kit components for slip-on type of joints.

04 DESIGN AND PERFORMACE REQUIREMENTS

Joints shall meet the type test performance requirements according to Type Test Protocol of IEC 600502-4 (latest applicable) (Appendix – I).

05 TESTING AND INSPECTION

5.1 Applicable Standards

The test requirements of joints shall generally comply with the latest editions or amendments thereto of the standards listed below:

Standard Latest Edition	Nomenclature
IEC 60502	Power cables with extruded insulation and their accessories
IEC 60060	High Voltage test techniques
IEC 60230	Impulse tests on cables and their accessories
IEC 60270	Partial discharge measurements
IEC 61442	Standard for thermal loading cycle & short circuit
ESI 09-11	Mechanical and Physical Testing for splices and terminations
ESI 09-13	Performance Specification for high voltage heat shrink Components used with solid type cable up-to and including 33 kV
IEC 60466	Continuous condensation test
C – 81	Electrically Council engineering recommendation for joints UK)

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5.2 Type Tests

The Bidder shall meet electrical and mechanical type tests given in appendix I and detailed in specifications. Type test report shall be provided with the bid as evidence of conformance with the requirements.

The Bidder shall provide with his bid a type test report from a reputable international test laboratory verifying performance of the product offered according to well proven standards and to these specifications. The type test report from KEMA Laboratories Holland shall be preferred. In case non-submission of Type Test report the bidder shall get the offered jointing kit tested from any internationally reputed laboratory in the presence of Owner/ Owner's Engineers, all expenses in this regard shall be borne by the bidder.

If the jointing kits have undergone any change or modification in respect of design, material and/or manufacturing process, the type tests shall be repeated at the cost of the Manufacturer in presence of Owner/ Owner's Engineers, all expenses in this regard shall be borne by the bidder.

From the date of Type Test carried out the Type test reports shall be valid for five (5) years only.

5.3 Visual inspection

For quality check each jointing kit offered for acceptance shall be visually inspected for the defects given below:

Inspection		Defects
a)	Material	i) Not of specified type or style
		ii) Components not made of specified material
		iii) Any component missing or damaged
b)	Finish	i) Pinholes, cracks or inclusion of foreign materials
		ii) Tubing not of even and uniform shape
		iii) Sealant coating if not even and continuous.

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		iv) Connector not of smooth uniform finish or with flaws such as bubbles, surface cracks or other inclusions
c)	Construction:	Design not in accordance with the drawings or sample kit
d)	Marking:	Missing, not legible, incomplete or not permanent
e)	Punching:	Code and trade mark not punched
f)	Packing:	Not in accordance with approved methods

Further, the dimensions shall be checked as per approved drawings, and the quantity shall be checked with the approved and ordered list of components.

06 TEST, SAMPLES, ACCEPTANCE AND REJECTION

6.1 Submission of Sample

Before the Award of contract, the Bidder shall provide with his bid one sample of each jointing kit quoted which shall be retained for comparison with the ordered kits when these are received.

Full type tests as indicated in Appendix I are required in presence of Owner/ Owner's Engineer, if the Bidder is unable to produce respective type test reports from a reputed international laboratory with his Bid. This testing will be at the Contractor's own expense.

6.2 Visual Inspection

For visual inspection tests, each consignment shall be grouped into lots of 100 jointing kits of each type and size. A sample of five percent subject to minimum of five samples shall be drawn randomly from each lot and subjected to the following tests:

- Visual inspection
- Measurement of dimensions

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- Quality check against pinholes and surface imperfections of other types
- Quantity check as per list of items

07 IDENTIFICATION AND PACKING

For the purpose of identification, all components of jointing kits shall be clearly marked with the original manufacturer's name and reference number. The name of the Contractor shall not be adequate.

Packing shall be designed to protect against ingress of moisture and mechanical damage during handling and transportation.

Components supplied with adhesive coating shall have means to prevent the coated surfaces from adhering to each other and shall not increase the rate of corrosion of any metal which they may come into contact.

Each complete package shall contain a comprehensive jointing instruction in English and Urdu languages giving all relevant dimensions and instructions for making the joint.

All components of a jointing kit shall be supplied wrapped in polythene bags and then placed in a single package (cardboard box) as a complete jointing kit.

Each jointing kit box shall be printed with the following information.

I. Type of jointing kit
II. Jointing kit suitable for sizes of cable
III. Joint parts name
IV. Purchase order number
V. Manufacturer's name
VI. Year of manufacture
VII. If limited shelf life of some items has to be considered, date till when the jointing material must be used shall be indicated.

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Suitable number of card board kit boxes up-to a maximum of ten shall be packed in a properly palletized wooden box and shall be fixed with a non-corroding metal plate bearing the items including gross weight in kg and position of slinging points and other relevant handling instructions.

08 GUARANTEE

8.1 Guarantee against Defects

The Bidder shall guarantee the jointing kits against all defects arising out of faulty design or workmanship, or of defective material for a period of one year from the date of commissioning of the joints.

8.2 Proof of Satisfactory Working

The cable joint manufacturing firm shall give proof that their joints are in successful operation at other electrical utilities for at-least the last 3 years.

09 PREVIOUS SUPPLY EXPERIENCE

The Manufacturers must submit a list of electrical utilities the world over to whom they have supplied such joints at voltages of 11 kV and above. The reference information listed below must be supplied for each type of jointing kit offered.

I. Name of utility with telephone No, Fax No and e-mail address
II. Order number
III. Order period (from _____ to _____)
IV. Total number of joints supplied
V. Number and details of each size of joints supplied
VI. System voltage for which joints were supplied
VII. Types of cables for which the joints were supplied
VIII. Since how long the firm is in the business of manufacturing cable joints for 15 kV cable?

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10 INFORMTION/ SAMPLES TO BE SUBMITTED WITH THE BID

The Bidders must submit with their bids the following:

I. Copies of technical literature for the type of joints offered from the original manufacturer in English language.
II. Complete installation instructions for making joints.
III. Detailed design drawing showing component dimensions, materials and their specifications.
IV. Joint type test performance requirements summary duly filled in (Appendix-I).
V. Jointing kit contents list duly filled in (Appendix- II).
VI. General data schedule, duly filled in according to the attached performance (Appendix-IV).
VII. Type test reports from an independent international laboratory.
VIII. One sample of each type of complete jointing kit offered.
IX. Bidder shall submit reference list of jointing kits already supplied to different utilities of the world.

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APPENDIX – I

TEST SEQUENCE AND REQUIREMENTS FOR STRAIGHT OR BRANCH JOINTS

Tests		Requirements	Test Methods	Offered Value
1	AC and DC voltage	AC for 5 min at 4,5 U_o and D.C for 15 min at 4 U_o	clauses 4 and 5	
2	Partial discharge	10 pC max. at 1.73 U_o	clause 7	
3	Impulse at ϕt	10 impulses of each polarity	Clause 6	
4	Heating cycles in air	30 cycles at ϕt and 2,5 U_o	clauses 9.2 and 9.3	
5	Heating cycle under water	30 cycles at ϕt and 2,5 U_o	clauses 9.2 and 9.3	
6	Partial discharge At ϕt and ambient temperature	10 pC max. at 1,73 U_o	clause 7	
7	Thermal short circuit (screen)	Two short circuit at I_{sc} of the Cable screen No visible deterioration	clause 10	
8	Thermal short circuit (conductor)	Two short circuit to raise conductor to ϕt of the cable. No visible deterioration	clause 11	
9	Dynamic short circuit	One short circuit at I_d No visible deterioration	clause 12	
10	Impulse	10 impulse of each polarity	clause 6	
11	AC voltage	15 min at 2,5 U_o	clause 4	
12	Examination	For information only		

a) Unless otherwise specified, tests shall be carried out at ambient temperature
b) Not required for accessories installed on 3,6/6 (7.2) kV cables having unscreened insulation
c) For transition joints (extruded insulation to extruded insulation),the testing parameters are those for the lower rated cable
d) Φt is the maximum cable conductor temperature in normal operation + 5 K to 10 K
e) 8 h total with $\geq$ 2 h steady and $\geq$ 3 h cooling
f) Measurement is made at the end of the heating period
g) Thermal short circuit may be combined with the dynamic short circuit
h) Only required for single- core cable accessories designed for initial peak currents ip>80 kA and three –core cable accessories designed for ip > 63 kA. Value of Id shall be declared by the manufacturer.
i) It is advised that the accessory is examined for signs of any of the following:-
   (i) Cracking in the filling media and/or tape or tube components; and /or.
   (ii) A moisture path across a primary seal; and/or
   (iii) Corrosion and/or tracking and /or erosion; and /or
   (iv) Leakage of any insulating material

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APPENDIX – II

Jointing Kit Contents List

(To be filled by the Bidder)

It is the Bidder's responsibility to ensure that his joint kit is complete in every respect and contains all necessary materials and components to make a complete joint. As a minimum, each kit shall contain the following components. The Bidder shall list below any additional item kit contains.

Sr. No	Item Description	Quantity Required	Quantity Offered
a.	Heat Shrink Joint		
1	Al. or Cu. Compression ferrules	3 Nos.	
2	Stress relieving void filling compound for ferrule and screen cut back	As reqd.	
3	Stress control tubing	3 Nos.	
4	Dual layer insulating/ screened tubing	3 Nos.	
5	Tinned Cu. mesh shield (50 mm x 4 metre) Armour support rings	3 Nos.	
6	Wrapped gal. steel armour case	2 Nos.	
7	Armour worm drive clamps	1 no.	
8	Outer heat shrink sleeve	2 nos.	
9	Cable cleaning solvent	1 no.	
10	Abrasive strip	As reqd.	
11		2 nos.	
b.	Cold Joint		
	Al. or Cu. Compression Ferrules		
1	Semi-conducting tape 19 mm x 1.5 metre	3 nos.	
2	Cold shrink Splice Copper Screen Sleeve for cores	I pc.	
3	Constant Force Spring for cores	3 nos.	
4	EPR Tape 19 mm x 9 metre	3 nos.	
5	Copper Screen sleeve for outer covering	6 nos.	
6	Constant Force Spring for outer covering	1 roll	

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7	Outer Heat Shrink Sleeve	1 no.	
8	Cable Cleaning Pads	2 nos.	
9	Slip-on Pre-mould	1 no.	
10	Compression connectors	1 no	
C.	Joint housing with internal & external stress control tubing	1 piece	
1	PVC tape	1piece.	
2	Mastic tape	03	
	Copper braid	03	
3	Semi conducting tape	03	
4	Cleaning solvent and sand paper	As required	
5	Lubricant	03	
6	Solder and spring clip	As required	
7	Heat shrink outer protection tubes	As required	
8	House clamps	As required	
9	Insulation instructions	As required	
10	All components to serial 1 to 12 for	02	
11	reference only; bidder is required to give	02	
12	detail of actual components as per design of offered jointing kit, if the same differ from the above.	01	

Notes:

1. The kit shall contain additional items for transitional joints i.e. between XLPE cables or between copper and aluminium cables if the Bid is called for such joints.
2. The kit shall also contain jointing instructions both in English and Urdu.

Name, Signature and Seal of
Original Manufacturer

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Appendix – III

List of Exceptions/ Deviations From Specifications

(To be filled by the Bidder)

Following is the list of deviations of this offer being made against the OCL Specification (if there are no deviations, bidder and manufacturer so state clearly "we confirm that our offer fully conforms to the OCL Specification with which there is no deviations"

On this schedule the bidder shall provide a list of non compliance with this specification, documenting the effects that such non compliance is likely to have on the equipment's life and operating characteristics. Each non- compliance shall be referred to the relevant specification clause.

Clause #	Non Compliance

Note: If any deviation not mentioned and found later on, the offer would be liable for straight rejection

Signed for and on-behalf of the Bidder by:

_____ _____

Name and designation Of Official

Signature

Signed for and on-behalf of the Original Manufacturer by:

(If different to Bidder)

_____ _____

Name and designation Of Official

Signature

_____

Name and Seal of Original Manufacturer

Date:_____

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Appendix – IV

General Data Schedule

(To be filled by the Bidder)

S.No	Question	Answer
1	Name of Bidder/ Supplier	
2	Name of original manufacturer	
3	Country of origin of material	
4	Has appendices I to III been submitted with bid?	
5	Has independent test lab. Report showing Conformance to OCL Specifications been submitted With bid?	
6	Has type test certificate been submitted with bid? Has complete technical literature in English and Urdu been submitted with bid?	
7	Has kit samples of each size and type been submitted with bid?	
8	Does your offer have any exceptions/ deviations to specifications? Have these been clearly stated in Appendix-III	
9		

Failure to answer any of the above questions or submit any of the required Appendices may cause rejection of bid by OWNER.

Signed by _____ for and on behalf of the bidder.

_____

Name, signature and seal

of the Bidder

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PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

01 SCOPE

This Specification covers performance, design, material construction and testing requirements of heat shrink, cold shrink and pre-moulded termination kits for indoor and outdoor use.

The cables for which the terminations covered herein are to be used shall be of 3 core, aluminium or copper Conductor, 8.7/15 (17.5) kV XLPE insulated, copper tape screened, steel wire armoured, PVC jacketed cable varying in size from 70 mm^2 to 185 mm^2 for copper and 95 mm^2 to 400 mm^2 for aluminium and conforming to IEC 60502 (latest publication).

The terminations shall be of well proven design conforming to international standard and suitable in all respects for system and climatic conditions given in general specification.

02 GENERAL REQUIREMENTS

2.1 The termination kits shall be of the heat shrink, cold shrink or pre-mould type suitable for system and climate conditions given.

2.2 The terminations shall meet all the requirements of IEC publication 60060, 60230 & 60270 (latest applicable)

2.3 The terminations after installation shall provide reliable water proofing, mechanical and electrical protection.

2.4 Terminations shall be supplied in complete kit form with all materials and components required to complete the installation.

2.5 All components of termination kits shall perform their function without distress under normal conditions, cyclic loading and fault conditions.

2.6 The materials and components to complete the terminations shall meet all the requirements of the specification as given hereafter.

03 CONSTRUCTION AND MATERIAL REQUIREMENTS

3.1 General

The terminations shall be constructed to give highly reliable performance from the combination of the following moulded and/or tubing components.

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3.2 Stress Control

Electrical stress at the screen cutback of each core of the cable shall be relieved by use of a suitable stress grading tubing with predefined impedance on pre-moulded core.

The diameter of heat shrink material shall reduce to a predetermined size upon application of heat in excess of 120˚C yielding a minimum shrink ratio of 2 to 1 and a maximum longitudinal shrinkage of 10%.

3.3 Track Resistant / Erosion Resistant Protective Core Tubing

For heat shrink or cold shrink method of termination the bare upper portion of XLPE insulation on each core from the lug to the trifurcation breakout shall be insulated and protected by the use of tubing possessing erosion resistant, track resistant, electrically insulating and weather resistant properties.

This track resistant tubing shall be sealed onto the lug barrel with appropriate anti-track sealant. Such tubing shall as a minimum cover a core length as follows:

- 650 mm for indoor terminations
- 800 mm for outdoor terminations

When shrunk down, the recovered wall thickness of tubing shall be at least of the same thickness as that of the original cable insulation as defined by IEC-60502 (latest publication).

3.4 Trifurcation Cable Break-out

A cable breakout internally coated with track resistant sealant shall be provided to positively seal the trifurcation (crutch) area of the cable terminations.

3.5 Track and Erosion Resistant Rain Sheds (For Outdoor Terminations)

Rain sheds for outdoor terminations shall be provided to increase creepage distance and prevent wet flashover. The material shall be erosion resistant and track resistant and internal surface of the part shall be coated with a track resistant adhesive.

3.6 Earthing Braid

An appropriate size of tinned copper braid earth wire of about one metre length shall be provided with each kit to ground the copper shield and wire armour of cable. The braid shall be solder blocked to ensure that no moisture enters the cable trifurcation. Complete sealing

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must be provided between cable over sheath, solder blocked area of braid and cable breakout by use of additional sealant.

The earthing braid shall be connected to copper tape shields of cores by means of constant force roll springs. Such roll springs shall be provided along with the kits. The earth braid shall also be connected to the steel wire armour by means of armour clamps. The earth braid shall be capable of handling the fault current of the system.

The minimum size of copper earthing braid for 70 mm^2 copper and 95 mm^2 aluminium conductor cables shall be 35 mm^2 and for all other higher sizes of cables it shall be 50 mm^2.

3.7 Armour Support Ring and Armour Clamps

An armour support ring shall be installed below the armour wires to prevent biting of armour wires into insulation of cores. Armour wires shall be clamped by using worm drive armour clamps.

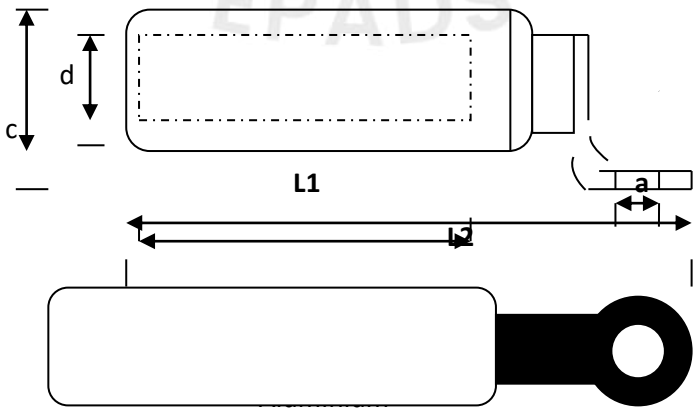
3.8 Lugs

For aluminium cables bimetallic compression type lugs with an aluminium barrel and copper palm (for sizes 95 mm sq, 185 mm sq, 300 mm sq and 400 mm sq) friction welded shall be supplied one for each core with the termination kit, for copper conductor cables, copper lugs shall be provided instead of bimetallic lugs as per dimensions mentioned in below mentioned table and diagram. The Bi-metallic lugs shall be as per International Standard.

There should be grease inside the lugs supplied the same shall be capped at the end.

Bi-metallic Lugs for The Termination of Aluminium Conductors and Copper Bus Bars

(Al.Barrel/Cu.Palm)



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Aluminium ◯ Copper ●

Sr.#	Cross sectional area	a (mm)	c (mm)	d (mm)	L1 (mm)	L2 (mm)
1	95 mm sq	13.0	20	13.5	43	90
2	185 mm sq	16.5	32	18.5	60	122
3	300 mm sq	16.5	34	23.0	62	125
4	400 mm sq	16.5	38	26.0	70	159

3.9 Wire for draining tracking current

For draining the tracking currents of protective core tubing to the earthing braid a cable of suitable size and about 1.5 metre length shall be provided.

04 DESIGN AND PERFORMANCE REQUIREMENTS

Terminations shall meet or exceed the design performance requirements according to Type Test Protocol as given in Table # 5 of IEC 60502-4 (latest applicable) (Appendix-I).

05 TESTING AND INSPECTION

5.1 Applicable standards

The test requirements of terminations shall generally comply with the latest edition or amendment thereto of the standards listed below:

Standard	Nomenclature
IEC 60502	Power cables with extruded insulation and their accessories
IEC60060	High voltage test techniques
IEC 60230	Impulse tests on cables and their accessories
IEC 60502	Extruded solid dielectric power cables for rated voltage From 1 kV up to 30 kV
IEC 60270	Partial discharge measurements
IEC 61442	Standard for thermal loading cycle & short circuit
ESI 09-11	Mechanical and Physical Testing for splices and terminations.
ESI 09-13	Performance specification for high voltage heat shrink

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components used with solid type cable up to and including 33 kV

IEC 60466	Continuous condensation test
C-81	Electricity council engineering recommendation for Terminations (UK)

5.2 Type Tests

The Bidder shall meet electrical and mechanical type tests given in Appendix I. Type test report shall be provided with the bid as evidence of conformance with the requirements.

The Bidder shall provide with his bid a type test report from a reputable international test laboratory verifying performance of the product offered according to well-proven standards and to these specifications. The type test from KEMA Laboratories Holland shall be preferred. In case of non-submission of Type Test report the bidder shall get the offered jointing kit tested from any internationally reputed laboratory in the presence of owner's Engineers, all expenses in this regard shall be borne by the bidder.

If the Termination kits have undergone any change or modification in respect of design, material and/or manufacturing process, the type tests shall be repeated at the cost of the Manufacturer in presence of owner's Engineers all expenses in this regard shall be borne by the bidder.

From the date of Type Tests carried out the Type test report shall be valid for five (05) years only.

5.3 Visual Inspection

For quality check each termination kit offered for acceptance shall be visually inspected for the defects given below:

Inspection			**Defects**
a)	Material	i)	Not of specified type or style
		ii)	Components not made of specified material
		iii)	Any component missing or damaged
b)	Finish	i)	Pinholes, cracks or inclusion of foreign Materials
		ii)	Tubings not of even and uniform shape
		iii)	Sealant coating if not even and continuous

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		iv) Connector not of smooth uniform finish or with flaws such as bubbles, surface cracks or other inclusions
c)	Construction	Design not in accordance with the drawings or sample kit
d)	Marking	Missing, not legible, incomplete or not permanent
e)	Punching	Code and trade mark not punched
f)	Packing	Not in accordance with approved methods

Further, the dimensions shall be checked as per approved drawings, and the quantity shall be checked with the approved and ordered list of components.

06 TEST SAMPLES, ACCEPTANCE AND REJECTION

6.1 Submission of Sample after the award of contract

The Bidder shall provide one samples of each kit quoted which shall be retained for comparison with the ordered kits when these are received.

Full type tests as indicated in Appendix I are required to be conducted in presence of owner's Engineer from any internationally accredited testing laboratory in case the bidder is unable to produce respective type test reports from a reputed international laboratory with his bid. Such type tests will be at the contractor's expense.

6.2 Testing after Material Delivery

When material is delivered, the Contractor will arrange acceptance tests to be carried out in the presence of owner's representative at a reputed Pakistani laboratory. The cost of this testing shall be at the Contractor's expense. One kit of each type and size shall be selected at random.

In the presence of the owner representative, these kits will be assembled completely on suitable size of cable and shall be subjected to reduced type tests as in Appendix-I. The tests performed shall be No. 1,2,3,4 and 11 as given in Appendix-I. If the samples pass the tests, the consignment will be deemed acceptable. If any sample fails, retesting will be done on another randomly selected sample of the same type and size that failed.

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6.3 Visual Inspection

For visual inspection, each consignment shall be grouped into lots of 100 items of each type and size. A sample of five percent subject to minimum of five samples shall be drawn randomly from each lot and subjected to the following tests

- Visual inspection
- Measurement of dimensions
- Quality check against pinholes, surface imperfections of tubings, connections/ lugs and other items
- Quantity check as per list of items

07 IDENTIFICATION AND PACKING

For the purpose of identification, all components of termination kits shall be clearly marked with the original manufacturer's name and reference number. The name of the Contractor shall not be adequate.

Packing shall be designed to protect against ingress of moisture and mechanical damage during handling and transportation.

Components supplied with adhesive coating shall have means to prevent the coated surfaces from adhering to each other and shall not increase the rate of corrosion of any metal which they may come into contact.

Each complete package shall contain a comprehensive termination instruction in English and Urdu languages giving all relevant dimensions and instructions for making the termination.

All components of a termination kit shall be supplied wrapped in polythene bags and then placed in a single package (cardboard box) as a complete termination kit.

Each termination kit box shall be printed with the following information.

i) Type of termination kit

ii) Termination kit suitable for sizes of cable

iii) Termination parts name

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iv) Purchase order number

v) Manufacturer's name

vi) Year of manufacture

If limited shelf life of some items has to be considered, date till when the termination material must be used shall be indicated.

Suitable number of card board kit boxes up-to a maximum of ten shall be packed in a properly palletized wooden box and shall be fixed with a non-corroding metal plate bearing the items including gross weight in kg and other relevant handling instructions.

08 GUARANTEE

8.1 Guarantee against defects

The Bidder shall guarantee the termination kits against all defects arising out of faulty design or workmanship, or of defective material for a period of one year from the date of commissioning of the terminations.

Termination kits shall have shelf life not less than 2 years from the date of delivery.

8.2 Proof of Satisfactory Working

The cable termination manufacturing firm shall give proof that their terminations are in successful operation at other electrical utilities for at-least the last 3 years.

09 PREVIOUS SUPPLY EXPERIENCE

The manufacturers must submit a list of electrical utilities to which they have supplied such terminations at voltages of 11 kV and above. The information listed below must be supplied for each order quoted. Name of utility with telephone. Fax # along-with e-mail address:

i. Order number

ii. Order period (from------- to--------)

iii. Total number of terminations supplied

iv. Number and details of each size of terminations supplied

v. System voltage for which terminations were supplied

vi. Types of cables for which the terminations were supplied

vii. Since how long the firm is in the business of manufacturing terminations for 15 kV cables?

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10 INFORMATION/ SAMPLES TO BE SUBMITTED WITH THE BID

Bidders must submit with their bids the following:

i. Copies of detailed technical literature in English language from original manufacturer for the type of terminations offered. Installation instructions for making terminations shall' also be provided.

ii. Detailed design drawing showing component dimensions and materials.

iii. Specifications of all the materials offered.

iv. Terminations type test performance summery as per IEC 60502-4 (latest publication), duly filled in (Appendix-I).

v. Termination kit contents list, duly filled in (Appendix-II). Plus list of deviation (Appendix-III)

vi. General data schedule, duly filled in according to the attached Performa (Appendix-IV)

vii. Copy of type test report from independent international laboratory showing performance of offered terminations against testing.

viii. Bidders shall submit reference list of termination kits already supplied to different utilities of the world. One sample of complete termination kit offered is to be submitted to owner.

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APPENDIX – I

TEST SEQUENCE AND REQUIREMENTS FOR TERMINATIONS

Tests		Requirements	Test Methods	Offered Value
1	AC and DC voltage	AC for 5 min at 4,5 U_o and d.c for 15 min at 4 U_o	clauses 4 and 5	
	AC (wet)	1 min at 4 U_o[b]	Clause 4	
2	Partial discharge[c]	10 pC max. at 1.73 U_o	clause 7	
3	Impulse at ϕt[d]	10 impulses of each polarity	Clause 6	
4	Heating cycles in air	60 cycles[e] at ϕt and 2,5 U_o	clauses 9.2 and 9.3	
5	Immersion test[b]	9 cycles at at ϕt[d]	clauses 9.5	
6	Partial discharge [c] At ϕt and ambient temperature	10 pC max. at 1,73 U_o	clause 7	
7	Thermal short circuit (screen)[g]	Two short circuit at Isc of the Cable screen No visible deterioration	clause 10	
8	Thermal short circuit (conductor)	Two short circuit to raise conductor to ϕt of the cable. No visible deterioration	clause 11	
9	Dynamic short circuit[i]	One short circuit at Id No visible deterioration	clause 12	
10	Impulse	10 impulse of each polarity	clause 6	
11	AC voltage	15 min at 2,5 U_o	Clause 4	
12	Humidity[j,k]	300 h at 1,25 U_o see table 13	Clause 13	
13	Salt fog[b,k]	1000 h at 1,25 U_o	Clause 13	
14	Examination	For information only	-	

a. Unless otherwise specified, tests shall be carried out at ambient temperature

b. For outdoor terminations only

c. Not required for accessories installed on 3,6/6 (7.2) kV cables having unscreened insulation

d. Φt is the maximum cable conductor temperature in normal operation +5 K to 10 K

e. 8 h total with $\geq$ 2 h steady and $\geq$ 3 h cooling

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f. Measurement is made at the end of the heating period

g. This test is only required for terminations that are equipped with a connection to, or adaptor for, the metallic screen of the cable.

h. Thermal short circuit may be combined with the dynamic short circuit.

i. Only required for single- core cable accessories designed for initial peak currents ip>80 kA and three –core cable accessories designed for ip > 63 kA. Value of Id shall be declared by the manufacturer.

j. For indoor terminations only, not required for compound –filled terminal boxes, shrouded terminations shall be tested in a three-phase condition.

k. Not required for terminations having porcelain insulators.

l. It is advised that the accessory is examined for signs of any of the following:-

(i)Cracking in the filling media and/or tape or tube components; and /or.

(ii)A moisture path across a primary seal; and/or

(iii)Corrosion and/or tracking and /or erosion; and /or

(iv)Leakage of any insulating material

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APPENDIX II
Cable termination kit contents
(To be filled in by the bidder)

It is the Bidder's responsibility to ensure that his termination kit is complete in every respect and contains all necessary materials and components to make a complete termination. As a minimum, each kit shall contain the following components. Bidder shall list below any additional materials his kit contains.

S.No	Item Description	Quantity Required	Quantity Offered
	Common for all termination types		
1	Bimetallic compression type lugs Cu. Palm and Al. cables (Cu. Lugs for copper cables)	3 Nos.	
2	Earthing braid with lug	1 metre	
3	Armour support ring & worm drive clamp	1set	
4	Lug sealing boots	3 nos.	
5	Rain sheds/ skirts(for outdoor only)	As required	
6	Wire for draining tracking current		
7	Installation instructions (both in English and Urdu)	1 #	
	Additional items for heat shrink		
1	Heat shrink stress control tubing	3 nos.	
2	Trifurcation cable breakout	1#	
3	Heat shrink core protecting tubes 650 mm for indoor 800 mm for outdoor	3 nos.	
4	Solder, flux, Cu binding wire, cleaning fluid, abrasive paper etc	As required	
	Additional items for cold shrink		
1	Cold shrink stress control tube	3 no.	
2	Trifurcation tube/ sealing boot straight type	1 roll	
3	Cold shrink core protecting tubes 650 mm for indoor 800 mm for outdoor	 1 roll 1 roll	
4	HT insulating tape or EP rubber tape 20 mm x 1metre Semi conducting tape 20 mm x 1 metre Silicone grease, binding wire, cleaning fluid, abrasive paper etc	As required	
	Additional items for pre mould joints		
1	Compression connectors	03	
2	Joint housing with internal & external stress control tubing PVC tape	 03	
3	Mastic tape	03	
4	Copper braid	As required	
5	Semi conducting tape	03	
6	Cleaning solvent and sand paper	As required	

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7	Lubricant	As required	
8	Solder or spring clip	As required	
9	Heat shrink outer protection tubes	As required	
10	House clamps	02	
11	Installation instruction	02	
12		01	
*	All components from serial 1 to 12 are for reference only; bidder is required to give details of actual components as per design of offered jointing kit, if the same differ from above.	-	

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APPENDIX – III

List of Exceptions/ Deviations From Specifications
(To be filled by the Bidder)

Following is the list of deviations of this offer being made against the Specification (if there are no deviations, bidder and manufacturer so state clearly "we confirm that our offer fully conforms to the Specification with which there is no deviations"

On this schedule the bidder shall provide a list of non compliance with this specification, documenting the effects that such non compliance is likely to have on the equipment's life and operating characteristics. Each non- compliance shall be referred to the relevant specification clause.

Clause #	Non Compliance

Note: If any deviation not mentioned and found later on, the offer would be liable for straight rejection

Signed for and on-behalf of the Bidder by:

_____ _____

Name and designation Signature

Of Official

Signed for and on-behalf of the Original Manufacturer by:

(If different to Bidder)

_____ _____

Name and designation Signature

Of Official

_____

Name and Seal of Original

Manufacturer Date: _____

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01 Scope:

The Specification covers design, material, construction and testing requirements in respect of metal oxide surge arresters to be used for 11 kV primary distribution system. These surge arresters shall be used to protect 11 kV distribution lines, transformers, capacitors, cables, etc. form lightning and surge voltages. The specification is based on IEC-60099. Part-4 (latest publication), metal oxide surge arresters without gaps for AC systems.

02 Design, Construction & Material Requirements

2.1 Design Requirements

The distribution class surge arresters shall be designed and manufactured for highly polluted atmosphere for outdoor mounting on a cross arm of the pole. The performance characteristics of surge arresters shall have equal or better values as given below:

i)	Arrester rated voltage	12 kV
ii)	Arrester maximum continuous operating voltage (MCOV)	9 kV (rms)
iii)	Insulation impulse withstand voltage	75 kV
iv)	Maximum residual voltage at	
	• Nominal discharge current (5 kA) of wave form 8/20 Microsecond	equal to or less than 36 kV
	• Steep current of wave form 1/10 micro-sec	equal to or less than 42 kV
v)	Nominal discharge current	5 kA
vi)	Creepage distance	480 mm
vii)	Peak high current short duration impulse of 4/10 micro-sec.	65 KA peak
viii)	Peak low current long duration impulse	75 Amps(peak)

2.2 Construction & Material

2.2.1 Surge arresters shall be of the metal oxide non-linear resistor type. The arrester assembly shall employ a fibre reinforced composite structure (to rigidly hold the non-linear resistor),

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fully and hermetically enclosed by a polymer based housing. The end caps and terminal studs shall be of stainless steel. The arrester shall be designed to meet the requirements of IEC 60099-4 (latest publication).

2.2.2 The surge arresters shall be provided with a flexible fully insulated lead for the line terminal. All connections and parts shall be insulated so that no live metal parts are exposed. The insulated lead shall be of stranded tinned copper of not less than 13 sq mm cross section and shall be at least 45 cm in length.

2.2.3 For ground connection a solder less clamp type terminal capable of securely clamping stranded copper conductor of 6 to 10 mm diameter, shall be provided.

2.2.4 Arresters shall be of maintenance free design and for outdoor installation. Insulator sheds shall trap minimum atmosphere contamination during service.

2.2.5 The creepage distance from line to earth shall be 508 mm for highly polluted atmosphere.

2.2.6 The minimum cantilever strength for application of load shall be 200 Nm. The surge arrester shall be able to act as a support insulator for the cable termination.

03 Testing & Inspection

3.1 General

3.1.1 The surge arresters shall be tested in accordance with IEC Publication 60099-4 (latest publication) or any other comparable international standard.

3.1.2 The power frequency and impulse voltages and currents to be used for testing arresters shall be in accordance with IEC publication 60 and IEC 60099-4 (latest publication) The complete arrester shall withstand a 1000 hour salt fog test at continuous voltage as per IEC 61109 (latest publication).

3.2 Type Tests

3.2.1 The manufacturer/bidder shall submit the complete type test reports for the offered surge arrester performed in accordance with IEC publication 60099-4 (latest publication) at an independent laboratory of international repute OR same shall be type tested in the presence of owner's engineers at an independent laboratory of international repute (All costs relating to testing, travel, boarding and lodging shall be borne by the bidder).

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3.3 Routine Tests

3.3.1 The following routine tests shall be performed on every surge arrester (All costs relating to testing, travel, boarding and lodging shall be borne by the bidder).

i) Measurement of reference voltage.
ii) Residual voltage test.
iii) Tests for absence from partial discharge and contact noise.
iv) Leakage test.

3.3.2 In addition, it shall be the responsibility of the manufacturer to determine and carry out any other tests on parts or materials to ensure that the arrester uniformly meets the characteristics established by the type tests.

04 Identification & Packing

4.1 Identification

Preferably the following information shall appear on the nameplate of the surge arrester:

i) Manufacturer's name or identification mark.
ii) Year of manufacture.
iii) Rated voltage.
iv) Rated frequency.
v) Nominal discharge current.
vi) Arrester type and line discharge class.

4.2 Packing

4.2.1 The surge arresters shall be packed in wooden crates containing convenient numbers of units to allow normal handling of the crates. Each arrester shall be held in a firm position and measures will be taken to avoid damage against jerks and collision between adjacent units during transportation.

4.2.2 Each packing shall contain a copy of installation and maintenance instruction in English language.

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05 Information to Be Supplied With the Bid

5.1 The bidder shall submit detailed technical particulars and data for the surge arresters offered including the following: -

i) Technical particulars data sheet duly filled in.

ii) The catalogue and descriptive data of the surge arresters in adequate detail to enable evaluation of the protective and operating characteristics of the arresters.

iii) Drawings showing all prominent dimensions of the arrester, the mounting of the arrester, the terminal connections and other hardware details.

iv) Type test reports and, if applicable, full details of in-house facility where type tests have been carried out on the surge arresters offered.

v) The bidder shall submit sufficient proof regarding ten years proven service record of the polymer used for the housing of the arrester in similar climatic conditions.

5.2 The following information shall also be furnished regarding the manufacturer of the surge arresters:

i) Name and address of the manufacturer.

ii) Experience of the firm (years) in manufacturing of surge arresters.

iii) Supplying the same device to other utilities/ clients for how many years?

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01 Scope

This Specification describes the Earth Fault Indicating Relay (self reset type) for 11 kV Underground distribution system which is designed to indicate the location of the Earth faults, in the 11 kV distribution systems for the quick isolation of the faulty Section, and prompt normalization of the remaining healthy distribution network.

The Earth fault indicative relay shall be Electromagnetic or Electronic self-reset type and in accordance to the general design.

02 Constructional details

The Earth fault-indicating Relay shall be designed in two parts.

2.1 Ring type C.Ts.

One ring type C.T(50/5) having the 3 1/2" (90 mm) dia shall be split able in to two halves, and fixable on live 11 kV XLPE underground cable to sense Earth fault current drain as a transducer between the 3 phase 11 kV leads and Earth mesh of the cable. The secondary (Output) of the C.T, shall be connected through 15 foot twin core 2 x 4 sq mm cable up to the indicating Relay. Proper weather proof connectors shall be provided on secondary terminals of the C.T, and incoming side of the Earth fault indicative Relay device.

2.2 Earth fault indicating relay assembly

This assembly shall be designed so as to mount it at 7 feet height on the 11 kV tubular poles with proper pole clamp. The EFIR assembly shall have the following devices properly installed in the weather proof Box.

a. The over current sensing unit shall be capable to accommodate the excessive secondary output fault currents, to operate the earth fault Relay and Flag indication.

b. Both the devices i.e. over current sensing device and Relay shall be enclosed in a suitable metallic weather proof Box.

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c. The Relay operations and earth fault current sensing indications shall be operative with the output currents of the CT/CTs or with a separate 220 Volts AC power source.

d. The Reset operation of the Earth fault indicative relay shall be activated automatically after restoration of the supply. An option shall also be provided for manual Reset of the Relay for its operational Check.

e. The Relay Tripping and Flag along with LED indications shall be distinct and visible clearly from a distance of at least 3 feet. The construction of the tripping Relay and Flag, LED indications system shall be rigid and factory adjusted type, there shall be no need to further readjust the settings.

2.3 Earth fault indicator device

Earth fault indicator device for earth fault detection and signalling on HT (11 kV) networks:

- Designed to be installed on HT cables up to 11 kV (underground, switchgears, RMU, Isolators etc.).
- Local and remote earth fault signalling by means of flashing LED and SCADA relay contact.
- Correct operation (test) can be checked pressing the pushbutton on the front.
- Self powered by the internal lithium battery with 10 years lifetime and over 2500 flashing
- Battery can be easily replaced with lithium 3.6 V - 1/2 AA type (no soldering or tools required).

03 General requirements

3.1 The EFIR assembly shall be enclosed in a metallic (Box) made with 2 mm thick M.S. sheet and shall be suitable for the installation, directly on tubular poles through pole clamps. The design shall be weatherproof and prevent entrance of rainwater.

3.2 The EFIR assembly shall be constructed to the best workman ship, standards, so as to

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comply with the requirements set out in this specification.

3.3 The EFIR tripping Flag and LED indications shall be clearly visible through the glass window and covered with the steel mesh having sufficient strength to protect the Relay from mishandling.

3.4 Access to main connection and all other items of the device for normal maintenance and manual Reset & testing shall be from the front hinged door and shall be provided with universal panel lock and key.

3.5 EFI shall be smart & Intelligent Electronic Devices (IEDs) having provision for remote on-line two way data and fault indication communication and provision for integration with AMI and SCADA for Distribution Automation (DMS & EMS) to achieve Smart Grid Concept.

3.6 It shall have potential free NO & NC contacts for remote communication of status/indication and control through SCADA.

3.7 All internal data and data coming from network shall be recorded with time stamping. This information can be transmitted to the remote control centre and/or archived in logs for consultation and downloading.

04 Painting

4.1 All interior and exterior surfaces of the mild steel parts shall be thoroughly cleaned by chemical Process or by sand blasting to prepare the metal surface for painting / galvanizing i.e. degreasing / phosphating.

4.2 In case of liquid paint system, three coats of paint shall be applied. The first coat shall be primer of zinc chromate / red oxide. The second and third coats shall be based on synthetic enamel paint of superior quality to have a hard durable surface and excellent weathering properties. The paint thickness shall be 120 micron.

4.3 Alternatively electrostatic dry charged paint can be applied. Electrostatic dry charged paint can be used without primer. The total paint thickness shall not be less than 120 micron.

4.4 The finish colour shall be grey having shade RAL 7023.

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05 Inspection

The proto type Earth fault indicating Relay (EFIR) shall be inspected by the Owner/ Owner's Engineers before its delivery, so as to ascertain that the EFIR device, manufactured, design conforms to the specification and its operations is as per requirements. The defects and shortcomings pointed out by the Owner/ Owner's Engineers shall be rectified accordingly.

5.1 Sample test

The following sample tests shall be carried out in the presence of Owner/ Owner's Engineer on the selected samples.

5.2 Visual inspection

The EFIR shall be inspected visually in accordance with the list of defects set forth below.

a). Relay Tripping Flag and tripping mechanism are not made of quality workman ship.

b). Equipment fixed properly or not.

c). Dirt and foreign matter embedded in finished surface.

d). Painting work not in order.

e). Steel parts rusted.

f). Weather shielding not proper.

g). Locking arrangement not proper

06 Acceptance rejection

6.1 The manufacturer shall provide all necessary facilities for carrying out the inspection.

6.2 The EFIR device, proto type offered for acceptance shall be grouped in lots containing 20 units each.

6.3 The 4 units from each lot of 20 pieces shall be selected from the lot at random. In case there is no defect in the unit, the lot shall be deemed to have passed. If the no. of defective unit is one or more than, the whole lot shall be inspected. In case more than 2-

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units are not complying with the requirements of this specification, the lot shall be rejected.

07 Marking and packing

7.1 Marking:

A marking / nameplate of suitable size shall be fitted at prominent place on the enclosure. The plate shall carry following details:

- Name of purchaser i.e. DHA order No.
- Type and production No.
- Year of manufacturer.
- Serial No.

7.2 Packing

EFIR device shall be supplied from factory in complete assembled form arrangement shall be made to ensure that the paint does not receive scratches and fixtures are not damaged by jerks during transportation. Any damage to the paint or fixtures shall be rectified by the supplier free of charge.

08 Accessories

The twin core flexible cables 4 sq mm of 15 feet length shall be provided with each EFIR unit to provide the connection between the CT, and EFIR unit.

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PREAMBLE

1. **FOR SCHEDULED AND NON-SCHEDULED ITEMS, THE BIDDER SHALL QUOTE PERCENTAGE ABOVE OR BELOW ON THE AMOUNT PUT TO BID AND GIVEN IN THE SUMMERY OF COST OF ESTIMATE.**

2. The Estimate shall be read in conjunction with the Conditions of Contract, Specifications and Drawings.

3. The Quantities given in the Estimates are estimated and provisional quantities and are given to provide a common basis for bidding. The basis for payment will be the factual 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 Contract.

4. The rates and prices quoted in the BOQ, except insofar as it is otherwise provided under the Contract, include all costs of Contractor's plant, labour, supervision; materials execution, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract. Furthermore, all duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior to deadline for submission of Bid, shall be included in the rates and prices, and the total Bid Price submitted by the Bidder.

5. The whole cost of complying with the provisions of the Contract is included in the rates and prices given in the Priced BOQ. Where no items are provided, the cost is deemed to be distributed among the rates and prices for the other related items of the Works.

6. In case of any discrepancy in description or unit of any scheduled item provided in the BOQ with the description or unit of any scheduled item provided in MRS 2nd Biannual 2026, the description and unit of item as provided in MRS 2nd Biannual shall prevail.

7. General directions and description of work and materials are not necessarily repeated nor summarized in the Priced BOQ. References to the relevant sections of the Bidding Documents shall be made.

8. The items mentioned in the BOQ consist of furnishing all plant, labor, equipment, machinery, appliances, materials, fittings, fixtures, fabrication, erection and installation required for completing the items/works. The work shall be done in accordance with the Drawings, Technical Specifications, BOQ and directions of the Engineer complete in all respect.

9. Complete description of items of works in the BOQ, general directions, conditions and limitations of works, location and place of works, applicable methods, means to be adopted, type and quality of materials, use of tools, plant, and machinery are not necessarily mentioned in the BOQ. Theses shall be referred to in accordance with the Drawings and Technical Specifications.

10. The bidder may ensure himself of the correctness of quantities and application of the individual items of works as per the Drawings, Technical Specifications and Contract Documents.

11. Notwithstanding provision of the General Conditions of Contract Part-1, no claim for extra payment will be admissible on account of anticipated profit or variation in overheads expenditure for the works not actually performed nor will any adjustment in the unit rate set forth in the Estimate be made because of any increase or decrease in the quantities indicated therein.

