

Pre-Qualification Document

Construction of Houses for ICT Police (Works)

National

Single Stage-Two Envelope



August 21, 2026

*National Police Foundation (National Police Foundation), Assistant Director Admin
Mauve Area G-10/4, Islamabad Capital Territory
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INVITATION FOR PRE-QUALIFICATION

PROCUREMENT OF CIVIL WORKS

1. The **National Police Foundation (National Police Foundation)** has reserved Funds for the procurement planned for FY **2026-27**. The **National Police Foundation (National Police Foundation)** intends to apply part of the proceeds of this Fund to cover eligible payments under the contract for the "**Construction of Houses for ICT Police**" with the reference of "**P95650**"
2. The **National Police Foundation (National Police Foundation)** intends to pre-qualify contractors for Invitation to Bid(s), and sign the contract agreement(s) with the selected bidder(s) subsequent to the bidding process.
3. The objective of the intended pre-qualification is the execution of "**Construction of Houses for ICT Police**" through subsequent signing of contract with successful bidders, and the purpose of this Pre-qualification Notice is to provide the very basic information to enable potential applicants to decide whether or not to respond to this Pre-qualification Notice.
4. Only the pre-qualified applicants shall be entitled to participate in the procurement proceedings, and it is expected that the Invitation to Bids will be made to the Pre-qualified Applicants.
5. The pre-qualification process is open to all **National** Applicants subject to fulfilling the eligibility requirements mentioned in the respective Pre-qualification Documents. Interested Applicants may obtain further information from the National Police Foundation (National Police Foundation) through **EPADS v2.0** during office hours. A complete set of Pre-qualification Documents may be accessed by interested Applicants through **EPADS v2.0** at **<https://epads.gov.pk/opportunities/federal/procurements/95650>**.
6. The application, prepared in accordance with the instructions in the Pre-qualification Documents, must be submitted through **EPADS v2.0** on or before **Saturday, September 5, 2026 12:00 PM**. E-bids will be opened using **EPADS v2.0** on the same day at **Saturday, September 5, 2026 12:30 PM**. Manual submission of applications shall not be entertained. Those contractors who have not yet registered on the new version of **EPADS v2.0** may register themselves at <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 Rule 48 of Public Procurement Rules, 2004, a Grievance Redressal Committee (GRC) is notified for the subject procurement and the notification copy is available on the procuring agency's website and on the Authority's website at (www.ppra.org.pk).

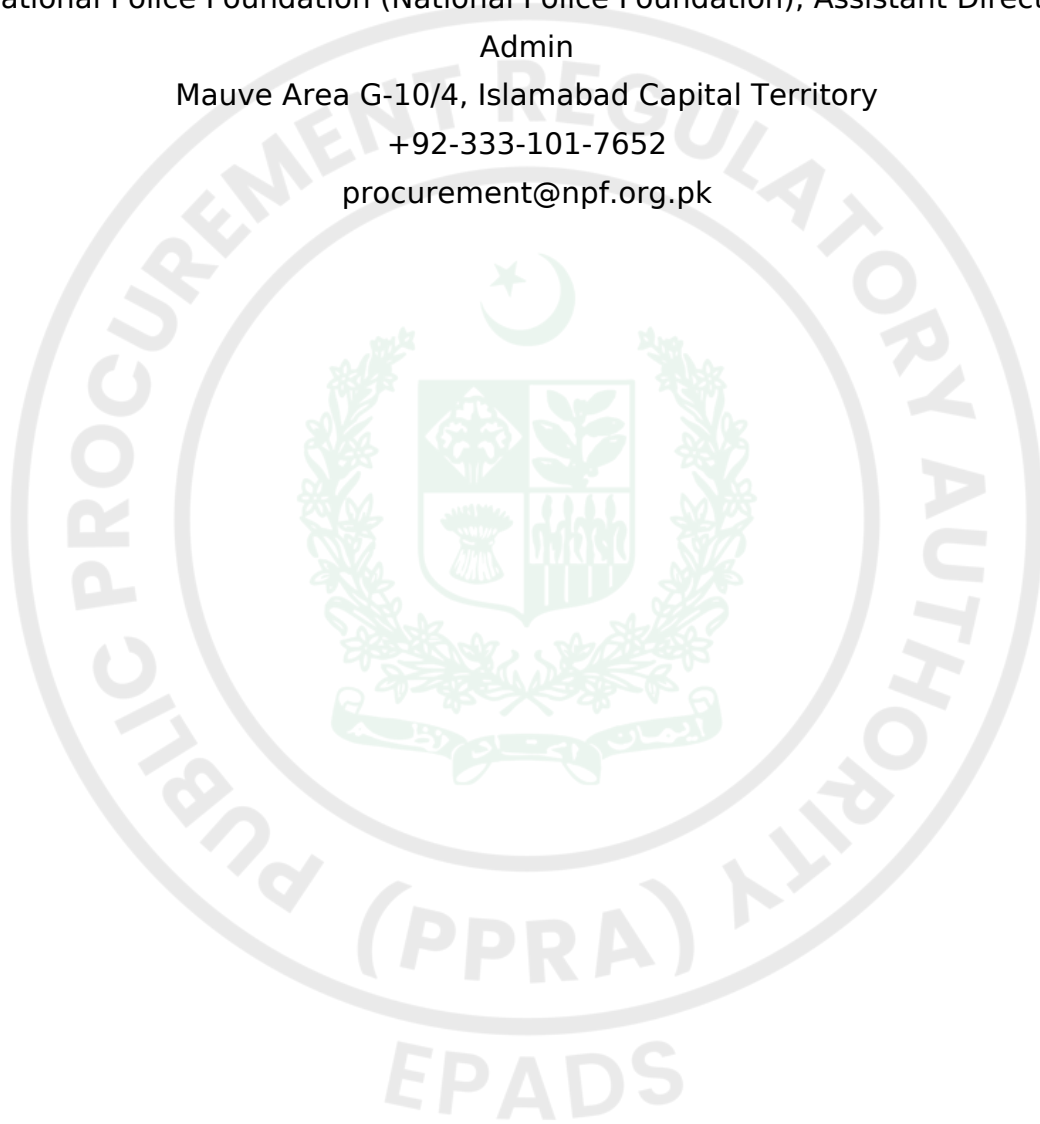
National Police Foundation (National Police Foundation), Assistant Director

Admin

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Instructions to Applicants

A. General

B. Contents of the Prequalification Documents

Sections of Prequalification Documents

1. **Scope of Application**

1.1. In connection with the “**Invitation for Prequalification**”, the Procuring Agency, as defined in Section II (Prequalification Data Sheet abbreviated as PDS), issues this set of Prequalification Documents (PD) to prospective applicants (also hereinafter referred as Applicants) interested in submitting applications (also hereinafter referred as Applications) to determine the capacity and capability of the Applicant(s) for supply of Goods and Related Services incidental thereto as specified in Section VII (Schedule of Requirements).

2. **Source of Funds**

2.1. Source of funds is same as referred in Invitation for Pre-qualification.

3. **Fraud and Corruption**

3.1. The Procuring Agency requires that the Applicants /Bidders/ Suppliers/Contractors under Government financed contracts, observe the highest standard of ethics during the procurement and execution of such agreements and contracts.

3.2. The Applicants/Bidders shall permit and shall cause their agents (whether declared or not), sub-contractors, sub-consultants, service providers, suppliers, and their personnel, to permit the Procuring Agency to inspect all accounts, records and other documents relating to any, Application/Bid submission, Secondary Procurement process, and to have them audited by auditors appointed by the Procuring Agency.

3.3. Any communications between the Applicant and the Procuring Agency related to matters of alleged corrupt and fraudulent practices must be made in writing or in electronic forms that provide record of the content of

communication.

3.4. Procuring Agency will reject an application or bid or proposal, if it is established that the Applicant or the Bidder or Prosper was engaged in corrupt and fraudulent practices in competing for the contract.

3.5. Procuring Agency will also declare the Applicant as blacklisted in accordance with rules and predefined standard mechanism.

4. Eligible Applicants

4.1. An Applicant may be a private entity, a state-owned enterprise or institution subject to ITB 4.6, or any combination of such entities in the form of a joint venture (JV) under an existing JV agreement or with the intent to enter into such an agreement supported by a letter of intent.

In case of single (private or state-owned entity), it shall be liable for execution of all the provisions of the Contract Agreement.

In the case of a joint venture, all members shall be jointly and severally liable for the execution of all the provisions of the Contract Agreement (if signed b/w the Procuring Agency and the JV), in accordance with the Contract conditions that apply.