12. The following abbreviations for the Units have been used in the estimate:

Unit	**Abbreviation**
Running feet	Rft.
Square feet	Sft.
Cubic feet	CA.
Kilogram	Kg.
Per Number	Each, Number, No.
Lump Sum Job	Job, Lot

Authorized Signature and official Seal: _____

Name: _____

Date: _____

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BILL OF QUANTITIES - SUMMARY

Phase 1 - Green Belts, Main Roads, Nullah Footpaths and Railing, Lake and Weir, Tube Wells, and Two Parks (Model Park and F-14/4), Sectors F-14 & F-15, Islamabad

Amounts roll up automatically from each bill - nothing on this sheet is typed

Bill No.	Bill Title	Scope covered	Amount (PKR)	% of Works Cost
PART A - CIVIL WORKS				
1	GREEN BELTS (5 NOS) - CIVIL WORKS	*The five green belts, one sub-section each - F-14 / F-15, F-14 / G-14, F-13 / F-14, F-15 / G-15 and the Linear Park: clearance and cut / fill, walkways, cycle and jogging tracks, rain-water harvesting pits (no boundary wall, railing or gates - Client instruction), and in the F-14 / F-15 belt the performance-deck stage and seating, the natural pond and the two nurseries.*	**548,446,784**	38.40%
2	MODEL PARK AND PARK F-14/4 - CIVIL WORKS	*The model park (park f-14 markaz) and park f-14/4 at actual size, one sub-section each: clearance, compacted fill (3 ft in the Phase 1 parks, 2 ft elsewhere) balanced from site cut, stone boundary wall, perimeter walkway, internal footpaths and sub-walkways, P.C.C. access stair with handrails, and the new storm-water drainage (R.C.C. pipe, manholes and gully chambers). Area grading of the Markaz and the playgrounds is not part of this estimate.*	**89,286,052**	6.25%
3	GATES AND ENTRANCES - GREEN BELTS AND PARKS	*The 30 ft wrought-iron entrance gates of the five green belts with their fence panels and paved aprons; one wicket gate 12 ft wide with its vehicle crossing and one revolving pedestrian entrance gate for each of the model park (park f-14 markaz) and park f-14/4.*	**13,901,128**	0.97%
4	NULLAH FOOTPATHS, SAFETY RAILING AND ACCESS STEPS - F-14 AND F-15	*The works on top of the two nullahs, under separate headings - the F-14 nullah (4,500 Rft) and the F-15 nullah (4,000 Rft): the 4 ft top-of-bank footpath on both banks with sand bedding, P.C.C. slab, tuff paving and edge kerbs, the galvanised M.S. safety railing on the top section, and the public access steps. The walled stone-masonry channel itself is not part of this estimate.*	**77,248,458**	5.41%
5	F-14 LAKE - PRESERVATION, STONE PITCHING, PERIMETER WALKWAY AND STONE-FILL WEIR	*The existing 13-Kanal F-14 lake preserved and re-profiled: desilting and bank trimming, 1 ft stone pitching on the 1:2 batter with its 4 ft toe apron and P.C.C. toe beam, the 945 Rft x 8 ft perimeter walkway, and one stone-fill weir of 20 ft span - granular fill, R.C.C. and P.C.C. aprons, mortared hard-stone body, 6 in shotcrete facing and stone-fill stilling basin.*	**15,843,954**	1.11%
6	TUBE WELLS, TRIAL BORES, PUMP ROOMS AND ELECTRIFICATION		**93,674,219**	6.56%
	SUB-TOTAL - PART A CIVIL WORKS		**838,400,595**	58.69%
PART B - HORTICULTURE				
7	GREEN BELTS (5 NOS) - HORTICULTURE	*The five green belts: imported sweet earth over the net soft area, shrub and ground-cover beds, the trees and shrubs of the planting schedule, the buried watering main with hose-bib watering points, and three years of establishment and maintenance.*	**277,633,075**	19.44%
8	MODEL PARK AND PARK F-14/4 - HORTICULTURE	*The model park (park f-14 markaz) and park f-14/4: imported sweet earth, Dhaka-grass turfing, shrub beds, trees and shrubs, a few ornamental palms and ficus at the entrances and sitting areas, the buried watering main with watering points, and three years of establishment and maintenance.*	**32,541,249**	2.28%
9	ROAD CENTRAL MEDIANS & ROADSIDE GREEN STRIPS	*Eleven main roads: imported sweet earth, turfing and three years of maintenance of all central medians and roadside green strips. Ground preparation and kerb painting are not part of this estimate.*	**75,997,630**	5.32%
10	ROAD PLANTING - 11 MAIN ROADS (105 FT & 120 FT)	*Trees and shrubs along the 11 main roads (105 ft and 120 ft) per the Client road inventory - 20,710 plants, one sub-section per road, at the lowest nursery quotation with planting sundries and 5% replacement.*	**19,035,216**	1.33%

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11	CHANNEL-SIDE GREEN BUFFER - SOFTSCAPE, PLANTING, WATERING AND 3-YEAR MAINTENANCE	*The 12 ft channel-side green buffer on both banks of both nullahs: imported sweet earth, Dhaka-grass turfing, shade trees, the buried watering main with hose-bib watering points, and three years of establishment and maintenance.*	**23,060,547**	1.61%
	SUB-TOTAL - PART B HORTICULTURE		**428,267,717**	29.98%

PART C - FIXTURES, FURNITURE AND LANDSCAPE LIGHTING				
12	MODEL PARK AND PARK F-14/4 - FIXTURES AND E&M WORKS	*The model park (park f-14 markaz) and park f-14/4: play structures and outdoor gym stations with EPDM safety surfacing, gazebos, benches, waste bins, decorative lamp posts with cabling, lighting control panels and earthing.*	**159,551,252**	11.17%
13	LAKESIDE FURNITURE & LIGHTING - FIXTURES	*Benches, waste bins and decorative 8 ft LED lamp posts around the lake walkway.*	**2,194,573**	0.15%
	SUB-TOTAL - PART C FIXTURES, FURNITURE AND LANDSCAPE LIGHTING		**161,745,825**	11.32%

	TOTAL WORKS COST (Bills 1 to 13)		**1,428,414,137**	100.00%

BREAKDOWN BY SUB-SECTION - each line links to the sub-total on its bill (already inside the bill totals above)

Sub-section	Green belt / park / road	Bill	Amount (PKR)	% of its bill
1.1	GREEN BELT F-14 / F-15 (5,800 ft x 390 ft)	*Bill 1 - Green Belts Civil (Part A - Civil works)*	**222,184,354**	40.51%
1.2	GREEN BELT F-14 / G-14 (5,800 ft x 390 ft)	*Bill 1 - Green Belts Civil (Part A - Civil works)*	**118,943,819**	21.69%
1.3	GREEN BELT F-13 / F-14 (5,800 ft x 195 ft)	*Bill 1 - Green Belts Civil (Part A - Civil works)*	**85,110,224**	15.52%
1.4	GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft)	*Bill 1 - Green Belts Civil (Part A - Civil works)*	**20,749,047**	3.78%
1.5	LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft)	*Bill 1 - Green Belts Civil (Part A - Civil works)*	**101,459,340**	18.50%
2.4	PARK F-14/4 (Park 4) (42 Kanal)	*Bill 2 - Two Parks Civil (Part A - Civil works)*	**40,894,695**	45.80%
2.5	PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)	*Bill 2 - Two Parks Civil (Part A - Civil works)*	**48,391,357**	54.20%
3.1	GREEN BELT F-14 / F-15 (5,800 ft x 390 ft) - VEHICLE ENTRANCE APRONS	*Bill 3 - Gates (Part A - Civil works)*	**2,626,621**	18.90%
3.2	GREEN BELT F-14 / G-14 (5,800 ft x 390 ft) - VEHICLE ENTRANCE APRONS	*Bill 3 - Gates (Part A - Civil works)*	**2,626,621**	18.90%
3.3	GREEN BELT F-13 / F-14 (5,800 ft x 195 ft) - VEHICLE ENTRANCE APRONS	*Bill 3 - Gates (Part A - Civil works)*	**2,626,621**	18.90%
3.4	GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft) - VEHICLE ENTRANCE APRONS	*Bill 3 - Gates (Part A - Civil works)*	**328,328**	2.36%
3.5	LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft) - VEHICLE ENTRANCE APRONS	*Bill 3 - Gates (Part A - Civil works)*	**3,611,605**	25.98%
3.6	PARK F-14/4 (Park 4) (42 Kanal) - GATES AND VEHICLE CROSSING	*Bill 3 - Gates (Part A - Civil works)*	**1,040,666**	7.49%
3.7	PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft) - GATES AND VEHICLE CROSSING	*Bill 3 - Gates (Part A - Civil works)*	**1,040,666**	7.49%
4.1	F-14 NULLAH (4,500 Rft)	*Bill 4 - Nullah Paths & Railing (Part A - Civil works)*	**40,948,034**	53.01%
4.2	F-15 NULLAH (4,000 Rft)	*Bill 4 - Nullah Paths & Railing (Part A - Civil works)*	**36,300,424**	46.99%
7.1	GREEN BELT F-14 / F-15 (5,800 ft x 390 ft)	*Bill 7 - Green Belts Hort (Part B - Horticulture)*	**81,683,007**	29.42%
7.2	GREEN BELT F-14 / G-14 (5,800 ft x 390 ft)	*Bill 7 - Green Belts Hort (Part B - Horticulture)*	**91,477,027**	32.95%
7.3	GREEN BELT F-13 / F-14 (5,800 ft x 195 ft)	*Bill 7 - Green Belts Hort (Part B - Horticulture)*	**45,643,245**	16.44%
7.4	GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft)	*Bill 7 - Green Belts Hort (Part B - Horticulture)*	**10,433,665**	3.76%
7.5	LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft)	*Bill 7 - Green Belts Hort (Part B - Horticulture)*	**48,396,131**	17.43%
8.4	PARK F-14/4 (Park 4) (42 Kanal)	*Bill 8 - Two Parks Hort (Part B - Horticulture)*	**13,209,700**	40.59%
8.5	PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)	*Bill 8 - Two Parks Hort (Part B - Horticulture)*	**19,331,549**	59.41%
10.1	AMALTAS ROAD (South Service Rd. 105', F-14, 8,187 ft)	*Bill 10 - Main Road Plants (Part B - Horticulture)*	**3,217,669**	16.90%
10.2	KURRAJONG ROAD (East Service Rd. 105', F-14, 5,372 ft)	*Bill 10 - Main Road Plants (Part B - Horticulture)*	**2,751,877**	14.46%
10.3	CHINAAR ROAD (West service Rd. 105', F-14, 5,371 ft)	*Bill 10 - Main Road Plants (Part B - Horticulture)*	**2,187,643**	11.49%
10.4	PINE ROAD (East Markaz Rd. 120', F-14, 3,087 ft)	*Bill 10 - Main Road Plants (Part B - Horticulture)*	**834,031**	4.38%
10.5	ILLAWARA ROAD (South Markaz Rd. 120', F-14, 3,696 ft)	*Bill 10 - Main Road Plants (Part B - Horticulture)*	**1,539,223**	8.09%
10.6	TERMINALIA ROAD (Dilzak Rd. 120', F-14, 5,224 ft)	*Bill 10 - Main Road Plants (Part B - Horticulture)*	**1,974,676**	10.37%

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10.7	GUL-E- NISHTAR ROAD (Hafeez Jalandhri Rd. 120', F-14, 2,285 ft)	*Bill 10 - Main Road Plants (Part B - Horticulture)*	**879,447**	4.62%
10.8	KACHNAR ROAD (East Service Rd. 105', F-15, 5,749 ft)	*Bill 10 - Main Road Plants (Part B - Horticulture)*	**2,326,871**	12.22%
10.9	ALSTONIA ROAD (West Service Rd. 105', F-15, 2,382 ft)	*Bill 10 - Main Road Plants (Part B - Horticulture)*	**1,540,912**	8.10%
10.10	BAKAIN ROAD (107 Markaz Rd. 105', F-15, 2,037 ft)	*Bill 10 - Main Road Plants (Part B - Horticulture)*	**1,179,108**	6.19%
10.11	SAPIUM ROAD (105 Rd. 120', F-15, 2,037 ft)	*Bill 10 - Main Road Plants (Part B - Horticulture)*	**603,759**	3.17%
11.1	F-14 NULLAH - CHANNEL-SIDE GREEN BUFFER	*Bill 11 - Buffer Softscape (Part B - Horticulture)*	**12,194,562**	52.88%
11.2	F-15 NULLAH - CHANNEL-SIDE GREEN BUFFER	*Bill 11 - Buffer Softscape (Part B - Horticulture)*	**10,865,985**	47.12%
12.4	PARK F-14/4 (Park 4) (42 Kanal)	*Bill 12 - Two Parks Fixtures (Part C - Fixtures)*	**67,450,951**	42.28%
12.5	PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)	*Bill 12 - Two Parks Fixtures (Part C - Fixtures)*	**92,100,301**	57.72%
13.1	F-14 LAKE - LAKESIDE FURNITURE AND LIGHTING	*Bill 13 - Lakeside Fixtures (Part C - Fixtures)*	**2,194,573**	100.00%

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

BILL No. 1 - GREEN BELTS (5 NOS) - CIVIL WORKS

1 F-14 / F-15; 1.2 F-14 / G-14; 1.3 F-13 / F-14; 1.4 F-15 / G-15 (Street 589); 1.5 Linear Park F-14/15 - E-14/15) - clearance and earthwork, boundary walls and railings, walkways, cycle and jogging tracks, performance deck, pond, nurseries and rain-water harvesting. Planting and softscape are in Bill 7, the fixtures in the estimate of an
Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
SUB-SECTION 1.1 - GREEN BELT F-14 / F-15 (5,800 ft x 390 ft)												
A. SITE PREPARATION & EARTHWORK (cross-sections, sheet 07A)												
1.1.01	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the site over the whole belt, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	R-C3-10	*Ch. 3 / Item 53*	**Sft**	**2,262,000.00**	1000 Sft	1000	5,292.20	**11,970,956**	*TG-103*	*Gross belt area*	*Civil - schedule*
1.1.02	Regular excavation dressed. [Ch. 3, Item 6: Regular excavation (cutting) of the belt to formation level, dressed to desiened section and levels]	R-C3-18	*Ch. 3 / Item 6*	**Cft**	**1,537,000.00**	1000 Cft	1000	8,385.70	**12,888,821**	*TG-104*	*Cut volume*	*Civil - schedule*
1.1.03	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 90% maximum modified AASHTO dry density. [Ch. 3, Item 5(ii): Earthwork in embankment / filling to formation level with suitable material from the belt cut, including ploughing, mixing, moisture conditioning, compaction to 90% modified AASHTO and dressing]	R-C3-19	*Ch. 3 / Item 5(ii)*	**Cft**	**1,537,000.00**	1000 Cft	1000	10,856.75	**16,686,825**	*TG-106*	*Cut re-used in fill*	*Civil - schedule*
1.1.04	Filling to formation level with approved select material borrowed from outside, in layers, watered and compacted.	R-C3-23	*NSI / EW-BF*	**Cft**	**700,950.00**	1000 Cft	1000	15,386.45	**10,785,132**	*TG-107*	*Fill in excess of cut*	*Civil - non-schedule*
1.1.05	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of surplus cut material to approved dumping ground, upto 5 km lead]	R-C3-07	*Ch. 3 / Item 17(a)*	**Cft**	**0.00**	1000 Cft	1000	7,190.50	**0**	*TG-108*	*Cut in excess of fill*	*Civil - schedule*
1.1.06	Compaction of natural ground. [Ch. 3, Item 54: Compaction of natural ground over the belt prior to formation of landscape works]	R-C3-15	*Ch. 3 / Item 54*	**Sft**	**2,262,000.00**	1000 Sft	1000	3,479.60	**7,870,855**	*TG-103*	*Gross belt area*	*Civil - schedule*
B. BOUNDARY WALL - stone masonry 9 in thick, 8 ft high, with railing, on 4.0% of the length of both long edges (2,080 Rft of the descoped wall retained)												
1.1.07	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the boundary wall, 4 ft wide x 3 ft deep, by excavator in ordinary soil, including dagbelling and dressing]	R-C3-01	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**5,589.50**	1000 Cft	1000	11,147.40	**62,308**	*TG-110*	*SD-1*	*Civil - schedule*
1.1.08	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick x 4 ft wide, as lean course under the wall footing]	R-C6-01	*Ch. 6 / Item 5(i)*	**Cft**	**621.06**	100 Cft	100	36,029.50	**223,763**	*TG-111*	*SD-1*	*Civil - schedule*
1.1.09	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and retaining walls, etc. and footing beams, other structural members other than those mentioned in 6 (a-d) above not requiring form work (i.e. horizontal shuttering), complete in all respects - Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(c)(2): Providing and laying reinforced cement concrete 1:1.5:3 in the wall strip footing, 3 ft wide x 9 in thick, including formwork, compacting and curing]	R-C6-07	*Ch. 6 / Item 6(c)(2)*	**Cft**	**1,048.03**	Cft	1	697.50	**731,002**	*TG-112*	*SD-1*	*Civil - schedule*
1.1.10	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing, including cutting, bending, laying and binding]	R-C6-08	*Ch. 6 / Item 12(b)(ii)*	**Kg**	**2,305.67**	100 Kg	100	30,827.85	**710,788**	*TG-113*	*SD-1*	*Civil - schedule*
1.1.11	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in foundation and upto plinth of the boundary wall]	R-C8-03	*Ch. 8 / Item 2(d)(iii)*	**Cft**	**873.36**	100 Cft	100	35,682.60	**311,637**	*TG-114*	*2 ft 6 in below ground*	*Civil - schedule*
1.1.12	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in the boundary wall above plinth, including scaffolding and curing]	R-C8-01	*Ch. 8 / Item 4(d)(iii)*	**Cft**	**1,921.39**	100 Cft	100	38,677.70	**743,149**	*TG-115*	*5 ft 6 in above ground*	*Civil - schedule*
1.1.13	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on top of the boundary wall]	R-C6-03	*Ch. 6 / Item 5(f)*	**Cft**	**58.22**	100 Cft	100	49,085.50	**28,580**	*TG-116*	*SD-1*	*Civil - schedule*
1.1.14	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the stone-masonry boundary wall]	R-C11-03	*Ch. 11 / Item 20(c)(ii)*	**Sft**	**5,123.71**	100 Sft	100	7,231.25	**370,508**	*TG-117*	*Both faces*	*Civil - schedule*
1.1.15	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, in layers, watered and compacted]	R-C3-05	*Ch. 3 / Item 5(i)*	**Cft**	**3,047.05**	1000 Cft	1000	11,261.30	**34,314**	*TG-118*	*Excavation less structure*	*Civil - schedule*
1.1.16	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. railing 3 ft high, 76x76x3 mm hollow box main member, on top of the boundary wall]	R-C25-03	*Ch. 25 / Item 34*	**Rft**	**465.79**	Rft	1	1,587.50	**739,444**	*TG-119*	*SD-1*	*Civil - schedule*
C. WALKWAY - 6 ft wide PCC tough paver on 4 in sand, two runs												
1.1.17	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of walkway sub-grade to designed level, in ordinary soil]	R-C3-01	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**34,800.00**	1000 Cft	1000	11,147.40	**387,930**	*TG-123*	*6 in build-up*	*Civil - schedule*

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1.1.18	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the walkway]	**R-C18-01**	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**11,600.00**	100 Cft	100	10,874.25	**1,261,413**	*TG-124*	*SD-2*	*Civil - schedule*
1.1.19	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the tough pavers]	**R-C10-01**	*Ch. 10 / Item 3*	**Cft**	**23,200.00**	100 Cft	100	3,556.70	**825,154**	*TG-125*	*Zone-1 note*	*Civil - schedule*
1.1.20	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi, 50% grey and 50% coloured, including grouting joints with sand]	**R-C10-04**	*Ch. 10 / Item 44*	**Sft**	**69,600.00**	Sft	1	231.35	**16,101,960**	*TG-126*	*Zone drawings*	*Civil - schedule*
1.1.21	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone of 3500 psi to both edges of the walkway, laid in cement-sand mortar 1:3]	**R-C10-05**	*Ch. 10 / Item 45*	**Rft**	**23,200.00**	Rft	1	573.35	**13,301,720**	*TG-127*	*2 edges x 2 runs*	*Civil - schedule*
D. CYCLE TRACK - 8 ft wide, 1 in asphalt on 1 in granular base (F-14 / F-15 belt only, per the green-belt zoning)												
1.1.22	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of cycle-track sub-grade to designed level, in ordinary soil]	**R-C3-01**	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**7,733.33**	1000 Cft	1000	11,147.40	**86,207**	*TG-129*	*2 in build-up*	*Civil - schedule*
1.1.23	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular base course, 1 in thick, under the cycle track]	**R-C18-01**	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**3,866.67**	100 Cft	100	10,874.25	**420,471**	*TG-130*	*SD-2*	*Civil - schedule*
1.1.24	Providing and laying bituminous priming coat, using 10 lbs. kerosene oil and 10 lbs. binder per 100 Sft. or 0.5 Kg kerosene and 0.5 Kg binder per square metre. [Ch. 18, Item 6: Providing and laying bituminous priming coat over the granular base of the cycle track]	**R-C18-05**	*Ch. 18 / Item 6*	**Sft**	**46,400.00**	100 Sft	100	2,582.55	**1,198,303**	*TG-131*	*Prime coat*	*Civil - schedule*
1.1.25	Providing and laying plant premixed bituminous carpet, including compaction and finishing to required camber, grade and density - wearing course, at the bitumen content of the approved Job Mix Formula (rate per inch thickness per 100 Sft, converted to Cft). [Ch. 18, Item 10(a): Providing and laying plant-premixed bituminous carpet wearing course, 1 in thick, to the cycle track, compacted and finished to camber and grade]	**R-C18-03**	*Ch. 18 / Item 10(a)*	**Cft**	**3,866.67**	Cft	1	931.93	**3,603,463**	*TG-132*	*SD-2*	*Civil - schedule*
1.1.26	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the cycle track]	**R-C10-05**	*Ch. 10 / Item 45*	**Rft**	**11,600.00**	Rft	1	573.35	**6,650,860**	*TG-133*	*2 edges*	*Civil - schedule*
D2. JOGGING TRACK - 8 ft wide, compacted earth formation with a 3 in pan crush wearing layer												
1.1.27	Preparation and compaction of the jogging-track formation to designed section - ploughing, moistening to optimum moisture content, levelling and compaction with power road roller.	**R-C3-22**	*NSI / EW-DL*	**Sft**	**46,400.00**	100 Sft	100	1,650.00	**765,600**	*TG-174*	*Compacted earth*	*Civil - non-schedule*
1.1.28	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying pan crush (crushed stone product of approved quality and grade), 3 in thick, on the compacted earth formation of the jogging track, including spreading, moistening and compaction to required camber and grade]	**R-C18-01**	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**11,600.00**	100 Cft	100	10,874.25	**1,261,413**	*TG-175*	*Client instruction*	*Civil - schedule*
1.1.29	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the jogging track]	**R-C10-05**	*Ch. 10 / Item 45*	**Rft**	**11,600.00**	Rft	1	573.35	**6,650,860**	*TG-176*	*2 edges*	*Civil - schedule*
E. STRUCTURES, ENTRANCES, PLAY AREAS & RAIN-WATER HARVESTING												
1.1.30	Construction of rain-water harvesting pit 12 ft x 12 ft x 6 ft deep, including excavation, stone-masonry stepped lining, filter media, geotextile, uPVC pipework, P.C.C. base and heavy-duty cover - complete.	**R-CA-17**	*COMP / CA-17*	**Nos**	**20.00**	Each	1	363,141.15	**7,262,823**	*TG-140*	*20 per belt (Client instruction)*	*Civil - non-schedule*
F. OPEN PERFORMANCE DECK (zone-4 / Section B-B)												
1.1.31	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as bedding under the performance-deck stage]	**R-C10-01**	*Ch. 10 / Item 3*	**Cft**	**418.88**	100 Cft	100	3,556.70	**14,898**	*TG-142*	*Section B-B*	*Civil - schedule*
1.1.32	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 4 in thick, as base slab under the stage]	**R-C6-03**	*Ch. 6 / Item 5(f)*	**Cft**	**418.88**	100 Cft	100	49,085.50	**205,609**	*TG-143*	*Section B-B*	*Civil - schedule*
1.1.33	Providing and laying mosaic flooring consisting of one part of cement and marble powder in the ratio of 3:1 and two parts of marble chips, laid over 1" (25 mm) thick flooring of 1:2:4 cement concrete, including rubbing and polishing complete with finishing: 1-3/8" (35 mm) thick mosaic flooring, consisting of 3/8" (10 mm) mosaic topping, using grey cement. [Ch. 10, Item 22(a)(i): Providing and laying 35 mm mosaic / terrazzo flooring with marble chips, including rubbing and polishing, to the stage]	**R-C10-07**	*Ch. 10 / Item 22(a)(i)*	**Sft**	**1,256.64**	100 Sft	100	31,412.90	**394,746**	*TG-144*	*Section B-B*	*Civil - schedule*
1.1.34	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry in cement-sand mortar 1:6 in the concentric seating steps, 2 ft thick x 5 ft high, including dressing of stones and curing]	**R-C8-01**	*Ch. 8 / Item 4(d)(iii)*	**Cft**	**9,738.94**	100 Cft	100	38,677.70	**3,766,797**	*TG-146*	*Zone-4*	*Civil - schedule*
1.1.35	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as cap on the masonry seating steps]	**R-C6-03**	*Ch. 6 / Item 5(f)*	**Cft**	**324.63**	100 Cft	100	49,085.50	**159,347**	*TG-147*	*Zone-4*	*Civil - schedule*
1.1.36	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing in cement mortar 1:3 to exposed stone-masonry faces of the seating steps]	**R-C11-03**	*Ch. 11 / Item 20(c)(ii)*	**Sft**	**4,869.47**	100 Sft	100	7,231.25	**352,123**	*TG-148*	*Face area*	*Civil - schedule*

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1.1.37	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm precast concrete interlocking tuff pavers to the plaza apron around the seating circle]	R-C10-04	*Ch. 10 / Item 44*	Sft	5,419.25	Sft	1	231.35	1,253,743	*TG-149*	*Zone-4*	*Civil - schedule*
1.1.38	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the plaza pavers]	R-C10-01	*Ch. 10 / Item 3*	Cft	1,806.42	100 Cft	100	3,556.70	64,249	*TG-150*	*Zone-4*	*Civil - schedule*
G. POND (Zone-3) - ENLARGED: 200 ft wide, 8.5 ft deep, with stone-pitched banks (Client instruction)												
1.1.39	Regular excavation dressed. [Ch. 3, Item 6: Desilting of the bed of the existing natural pond in Zone-3]	R-C3-18	*Ch. 3 / Item 6*	Cft	243,000.00	1000 Cft	1000	8,385.70	2,037,725	*TG-153*	*30% of the existing prism*	*Civil - schedule*
1.1.40	Regular excavation dressed. [Ch. 3, Item 6: Excavation of the pond to the enlarged section, 200 ft wide and 8.5 ft deep with 2:1 banks, dressed to the designed section]	R-C3-18	*Ch. 3 / Item 6*	Cft	1,367,700.00	1000 Cft	1000	8,385.70	11,469,122	*TG-155*	*Enlarged prism less the existing pond*	*Civil - schedule*
1.1.41	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of the silt and the surplus excavated material of the pond to approved dumping ground]	R-C3-07	*Ch. 3 / Item 17(a)*	Cft	1,610,700.00	1000 Cft	1000	7,190.50	11,581,738	*TG-154*	*All excavated material*	*Civil - schedule*
G2. STONE-PITCHED BANKS OF THE POND (section of the F-14 lake bank)												
1.1.42	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Clean screened sand, 3 in thick, as filter bedding under the stone pitching of the pond banks]	R-C10-01	*Ch. 10 / Item 3*	Cft	15,205.26	100 Cft	100	3,556.70	540,806	*TG-180*	*Under the pitching*	*Civil - schedule*
1.1.43	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Stone pitching, 1 ft thick, on the pitched banks of the pond]	R-C8-02	*Ch. 16 / Item 28*	Cft	60,821.05	100 Cft	100	15,198.50	9,243,887	*TG-181*	*Shoreline x developed slope*	*Civil - schedule*
1.1.44	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Stone pitching, 6 in thick, to the 4 ft wide toe apron at the bottom of the banks]	R-C8-02	*Ch. 16 / Item 28*	Cft	6,400.00	100 Cft	100	15,198.50	972,704	*TG-182*	*Toe apron*	*Civil - schedule*
1.1.45	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4 in the toe beam, 1 ft 6 in x 1 ft 6 in]	R-C6-03	*Ch. 6 / Item 5(f)*	Cft	7,200.00	100 Cft	100	49,085.50	3,534,156	*TG-183*	*Toe beam*	*Civil - schedule*
1.1.46	Grouting stone filling or pitching, with bajri. [Ch. 16, Item 34: Grouting of the pitching and the toe apron with bajri]	R-C16-34	*Ch. 16 / Item 34*	Cft	67,221.05	100 Cft	100	3,905.70	2,625,453	*TG-184*	*All pitching*	*Civil - schedule*
1.1.47	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the lead from the approved source to site (composite of the chain and kilometre rates of the item). [Ch. 1, Item 1: Carriage of stone, aggregate and sand for the pond banks and walkway]	R-C1-01	*Ch. 1 / Item 1*	Cft	106,692.98	100 Cft	100	4,590.00	4,897,208	*TG-190*	*All pond materials*	*Civil - schedule*
G3. PERIMETER WALKWAY OF THE POND - 8 ft wide												
1.1.48	Dressing and levelling of the walkway sub-grade to designed section, with compaction.	R-C3-22	*NSI / EW-DL*	Sft	25,600.00	100 Sft	100	1,650.00	422,400	*TG-185*	*8 ft walkway*	*Civil - non-schedule*
1.1.49	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Sand bedding, 4 in thick, under the walkway]	R-C10-01	*Ch. 10 / Item 3*	Cft	8,533.33	100 Cft	100	3,556.70	303,505	*TG-186*	*4 in*	*Civil - schedule*
1.1.50	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4, 4 in thick, as the walkway slab]	R-C6-03	*Ch. 6 / Item 5(f)*	Cft	8,533.33	100 Cft	100	49,085.50	4,188,629	*TG-187*	*4 in slab*	*Civil - schedule*
1.1.51	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Tuff-paver wearing surface of the walkway]	R-C10-04	*Ch. 10 / Item 44*	Sft	25,600.00	Sft	1	231.35	5,922,560	*TG-188*	*Walkway*	*Civil - schedule*
1.1.52	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Precast edge kerb stone to both edges of the walkway]	R-C10-05	*Ch. 10 / Item 45*	Rft	6,400.00	Rft	1	573.35	3,669,440	*TG-189*	*Both edges*	*Civil - schedule*
G4. STONE-FILL WEIR OF THE POND (section of the F-14 lake weir, 50 ft span, at the corner of the pond - Client instruction)												
1.1.53	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth from 5.1 ft. (1.5 m) to 15 ft. (4.5 m), in ordinary soil. [Ch. 3, Item 21, 2(a)(ii): Excavation in foundation of the weir, its aprons and the stilling basin, 5.1 ft to 15 ft deep]	R-C3-02	*Ch. 3 / Item 21, 2(a)(ii)*	Cft	19,936.00	1000 Cft	1000	13,528.20	269,698	*TG-191*	*Section of the lake weir*	*Civil - schedule*
1.1.54	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Well-compacted granular fill of stone product, 3 ft thick, under the aprons and the weir base]	R-C18-01	*Ch. 18 / Item 3(a)(ii)*	Cft	10,050.00	100 Cft	100	10,874.25	1,092,862	*TG-192*	*As the lake weir*	*Civil - schedule*
1.1.55	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in roof slab, beams, columns, lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects - Type C (nominal mix 1:2:4). [Ch. 6, Item 6(a)(3): Reinforced cement concrete 1:2:4 in the upstream apron and the weir base slab, 8 in thick]	R-C6-05	*Ch. 6 / Item 6(a)(3)*	Cft	1,400.00	Cft	1	773.55	1,082,970	*TG-193*	*As the lake weir*	*Civil - schedule*
1.1.56	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Reinforcement, deformed bars Grade-60, in the apron and base slab]	R-C6-08	*Ch. 6 / Item 12(b)(ii)*	Kg	3,080.00	100 Kg	100	30,827.85	949,498	*TG-194*	*#3 @ 8 in c/c*	*Civil - schedule*
1.1.57	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4 in the downstream apron, 8 in thick]	R-C6-03	*Ch. 6 / Item 5(f)*	Cft	833.33	100 Cft	100	49,085.50	409,046	*TG-195*	*As the lake weir*	*Civil - schedule*
1.1.58	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Hand-placed angular hard stone laid in mortar forming the body of the weir (crest 8 ft, base 27 ft, height 10 ft)]	R-C8-02	*Ch. 16 / Item 28*	Cft	8,750.00	100 Cft	100	15,198.50	1,329,869	*TG-196*	*As the lake weir*	*Civil - schedule*
1.1.59	Shotcrete facing 6 in thick (1:2:2) to both faces and the crest of the weir.	R-CA-20	*COMP / CA-20*	Sft	1,779.31	Sft	1	1,531.20	2,724,482	*TG-197*	*As the lake weir*	*Civil - non-schedule*
1.1.60	Providing and laying stone pitching / filling, dry hand packed, as filling behind retaining walls or in pitching and aprons. [Ch. 16, Item 27: Dry hand-packed stone fill, 3 ft thick, in the stilling basin, with friction blocks]	R-C16-27	*Ch. 16 / Item 27*	Cft	3,300.00	100 Cft	100	8,234.15	271,727	*TG-198*	*As the lake weir*	*Civil - schedule*
1.1.61	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the shorter lead adopted for the nullah and lake works. [Ch. 1, Item 1: Carriage of stone, aggregate and sand for the weir and its aprons]	R-C1-02	*Ch. 1 / Item 1*	Cft	24,333.33	100 Cft	100	3,881.75	944,559	*TG-199*	*All weir materials*	*Civil - schedule*

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H. NURSERIES												
1.1.62	Ground preparation for the plant nursery (244 ft x 200 ft) - clearing, levelling, dressing and compaction.	R-C3-22	*NSI / EW-DL*	**Sft**	**48,800.00**	100 Sft	100	1,650.00	**805,200**	*TG-157*	*zone-3.pdf*	*Civil - non-schedule*
1.1.63	Ground preparation for the fruit nursery (150 ft square) - clearing, levelling, dressing and compaction.	R-C3-22	*NSI / EW-DL*	**Sft**	**22,500.00**	100 Sft	100	1,650.00	**371,250**	*TG-158*	*Tender drawing*	*Civil - non-schedule*
H1. NURSERY SHADE-NET SHEDS - green shade net on G.I. pipe posts over both nursery plots (Client instruction)												
1.1.64	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation for the footings of the shed posts, in ordinary soil, including refilling and ramming]	R-C3-01	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**2,199.38**	1000 Cft	1000	11,147.40	**24,517**	*TG-1105*	*Footing volume*	*Civil - schedule*
1.1.65	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4 in the footings of the shed posts, 1.5 ft x 1.5 ft x 2.5 ft]	R-C6-03	*Ch. 6 / Item 5(f)*	**Cft**	**2,199.38**	100 Cft	100	49,085.50	**1,079,574**	*TG-1105*	*One per post*	*Civil - schedule*
1.1.66	Fabrication of heavy steel / iron work, with angle, tees, flat iron, round iron and sheet iron for making trusses, girders, tanks, etc., including cutting, drilling, rivetting, handling, assembling and fixing, but excluding erection in position. [Ch. 25, Item 10: Fabrication of the shed structure of G.I. pipes - 2 in posts and 1-1/2 in top runners on both grid lines - cut, welded / clamped, with base and cap fittings]	R-C25-01	*Ch. 25 / Item 10*	**Kg**	**20,327.10**	100 Kg	100	36,401.60	**7,399,390**	*TG-1104*	*Weight of the pipe structure*	*Civil - schedule*
1.1.67	Erection and fitting in position iron trusses, staging of water tanks, etc. [Ch. 25, Item 11: Erection and fitting in position of the shed structure]	R-TP-29	*Ch. 25 / Item 11*	**Kg**	**20,327.10**	100 Kg	100	1,535.90	**312,204**	*TG-1104*	*Weight of the pipe structure*	*Civil - schedule*
1.1.68	Green HDPE shade net over the roof and the four sides of both sheds, stretched and tied to the runners.	R-NS-NET	*MKT / NS-1*	**Sft**	**86,180.00**	Sft	1	30.00	**2,585,400**	*TG-1106*	*PROVISIONAL market rate*	*Civil - non-schedule*
H2. NURSERY ROOM - one room outside the two nursery plots (Client instruction), built as the tube-well pump room												
1.1.69	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft (1.5 m): 1) depth upto 5 ft (1.5 m) - a) by manual - ii) ordinary soil. [Ch. 3, Item 21, 1(a)(ii): Excavation in foundation of the room, by manual means, in ordinary soil, including refilling, watering and ramming]	R-TP-01	*Ch. 3 / Item 21, 1(a)(ii)*	**Cft**	**1,880.00**	1000 Cft	1000	17,088.20	**32,126**	*02-Parameters*	*Tausna sheet 1.2, per room: 1.88 x 1000 Cft*	*Civil - schedule*
1.1.70	Cement concrete brick or stone ballast 1-1/2" to 2" (40 mm to 50 mm) gauge, in foundation and plinth: (b) ratio 1:4:8. [Ch. 6, Item 3(b): Cement concrete brick / stone ballast 1:4:8 in foundation]	R-TP-02	*Ch. 6 / Item 3(b)*	**Cft**	**35.00**	100 Cft	100	36,435.60	**12,752**	*02-Parameters*	*Tausna sheet 1.2, per room: 0.35 x 100 Cft*	*Civil - schedule*
1.1.71	Pacca brick work in foundation and plinth in: i) cement, sand mortar - ratio 1:3. [Ch. 7, Item 4(i): Pacca brick work in foundation and plinth in cement-sand mortar 1:3]	R-TP-03	*Ch. 7 / Item 4(i)*	**Cft**	**164.00**	100 Cft	100	44,342.85	**72,722**	*02-Parameters*	*Tausna sheet 1.2, per room: 1.64 x 100 Cft*	*Civil - schedule*
1.1.72	Providing and laying damp proof course of cement concrete 1:2:4 (using cement, sand and shingle), including bitumen coating: (b) with 2 coats of bitumen - ii) 2" thick (50 mm). [Ch. 6, Item 37(b)(ii): Damp proof course of cement concrete 1:2:4, 2" thick, with 2 coats of bitumen]	R-TP-04	*Ch. 6 / Item 37(b)(ii)*	**Sft**	**62.00**	100 Sft	100	14,064.30	**8,720**	*02-Parameters*	*Tausna sheet 1.2, per room: 0.62 x 100 Sft*	*Civil - schedule*
1.1.73	Providing and laying vertical damp proof course with cement sand plaster and bitumen coating: (b) with 2 coats of bitumen - 2) ratio 1:3 - b) 3/4" thick (20 mm). [Ch. 6, Item 39(b)(2)(b): Vertical damp proof course of cement-sand plaster 1:3, 3/4" thick, with 2 coats of bitumen]	R-TP-05	*Ch. 6 / Item 39(b)(2)(b)*	**Sft**	**86.00**	100 Sft	100	9,434.50	**8,114**	*02-Parameters*	*Tausna sheet 1.2, per room: 0.86 x 100 Sft*	*Civil - schedule*
1.1.74	Pacca brick work in ground floor: i) cement, sand mortar - ratio 1:4. [Ch. 7, Item 5(i): Pacca brick work in the superstructure (ground floor) in cement-sand mortar 1:4]	R-TP-06	*Ch. 7 / Item 5(i)*	**Cft**	**384.00**	100 Cft	100	43,384.35	**166,596**	*02-Parameters*	*Tausna sheet 1.2, per room: 3.84 x 100 Cft*	*Civil - schedule*
1.1.75	Filling, watering and ramming earth under floors: i) with surplus earth from foundation, etc. [Ch. 3, Item 15(i): Filling, watering and ramming earth under the floor with surplus earth from the foundation]	R-TP-07	*Ch. 3 / Item 15(i)*	**Cft**	**1,190.00**	1000 Cft	1000	8,155.50	**9,705**	*02-Parameters*	*Tausna sheet 1.2, per room: 1.19 x 1000 Cft*	*Civil - schedule*
1.1.76	Filling, watering and ramming earth under floors: ii) with new earth excavated from outside, lead upto one chain (30 m). [Ch. 3, Item 15(ii): Filling, watering and ramming earth under the floor with new earth from outside, lead upto one chain]	R-TP-08	*Ch. 3 / Item 15(ii)*	**Cft**	**390.00**	1000 Cft	1000	17,545.50	**6,843**	*02-Parameters*	*Tausna sheet 1.2, per room: 0.39 x 1000 Cft*	*Civil - schedule*
1.1.77	Extra for every 50 ft (15 m) additional lead or part thereof: i) for earthwork soft, ordinary, hard and very hard. [Ch. 3, Item 16(i): Extra for additional lead of the new earth - two increments of 50 ft, as priced in the source estimate]	R-TP-09	*Ch. 3 / Item 16(i)*	**Cft**	**780.00**	1000 Cft	1000	74.25	**58**	*02-Parameters*	*Tausna sheet 1.2, per room: 0.39 x 1000 Cft x 2 increments*	*Civil - schedule*
1.1.78	Dry rammed brick or stone ballast, 1-1/2" to 2" (40 mm to 50 mm) gauge. [Ch. 6, Item 2: Dry rammed brick / stone ballast 1-1/2" to 2" gauge under the floor]	R-TP-10	*Ch. 6 / Item 2*	**Cft**	**50.00**	100 Cft	100	14,076.50	**7,038**	*02-Parameters*	*Tausna sheet 1.2, per room: 0.50 x 100 Cft*	*Civil - schedule*
1.1.79	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (f) ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4]	R-TP-11	*Ch. 6 / Item 5(f)*	**Cft**	**1.00**	100 Cft	100	49,085.50	**491**	*02-Parameters*	*Tausna sheet 1.2, per room: 0.01 x 100 Cft*	*Civil - schedule*
1.1.80	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (i) ratio 1:4:8. [Ch. 6, Item 5(i): Plain cement concrete 1:4:8 under the floor]	R-TP-12	*Ch. 6 / Item 5(i)*	**Cft**	**25.00**	100 Cft	100	36,029.50	**9,007**	*02-Parameters*	*Tausna sheet 1.2, per room: 0.25 x 100 Cft*	*Civil - schedule*
1.1.81	Providing and laying topping of cement concrete 1:2:4, including surface finishing and dividing in panels: (c) 1-1/2" (40 mm) thick. [Ch. 10, Item 16(c): Cement concrete 1:2:4 floor topping, 1-1/2" thick, finished and divided in panels]	R-TP-13	*Ch. 10 / Item 16(c)*	**Sft**	**99.00**	100 Sft	100	10,169.60	**10,068**	*02-Parameters*	*Tausna sheet 1.2, per room: 0.99 x 100 Sft*	*Civil - schedule*
1.1.82	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): (a) reinforced cement concrete in roof slab, beams, columns, lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects - (2) Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(a)(2): Reinforced cement concrete Type B (1:1.5:3) in roof slab, beams, columns and lintels]	R-TP-14	*Ch. 6 / Item 6(a)(2)*	**Cft**	**126.07**	Cft	1	853.15	**107,557**	*02-Parameters*	*Tausna sheet 1.2, per room: 126.07 Cft*	*Civil - schedule*
1.1.83	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): (c) reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and retaining walls, etc. and footing beams, other structural members other than those mentioned in 6(a-d) above not requiring form work (i.e. horizontal shuttering) complete in all respects - (2) Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(c)(2): Reinforced cement concrete Type B (1:1.5:3) in the raft / strip foundation and plinth beams]	R-TP-15	*Ch. 6 / Item 6(c)(2)*	**Cft**	**90.40**	Cft	1	697.50	**63,054**	*02-Parameters*	*Tausna sheet 1.2, per room: 90.40 Cft*	*Civil - schedule*
1.1.84	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): (b) deformed bars - (ii) Grade-60. [Ch. 6, Item 12(b)(ii): Fabrication of deformed bar reinforcement Grade-60, cut, bent, placed and bound]	R-TP-16	*Ch. 6 / Item 12(b)(ii)*	**Kg**	**540.00**	100 Kg	100	30,827.85	**166,470**	*02-Parameters*	*Tausna sheet 1.2, per room: 5.40 x 100 Kg*	*Civil - schedule*
1.1.85	Cement plaster 1:4 upto 20 ft (6.00 m) height: c) 3/4" (20 mm) thick. [Ch. 11, Item 9(c): Cement plaster 1:4, 3/4" thick, to the walls]	R-TP-17	*Ch. 11 / Item 9(c)*	**Sft**	**514.00**	100 Sft	100	6,641.30	**34,136**	*02-Parameters*	*Tausna sheet 1.2, per room: 5.14 x 100 Sft*	*Civil - schedule*

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1.1.86	Cement pointing struck joints, on walls, upto 20 ft (6.00 m) height: a) ratio 1:2. [Ch. 11, Item 18(a): Cement pointing struck joints 1:2 to the external brick faces]	R-TP-18	*Ch. 11 / Item 18(a)*	Sft	558.00	100 Sft	100	5,418.05	30,233	*02-Parameters*	*Taunsa sheet 1.2, per room: 5.58 x 100 Sft*	*Civil - schedule*
1.1.87	Cement plaster 3/8" (10 mm) thick under soffit of R.C.C. roof slabs only, upto 20 ft height: c) 1:4. [Ch. 11, Item 12(c): Cement plaster 1:4, 3/8" thick, under the soffit of the roof slab]	R-TP-19	*Ch. 11 / Item 12(c)*	Sft	216.00	100 Sft	100	5,537.20	11,960	*02-Parameters*	*Taunsa sheet 1.2, per room: 2.16 x 100 Sft*	*Civil - schedule*
1.1.88	Single layer of tiles 9" x 4-1/2" x 1-1/2" (225 x 113 x 40 mm) laid over 4" (100 mm) earth and 1" (25 mm) mud plaster without bhoosa, grouted with cement sand 1:3 on top of RCC roof slab, provided with 34 lbs per 100 Sft or 1.72 kg/sq.m bitumen coating sand blinded. [Ch. 9, Item 5: Single layer of roof tiles over 4" earth and 1" mud plaster with bitumen coating]	R-TP-20	*Ch. 9 / Item 5*	Sft	201.00	100 Sft	100	14,518.05	29,181	*02-Parameters*	*Taunsa sheet 1.2, per room: 2.01 x 100 Sft*	*Civil - schedule*
1.1.89	Khassi parnalas in cement, sand mortar 1:2, 12" (300 mm) outside width finished smooth with a floating coat of neat cement. [Ch. 9, Item 14: Khassi parnalas 12" wide in cement-sand mortar 1:2]	R-TP-21	*Ch. 9 / Item 14*	Rft	12.50	Rft	1	279.45	3,493	*02-Parameters*	*Taunsa sheet 1.2, per room: 12.5 Rft*	*Civil - schedule*
1.1.90	Khuras on roof 2' x 2' x 6" (600 x 600 x 150 mm). [Ch. 9, Item 15: Khuras on roof 2 ft x 2 ft x 6 in]	R-TP-22	*Ch. 9 / Item 15*	Each	1.00	Each	1	1,240.85	1,241	*02-Parameters*	*Taunsa sheet 1.2, per room: 1 No.*	*Civil - schedule*
1.1.91	Bottom khuras of brick masonry in cement mortar 1:6, 4' x 2' x 4-1/2" (1200 x 600 x 113 mm) over 3" (75 mm) cement concrete 1:4:8. [Ch. 9, Item 16: Bottom khuras of brick masonry 4 ft x 2 ft x 4-1/2 in]	R-TP-23	*Ch. 9 / Item 16*	Each	1.00	Each	1	2,399.30	2,399	*02-Parameters*	*Taunsa sheet 1.2, per room: 1 No.*	*Civil - schedule*
1.1.92	White washing: a) new surface - iii) three coats. [Ch. 11, Item 26(a)(iii): White washing three coats on new surfaces]	R-TP-24	*Ch. 11 / Item 26(a)(iii)*	Sft	495.00	100 Sft	100	971.55	4,809	*02-Parameters*	*Taunsa sheet 1.2, per room: 4.95 x 100 Sft*	*Civil - schedule*
1.1.93	P/F iron door comprising of specified leaves made of 1-1/4" x 1-1/4" x 3/16" MS angle iron for leaf frame, diagonal and horizontal braces duly welded with MS sheet 18-SWG i/c the cost of sliding bolt, tower bolt and painting 3-coats but excluding the cost of chowkat, complete in all respect as approved and directed by the Engineer Incharge: (ii) double leaf. [Ch. 25, Item 61(ii): Iron door, double leaf, of M.S. angle frame and 18 SWG sheet, painted, excluding chowkat]	R-TP-25	*Ch. 25 / Item 61(ii)*	Sft	28.00	Sft	1	1,481.90	41,493	*02-Parameters*	*Taunsa sheet 1.2, per room: 28 Sft*	*Civil - schedule*
1.1.94	Providing and fixing 2" wide MS / GI chowkat single / double rebate made of 16 SWG MS sheet pressed / welded / supported with M.S. flat 1-1/4" x 1/8" i/c 6" long M.S. flat 1" x 1/8" hold fasts (6 Nos) welded / screwed, punching of lock hole covered with MS box, coating with antirust paint including filling with cement sand mortar (1:8) and embedding hold fast in cement concrete (1:2:4), complete in all respect as approved and directed by the Engineer Incharge: (ii) 10.5" wide. [Ch. 12, Item 17(ii): M.S. / G.I. pressed-steel chowkat 10.5" wide for the door]	R-TP-26	*Ch. 12 / Item 17(ii)*	Sft	28.00	Sft	1	733.40	20,535	*02-Parameters*	*Taunsa sheet 1.2, per room: 28 Sft*	*Civil - schedule*
1.1.95	Providing and fixing steel windows using M.S. sheet (16 SWG) moulded tubular pipe 1-1/2" x 1-1/2" (40 x 40 mm) for frame and 1-1/4" x 1-1/4" (30 x 30 mm) for leaves including M.S. square bars 1/4" x 1/4" (6 x 6 mm) welded around each panel of frame, 5 mm thick glass panes fixed with double M.S. square tubular pipe 3/8" x 3/8" (10 x 10 mm) (22 SWG) beading with U-shaped rubber lining, brass fitting, holdfast, including painting three coats complete in all respects: a) for openable panels fixed with wire gauze 24 SWG, 12 x 12 mesh and glass panes 1/4" (6 mm) thick. [Ch. 25, Item 45(a): Steel windows of moulded tubular M.S. sections with wire gauze and glass panes, painted]	R-TP-27	*Ch. 25 / Item 45(a)*	Sft	18.00	Sft	1	1,345.65	24,222	*02-Parameters*	*Taunsa sheet 1.2, per room: 18 Sft*	*Civil - schedule*
1.1.96	Carriage of 100 Cft (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the lead P_TWLEAD from the approved quarry (sum of the kilometre rates of the item: 1st to 10th km, then 69.30 per km). [Ch. 1, Item 1: Carriage of crushed stone aggregate and bajri for the concrete, from the approved quarry]	R-TP-31	*Ch. 1 / Item 1*	Cft	206.00	100 Cft	100	3,425.20	7,056	*02-Parameters*	*Taunsa sheet 1.2, per room: 2.06 x 100 Cft*	*Civil - schedule*
H3. NURSERY STOCK, MATERIALS AND EQUIPMENT - Client Nursery BOQ "BOQ to establish a plant nursery" (Client instruction)												
1.1.97	Supply and erection of a green shade structure for the nursery - frame with green shade cover, anchored to the ground, complete.	R-NB-03	*NSI / NB-3*	Job	1.00	Job	1	200,000.00	200,000	*TG-1109*	*Client Nursery BOQ, item 3*	*Civil - non-schedule*
1.1.98	Supply and fixing of green jali (shade net) in rolls for the nursery beds and the shade structure.	R-NB-04	*NSI / NB-4*	Rolls	5.00	Roll	1	15,000.00	75,000	*TG-1110*	*Client Nursery BOQ, item 4*	*Civil - non-schedule*
1.1.99	Fencing of the nursery area with posts, wire mesh and an entrance gate, complete.	R-NB-05	*NSI / NB-5*	Job	1.00	Job	1	300,000.00	300,000	*TG-1111*	*Client Nursery BOQ, item 5*	*Civil - non-schedule*
1.1.100	Construction of a room / store for the nursery, complete with door, window, flooring and finishes.	R-NB-06	*NSI / NB-6*	Nos	2.00	No.	1	800,000.00	1,600,000	*TG-1112*	*Client Nursery BOQ, item 6*	*Civil - non-schedule*
1.1.101	Water bore for the nursery with pump, pipework and electrical connection, complete.	R-NB-19	*NSI / NB-19*	Job	1.00	Job	1	600,000.00	600,000	*TG-1125*	*Client Nursery BOQ, item 19*	*E/M - non-schedule*
J. SOFT LANDSCAPE & IRRIGATION												
1.1.102	Preparation of shrub / ground-cover beds over 20% of the net soft-landscape area, including forking, weeding, manuring and levelling.	R-C3-22	*NSI / EW-DL*	Sft	321,692.43	100 Sft	100	1,650.00	5,307,925	*TG-165*	*Design allocation*	*Civil - non-schedule*
1.1	**SUB-TOTAL - 1.1 GREEN BELT F-14 / F-15 (5,800 ft x 390 ft)**								222,184,354			

SUB-SECTION 1.2 - GREEN BELT F-14 / G-14 (5,800 ft x 390 ft)

A. SITE PREPARATION & EARTHWORK (cross-section intensity of GB F-14 / F-15 applied by area)												
1.2.01	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the site over the whole belt, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	R-C3-10	*Ch. 3 / Item 53*	Sft	2,262,000.00	1000 Sft	1000	5,292.20	11,970,956	*TG-203*	*Gross belt area*	*Civil - schedule*
1.2.02	Regular excavation dressed. [Ch. 3, Item 6: Regular excavation (cutting) of the belt to formation level, dressed to designed section and levels]	R-C3-18	*Ch. 3 / Item 6*	Cft	1,537,000.00	1000 Cft	1000	8,385.70	12,888,821	*TG-204*	*Cut volume*	*Civil - schedule*
1.2.03	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 90% maximum modified AASHTO dry density. [Ch. 3, Item 5(ii): Earthwork in embankment / filling to formation level with suitable material from the belt cut, including ploughing, mixing, moisture conditioning, compaction to 90% modified AASHTO and dressing]	R-C3-19	*Ch. 3 / Item 5(ii)*	Cft	1,537,000.00	1000 Cft	1000	10,856.75	16,686,825	*TG-206*	*Cut re-used in fill*	*Civil - schedule*
1.2.04	Filling to formation level with approved select material borrowed from outside, in layers, watered and compacted.	R-C3-23	*NSI / EW-BF*	Cft	700,950.00	1000 Cft	1000	15,386.45	10,785,132	*TG-207*	*Fill in excess of cut*	*Civil - non-schedule*
1.2.05	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of surplus cut material to approved dumping ground, upto 5 km lead]	R-C3-07	*Ch. 3 / Item 17(a)*	Cft	0.00	1000 Cft	1000	7,190.50	0	*TG-208*	*Cut in excess of fill*	*Civil - schedule*
1.2.06	Compaction of natural ground. [Ch. 3, Item 54: Compaction of natural ground over the belt prior to formation of landscape works]	R-C3-15	*Ch. 3 / Item 54*	Sft	2,262,000.00	1000 Sft	1000	3,479.60	7,870,855	*TG-203*	*Gross belt area*	*Civil - schedule*
B. BOUNDARY WALL - stone masonry 9 in thick, 8 ft high, with railing, on 4.0% of the length of both long edges (2,080 Rft of the descoped wall retained)												
1.2.07	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the boundary wall, 4 ft wide x 3 ft deep, by excavator in ordinary soil, including dagbelling and dressing]	R-C3-01	*Ch. 3 / Item 21, 1(b)(ii)*	Cft	5,589.50	1000 Cft	1000	11,147.40	62,308	*TG-210*	*SD-1*	*Civil - schedule*
1.2.08	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick x 4 ft wide, as lean course under the wall footing]	R-C6-01	*Ch. 6 / Item 5(i)*	Cft	621.06	100 Cft	100	36,029.50	223,763	*TG-211*	*SD-1*	*Civil - schedule*

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1.2.09	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and retaining walls, etc. and footing beams, other structural members other than those mentioned in 6 (a-d) above not requiring form work (i.e. horizontal shuttering), complete in all respects - Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(c)(2): Providing and laying reinforced cement concrete 1:1.5:3 in the wall strip footing, 3 ft wide x 9 in thick, including formwork, compacting and curing]	R-C6-07	*Ch. 6 / Item 6(c)(2)*	Cft	1,048.03	Cft	1	697.50	731,002	*TG-212*	*SD-1*	*Civil - schedule*
1.2.10	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing, including cutting, bending, laying and binding]	R-C6-08	*Ch. 6 / Item 12(b)(ii)*	Kg	2,305.67	100 Kg	100	30,827.85	710,788	*TG-213*	*SD-1*	*Civil - schedule*
1.2.11	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in foundation and upto plinth of the boundary wall]	R-C8-03	*Ch. 8 / Item 2(d)(iii)*	Cft	873.36	100 Cft	100	35,682.60	311,637	*TG-214*	*2 ft 6 in below ground*	*Civil - schedule*
1.2.12	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in the boundary wall above plinth, including scaffolding and curing]	R-C8-01	*Ch. 8 / Item 4(d)(iii)*	Cft	1,921.39	100 Cft	100	38,677.70	743,149	*TG-215*	*5 ft 6 in above ground*	*Civil - schedule*
1.2.13	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on top of the boundary wall]	R-C6-03	*Ch. 6 / Item 5(f)*	Cft	58.22	100 Cft	100	49,085.50	28,580	*TG-216*	*SD-1*	*Civil - schedule*
1.2.14	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the stone-masonry boundary wall]	R-C11-03	*Ch. 11 / Item 20(c)(ii)*	Sft	5,123.71	100 Sft	100	7,231.25	370,508	*TG-217*	*Both faces*	*Civil - schedule*
1.2.15	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, in layers, watered and compacted]	R-C3-05	*Ch. 3 / Item 5(i)*	Cft	3,047.05	1000 Cft	1000	11,261.30	34,314	*TG-218*	*Excavation less structure*	*Civil - schedule*
1.2.16	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. railing 3 ft high, 76x76x3 mm hollow box main member, on top of the boundary wall]	R-C25-03	*Ch. 25 / Item 34*	Rft	465.79	Rft	1	1,587.50	739,444	*TG-219*	*SD-1*	*Civil - schedule*
C. WALKWAY - 6 ft wide PCC tough paver on 4 in sand, two runs												
1.2.17	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of walkway sub-grade to designed level, in ordinary soil]	R-C3-01	*Ch. 3 / Item 21, 1(b)(ii)*	Cft	34,800.00	1000 Cft	1000	11,147.40	387,930	*TG-223*	*6 in build-up*	*Civil - schedule*
1.2.18	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the walkway]	R-C18-01	*Ch. 18 / Item 3(a)(ii)*	Cft	11,600.00	100 Cft	100	10,874.25	1,261,413	*TG-224*	*SD-2*	*Civil - schedule*
1.2.19	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the tough pavers]	R-C10-01	*Ch. 10 / Item 3*	Cft	23,200.00	100 Cft	100	3,556.70	825,154	*TG-225*	*Zone-1 note*	*Civil - schedule*
1.2.20	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi, 50% grey and 50% coloured, including grouting joints with sand]	R-C10-04	*Ch. 10 / Item 44*	Sft	69,600.00	Sft	1	231.35	16,101,960	*TG-226*	*Zone drawings*	*Civil - schedule*
1.2.21	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone of 3500 psi to both edges of the walkway, laid in cement-sand mortar 1:3]	R-C10-05	*Ch. 10 / Item 45*	Rft	23,200.00	Rft	1	573.35	13,301,720	*TG-227*	*2 edges x 2 runs*	*Civil - schedule*
D2. JOGGING TRACK - 8 ft wide, compacted earth formation with a 3 in pan crush wearing layer												
1.2.22	Preparation and compaction of the jogging-track formation to designed section - ploughing, moistening to optimum moisture content, levelling and compaction with power road roller.	R-C3-22	*NSI / EW-DL*	Sft	46,400.00	100 Sft	100	1,650.00	765,600	*TG-274*	*Compacted earth*	*Civil - non-schedule*
1.2.23	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying pan crush (crushed stone product of approved quality and grade), 3 in thick, on the compacted earth formation of the jogging track, including spreading, moistening and compaction to required camber and grade]	R-C18-01	*Ch. 18 / Item 3(a)(ii)*	Cft	11,600.00	100 Cft	100	10,874.25	1,261,413	*TG-275*	*Client instruction*	*Civil - schedule*
1.2.24	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the jogging track]	R-C10-05	*Ch. 10 / Item 45*	Rft	11,600.00	Rft	1	573.35	6,650,860	*TG-276*	*2 edges*	*Civil - schedule*
E. STRUCTURES, ENTRANCES, PLAY AREAS & RAIN-WATER HARVESTING												
1.2.25	Construction of rain-water harvesting pit 12 ft x 12 ft x 6 ft deep, including excavation, stone-masonry stepped lining, filter media, geotextile, uPVC pipework, P.C.C. base and heavy-duty cover - complete.	R-CA-17	*COMP / CA-17*	Nos	20.00	Each	1	363,141.15	7,262,823	*TG-240*	*20 per belt (Client instruction)*	*Civil - non-schedule*
J. SOFT LANDSCAPE & IRRIGATION												
1.2.26	Preparation of shrub / ground-cover beds over 20% of the net soft-landscape area, including forking, weeding, manuring and levelling	R-C3-22	*NSI / EW-DL*	Sft	422,234.17	100 Sft	100	1,650.00	6,966,864	*TG-265*	*Design allocation*	*Civil - non-schedule*

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1.2	**SUB-TOTAL - 1.2 GREEN BELT F-14 / G-14 (5,800 ft x 390 ft)**								**118,943,819**		
SUB-SECTION 1.3 - GREEN BELT F-13 / F-14 (5,800 ft x 195 ft)											
A. SITE PREPARATION & EARTHWORK (cross-section intensity of GB F-14 / F-15 applied by area)											
1.3.01	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the site over the whole belt, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	**R-C3-10**	*Ch. 3 / Item 53*	**Sft**	**1,131,000.00**	1000 Sft	1000	5,292.20	**5,985,478**	*TG-303*	*Gross belt area*
1.3.02	Regular excavation dressed. [Ch. 3, Item 6: Regular excavation (cutting) of the belt to formation level, dressed to designed section and levels]	**R-C3-18**	*Ch. 3 / Item 6*	**Cft**	**768,500.00**	1000 Cft	1000	8,385.70	**6,444,410**	*TG-304*	*Cut volume*
1.3.03	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 90% maximum modified AASHTO dry density. [Ch. 3, Item 5(ii): Earthwork in embankment / filling to formation level with suitable material from the belt cut, including ploughing, mixing, moisture conditioning, compaction to 90% modified AASHTO and dressing]	**R-C3-19**	*Ch. 3 / Item 5(ii)*	**Cft**	**768,500.00**	1000 Cft	1000	10,856.75	**8,343,412**	*TG-306*	*Cut re-used in fill*
1.3.04	Filling to formation level with approved select material borrowed from outside, in layers, watered and compacted.	**R-C3-23**	*NSI / EW-BF*	**Cft**	**350,475.00**	1000 Cft	1000	15,386.45	**5,392,566**	*TG-307*	*Fill in excess of cut*
1.3.05	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of surplus cut material to approved dumping ground, upto 5 km lead]	**R-C3-07**	*Ch. 3 / Item 17(a)*	**Cft**	**0.00**	1000 Cft	1000	7,190.50	**0**	*TG-308*	*Cut in excess of fill*
1.3.06	Compaction of natural ground. [Ch. 3, Item 54: Compaction of natural ground over the belt prior to formation of landscape works]	**R-C3-15**	*Ch. 3 / Item 54*	**Sft**	**1,131,000.00**	1000 Sft	1000	3,479.60	**3,935,428**	*TG-303*	*Gross belt area*
B. BOUNDARY WALL - stone masonry 9 in thick, 8 ft high, with railing, on 4.0% of the length of both long edges (2,080 Rft of the descoped wall retained)											
1.3.07	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the boundary wall, 4 ft wide x 3 ft deep, by excavator in ordinary soil, including dagbelling and dressing]	**R-C3-01**	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**5,589.50**	1000 Cft	1000	11,147.40	**62,308**	*TG-310*	*SD-1*
1.3.08	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick x 4 ft wide, as lean course under the wall footing]	**R-C6-01**	*Ch. 6 / Item 5(i)*	**Cft**	**621.06**	100 Cft	100	36,029.50	**223,763**	*TG-311*	*SD-1*
1.3.09	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and retaining walls, etc. and footing beams, other structural members other than those mentioned in 6 (a-d) above not requiring form work (i.e. horizontal shuttering), complete in all respects - Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(c)(2): Providing and laying reinforced cement concrete 1:1.5:3 in the wall strip footing, 3 ft wide x 9 in thick, including formwork, compacting and curing]	**R-C6-07**	*Ch. 6 / Item 6(c)(2)*	**Cft**	**1,048.03**	Cft	1	697.50	**731,002**	*TG-312*	*SD-1*
1.3.10	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing, including cutting, bending, laying and binding]	**R-C6-08**	*Ch. 6 / Item 12(b)(ii)*	**Kg**	**2,305.67**	100 Kg	100	30,827.85	**710,788**	*TG-313*	*SD-1*
1.3.11	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in foundation and upto plinth of the boundary wall]	**R-C8-03**	*Ch. 8 / Item 2(d)(iii)*	**Cft**	**873.36**	100 Cft	100	35,682.60	**311,637**	*TG-314*	*2 ft 6 in below ground*
1.3.12	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in the boundary wall above plinth, including scaffolding and curing]	**R-C8-01**	*Ch. 8 / Item 4(d)(iii)*	**Cft**	**1,921.39**	100 Cft	100	38,677.70	**743,149**	*TG-315*	*5 ft 6 in above ground*
1.3.13	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on top of the boundary wall]	**R-C6-03**	*Ch. 6 / Item 5(f)*	**Cft**	**58.22**	100 Cft	100	49,085.50	**28,580**	*TG-316*	*SD-1*
1.3.14	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the stone-masonry boundary wall]	**R-C11-03**	*Ch. 11 / Item 20(c)(ii)*	**Sft**	**5,123.71**	100 Sft	100	7,231.25	**370,508**	*TG-317*	*Both faces*
1.3.15	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, in layers, watered and compacted]	**R-C3-05**	*Ch. 3 / Item 5(i)*	**Cft**	**3,047.05**	1000 Cft	1000	11,261.30	**34,314**	*TG-318*	*Excavation less structure*
1.3.16	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. railing 3 ft high, 76x76x3 mm hollow box main member, on top of the boundary wall]	**R-C25-03**	*Ch. 25 / Item 34*	**Rft**	**465.79**	Rft	1	1,587.50	**739,444**	*TG-319*	*SD-1*
C. WALKWAY - 6 ft wide PCC tough paver on 4 in sand, two runs											
1.3.17	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of walkway sub-grade to designed level, in ordinary soil]	**R-C3-01**	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**34,800.00**	1000 Cft	1000	11,147.40	**387,930**	*TG-323*	*6 in build-up*
1.3.18	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the walkway]	**R-C18-01**	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**11,600.00**	100 Cft	100	10,874.25	**1,261,413**	*TG-324*	*SD-2*
1.3.19	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the tough pavers]	**R-C10-01**	*Ch. 10 / Item 3*	**Cft**	**23,200.00**	100 Cft	100	3,556.70	**825,154**	*TG-325*	*Zone-1 note*

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1.3.20	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi, 50% grey and 50% coloured, including grouting joints with sand]	**R-C10-04**	*Ch. 10 / Item 44*	**Sft**	**69,600.00**	Sft	1	231.35	**16,101,960**	*TG-326*	*Zone drawings*	*Civil - schedule*
1.3.21	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone of 3500 psi to both edges of the walkway, laid in cement-sand mortar 1:3]	**R-C10-05**	*Ch. 10 / Item 45*	**Rft**	**23,200.00**	Rft	1	573.35	**13,301,720**	*TG-327*	*2 edges x 2 runs*	*Civil - schedule*
D2. JOGGING TRACK - 8 ft wide, compacted earth formation with a 3 in pan crush wearing layer												
1.3.22	Preparation and compaction of the jogging-track formation to designed section - ploughing, moistening to optimum moisture content, levelling and compaction with power road roller.	**R-C3-22**	*NSI / EW-DL*	**Sft**	**46,400.00**	100 Sft	100	1,650.00	**765,600**	*TG-374*	*Compacted earth*	*Civil - non-schedule*
1.3.23	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying pan crush (crushed stone product of approved quality and grade), 3 in thick, on the compacted earth formation of the jogging track, including spreading, moistening and compaction to required camber and grade]	**R-C18-01**	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**11,600.00**	100 Cft	100	10,874.25	**1,261,413**	*TG-375*	*Client instruction*	*Civil - schedule*
1.3.24	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the jogging track]	**R-C10-05**	*Ch. 10 / Item 45*	**Rft**	**11,600.00**	Rft	1	573.35	**6,650,860**	*TG-376*	*2 edges*	*Civil - schedule*
E. STRUCTURES, ENTRANCES, PLAY AREAS & RAIN-WATER HARVESTING												
1.3.25	Construction of rain-water harvesting pit 12 ft x 12 ft x 6 ft deep, including excavation, stone-masonry stepped lining, filter media, geotextile, uPVC pipework, P.C.C. base and heavy-duty cover - complete.	**R-CA-17**	*COMP / CA-17*	**Nos**	**20.00**	Each	1	363,141.15	**7,262,823**	*TG-340*	*20 per belt (Client instruction)*	*Civil - non-schedule*
J. SOFT LANDSCAPE & IRRIGATION												
1.3.26	Preparation of shrub / ground-cover beds over 20% of the net soft-landscape area, including forking, weeding, manuring and levelling	**R-C3-22**	*NSI / EW-DL*	**Sft**	**196,034.17**	100 Sft	100	1,650.00	**3,234,564**	*TG-365*	*Design allocation*	*Civil - non-schedule*
1.3	**SUB-TOTAL - 1.3 GREEN BELT F-13 / F-14 (5,800 ft x 195 ft)**								**85,110,224**			

SUB-SECTION 1.4 - GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft)												
A. SITE PREPARATION & EARTHWORK (cross-section intensity of GB F-14 / F-15 applied by area)												
1.4.01	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the site over the whole belt, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	**R-C3-10**	*Ch. 3 / Item 53*	**Sft**	**273,000.00**	1000 Sft	1000	5,292.20	**1,444,771**	*TG-403*	*Gross belt area*	*Civil - schedule*
1.4.02	Regular excavation dressed. [Ch. 3, Item 6: Regular excavation (cutting) of the belt to formation level, dressed to designed section and levels]	**R-C3-18**	*Ch. 3 / Item 6*	**Cft**	**185,500.00**	1000 Cft	1000	8,385.70	**1,555,547**	*TG-404*	*Cut volume*	*Civil - schedule*
1.4.03	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 90% maximum modified AASHTO dry density. [Ch. 3, Item 5(ii): Earthwork in embankment / filling to formation level with suitable material from the belt cut, including ploughing, mixing, moisture conditioning, compaction to 90% modified AASHTO and dressing]	**R-C3-19**	*Ch. 3 / Item 5(ii)*	**Cft**	**185,500.00**	1000 Cft	1000	10,856.75	**2,013,927**	*TG-406*	*Cut re-used in fill*	*Civil - schedule*
1.4.04	Filling to formation level with approved select material borrowed from outside, in layers, watered and compacted.	**R-C3-23**	*NSI / EW-BF*	**Cft**	**84,597.41**	1000 Cft	1000	15,386.45	**1,301,654**	*TG-407*	*Fill in excess of cut*	*Civil - non-schedule*
1.4.05	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of surplus cut material to approved dumping ground, upto 5 km lead]	**R-C3-07**	*Ch. 3 / Item 17(a)*	**Cft**	**0.00**	1000 Cft	1000	7,190.50	**0**	*TG-408*	*Cut in excess of fill*	*Civil - schedule*
1.4.06	Compaction of natural ground. [Ch. 3, Item 54: Compaction of natural ground over the belt prior to formation of landscape works]	**R-C3-15**	*Ch. 3 / Item 54*	**Sft**	**273,000.00**	1000 Sft	1000	3,479.60	**949,931**	*TG-403*	*Gross belt area*	*Civil - schedule*
B. BOUNDARY WALL - stone masonry 9 in thick, 8 ft high, with railing, on 4.0% of the length of both long edges (2,080 Rft of the descoped wall retained)												
1.4.07	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the boundary wall, 4 ft wide x 3 ft deep, by excavator in ordinary soil, including dagbelling and dressing]	**R-C3-01**	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**674.59**	1000 Cft	1000	11,147.40	**7,520**	*TG-410*	*SD-1*	*Civil - schedule*
1.4.08	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick x 4 ft wide, as lean course under the wall footing]	**R-C6-01**	*Ch. 6 / Item 5(i)*	**Cft**	**74.95**	100 Cft	100	36,029.50	**27,006**	*TG-411*	*SD-1*	*Civil - schedule*
1.4.09	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and retaining walls, etc. and footing beams, other structural members other than those mentioned in 6 (a-d) above not requiring form work (i.e. horizontal shuttering), complete in all respects - Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(c)(2): Providing and laying reinforced cement concrete 1:1.5:3 in the wall strip footing, 3 ft wide x 9 in thick, including formwork, compacting and curing]	**R-C6-07**	*Ch. 6 / Item 6(c)(2)*	**Cft**	**126.49**	Cft	1	697.50	**88,224**	*TG-412*	*SD-1*	*Civil - schedule*
1.4.10	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing, including cutting, bending, laying and binding]	**R-C6-08**	*Ch. 6 / Item 12(b)(ii)*	**Kg**	**278.27**	100 Kg	100	30,827.85	**85,785**	*TG-413*	*SD-1*	*Civil - schedule*
1.4.11	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in foundation and upto plinth of the boundary wall]	**R-C8-03**	*Ch. 8 / Item 2(d)(iii)*	**Cft**	**105.41**	100 Cft	100	35,682.60	**37,611**	*TG-414*	*2 ft 6 in below ground*	*Civil - schedule*

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1.4.12	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in the boundary wall above plinth, including scaffolding and curing]	**R-C8-01**	*Ch. 8 / Item 4(d)(iii)*	**Cft**	**231.89**	100 Cft	100	38,677.70	**89,690**	*TG-415*	*5 ft 6 in above ground*	*Civil - schedule*
1.4.13	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on top of the boundary wall]	**R-C6-03**	*Ch. 6 / Item 5(f)*	**Cft**	**7.03**	100 Cft	100	49,085.50	**3,449**	*TG-416*	*SD-1*	*Civil - schedule*
1.4.14	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the stone-masonry boundary wall]	**R-C11-03**	*Ch. 11 / Item 20(c)(ii)*	**Sft**	**618.38**	100 Sft	100	7,231.25	**44,716**	*TG-417*	*Both faces*	*Civil - schedule*
1.4.15	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, in layers, watered and compacted]	**R-C3-05**	*Ch. 3 / Item 5(i)*	**Cft**	**367.75**	1000 Cft	1000	11,261.30	**4,141**	*TG-418*	*Excavation less structure*	*Civil - schedule*
1.4.16	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. railing 3 ft high, 76x76x3 mm hollow box main member, on top of the boundary wall]	**R-C25-03**	*Ch. 25 / Item 34*	**Rft**	**56.22**	Rft	1	1,587.50	**89,243**	*TG-419*	*SD-1*	*Civil - schedule*
C. WALKWAY - 6 ft wide PCC tough paver on 4 in sand, two runs												
1.4.17	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of walkway sub-grade to designed level, in ordinary soil]	**R-C3-01**	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**4,200.00**	1000 Cft	1000	11,147.40	**46,819**	*TG-423*	*6 in build-up*	*Civil - schedule*
1.4.18	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the walkway]	**R-C18-01**	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**1,400.00**	100 Cft	100	10,874.25	**152,240**	*TG-424*	*SD-2*	*Civil - schedule*
1.4.19	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the tough pavers]	**R-C10-01**	*Ch. 10 / Item 3*	**Cft**	**2,800.00**	100 Cft	100	3,556.70	**99,588**	*TG-425*	*Zone-1 note*	*Civil - schedule*
1.4.20	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi, 50% grey and 50% coloured, including grouting joints with sand]	**R-C10-04**	*Ch. 10 / Item 44*	**Sft**	**8,400.00**	Sft	1	231.35	**1,943,340**	*TG-426*	*Zone drawings*	*Civil - schedule*
1.4.21	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone of 3500 psi to both edges of the walkway, laid in cement-sand mortar 1:3]	**R-C10-05**	*Ch. 10 / Item 45*	**Rft**	**2,800.00**	Rft	1	573.35	**1,605,380**	*TG-427*	*2 edges x 2 runs*	*Civil - schedule*
D2. JOGGING TRACK - 8 ft wide, compacted earth formation with a 3 in pan crush wearing layer												
1.4.22	Preparation and compaction of the jogging-track formation to designed section - ploughing, moistening to optimum moisture content, levelling and compaction with power road roller.	**R-C3-22**	*NSI / EW-DL*	**Sft**	**5,600.00**	100 Sft	100	1,650.00	**92,400**	*TG-474*	*Compacted earth*	*Civil - non-schedule*
1.4.23	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying pan crush (crushed stone product of approved quality and grade), 3 in thick, on the compacted earth formation of the jogging track, including spreading, moistening and compaction to required camber and grade]	**R-C18-01**	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**1,400.00**	100 Cft	100	10,874.25	**152,240**	*TG-475*	*Client instruction*	*Civil - schedule*
1.4.24	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the jogging track]	**R-C10-05**	*Ch. 10 / Item 45*	**Rft**	**1,400.00**	Rft	1	573.35	**802,690**	*TG-476*	*2 edges*	*Civil - schedule*
E. STRUCTURES, ENTRANCES, PLAY AREAS & RAIN-WATER HARVESTING												
1.4.25	Construction of rain-water harvesting pit 12 ft x 12 ft x 6 ft deep, including excavation, stone-masonry stepped lining, filter media, geotextile, uPVC pipework, P.C.C. base and heavy-duty cover - complete.	**R-CA-17**	*COMP / CA-17*	**Nos**	**20.00**	Each	1	363,141.15	**7,262,823**	*TG-440*	*20 per belt (Client instruction)*	*Civil - non-schedule*
J. SOFT LANDSCAPE & IRRIGATION												
1.4.26	Preparation of shrub / ground-cover beds over 20% of the net soft-landscape area, including forking, weeding, manuring and levelling	**R-C3-22**	*NSI / EW-DL*	**Sft**	**51,412.83**	100 Sft	100	1,650.00	**848,312**	*TG-465*	*Design allocation*	*Civil - non-schedule*
1.4	**SUB-TOTAL - 1.4 GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft)**								**20,749,047**			

SUB-SECTION 1.5 - LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft)												
A. SITE PREPARATION & EARTHWORK (cross-section intensity of GB F-14 / F-15 applied by area)												
1.5.01	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the site over the whole belt, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	**R-C3-10**	*Ch. 3 / Item 53*	**Sft**	**1,170,000.00**	1000 Sft	1000	5,292.20	**6,191,874**	*TG-503*	*Gross belt area*	*Civil - schedule*
1.5.02	Regular excavation dressed. [Ch. 3, Item 6: Regular excavation (cutting) of the belt to formation level, dressed to designed section and levels]	**R-C3-18**	*Ch. 3 / Item 6*	**Cft**	**795,000.00**	1000 Cft	1000	8,385.70	**6,666,632**	*TG-504*	*Cut volume*	*Civil - schedule*
1.5.03	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 90% maximum modified AASHTO dry density. [Ch. 3, Item 5(ii): Earthwork in embankment / filling to formation level with suitable material from the belt cut, including ploughing, mixing, moisture conditioning, compaction to 90% modified AASHTO and dressing]	**R-C3-19**	*Ch. 3 / Item 5(ii)*	**Cft**	**795,000.00**	1000 Cft	1000	10,856.75	**8,631,116**	*TG-506*	*Cut re-used in fill*	*Civil - schedule*
1.5.04	Filling to formation level with approved select material borrowed from outside, in layers, watered and compacted.	**R-C3-23**	*NSI / EW-BF*	**Cft**	**362,560.34**	1000 Cft	1000	15,386.45	**5,578,517**	*TG-507*	*Fill in excess of cut*	*Civil - non-schedule*
1.5.05	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of surplus cut material to approved dumping ground, upto 5 km lead]	**R-C3-07**	*Ch. 3 / Item 17(a)*	**Cft**	**0.00**	1000 Cft	1000	7,190.50	**0**	*TG-508*	*Cut in excess of fill*	*Civil - schedule*

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1.5.06	Compaction of natural ground. [Ch. 3, Item 54: Compaction of natural ground over the belt prior to formation of landscape works]	**R-C3-15**	*Ch. 3 / Item 54*	**Sft**	**1,170,000.00**	1000 Sft	1000	3,479.60	**4,071,132**	*TG-503*	*Gross belt area*	*Civil - schedule*
B. BOUNDARY WALL - stone masonry 9 in thick, 8 ft high, with railing, on 4.0% of the length of both long edges (2,080 Rft of the descoped wall retained)												
1.5.07	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the boundary wall, 4 ft wide x 3 ft deep, by excavator in ordinary soil, including dagbelling and dressing]	**R-C3-01**	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**7,516.91**	1000 Cft	1000	11,147.40	**83,794**	*TG-510*	*SD-1*	*Civil - schedule*
1.5.08	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick x 4 ft wide, as lean course under the wall footing]	**R-C6-01**	*Ch. 6 / Item 5(i)*	**Cft**	**835.21**	100 Cft	100	36,029.50	**300,923**	*TG-511*	*SD-1*	*Civil - schedule*
1.5.09	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and retaining walls, etc. and footing beams, other structural members other than those mentioned in 6 (a-d) above not requiring form work (i.e. horizontal shuttering), complete in all respects - Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(c)(2): Providing and laying reinforced cement concrete 1:1.5:3 in the wall strip footing, 3 ft wide x 9 in thick, including formwork, compacting and curing]	**R-C6-07**	*Ch. 6 / Item 6(c)(2)*	**Cft**	**1,409.42**	Cft	1	697.50	**983,071**	*TG-512*	*SD-1*	*Civil - schedule*
1.5.10	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing, including cutting, bending, laying and binding]	**R-C6-08**	*Ch. 6 / Item 12(b)(ii)*	**Kg**	**3,100.73**	100 Kg	100	30,827.85	**955,887**	*TG-513*	*SD-1*	*Civil - schedule*
1.5.11	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in foundation and upto plinth of the boundary wall]	**R-C8-03**	*Ch. 8 / Item 2(d)(iii)*	**Cft**	**1,174.52**	100 Cft	100	35,682.60	**419,098**	*TG-514*	*2 ft 6 in below ground*	*Civil - schedule*
1.5.12	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 9 in thick, in cement-sand mortar 1:6, in the boundary wall above plinth, including scaffolding and curing]	**R-C8-01**	*Ch. 8 / Item 4(d)(iii)*	**Cft**	**2,583.94**	100 Cft	100	38,677.70	**999,408**	*TG-515*	*5 ft 6 in above ground*	*Civil - schedule*
1.5.13	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on top of the boundary wall]	**R-C6-03**	*Ch. 6 / Item 5(f)*	**Cft**	**78.30**	100 Cft	100	49,085.50	**38,435**	*TG-516*	*SD-1*	*Civil - schedule*
1.5.14	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the stone-masonry boundary wall]	**R-C11-03**	*Ch. 11 / Item 20(c)(ii)*	**Sft**	**6,890.50**	100 Sft	100	7,231.25	**498,269**	*TG-517*	*Both faces*	*Civil - schedule*
1.5.15	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, in layers, watered and compacted]	**R-C3-05**	*Ch. 3 / Item 5(i)*	**Cft**	**4,097.76**	1000 Cft	1000	11,261.30	**46,146**	*TG-518*	*Excavation less structure*	*Civil - schedule*
1.5.16	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. railing 3 ft high, 76x76x3 mm hollow box main member, on top of the boundary wall]	**R-C25-03**	*Ch. 25 / Item 34*	**Rft**	**626.41**	Rft	1	1,587.50	**994,425**	*TG-519*	*SD-1*	*Civil - schedule*
C. WALKWAY - 6 ft wide PCC tough paver on 4 in sand, two runs												
1.5.17	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of walkway sub-grade to designed level, in ordinary soil]	**R-C3-01**	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**46,800.00**	1000 Cft	1000	11,147.40	**521,698**	*TG-523*	*6 in build-up*	*Civil - schedule*
1.5.18	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the walkway]	**R-C18-01**	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**15,600.00**	100 Cft	100	10,874.25	**1,696,383**	*TG-524*	*SD-2*	*Civil - schedule*
1.5.19	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the tough pavers]	**R-C10-01**	*Ch. 10 / Item 3*	**Cft**	**31,200.00**	100 Cft	100	3,556.70	**1,109,690**	*TG-525*	*Zone-1 note*	*Civil - schedule*
1.5.20	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi, 50% grey and 50% coloured, including grouting joints with sand]	**R-C10-04**	*Ch. 10 / Item 44*	**Sft**	**93,600.00**	Sft	1	231.35	**21,654,360**	*TG-526*	*Zone drawings*	*Civil - schedule*
1.5.21	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone of 3500 psi to both edges of the walkway, laid in cement-sand mortar 1:3]	**R-C10-05**	*Ch. 10 / Item 45*	**Rft**	**31,200.00**	Rft	1	573.35	**17,888,520**	*TG-527*	*2 edges x 2 runs*	*Civil - schedule*
D2. JOGGING TRACK - 8 ft wide, compacted earth formation with a 3 in pan crush wearing layer												
1.5.22	Preparation and compaction of the jogging-track formation to designed section - ploughing, moistening to optimum moisture content, levelling and compaction with power road roller.	**R-C3-22**	*NSI / EW-DL*	**Sft**	**62,400.00**	100 Sft	100	1,650.00	**1,029,600**	*TG-574*	*Compacted earth*	*Civil - non-schedule*
1.5.23	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying pan crush (crushed stone product of approved quality and grade), 3 in thick, on the compacted earth formation of the jogging track, including spreading, moistening and compaction to required camber and grade]	**R-C18-01**	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**15,600.00**	100 Cft	100	10,874.25	**1,696,383**	*TG-575*	*Client instruction*	*Civil - schedule*

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1.5.24	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the jogging track]	**R-C10-05**	*Ch. 10 / Item 45*	**Rft**	**15,600.00**	Rft	1	573.35	**8,944,260**	*TG-576*	*2 edges*	*Civil - schedule*
E. STRUCTURES, ENTRANCES, PLAY AREAS & RAIN-WATER HARVESTING												
1.5.25	Construction of rain-water harvesting pit 12 ft x 12 ft x 6 ft deep, including excavation, stone-masonry stepped lining, filter media, geotextile, uPVC pipework, P.C.C. base and heavy-duty cover - complete.	**R-CA-17**	*COMP / CA-17*	**Nos**	**20.00**	Each	1	363,141.15	**7,262,823**	*TG-540*	*20 per belt (Client instruction)*	*Civil - non-schedule*
J. SOFT LANDSCAPE & IRRIGATION												
1.5.26	Preparation of shrub / ground-cover beds over 20% of the net soft-landscape area, including forking, weeding, manuring and levelling	**R-C3-22**	*NSI / EW-DL*	**Sft**	**193,751.27**	100 Sft	100	1,650.00	**3,196,896**	*TG-565*	*Design allocation*	*Civil - non-schedule*
1.5	**SUB-TOTAL - 1.5 LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft)**								**101,459,340**			

SUMMARY OF BILL No. 1 BY SUB-SECTION												
1.1	GREEN BELT F-14 / F-15 (5,800 ft x 390 ft)								**222,184,354**			
1.2	GREEN BELT F-14 / G-14 (5,800 ft x 390 ft)								**118,943,819**			
1.3	GREEN BELT F-13 / F-14 (5,800 ft x 195 ft)								**85,110,224**			
1.4	GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft)								**20,749,047**			
1.5	LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft)								**101,459,340**			
	TOTAL - BILL No. 1 - GREEN BELTS (5 NOS) - CIVIL WORKS								**548,446,784**			

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

BILL No. 2 - MODEL PARK AND PARK F-14/4 - CIVIL WORKS

One sub-section per park at its actual size (Client plant workbook), each with 2 ft of compacted fill, boundary wall, walkways, access stair and storm-water drainage. Planting and softscape are in Bill 8, the fixtures in Bill 12 and the gates in Bill 3
Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
SUB-SECTION 2.4 - PARK F-14/4 (Park 4) (42 Kanal)												
A. SITE PREPARATION & EARTH FILLING												
2.4.01	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the park site, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	R-C3-10	*Ch. 3 / Item 53*	**Sft**	**228,690.00**	1000 Sft	1000	5,292.20	**1,210,273**	*TP-405*	*Park area*	*Civil - schedule*
2.4.02	Regular excavation dressed. [Ch. 3, Item 6: Cutting down mounds and ridges inside the park to balance the filling areas, regular excavation dressed to designed section and levels, including haulage within the park]	R-C3-18	*Ch. 3 / Item 6*	**Cft**	**686,070.00**	1000 Cft	1000	8,385.70	**5,753,177**	*TP-462*	*Client instruction - avoid borrow material*	*Civil - schedule*
2.4.03	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Earth filling to raise the park, average 3 ft depth over the whole park area, with the material obtained from the park cut, laid in layers, watered and compacted]	R-C3-05	*Ch. 3 / Item 5(i)*	**Cft**	**686,070.00**	1000 Cft	1000	11,261.30	**7,726,040**	*TP-462*	*Fill from site cut*	*Civil - schedule*
2.4.04	Earth filling with approved select material borrowed from outside - only the shortfall that the site cut cannot balance.	R-C3-23	*NSI / EW-BF*	**Cft**	**0.00**	1000 Cft	1000	15,386.45	**0**	*TP-463*	*Balance only (P_PKCUTBAL)*	*Civil - non-schedule*
2.4.05	Dressing and levelling of the finished fill surface to designed section, including compaction with power road roller.	R-C3-22	*NSI / EW-DL*	**Sft**	**228,690.00**	100 Sft	100	1,650.00	**3,773,385**	*TP-407*	*Park area*	*Civil - non-schedule*
B. BOUNDARY WALL - stone masonry 18 in thick, 4 ft high												
2.4.06	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the park boundary wall, 3 ft wide x 2 ft 6 in deep, by excavator in ordinary soil]	R-C3-01	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**14,550.69**	1000 Cft	1000	11,147.40	**162,202**	*TP-408*	*Park perimeter*	*Civil - schedule*
2.4.07	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick, as lean course under the wall footing]	R-C6-01	*Ch. 6 / Item 5(i)*	**Cft**	**1,940.09**	100 Cft	100	36,029.50	**699,005**	*TP-409*	*Standard detail*	*Civil - schedule*
2.4.08	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and retaining walls, etc. and footing beams, other structural members other than those mentioned in 6 (a-d) above not requiring form work (i.e. horizontal shuttering), complete in all respects - Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(c)(2): Providing and laying reinforced cement concrete 1:1.5:3 in the wall strip footing, 2 ft 6 in wide x 9 in thick, including formwork and curing]	R-C6-07	*Ch. 6 / Item 6(c)(2)*	**Cft**	**3,637.67**	Cft	1	697.50	**2,537,276**	*TP-410*	*Standard detail*	*Civil - schedule*
2.4.09	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing]	R-C6-08	*Ch. 6 / Item 12(b)(ii)*	**Kg**	**8,002.88**	100 Kg	100	30,827.85	**2,467,116**	*TP-411*	*#4 bars at 6 in c/c*	*Civil - schedule*
2.4.10	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 18 in thick, in cement-sand mortar 1:6, in foundation and upto plinth]	R-C8-03	*Ch. 8 / Item 2(d)(iii)*	**Cft**	**4,365.21**	100 Cft	100	35,682.60	**1,557,619**	*TP-412*	*Park Tender Drawing*	*Civil - schedule*
2.4.11	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 18 in thick, in cement-sand mortar 1:6, in the wall above plinth, 4 ft high]	R-C8-01	*Ch. 8 / Item 4(d)(iii)*	**Cft**	**11,640.55**	100 Cft	100	38,677.70	**4,502,297**	*TP-413*	*Park Tender Drawing*	*Civil - schedule*
2.4.12	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on the boundary wall]	R-C6-03	*Ch. 6 / Item 5(f)*	**Cft**	**485.02**	100 Cft	100	49,085.50	**238,076**	*TP-414*	*Standard detail*	*Civil - schedule*
2.4.13	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the boundary wall]	R-C11-03	*Ch. 11 / Item 20(c)(ii)*	**Sft**	**15,520.73**	100 Sft	100	7,231.25	**1,122,343**	*TP-415*	*Both faces*	*Civil - schedule*
2.4.14	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, watered and compacted]	R-C3-05	*Ch. 3 / Item 5(i)*	**Cft**	**4,607.72**	1000 Cft	1000	11,261.30	**51,889**	*TP-416*	*Excavation less structure*	*Civil - schedule*
C. CIRCULATION - perimeter walkway, internal footpath, sub-walkway												
2.4.15	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of the perimeter walkway sub-grade to designed level]	R-C3-01	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**5,820.28**	1000 Cft	1000	11,147.40	**64,881**	*TP-418*	*6 in build-up*	*Civil - schedule*
2.4.16	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the perimeter walkway]	R-C18-01	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**1,940.09**	100 Cft	100	10,874.25	**210,970**	*TP-420*	*Standard*	*Civil - schedule*
2.4.17	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the walkway pavers]	R-C10-01	*Ch. 10 / Item 3*	**Cft**	**3,880.18**	100 Cft	100	3,556.70	**138,006**	*TP-419*	*Standard*	*Civil - schedule*
2.4.18	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm precast concrete interlocking tuff pavers, 7000 psi, to the perimeter walkway 6 ft wide, including grouting joints]	R-C10-04	*Ch. 10 / Item 44*	**Sft**	**11,640.55**	Sft	1	231.35	**2,693,042**	*TP-417*	*Park Tender Drawing*	*Civil - schedule*