The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the Prequalification process, Bidding process (in the event the prequalified JV submits a Bid) and during the period of contract agreement and contract execution (in the event the JV is awarded the Contract). Unless specified in the PDS, there is no limit on the number of members in a JV.

4.2. An Applicant may apply for Prequalification both individually, and as part of a joint venture, or participate as a subcontractor. If prequalified as a JV only, it will not be permitted to bid for the same contract as an individual entity. Bids submitted in violation of this provision will be rejected.

4.3. An Applicant and any of its affiliates (that directly or indirectly control, are controlled by or are under common control with that entity) may submit its Application for Prequalification either individually, as joint venture or as a sub-contractor among them for the same contract. However, if prequalified only one prequalified Applicant will be allowed to bid for the same contract.

All Bids submitted in violation of this provision will be rejected.

4.4. Applicants shall be considered to have a conflict of interest, if they participated as a consultant in the preparation of the design or technical specifications or have been hired or proposed to be hired by the Procuring Agency for execution of subsequent Contract Agreement. In addition, Applicants may be considered to have a conflict of interest if they have a close business or family relationship with such professional staff of the Procuring Agency (or a recipient of a part of the funds) who:

4.4.1. are directly or indirectly involved in the preparation of the Prequalification Documents or Bidding Documents or specifications of Contract and/or the Prequalification or Bid evaluation process of such Contract; or

4.4.2. would be involved in the implementation or supervision of such Agreement t, unless the conflict stemming from such relationship has been resolved throughout the Procurement Process, Bidding.

4.5. An Applicant that has been declared debarred or blacklisted shall be ineligible to be prequalified to bid for such period of time and for such type of procurement for which he has been declared debarred or blacklisted. The list of debarred firms and individuals is available at PPRA's website.

4.6. An Applicant shall provide such documentary evidence for determining the eligibility of the Applicant to the reasonable satisfaction of the Procuring Agency.

5. Eligibility (in terms of Nationality)

5.1. Applicants may be ineligible if they are nationals of ineligible countries as indicated in Section V.

B. Contents of the Prequalification Documents

6. Sections of Prequalification Documents

6.1. This set of Prequalification Documents consists of Parts 1 and 2 which comprise all the sections indicated below, and which should be read in conjunction with any Addendum issued in accordance with ITA 8.

PART 1 Prequalification Procedures PART 2 Supply Requirements

6.2. Section I - Instructions to Applicants (ITA)

6.3. Section II - Prequalification Data Sheet (PDS)

6.4. Section III - Qualification Criteria and Requirements

6.5. Section IV - Application Forms

6.6. Section V - Eligible Countries

6.7. Section VI - Fraud and Corruption

6.8. Section VII – Schedule of Requirements

6.9. The Procuring Agency accepts no responsibility for the completeness of the Prequalification documents, responses to requests for clarification, the minutes of the pre-Application meeting (if any), or Addenda to the Prequalification documents in accordance with ITA 8. In case of any discrepancies, documents issued directly through ePADS shall prevail.

6.10. The Applicant is expected to examine all instructions, forms, and terms in the Prequalification Documents and to furnish with its Application all information or documentation as is required by the Prequalification Documents.

7. Clarification of Pre-qualification Documents and Pre-Application Meeting

7.1. An Applicant requiring any clarification of the Pre-qualification Documents shall contact the Procuring Agency in writing through ePADS as. The Procuring Agency will respond in writing through ePADS to any request for clarification provided that such request is received no later than three (03) days prior to the deadline for submission of the Applications. The Procuring Agency shall forward a copy of its response to all prospective

Applicants through ePADS who have obtained the Prequalification Documents from ePADS, including a description of the inquiry but without identifying its source. If so indicated in the PDS, the Procuring Agency shall also promptly publish its response through ePADS. Should the Procuring Agency deem it necessary to amend the Prequalification Documents as a result of a clarification, it shall do so in accordance with the provisions of ITA 16.2.

7.2. If indicated in the PDS, the Applicant's designated representative is invited at the Applicant's cost to attend a pre-Application meeting through online platform / **EPADS v2.0** as per date and time mentioned in the PDS. During this Pre-Application meeting, prospective Applicants may request clarification of the schedule of requirement, the qualification criteria or any other aspects of the Pre-qualification Documents.