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2.4.19	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the perimeter walkway]	R-C10-05	*Ch. 10 / Item 45*	Rft	3,880.18	Rft	1	573.35	2,224,703	*TP-421*	*2 edges*	*Civil - schedule*
2.4.20	Providing, laying, watering and ramming brick or stone ballast 1-1/2" to 2" (40 mm to 50 mm) gauge mixed with 25% sand, for foundation, complete in all respects. [Ch. 10, Item 4: Providing, laying, watering and ramming compacted granular fill 4 in thick to the internal footpath, 4 ft wide]	R-C10-02	*Ch. 10 / Item 4*	Cft	5,523.91	100 Cft	100	14,479.40	799,829	*TP-423*	*Scaled by area*	*Civil - schedule*
2.4.21	Providing and laying hand-packed rock-stone fill sub-walkway, 1 ft size stone, 3 ft wide, over compacted sub-grade.	R-CA-16	*COMP / CA-16*	Sft	7,457.28	Sft	1	153.68	1,146,035	*TP-424*	*Scaled by area*	*Civil - non-schedule*
E. ACCESS STAIR - P.C.C., 8 ft long steps rising the 3 ft park fill, M.S. handrails both sides												
2.4.22	Regular excavation dressed. [Ch. 3, Item 6: Excavation / trimming of the compacted park fill to the stair profile, dressed to designed section]	R-C3-18	*Ch. 3 / Item 6*	Cft	205.06	1000 Cft	1000	8,385.70	1,720	*TP-436*	*Stair seat*	*Civil - schedule*
2.4.23	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 3 in thick, as blinding under the stair slab, landings and cheek walls]	R-C6-01	*Ch. 6 / Item 5(i)*	Cft	42.35	100 Cft	100	36,029.50	15,258	*TP-437*	*Blinding*	*Civil - schedule*
2.4.24	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair waist slab and top / bottom landings, 6 in thick, including formwork and curing]	R-C6-03	*Ch. 6 / Item 5(f)*	Cft	71.32	100 Cft	100	49,085.50	35,010	*TP-438*	*Waist slab + landings*	*Civil - schedule*
2.4.25	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair steps (6 in risers x 12 in treads, 8 ft long), broom-finished treads and rounded nosings]	R-C6-03	*Ch. 6 / Item 5(f)*	Cft	12.00	100 Cft	100	49,085.50	5,890	*TP-439*	*16 risers*	*Civil - schedule*
2.4.26	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair cheek walls, 9 in thick, both sides, including formwork and curing]	R-C6-03	*Ch. 6 / Item 5(f)*	Cft	53.49	100 Cft	100	49,085.50	26,257	*TP-440*	*Retains fill*	*Civil - schedule*
2.4.27	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing M.S. stair handrail (box section 1-1/2 in x 3 in with square-bar balusters), both sides, grouted into the cheek walls]	R-C25-03	*Ch. 25 / Item 34*	Rft	15.66	Rft	1	1,587.50	24,863	*TP-441*	*Both sides*	*Civil - schedule*
F2. STORM-WATER DRAINAGE OF THE PARK (Client instruction)												
2.4.28	Earthwork excavation in open cutting for storm water channels, drains, sullage drains in open areas, roads, streets, lanes, including under pinning of walls and shoring to protect existing works, shuttering and timbering the trenches, dressed to designed level and dimensions, trimming, removal of surface water from trenches, back filling and surplus excavated material disposed of and dressed within 50 ft. (15 m) lead: upto 5 ft. (1.5 m) depth, by manual, ordinary soil. [Ch. 3, Item 7, 1(A)(i): Earthwork excavation in open cutting upto 5 ft depth for the storm-water pipe trench, including shoring, dressing to designed level and grade and removal of surface water]	R-C3-03	*Ch. 3 / Item 7, 1(A)(i)*	Cft	9,700.46	1000 Cft	1000	14,409.70	139,781	*TP-467*	*2 ft 6 in wide x 4 ft deep*	*Civil - schedule*
2.4.29	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand as bedding and surround to the storm-water pipe]	R-C10-01	*Ch. 10 / Item 3*	Cft	2,425.11	100 Cft	100	3,556.70	86,254	*TP-468*	*1 ft deep bed and surround*	*Civil - schedule*
2.4.30	Providing and laying R.C.C. pipe sewers, moulded with cement concrete 4000 psi conforming to ASTM Specification C-76-20, specific class, Wall B, including carriage of pipe from factory to site of work, lowering in trenches to correct alignment and grade, jointing with rubber ring, cutting pipes where necessary, testing, etc., complete: Class-II, 310 mm (12") i/d. [Ch. 21, Item 3(a)(i): Providing and laying R.C.C. pipe sewer, 310 mm (12 in) internal diameter, Class-II to ASTM C-76, including carriage, lowering in trench to correct alignment and grade, jointing with rubber ring and testing]	R-C21-01	*Ch. 21 / Item 3(a)(i)*	Rft	970.05	Rft	1	909.20	881,966	*TP-464*	*Collector along the length and the width*	*Civil - schedule*
2.4.31	Constructing storm-water manhole 3 ft x 3 ft internal, average 5 ft deep, including excavation, P.C.C. base, brick-masonry chamber rendered inside, R.C.C. cover slab with 6 in R.C.C. cover and frame, steps and benching - complete.	R-CA-19	*COMP / CA-19*	Nos	6.00	Each	1	60,761.75	364,571	*TP-465*	*200 ft centres*	*Civil - non-schedule*
2.4.32	Constructing standard gully grating chamber, 3' x 2-1/2' (900 x 750 mm), with chinaware trap as per PHED Drawing STD/PD No. 3 of 1977, complete in all respects. [Ch. 21, Item 6: Constructing standard gully grating chamber 3 ft x 2 ft 6 in with chinaware trap as per PHED standard drawing, complete in all respects]	R-C21-02	*Ch. 21 / Item 6*	Nos	7.00	Each	1	21,861.60	153,031	*TP-466*	*150 ft centres*	*Civil - schedule*
2.4.33	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling of the pipe trench with approved excavated material in layers not exceeding 6 in, watered and compacted]	R-C3-05	*Ch. 3 / Item 5(i)*	Cft	7,275.34	1000 Cft	1000	11,261.30	81,930	*TP-469*	*Trench less bedding*	*Civil - schedule*
F. SOFT LANDSCAPE & WATERING												
2.4	**SUB-TOTAL - 2.4 PARK F-14/4 (Park 4) (42 Kanal)**								**40,894,695**			

SUB-SECTION 2.5 - PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)												
A. SITE PREPARATION & EARTH FILLING												
2.5.01	Earth filling with approved select material borrowed from outside - only the shortfall that the site cut cannot balance.	R-C3-23	*NSI / EW-BF*	Cft	1,002,000.00	1000 Cft	1000	15,386.45	15,417,223	*TP-563*	*Balance only (P_PKCUTBAL)*	*Civil - non-schedule*
2.5.02	Dressing and levelling of the finished fill surface to designed section, including compaction with power road roller.	R-C3-22	*NSI / EW-DL*	Sft	334,000.00	100 Sft	100	1,650.00	5,511,000	*TP-507*	*Park area*	*Civil - non-schedule*
B. BOUNDARY WALL - stone masonry 18 in thick, 4 ft high												
2.5.03	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation in foundation of the park boundary wall, 3 ft wide x 2 ft 6 in deep, by excavator in ordinary soil]	R-C3-01	*Ch. 3 / Item 21, 1(b)(ii)*	Cft	17,520.00	1000 Cft	1000	11,147.40	195,302	*TP-508*	*Park perimeter*	*Civil - schedule*
2.5.04	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 4 in thick, as lean course under the wall footing]	R-C6-01	*Ch. 6 / Item 5(i)*	Cft	2,336.00	100 Cft	100	36,029.50	841,649	*TP-509*	*Standard detail*	*Civil - schedule*

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2.5.05	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and retaining walls, etc. and footing beams, other structural members other than those mentioned in 6 (a-d) above not requiring form work (i.e. horizontal shuttering), complete in all respects - Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(c)(2): Providing and laying reinforced cement concrete 1:1.5:3 in the wall strip footing, 2 ft 6 in wide x 9 in thick, including formwork and curing]	**R-C6-07**	*Ch. 6 / Item 6(c)(2)*	**Cft**	**4,380.00**	Cft	1	697.50	**3,055,050**	*TP-510*	*Standard detail*	*Civil - schedule*
2.5.06	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the wall footing]	**R-C6-08**	*Ch. 6 / Item 12(b)(ii)*	**Kg**	**9,636.00**	100 Kg	100	30,827.85	**2,970,572**	*TP-511*	*#4 bars at 6 in c/c*	*Civil - schedule*
2.5.07	Coursed rubble masonry hammer dressed, in foundation and plinth, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 2(d)(iii): Stone masonry (random rubble / coursed), 18 in thick, in cement-sand mortar 1:6, in foundation and upto plinth]	**R-C8-03**	*Ch. 8 / Item 2(d)(iii)*	**Cft**	**5,256.00**	100 Cft	100	35,682.60	**1,875,477**	*TP-512*	*Park Tender Drawing*	*Civil - schedule*
2.5.08	Coursed rubble masonry hammer dressed, in ground floor or 20 ft. (6 m) height, building / other than building, in cement, sand mortar: ratio 1:6. (Rates for all finished work include the removal of surplus debris, unused material and byproducts.) [Ch. 8, Item 4(d)(iii): Stone masonry (random rubble / coursed), 18 in thick, in cement-sand mortar 1:6, in the wall above plinth, 4 ft high]	**R-C8-01**	*Ch. 8 / Item 4(d)(iii)*	**Cft**	**14,016.00**	100 Cft	100	38,677.70	**5,421,066**	*TP-513*	*Park Tender Drawing*	*Civil - schedule*
2.5.09	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4, 2 in thick, as copping on the boundary wall]	**R-C6-03**	*Ch. 6 / Item 5(f)*	**Cft**	**584.00**	100 Cft	100	49,085.50	**286,659**	*TP-514*	*Standard detail*	*Civil - schedule*
2.5.10	Pointing on stone work upto 20 ft. (6.00 m) height, raised, in cement mortar 1:3. [Ch. 11, Item 20(c)(ii): Cement pointing, raised, in cement mortar 1:3 to both exposed faces of the boundary wall]	**R-C11-03**	*Ch. 11 / Item 20(c)(ii)*	**Sft**	**18,688.00**	100 Sft	100	7,231.25	**1,351,376**	*TP-515*	*Both faces*	*Civil - schedule*
2.5.11	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling around the wall foundation with approved excavated material, watered and compacted]	**R-C3-05**	*Ch. 3 / Item 5(i)*	**Cft**	**5,548.00**	1000 Cft	1000	11,261.30	**62,478**	*TP-516*	*Excavation less structure*	*Civil - schedule*
C. CIRCULATION - perimeter walkway, internal footpath, sub-walkway												
2.5.12	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth upto 5 ft. (1.5 m), by excavator, in ordinary soil. [Ch. 3, Item 21, 1(b)(ii): Excavation and dressing of the perimeter walkway sub-grade to designed level]	**R-C3-01**	*Ch. 3 / Item 21, 1(b)(ii)*	**Cft**	**7,008.00**	1000 Cft	1000	11,147.40	**78,121**	*TP-518*	*6 in build-up*	*Civil - schedule*
2.5.13	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying compacted granular fill, 2 in thick, under the perimeter walkway]	**R-C18-01**	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**2,336.00**	100 Cft	100	10,874.25	**254,022**	*TP-520*	*Standard*	*Civil - schedule*
2.5.14	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4 in thick, as cushion under the walkway pavers]	**R-C10-01**	*Ch. 10 / Item 3*	**Cft**	**4,672.00**	100 Cft	100	3,556.70	**166,169**	*TP-519*	*Standard*	*Civil - schedule*
2.5.15	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm precast concrete interlocking tuff pavers, 7000 psi, to the perimeter walkway 6 ft wide, including grouting joints]	**R-C10-04**	*Ch. 10 / Item 44*	**Sft**	**14,016.00**	Sft	1	231.35	**3,242,602**	*TP-517*	*Park Tender Drawing*	*Civil - schedule*
2.5.16	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone to both edges of the perimeter walkway]	**R-C10-05**	*Ch. 10 / Item 45*	**Rft**	**4,672.00**	Rft	1	573.35	**2,678,691**	*TP-521*	*2 edges*	*Civil - schedule*
2.5.17	Providing, laying, watering and ramming brick or stone ballast 1-1/2" to 2" (40 mm to 50 mm) gauge mixed with 25% sand, for foundation, complete in all respects. [Ch. 10, Item 4: Providing, laying, watering and ramming compacted granular fill 4 in thick to the internal footpath, 4 ft wide]	**R-C10-02**	*Ch. 10 / Item 4*	**Cft**	**8,067.63**	100 Cft	100	14,479.40	**1,168,145**	*TP-523*	*Scaled by area*	*Civil - schedule*
2.5.18	Providing and laying hand-packed rock-stone fill sub-walkway, 1 ft size stone, 3 ft wide, over compacted sub-grade.	**R-CA-16**	*COMP / CA-16*	**Sft**	**10,891.30**	Sft	1	153.68	**1,673,776**	*TP-524*	*Scaled by area*	*Civil - non-schedule*
E. ACCESS STAIR - P.C.C., 8 ft long steps rising the 3 ft park fill, M.S. handrails both sides												
2.5.19	Regular excavation dressed. [Ch. 3, Item 6: Excavation / trimming of the compacted park fill to the stair profile, dressed to designed section]	**R-C3-18**	*Ch. 3 / Item 6*	**Cft**	**205.06**	1000 Cft	1000	8,385.70	**1,720**	*TP-536*	*Stair seat*	*Civil - schedule*
2.5.20	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:4:8. [Ch. 6, Item 5(i): Providing and laying plain cement concrete 1:4:8, 3 in thick, as blinding under the stair slab, landings and cheek walls]	**R-C6-01**	*Ch. 6 / Item 5(i)*	**Cft**	**42.35**	100 Cft	100	36,029.50	**15,258**	*TP-537*	*Blinding*	*Civil - schedule*
2.5.21	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair waist slab and top / bottom landings, 6 in thick, including formwork and curing]	**R-C6-03**	*Ch. 6 / Item 5(f)*	**Cft**	**71.32**	100 Cft	100	49,085.50	**35,010**	*TP-538*	*Waist slab + landings*	*Civil - schedule*
2.5.22	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair steps (6 in risers x 12 in treads, 8 ft long), broom-finished treads and rounded nosings]	**R-C6-03**	*Ch. 6 / Item 5(f)*	**Cft**	**12.00**	100 Cft	100	49,085.50	**5,890**	*TP-539*	*16 risers*	*Civil - schedule*
2.5.23	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete 1:2:4 in the stair cheek walls, 9 in thick, both sides, including formwork and curing]	**R-C6-03**	*Ch. 6 / Item 5(f)*	**Cft**	**53.49**	100 Cft	100	49,085.50	**26,257**	*TP-540*	*Retains fill*	*Civil - schedule*
2.5.24	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing M.S. stair handrail (box section 1-1/2 in x 3 in with square-bar balusters), both sides, grouted into the cheek walls]	**R-C25-03**	*Ch. 25 / Item 34*	**Rft**	**15.66**	Rft	1	1,587.50	**24,863**	*TP-541*	*Both sides*	*Civil - schedule*

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F2. STORM-WATER DRAINAGE OF THE PARK (Client instruction)												
2.5.25	Earthwork excavation in open cutting for storm water channels, drains, sullage drains in open areas, roads, streets, lanes, including under pinning of walls and shoring to protect existing works, shuttering and timbering the trenches, dressed to designed level and dimensions, trimming, removal of surface water from trenches, back filling and surplus excavated material disposed of and dressed within 50 ft. (15 m) lead: upto 5 ft. (1.5 m) depth, by manual, ordinary soil. [Ch. 3, Item 7, 1(A)(i): Earthwork excavation in open cutting upto 5 ft depth for the storm-water pipe trench, including shoring, dressing to designed level and grade and removal of surface water]	**R-C3-03**	*Ch. 3 / Item 7, 1(A)(i)*	**Cft**	**11,680.00**	1000 Cft	1000	14,409.70	**168,305**	*TP-567*	*2 ft 6 in wide x 4 ft deep*	*Civil - schedule*
2.5.26	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand as bedding and surround to the storm-water pipe]	**R-C10-01**	*Ch. 10 / Item 3*	**Cft**	**2,920.00**	100 Cft	100	3,556.70	**103,856**	*TP-568*	*1 ft deep bed and surround*	*Civil - schedule*
2.5.27	Providing and laying R.C.C. pipe sewers, moulded with cement concrete 4000 psi conforming to ASTM Specification C-76-20, specific class, Wall B, including carriage of pipe from factory to site of work, lowering in trenches to correct alignment and grade, jointing with rubber ring, cutting pipes where necessary, testing, etc., complete: Class-II, 310 mm (12") i/d. [Ch. 21, Item 3(a)(i): Providing and laying R.C.C. pipe sewer, 310 mm (12 in) internal diameter, Class-II to ASTM C-76, including carriage, lowering in trench to correct alignment and grade, jointing with rubber ring and testing]	**R-C21-01**	*Ch. 21 / Item 3(a)(i)*	**Rft**	**1,168.00**	Rft	1	909.20	**1,061,946**	*TP-564*	*Collector along the length and the width*	*Civil - schedule*
2.5.28	Constructing storm-water manhole 3 ft x 3 ft internal, average 5 ft deep, including excavation, P.C.C. base, brick-masonry chamber rendered inside, R.C.C. cover slab with 6 in R.C.C. cover and frame, steps and benching - complete.	**R-CA-19**	*COMP / CA-19*	**Nos**	**7.00**	Each	1	60,761.75	**425,332**	*TP-565*	*200 ft centres*	*Civil - non-schedule*
2.5.29	Constructing standard gully grating chamber, 3' x 2-1/2' (900 x 750 mm), with chinaware trap as per PHED Drawing STD/PD No. 3 of 1977, complete in all respects. [Ch. 21, Item 6: Constructing standard gully grating chamber 3 ft x 2 ft 6 in with chinaware trap as per PHED standard drawing, complete in all respects]	**R-C21-02**	*Ch. 21 / Item 6*	**Nos**	**8.00**	Each	1	21,861.60	**174,893**	*TP-566*	*150 ft centres*	*Civil - schedule*
2.5.30	Earthwork in ordinary soil for embankments, lead upto 100 ft. (30 m), including ploughing, mixing and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects: 95% to 100% maximum modified AASHTO dry density. [Ch. 3, Item 5(i): Backfilling of the pipe trench with approved excavated material in layers not exceeding 6 in, watered and compacted]	**R-C3-05**	*Ch. 3 / Item 5(i)*	**Cft**	**8,760.00**	1000 Cft	1000	11,261.30	**98,649**	*TP-569*	*Trench less bedding*	*Civil - schedule*
F. SOFT LANDSCAPE & WATERING												
2.5	**SUB-TOTAL - 2.5 PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)**								**48,391,357**			

SUMMARY OF BILL No. 2 BY SUB-SECTION		
2.4	PARK F-14/4 (Park 4) (42 Kanal)	**40,894,695**
2.5	PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)	**48,391,357**
	TOTAL - BILL No. 2 - MODEL PARK AND PARK F-14/4 - CIVIL WORKS	**89,286,052**

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BILL No. 3 - GATES AND ENTRANCES - GREEN BELTS AND PARKS

The paved vehicle entrance aprons of the green belts (the gates themselves are descoped); for each park one wicket gate 12 ft wide with its vehicle crossing and one revolving pedestrian entrance gate
Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
SUB-SECTION 3.1 - GREEN BELT F-14 / F-15 (5,800 ft x 390 ft) - VEHICLE ENTRANCE APRONS												
A. VEHICLE ENTRANCE APRONS - the 30 ft gates and fence panels are descoped; the paved aprons are kept												
3.1.01	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the vehicle entrance apron at each entrance position of the belt]	R-C10-04	*Ch. 10 / Item 44*	**Sft**	**10,800.00**	Sft	1	231.35	**2,498,580**	*TG-137*	*Entrance positions of the zone sheets, pro rata to belt length*	*Civil - schedule*
3.1.02	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the apron pavers]	R-C10-01	*Ch. 10 / Item 3*	**Cft**	**3,600.00**	100 Cft	100	3,556.70	**128,041**	*TG-137*	*4" sand*	*Civil - schedule*
3.1	**SUB-TOTAL - 3.1 GREEN BELT F-14 / F-15 (5,800 ft x 390 ft) - VEHICLE ENTRANCE APRONS**								**2,626,621**			
SUB-SECTION 3.2 - GREEN BELT F-14 / G-14 (5,800 ft x 390 ft) - VEHICLE ENTRANCE APRONS												
A. VEHICLE ENTRANCE APRONS - the 30 ft gates and fence panels are descoped; the paved aprons are kept												
3.2.01	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the vehicle entrance apron at each entrance position of the belt]	R-C10-04	*Ch. 10 / Item 44*	**Sft**	**10,800.00**	Sft	1	231.35	**2,498,580**	*TG-237*	*Entrance positions of the zone sheets, pro rata to belt length*	*Civil - schedule*
3.2.02	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the apron pavers]	R-C10-01	*Ch. 10 / Item 3*	**Cft**	**3,600.00**	100 Cft	100	3,556.70	**128,041**	*TG-237*	*4" sand*	*Civil - schedule*
3.2	**SUB-TOTAL - 3.2 GREEN BELT F-14 / G-14 (5,800 ft x 390 ft) - VEHICLE ENTRANCE APRONS**								**2,626,621**			
SUB-SECTION 3.3 - GREEN BELT F-13 / F-14 (5,800 ft x 195 ft) - VEHICLE ENTRANCE APRONS												
A. VEHICLE ENTRANCE APRONS - the 30 ft gates and fence panels are descoped; the paved aprons are kept												
3.3.01	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the vehicle entrance apron at each entrance position of the belt]	R-C10-04	*Ch. 10 / Item 44*	**Sft**	**10,800.00**	Sft	1	231.35	**2,498,580**	*TG-337*	*Entrance positions of the zone sheets, pro rata to belt length*	*Civil - schedule*
3.3.02	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the apron pavers]	R-C10-01	*Ch. 10 / Item 3*	**Cft**	**3,600.00**	100 Cft	100	3,556.70	**128,041**	*TG-337*	*4" sand*	*Civil - schedule*
3.3	**SUB-TOTAL - 3.3 GREEN BELT F-13 / F-14 (5,800 ft x 195 ft) - VEHICLE ENTRANCE APRONS**								**2,626,621**			
SUB-SECTION 3.4 - GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft) - VEHICLE ENTRANCE APRONS												
A. VEHICLE ENTRANCE APRONS - the 30 ft gates and fence panels are descoped; the paved aprons are kept												
3.4.01	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the vehicle entrance apron at each entrance position of the belt]	R-C10-04	*Ch. 10 / Item 44*	**Sft**	**1,350.00**	Sft	1	231.35	**312,323**	*TG-437*	*Entrance positions of the zone sheets, pro rata to belt length*	*Civil - schedule*
3.4.02	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the apron pavers]	R-C10-01	*Ch. 10 / Item 3*	**Cft**	**450.00**	100 Cft	100	3,556.70	**16,005**	*TG-437*	*4" sand*	*Civil - schedule*
3.4	**SUB-TOTAL - 3.4 GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft) - VEHICLE ENTRANCE APRONS**								**328,328**			
SUB-SECTION 3.5 - LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft) - VEHICLE ENTRANCE APRONS												
A. VEHICLE ENTRANCE APRONS - the 30 ft gates and fence panels are descoped; the paved aprons are kept												
3.5.01	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the vehicle entrance apron at each entrance position of the belt]	R-C10-04	*Ch. 10 / Item 44*	**Sft**	**14,850.00**	Sft	1	231.35	**3,435,548**	*TG-537*	*Entrance positions of the zone sheets, pro rata to belt length*	*Civil - schedule*
3.5.02	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the apron pavers]	R-C10-01	*Ch. 10 / Item 3*	**Cft**	**4,950.00**	100 Cft	100	3,556.70	**176,057**	*TG-537*	*4" sand*	*Civil - schedule*
3.5	**SUB-TOTAL - 3.5 LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft) - VEHICLE ENTRANCE APRONS**								**3,611,605**			
SUB-SECTION 3.6 - PARK F-14/4 (Park 4) (42 Kanal) - GATES AND VEHICLE CROSSING												
A. WICKET GATE (VEHICLE WIDTH), REVOLVING PEDESTRIAN ENTRANCE AND VEHICLE CROSSING												
3.6.01	Supply, fabrication and erection of wicket gate 12'-0" x 7'-0" in the park boundary wall, wide enough for a vehicle - double-leaf wrought-iron grill gate with a pedestrian door in one leaf, hot-dip galvanised and powder-coated, on 100x100x5 mm hollow-box posts in R.C.C. foundations, with lock set, hinges, drop bolts and stoppers - complete.	R-CA-21	*COMP / CA-21*	**Nos**	**1.00**	Each	1	160,229.98	**160,230**	*TP-430*	*One per park, 12 ft wide*	*Civil - non-schedule*
3.6.02	Supply, installation, testing and commissioning of revolving pedestrian entrance gate (full-height three-arm turnstile), hot-dip galvanised and powder-coated steel, on P.C.C. foundation with guide railings to the approach - complete and operational	R-CA-22	*COMP / CA-22*	**Nos**	**1.00**	Each	1	596,619.03	**596,619**	*TP-472*	*Main entrance of the park*	*Civil - non-schedule*
3.6.03	Forming vehicle crossing at the wicket gate, 12'-0" wide - mountable kerb and heavy-duty tuff-paver crossing on a granular base with edge beams, so that a fire tender or an ambulance can drive in through the wicket gate.	R-CA-23	*COMP / CA-23*	**Nos**	**1.00**	Each	1	89,251.60	**89,252**	*TP-473*	*One per park*	*Civil - non-schedule*

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3.6.04	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the entrance apron at each gate position]	R-C10-04	*Ch. 10 / Item 44*	Sft	800.00	Sft	1	231.35	185,080	*TP-431*	*20 ft x 20 ft per gate position*	*Civil - schedule*
3.6.05	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the gate-apron pavers]	R-C10-01	*Ch. 10 / Item 3*	Cft	266.67	100 Cft	100	3,556.70	9,485	*TP-431*	*4" sand*	*Civil - schedule*
3.6	SUB-TOTAL - 3.6 PARK F-14/4 (Park 4) (42 Kanal) - GATES AND VEHICLE CROSSING								1,040,666			

SUB-SECTION 3.7 - PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft) - GATES AND VEHICLE CROSSING

A. WICKET GATE (VEHICLE WIDTH), REVOLVING PEDESTRIAN ENTRANCE AND VEHICLE CROSSING

3.7.01	Supply, fabrication and erection of wicket gate 12'-0" x 7'-0" in the park boundary wall, wide enough for a vehicle - double-leaf wrought-iron grill gate with a pedestrian door in one leaf, hot-dip galvanised and powder-coated, on 100x100x5 mm hollow-box posts in R.C.C. foundations, with lock set, hinges, drop bolts and stoppers - complete.	R-CA-21	*COMP / CA-21*	Nos	1.00	Each	1	160,229.98	160,230	*TP-530*	*One per park, 12 ft wide*	*Civil - non-schedule*
3.7.02	Supply, installation, testing and commissioning of revolving pedestrian entrance gate (full-height three-arm turnstile), hot-dip galvanised and powder-coated steel, on P.C.C. foundation with guide railings to the approach - complete and operational	R-CA-22	*COMP / CA-22*	Nos	1.00	Each	1	596,619.03	596,619	*TP-572*	*Main entrance of the park*	*Civil - non-schedule*
3.7.03	Forming vehicle crossing at the wicket gate, 12'-0" wide - mountable kerb and heavy-duty tuff-paver crossing on a granular base with edge beams, so that a fire tender or an ambulance can drive in through the wicket gate.	R-CA-23	*COMP / CA-23*	Nos	1.00	Each	1	89,251.60	89,252	*TP-573*	*One per park*	*Civil - non-schedule*
3.7.04	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers to the entrance apron at each gate position]	R-C10-04	*Ch. 10 / Item 44*	Sft	800.00	Sft	1	231.35	185,080	*TP-531*	*20 ft x 20 ft per gate position*	*Civil - schedule*
3.7.05	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as cushion under the gate-apron pavers]	R-C10-01	*Ch. 10 / Item 3*	Cft	266.67	100 Cft	100	3,556.70	9,485	*TP-531*	*4" sand*	*Civil - schedule*
3.7	SUB-TOTAL - 3.7 PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft) - GATES AND VEHICLE CROSSING								1,040,666			

SUMMARY OF BILL No. 3 BY SUB-SECTION

3.1	GREEN BELT F-14 / F-15 (5,800 ft x 390 ft) - VEHICLE ENTRANCE APRONS								2,626,621			
3.2	GREEN BELT F-14 / G-14 (5,800 ft x 390 ft) - VEHICLE ENTRANCE APRONS								2,626,621			
3.3	GREEN BELT F-13 / F-14 (5,800 ft x 195 ft) - VEHICLE ENTRANCE APRONS								2,626,621			
3.4	GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft) - VEHICLE ENTRANCE APRONS								328,328			
3.5	LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft) - VEHICLE ENTRANCE APRONS								3,611,605			
3.6	PARK F-14/4 (Park 4) (42 Kanal) - GATES AND VEHICLE CROSSING								1,040,666			
3.7	PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft) - GATES AND VEHICLE CROSSING								1,040,666			
	TOTAL - BILL No. 3 - GATES AND ENTRANCES - GREEN BELTS AND PARKS								13,901,128			

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BILL No. 4 - NULLAH FOOTPATHS, SAFETY RAILING AND ACCESS STEPS - F-14 AND F-15

The two nullahs on one sheet, each under its own heading (F-14, 4,500 Rft and F-15, 4,000 Rft): the top-of-bank footpath on both banks, the safety railing on the top section and the public access steps. The walled stone-masonry channel itself is not part of this estimate

Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
SUB-SECTION 4.1 - F-14 NULLAH (4,500 Rft)												
A. TOP-OF-BANK FOOTPATH - both banks												
4.1.01	Dressing and levelling of the footpath sub-grade to designed section, including compaction and moistening to optimum moisture content	R-C3-22	*NSI / EW-DL*	**Sft**	**36,000.00**	100 Sft	100	1,650.00	**594,000**	*TN-121*	*4'-0" wide footpath on both banks*	*Civil - non-schedule*
4.1.02	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as bedding under the footpath]	R-C10-01	*Ch. 10 / Item 3*	**Cft**	**12,000.00**	100 Cft	100	3,556.70	**426,804**	*TN-122*	*Section B-B: "4" Th Sand"*	*Civil - schedule*
4.1.03	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete ratio 1:2:4, 4" thick, as the footpath slab, including placing, compacting, finishing and curing]	R-C6-03	*Ch. 6 / Item 5(f)*	**Cft**	**12,000.00**	100 Cft	100	49,085.50	**5,890,260**	*TN-123*	*Section B-B: "4" Th PCC"*	*Civil - schedule*
4.1.04	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi crushing strength, in approved pattern with 50% grey and 50% coloured, over sand cushion, including grouting of joints]	R-C10-04	*Ch. 10 / Item 44*	**Sft**	**36,000.00**	Sft	1	231.35	**8,328,600**	*TN-124*	*Zone drawings: PCC tough paver*	*Civil - schedule*
4.1.05	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone (4" to 6" thick) of 3500 psi compressive strength to both edges of both footpaths, laid in cement-sand mortar 1:3, complete]	R-C10-05	*Ch. 10 / Item 45*	**Rft**	**18,000.00**	Rft	1	573.35	**10,320,300**	*TN-125*	*2 edges x 2 banks*	*Civil - schedule*
B. SAFETY RAILING - top section of both banks												
4.1.06	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. safety railing 3'-0" high, main member 76x76x3 mm hollow box section, welded with intermediate members, ON THE TOP SECTION of both banks of the channel, complete in all respects]	R-C25-03	*Ch. 25 / Item 34*	**Rft**	**9,000.00**	Rft	1	1,587.50	**14,287,500**	*TN-126*	*Top of bank only - Client instruction*	*Civil - schedule*
C. PUBLIC ACCESS STEPS												
4.1.07	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and retaining walls, etc. and footing beams, other structural members other than those mentioned in 6 (a-d) above not requiring form work (i.e. horizontal shuttering), complete in all respects - Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(c)(2): Providing and laying reinforced cement concrete ratio 1:1.5:3 in public access steps from footpath level down to the channel (80 Cft per flight), including formwork and finishing]	R-C6-07	*Ch. 6 / Item 6(c)(2)*	**Cft**	**800.00**	Cft	1	697.50	**558,000**	*TN-134*	*80 Cft per access stair*	*Civil - schedule*
4.1.08	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the access steps]	R-C6-08	*Ch. 6 / Item 12(b)(ii)*	**Kg**	**1,760.00**	100 Kg	100	30,827.85	**542,570**	*TN-134*	*2.2 kg per Cft of concrete*	*Civil - schedule*
4.1	**SUB-TOTAL - 4.1 F-14 NULLAH (4,500 Rft)**								**40,948,034**			
SUB-SECTION 4.2 - F-15 NULLAH (4,000 Rft)												
A. TOP-OF-BANK FOOTPATH - both banks												
4.2.01	Dressing and levelling of the footpath sub-grade to designed section, including compaction and moistening to optimum moisture content	R-C3-22	*NSI / EW-DL*	**Sft**	**32,000.00**	100 Sft	100	1,650.00	**528,000**	*TN-221*	*4'-0" wide footpath on both banks*	*Civil - non-schedule*
4.2.02	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as bedding under the footpath]	R-C10-01	*Ch. 10 / Item 3*	**Cft**	**10,666.67**	100 Cft	100	3,556.70	**379,381**	*TN-222*	*Section B-B: "4" Th Sand"*	*Civil - schedule*
4.2.03	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete ratio 1:2:4, 4" thick, as the footpath slab, including placing, compacting, finishing and curing]	R-C6-03	*Ch. 6 / Item 5(f)*	**Cft**	**10,666.67**	100 Cft	100	49,085.50	**5,235,787**	*TN-223*	*Section B-B: "4" Th PCC"*	*Civil - schedule*
4.2.04	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi crushing strength, in approved pattern with 50% grey and 50% coloured, over sand cushion, including grouting of joints]	R-C10-04	*Ch. 10 / Item 44*	**Sft**	**32,000.00**	Sft	1	231.35	**7,403,200**	*TN-224*	*Zone drawings: PCC tough paver*	*Civil - schedule*
4.2.05	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone (4" to 6" thick) of 3500 psi compressive strength to both edges of both footpaths, laid in cement-sand mortar 1:3, complete]	R-C10-05	*Ch. 10 / Item 45*	**Rft**	**16,000.00**	Rft	1	573.35	**9,173,600**	*TN-225*	*2 edges x 2 banks*	*Civil - schedule*
B. SAFETY RAILING - top section of both banks												
4.2.06	Providing / fixing stair railing consisting of M.S. Box section size 1-1/2" x 3" of 16 SWG welded with M.S. flat 1" x 1/8" continuously and welded over M.S. square bars 5/8" x 5/8" punched in M.S. flat 2-3/4' high @ 5-1/2" c/c fixed in steps of stair i/c painting 3 coats complete. [Ch. 25, Item 34: Providing and fixing hot-dip galvanised M.S. safety railing 3'-0" high, main member 76x76x3 mm hollow box section, welded with intermediate members, ON THE TOP SECTION of both banks of the channel, complete in all respects]	R-C25-03	*Ch. 25 / Item 34*	**Rft**	**8,000.00**	Rft	1	1,587.50	**12,700,000**	*TN-226*	*Top of bank only - Client instruction*	*Civil - schedule*
C. PUBLIC ACCESS STEPS												

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4.2.07	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and retaining walls, etc. and footing beams, other structural members other than those mentioned in 6 (a-d) above not requiring form work (i.e. horizontal shuttering), complete in all respects - Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(c)(2): Providing and laying reinforced cement concrete ratio 1:1.5:3 in public access steps from footpath level down to the channel (80 Cft per flight), including formwork and finishing]	**R-C6-07**	*Ch. 6 / Item 6(c)(2)*	**Cft**	**640.00**	Cft	1	697.50	**446,400**	*TN-234*	*80 Cft per access stair*	*Civil - schedule*
4.2.08	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-60 in the access steps]	**R-C6-08**	*Ch. 6 / Item 12(b)(ii)*	**Kg**	**1,408.00**	100 Kg	100	30,827.85	**434,056**	*TN-234*	*2.2 kg per Cft of concrete*	*Civil - schedule*
4.2	**SUB-TOTAL - 4.2 F-15 NULLAH (4,000 Rft)**								**36,300,424**			

SUMMARY OF BILL No. 4 BY SUB-SECTION											
4.1	F-14 NULLAH (4,500 Rft)								**40,948,034**		
4.2	F-15 NULLAH (4,000 Rft)								**36,300,424**		
	TOTAL - BILL No. 4 - NULLAH FOOTPATHS, SAFETY RAILING AND ACCESS STEPS - F-14 AND F-15								**77,248,458**		

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BILL No. 5 - F-14 LAKE - PRESERVATION, STONE PITCHING, PERIMETER WALKWAY AND STONE-FILL WEIR

Existing 13-Kanal lake preserved and re-profiled, stone-pitched bank at a 1:2 batter with toe apron and beam, 945 Rft of 8 ft wide perimeter walkway, and one stone-fill weir of 20 ft span with its aprons and stilling basin (drawings of Sep 2026)

Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
A. PRESERVATION AND RE-PROFILING OF THE EXISTING F-14 LAKE												
5.01	Clearing and grubbing. [Ch. 3, Item 53: Clearing and grubbing of the lake margin and of the corridor of the perimeter walkway, including removal of vegetation, shrubs, roots, rubbish and debris and disposal thereof]	R-C3-10	*Ch. 3 / Item 53*	**Sft**	**17,955.00**	1000 Sft	1000	5,292.20	**95,021**	*TN-302*	*Shoreline 945 Rft*	*Civil - schedule*
5.02	Regular excavation dressed. [Ch. 3, Item 6: Desilting and re-profiling of the bed of the existing lake, average 2'-0" deep, including dressing to the designed profile and disposal of the silt within the measured lead]	R-C3-18	*Ch. 3 / Item 6*	**Cft**	**141,570.00**	1000 Cft	1000	8,385.70	**1,187,164**	*TN-303*	*13 Kanal water surface*	*Civil - schedule*
5.03	Regular excavation dressed. [Ch. 3, Item 6: Excavation and trimming of the lake bank to the designed 1:2 batter, 12'-0" high, dressed to section and levels]	R-C3-18	*Ch. 3 / Item 6*	**Cft**	**34,020.00**	1000 Cft	1000	8,385.70	**285,282**	*TN-304*	*Shoreline x bank section*	*Civil - schedule*
5.04	Transportation of earth of all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m): upto 1/4 mile (400 m). [Ch. 3, Item 17(a): Transportation of silt and surplus excavated material of all types to approved dumping ground, total distance upto 5 km lead]	R-C3-07	*Ch. 3 / Item 17(a)*	**Cft**	**175,590.00**	1000 Cft	1000	7,190.50	**1,262,580**	*TN-305*	*Desilting plus bank trimming*	*Civil - schedule*
B. STONE-PITCHED LAKE BANK (Stone Pitched Section of F14 Lake - batter 1:2, bank height 12 ft)												
5.05	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 3" thick, as filter bedding under the stone pitching of the lake bank]	R-C10-01	*Ch. 10 / Item 3*	**Cft**	**3,169.63**	100 Cft	100	3,556.70	**112,734**	*TN-306*	*Under the pitching*	*Civil - schedule*
5.06	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Providing and laying stone pitching, 1'-0" thick, with hammer-dressed stones laid in courses on the prepared 1:2 slope of the lake bank, complete in all respects]	R-C8-02	*Ch. 16 / Item 28*	**Cft**	**12,678.51**	100 Cft	100	15,198.50	**1,926,943**	*TN-307*	*Developed slope length 13.4 ft*	*Civil - schedule*
5.07	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Providing and laying stone pitching, 6" thick, to the 4'-0" wide toe apron at the bottom of the pitched slope]	R-C8-02	*Ch. 16 / Item 28*	**Cft**	**1,890.00**	100 Cft	100	15,198.50	**287,252**	*TN-308*	*Stone Pitched Section: 4'-0" apron*	*Civil - schedule*
5.08	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete ratio 1:2:4 in the toe beam under the apron, 1'-6" x 1'-6", including formwork, compacting, finishing and curing]	R-C6-03	*Ch. 6 / Item 5(f)*	**Cft**	**2,126.25**	100 Cft	100	49,085.50	**1,043,680**	*TN-309*	*Stone Pitched Section: "1'-6""*	*Civil - schedule*
5.09	Grouting stone filling or pitching, with bajri. [Ch. 16, Item 34: Grouting of the stone pitching and the toe apron with bajri]	R-C16-34	*Ch. 16 / Item 34*	**Cft**	**14,568.51**	100 Cft	100	3,905.70	**569,002**	*TN-310*	*Grouting of all pitching*	*Civil - schedule*
5.10	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the lead from the approved source to site (composite of the chain and kilometre rates of the item). [Ch. 1, Item 1: Carriage of stone, aggregate, sand and other materials for the lake pitching, toe and walkway]	R-C1-01	*Ch. 1 / Item 1*	**Cft**	**24,904.38**	100 Cft	100	4,590.00	**1,143,111**	*TN-319*	*Carriage on lakeside materials*	*Civil - schedule*
C. PERIMETER WALKWAY OF THE LAKE - 8'-0" wide, 945 Rft long												
5.11	Dressing and levelling of the walkway sub-grade to designed section, including compaction and moistening to optimum moisture content	R-C3-22	*NSI / EW-DL*	**Sft**	**7,560.00**	100 Sft	100	1,650.00	**124,740**	*TN-311*	*8'-0" wide walkway*	*Civil - non-schedule*
5.12	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling clean screened sand, 4" thick, as bedding under the walkway]	R-C10-01	*Ch. 10 / Item 3*	**Cft**	**2,520.00**	100 Cft	100	3,556.70	**89,629**	*TN-312*	*4" bedding*	*Civil - schedule*
5.13	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete ratio 1:2:4, 4" thick, as the walkway slab, including placing, compacting, finishing and curing]	R-C6-03	*Ch. 6 / Item 5(f)*	**Cft**	**2,520.00**	100 Cft	100	49,085.50	**1,236,955**	*TN-313*	*4" slab*	*Civil - schedule*
5.14	Providing and laying Polygon Pavers, having 7000 PSI crushing strength of approved manufacturer, 60 mm thick, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope, in pattern as approved by Engineer Incharge. Complete in all respect. (50% Grey & 50% Coloured) [Ch. 10, Item 44: Providing and laying 60 mm thick precast concrete interlocking tuff pavers, 7000 psi crushing strength, in approved pattern, over sand cushion, including grouting of joints]	R-C10-04	*Ch. 10 / Item 44*	**Sft**	**7,560.00**	Sft	1	231.35	**1,749,006**	*TN-314*	*Walkway wearing surface*	*Civil - schedule*
5.15	Providing and fixing precast (K-2 type) Edge Kerb Stone (3-1/2" x 6-1/2" x 7-1/2"), of 3500 PSI compressive strength, embedded in PCC (1:2:4) over lean concrete (1:4:8) i/c excavation and grouting with cement etc. complete in all respect as approved and directed by the Engineer Incharge. [Ch. 10, Item 45: Providing and fixing precast edge kerb stone (4" to 6" thick) of 3500 psi compressive strength to both edges of the walkway, laid in cement-sand mortar 1:3, complete]	R-C10-05	*Ch. 10 / Item 45*	**Rft**	**1,890.00**	Rft	1	573.35	**1,083,632**	*TN-315*	*Both edges*	*Civil - schedule*
D. STONE-FILL WEIR AT THE LAKE (span 20 ft - Section of Stone Fill Weir)												
5.16	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft. (1.5 m): depth from 5.1 ft. (1.5 m) to 15 ft. (4.5 m), in ordinary soil. [Ch. 3, Item 21, 2(a)(ii): Excavation in foundation of the weir, its aprons and the stilling basin, from 5.1 ft to 15 ft depth, by excavator, in ordinary soil, including dagbelling, dressing and refilling around the structure]	R-C3-02	*Ch. 3 / Item 21, 2(a)(ii)*	**Cft**	**9,256.00**	1000 Cft	1000	13,528.20	**125,217**	*TN-320*	*89 ft long structure x 20 ft span*	*Civil - schedule*
5.17	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate: crushed stone aggregate. (The rates include the provision and maintenance of field test laboratory.) [Ch. 18, Item 3(a)(ii): Providing and laying well-compacted granular fill of stone product of approved quality, 3'-0" thick, under the aprons and the weir base, including placing, spreading and compaction to specified density]	R-C18-01	*Ch. 18 / Item 3(a)(ii)*	**Cft**	**4,020.00**	100 Cft	100	10,874.25	**437,145**	*TN-321*	*Section of Stone Fill Weir*	*Civil - schedule*
5.18	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate Resisting cement / Slag cement as may be required, coarse sand and graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): reinforced cement concrete in roof slab, beams, columns, lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects - Type C (nominal mix 1:2:4). [Ch. 6, Item 6(a)(3): Providing and laying reinforced cement concrete ratio 1:2:4, 8" thick, in the upstream apron and the weir base slab, including formwork, compacting, finishing and curing]	R-C6-05	*Ch. 6 / Item 6(a)(3)*	**Cft**	**560.00**	Cft	1	773.55	**433,188**	*TN-322*	*Grade 40, #3 @ 8" c/c*	*Civil - schedule*