7.3. Minutes of the Pre-Application meeting, if applicable, including the text of the questions asked by Applicants, including those during the meeting (without identifying the source) and the responses given, together with any responses prepared after the meeting will be transmitted promptly through ePADS to all prospective Applicants who have obtained the Pre-qualification Documents. Any modification to the Pre-qualification Documents that may become necessary as a result of the pre-Application meeting shall be made by the Procuring Agency exclusively through the use of an Addendum pursuant to ITA 8 and through **EPADS v2.0**. Non-attendance at the pre-Application meeting will not be a cause for disqualification of an Applicant.

8. Amendment of Prequalification Documents

8.1. At any time prior to the deadline for submission of Applications, the Procuring Agency may amend the Prequalification Documents by issuing an Addendum through **EPADS v2.0**.

8.2. Any Addendum issued shall be part of the Prequalification Document and shall be communicated in writing through ePADS to all Applicants who have obtained the Prequalification Documents from the Procuring Agency. The Procuring Agency shall promptly publish the Addendum at the Procuring Agency's web page and **EPADS v2.0**.

Provided that an Applicant who had already submitted their Applications

prior to the issuance of any such addendum shall have the right to withdraw his already submitted Application and submit the revised Application prior to the original or extended Application submission deadline through **EPADS v2.0**.

8.3. To give Applicants reasonable time to take an Addendum into account in preparing their Applications, the Procuring Agency may at its discretion, extend the deadline for the submission of Applications in accordance with ITA 16.2:

Provided that the Procuring Agency shall extend the deadline for submission of Applications, if such an addendum is issued within last three (03) days of the Application submission deadline.

C. Preparation of Applications

9. Cost of Applications

9.1. The Applicant shall bear all costs associated with the preparation and submission of its Application. The Procuring Agency will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the Pre-qualification process.

10. Language of Application

10.1. The Application as well as all correspondence and documents relating to the Pre-qualification exchanged by the Applicant and the Procuring Agency, shall be written in the language specified in the PDS. Supporting documents and printed literature that are part of the Application may be in another language, provided they are accompanied by an accurate translation of the relevant passages in the language specified in the PDS, in which case, for purposes of interpretation of the Application, the translation shall govern.

11. Documents Comprising the Application

11.1. The Application shall comprise the following:

11.1.1. **Application Submission Letter**, in accordance with ITA 12.1;

11.1.2. **Eligibility**: documentary evidence establishing the Applicant's eligibility, in accordance with ITA 13.1;

11.1.3. **Qualifications**: documentary evidence establishing the Applicant's qualifications, in accordance with ITA 14; and

11.1.4. any other document required as specified in the PDS.

11.2. **Application Submission Letter**

11.2.1. The Applicant shall complete an Application Submission Letter as provided in Section IV (Application Forms). This Form must be completed without any alteration to its format.

11.3. **Documents Establishing the Eligibility of the Applicant**

11.3.1. To establish its eligibility in accordance with ITA 4, the Applicant shall complete the eligibility declarations in the Application Submission Letter and Form ELI-1.1 (eligibility), included in Section IV (Application Forms).

11.4. **Documents Establishing the Qualifications of the Applicant**

11.4.1. To establish its qualifications to perform the contract(s) in accordance with Section III (**Qualification Criteria and Requirements**), the Applicant shall provide the information requested in the corresponding Information Sheets included in **Section IV (Application Forms)**.

11.4.2. Wherever an Application Form requires an Applicant to state a monetary amount, Applicants should indicate the Pak Rupee equivalent using the rate of exchange determined as follows:

11.4.2.1. for turnover or financial data required for each year - Exchange rate prevailing on the last day of the respective calendar year (in which the amounts for that year is to be converted).

11.4.2.2. value of single contract - Exchange rate prevailing on the date of the contract.

11.4.3. Exchange rates shall be taken from the publicly available source identified in the PDS. Any error in determining the exchange rates in the Application may be corrected by the Procuring Agency.