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5.19	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): deformed bars (Grade-60). [Ch. 6, Item 12(b)(ii): Fabrication of mild steel deformed bar reinforcement Grade-40 in the apron and base slab, including cutting, bending, laying in position and binding]	**R-C6-08**	*Ch. 6 / Item 12(b)(ii)*	**Kg**	**1,232.00**	100 Kg	100	30,827.85	**379,799**	*TN-323*	*2.2 kg per Cft of concrete*	*Civil - schedule*
5.20	Cement concrete plain, including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): ratio 1:2:4. [Ch. 6, Item 5(f): Providing and laying plain cement concrete ratio 1:2:4, 8" thick, in the downstream apron, including compacting, finishing and curing]	**R-C6-03**	*Ch. 6 / Item 5(f)*	**Cft**	**333.33**	100 Cft	100	49,085.50	**163,618**	*TN-324*	*Downstream apron 25 ft*	*Civil - schedule*
5.21	Providing and laying stone pitching with hammer dressed stones on surface, laid in courses. [Ch. 16, Item 28: Providing and laying hand-placed angular hard stone of toughness more than 1,500 psi, set in mortar, forming the body of the stone-fill weir (crest 8'-0", base 27'-0", height 10'-0"), complete in all respects]	**R-C8-02**	*Ch. 16 / Item 28*	**Cft**	**3,500.00**	100 Cft	100	15,198.50	**531,948**	*TN-325*	*Trapezoidal weir body x 20 ft span*	*Civil - schedule*
5.22	Providing and applying 6" thick shotcrete (1:2:2) to both faces and the crest of the weir, including #1 stainless steel re-bars at 6" centres both ways, surface preparation, nozzle work, rebound allowance and curing, complete.	**R-CA-20**	*COMP / CA-20*	**Sft**	**711.72**	Sft	1	1,531.20	**1,089,793**	*TN-326*	*Section of Stone Fill Weir*	*Civil - non-schedule*
5.23	Providing and laying stone pitching / filling, dry hand packed, as filling behind retaining walls or in pitching and aprons. [Ch. 16, Item 27: Providing and laying dry hand-packed stone fill, 3'-0" thick, in the stilling basin downstream of the apron, including 12" friction blocks at 5'-0" centres, complete]	**R-C16-27**	*Ch. 16 / Item 27*	**Cft**	**1,320.00**	100 Cft	100	8,234.15	**108,691**	*TN-327*	*Stone Fill Stilling Basin, 22 ft*	*Civil - schedule*
5.24	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the shorter lead adopted for the nullah and lake works. [Ch. 1, Item 1: Carriage of stone, aggregate, sand and other materials for the weir, its aprons and the stilling basin]	**R-C1-02**	*Ch. 1 / Item 1*	**Cft**	**9,733.33**	100 Cft	100	3,881.75	**377,824**	*TN-328*	*Carriage on weir materials*	*Civil - schedule*
	TOTAL - BILL No. 5 - F-14 LAKE - PRESERVATION, STONE PITCHING, PERIMETER WALKWAY AND STONE-FILL								**15,843,954**			

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

BILL No. 6 - TUBE WELLS, TRIAL BORES, PUMP ROOMS AND ELECTRIFICATION

5 tube wells and 10 trial bores, each bored to 600 ft, with a pump room and its electrification at every tube well - the Taunsa TAU-02 estimate re-priced at the MRS 2nd Bi-Annual 2026 (Rawalpindi), blind pipe in M.S.; no transmission or distribution mains (Client instructions)

Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
A. TUBE WELLS - 5 Nos, each bored to 600 ft (Client instructions)												
6.01	Earthwork excavation in ashes, sand and soft soil or silt clearance, undressed lead upto 50 ft (15 metre) through mechanical means. [Ch. 3, Item 2: Earthwork excavation for the water storage pit 35 ft x 25 ft x 5 ft at each well, undressed, lead upto 50 ft]	R-TW-01	*Ch. 3 / Item 2*	**Cft**	**21,875.00**	1000 Cft	1000	8,932.70	**195,403**	*02-Parameters*	*Taunsa sheet 1.1, per well: 4,375 Cft*	*Civil - schedule*
6.02	Direct Rotary / Reverse Rotary drilling of bore for tubewells, in all types of soil except shingle, gravel and rock: (a) from ground level to 250 ft (75 m) below ground level - (i) 15" to 18" (375 to 450 mm) i/d. [Ch. 23, Item 2(a)(i): Direct / reverse rotary drilling of the bore, 15" to 18" i/d, from ground level to 250 ft]	R-TW-02	*Ch. 23 / Item 2(a)(i)*	**Rft**	**1,250.00**	Rft	1	956.30	**1,195,375**	*02-Parameters*	*250 ft per well*	*Civil - schedule*
6.03	Direct Rotary / Reverse Rotary drilling of bore for tubewells, in all types of soil except shingle, gravel and rock: (b) exceeding 250 ft (75 m) depth below ground level - (i) 15" to 18" (375 to 450 mm) i/d. [Ch. 23, Item 2(b)(i): Direct / reverse rotary drilling of the bore, 15" to 18" i/d, below 250 ft to the full depth]	R-TW-03	*Ch. 23 / Item 2(b)(i)*	**Rft**	**1,750.00**	Rft	1	1,050.55	**1,838,463**	*02-Parameters*	*P_TWD - 250 ft per well*	*Civil - schedule*
6.04	Providing and installing M.S. blind pipe socketed / welded joint, M.S. reducer (where necessary), in tubewell bore hole, including jointing / welding with strainer, etc. complete: (g) 8" i/d, 3/16" (200 mm i/d, 5 mm) thick. [Ch. 23, Item 12(g): M.S. blind pipe 8" i/d, 3/16" thick, socketed / welded, in the bore hole (replaces the FRP blank pipe of the source)]	R-TW-04	*Ch. 23 / Item 12(g)*	**Rft**	**2,700.00**	Rft	1	3,537.80	**9,552,060**	*02-Parameters*	*Depth less strainer and bail plug*	*Civil - schedule*
6.05	Providing and installing Fiberglass Reinforced Polypropelene (FRP) strainer of specified wall thickness having slot size of 0.9 mm to 1.10 mm in tubewell borehole i/c the cost of male / female coupling with nylone strip, studs complete in all respect as approved and directed by the Engineer Incharge: (v) 8" dia (5 mm thickness). [Ch. 23, Item 9(v): FRP strainer 8" dia, 5 mm wall, slot 0.9 - 1.10 mm, in the bore hole]	R-TW-05	*Ch. 23 / Item 9(v)*	**Rft**	**250.00**	Rft	1	2,650.40	**662,600**	*02-Parameters*	*Taunsa sheet 1.1, per well: 50 Rft*	*Civil - schedule*
6.06	Providing and installing Fiber glass Reinforced Polypropelene (FRP) bail plug of specified wall thickness in tubewell bore hole i/c the cost of male / female coupling with nylone strip, studs complete in all respect as approved and directed by the Engineer Incharge: (v) 8" dia (5 mm thickness). [Ch. 23, Item 10(v): FRP bail plug 8" dia, 5 mm wall, at the bottom of the assembly]	R-TW-06	*Ch. 23 / Item 10(v)*	**Rft**	**50.00**	Rft	1	2,495.40	**124,770**	*02-Parameters*	*Taunsa sheet 1.1, per well: 10 Rft*	*Civil - schedule*
6.07	Shrouding with graded pea gravel 3/8" to 1/8" (10 to 3 mm), around tubewell in bore hole (including wastage etc.). [Ch. 23, Item 17: Shrouding with graded pea gravel 3/8" to 1/8" around the well assembly]	R-TW-07	*Ch. 23 / Item 17*	**Cft**	**4,140.00**	Cft	1	189.30	**783,702**	*02-Parameters*	*Taunsa sheet 1.1, per well: 629.2 Cft for 455 ft = 1.38 Cft/ft*	*Civil - schedule*
6.08	Providing & mixing bentonite clay / powder having swelling factor of 1200% for lining / seal and plug earthen bore holes / ponds in the specified ratio conforming to IS:6186 for stabilization of soil as specified by the designer etc. complete in all respect. [Ch. 23, Item 31: Bentonite clay / powder for the seal and plug of the bore hole]	R-TW-08	*Ch. 23 / Item 31*	**Pound**	**5,280.00**	Pound	1	13.20	**69,696**	*02-Parameters*	*Taunsa sheet 1.1, per well: 1,056 lb*	*Civil - schedule*
6.09	Providing and installing P.V.C. blind pipe, B.S.S., in tubewell bore hole, including sockets and solvents and jointing with strainer (PS-3051 = BS-3505), etc. complete: (a) Class-B (6 bar) - (i) 3" i/d (75 mm). [Ch. 23, Item 13(a)(i): P.V.C. blind pipe Class-B 3" i/d for gravel feeding]	R-TW-09	*Ch. 23 / Item 13(a)(i)*	**Rft**	**150.00**	Rft	1	401.50	**60,225**	*02-Parameters*	*Taunsa sheet 1.1, per well: 30 Rft*	*Civil - schedule*
6.10	Testing and developing of tubewell of size 6" (150 mm) i/d and above continuously: (i) upto 1.5 cs discharge. [Ch. 23, Item 16(i): Testing and developing of the tube well continuously (discharge upto 1.5 cusec), including the long-duration pumping test]	R-TW-10	*Ch. 23 / Item 16(i)*	**Hour**	**100.00**	Hour	1	3,195.35	**319,535**	*02-Parameters*	*Taunsa sheet 1.1, per well: 20 hours*	*Civil - schedule*
6.11	Taking samples of the strata at every 5 ft, with construction charts and analysis.	R-TW-21	*NSI / TW-N1*	**Each**	**600.00**	Each	1	202.00	**121,200**	*02-Parameters*	*One sample per 5 ft of bore*	*Civil - non-schedule*
6.12	Geophysical logging of the bore.	R-TW-22	*NSI / TW-N2*	**Job**	**5.00**	Job	1	63,180.00	**315,900**	*02-Parameters*	*Taunsa sheet 1.1, per well: 1 per well*	*Civil - non-schedule*
6.13	M.S. centralizers.	R-TW-23	*NSI / TW-N3*	**Each**	**75.00**	Each	1	2,906.00	**217,950**	*02-Parameters*	*Taunsa sheet 1.1, per well: one per 40 ft*	*Civil - non-schedule*
6.14	Chemical and physical analysis of water samples after every 24 hours of pumping.	R-TW-24	*NSI / TW-N4*	**Job**	**10.00**	Job	1	17,021.00	**170,210**	*02-Parameters*	*Taunsa sheet 1.1, per well: 2 per well*	*Civil - non-schedule*
6.15	M.S. cap 8" dia, 1/4" thick.	R-TW-25	*NSI / TW-N5*	**Each**	**5.00**	Each	1	2,249.00	**11,245**	*02-Parameters*	*Taunsa sheet 1.1, per well: 1 per well*	*Civil - non-schedule*
6.16	Submersible pump set 0.25 cfs, head 250 ft, with motor, cable and motor control unit, installed, tested and commissioned	R-TW-26	*NSI / TW-N6*	**Each**	**5.00**	Each	1	2,039,040.00	**10,195,200**	*02-Parameters*	*H-250 ft set of the source - head from the pumping test*	*E/M - non-schedule*
6.17	Hypo-chlorinator with dosing pump and controller.	R-TW-27	*NSI / TW-N7*	**Job**	**5.00**	Job	1	150,841.20	**754,206**	*02-Parameters*	*Taunsa sheet 1.1, per well: 1 per well*	*E/M - non-schedule*
B. TRIAL BORES - 10 Nos, each bored to 600 ft and plugged												
6.18	Earthwork excavation in ashes, sand and soft soil or silt clearance, undressed lead upto 50 ft (15 metre) through mechanical means. [Ch. 3, Item 2: Earthwork excavation for the water pit 35 ft x 25 ft x 5 ft at each trial bore, undressed, lead upto 50 ft]	R-TW-01	*Ch. 3 / Item 2*	**Cft**	**43,750.00**	1000 Cft	1000	8,932.70	**390,806**	*02-Parameters*	*Taunsa sheet 1.1a, per bore: 4,375 Cft*	*Civil - schedule*
6.19	Direct Rotary / Reverse Rotary drilling of bore for tubewells, in all types of soil except shingle, gravel and rock: (a) from ground level to 250 ft (75 m) below ground level - (i) 15" to 18" (375 to 450 mm) i/d. [Ch. 23, Item 2(a)(i): Direct / reverse rotary drilling of the trial bore, 15" to 18" i/d, from ground level to 250 ft]	R-TW-02	*Ch. 23 / Item 2(a)(i)*	**Rft**	**2,500.00**	Rft	1	956.30	**2,390,750**	*02-Parameters*	*250 ft per bore*	*Civil - schedule*
6.20	Direct Rotary / Reverse Rotary drilling of bore for tubewells, in all types of soil except shingle, gravel and rock: (b) exceeding 250 ft (75 m) depth below ground level - (i) 15" to 18" (375 to 450 mm) i/d. [Ch. 23, Item 2(b)(i): Direct / reverse rotary drilling of the trial bore, 15" to 18" i/d, below 250 ft to the full depth]	R-TW-03	*Ch. 23 / Item 2(b)(i)*	**Rft**	**3,500.00**	Rft	1	1,050.55	**3,676,925**	*02-Parameters*	*P_TWD - 250 ft per bore*	*Civil - schedule*
6.21	Supplying and filling sand under floor, or plugging in wells. [Ch. 10, Item 3: Supplying and filling sand for plugging the trial bore after logging and sampling]	R-TW-11	*Ch. 10 / Item 3*	**Cft**	**10,620.00**	100 Cft	100	3,556.70	**377,722**	*02-Parameters*	*Taunsa sheet 1.1a, per bore: 680 Cft for 385 ft = 1.77 Cft/ft*	*Civil - schedule*
6.22	Taking samples of the strata at every 5 ft, with construction charts and analysis.	R-TW-21	*NSI / TW-N1*	**Each**	**1,200.00**	Each	1	202.00	**242,400**	*02-Parameters*	*One sample per 5 ft of bore*	*Civil - non-schedule*
6.23	Geophysical logging of the trial bore.	R-TW-22	*NSI / TW-N2*	**Job**	**10.00**	Job	1	63,180.00	**631,800**	*02-Parameters*	*Taunsa sheet 1.1a, per bore: 1 per bore*	*Civil - non-schedule*
6.24	Chemical and physical analysis of the water sample.	R-TW-24	*NSI / TW-N4*	**Job**	**10.00**	Job	1	17,021.00	**170,210**	*02-Parameters*	*Taunsa sheet 1.1a, per bore: 1 per bore*	*Civil - non-schedule*
C. PUMP ROOMS - one at each tube well (Taunsa sheet 1.2, per room)												
6.25	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming, lead upto one chain (30 m) and lift upto 5 ft (1.5 m): 1) depth upto 5 ft (1.5 m) - a) by manual - ii) ordinary soil. [Ch. 3, Item 21, 1(a)(ii): Excavation in foundation of the room, by manual means, in ordinary soil, including refilling, watering and ramming]	R-TP-01	*Ch. 3 / Item 21, 1(a)(ii)*	**Cft**	**9,400.00**	1000 Cft	1000	17,088.20	**160,629**	*02-Parameters*	*Taunsa sheet 1.2, per room: 1.88 x 1000 Cft*	*Civil - schedule*
6.26	Cement concrete brick or stone ballast 1-1/2" to 2" (40 mm to 50 mm) gauge, in foundation and plinth: (b) ratio 1:4:8. [Ch. 6, Item 3(b): Cement concrete brick / stone ballast 1:4:8 in foundation]	R-TP-02	*Ch. 6 / Item 3(b)*	**Cft**	**175.00**	100 Cft	100	36,435.60	**63,762**	*02-Parameters*	*Taunsa sheet 1.2, per room: 0.35 x 100 Cft*	*Civil - schedule*
6.27	Pacca brick work in foundation and plinth in: i) cement, sand mortar - ratio 1:3. [Ch. 7, Item 4(i): Pacca brick work in foundation and plinth in cement-sand mortar 1:3]	R-TP-03	*Ch. 7 / Item 4(i)*	**Cft**	**820.00**	100 Cft	100	44,342.85	**363,611**	*02-Parameters*	*Taunsa sheet 1.2, per room: 1.64 x 100 Cft*	*Civil - schedule*
6.28	Providing and laying damp proof course of cement concrete 1:2:4 (using cement, sand and shingle), including bitumen coating: (b) with 2 coats of bitumen - ii) 2" thick (50 mm). [Ch. 6, Item 37(b)(ii): Damp proof course of cement concrete 1:2:4, 2" thick, with 2 coats of bitumen]	R-TP-04	*Ch. 6 / Item 37(b)(ii)*	**Sft**	**310.00**	100 Sft	100	14,064.30	**43,599**	*02-Parameters*	*Taunsa sheet 1.2, per room: 0.62 x 100 Sft*	*Civil - schedule*

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6.29	Providing and laying vertical damp proof course with cement sand plaster and bitumen coating: (b) with 2 coats of bitumen - 2) ratio 1:3 - b) 3/4" thick (20 mm). [Ch. 6, Item 39(b)(2)(b): Vertical damp proof course of cement-sand plaster 1:3, 3/4" thick, with 2 coats of bitumen]	**R-TP-05**	*Ch. 6 / Item 39(b)(2)(b)*	**Sft**	**430.00**	100 Sft	100	9,434.50	**40,568**	*02-Parameters*	*Taunsa sheet 1.2, per room: 0.86 x 100 Sft*	*Civil - schedule*
6.30	Pacca brick work in ground floor: i) cement, sand mortar - ratio 1:4. [Ch. 7, Item 5(i): Pacca brick work in the superstructure (ground floor) in cement-sand mortar 1:4]	**R-TP-06**	*Ch. 7 / Item 5(i)*	**Cft**	**1,920.00**	100 Cft	100	43,384.35	**832,980**	*02-Parameters*	*Taunsa sheet 1.2, per room: 3.84 x 100 Cft*	*Civil - schedule*
6.31	Filling, watering and ramming earth under floors: i) with surplus earth from foundation, etc. [Ch. 3, Item 15(i): Filling, watering and ramming earth under the floor with surplus earth from the foundation]	**R-TP-07**	*Ch. 3 / Item 15(i)*	**Cft**	**5,950.00**	1000 Cft	1000	8,155.50	**48,525**	*02-Parameters*	*Taunsa sheet 1.2, per room: 1.19 x 1000 Cft*	*Civil - schedule*
6.32	Filling, watering and ramming earth under floors: ii) with new earth excavated from outside, lead upto one chain (30 m). [Ch. 3, Item 15(ii): Filling, watering and ramming earth under the floor with new earth from outside, lead upto one chain]	**R-TP-08**	*Ch. 3 / Item 15(ii)*	**Cft**	**1,950.00**	1000 Cft	1000	17,545.50	**34,214**	*02-Parameters*	*Taunsa sheet 1.2, per room: 0.39 x 1000 Cft*	*Civil - schedule*
6.33	Extra for every 50 ft (15 m) additional lead or part thereof: i) for earthwork soft, ordinary, hard and very hard. [Ch. 3, Item 16(i): Extra for additional lead of the new earth - two increments of 50 ft, as priced in the source estimate]	**R-TP-09**	*Ch. 3 / Item 16(i)*	**Cft**	**3,900.00**	1000 Cft	1000	74.25	**290**	*02-Parameters*	*Taunsa sheet 1.2, per room: 0.39 x 1000 Cft x 2 increments*	*Civil - schedule*
6.34	Dry rammed brick or stone ballast, 1-1/2" to 2" (40 mm to 50 mm) gauge. [Ch. 6, Item 2: Dry rammed brick / stone ballast 1-1/2" to 2" gauge under the floor]	**R-TP-10**	*Ch. 6 / Item 2*	**Cft**	**250.00**	100 Cft	100	14,076.50	**35,191**	*02-Parameters*	*Taunsa sheet 1.2, per room: 0.50 x 100 Cft*	*Civil - schedule*
6.35	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (f) ratio 1:2:4. [Ch. 6, Item 5(f): Plain cement concrete 1:2:4]	**R-TP-11**	*Ch. 6 / Item 5(f)*	**Cft**	**5.00**	100 Cft	100	49,085.50	**2,454**	*02-Parameters*	*Taunsa sheet 1.2, per room: 0.01 x 100 Cft*	*Civil - schedule*
6.36	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (i) ratio 1:4:8. [Ch. 6, Item 5(i): Plain cement concrete 1:4:8 under the floor]	**R-TP-12**	*Ch. 6 / Item 5(i)*	**Cft**	**125.00**	100 Cft	100	36,029.50	**45,037**	*02-Parameters*	*Taunsa sheet 1.2, per room: 0.25 x 100 Cft*	*Civil - schedule*
6.37	Providing and laying topping of cement concrete 1:2:4, including surface finishing and dividing in panels: (c) 1-1/2" (40 mm) thick. [Ch. 10, Item 16(c): Cement concrete 1:2:4 floor topping, 1-1/2" thick, finished and divided in panels]	**R-TP-13**	*Ch. 10 / Item 16(c)*	**Sft**	**495.00**	100 Sft	100	10,169.60	**50,340**	*02-Parameters*	*Taunsa sheet 1.2, per room: 0.99 x 100 Sft*	*Civil - schedule*
6.38	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): (a) reinforced cement concrete in roof slab, beams, columns, lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects - (2) Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(a)(2): Reinforced cement concrete Type B (1:1.5:3) in roof slab, beams, columns and lintels]	**R-TP-14**	*Ch. 6 / Item 6(a)(2)*	**Cft**	**630.35**	Cft	1	853.15	**537,783**	*02-Parameters*	*Taunsa sheet 1.2, per room: 126.07 Cft*	*Civil - schedule*
6.39	Providing and laying reinforced cement concrete (including prestressed concrete), using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.): (c) reinforced cement concrete in pile cap, slab of rafts / strip foundation, base slab of column and retaining walls, etc. and footing beams, other structural members other than those mentioned in 6(a-d) above not requiring form work (i.e. horizontal shuttering) complete in all respects - (2) Type B (nominal mix 1:1-1/2:3). [Ch. 6, Item 6(c)(2): Reinforced cement concrete Type B (1:1.5:3) in the raft / strip foundation and plinth beams]	**R-TP-15**	*Ch. 6 / Item 6(c)(2)*	**Cft**	**452.00**	Cft	1	697.50	**315,270**	*02-Parameters*	*Taunsa sheet 1.2, per room: 90.40 Cft*	*Civil - schedule*
6.40	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): (b) deformed bars - (ii) Grade-60. [Ch. 6, Item 12(b)(ii): Fabrication of deformed bar reinforcement Grade-60, cut, bent, placed and bound]	**R-TP-16**	*Ch. 6 / Item 12(b)(ii)*	**Kg**	**2,700.00**	100 Kg	100	30,827.85	**832,352**	*02-Parameters*	*Taunsa sheet 1.2, per room: 5.40 x 100 Kg*	*Civil - schedule*
6.41	Cement plaster 1:4 upto 20 ft (6.00 m) height: c) 3/4" (20 mm) thick. [Ch. 11, Item 9(c): Cement plaster 1:4, 3/4" thick, to the walls]	**R-TP-17**	*Ch. 11 / Item 9(c)*	**Sft**	**2,570.00**	100 Sft	100	6,641.30	**170,681**	*02-Parameters*	*Taunsa sheet 1.2, per room: 5.14 x 100 Sft*	*Civil - schedule*
6.42	Cement pointing struck joints, on walls, upto 20 ft (6.00 m) height: a) ratio 1:2. [Ch. 11, Item 18(a): Cement pointing struck joints 1:2 to the external brick faces]	**R-TP-18**	*Ch. 11 / Item 18(a)*	**Sft**	**2,790.00**	100 Sft	100	5,418.05	**151,164**	*02-Parameters*	*Taunsa sheet 1.2, per room: 5.58 x 100 Sft*	*Civil - schedule*
6.43	Cement plaster 3/8" (10 mm) thick under soffit of R.C.C. roof slabs only, upto 20 ft height: c) 1:4. [Ch. 11, Item 12(c): Cement plaster 1:4, 3/8" thick, under the soffit of the roof slab]	**R-TP-19**	*Ch. 11 / Item 12(c)*	**Sft**	**1,080.00**	100 Sft	100	5,537.20	**59,802**	*02-Parameters*	*Taunsa sheet 1.2, per room: 2.16 x 100 Sft*	*Civil - schedule*
6.44	Single layer of tiles 9" x 4-1/2" x 1-1/2" (225 x 113 x 40 mm) laid over 4" (100 mm) earth and 1" (25 mm) mud plaster without bhoosa, grouted with cement sand 1:3 on top of RCC roof slab, provided with 34 lbs per 100 Sft or 1.72 kg/sq.m bitumen coating sand blinded. [Ch. 9, Item 5: Single layer of roof tiles over 4" earth and 1" mud plaster with bitumen coating]	**R-TP-20**	*Ch. 9 / Item 5*	**Sft**	**1,005.00**	100 Sft	100	14,518.05	**145,906**	*02-Parameters*	*Taunsa sheet 1.2, per room: 2.01 x 100 Sft*	*Civil - schedule*
6.45	Khassi parnalas in cement, sand mortar 1:2, 12" (300 mm) outside width finished smooth with a floating coat of neat cement. [Ch. 9, Item 14: Khassi parnalas 12" wide in cement-sand mortar 1:2]	**R-TP-21**	*Ch. 9 / Item 14*	**Rft**	**62.50**	Rft	1	279.45	**17,466**	*02-Parameters*	*Taunsa sheet 1.2, per room: 12.5 Rft*	*Civil - schedule*
6.46	Khuras on roof 2' x 2' x 6" (600 x 600 x 150 mm). [Ch. 9, Item 15: Khuras on roof 2 ft x 2 ft x 6 in]	**R-TP-22**	*Ch. 9 / Item 15*	**Each**	**5.00**	Each	1	1,240.85	**6,204**	*02-Parameters*	*Taunsa sheet 1.2, per room: 1 No.*	*Civil - schedule*
6.47	Bottom khuras of brick masonry in cement mortar 1:6, 4' x 2' x 4-1/2" (1200 x 600 x 113 mm) over 3" (75 mm) cement concrete 1:4:8. [Ch. 9, Item 16: Bottom khuras of brick masonry 4 ft x 2 ft x 4-1/2 in]	**R-TP-23**	*Ch. 9 / Item 16*	**Each**	**5.00**	Each	1	2,399.30	**11,997**	*02-Parameters*	*Taunsa sheet 1.2, per room: 1 No.*	*Civil - schedule*
6.48	White washing: a) new surface - iii) three coats. [Ch. 11, Item 26(a)(iii): White washing three coats on new surfaces]	**R-TP-24**	*Ch. 11 / Item 26(a)(iii)*	**Sft**	**2,475.00**	100 Sft	100	971.55	**24,046**	*02-Parameters*	*Taunsa sheet 1.2, per room: 4.95 x 100 Sft*	*Civil - schedule*
6.49	P/F iron door comprising of specified leaves made of 1-1/4" x 1-1/4" x 3/16" MS angle iron for leaf frame, diagonal and horizontal braces duly welded with MS sheet 18-SWG i/c the cost of sliding bolt, tower bolt and painting 3-coats but excluding the cost of chowkat, complete in all respect as approved and directed by the Engineer Incharge: (ii) double leaf. [Ch. 25, Item 61(ii): Iron door, double leaf, of M.S. angle frame and 18 SWG sheet, painted, excluding chowkat]	**R-TP-25**	*Ch. 25 / Item 61(ii)*	**Sft**	**140.00**	Sft	1	1,481.90	**207,466**	*02-Parameters*	*Taunsa sheet 1.2, per room: 28 Sft*	*Civil - schedule*
6.50	Providing and fixing 2" wide MS / GI chowkat single / double rebate made of 16 SWG MS sheet pressed / welded / supported with M.S. flat 1-1/4" x 1/8" i/c 6" long M.S. flat 1" x 1/8" hold fasts (6 Nos) welded / screwed, punching of lock hole covered with MS box, coating with antirust paint including filling with cement sand mortar (1:8) and embedding hold fast in cement concrete (1:2:4), complete in all respect as approved and directed by the Engineer Incharge: (ii) 10.5" wide. [Ch. 12, Item 17(ii): M.S. / G.I. pressed-steel chowkat 10.5" wide for the door]	**R-TP-26**	*Ch. 12 / Item 17(ii)*	**Sft**	**140.00**	Sft	1	733.40	**102,676**	*02-Parameters*	*Taunsa sheet 1.2, per room: 28 Sft*	*Civil - schedule*

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6.51	Providing and fixing steel windows using M.S. sheet (16 SWG) moulded tubular pipe 1-1/2" x 1-1/2" (40 x 40 mm) for frame and 1-1/4" x 1-1/4" (30 x 30 mm) for leaves including M.S. square bars 1/4" x 1/4" (6 x 6 mm) welded around each panel of frame, 5 mm thick glass panes fixed with double M.S. square tubular pipe 3/8" x 3/8" (10 x 10 mm) (22 SWG) beading with U-shaped rubber lining, brass fitting, holdfast, including painting three coats complete in all respects: a) for openable panels fixed with wire gauze 24 SWG, 12 x 12 mesh and glass panes 1/4" (6 mm) thick. [Ch. 25, Item 45(a): Steel windows of moulded tubular M.S. sections with wire gauze and glass panes, painted]	**R-TP-27**	*Ch. 25 / Item 45(a)*	**Sft**	**90.00**	Sft	1	1,345.65	**121,109**	*02-Parameters*	*Taunsa sheet 1.2, per room: 18 Sft*	*Civil - schedule*
6.52	Fabrication of heavy steel / iron work, with angle, tees, flat iron, round iron and sheet iron for making trusses, girders, tanks, etc., including cutting, drilling, revitting, handling, assembling and fixing, but excluding erection in position. [Ch. 25, Item 10: Fabrication of heavy steel work for the well top cover, base plate and lifting girder]	**R-TP-28**	*Ch. 25 / Item 10*	**Kg**	**1,660.00**	100 Kg	100	36,401.60	**604,267**	*02-Parameters*	*Taunsa sheet 1.2, per room: 3.32 x 100 Kg*	*Civil - schedule*
6.53	Erection and fitting in position iron trusses, staging of water tanks, etc. [Ch. 25, Item 11: Erection and fitting in position of the steel work above]	**R-TP-29**	*Ch. 25 / Item 11*	**Kg**	**1,660.00**	100 Kg	100	1,535.90	**25,496**	*02-Parameters*	*Taunsa sheet 1.2, per room: 3.32 x 100 Kg*	*Civil - schedule*
6.54	Providing and fixing chain pulley block of 5 ton capacity with 5 metre length of chain, as per required specifications complete in all respect and as approved by the Engineer Incharge. [Ch. 23, Item 52: Chain pulley block of 5 ton capacity with 5 m chain]	**R-TP-30**	*Ch. 23 / Item 52*	**Each**	**5.00**	Each	1	53,030.00	**265,150**	*02-Parameters*	*Taunsa sheet 1.2, per room: 1 No.*	*Civil - schedule*
6.55	Carriage of 100 Cft (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft (4.25 cu.m) of timber, by truck or by any other means owned by the contractor - for the lead P_TWLEAD from the approved quarry (sum of the kilometre rates of the item: 1st to 10th km, then 69.30 per km). [Ch. 1, Item 1: Carriage of crushed stone aggregate and bajri for the concrete, from the approved quarry]	**R-TP-31**	*Ch. 1 / Item 1*	**Cft**	**1,030.00**	100 Cft	100	3,425.20	**35,280**	*02-Parameters*	*Taunsa sheet 1.2, per room: 2.06 x 100 Cft*	*Civil - schedule*
D. ELECTRIFICATION OF THE PUMP ROOMS - one set at each tube well (Taunsa sheet 1.3, per room)												
6.56	Wiring of light / fan points from the switch, in concealed PVC pipe, with switches and boxes.	**R-TE-01**	*NSI / TE-C1*	**Each**	**15.00**	Each	1	2,720.00	**40,800**	*02-Parameters*	*Taunsa sheet 1.3, per room: 3 points*	*E/M - non-schedule*
6.57	Circuit wiring from the MCB board to the gang switch board, 3 x 2.5 sq.mm in PVC conduit.	**R-TE-02**	*NSI / TE-C2*	**Each**	**5.00**	Each	1	8,871.00	**44,355**	*02-Parameters*	*Taunsa sheet 1.3, per room: 1 No.*	*E/M - non-schedule*
6.58	Wiring from one light point to another light point.	**R-TE-03**	*NSI / TE-C3*	**Each**	**10.00**	Each	1	2,246.00	**22,460**	*02-Parameters*	*Taunsa sheet 1.3, per room: 2 points*	*E/M - non-schedule*
6.59	5 A switch socket unit wired with 3 x 4 sq.mm cable in concealed conduit.	**R-TE-04**	*NSI / TE-C4*	**Each**	**5.00**	Each	1	10,838.00	**54,190**	*02-Parameters*	*Taunsa sheet 1.3, per room: 1 No.*	*E/M - non-schedule*
6.60	Wiring from one socket to another socket with 3 x 2.5 sq.mm cable.	**R-TE-05**	*NSI / TE-C5*	**Each**	**5.00**	Each	1	5,914.00	**29,570**	*02-Parameters*	*Taunsa sheet 1.3, per room: 1 No.*	*E/M - non-schedule*
6.61	15/20 A switch socket unit wired with 3 x 6 sq.mm cable from the D.B.	**R-TE-06**	*NSI / TE-C6*	**Each**	**5.00**	Each	1	13,463.00	**67,315**	*02-Parameters*	*Taunsa sheet 1.3, per room: 1 No.*	*E/M - non-schedule*
6.62	Supply and erection of PVC insulated, PVC sheathed copper conductor cables for service connection, in prelaid pipe / G.I. wire / trenches, etc. (rate for cable only): c) four core, 600/1000 volt non armoured cable - vi) 10 mm (7/0.052"). [Ch. 24, Item 11(c)(vi): Four-core 10 sq.mm PVC/PVC copper cable 600/1000 V, non-armoured, for the service connection]	**R-TE-07**	*Ch. 24 / Item 11(c)(vi)*	**Rft**	**250.00**	Rft	1	621.90	**155,475**	*02-Parameters*	*Taunsa sheet 1.3, per room: 50 Rft*	*E/M - schedule*
6.63	Supply and erection of PVC insulated, PVC sheathed copper conductor cables for service connection, in prelaid pipe / G.I. wire / trenches, etc. (rate for cable only): c) four core, 600/1000 volt non armoured cable - viii) 25 mm (19/0.052"). [Ch. 24, Item 11(c)(viii): Four-core 25 sq.mm PVC/PVC copper cable 600/1000 V, non-armoured, for the service connection]	**R-TE-08**	*Ch. 24 / Item 11(c)(viii)*	**Rft**	**1,000.00**	Rft	1	1,465.00	**1,465,000**	*02-Parameters*	*Taunsa sheet 1.3, per room: 200 Rft*	*E/M - schedule*
6.64	Supply and erection of single core PVC insulated copper conductor cables, in prelaid PVC pipe / M.S. conduit / G.I. pipe / wooden strip batten / wooden casing and capping / G.I. wire / trenches (rate for cables only): c) 450/750 volts, PVC insulated - vi) 10 mm sq (7/0.052"). [Ch. 24, Item 8(c)(vi): Single-core 10 sq.mm PVC insulated copper cable 450/750 V in prelaid pipe]	**R-TE-09**	*Ch. 24 / Item 8(c)(vi)*	**Rft**	**500.00**	Rft	1	182.30	**91,150**	*02-Parameters*	*Taunsa sheet 1.3, per room: 100 Rft*	*E/M - schedule*
6.65	Supply and erection of single core PVC insulated copper conductor cables, in prelaid PVC pipe / M.S. conduit / G.I. pipe / wooden strip batten / wooden casing and capping / G.I. wire / trenches (rate for cables only): c) 450/750 volts, PVC insulated - vii) 16 mm sq (7/0.064"). [Ch. 24, Item 8(c)(vii): Single-core 16 sq.mm PVC insulated copper cable 450/750 V in prelaid pipe]	**R-TE-10**	*Ch. 24 / Item 8(c)(vii)*	**Rft**	**1,500.00**	Rft	1	274.60	**411,900**	*02-Parameters*	*Taunsa sheet 1.3, per room: 300 Rft*	*E/M - schedule*
6.66	Providing and fixing 4" deep cable tray with straight flange fabricated with perforated G.I. sheet of specified gauge, size and depth duly supported on painted brackets of MS angle iron of 1-1/2" x 1-1/2" x 3/16" and MS patti of 1-1/2" x 3/16" size @ 3 ft c/c, hangers i/c the cost of hardwares as approved and directed by the Engineer Incharge: 14 SWG - (i) 12" x 4". [Ch. 24, Item 99(i): Perforated G.I. cable tray 12" x 4", 14 SWG, on M.S. angle brackets at 3 ft centres]	**R-TE-11**	*Ch. 24 / Item 99(i)*	**Rft**	**250.00**	Rft	1	1,307.35	**326,838**	*02-Parameters*	*Taunsa sheet 1.3, per room: 50 Rft*	*E/M - schedule*
6.67	Providing and fixing Pakistan Energy Label NEECA approved copper winded exhaust fan i/c the cost of necessary cable and hardware for connection from ceiling rose complete as approved and directed by Engineer Incharge: a) plastic body - (ii) 12" dia. [Ch. 24, Item 102(a)(ii): Exhaust fan 12" dia, plastic body, copper winding, with louver and shutter]	**R-TE-12**	*Ch. 24 / Item 102(a)(ii)*	**Each**	**5.00**	Each	1	5,685.50	**28,428**	*02-Parameters*	*Taunsa sheet 1.3, per room: 1 No.*	*E/M - schedule*
6.68	Two-core 10 sq.mm PVC/PVC copper cable 600/1000 V with glands and lugs.	**R-TE-13**	*NSI / TE-N1*	**Rft**	**250.00**	Rft	1	360.00	**90,000**	*02-Parameters*	*Taunsa sheet 1.3, per room: 50 Rft*	*E/M - non-schedule*
6.69	LED batten light fixture 18 W.	**R-TE-14**	*NSI / TE-N2*	**Each**	**10.00**	Each	1	3,284.00	**32,840**	*02-Parameters*	*Taunsa sheet 1.3, per room: 2 Nos*	*E/M - non-schedule*
6.70	Wall bracket LED light fixture 12 W.	**R-TE-15**	*NSI / TE-N3*	**Each**	**5.00**	Each	1	5,065.00	**25,325**	*02-Parameters*	*Taunsa sheet 1.3, per room: 1 No.*	*E/M - non-schedule*
6.71	Providing and fixing Pakistan Energy Label NEECA approved copper winded wall bracket fan i/c the cost of necessary cable and hardware for connection as approved and directed by Engineer Incharge: i) 18" sweep dia. [Ch. 24, Item 103(i): Wall bracket fan 18" sweep, copper winding]	**R-TE-16**	*Ch. 24 / Item 103(i)*	**Each**	**5.00**	Each	1	6,861.15	**34,306**	*02-Parameters*	*Taunsa sheet 1.3, per room: 1 No.*	*E/M - schedule*
6.72	uPVC conduit 100 mm dia, Class-B.	**R-TE-17**	*NSI / TE-N4*	**Rft**	**400.00**	Rft	1	876.00	**350,400**	*02-Parameters*	*Taunsa sheet 1.3, per room: 80 Rft*	*E/M - non-schedule*
6.73	uPVC conduit 100 mm dia, Class-D.	**R-TE-18**	*NSI / TE-N5*	**Rft**	**250.00**	Rft	1	1,410.00	**352,500**	*02-Parameters*	*Taunsa sheet 1.3, per room: 50 Rft*	*E/M - non-schedule*
6.74	Distribution board for the tube-well room, complete as specified.	**R-TE-19**	*NSI / TE-N6*	**Each**	**5.00**	Each	1	59,789.00	**298,945**	*02-Parameters*	*Taunsa sheet 1.3, per room: 1 No.*	*E/M - non-schedule*
6.75	LV switchgear panel / main panel board, complete as specified.	**R-TE-20**	*NSI / TE-N7*	**Each**	**5.00**	Each	1	397,311.00	**1,986,555**	*02-Parameters*	*Taunsa sheet 1.3, per room: 1 No.*	*E/M - non-schedule*
6.76	Providing, making & testing / commissioning of rod type earth point comprising of 5/8" dia (16 mm dia) 10 ft long copper coated M.S. rod driven in ground duly fixed with clamp with tinned earth test link copper plate (300 x 50 x 10 mm), i/c the cost of brass nuts, spacers, bolts, washers, lugs etc. but excluding the cost of copper strand & manhole, as approved and directed by Engineer Incharge (rod type earthing). [Ch. 24, Item 118: Rod-type earth point, 10 ft x 5/8" copper-coated M.S. rod with test link]	**R-TE-21**	*Ch. 24 / Item 118*	**Job**	**25.00**	Job	1	21,210.95	**530,274**	*02-Parameters*	*Taunsa sheet 1.3, per room: 5 Nos*	*E/M - schedule*
6.77	Power factor improvement panel 10 kVAR, complete as specified.	**R-TE-22**	*NSI / TE-N8*	**Each**	**5.00**	Each	1	335,073.00	**1,675,365**	*02-Parameters*	*Taunsa sheet 1.3, per room: 1 No.*	*E/M - non-schedule*
E. SOLAR POWER SYSTEMS - one complete system at each tube well (Client instruction)												

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6.78	Design, supply, installation, testing and commissioning of a complete solar power system for the tube well and its pump room, comprising approximately 20 kWp capacity of Tier-1 N-type bifacial photovoltaic (PV) modules, terminated with MC4 connectors, complete with branded 6 mm² DC solar cables as required. The solar PV modules shall carry a minimum 15-year manufacturer's warranty. The system shall include a hot-dip galvanized/powder-coated 12 SWG solar panel mounting structure, including stainless-steel (SS) bolts, mid-clamps, end-clamps, accessories and 1-foot-long J-bolts as required; a 25 kW, three-phase hybrid inverter with pure sine-wave output, IP65 protection, suitable pump soft-start facility and compatibility with the proposed PV array and battery bank, carrying a minimum 10-year manufacturer's warranty; and a 100 kWh $LiFePO_4$ battery energy storage system carrying a minimum 10-year manufacturer's warranty. The system shall further include complete AC/DC cabling, combiner boxes, distribution/changeover panels, fuses, surge protection devices (SPDs), four-pole isolator, and all necessary connectors and accessories; separate DC and AC earthing systems for the PV array and inverter, each having earth resistance of less than 5 ohms; a lightning protection system comprising air terminals (lightning rods/arresters), down conductors and earthing arrangements; protective fencing, foundations, cable termination, interconnections, transportation, labour, installation, configuration, testing, commissioning and all ancillary works required to provide a complete, safe and operational system, in accordance with applicable standards, manufacturer recommendations and approved drawings. All warranties shall be supported by official manufacturer's warranty certificates and shall commence from the date of successful commissioning and acceptance of the system, subject to the applicable warranty terms. Rate analysis reference: CA-29. Complete in all respects.	**R-CA-29**	*COMP / CA-29*	**Set**	**5.00**	Set	1	9,147,312.07	**45,736,560**	*02-Parameters*	*One system per tube well*	*E/M - non-schedule*
	TOTAL - BILL No. 6 - TUBE WELLS, TRIAL BORES, PUMP ROOMS AND ELECTRIFICATION								**93,674,219**			

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

BILL No. 7 - GREEN BELTS (5 NOS) - HORTICULTURE

Imported sweet earth, shrub and ground-cover beds, all Client-scheduled planting, watering connections and three years of establishment and maintenance - the sub-sections mirror the civil works of Bill 1

Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
SUB-SECTION 7.1 - GREEN BELT F-14 / F-15 (5,800 ft x 390 ft)												
H3. NURSERY STOCK, MATERIALS AND EQUIPMENT - Client Nursery BOQ "BOQ to establish a plant nursery" (Client instruction)												
7.1.01	Supply of indoor plants for the nursery stock - assorted species as approved by the Engineer, healthy and well rooted, in nursery bags, delivered to the nursery.	R-NB-01	NSI / NB-1	Nos	3,500.00	No.	1	300.00	1,050,000	TG-1107	Client Nursery BOQ, item 1	Horticulture - non-schedule
7.1.02	Supply of outdoor plants for the nursery stock - assorted ornamental and landscape species as approved by the Engineer, healthy and well rooted, in nursery bags, delivered to the nursery.	R-NB-02	NSI / NB-2	Nos	3,000.00	No.	1	300.00	900,000	TG-1108	Client Nursery BOQ, item 2	Horticulture - non-schedule
7.1.03	Supply of grow bags for raising plants in the nursery.	R-NB-07	NSI / NB-7	Nos	4,000.00	No.	1	300.00	1,200,000	TG-1113	Client Nursery BOQ, item 7	Horticulture - non-schedule
7.1.04	Supply of plant pots for the nursery.	R-NB-08	NSI / NB-8	Nos	1,000.00	No.	1	400.00	400,000	TG-1114	Client Nursery BOQ, item 8	Horticulture - non-schedule
7.1.05	Supply of polythene nursery bags, in bundles.	R-NB-09	NSI / NB-9	Bundles	7.00	Bundle	1	5,500.00	38,500	TG-1115	Client Nursery BOQ, item 9	Horticulture - non-schedule
7.1.06	Supply of bhall (fine river silt) for the potting mixture, delivered to the nursery by trolley.	R-NB-10	NSI / NB-10	Trolleys	10.00	Trolley	1	12,000.00	120,000	TG-1116	Client Nursery BOQ, item 10	Horticulture - non-schedule
7.1.07	Labour for setting up the nursery - filling of bags and pots, bed preparation and shifting of plants.	R-NB-11	NSI / NB-11	Man-days	5.00	Man-day	1	1,500.00	7,500	TG-1117	Client Nursery BOQ, item 11	Horticulture - non-schedule
7.1.08	Supply of plant and flower seed packs.	R-NB-12	NSI / NB-12	Packs	150.00	Pack	1	1,200.00	180,000	TG-1118	Client Nursery BOQ, item 12	Horticulture - non-schedule
7.1.09	Supply of plant cuttings for propagation in the nursery.	R-NB-13	NSI / NB-13	Nos	2,000.00	No.	1	50.00	100,000	TG-1119	Client Nursery BOQ, item 13	Horticulture - non-schedule
7.1.10	Supply of polythene sheet roll for the nursery beds and propagation.	R-NB-14	NSI / NB-14	Roll	1.00	Roll	1	10,000.00	10,000	TG-1120	Client Nursery BOQ, item 14	Horticulture - non-schedule
7.1.11	Supply of fertilizer for the nursery, in bags.	R-NB-15	NSI / NB-15	Bags	5.00	Bag	1	5,000.00	25,000	TG-1121	Client Nursery BOQ, item 15	Horticulture - non-schedule
7.1.12	Supply of well-rotted cow dung (farmyard manure) for the potting mixture, delivered by trolley.	R-NB-16	NSI / NB-16	Trolleys	3.00	Trolley	1	3,000.00	9,000	TG-1122	Client Nursery BOQ, item 16	Horticulture - non-schedule
7.1.13	Supply of nursery hand tools - spades, khurpas, secateurs, rakes, watering cans and the like.	R-NB-17	NSI / NB-17	Nos	20.00	No.	1	1,500.00	30,000	TG-1123	Client Nursery BOQ, item 17	Horticulture - non-schedule
7.1.14	Supply of bamboo sticks for staking the plants.	R-NB-18	NSI / NB-18	Nos	300.00	No.	1	100.00	30,000	TG-1124	Client Nursery BOQ, item 18	Horticulture - non-schedule
7.1.15	Supply of a hand cart (wheel barrow) for the nursery.	R-NB-20	NSI / NB-20	No.	1.00	No.	1	8,000.00	8,000	TG-1126	Client Nursery BOQ, item 20	Horticulture - non-schedule
7.1.16	Supply of a loader rickshaw for the nursery.	R-NB-21	NSI / NB-21	No.	1.00	No.	1	500,000.00	500,000	TG-1127	Client Nursery BOQ, item 21	Horticulture - non-schedule
7.1.17	Supply of a lawn watering hose roll for the nursery.	R-NB-22	NSI / NB-22	Roll	1.00	Roll	1	17,000.00	17,000	TG-1128	Client Nursery BOQ, item 22	Horticulture - non-schedule
J. SOFT LANDSCAPE & IRRIGATION												
7.1.18	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the belt.	R-LS-06	NSI / LS-6	Sft	1,608,462.16	Sft	1	7.50	12,063,466	TG-163	PPTX rate basis	Horticulture - non-schedule
7.1.19	Providing and laying buried HDPE watering main, 2 in dia, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	R-CA-25	COMP / CA-25	Rft	7,540.00	Rft	1	433.61	3,269,419	TG-178	One run along the belt with branches	Horticulture - non-schedule
7.1.20	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	R-CA-24	COMP / CA-24	Nos	40.00	Each	1	22,849.37	913,975	TG-177	300 ft centres on both walkway runs	Horticulture - non-schedule
K. PLANTING - FRUIT PLANTS (Client plant workbook; rate incl. sundries and 5% replacement)												
7.1.21	Supply and planting of Guava Mexican (Variety) (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-01	Plant / SP-01	Nos	220.00	No.	1	4,754.41	1,045,970	04A	Client schedule: 220	Horticulture - non-schedule
7.1.22	Supply and planting of Fig (Variety) (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-02	Plant / SP-02	Nos	160.00	No.	1	4,754.41	760,706	04A	Client schedule: 160	Horticulture - non-schedule
7.1.23	Supply and planting of Jamun (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-03	Plant / SP-03	Nos	180.00	No.	1	4,754.41	855,794	04A	Client schedule: 180	Horticulture - non-schedule
7.1.24	Supply and planting of Papaya (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-04	Plant / SP-04	Nos	160.00	No.	1	4,754.41	760,706	04A	Client schedule: 160	Horticulture - non-schedule
7.1.25	Supply and planting of Grapes (Variety) (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-05	Plant / SP-05	Nos	90.00	No.	1	4,754.41	427,897	04A	Client schedule: 90	Horticulture - non-schedule
7.1.26	Supply and planting of Spineless Ber (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-06	Plant / SP-06	Nos	120.00	No.	1	4,754.41	570,529	04A	Client schedule: 120	Horticulture - non-schedule
7.1.27	Supply and planting of Shahtoot (Variety) (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-07	Plant / SP-07	Nos	130.00	No.	1	4,754.41	618,073	04A	Client schedule: 130	Horticulture - non-schedule
7.1.28	Supply and planting of Imli (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-08	Plant / SP-08	Nos	140.00	No.	1	4,229.41	592,117	04A	Client schedule: 140	Horticulture - non-schedule
7.1.29	Supply and planting of Falsa (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-09	Plant / SP-09	Nos	130.00	No.	1	4,754.41	618,073	04A	Client schedule: 130	Horticulture - non-schedule
7.1.30	Supply and planting of Lichi (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-10	Plant / SP-10	Nos	130.00	No.	1	5,804.41	754,573	04A	Client schedule: 130	Horticulture - non-schedule
7.1.31	Supply and planting of Pear (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-11	Plant / SP-11	Nos	120.00	No.	1	4,754.41	570,529	04A	Client schedule: 120	Horticulture - non-schedule
7.1.32	Supply and planting of Louqat (fruit tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-12	Plant / SP-12	Nos	120.00	No.	1	3,704.41	444,529	04A	Client schedule: 120	Horticulture - non-schedule
L. PLANTING - SHADY TREES (Client plant workbook; rate incl. sundries and 5% replacement)												
7.1.33	Supply and planting of Amaltas (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-13	Plant / SP-13	Nos	180.00	No.	1	3,914.41	704,594	04A	Client schedule: 180	Horticulture - non-schedule
7.1.34	Supply and planting of Kachnar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-14	Plant / SP-14	Nos	80.00	No.	1	3,809.41	304,753	04A	Client schedule: 80	Horticulture - non-schedule
7.1.35	Supply and planting of Tabebuia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-15	Plant / SP-15	Nos	130.00	No.	1	3,809.41	495,223	04A	Client schedule: 130	Horticulture - non-schedule
7.1.36	Supply and planting of Alastonia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-16	Plant / SP-16	Nos	180.00	No.	1	3,809.41	685,694	04A	Client schedule: 180	Horticulture - non-schedule
7.1.37	Supply and planting of Chinar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-17	Plant / SP-17	Nos	150.00	No.	1	3,914.41	587,162	04A	Client schedule: 150	Horticulture - non-schedule
7.1.38	Supply and planting of Sukh Chyn (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-18	Plant / SP-18	Nos	155.00	No.	1	3,809.41	590,459	04A	Client schedule: 155	Horticulture - non-schedule
7.1.39	Supply and planting of Terminalia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-19	Plant / SP-19	Nos	200.00	No.	1	3,809.41	761,882	04A	Client schedule: 200	Horticulture - non-schedule
7.1.40	Supply and planting of Bakain (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-20	Plant / SP-20	Nos	200.00	No.	1	3,704.41	740,882	04A	Client schedule: 200	Horticulture - non-schedule
7.1.41	Supply and planting of Pilkan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-21	Plant / SP-21	Nos	185.00	No.	1	3,914.41	724,166	04A	Client schedule: 185	Horticulture - non-schedule
7.1.42	Supply and planting of Neem (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-22	Plant / SP-22	Nos	160.00	No.	1	4,754.41	760,706	04A	Client schedule: 160	Horticulture - non-schedule
M. PLANTING - SHRUBS / BUSHES (Client plant workbook; rate incl. sundries and 5% replacement)												

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7.1.43	Supply and planting of Osmanthus (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-34	*Plant / SP-34*	Nos	160.00	No.	1	1,904.29	304,686	*04A*	*Client schedule: 160*	*Horticulture - non-schedule*
7.1.44	Supply and planting of Franciscia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-35	*Plant / SP-35*	Nos	160.00	No.	1	486.79	77,886	*04A*	*Client schedule: 160*	*Horticulture - non-schedule*
7.1.45	Supply and planting of Marwi (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-36	*Plant / SP-36*	Nos	160.00	No.	1	434.29	69,486	*04A*	*Client schedule: 160*	*Horticulture - non-schedule*
7.1.46	Supply and planting of Raat ki Rani (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-37	*Plant / SP-37*	Nos	160.00	No.	1	413.29	66,126	*04A*	*Client schedule: 160*	*Horticulture - non-schedule*
7.1.47	Supply and planting of Din ka Raja (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-38	*Plant / SP-38*	Nos	160.00	No.	1	413.29	66,126	*04A*	*Client schedule: 160*	*Horticulture - non-schedule*
7.1.48	Supply and planting of HaarSinghar (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-39	*Plant / SP-39*	Nos	160.00	No.	1	465.79	74,526	*04A*	*Client schedule: 160*	*Horticulture - non-schedule*
7.1.49	Supply and planting of Lagerstroemia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-40	*Plant / SP-40*	Nos	160.00	No.	1	413.29	66,126	*04A*	*Client schedule: 160*	*Horticulture - non-schedule*
7.1.50	Supply and planting of Motiya (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-41	*Plant / SP-41*	Nos	180.00	No.	1	381.79	68,722	*04A*	*Client schedule: 180*	*Horticulture - non-schedule*
7.1.51	Supply and planting of Tacoma Grocha (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-43	*Plant / SP-43*	Nos	190.00	No.	1	486.79	92,490	*04A*	*Client schedule: 190*	*Horticulture - non-schedule*
7.1.52	Supply and planting of Dwarf Burning Bush (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-46	*Plant / SP-46*	Nos	190.00	No.	1	434.29	82,515	*04A*	*Client schedule: 190*	*Horticulture - non-schedule*
M2. ORNAMENTAL ACCENT PLANTS - at the entrance gates and the gazebos only (Ahmad Nursery list of 08.10.2026)												
7.1.53	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-27	*COMP / CA-27*	Nos	14.00	Each	1	9,765.51	136,717	*TG-179*	*Half of the accent plants*	*Horticulture - non-schedule*
7.1.54	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-28	*COMP / CA-28*	Nos	14.00	Each	1	9,590.51	134,267	*TG-179*	*Balance of the accent plants*	*Horticulture - non-schedule*
P. ESTABLISHMENT & MAINTENANCE - 3 YEARS												
7.1.55	Landscape establishment and maintenance for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	R-CA-15	*COMP / CA-15*	Kanal-year	886.21	Kanal	1	51,000.00	45,196,457	*TG-162*	*Soft area x 3 years (P_MAINTM = 36 months)*	*Horticulture - non-schedule*
7.1	**SUB-TOTAL - 7.1 GREEN BELT F-14 / F-15 (5,800 ft x 390 ft)**								81,683,007			

SUB-SECTION 7.2 - GREEN BELT F-14 / G-14 (5,800 ft x 390 ft)

J. SOFT LANDSCAPE & IRRIGATION												
7.2.01	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the belt.	R-LS-06	*NSI / LS-6*	Sft	2,111,170.83	Sft	1	7.50	15,833,781	*TG-263*	*PPTX rate basis*	*Horticulture - non-schedule*
7.2.02	Providing and laying buried HDPE watering main, 2 in dia, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	R-CA-25	*COMP / CA-25*	Rft	7,540.00	Rft	1	433.61	3,269,419	*TG-278*	*One run along the belt with branches*	*Horticulture - non-schedule*
7.2.03	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	R-CA-24	*COMP / CA-24*	Nos	40.00	Each	1	22,849.37	913,975	*TG-277*	*300 ft centres on both walkway runs*	*Horticulture - non-schedule*
K. PLANTING - SHADY TREES (Client plant workbook; rate incl. sundries and 5% replacement)												
7.2.04	Supply and planting of Amaltas (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-13	*Plant / SP-13*	Nos	200.00	No.	1	3,914.41	782,882	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.05	Supply and planting of Bakain (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-20	*Plant / SP-20*	Nos	200.00	No.	1	3,704.41	740,882	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.06	Supply and planting of Tabebuia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-15	*Plant / SP-15*	Nos	200.00	No.	1	3,809.41	761,882	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.07	Supply and planting of Alastonia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-16	*Plant / SP-16*	Nos	200.00	No.	1	3,809.41	761,882	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.08	Supply and planting of Chinar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-17	*Plant / SP-17*	Nos	200.00	No.	1	3,914.41	782,882	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.09	Supply and planting of Sukh Chyn (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-18	*Plant / SP-18*	Nos	200.00	No.	1	3,809.41	761,882	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.10	Supply and planting of Terminalia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-19	*Plant / SP-19*	Nos	200.00	No.	1	3,809.41	761,882	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.11	Supply and planting of Neem (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-22	*Plant / SP-22*	Nos	150.00	No.	1	4,754.41	713,162	*04A*	*Client schedule: 150*	*Horticulture - non-schedule*
7.2.12	Supply and planting of Pilkan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-21	*Plant / SP-21*	Nos	150.00	No.	1	3,914.41	587,162	*04A*	*Client schedule: 150*	*Horticulture - non-schedule*
7.2.13	Supply and planting of Kurrajong (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-23	*Plant / SP-23*	Nos	200.00	No.	1	4,019.41	803,882	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.14	Supply and planting of Soap Berry/Reetha (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-24	*Plant / SP-24*	Nos	200.00	No.	1	3,809.41	761,882	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.15	Supply and planting of Weeping Willow (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-25	*Plant / SP-25*	Nos	200.00	No.	1	3,809.41	761,882	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.16	Supply and planting of Gul-e-Nishtar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-26	*Plant / SP-26*	Nos	200.00	No.	1	4,019.41	803,882	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.17	Supply and planting of Bottle Brush (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-27	*Plant / SP-27*	Nos	200.00	No.	1	3,777.91	755,582	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
L. PLANTING - SHRUBS / BUSHES (Client plant workbook; rate incl. sundries and 5% replacement)												
7.2.18	Supply and planting of Osmanthus (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-34	*Plant / SP-34*	Nos	200.00	No.	1	1,904.29	380,858	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.19	Supply and planting of Franciscia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-35	*Plant / SP-35*	Nos	200.00	No.	1	486.79	97,358	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.20	Supply and planting of Marwi (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-36	*Plant / SP-36*	Nos	200.00	No.	1	434.29	86,858	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.21	Supply and planting of Raat ki Rani (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-37	*Plant / SP-37*	Nos	150.00	No.	1	413.29	61,994	*04A*	*Client schedule: 150*	*Horticulture - non-schedule*
7.2.22	Supply and planting of Din ka Raja (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-38	*Plant / SP-38*	Nos	200.00	No.	1	413.29	82,658	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.23	Supply and planting of HaarSinghar (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-39	*Plant / SP-39*	Nos	150.00	No.	1	465.79	69,869	*04A*	*Client schedule: 150*	*Horticulture - non-schedule*
7.2.24	Supply and planting of Lagerstroemia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-40	*Plant / SP-40*	Nos	200.00	No.	1	413.29	82,658	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.25	Supply and planting of Motiya (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-41	*Plant / SP-41*	Nos	200.00	No.	1	381.79	76,358	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
7.2.26	Supply and planting of Rose (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-42	*Plant / SP-42*	Nos	300.00	No.	1	527.74	158,322	*04A*	*Client schedule: 300*	*Horticulture - non-schedule*
7.2.27	Supply and planting of Tacoma Stance (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-44	*Plant / SP-44*	Nos	150.00	No.	1	455.29	68,294	*04A*	*Client schedule: 150*	*Horticulture - non-schedule*

7.2.28	Supply and planting of Tacoma Grocha (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-43	*Plant / SP-43*	Nos	150.00	No.	1	486.79	73,019	*04A*	*Client schedule: 150*	*Horticulture - non-schedule*
7.2.29	Supply and planting of Dwarf Burning Bush (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-46	*Plant / SP-46*	Nos	200.00	No.	1	434.29	86,858	*04A*	*Client schedule: 200*	*Horticulture - non-schedule*
M2. ORNAMENTAL ACCENT PLANTS - at the entrance gates and the gazebos only (Ahmad Nursery list of 08.10.2026)												
7.2.30	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-27	*COMP / CA-27*	Nos	14.00	Each	1	9,765.51	136,717	*TG-279*	*Half of the accent plants*	*Horticulture - non-schedule*
7.2.31	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-28	*COMP / CA-28*	Nos	14.00	Each	1	9,590.51	134,267	*TG-279*	*Balance of the accent plants*	*Horticulture - non-schedule*
P. ESTABLISHMENT & MAINTENANCE - 3 YEARS												
7.2.32	Landscape establishment and maintenance for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	R-CA-15	*COMP / CA-15*	Kanal-year	1,163.18	Kanal	1	51,000.00	59,322,156	*TG-262*	*Soft area x 3 years (P_MAINTM = 36 months)*	*Horticulture - non-schedule*
7.2	**SUB-TOTAL - 7.2 GREEN BELT F-14 / G-14 (5,800 ft x 390 ft)**								91,477,027			

SUB-SECTION 7.3 - GREEN BELT F-13 / F-14 (5,800 ft x 195 ft)												
J. SOFT LANDSCAPE & IRRIGATION												
7.3.01	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the belt.	R-LS-06	*NSI / LS-6*	Sft	980,170.83	Sft	1	7.50	7,351,281	*TG-363*	*PPTX rate basis*	*Horticulture - non-schedule*
7.3.02	Providing and laying buried HDPE watering main, 2 in dia, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	R-CA-25	*COMP / CA-25*	Rft	7,540.00	Rft	1	433.61	3,269,419	*TG-378*	*One run along the belt with branches*	*Horticulture - non-schedule*
7.3.03	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	R-CA-24	*COMP / CA-24*	Nos	40.00	Each	1	22,849.37	913,975	*TG-377*	*300 ft centres on both walkway runs*	*Horticulture - non-schedule*
K. PLANTING - SHADY TREES (Client plant workbook; rate incl. sundries and 5% replacement)												
7.3.04	Supply and planting of Amaltas (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-13	*Plant / SP-13*	Nos	100.00	No.	1	3,914.41	391,441	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.05	Supply and planting of Bakain (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-20	*Plant / SP-20*	Nos	100.00	No.	1	3,704.41	370,441	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.06	Supply and planting of Putanjiva (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-28	*Plant / SP-28*	Nos	100.00	No.	1	4,019.41	401,941	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.07	Supply and planting of Alastonia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-16	*Plant / SP-16*	Nos	100.00	No.	1	3,809.41	380,941	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.08	Supply and planting of Chinar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-17	*Plant / SP-17*	Nos	100.00	No.	1	3,914.41	391,441	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.09	Supply and planting of Chestnut Tree/Shah Baloot (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-29	*Plant / SP-29*	Nos	100.00	No.	1	3,977.41	397,741	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.10	Supply and planting of Terminalia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-19	*Plant / SP-19*	Nos	100.00	No.	1	3,809.41	380,941	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.11	Supply and planting of Neem (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-22	*Plant / SP-22*	Nos	100.00	No.	1	4,754.41	475,441	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.12	Supply and planting of Pilkan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-21	*Plant / SP-21*	Nos	100.00	No.	1	3,914.41	391,441	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.13	Supply and planting of Sapium (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-30	*Plant / SP-30*	Nos	100.00	No.	1	3,284.41	328,441	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.14	Supply and planting of Soap Berry/Reetha (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-24	*Plant / SP-24*	Nos	100.00	No.	1	3,809.41	380,941	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.15	Supply and planting of Katsagan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-31	*Plant / SP-31*	Nos	100.00	No.	1	4,754.41	475,441	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.16	Supply and planting of Gul-e-Nishtar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-26	*Plant / SP-26*	Nos	100.00	No.	1	4,019.41	401,941	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.17	Supply and planting of Amla (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-32	*Plant / SP-32*	Nos	100.00	No.	1	4,019.41	401,941	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
L. PLANTING - SHRUBS / BUSHES (Client plant workbook; rate incl. sundries and 5% replacement)												
7.3.18	Supply and planting of Osmanthus (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-34	*Plant / SP-34*	Nos	100.00	No.	1	1,904.29	190,429	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.19	Supply and planting of Franciscia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-35	*Plant / SP-35*	Nos	100.00	No.	1	486.79	48,679	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.20	Supply and planting of Marwi (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-36	*Plant / SP-36*	Nos	100.00	No.	1	434.29	43,429	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.21	Supply and planting of Raat ki Rani (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-37	*Plant / SP-37*	Nos	100.00	No.	1	413.29	41,329	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.22	Supply and planting of Din ka Raja (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-38	*Plant / SP-38*	Nos	100.00	No.	1	413.29	41,329	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.23	Supply and planting of HaarSinghar (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-39	*Plant / SP-39*	Nos	100.00	No.	1	465.79	46,579	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.24	Supply and planting of Lagerstroemia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-40	*Plant / SP-40*	Nos	100.00	No.	1	413.29	41,329	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.25	Supply and planting of Motiya (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-41	*Plant / SP-41*	Nos	100.00	No.	1	381.79	38,179	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.26	Supply and planting of Rose (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-42	*Plant / SP-42*	Nos	100.00	No.	1	527.74	52,774	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.27	Supply and planting of Tacoma Stance (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-44	*Plant / SP-44*	Nos	100.00	No.	1	455.29	45,529	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.28	Supply and planting of Tacoma Grocha (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-43	*Plant / SP-43*	Nos	100.00	No.	1	486.79	48,679	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.29	Supply and planting of Dwarf Burning Bush (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-46	*Plant / SP-46*	Nos	100.00	No.	1	434.29	43,429	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
7.3.30	Supply and planting of MorPunkh (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-47	*Plant / SP-47*	Nos	100.00	No.	1	434.29	43,429	*04A*	*Client schedule: 100*	*Horticulture - non-schedule*
M2. ORNAMENTAL ACCENT PLANTS - at the entrance gates and the gazebos only (Ahmad Nursery list of 08.10.2026)												
7.3.31	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-27	*COMP / CA-27*	Nos	14.00	Each	1	9,765.51	136,717	*TG-379*	*Half of the accent plants*	*Horticulture - non-schedule*
7.3.32	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-28	*COMP / CA-28*	Nos	14.00	Each	1	9,590.51	134,267	*TG-379*	*Balance of the accent plants*	*Horticulture - non-schedule*
P. ESTABLISHMENT & MAINTENANCE - 3 YEARS												
7.3.33	Landscape establishment and maintenance for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	R-CA-15	*COMP / CA-15*	Kanal-year	540.04	Kanal	1	51,000.00	27,541,990	*TG-362*	*Soft area x 3 years (P_MAINTM = 36 months)*	*Horticulture - non-schedule*

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7.3	**SUB-TOTAL - 7.3 GREEN BELT F-13 / F-14 (5,800 ft x 195 ft)**								**45,643,245**		
SUB-SECTION 7.4 - GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft)											
J. SOFT LANDSCAPE & IRRIGATION											
7.4.01	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the belt.	**R-LS-06**	*NSI / LS-6*	**Sft**	**257,064.14**	Sft	1	7.50	**1,927,981**	*TG-463*	*PPTX rate basis*
7.4.02	Providing and laying buried HDPE watering main, 2 in dia, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	**R-CA-25**	*COMP / CA-25*	**Rft**	**910.00**	Rft	1	433.61	**394,585**	*TG-478*	*One run along the belt with branches*
7.4.03	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	**R-CA-24**	*COMP / CA-24*	**Nos**	**6.00**	Each	1	22,849.37	**137,096**	*TG-477*	*300 ft centres on both walkway runs*
K. PLANTING - SHADY TREES (Client plant workbook; rate incl. sundries and 5% replacement)											
7.4.04	Supply and planting of Amaltas (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-13**	*Plant / SP-13*	**Nos**	**12.00**	No.	1	3,914.41	**46,973**	*04A*	*Client schedule: 12*
7.4.05	Supply and planting of Bakain (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-20**	*Plant / SP-20*	**Nos**	**12.00**	No.	1	3,704.41	**44,453**	*04A*	*Client schedule: 12*
7.4.06	Supply and planting of Tabebuia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-15**	*Plant / SP-15*	**Nos**	**12.00**	No.	1	3,809.41	**45,713**	*04A*	*Client schedule: 12*
7.4.07	Supply and planting of Alastonia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-16**	*Plant / SP-16*	**Nos**	**12.00**	No.	1	3,809.41	**45,713**	*04A*	*Client schedule: 12*
7.4.08	Supply and planting of Chinar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-17**	*Plant / SP-17*	**Nos**	**12.00**	No.	1	3,914.41	**46,973**	*04A*	*Client schedule: 12*
7.4.09	Supply and planting of Sukh Chyn (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-18**	*Plant / SP-18*	**Nos**	**12.00**	No.	1	3,809.41	**45,713**	*04A*	*Client schedule: 12*
7.4.10	Supply and planting of Terminalia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-19**	*Plant / SP-19*	**Nos**	**12.00**	No.	1	3,809.41	**45,713**	*04A*	*Client schedule: 12*
7.4.11	Supply and planting of Neem (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-22**	*Plant / SP-22*	**Nos**	**9.00**	No.	1	4,754.41	**42,790**	*04A*	*Client schedule: 9*
7.4.12	Supply and planting of Pilkan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-21**	*Plant / SP-21*	**Nos**	**9.00**	No.	1	3,914.41	**35,230**	*04A*	*Client schedule: 9*
7.4.13	Supply and planting of Kurrajong (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-23**	*Plant / SP-23*	**Nos**	**12.00**	No.	1	4,019.41	**48,233**	*04A*	*Client schedule: 12*
7.4.14	Supply and planting of Soap Berry/Reetha (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-24**	*Plant / SP-24*	**Nos**	**12.00**	No.	1	3,809.41	**45,713**	*04A*	*Client schedule: 12*
7.4.15	Supply and planting of Weeping Willow (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-25**	*Plant / SP-25*	**Nos**	**12.00**	No.	1	3,809.41	**45,713**	*04A*	*Client schedule: 12*
7.4.16	Supply and planting of Gul-e-Nishtar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-26**	*Plant / SP-26*	**Nos**	**12.00**	No.	1	4,019.41	**48,233**	*04A*	*Client schedule: 12*
7.4.17	Supply and planting of Bottle Brush (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-27**	*Plant / SP-27*	**Nos**	**12.00**	No.	1	3,777.91	**45,335**	*04A*	*Client schedule: 12*
L. PLANTING - SHRUBS / BUSHES (Client plant workbook; rate incl. sundries and 5% replacement)											
7.4.18	Supply and planting of Osmanthus (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-34**	*Plant / SP-34*	**Nos**	**12.00**	No.	1	1,904.29	**22,851**	*04A*	*Client schedule: 12*
7.4.19	Supply and planting of Franciscia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-35**	*Plant / SP-35*	**Nos**	**12.00**	No.	1	486.79	**5,841**	*04A*	*Client schedule: 12*
7.4.20	Supply and planting of Marwi (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-36**	*Plant / SP-36*	**Nos**	**12.00**	No.	1	434.29	**5,211**	*04A*	*Client schedule: 12*
7.4.21	Supply and planting of Raat ki Rani (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-37**	*Plant / SP-37*	**Nos**	**9.00**	No.	1	413.29	**3,720**	*04A*	*Client schedule: 9*
7.4.22	Supply and planting of Din ka Raja (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-38**	*Plant / SP-38*	**Nos**	**12.00**	No.	1	413.29	**4,959**	*04A*	*Client schedule: 12*
7.4.23	Supply and planting of HaarSinghar (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-39**	*Plant / SP-39*	**Nos**	**9.00**	No.	1	465.79	**4,192**	*04A*	*Client schedule: 9*
7.4.24	Supply and planting of Lagerstroemia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-40**	*Plant / SP-40*	**Nos**	**12.00**	No.	1	413.29	**4,959**	*04A*	*Client schedule: 12*
7.4.25	Supply and planting of Motiya (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-41**	*Plant / SP-41*	**Nos**	**12.00**	No.	1	381.79	**4,581**	*04A*	*Client schedule: 12*
7.4.26	Supply and planting of Rose (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-42**	*Plant / SP-42*	**Nos**	**18.00**	No.	1	527.74	**9,499**	*04A*	*Client schedule: 18*
7.4.27	Supply and planting of Tacoma Stance (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-44**	*Plant / SP-44*	**Nos**	**9.00**	No.	1	455.29	**4,098**	*04A*	*Client schedule: 9*
7.4.28	Supply and planting of Tacoma Grocha (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-43**	*Plant / SP-43*	**Nos**	**9.00**	No.	1	486.79	**4,381**	*04A*	*Client schedule: 9*
7.4.29	Supply and planting of Dwarf Burning Bush (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	**R-PL-46**	*Plant / SP-46*	**Nos**	**12.00**	No.	1	434.29	**5,211**	*04A*	*Client schedule: 12*
M2. ORNAMENTAL ACCENT PLANTS - at the entrance gates and the gazebos only (Ahmad Nursery list of 08.10.2026)											
7.4.30	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	**R-CA-27**	*COMP / CA-27*	**Nos**	**2.00**	Each	1	9,765.51	**19,531**	*TG-479*	*Half of the accent plants*
7.4.31	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	**R-CA-28**	*COMP / CA-28*	**Nos**	**2.00**	Each	1	9,590.51	**19,181**	*TG-479*	*Balance of the accent plants*
P. ESTABLISHMENT & MAINTENANCE - 3 YEARS											
7.4.32	Landscape establishment and maintenance for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	**R-CA-15**	*COMP / CA-15*	**Kanal-year**	**141.63**	Kanal	1	51,000.00	**7,223,290**	*TG-462*	*Soft area x 3 years (P_MAINTM = 36 months)*
7.4	**SUB-TOTAL - 7.4 GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft)**								**10,433,665**		
SUB-SECTION 7.5 - LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft)											
J. SOFT LANDSCAPE & IRRIGATION											
7.5.01	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the belt.	**R-LS-06**	*NSI / LS-6*	**Sft**	**968,756.36**	Sft	1	7.50	**7,265,673**	*TG-563*	*PPTX rate basis*
7.5.02	Providing and laying buried HDPE watering main, 2 in dia, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing.	**R-CA-25**	*COMP / CA-25*	**Rft**	**10,140.00**	Rft	1	433.61	**4,396,805**	*TG-578*	*One run along the belt with branches*
7.5.03	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	**R-CA-24**	*COMP / CA-24*	**Nos**	**52.00**	Each	1	22,849.37	**1,188,167**	*TG-577*	*300 ft centres on both walkway runs*
K. PLANTING - SHADY TREES (Client plant workbook; rate incl. sundries and 5% replacement)											
7.5.04	Supply and planting of Amaltas (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	**R-PL-13**	*Plant / SP-13*	**Nos**	**134.00**	No.	1	3,914.41	**524,531**	*04A*	*Client schedule: 134*

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7.5.05	Supply and planting of Bakain (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-20	Plant / SP-20	Nos	134.00	No.	1	3,704.41	496,391	04A	Client schedule: 134	Horticulture - non-schedule
7.5.06	Supply and planting of Tabebuia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-15	Plant / SP-15	Nos	134.00	No.	1	3,809.41	510,461	04A	Client schedule: 134	Horticulture - non-schedule
7.5.07	Supply and planting of Alastonia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-16	Plant / SP-16	Nos	134.00	No.	1	3,809.41	510,461	04A	Client schedule: 134	Horticulture - non-schedule
7.5.08	Supply and planting of Chinar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-17	Plant / SP-17	Nos	134.00	No.	1	3,914.41	524,531	04A	Client schedule: 134	Horticulture - non-schedule
7.5.09	Supply and planting of Sukh Chyn (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-18	Plant / SP-18	Nos	134.00	No.	1	3,809.41	510,461	04A	Client schedule: 134	Horticulture - non-schedule
7.5.10	Supply and planting of Terminalia (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-19	Plant / SP-19	Nos	134.00	No.	1	3,809.41	510,461	04A	Client schedule: 134	Horticulture - non-schedule
7.5.11	Supply and planting of Neem (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-22	Plant / SP-22	Nos	101.00	No.	1	4,754.41	480,195	04A	Client schedule: 101	Horticulture - non-schedule
7.5.12	Supply and planting of Pilkan (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-21	Plant / SP-21	Nos	101.00	No.	1	3,914.41	395,355	04A	Client schedule: 101	Horticulture - non-schedule
7.5.13	Supply and planting of Kurrajong (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-23	Plant / SP-23	Nos	134.00	No.	1	4,019.41	538,601	04A	Client schedule: 134	Horticulture - non-schedule
7.5.14	Supply and planting of Soap Berry/Reetha (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-24	Plant / SP-24	Nos	134.00	No.	1	3,809.41	510,461	04A	Client schedule: 134	Horticulture - non-schedule
7.5.15	Supply and planting of Weeping Willow (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-25	Plant / SP-25	Nos	134.00	No.	1	3,809.41	510,461	04A	Client schedule: 134	Horticulture - non-schedule
7.5.16	Supply and planting of Gul-e-Nishtar (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-26	Plant / SP-26	Nos	134.00	No.	1	4,019.41	538,601	04A	Client schedule: 134	Horticulture - non-schedule
7.5.17	Supply and planting of Bottle Brush (tree), complete with pit, sweet-earth and manure backfill, stake and guard, watering and first-season care.	R-PL-27	Plant / SP-27	Nos	134.00	No.	1	3,777.91	506,240	04A	Client schedule: 134	Horticulture - non-schedule
L. PLANTING - SHRUBS / BUSHES (Client plant workbook; rate incl. sundries and 5% replacement)												
7.5.18	Supply and planting of Osmanthus (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-34	Plant / SP-34	Nos	134.00	No.	1	1,904.29	255,175	04A	Client schedule: 134	Horticulture - non-schedule
7.5.19	Supply and planting of Franciscia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-35	Plant / SP-35	Nos	134.00	No.	1	486.79	65,230	04A	Client schedule: 134	Horticulture - non-schedule
7.5.20	Supply and planting of Marwi (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-36	Plant / SP-36	Nos	134.00	No.	1	434.29	58,195	04A	Client schedule: 134	Horticulture - non-schedule
7.5.21	Supply and planting of Raat ki Rani (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-37	Plant / SP-37	Nos	101.00	No.	1	413.29	41,742	04A	Client schedule: 101	Horticulture - non-schedule
7.5.22	Supply and planting of Din ka Raja (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-38	Plant / SP-38	Nos	134.00	No.	1	413.29	55,381	04A	Client schedule: 134	Horticulture - non-schedule
7.5.23	Supply and planting of HaarSinghar (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-39	Plant / SP-39	Nos	101.00	No.	1	465.79	47,045	04A	Client schedule: 101	Horticulture - non-schedule
7.5.24	Supply and planting of Lagerstroemia (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-40	Plant / SP-40	Nos	134.00	No.	1	413.29	55,381	04A	Client schedule: 134	Horticulture - non-schedule
7.5.25	Supply and planting of Motiya (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-41	Plant / SP-41	Nos	134.00	No.	1	381.79	51,160	04A	Client schedule: 134	Horticulture - non-schedule
7.5.26	Supply and planting of Rose (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-42	Plant / SP-42	Nos	202.00	No.	1	527.74	106,603	04A	Client schedule: 202	Horticulture - non-schedule
7.5.27	Supply and planting of Tacoma Stance (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-44	Plant / SP-44	Nos	101.00	No.	1	455.29	45,984	04A	Client schedule: 101	Horticulture - non-schedule
7.5.28	Supply and planting of Tacoma Grocha (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-43	Plant / SP-43	Nos	101.00	No.	1	486.79	49,166	04A	Client schedule: 101	Horticulture - non-schedule
7.5.29	Supply and planting of Dwarf Burning Bush (shrub), complete with pit, sweet-earth and manure backfill, watering and first-season care.	R-PL-46	Plant / SP-46	Nos	134.00	No.	1	434.29	58,195	04A	Client schedule: 134	Horticulture - non-schedule
M2. ORNAMENTAL ACCENT PLANTS - at the entrance gates and the gazebos only (Ahmad Nursery list of 08.10.2026)												
7.5.30	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-27	COMP / CA-27	Nos	19.00	Each	1	9,765.51	185,545	TG-579	Half of the accent plants	Horticulture - non-schedule
7.5.31	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-28	COMP / CA-28	Nos	19.00	Each	1	9,590.51	182,220	TG-579	Balance of the accent plants	Horticulture - non-schedule
P. ESTABLISHMENT & MAINTENANCE - 3 YEARS												
7.5.32	Landscape establishment and maintenance for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	R-CA-15	COMP / CA-15	Kanal-year	533.75	Kanal	1	51,000.00	27,221,253	TG-562	Soft area x 3 years (P_MAINTM = 36 months)	Horticulture - non-schedule
7.5	**SUB-TOTAL - 7.5 LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft)**								48,396,131			

SUMMARY OF BILL No. 7 BY SUB-SECTION												
7.1	GREEN BELT F-14 / F-15 (5,800 ft x 390 ft)								81,683,007			
7.2	GREEN BELT F-14 / G-14 (5,800 ft x 390 ft)								91,477,027			
7.3	GREEN BELT F-13 / F-14 (5,800 ft x 195 ft)								45,643,245			
7.4	GREEN BELT F-15 / G-15 (STREET 589) (700 ft x 390 ft)								10,433,665			
7.5	LINEAR PARK (GREEN BELT F-14/15 - E-14/15) (7,800 ft x 150 ft)								48,396,131			
	TOTAL - BILL No. 7 - GREEN BELTS (5 NOS) - HORTICULTURE								277,633,075			

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BILL No. 8 - MODEL PARK AND PARK F-14/4 - HORTICULTURE

Imported sweet earth, Dhaka-grass turfing, shrub beds, trees and shrubs, watering connections and three years of establishment and maintenance - the sub-sections mirror the civil works of Bill 2
Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
SUB-SECTION 8.4 - PARK F-14/4 (Park 4) (42 Kanal)												
F. SOFT LANDSCAPE & WATERING												
8.4.01	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the park.	R-LS-06	*NSI / LS-6*	**Sft**	**178,887.79**	Sft	1	7.50	**1,341,658**	*TP-448*	*PPTX rate basis*	*Horticulture - non-schedule*
8.4.02	Turfing with Dhaka grass over 70% of the net soft-landscape area of the park.	R-CA-14	*COMP / CA-14*	**Sft**	**125,221.45**	Sft	1	36.00	**4,507,972**	*TP-449*	*Park Tender Drawing*	*Horticulture - non-schedule*
8.4.03	Providing and laying buried HDPE watering main, 2 in dia, around the park, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing	R-CA-25	*COMP / CA-25*	**Rft**	**2,328.11**	Rft	1	433.61	**1,009,492**	*TP-471*	*Perimeter plus branches*	*Horticulture - non-schedule*
8.4.04	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	R-CA-24	*COMP / CA-24*	**Nos**	**7.00**	Each	1	22,849.37	**159,946**	*TP-470*	*300 ft centres*	*Horticulture - non-schedule*
G. PLANTING - species from the Client park list, numbers from standard densities (rate incl. sundries and 5% replacement)												
8.4.05	Supply and planting of trees - mix of the 15 tree species on the Client park list in equal numbers (perimeter row and lawn trees)	R-PL-PKT	*Plant / PK-MIX-T*	**Nos**	**123.00**	No.	1	3,922.81	**482,506**	*TP-453*	*Species split: sheet 04A*	*Horticulture - non-schedule*
8.4.06	Supply and planting of shrubs / bushes - mix of the 12 shrub species on the Client park list in equal numbers (borders).	R-PL-PKS	*Plant / PK-MIX-S*	**Nos**	**1,003.00**	No.	1	563.70	**565,391**	*TP-456*	*Species split: sheet 04A*	*Horticulture - non-schedule*
G2. ORNAMENTAL ACCENT PLANTS - at the entrances, the sitting area and the flower beds only (Ahmad Nursery list of 08.10.2026)												
8.4.07	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-27	*COMP / CA-27*	**Nos**	**6.00**	Each	1	9,765.51	**58,593**	*TP-474*	*Half of the accent plants*	*Horticulture - non-schedule*
8.4.08	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-28	*COMP / CA-28*	**Nos**	**6.00**	Each	1	9,590.51	**57,543**	*TP-474*	*Balance of the accent plants*	*Horticulture - non-schedule*
J. ESTABLISHMENT & MAINTENANCE - 3 YEARS												
8.4.09	Landscape establishment and maintenance of the park for three years - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	R-CA-15	*COMP / CA-15*	**Kanal-year**	**98.56**	Kanal	1	51,000.00	**5,026,599**	*TP-447*	*Soft area x 3 years (P_MAINTM = 36 months)*	*Horticulture - non-schedule*
8.4	**SUB-TOTAL - 8.4 PARK F-14/4 (Park 4) (42 Kanal)**								**13,209,700**			
SUB-SECTION 8.5 - PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)												
F. SOFT LANDSCAPE & WATERING												
8.5.01	Supply and spreading of sweet earth (imported fertile topsoil), 1 ft thick, over the net soft-landscape area of the park.	R-LS-06	*NSI / LS-6*	**Sft**	**270,163.30**	Sft	1	7.50	**2,026,225**	*TP-548*	*PPTX rate basis*	*Horticulture - non-schedule*
8.5.02	Turfing with Dhaka grass over 70% of the net soft-landscape area of the park.	R-CA-14	*COMP / CA-14*	**Sft**	**189,114.31**	Sft	1	36.00	**6,808,115**	*TP-549*	*Park Tender Drawing*	*Horticulture - non-schedule*
8.5.03	Providing and laying buried HDPE watering main, 2 in dia, around the park, including trenching, sand bedding and surround, specials, thrust blocks, backfilling and testing	R-CA-25	*COMP / CA-25*	**Rft**	**2,803.20**	Rft	1	433.61	**1,215,496**	*TP-571*	*Perimeter plus branches*	*Horticulture - non-schedule*
8.5.04	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main.	R-CA-24	*COMP / CA-24*	**Nos**	**8.00**	Each	1	22,849.37	**182,795**	*TP-570*	*300 ft centres*	*Horticulture - non-schedule*
G. PLANTING - species from the Client park list, numbers from standard densities (rate incl. sundries and 5% replacement)												
8.5.05	Supply and planting of trees - mix of the 15 tree species on the Client park list in equal numbers (perimeter row and lawn trees)	R-PL-PKT	*Plant / PK-MIX-T*	**Nos**	**162.00**	No.	1	3,922.81	**635,495**	*TP-553*	*Species split: sheet 04A*	*Horticulture - non-schedule*
8.5.06	Supply and planting of shrubs / bushes - mix of the 12 shrub species on the Client park list in equal numbers (borders).	R-PL-PKS	*Plant / PK-MIX-S*	**Nos**	**1,341.00**	No.	1	563.70	**755,922**	*TP-556*	*Species split: sheet 04A*	*Horticulture - non-schedule*
G2. ORNAMENTAL ACCENT PLANTS - at the entrances, the sitting area and the flower beds only (Ahmad Nursery list of 08.10.2026)												
8.5.07	Supply and planting of ornamental palms (Phoenix, Foxtail, Copernicia, Sagu / Kanghi, Bismarckia and Bottle palm in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-27	*COMP / CA-27*	**Nos**	**6.00**	Each	1	9,765.51	**58,593**	*TP-574*	*Half of the accent plants*	*Horticulture - non-schedule*
8.5.08	Supply and planting of ornamental ficus (White, Panda 3 head, Multihead and Simple Panda Ficus in equal numbers), complete with pit, sweet-earth and manure backfill, stake, watering and first-season care.	R-CA-28	*COMP / CA-28*	**Nos**	**6.00**	Each	1	9,590.51	**57,543**	*TP-574*	*Balance of the accent plants*	*Horticulture - non-schedule*
J. ESTABLISHMENT & MAINTENANCE - 3 YEARS												
8.5.09	Landscape establishment and maintenance of the park for three years - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	R-CA-15	*COMP / CA-15*	**Kanal-year**	**148.85**	Kanal	1	51,000.00	**7,591,365**	*TP-547*	*Soft area x 3 years (P_MAINTM = 36 months)*	*Horticulture - non-schedule*
8.5	**SUB-TOTAL - 8.5 PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)**								**19,331,549**			

SUMMARY OF BILL No. 8 BY SUB-SECTION												
8.4	PARK F-14/4 (Park 4) (42 Kanal)								**13,209,700**			
8.5	PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)								**19,331,549**			
	TOTAL - BILL No. 8 - MODEL PARK AND PARK F-14/4 - HORTICULTURE								**32,541,249**			