11.4.4. The documentary evidence of the Applicant's qualifications to conclude a contract Agreement, shall establish to the Procuring Agency's satisfaction:

11.4.4.1. that, if required in the BDS, an Applicant that does not manufacture or produce the Goods it offers to supply shall submit the Manufacturer's Authorization using the form included in Section IV A (Bidding Forms) to demonstrate that it has been duly authorized by the manufacturer or producer of the Goods to supply these Goods in the Procuring Agency's Country;

11.4.4.2. that, if required in the BDS, in case of an Applicant not doing business within Islamic Republic of Pakistan (or the country where the procurement is being made), the Applicant is, or will be, (if awarded the call off contract) represented by an Agent in the country, equipped and able to carry out the Supplier's maintenance, repair, and spare parts stocking obligations in respect of the Goods.

D. Submission of Applications

15. Submission of the Applications through EPADS v2.0

15.1. The Bidder shall prepare and submit Bid with due diligence after carefully reading all the terms and condition before submission through ePADS in accordance with the procedures specified in the PDS.

15.2. In case the Applicant is a JV, the Application shall submit an authorized representative of the JV on behalf of the JV and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally

authorized signatories.

16. **Deadline for Submission of Applications**

16.1. Applicants shall be submitted through ePADS no later than the deadline indicated in the PDS.

16.2. If required in accordance with the provisions of ITA 8.3, the Procuring Agency will extend the deadline for the submission of Applications, in which case all rights and obligations of the Procuring Agency and the Applicants subject to the previous deadline shall thereafter be subject to the deadline as extended.

16.3. The deadline will be extended in the same manner as that of original Invitation for Prequalification (or the advertisement) through **EPADS v2.0**.

17. **Opening of Applications**

17.1. The Procuring Agency shall open all Applications on the date and time specified in the PDS through **EPADS v2.0**. Late Applications shall be treated in accordance with ITA 16.1.

E. Procedures for Evaluation of Applications

18. **Confidentiality**

18.1. Information relating to the Applications, their evaluation and results of the Prequalification shall not be disclosed to Applicants or any other persons not officially concerned with the Prequalification process until the notification of Prequalification results is made to all Applicants in accordance with ITA 26 through **EPADS v2.0**.

18.2. From the deadline for submission of Applications to the time of notification of the results of the Prequalification in accordance with ITA 26, any Applicant that wishes to contact the Procuring Agency on any matter related to the Prequalification process may do so only in writing through **EPADS v2.0**

19. **Clarification of Applications**

19.1. To assist in the evaluation of Applications, the Procuring Agency may, ask an Applicant for a clarification (including missing documents) of its Application, to be submitted within a stated reasonable period of time. Any request for clarification from the Procuring Agency and all clarifications from the Applicant shall be in writing through **EPADS v2.0**

19.2. If an Applicant does not provide clarifications and/or documents requested by the date and time set in the Procuring Agency's request for clarification, its Application shall be evaluated based on the information and documents available at the time of evaluation of the Application.

20. Responsiveness of Applications

20.1. The Procuring Agency may reject any Application which is not responsive to the requirements of the Prequalification Documents. In case the information furnished by the Applicant is incomplete or otherwise requires clarification as per ITA 19.1, and the Applicant fails to provide satisfactory clarification and/or missing information within prescribed time, it may result in disqualification of the Applicant.

21. Margin of Preference

21.1. Unless otherwise specified in the PDS, a margin of preference shall not apply in the Bidding process resulting from this Pre-qualification.

22. Sub-contractors

22.1. Subcontractors' qualification and experience will not be considered for evaluation of the Applicant. The Applicant on its own (without taking into account the qualification and experience of the Subcontractor) should meet the qualification criteria.

F. Evaluation of Applications and Prequalification of Applicants

23. Evaluation of Applications

23.1. The Procuring Agency shall use the factors, methods, criteria, and requirements defined in Section III, Qualification Criteria and Requirements, to evaluate the qualifications of the Applicants, and no other methods, criteria, or requirements shall be used. The Procuring Agency reserves the right to waive minor deviations from the qualification criteria if they do not materially affect the technical capability and financial resources of an Applicant to perform the contract, however subject to the provisions of ITA 25.

23.2. Subcontractors proposed by the Applicant shall be fully qualified for their parts of the Scope of Supply of the Goods and Allied Services.

23.3. In case of multiple contracts, Applicants should indicate in their Applications the individual contract or combination of contracts in which they are interested. The Procuring Agency shall prequalify each Applicant for the maximum combination of contracts for which the Applicant has thereby indicated its interest and for which the Applicant meets the appropriate aggregate requirements. The Qualification Criteria and Requirements are mentioned in Section III.