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BILL No. 9 - ROAD CENTRAL MEDIANS & ROADSIDE GREEN STRIPS

Eleven main roads of Sectors F-14 and F-15 - imported topsoil, turfing and three years of maintenance (ground preparation is not part of this estimate)
Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
A. ROAD CENTRAL MEDIANS & ROADSIDE GREEN STRIPS - eleven main roads of Sectors F-14 and F-15												
9.01	Supply and spreading of sweet earth (imported fertile topsoil), 1'-0" thick, over the prepared formation of all central medians and roadside green strips	R-LS-06	*NSI / LS-6*	**Sft**	**1,249,978.00**	Sft	1	7.50	**9,374,835**	*TR-07*	*PPTX: "Sweet Earth (1ft Thick) - PKR 7.5/Sft"*	*Horticulture - non-schedule*
9.02	Turfing with Dhaka grass over 70% of the median and roadside soft area, including levelling, dressing, laying, rolling, first watering and maintenance until established	R-CA-14	*COMP / CA-14*	**Sft**	**874,984.60**	Sft	1	36.00	**31,499,446**	*TR-08*	*Balance is shrub bed and tree pits*	*Horticulture - non-schedule*
B. ESTABLISHMENT & MAINTENANCE - 3 YEARS												
9.03	Landscape establishment and maintenance of the road central medians and roadside green strips for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	R-CA-15	*COMP / CA-15*	**Kanal-year**	**688.69**	Kanal	1	51,000.00	**35,123,349**	*TR-05*	*Median and roadside soft area x 3 years*	*Horticulture - non-schedule*
	TOTAL - BILL No. 9 - ROAD CENTRAL MEDIANS & ROADSIDE GREEN STRIPS								**75,997,630**			

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BILL No. 10 - ROAD PLANTING - 11 MAIN ROADS (105 FT & 120 FT)

Client road inventory "F14,15 Plants Inventory NEW.xlsx" (20,710 plants), one sub-section per road under its proposed plant-based name (Road Titles.docx); rates = adopted (lowest) nursery quotation + planting sundries + 5% replacement
Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
SUB-SECTION 10.1 - AMALTAS ROAD (South Service Rd. 105', F-14, 8,187 ft)												
A. TREES												
10.1.01	Supply and planting of AMALTAS (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QT-32	*Plant / Q-T32*	Nos	410.00	No.	1	3,914.41	1,604,908	*09A*	*Inventory: AMALTAS 410*	*Horticulture - non-schedule*
B. SHRUBS / BUSHES												
10.1.02	Supply and planting of HAMELIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-01	*Plant / Q-S01*	Nos	324.00	No.	1	434.29	140,710	*09A*	*Inventory: HAMELIA 324*	*Horticulture - non-schedule*
10.1.03	Supply and planting of MARWA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-02	*Plant / Q-S02*	Nos	1,228.00	No.	1	434.29	533,308	*09A*	*Inventory: MARWA 1228*	*Horticulture - non-schedule*
10.1.04	Supply and planting of ICE BERG (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-03	*Plant / Q-S03*	Nos	1,228.00	No.	1	486.79	597,778	*09A*	*Inventory: ICE BERG 1228*	*Horticulture - non-schedule*
10.1.05	Supply and planting of HABISCUS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-04	*Plant / Q-S04*	Nos	275.00	No.	1	413.29	113,655	*09A*	*Inventory: HABISCUS 275*	*Horticulture - non-schedule*
10.1.06	Supply and planting of RAAT KI RANI (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-05	*Plant / Q-S05*	Nos	275.00	No.	1	413.29	113,655	*09A*	*Inventory: RAAT KI RANI 275*	*Horticulture - non-schedule*
10.1.07	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-06	*Plant / Q-S06*	Nos	275.00	No.	1	413.29	113,655	*09A*	*Inventory: LAGERSTROEMIA 275*	*Horticulture - non-schedule*
10.1	**SUB-TOTAL - 10.1 AMALTAS ROAD (South Service Rd. 105', F-14, 8,187 ft)**								3,217,669			
SUB-SECTION 10.2 - KURRAJONG ROAD (East Service Rd. 105', F-14, 5,372 ft)												
A. TREES												
10.2.01	Supply and planting of KURRAJONG (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QT-33	*Plant / Q-T33*	Nos	269.00	No.	1	4,019.41	1,081,221	*09A*	*Inventory: KURRAJONG 269*	*Horticulture - non-schedule*
B. SHRUBS / BUSHES												
10.2.02	Supply and planting of POTATO TREE (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-07	*Plant / Q-S07*	Nos	215.00	No.	1	591.79	127,235	*09A*	*Inventory: POTATO TREE 215*	*Horticulture - non-schedule*
10.2.03	Supply and planting of VINCA MINOR (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-08	*Plant / Q-S08*	Nos	1,600.00	No.	1	486.79	778,864	*09A*	*Inventory: VINCA MINOR 1600*	*Horticulture - non-schedule*
10.2.04	Supply and planting of EUPHORBIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-09	*Plant / Q-S09*	Nos	1,600.00	No.	1	402.79	644,464	*09A*	*Inventory: EUPHORBIA 1600*	*Horticulture - non-schedule*
10.2.05	Supply and planting of DIN KA RAJA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-10	*Plant / Q-S10*	Nos	90.00	No.	1	413.29	37,196	*09A*	*Inventory: DIN KA RAJA 90*	*Horticulture - non-schedule*
10.2.06	Supply and planting of TECOMA GROCHA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-11	*Plant / Q-S11*	Nos	90.00	No.	1	486.79	43,811	*09A*	*Inventory: TECOMA GROCHA 90*	*Horticulture - non-schedule*
10.2.07	Supply and planting of BURNING BUSH (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-13	*Plant / Q-S13*	Nos	90.00	No.	1	434.29	39,086	*09A*	*Inventory: BURNING BUSH 90*	*Horticulture - non-schedule*
10.2	**SUB-TOTAL - 10.2 KURRAJONG ROAD (East Service Rd. 105', F-14, 5,372 ft)**								2,751,877			
SUB-SECTION 10.3 - CHINAAR ROAD (West service Rd. 105', F-14, 5,371 ft)												
A. TREES												
10.3.01	Supply and planting of Chinar (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QT-34	*Plant / Q-T34*	Nos	268.00	No.	1	3,914.41	1,049,062	*09A*	*Inventory: CHINAR 268*	*Horticulture - non-schedule*
B. SHRUBS / BUSHES												
10.3.02	Supply and planting of HABISCUS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-04	*Plant / Q-S04*	Nos	90.00	No.	1	413.29	37,196	*09A*	*Inventory: HABISCUS 90*	*Horticulture - non-schedule*
10.3.03	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-06	*Plant / Q-S06*	Nos	90.00	No.	1	413.29	37,196	*09A*	*Inventory: LAGERSTROEMIA 90*	*Horticulture - non-schedule*
10.3.04	Supply and planting of CASSIA GALAUCA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-14	*Plant / Q-S14*	Nos	215.00	No.	1	434.29	93,372	*09A*	*Inventory: CASSIA GALAUCA 215*	*Horticulture - non-schedule*
10.3.05	Supply and planting of DESI GULAB (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-15	*Plant / Q-S15*	Nos	1,200.00	No.	1	392.29	470,748	*09A*	*Inventory: DESI GULAB 1200*	*Horticulture - non-schedule*
10.3.06	Supply and planting of MOTIYA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-16	*Plant / Q-S16*	Nos	1,200.00	No.	1	381.79	458,148	*09A*	*Inventory: (MOTIYA) JASMININUM MULTIFLORUM 1200*	*Horticulture - non-schedule*
10.3.07	Supply and planting of HARSINGHAR (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-17	*Plant / Q-S17*	Nos	90.00	No.	1	465.79	41,921	*09A*	*Inventory: HARSINGHAR 90*	*Horticulture - non-schedule*
10.3	**SUB-TOTAL - 10.3 CHINAAR ROAD (West service Rd. 105', F-14, 5,371 ft)**								2,187,643			
SUB-SECTION 10.4 - PINE ROAD (East Markaz Rd. 120', F-14, 3,087 ft)												
A. TREES												
10.4.01	Supply and planting of Pine (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QT-35	*Plant / Q-T35*	Nos	125.00	No.	1	4,229.41	528,676	*09A*	*Inventory: PINE 125*	*Horticulture - non-schedule*
B. SHRUBS / BUSHES												

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10.4.02	Supply and planting of ICE BERG (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-03	*Plant / Q-S03*	Nos	200.00	No.	1	486.79	97,358	09A	*Inventory: ICE BERG 200*	*Horticulture - non-schedule*
10.4.03	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-06	*Plant / Q-S06*	Nos	65.00	No.	1	413.29	26,864	09A	*Inventory: LAGERSTROEMIA 65*	*Horticulture - non-schedule*
10.4.04	Supply and planting of DIN KA RAJA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-10	*Plant / Q-S10*	Nos	65.00	No.	1	413.29	26,864	09A	*Inventory: DIN KA RAJA 65*	*Horticulture - non-schedule*
10.4.05	Supply and planting of ARIZONA CYPRUS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-18	*Plant / Q-S18*	Nos	125.00	No.	1	539.29	67,411	09A	*Inventory: ARIZONA CYPRUS 125*	*Horticulture - non-schedule*
10.4.06	Supply and planting of DAY LILLY (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-19	*Plant / Q-S19*	Nos	200.00	No.	1	434.29	86,858	09A	*Inventory: DAY LILLY 200*	*Horticulture - non-schedule*
10.4	SUB-TOTAL - 10.4 PINE ROAD (East Markaz Rd. 120', F-14, 3,087 ft)								834,031			
SUB-SECTION 10.5 - ILLAWARA ROAD (South Markaz Rd. 120', F-14, 3,696 ft)												
A. TREES												
10.5.01	Supply and planting of BRACHYCHITON FLAME TREE (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QT-36	*Plant / Q-T36*	Nos	288.00	No.	1	4,754.41	1,369,270	09A	*Inventory: BRACHYCHITON FLAME TREE 288*	*Horticulture - non-schedule*
B. SHRUBS / BUSHES												
10.5.02	Supply and planting of TECOMA STANS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-12	*Plant / Q-S12*	Nos	72.00	No.	1	455.29	32,781	09A	*Inventory: TECOMA STANS 72*	*Horticulture - non-schedule*
10.5.03	Supply and planting of HARSINGHAR (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-17	*Plant / Q-S17*	Nos	144.00	No.	1	465.79	67,074	09A	*Inventory: HARSINGHAR 72 + HARSINGHAR 72*	*Horticulture - non-schedule*
10.5.04	Supply and planting of JATROPHA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-20	*Plant / Q-S20*	Nos	72.00	No.	1	434.29	31,269	09A	*Inventory: JATROPHA 72*	*Horticulture - non-schedule*
10.5.05	Supply and planting of PLUMBAGO AURICULATA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-21	*Plant / Q-S21*	Nos	72.00	No.	1	539.29	38,829	09A	*Inventory: PLUMBAGO AURICULATA 72*	*Horticulture - non-schedule*
10.5	SUB-TOTAL - 10.5 ILLAWARA ROAD (South Markaz Rd. 120', F-14, 3,696 ft)								1,539,223			
SUB-SECTION 10.6 - TERMINALIA ROAD (Dilzak Rd. 120', F-14, 5,224 ft)												
A. TREES												
10.6.01	Supply and planting of TERMINALIA (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QT-37	*Plant / Q-T37*	Nos	430.00	No.	1	3,809.41	1,638,046	09A	*Inventory: TERMINALIA 430*	*Horticulture - non-schedule*
B. SHRUBS / BUSHES												
10.6.02	Supply and planting of RAAT KI RANI (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-05	*Plant / Q-S05*	Nos	110.00	No.	1	413.29	45,462	09A	*Inventory: RAAT KI RANI 110*	*Horticulture - non-schedule*
10.6.03	Supply and planting of BURNING BUSH (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-13	*Plant / Q-S13*	Nos	110.00	No.	1	434.29	47,772	09A	*Inventory: BURNING BUSH 110*	*Horticulture - non-schedule*
10.6.04	Supply and planting of PITTOSPORUM (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-22	*Plant / Q-S22*	Nos	250.00	No.	1	486.79	121,698	09A	*Inventory: PITTOSPORUM 250*	*Horticulture - non-schedule*
10.6.05	Supply and planting of BRUNFELSIA Punsilora (Franciscia) (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-23	*Plant / Q-S23*	Nos	250.00	No.	1	486.79	121,698	09A	*Inventory: BRUNFELSIA PAUNCIFLORA 250*	*Horticulture - non-schedule*
10.6	SUB-TOTAL - 10.6 TERMINALIA ROAD (Dilzak Rd. 120', F-14, 5,224 ft)								1,974,676			
SUB-SECTION 10.7 - GUL-E- NISHTAR ROAD (Hafeez Jalandhri Rd. 120', F-14, 2,285 ft)												
A. TREES												
10.7.01	Supply and planting of Erithrina Subrosa/Gul-e- Nishtar (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QT-07	*Plant / Q-T07*	Nos	184.00	No.	1	4,019.41	739,571	09A	*Inventory: Gul-e-Nishtar 184*	*Horticulture - non-schedule*
B. SHRUBS / BUSHES												
10.7.02	Supply and planting of MARWA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-02	*Plant / Q-S02*	Nos	103.00	No.	1	434.29	44,732	09A	*Inventory: MARWA 103*	*Horticulture - non-schedule*
10.7.03	Supply and planting of RAAT KI RANI (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-05	*Plant / Q-S05*	Nos	50.00	No.	1	413.29	20,665	09A	*Inventory: RAAT KI RANI 50*	*Horticulture - non-schedule*
10.7.04	Supply and planting of TECOMA GROCHA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-11	*Plant / Q-S11*	Nos	50.00	No.	1	486.79	24,340	09A	*Inventory: TECOMA GROCHA 50*	*Horticulture - non-schedule*
10.7.05	Supply and planting of BRUNFELSIA Punsilora (Franciscia) (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-23	*Plant / Q-S23*	Nos	103.00	No.	1	486.79	50,139	09A	*Inventory: BRUNFELSIA PAUNCIFLORA 103*	*Horticulture - non-schedule*
10.7	SUB-TOTAL - 10.7 GUL-E- NISHTAR ROAD (Hafeez Jalandhri Rd. 120', F-14, 2,285 ft)								879,447			
SUB-SECTION 10.8 - KACHNAR ROAD (East Service Rd. 105', F-15, 5,749 ft)												
A. TREES												
10.8.01	Supply and planting of KACHNAR (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QT-38	*Plant / Q-T38*	Nos	287.00	No.	1	3,809.41	1,093,301	09A	*Inventory: KACHNAR 287*	*Horticulture - non-schedule*
B. SHRUBS / BUSHES												
10.8.02	Supply and planting of MARWA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-02	*Plant / Q-S02*	Nos	96.00	No.	1	434.29	41,692	09A	*Inventory: MARWA 96*	*Horticulture - non-schedule*
10.8.03	Supply and planting of HABISCUS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-04	*Plant / Q-S04*	Nos	96.00	No.	1	413.29	39,676	09A	*Inventory: HABISCUS 96*	*Horticulture - non-schedule*

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10.8.04	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-06	*Plant / Q-S06*	Nos	287.00	No.	1	413.29	118,614	09A	*Inventory: LAGERSTROEMIA 287*	*Horticulture - non-schedule*
10.8.05	Supply and planting of BURNING BUSH (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-13	*Plant / Q-S13*	Nos	96.00	No.	1	434.29	41,692	09A	*Inventory: BURNING BUSH 96*	*Horticulture - non-schedule*
10.8.06	Supply and planting of DESI GULAB (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-15	*Plant / Q-S15*	Nos	1,200.00	No.	1	392.29	470,748	09A	*Inventory: DESI GULAB 1200*	*Horticulture - non-schedule*
10.8.07	Supply and planting of MORPUNKH (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-24	*Plant / Q-S24*	Nos	1,200.00	No.	1	434.29	521,148	09A	*Inventory: MORPUNKH 1200*	*Horticulture - non-schedule*
10.8	SUB-TOTAL - 10.8 KACHNAR ROAD (East Service Rd. 105', F-15, 5,749 ft)								2,326,871			
SUB-SECTION 10.9 - ALSTONIA ROAD (West Service Rd. 105', F-15, 2,382 ft)												
A. TREES												
10.9.01	Supply and planting of ALSTONIA (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QT-39	*Plant / Q-T39*	Nos	120.00	No.	1	3,809.41	457,129	09A	*Inventory: ALSTONIA 120*	*Horticulture - non-schedule*
10.9.02	Supply and planting of FIDDLEWOOD (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QT-40	*Plant / Q-T40*	Nos	96.00	No.	1	4,439.41	426,183	09A	*Inventory: FIDDLEWOOD 96*	*Horticulture - non-schedule*
B. SHRUBS / BUSHES												
10.9.03	Supply and planting of RAAT KI RANI (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-05	*Plant / Q-S05*	Nos	60.00	No.	1	413.29	24,797	09A	*Inventory: RAAT KI RANI 60*	*Horticulture - non-schedule*
10.9.04	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-06	*Plant / Q-S06*	Nos	60.00	No.	1	413.29	24,797	09A	*Inventory: LAGERSTROEMIA 60*	*Horticulture - non-schedule*
10.9.05	Supply and planting of MOTIYA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-16	*Plant / Q-S16*	Nos	700.00	No.	1	381.79	267,253	09A	*Inventory: (MOTIYA) JASMININUM MULTIFLORUM 700*	*Horticulture - non-schedule*
10.9.06	Supply and planting of VINCA MINOR (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-08	*Plant / Q-S08*	Nos	700.00	No.	1	486.79	340,753	09A	*Inventory: VINCA MINOR 700*	*Horticulture - non-schedule*
10.9	SUB-TOTAL - 10.9 ALSTONIA ROAD (West Service Rd. 105', F-15, 2,382 ft)								1,540,912			
SUB-SECTION 10.10 - BAKAIN ROAD (107 Markaz Rd. 105', F-15, 2,037 ft)												
A. TREES												
10.10.01	Supply and planting of MELALEUCA (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QS-25	*Plant / Q-S25*	Nos	82.00	No.	1	3,305.41	271,044	09A	*Inventory: MELALEUCA 82*	*Horticulture - non-schedule*
10.10.02	Supply and planting of Bakain (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QT-41	*Plant / Q-T41*	Nos	102.00	No.	1	3,704.41	377,850	09A	*Inventory: BAKAIN 102*	*Horticulture - non-schedule*
B. SHRUBS / BUSHES												
10.10.03	Supply and planting of DIN KA RAJA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-10	*Plant / Q-S10*	Nos	52.00	No.	1	413.29	21,491	09A	*Inventory: DIN KA RAJA 52*	*Horticulture - non-schedule*
10.10.04	Supply and planting of ROSE (MULTICOLOR) (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-26	*Plant / Q-S26*	Nos	916.00	No.	1	527.74	483,410	09A	*Inventory: ROSE (MULTICOLOR) 916*	*Horticulture - non-schedule*
10.10.05	Supply and planting of VITEX (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-27	*Plant / Q-S27*	Nos	52.00	No.	1	486.79	25,313	09A	*Inventory: VITEX 52*	*Horticulture - non-schedule*
10.10	SUB-TOTAL - 10.10 BAKAIN ROAD (107 Markaz Rd. 105', F-15, 2,037 ft)								1,179,108			
SUB-SECTION 10.11 - SAPIUM ROAD (105 Rd. 120', F-15, 2,037 ft)												
A. TREES												
10.11.01	Supply and planting of SAPIUM (tree) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, stake and guard, watering, first-season care and replacement allowance.	R-QS-28	*Plant / Q-S28*	Nos	164.00	No.	1	3,284.41	538,643	09A	*Inventory: SAPIUM 164*	*Horticulture - non-schedule*
B. SHRUBS / BUSHES												
10.11.02	Supply and planting of RAAT KI RANI (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-05	*Plant / Q-S05*	Nos	35.00	No.	1	413.29	14,465	09A	*Inventory: RAAT KI RANI 35*	*Horticulture - non-schedule*
10.11.03	Supply and planting of LAGERSTROEMIA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-06	*Plant / Q-S06*	Nos	42.00	No.	1	413.29	17,358	09A	*Inventory: LAGERSTROEMIA 42*	*Horticulture - non-schedule*
10.11.04	Supply and planting of DIN KA RAJA (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-10	*Plant / Q-S10*	Nos	42.00	No.	1	413.29	17,358	09A	*Inventory: DIN KA RAJA 42*	*Horticulture - non-schedule*
10.11.05	Supply and planting of TECOMA STANS (shrub) - adopted nursery quotation, complete with pit, sweet-earth and manure backfill, watering, first-season care and replacement allowance.	R-QS-12	*Plant / Q-S12*	Nos	35.00	No.	1	455.29	15,935	09A	*Inventory: TECOMA STANS 35*	*Horticulture - non-schedule*
10.11	SUB-TOTAL - 10.11 SAPIUM ROAD (105 Rd. 120', F-15, 2,037 ft)								603,759			

SUMMARY OF BILL No. 10 BY SUB-SECTION		
10.1	AMALTAS ROAD (South Service Rd. 105', F-14, 8,187 ft)	3,217,669
10.2	KURRAJONG ROAD (East Service Rd. 105', F-14, 5,372 ft)	2,751,877
10.3	CHINAAR ROAD (West service Rd. 105', F-14, 5,371 ft)	2,187,643
10.4	PINE ROAD (East Markaz Rd. 120', F-14, 3,087 ft)	834,031
10.5	ILLAWARA ROAD (South Markaz Rd. 120', F-14, 3,696 ft)	1,539,223
10.6	TERMINALIA ROAD (Dilzak Rd. 120', F-14, 5,224 ft)	1,974,676
10.7	GUL-E- NISHTAR ROAD (Hafeez Jalandhri Rd. 120', F-14, 2,285 ft)	879,447
10.8	KACHNAR ROAD (East Service Rd. 105', F-15, 5,749 ft)	2,326,871
10.9	ALSTONIA ROAD (West Service Rd. 105', F-15, 2,382 ft)	1,540,912
10.10	BAKAIN ROAD (107 Markaz Rd. 105', F-15, 2,037 ft)	1,179,108

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10.11	SAPIUM ROAD (105 Rd. 120', F-15, 2,037 ft)								**603,759**		
	TOTAL - BILL No. 10 - ROAD PLANTING - 11 MAIN ROADS (105 FT & 120 FT)								**19,035,216**		

PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

BILL No. 11 - CHANNEL-SIDE GREEN BUFFER - SOFTSCAPE, PLANTING, WATERING AND 3-YEAR MAINTENANCE

The 12 ft landscaped strip on both banks of each channel - imported sweet earth, Dhaka-grass turfing, shade trees at 30 ft centres, buried watering main with hose-bib watering points and three years of establishment and maintenance. The first sub-section is the F-14 nullah, the second the F-15 nullah
Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
SUB-SECTION 11.1 - F-14 NULLAH - CHANNEL-SIDE GREEN BUFFER												
A. SOFT LANDSCAPE OF THE F-14 CHANNEL-SIDE GREEN BUFFER - 12 ft strip on both banks												
11.1.01	Supply and spreading of sweet earth (imported fertile topsoil), 1'-0" thick, over the prepared sub-grade of the channel-side green buffer strip	R-LS-06	*NSI / LS-6*	**Sft**	**108,000.00**	Sft	1	7.50	**810,000**	*TN-135*	*12'-0" strip each bank*	*Horticulture - non-schedule*
11.1.02	Turfing with Dhaka grass over the prepared bed of the channel-side green buffer, including levelling, dressing, laying, rolling and watering until established - 70% of the buffer area.	R-CA-14	*COMP / CA-14*	**Sft**	**75,600.00**	Sft	1	36.00	**2,721,600**	*TN-135*	*Balance is tree pits and shrub beds*	*Horticulture - non-schedule*
B. PLANTING ALONG THE F-14 CHANNEL												
11.1.03	Supply and planting of shade trees along the buffer strip at 30 ft centres on each bank, complete with pit excavation, sweet-earth and manure backfill, stake and guard, initial watering and first-season care.	R-CA-26	*COMP / CA-26*	**Nos**	**226.00**	Each	1	4,603.01	**1,040,280**	*TN-140*	*Client instruction - trees along the F-14 and F-15 nullahs*	*Horticulture - non-schedule*
C. WATERING CONNECTIONS FOR THE F-14 BUFFER												
11.1.04	Providing and laying buried HDPE watering main, 2" dia, along each bank, including trenching, bedding, specials, thrust blocks, backfilling and testing, complete	R-CA-25	*COMP / CA-25*	**Rft**	**9,000.00**	Rft	1	433.61	**3,902,490**	*TN-142*	*One run along each bank*	*Horticulture - non-schedule*
11.1.05	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main, complete.	R-CA-24	*COMP / CA-24*	**Nos**	**30.00**	Each	1	22,849.37	**685,481**	*TN-141*	*At 300 ft centres on each bank*	*Horticulture - non-schedule*
D. ESTABLISHMENT & MAINTENANCE - 3 YEARS												
11.1.06	Landscape establishment and maintenance of the channel-side green buffer for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	R-CA-15	*COMP / CA-15*	**Kanal-year**	**59.50**	Kanal	1	51,000.00	**3,034,711**	*TN-136*	*Buffer area x 3 years (P_MAINTM = 36 months)*	*Horticulture - non-schedule*
11.1	**SUB-TOTAL - 11.1 F-14 NULLAH - CHANNEL-SIDE GREEN BUFFER**								**12,194,562**			
SUB-SECTION 11.2 - F-15 NULLAH - CHANNEL-SIDE GREEN BUFFER												
A. SOFT LANDSCAPE OF THE F-15 CHANNEL-SIDE GREEN BUFFER - 12 ft strip on both banks												
11.2.01	Supply and spreading of sweet earth (imported fertile topsoil), 1'-0" thick, over the prepared sub-grade of the channel-side green buffer strip	R-LS-06	*NSI / LS-6*	**Sft**	**96,000.00**	Sft	1	7.50	**720,000**	*TN-235*	*12'-0" strip each bank*	*Horticulture - non-schedule*
11.2.02	Turfing with Dhaka grass over the prepared bed of the channel-side green buffer, including levelling, dressing, laying, rolling and watering until established - 70% of the buffer area.	R-CA-14	*COMP / CA-14*	**Sft**	**67,200.00**	Sft	1	36.00	**2,419,200**	*TN-235*	*Balance is tree pits and shrub beds*	*Horticulture - non-schedule*
B. PLANTING ALONG THE F-15 CHANNEL												
11.2.03	Supply and planting of shade trees along the buffer strip at 30 ft centres on each bank, complete with pit excavation, sweet-earth and manure backfill, stake and guard, initial watering and first-season care.	R-CA-26	*COMP / CA-26*	**Nos**	**200.00**	Each	1	4,603.01	**920,602**	*TN-240*	*Client instruction - trees along the F-14 and F-15 nullahs*	*Horticulture - non-schedule*
C. WATERING CONNECTIONS FOR THE F-15 BUFFER												
11.2.04	Providing and laying buried HDPE watering main, 2" dia, along each bank, including trenching, bedding, specials, thrust blocks, backfilling and testing, complete	R-CA-25	*COMP / CA-25*	**Rft**	**8,000.00**	Rft	1	433.61	**3,468,880**	*TN-242*	*One run along each bank*	*Horticulture - non-schedule*
11.2.05	Providing and fixing watering point - galvanised standpost with quick-coupling hose valve and lockable gate valve in a masonry chamber with cover, connected to the watering main, complete.	R-CA-24	*COMP / CA-24*	**Nos**	**28.00**	Each	1	22,849.37	**639,782**	*TN-241*	*At 300 ft centres on each bank*	*Horticulture - non-schedule*
D. ESTABLISHMENT & MAINTENANCE - 3 YEARS												
11.2.06	Landscape establishment and maintenance of the channel-side green buffer for three years from substantial completion - watering, mowing, weeding, pruning, fertilising, pest control and routine replacement.	R-CA-15	*COMP / CA-15*	**Kanal-year**	**52.89**	Kanal	1	51,000.00	**2,697,521**	*TN-236*	*Buffer area x 3 years (P_MAINTM = 36 months)*	*Horticulture - non-schedule*
11.2	**SUB-TOTAL - 11.2 F-15 NULLAH - CHANNEL-SIDE GREEN BUFFER**								**10,865,985**			

SUMMARY OF BILL No. 11 BY SUB-SECTION		
11.1	F-14 NULLAH - CHANNEL-SIDE GREEN BUFFER	**12,194,562**
11.2	F-15 NULLAH - CHANNEL-SIDE GREEN BUFFER	**10,865,985**
	TOTAL - BILL No. 11 - CHANNEL-SIDE GREEN BUFFER - SOFTSCAPE, PLANTING, WATERING AND 3-YEAR	**23,060,547**

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BILL No. 12 - MODEL PARK AND PARK F-14/4 - FIXTURES AND E&M WORKS

Play structures, gym stations and EPDM safety surfacing, gazebos, benches, waste bins, decorative lamp posts, lighting control panels and earthing - one sub-section per park, then the playgrounds
Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
SUB-SECTION 12.4 - PARK F-14/4 (Park 4) (42 Kanal)												
D. PLAY AREA, GYM, GAZEBO & GATES												
12.4.01	Providing and laying 2 in EPDM / rubber safety tiles to ASTM F1292 over 4 in P.C.C. base with kerb edge restraint, to the children's play area (100 ft x 50 ft)	R-CA-07	COMP / CA-7	Sft	5,000.00	Sft	1	1,134.27	5,671,350	TP-425	One per park	Civil - non-schedule
12.4.02	Providing and laying 2 in EPDM / rubber safety tiles over 4 in P.C.C. base to the open-air gym area (70 ft square).	R-CA-07	COMP / CA-7	Sft	4,900.00	Sft	1	1,134.27	5,557,923	TP-426	One per park	Civil - non-schedule
12.4.03	Supply and installation of children's multi-play structure (tower, slide, climbing net and swings), complete with foundations.	R-CA-11	COMP / CA-11	Set	1.00	Set	1	1,330,929.71	1,330,930	TP-427	One set	Civil - non-schedule
12.4.04	Supply and installation of outdoor open-air gym equipment station, galvanised / powder coated, complete with foundations.	R-CA-12	COMP / CA-12	Nos	6.00	Each	1	198,115.40	1,188,692	TP-428	Six per park	Civil - non-schedule
12.4.05	Supply, fabrication and erection of gazebo 19 ft x 19 ft, 14 ft clear height, complete as specified for the green-belt gazebos	R-CA-01	COMP / CA-1	Nos	1.00	Each	1	1,237,233.88	1,237,234	TP-429	One per park	Civil - non-schedule
H. SITE FURNITURE & LANDSCAPE LIGHTING												
12.4.06	Supply and fixing of park bench with recycled plastic (HDPE) lumber slats on galvanised M.S. frame.	R-CA-04	COMP / CA-4	Nos	44.00	Each	1	65,340.40	2,874,978	TP-457	Scaled by area	Civil - non-schedule
12.4.07	Supply and fixing of 60-litre waste bin.	R-CA-05	COMP / CA-5	Nos	22.00	Each	1	17,720.20	389,844	TP-458	Scaled by area	Civil - non-schedule
12.4.08	Solar flood light 2 x 60 W LED (two on each pole) on a hot-dip galvanized pole 4-6 m high, complete as specified - rest areas	R-SL-02	MKT / SL-2	Each	28.00	Each	1	450,000.00	12,600,000	02-Parameters	CLIENT BOQ 23.10.2026: 70 for the two parks, pro rata to area	E/M - non-schedule
12.4.09	Solar post-top light 30-40 W LED on a hot-dip galvanized pole 3-4 m high, complete as specified - walkways.	R-SL-03	MKT / SL-3	Each	122.00	Each	1	300,000.00	36,600,000	02-Parameters	CLIENT BOQ 23.10.2026: 300 for the two parks (370 lights in all), pro rata to area	E/M - non-schedule
12.4	**SUB-TOTAL - 12.4 PARK F-14/4 (Park 4) (42 Kanal)**								67,450,951			
SUB-SECTION 12.5 - PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)												
D. PLAY AREA, GYM, GAZEBO & GATES												
12.5.01	Providing and laying 2 in EPDM / rubber safety tiles to ASTM F1292 over 4 in P.C.C. base with kerb edge restraint, to the children's play area (100 ft x 50 ft)	R-CA-07	COMP / CA-7	Sft	5,000.00	Sft	1	1,134.27	5,671,350	TP-525	One per park	Civil - non-schedule
12.5.02	Providing and laying 2 in EPDM / rubber safety tiles over 4 in P.C.C. base to the open-air gym area (70 ft square).	R-CA-07	COMP / CA-7	Sft	4,900.00	Sft	1	1,134.27	5,557,923	TP-526	One per park	Civil - non-schedule
12.5.03	Supply and installation of children's multi-play structure (tower, slide, climbing net and swings), complete with foundations.	R-CA-11	COMP / CA-11	Set	1.00	Set	1	1,330,929.71	1,330,930	TP-527	One set	Civil - non-schedule
12.5.04	Supply and installation of outdoor open-air gym equipment station, galvanised / powder coated, complete with foundations.	R-CA-12	COMP / CA-12	Nos	6.00	Each	1	198,115.40	1,188,692	TP-528	Six per park	Civil - non-schedule
12.5.05	Supply, fabrication and erection of gazebo 19 ft x 19 ft, 14 ft clear height, complete as specified for the green-belt gazebos	R-CA-01	COMP / CA-1	Nos	1.00	Each	1	1,237,233.88	1,237,234	TP-529	One per park	Civil - non-schedule
H. SITE FURNITURE & LANDSCAPE LIGHTING												
12.5.06	Supply and fixing of park bench with recycled plastic (HDPE) lumber slats on galvanised M.S. frame.	R-CA-04	COMP / CA-4	Nos	65.00	Each	1	65,340.40	4,247,126	TP-557	Scaled by area	Civil - non-schedule
12.5.07	Supply and fixing of 60-litre waste bin.	R-CA-05	COMP / CA-5	Nos	32.00	Each	1	17,720.20	567,046	TP-558	Scaled by area	Civil - non-schedule
12.5.08	Solar flood light 2 x 60 W LED (two on each pole) on a hot-dip galvanized pole 4-6 m high, complete as specified - rest areas	R-SL-02	MKT / SL-2	Each	42.00	Each	1	450,000.00	18,900,000	02-Parameters	CLIENT BOQ 23.10.2026: 70 for the two parks, pro rata to area	E/M - non-schedule
12.5.09	Solar post-top light 30-40 W LED on a hot-dip galvanized pole 3-4 m high, complete as specified - walkways.	R-SL-03	MKT / SL-3	Each	178.00	Each	1	300,000.00	53,400,000	02-Parameters	CLIENT BOQ 23.10.2026: 300 for the two parks (370 lights in all), pro rata to area	E/M - non-schedule
12.5	**SUB-TOTAL - 12.5 PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)**								92,100,301			

SUMMARY OF BILL No. 12 BY SUB-SECTION												
12.4	PARK F-14/4 (Park 4) (42 Kanal)								67,450,951			
12.5	PARK F-14 MARKAZ - THE MODEL PARK (668 ft x 500 ft)								92,100,301			
	TOTAL - BILL No. 12 - MODEL PARK AND PARK F-14/4 - FIXTURES AND E&M WORKS								159,551,252			

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BILL No. 13 - LAKESIDE FURNITURE & LIGHTING - FIXTURES

Benches, waste bins and decorative 8 ft LED lamp posts around the lake walkway

Quantity links to the take-off sheet; Rate is looked up from the Rate Library by Rate Code; Amount = Quantity / Divisor x Rate.

Item No.	Description of Work	Rate Code	MRS / Source Reference	Unit	Quantity	Rate Unit	Divisor	Rate (PKR)	Amount (PKR)	Take-off Ref.	Remarks	T.S. head
SUB-SECTION 13.1 - F-14 LAKE - LAKESIDE FURNITURE AND LIGHTING												
E. LAKESIDE FURNITURE AND LIGHTING												
13.1.01	Supply and fixing of bench with UV-stabilised outdoor-grade recycled plastic (HDPE) lumber slats on hot-dip galvanised M.S. frame, anchored on P.C.C. base - complete	**R-CA-04**	*COMP / CA-4*	**Nos**	**7.00**	Each	1	65,340.40	**457,383**	*TN-316*	*One every 150 ft of walkway*	*Civil - non-schedule*
13.1.02	Supply and fixing of 60-litre waste bin, recycled plastic / HDPE body on galvanised M.S. frame, anchored on P.C.C. base - complete	**R-CA-05**	*COMP / CA-5*	**Nos**	**4.00**	Each	1	17,720.20	**70,881**	*TN-317*	*One every 300 ft of walkway*	*Civil - non-schedule*
13.1.03	Supply, installation, testing and commissioning of decorative landscape lamp post / lantern 8'-0" high, hot-dip galvanised and black powder-coated M.S. with LED 3000 K lamp, on P.C.C. foundation with conduit and cabling - complete.	**R-CA-06**	*COMP / CA-6*	**Nos**	**25.00**	Each	1	66,652.36	**1,666,309**	*TN-318*	*40 ft centres along the walkway*	*E/M - non-schedule*
13.1	**SUB-TOTAL - 13.1 F-14 LAKE - LAKESIDE FURNITURE AND LIGHTING**								**2,194,573**			

SUMMARY OF BILL No. 13 BY SUB-SECTION		
13.1	F-14 LAKE - LAKESIDE FURNITURE AND LIGHTING	**2,194,573**
	TOTAL - BILL No. 13 - LAKESIDE FURNITURE & LIGHTING - FIXTURES	**2,194,573**

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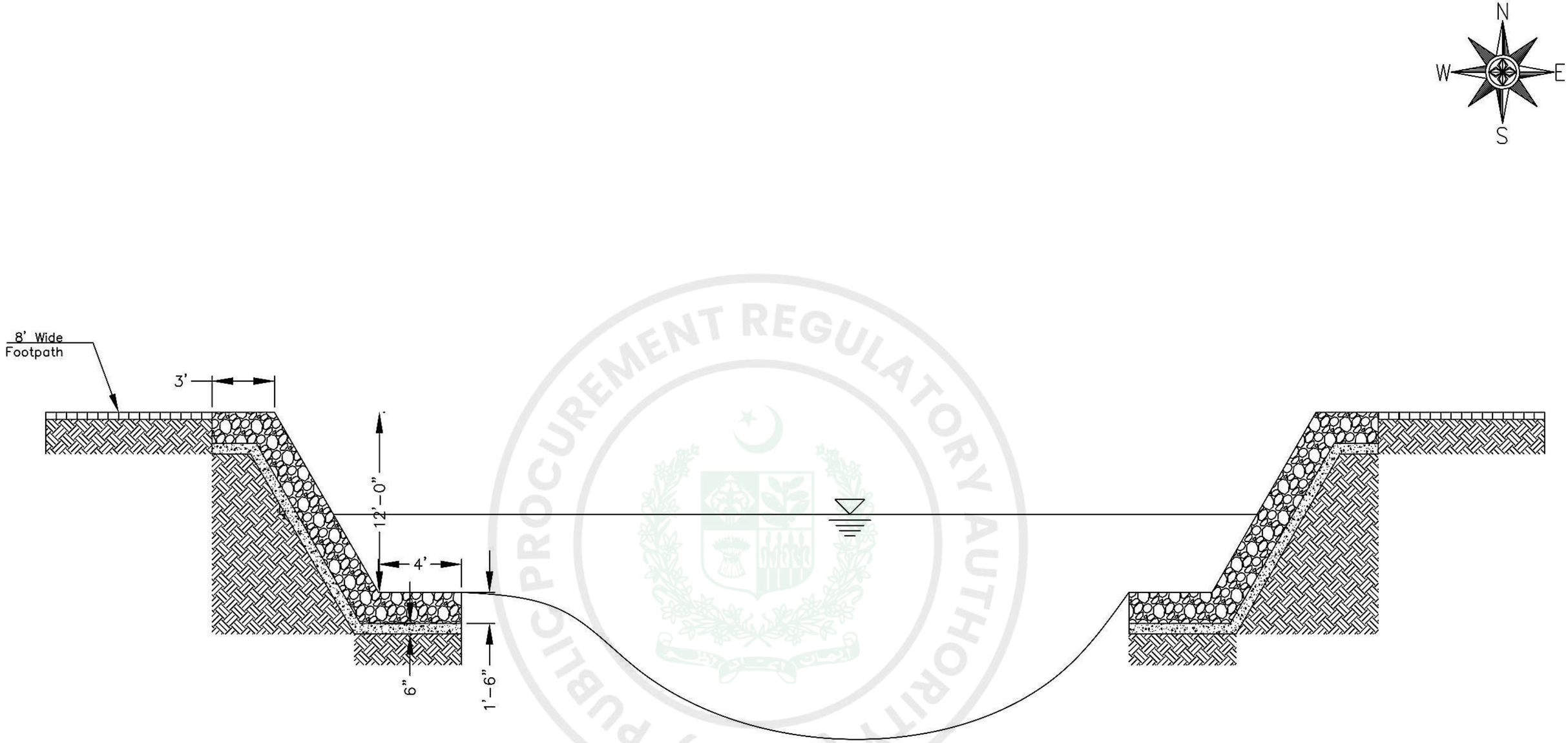

Client	Contractor	Project:	Design & Drawn By:	Aziz	Consultant
		Infrastructure Development Works of Sectors F14/F15, Islamabad	Drawing Type:	Tender Drawing of F14 LAKE REVETMENT	
			Date:	Oct, 2026	

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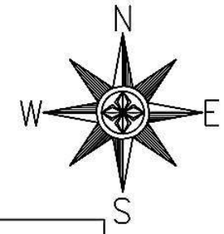
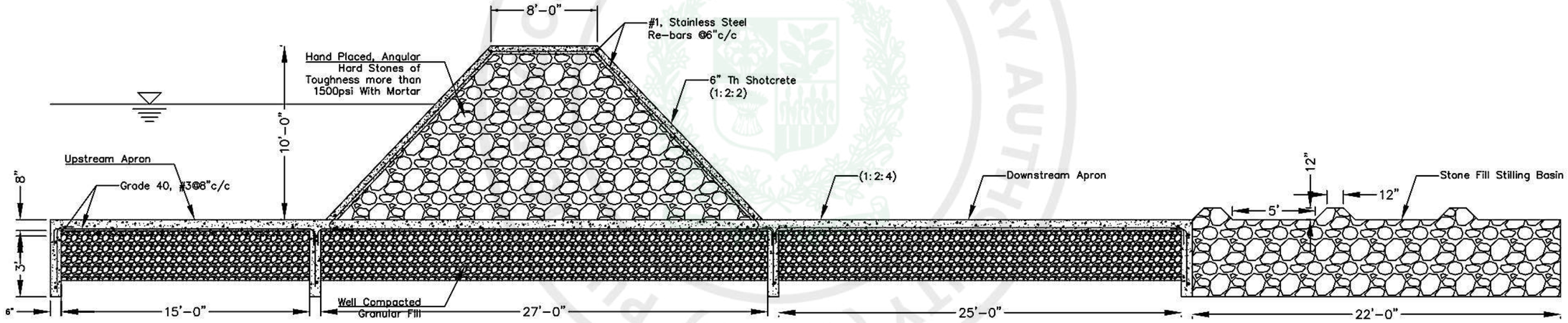


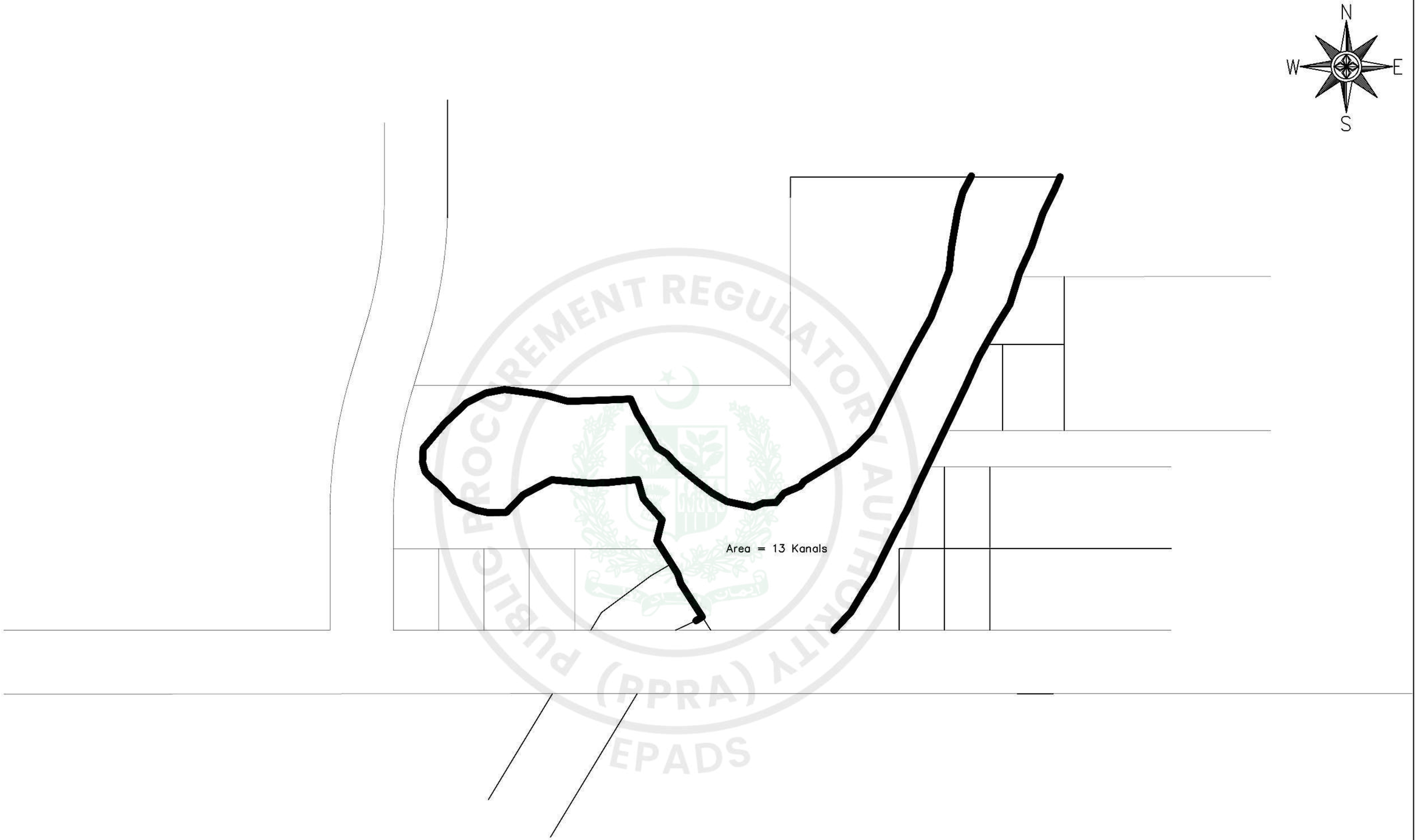
1. All Dimensions are in feet unless otherwise mentioned
2. Weir span assumed as 20ft.
3. Area of lake assumed as 13 kanals.
4. Depth of lake assumed as 20ft.
5. Dimensions may vary upon the findings of actual topographic survey.
6. Stone pitching on lake sides shall be provided with batter 1: 2.
7. Length of walkway is 945ft approx.



PROCUREMENT REGULATORY AUTHORITY (PPRA) EPADS

Client	Contractor	Project:		
FGEHA		Infrastructure Development Works of Sectors F14/F15, Islamabad	Design & Drawn By:	Aziz
			Drawing Type:	Tender Drawing of F14 LAKE WEIR
			Date:	Oct, 2026

Consultant



Client	Contractor	Project:		
FGEHA		Infrastructure Development Works of Sectors F14/F15, Islamabad	Design & Drawn By:	Aziz
			Drawing Type:	Tender Drawing of F14 LAKE
			Date:	Oct, 2026

Consultant

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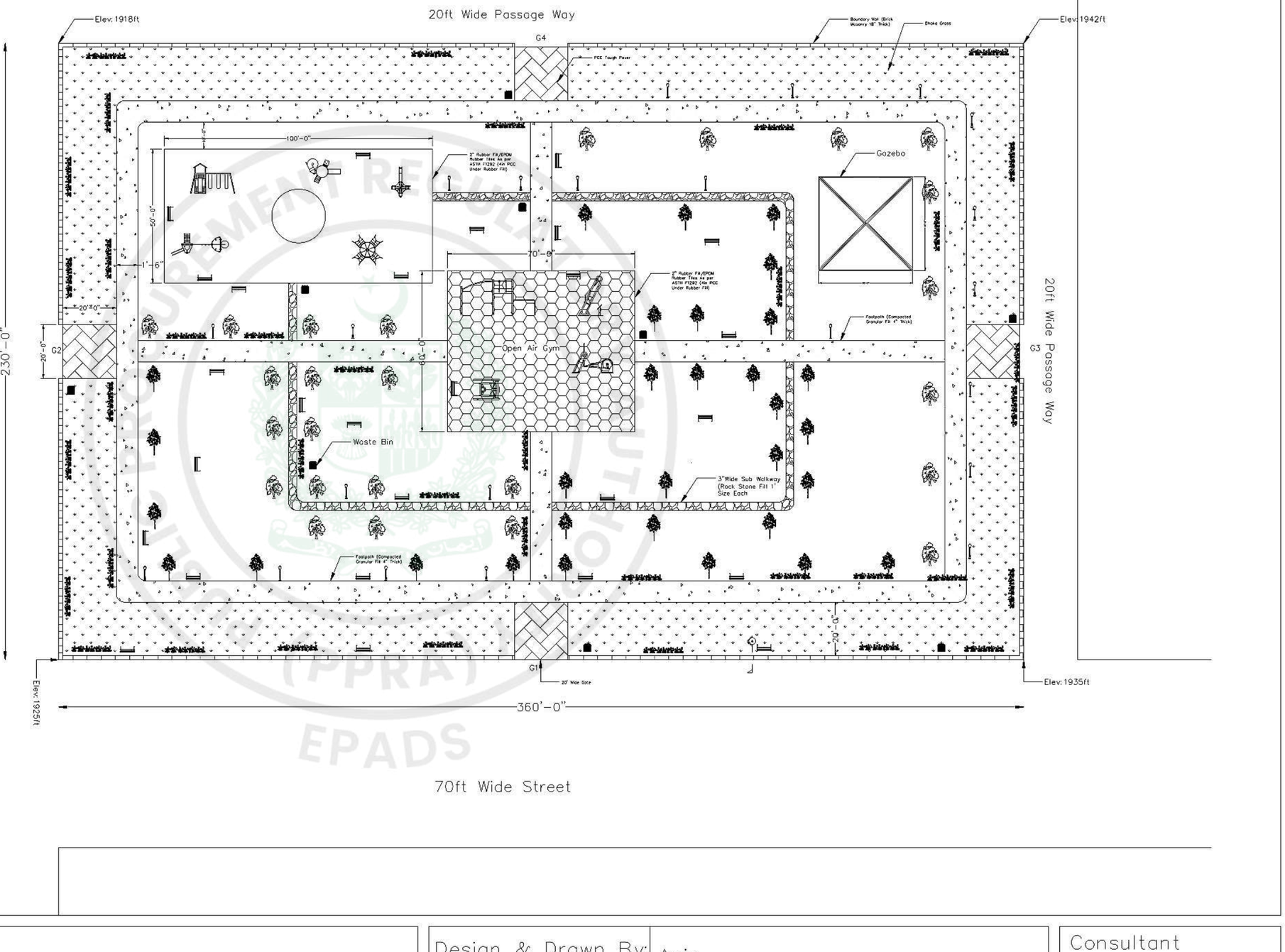

Client	Contractor	Project:	Design & Drawn By:	Aziz	Consultant
		Infrastructure Development Works of Sectors F14/F15, Islamabad	Drawing Type:	Tender Drawing of F14 PARK	
			Date:	Oct, 2026	

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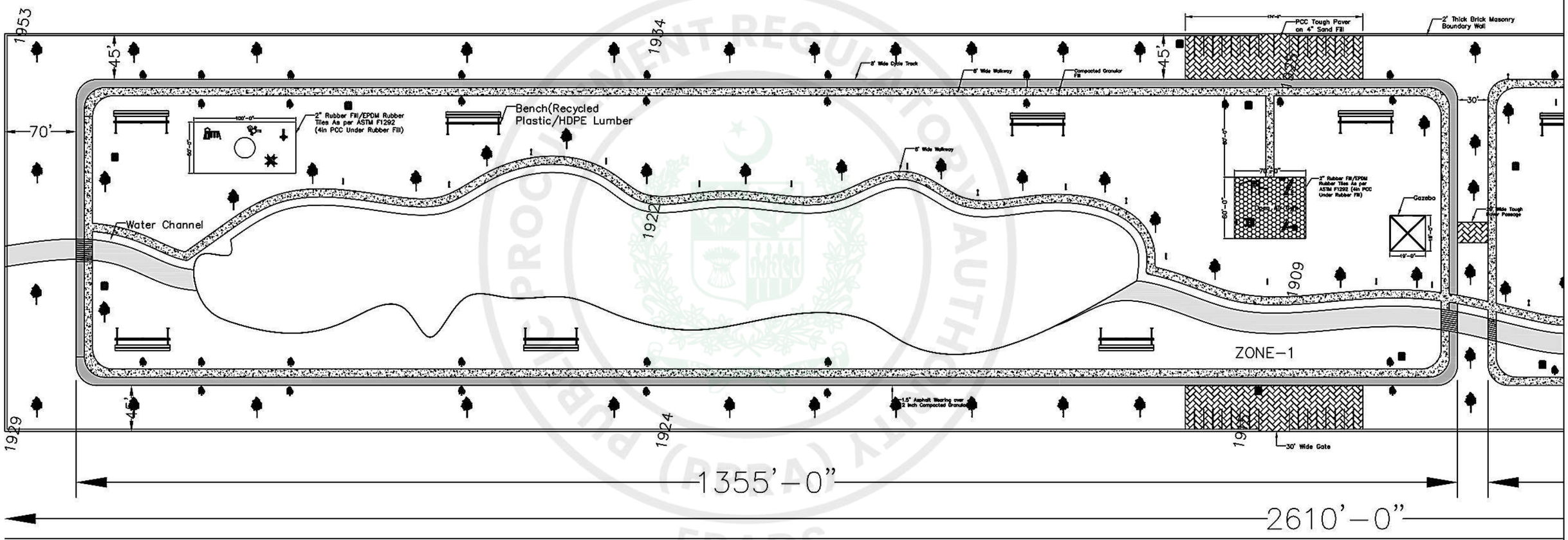

Client	Contractor	Project:	Design & Drawn By:	Aziz	Consultant
		Infrastructure Development Works of Sectors F14/F15, Islamabad	Drawing Type:	Tender Drawing of Green Belt	
			Date:	Oct, 2026	

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N
W E
S

1910

1926

WEST SERVICEROAD 105
WIDE

2' Thick Brick Masonry Boundary Wall

Compacted Granular Fill

45'

30'

Gazebo

Proposed Lake in Green Belt

1900

1905

ZONE-2

1395'-0"

1910

Client	Contractor	Project:		
FGEHA		Infrastructure Development Works of Sectors F14/F15, Islamabad	Design & Drawn By:	Aziz
			Drawing Type:	Tender Drawing of Green Belt
			Date:	Oct, 2026

Consultant

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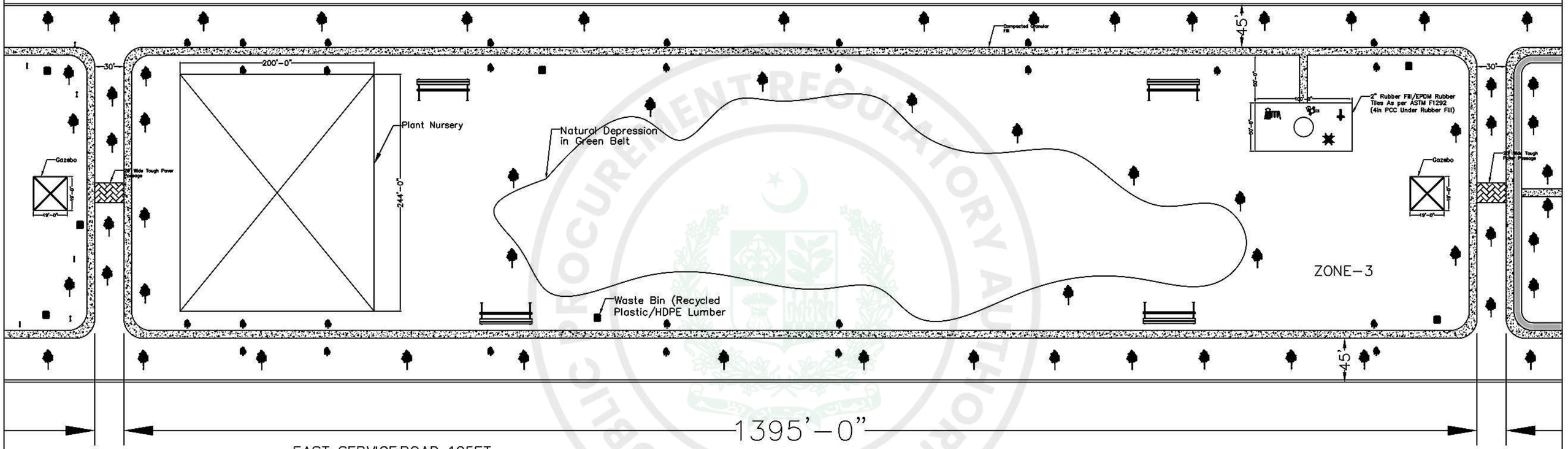
N

W E

S

WEST SERVICE ROAD 105FT WIDE



EAST SERVICE ROAD 105FT WIDE

Client	Contractor	Project:		
FGEHA		Infrastructure Development Works of Sectors F14/F15, Islamabad	Design & Drawn By:	Aziz
			Drawing Type:	Tender Drawing of Green Belt
			Date:	Oct, 2026

Consultant

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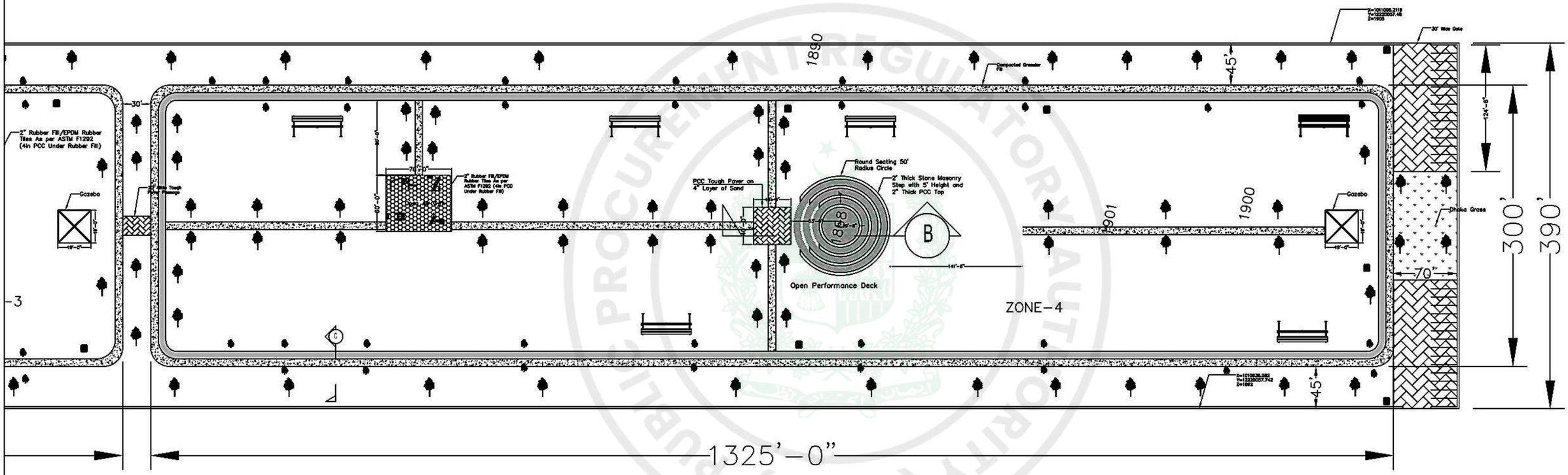

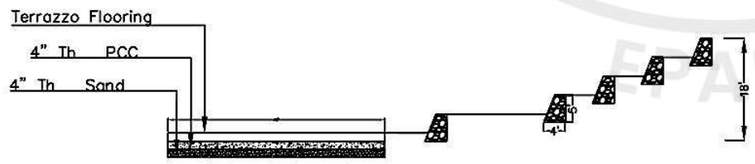

SECTION B-B

Client	Contractor	Project:	Design & Drawn By:	Aziz	Consultant
		Infrastructure Development Works of Sectors F14/F15, Islamabad	Drawing Type:	Tender Drawing of Green Belt	
			Date:	Oct, 2026	

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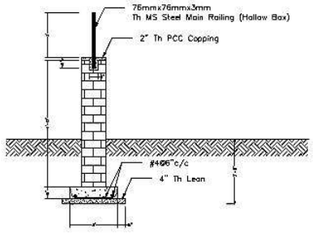
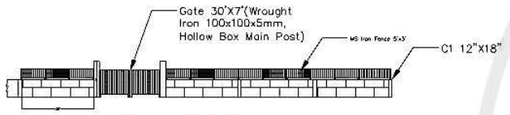
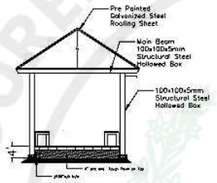
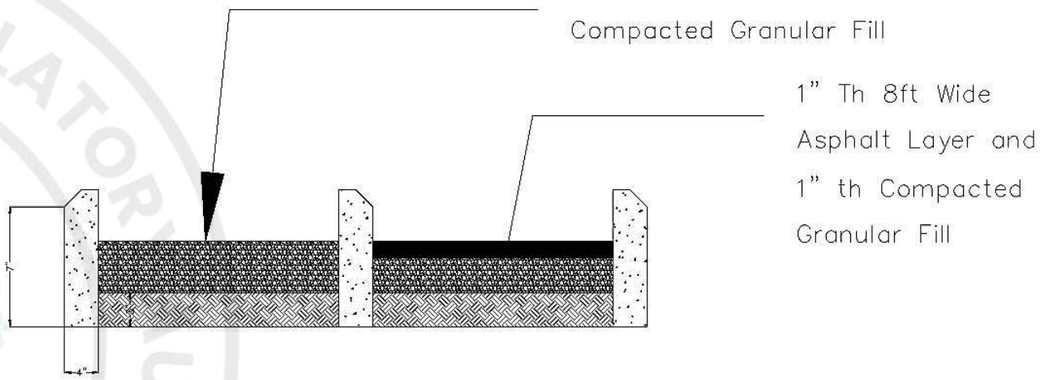




Boundary Wall Section





Client	Contractor	Project:	Design & Drawn By:	Aziz	Consultant
		Infrastructure Development Works of Sectors F14/F15, Islamabad	Drawing Type:	Tender Drawing of F14 Green Belt	
			Date:	Oct, 2026	

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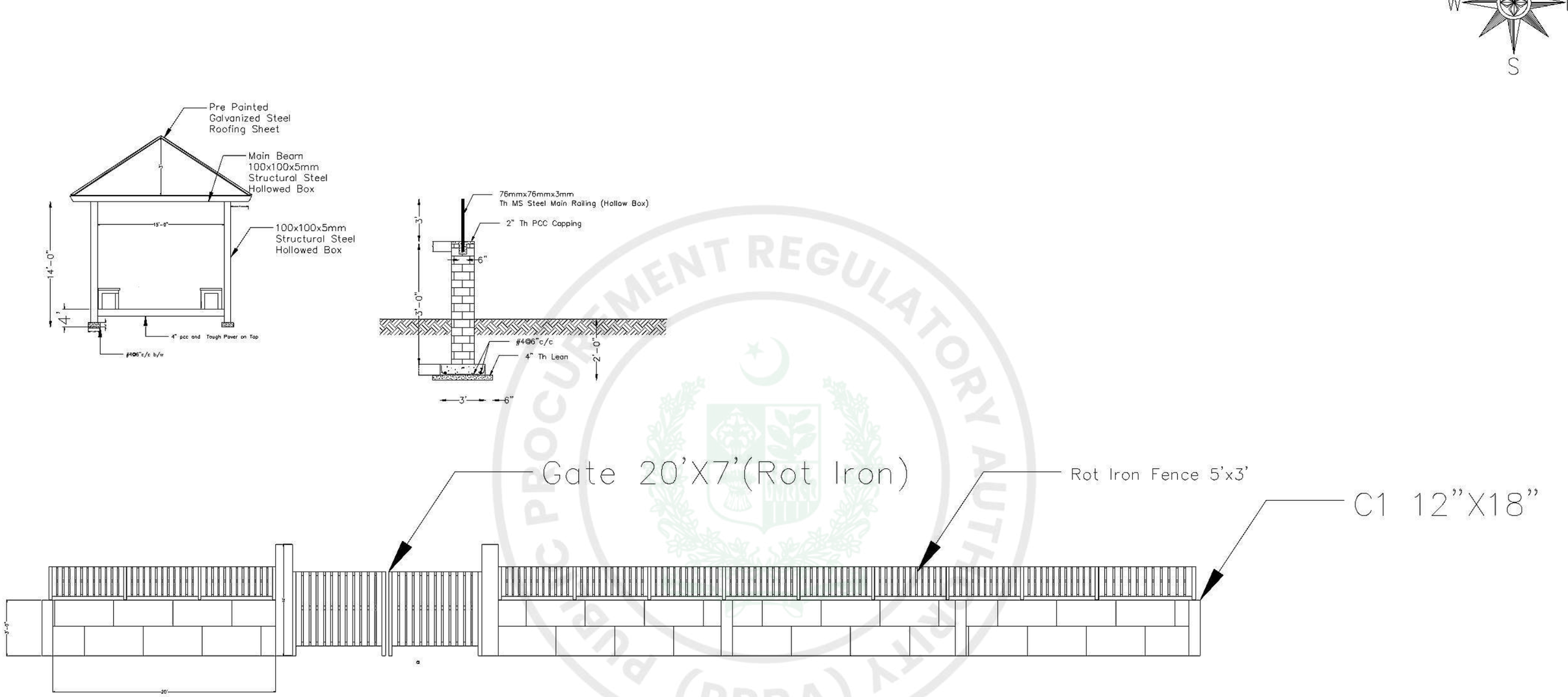

Boundary Wall Section

Client	Contractor	Project:		
		Infrastructure Development Works of Sectors F14/F15, Islamabad	Design & Drawn By:	Aziz
			Drawing Type:	Tender Drawing of F14 PARK
			Date:	Oct, 2026

Consultant

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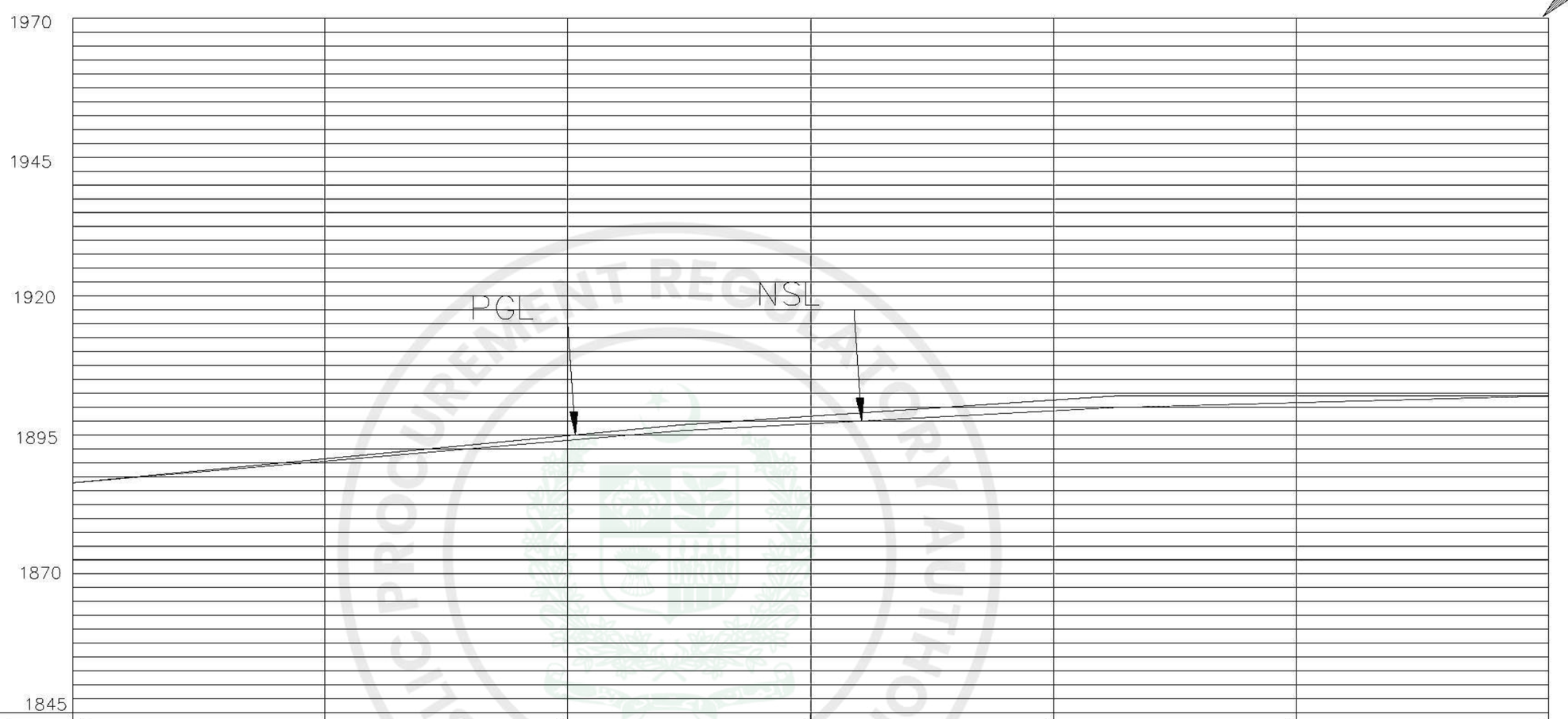

PGL	Level	1890	1891	1892	1892	1902	1907	1907
	Offset	255.00	180.00	105.00	0.000	105.00	180.00	255.00
NSL	Level	1890	1891	1892	1892	1901	1905	1907
	Offset	255.00	180.00	105.00	0.000	105.00	180.00	255.00
RD: 0+000								

Client	Contractor	Project:	Design & Drawn By:	Aziz	Consultant
		Infrastructure Development Works of Sectors F14/F15, Islamabad	Drawing Type:	Tender Drawing of F14 GB Sections	
			Date:	Oct, 2026	

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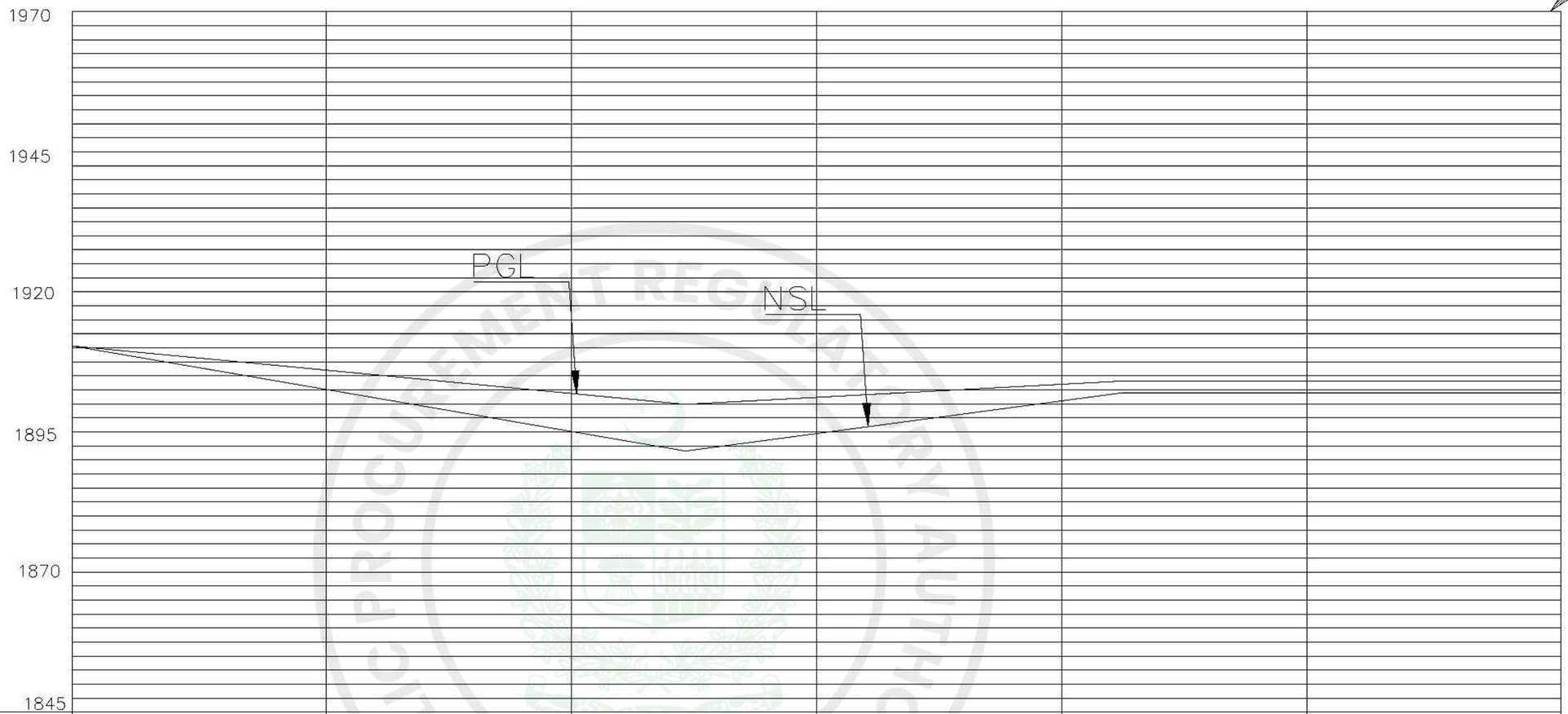

PGL	Level	1914		1914			1915			1915		1905		1909		1909							
	Offset	255.00		180.00			105.00			0.000		105.00		180.00		255.00							
NSL	Level	1911		1914			1915			1915		1897		1907		1907							
	Offset	255.00		180.00			105.00			0.000		105.00		180.00		255.00							

RD: 1+1000

EPADS PUBLIC PROCUREMENT REGULATORY AUTHORITY (PPRA)

Client	Contractor	Project:	Design & Drawn By:	Aziz	Consultant
		Infrastructure Development Works of Sectors F14/F15, Islamabad	Drawing Type:	Tender Drawing of F14 GB Sections	
			Date:	Oct, 2026	

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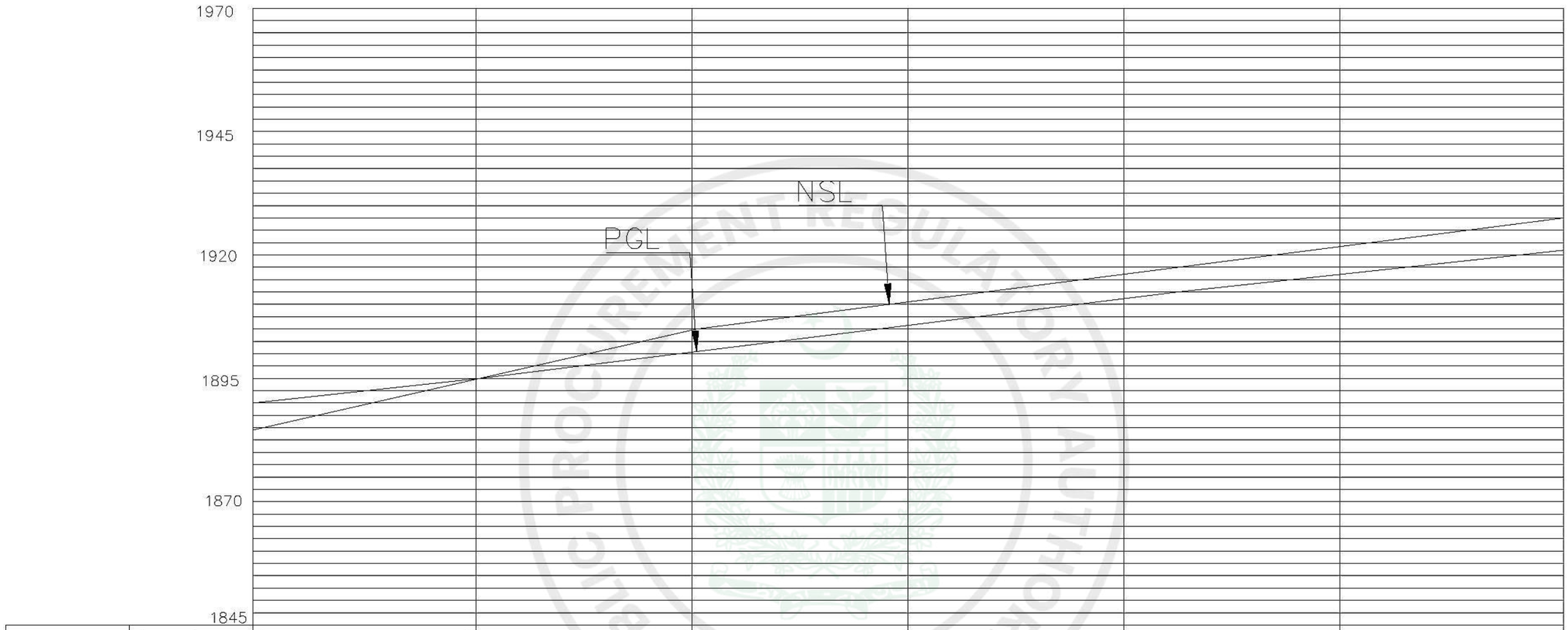

PGL	Level	1890		1895		1905		1905	1914		1917		1922
	Offset	255.00		180.00		105.00		0.000	105.00		180.00		255.00
NSL	Level	1883		1895		1907		1907	1917		1921		1926
	Offset	255.00		180.00		105.00		0.000	105.00		180.00		255.00
RD: 2+1000													

GOVERNMENT REGULATORY AUTHORITY
PUBLIC PROCUREMENT (PPRA)
EPADS

Client	Contractor	Project:		
		Infrastructure Development Works of Sectors F14/F15, Islamabad	Design & Drawn By:	Aziz
			Drawing Type:	Tender Drawing of F14 GB Sections
			Date:	Oct, 2026

Consultant

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Solar System for tube well Technical Specs
Design, supply, installation, testing and commissioning of a complete solar power system for the tube well and its pump room, comprising approximately 20 kWp capacity of Tier-1 N-type bifacial photovoltaic (PV) modules, terminated with MC4 connectors, complete with branded 6 mm² DC solar cables as required; hot-dip galvanized/powder-coated 12 SWG solar panel mounting structure, including stainless-steel (SS) bolts, mid-clamps, end-clamps, accessories and 1-foot-long J-bolts as required; 25 kW, three-phase hybrid inverter with pure sine-wave output, IP65 protection, suitable pump soft-start facility and compatibility with the proposed PV array and battery bank; 100 kWh $LiFePO_4$ battery energy storage system; complete AC/DC cabling, combiner boxes, distribution/changeover panels, fuses, surge protection devices (SPDs), four-pole isolator, and all necessary connectors and accessories; separate DC and AC earthing systems for the PV array and inverter, each having earth resistance of less than 5 ohms; lightning protection system comprising air terminals (lightning rods/arresters), down conductors and earthing arrangements; protective fencing, foundations, cable termination, interconnections, transportation, labour, installation, configuration, testing, commissioning and all ancillary works required to provide a complete, safe and operational system, in accordance with applicable standards, manufacturer recommendations and approved drawings. Rate analysis reference: CA-29. Complete in all respects.
Solar Flood Lights Technical Specs
High Power Solar Based 2x60 Watt LED Flood Light (Two on each pole) with hot dip galvanized steel poles with colored powder coating (6 metre high), 4 mm thick with 16 mm base plate including 4 no. stiffner, mounting brackets, reinforced concrete foundations (2x2x4), anchor bolts, theft protection and surge protection where required, excavation, civil works, transportation, installation labour and all necessary accessories, complete in all respects as per approved by engineer incharge. Contractor to submit lighting design calculation as per the offered light fixtures. Required specifications: 1. Complete integrated unit with solar panel mounted on top plate, $LiFePO_4$ battery, MPPT controller, wiring, casing, brackets (all required accessories to be included). 2. Automatic day OFF (charging) and night ON. 3. 170 lm/w minimum. 4. Minimum IP65 rating. 5. Minimum 8-10 hours lighting time. 6. 2–3 days autonomy during cloudy/rainy weather. 7. LED chip: Philips / Osram or equivalent. 8. A-grade high-efficiency solar panel. 9. $LiFePO_4$ battery with smart BMS (integrated inside light).Battery charging and discharging 2000 cycles minimum. 10. Overcharge, over-discharge, surge & short-circuit protection. 11. High-quality die cast aluminum casing, easy maintenance. 12. Minimum 5 year warranty on complete unit

Solar Post Top Lights Technical Specs
High Power Solar Based 30-40 Watt LED post top with hot dip galvanized steel poles (4 metre high) with colored powder coating , 4 mm thick with 16 mm base plate including 4 no. stiffner, mounting brackets, reinforced concrete foundations (2x2x4), mounting brackets, reinforced concrete foundations, anchor bolts and surge protection where required, excavation, civil works, transportation, installation labour and all necessary accessories, complete in all respects as approved by engineer incharge. Contractor to submit lighting design calculation as per the offered light fixtures. Required specifications: 1. Complete integrated unit with solar panel mounted on top plate, $LiFePO_4$ battery, MPPT controller, wiring, casing, brackets (all required accessories to be included). 2. Automatic day OFF (charging) and night ON. 3. 170 lm/w minimum. 4. Minimum IP66 rating. 5. Minimum 8-10 hours lighting time. 6. 2–3 days autonomy during cloudy/rainy weather. 7. LED chip: Philips / Osram or equivalent. 8. A-grade high-efficiency solar panel. 9. $LiFePO_4$ battery with smart BMS (integrated inside light). Battery charging and discharging 2000 cycles minimum. 10. Overcharge, over-discharge, surge & short-circuit protection. 11. High-quality die cast aluminum casing, easy maintenance. 12. Minimum 5 year warranty on complete unit

CONSTRUCTION EXPERIENCE

Form EXP - 4.1
General Construction Experience

Bidder's Name: _____
Date: _____
JV Member's Name_____
Bid Reference No. (if any) and title: _____
Page _____of _____pages

Starting Year	Ending Year	Contract Identification	Role of Bidder
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of EMPLOYER: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of EMPLOYER: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of EMPLOYER: _____ Address: _____	

Form EXP - 4.2(a)

Specific Construction and Contract Management Experience

Bidder's Name: _____
Date: _____
JV Member's Name_____
Bid Reference No. (if any) and title: _____
Page _____of _____pages

Similar Contract No.	**Information**			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Sub-contractor ☐
Total Contract Amount			PKR equivalent	
If member in a JV or sub-contractor, specify participation in total Contract amount				
EMPLOYER's Name:				
Address: Telephone/fax number E-mail:				

Form EXP - 4.2(a) (cont.)
Specific Construction and Contract Management Experience (cont.)

Similar Contract No.	Information
Description of the similarity in accordance with Sub-Factor 4.2(a) of Section III:	
1. Amount	
2. Physical size of required works items	
3. Complexity	
4. Methods/Technology	
5. Construction rate for key activities	
6. Other Characteristics	

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Form EXP - 4.2(b)
Construction Experience in Key Activities

Bidder's Name: _____
Date: _____
Bidder's JV Member Name: _____
Sub-contractor's Name (if any): _____
Bid Reference No. (if any) and title: _____

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All Sub-contractors for key activities must complete the information and Qualification Criteria and Requirements, Sub-Factor 4.2.

1. Key Activity No One: _____

	Information			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Sub-contractor ☐
Total Contract Amount			PKR equivalent	
Quantity (Volume, number or rate of production, as applicable) performed under the contract per year or part of the year	Total quantity in the contract (i)	Percentage participation (ii)		Actual Quantity Performed (i) x (ii)
Year 1				
Year 2				
Year 3				
Year 4				
EMPLOYER's Name:				
Address: Telephone/fax number				

	Information
E-mail:	

2. Activity No. Two

3. ……

	Information
Description of the key activities in accordance with Section III:	

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Form EXP - 4.2 (c)
Specific Experience in Managing ES aspects

[The following table shall be filled in for contracts performed by the Bidder, and each member of a Joint Venture]

Bidder's Name: *[insert full name]*
Date: *[insert day, month, year]*
Joint Venture Member Name: *[insertfull name]*
Bid Reference No. (if any) and title: *[insert ICB/NCB number and title]*
Page *[insert page number]* of *[insert total number]* pages

1. Key Requirement no 1 in accordance with 4.2 (c): _____

Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Subcontractor ☐
Total Contract Amount			PKR	
Details of relevant experience				

2. Key Requirement no 2 in accordance with 4.2 (c): _____

3. Key Requirement no 3 in accordance with 4.2 (c): _____

4. [PA define key requirements]

Contractor's Representative and Key Personnel Schedule

Bidders should provide the names and details of the suitably qualified Contractor's Representative and Key Personnel to perform the Contract. The data on their experience should be supplied using the Form PER-2 below for each candidate.

Contractor' Representative and Key Personnel

1.	**Title of position:**	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
2.	**Title of position:**	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
3.	**Title of position:**	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
4.	**Title of position:**	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]

	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
5.	**Title of position:**	
	Name of candidate	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
6.	**Title of position:** *[insert title]*	
	Name of candidate	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]

Form PER-2:
Resume and Declaration
Contractor's Representative and Key Personnel

Name of Bidder

Position [*#1*]: [*title of position from Form PER-1*]		
Personnel information	**Name:**	**Date of birth:**
	Address:	**E-mail:**
	Professional qualifications:	
	Academic qualifications:	
	Language proficiency: *[language and levels of speaking, reading and writing skills]*	
details		
	Address of Employer:	
	Telephone:	**Contact (manager / personnel officer):**
	Fax:	
	Job title:	**Years with present Employer:**

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

Project	**Role**	**Duration of involvement**	**Relevant experience**
[main project details]	*[role and responsibilities on the project]*	*[time in role]*	*[describe the experience relevant to this position]*

Declaration

I, the undersigned *[insert either "Contractor's Representative" or "Key Personnel" as applicable]* , certify that to the best of my knowledge and belief, the information contained in this Form PER-2 correctly describes myself, my qualifications and my experience.

I confirm that I am available as certified in the following table and throughout the expected time schedule for this position as provided in the Bid:

Commitment	**Details**
Commitment to duration of contract:	*[insert period (start and end dates) for which this Contractor's Representative orKey Personnel is available to work on this contract]*
Time commitment:	*[insert period (start and end dates) for which this Contractor's Representative orKey Personnel is available to work on this contract]*

I understand that any misrepresentation or omission in this Form may:

(a) be taken into consideration during Bid evaluation;

(b) result in my disqualification from participating in the Bid;

(c) result in my dismissal from the contract.

Name of Contractor's Representative or **Key Personnel: [*insert name*]**

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Bidder:

Signature: _____

Date: (day/month/year): _____

Financial Resources

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

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

Past Experience / Contracts

Contracts over *[insert amount]* during the last three years:				
Procuring Agency	Value	Year	Goods/Services Supplied	Country of Destination

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Historical Contract Non-Performance, and Pending Litigation and Litigation History

[The following table shall be filled in for the Applicant and for each member of a Joint Venture]

Applicant's Name: *[insert full name]*
Date: *[insert day, month, year]*
Joint Venture Member Name: *[insert full name]*
IFP No. and title: *[insert IFP number and title]*
Page *[insert page number]* of *[insert total number]* pages

☐ Not debarred due to deviation from commitment of Bid Securing Declaration-☐ Not debarred due to non-performance			
Year	**Non-performed portion of contract**	**Contract Identification**	**Total Contract Amount (current value, currency, exchange rate and PKR equivalent)**
[insert year]	*[insert amount and percentage]*	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Procuring Agency: *[insert full name]* Address of Procuring Agency: *[insert street/city/country]* Reason(s) for nonperformance: *[indicate main reason(s)]*	*[insert amount]*
Pending Litigation, in accordance with Section III, Qualification Criteria and Requirements			
☐ Pending litigation in accordance with Section III, Qualification Criteria and Requirements, Sub-Factor 2.3 as indicated below.			

Year of dispute	**Amount in dispute (currency)**	**Contract Identification**	**Total Contract Amount (currency), ~~US$~~ PKR Equivalent (exchange rate)**

[insert year]	*[insert amount]*	Contract Identification: [indicate complete contract name, number, and any other identification] Name of Procuring Agency: *[insert full name]* Address of Procuring Agency: *[insert street/city/country]* Matter in dispute: *[indicate main issues in dispute]* Party who initiated the dispute: *[indicate "Procuring Agency" or "Supplier"]* Status of dispute: *[Indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary]*	*[insert amount]*

☐ No consistent history of court/arbitral award decisions in accordance with Section III, Qualification Criteria and Requirements, Sub-Factor 2.4.

☐ Consistent history of court/arbitral award decisions in accordance with Section III, Qualification Criteria and Requirements, Sub-Factor 2.4 as indicated below.

Year of award	**Outcome as percentage of Net Worth**	**Contract Identification**	**Total Contract Amount (currency), PKR Equivalent (exchange rate)**
[insert year]	*[insert percentage]*	Contract Identification: [indicate complete contract name, number, and any other identification] Name of Procuring Agency: *[insert full name]* Address of Procuring Agency: *[insert street/city/country]* Matter in dispute: *[indicate main issues in dispute]* Party who initiated the dispute: *[indicate "Procuring Agency" or "Supplier"]* Court/ arbitral award decision: *[Indicate if the award decision was against the Applicant or any member of a joint venture.]y]*	*[insert amount]*

Current Contract Commitments / Works in Progress

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

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

Financial Situation and Performance

[The following table shall be filled in for the Applicant and for each member of a Joint Venture]

Applicant's Name: *[insert full name]*
Date: *[insert day, month, year]*
Joint Venture Member Name: *[insert full name]*
IFP No. and title: *[insert IFP number and title]*
Page *[insert page number]* of *[insert total number]* pages

1. Financial data

Type of Financial information in (currency)	**Historic information for previous _[insert number] years, [insert in words] (amount in currency, currency, exchange rate*, PKR equivalent)**				
	Year 1	Year 2	Year 3		
Statement of Financial Position (Information from Balance Sheet)					
Total Assets (TA)					
Total Liabilities (TL)					
Total Equity/Net Worth (NW)					
Current Assets (CA)					
Current Liabilities (CL)					
Working Capital (WC)					
Information from Income Statement					
Total Revenue (TR)					
Profits Before Taxes (PBT)					
Cash Flow Information					
Cash Flow from Operating Activities					

* Refer ITA 14 for the exchange rate

3. Financial documents

The Applicant and in case of JV, members of JV shall provide copies of financial statements for *[number]* years pursuant Section III, Qualifications Criteria and Requirements. The financial statements shall:

(a) reflect the financial situation of the Applicant or in case of JV member, and not an affiliated entity (such as parent company or group member).

(b) be independently audited or certified in accordance with local legislation.

(c) be complete, including all notes to the financial statements.

(d) correspond to accounting periods already completed and audited.

☐ Attached are copies of financial statements[1] for the *[number]* years required above; and complying with the requirements.

[1] If the most recent set of financial statements is for a period earlier than 12 months from the date of Application, the reason for this should be justified.

Average Annual Turnover (Annual Sales Value)

[The following table shall be filled in for the Applicant and for each member of a Joint Venture]

Applicant's Name: *[insert full name]*
Date: *[insert day, month, year]*
Joint Venture Member Name: *[insert full name]*
IFP No. and title: *[insert IFP number and title]*
Page *[insert page number]* of *[insert total number]* pages

Annual Turnover Data			
Year	**Amount** **Currency**	**Exchange rate*** **(If applicable)**	**PKR equivalent**
[indicate calendar year]	*[insert amount and indicate currency]*		
		Average Annual Turnover **	

* Refer ITA for date and source of exchange rate.

** Total PKR equivalent for all years divided by the total number of years. See Section III, Qualification Criteria and Requirements, ITA.

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