Only the qualifications of the Applicant shall be considered. The qualifications of other related entities such as the Applicant's subsidiaries, parent entities, affiliates, subcontractors or any other firm(s) different from the Applicant shall not be taken into consideration in determining the qualifications of the Applicant.

24. Procuring Agency's Right to Accept or Reject Applications

24.1. The Procuring Agency reserves the right to accept or reject all the Applications, and to annul the Prequalification process at any time, without thereby incurring any liability to the Applicants. However, the procuring agency shall record its reasons and justifications on **EPADS v2.0**, duly approved by the Principal Accounting Officer or Head of Organization.

25. Pre-qualification of Applicants

25.1. All Applicants whose Applications substantially meet or exceed the specified qualification requirements will be prequalified by the Procuring

Agency.

25.2. An Applicant may be “conditionally prequalified,” that is, qualified subject to the Applicant submitting or correcting certain specified nonmaterial documents or deficiencies to the satisfaction of the Procuring Agency.

25.3. Applicants that are conditionally prequalified will be so informed along with the statement of the condition(s) which must be met to the satisfaction of the Procuring Agency before or at the time of submitting their Bids.

26. Notification of Prequalification

26.1. The Procuring Agency shall notify all Applicants in writing through **EPADS v2.0** indicating the names of those Applicants who have been prequalified or conditionally prequalified. In addition, those Applicants who have been disqualified will be informed separately through **EPADS v2.0**.

26.2. The procuring agency shall communicate to those suppliers or contractors who have not been pre-qualified the reasons for not pre-qualifying them through **EPADS v2.0**

27. Request for Bids

27.1. Promptly after the notification of the results of the Prequalification, the Procuring Agency will invite the Bids from all the Applicants that have been prequalified through **EPADS v2.0**.

28. Changes in Qualifications of Applicants

28.1. Any change in the structure or formation of an Applicant after being prequalified in accordance with ITA 25 and invited to bid (including, in the case of a JV, any change in the structure or formation of any member thereto) shall be subject to the written approval of the Procuring Agency prior to the deadline for submission of Bids. Such approval shall be denied if:

28.1.1. a prequalified Applicant proposes to associate with a disqualified Applicant or in case of a disqualified joint venture, any of its members;

28.1.2. as a consequence of the change, the Applicant no longer substantially meets the qualification criteria set forth in Section III, Qualification Criteria and Requirements; or

28.1.3. in the opinion of the Procuring Agency, the change may result in a substantial reduction in competition.

28.2. Any such change should be submitted to the Procuring Agency before the date of "Invitation to Bids".

29. Redressal of Grievances

29.1. Procuring agency shall constitute a Grievance Redressal Committee (GRC) and proceed in accordance with the procedure and mechanism defined under Rule-48 of Public Procurement Rules, 2004.

29.2. The GRC shall not have any of the members of Procurement Evaluation Committee. The committee must have one subject specialist depending on the nature of the procurement.

30. Mechanism of Blacklisting

30.1. The procuring agency shall initiate blacklisting or debarment proceedings against any bidder, supplier or contractor in accordance with the mechanism prescribed under Rule-19 of Public Procurement Rules, 2004 read with "Mechanism for Blacklisting Regulations, 2024".



Pre-qualification Data Sheet

Prequalification Data Sheet (PDS)

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

PDS Clause No.	ITA No.	Amendments of, and Supplements to, Clauses in the Instructions to Applicants
A. General		
1.	1.1	Identification Number of the Invitation for Prequalification: P95650 The Procuring Agency is: National Police Foundation (National Police Foundation) List of Works Contracts: <i>See section items and Lots</i>
2.	2.1	The name of Procuring Agency is: National Police Foundation (National Police Foundation) The name of Project / Procurement is: Construction of Houses for ICT Police
3.	4.2	Maximum number of members in a Joint Venture (JV): Nil
4.	4.5	A list of debarred firms and individuals is available on PPRA website: https://ppra.gov.pk
B. Contents of the Prequalification Document		
5.	7.1	For clarification, the Applicant shall seek clarifications through: EPADS v2.0

6.	7.1 & 8.2	Information related to Prequalification shall be published on: EPADS v2.0
7.	7.2	Pre-Application Meeting: Clarification Date: Friday, September 4, 2026 Pre-Bid Meeting: Friday, August 28, 2026 11:00 AM Venue: National Police Foundation HQ Mauve Area G-10/4

C. Preparation of Applications

8.	10.1	This Prequalification Document has been issued in the language: English
9.	11.1(d)	Additional documents to be submitted through EPADS v2.0: No
10.	14.2	Source for determining exchange rates: Not Applicable

D. Submission of Applications

11.	16.1	Deadline for Application Submission: Day: Saturday Date: Saturday, September 5, 2026 Time: 12:00 PM
12.	17.1	Opening of Applications shall be conducted through: EPADS v2.0 Day: Saturday Date: Saturday, September 5, 2026 Time: 12:30 PM Virtual participation link: https://vendors.epads.gov.pk/

E. Procedures for Evaluation of Applications

13.	21.1	Margin of Domestic Preference: Not Applicable (Applicable only if authorized in Procurement Plan)
14.	29.1	Prequalification-related complaints / grievances shall be submitted in writing through: EPADS v2.0 A complaint may challenge: • The terms of the Prequalification Documents • The Procuring Agency's decision not to prequalify an Applicant



Eligibility & Qualification Criteria

Bidder's Type	Required Registration
Partnership Firm	NADRA CITIZENSHIP (CNIC/NICOP)
Company (Private Limited)	FBR (NTN)
Company (Public Limited)	FBR (GSTN)
Company (Holding Company)	PEC

Eligibility Criteria	Document
PEC registration C-3 or above with CE-01, CE-09, CE-10, EE-02, EE-04, EE-06, EE-07, ME-01 & ME-02. Notarized Rs.100 non-judicial stamp-paper affidavit (current month) confirming no debarment/blacklisting. Provide litigation/arbitration details; firms with majority adverse decisions or Govt./Semi-Govt./Autonomous blacklisting disqualified; no-litigation firms must submit affidavit. Security clearance from AIG General ICT Police; valid NTN, GST/PST registration and ATL status required	Yes

Evaluation Criteria

Quality Based Selection (QBS)

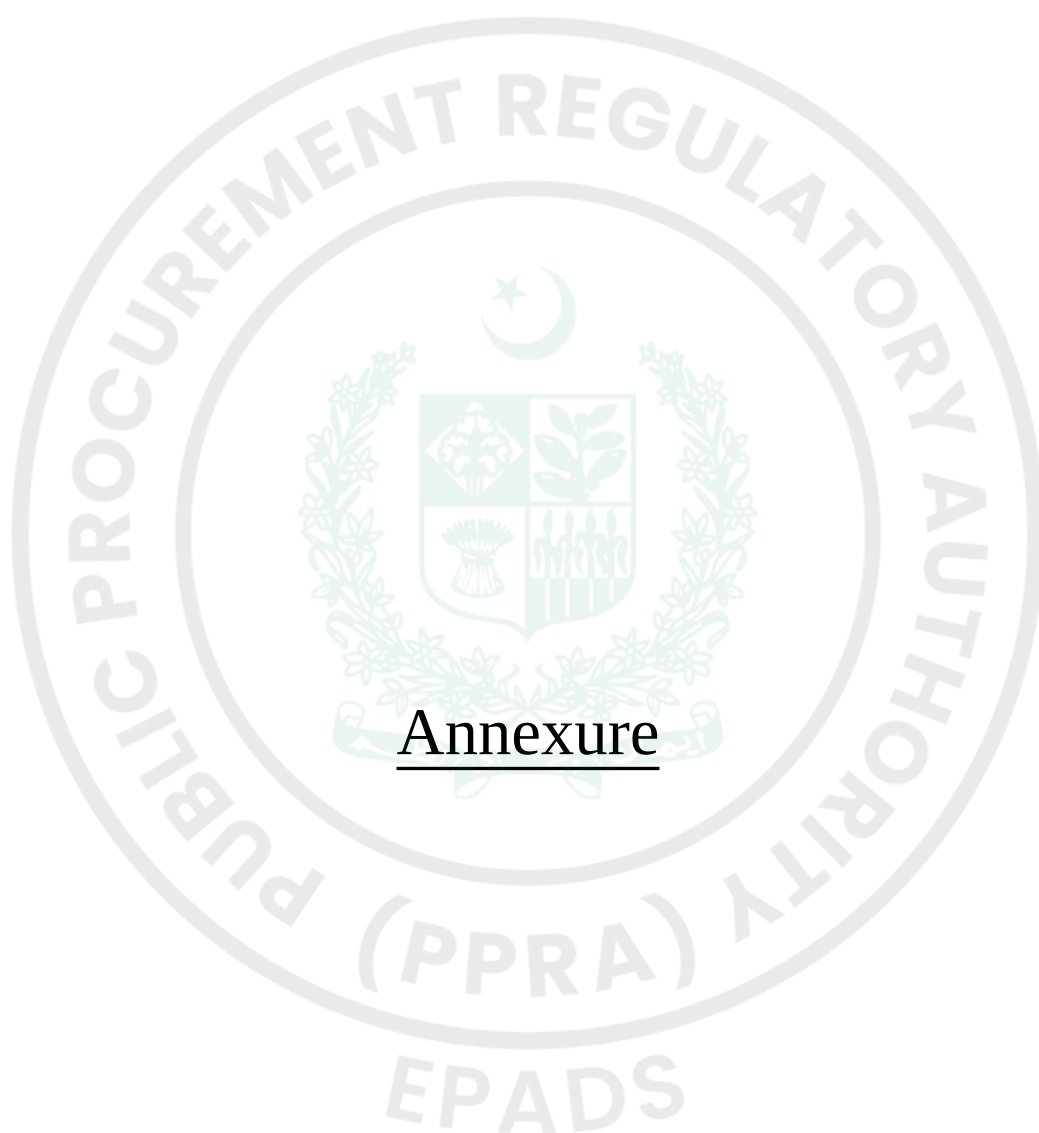
Weightage (With Financial Criteria)

Technical Evaluation Weightage	Financial Evaluation Weightage
70	30

Technical Marks	70
Passing Marks	35
Technical Evaluation Criteria	
Experience as constructor in execution of Building Works Projects completed during last five (05) years. (Quantitative) (Doc Required)	24
Experience as constructor for ongoing/in-hand Building Works Projects. (Quantitative)(Doc Required)	16
Project Manager (B.Sc. Civil Engineer registered with Pakistan Engineering Council) (Quantitative)(Doc Required)	4
Site Engineer (B.Sc. Civil Engineer registered with Pakistan Engineering Council) (Quantitative)(Doc Required)	3
Associate Engineer B-Tech / DAE Civil (Quantitative)(Doc Required)	3
Associate Engineer B-Tech / DAE (E/M) (Quantitative)(Doc Required)	2
Quantity Surveyor B-Tech / DAE Civil (Quantitative)(Doc Required)	2
Surveyor Survey Certificate (Quantitative)(Doc Required)	1
Ready mix concrete Batching Plant (75 cubic meter/ hour) Min 3 No. (Quantitative)(Doc Required)	3
Concrete Pump (capacity 1 cubic meter) Min 1 No. (Quantitative)(Doc Required)	1
Ready mix Transit Mixer (capacity 6 cubic meter) Min. 5 No (Quantitative)(Doc Required)	3
Mobile Crane (150 Tones) Min 1 No (Quantitative)(Doc Required)	1
Excavator Chain 2 No. Tyre: 2 No.) (Quantitative)(Doc Required)	2

Dewatering Pump (3HP) 1 No. (Quantitative)(Doc Required)	1
Scaffolding Min 100,000 Rft (Quantitative)(Doc Required)	1
Shuttering Min 100,000 Sft (Quantitative)(Doc Required)	1
Tractor Trolley Min 3 Nos Steel Cutting / Bending Machine Min 2 No (Quantitative)(Doc Required)	1
Generator Set (100 KVA) Min 2 Nos. Total Station Min 1 Nos. (Quantitative)(Doc Required)	1
Financial Marks	30
Financial Evaluation Criteria	
Annual Turn Over Rs. 500 million to Rs. 600 million Marks 7.5 ii. Above Rs. 600 million (Quantitative)(Doc Required)	15
Above Rs. 600 million (15)	
Liquid Assets / Bank Line of Credit Rs. 100 million to Rs. 200 million Above Rs. 200 million (Quantitative)	15
Above Rs. 200 million (15)	





Annexure

Tender Documents V 1

Technical Submission (Vendor)

Document Required

See Form Under Additional Forms and Documents: **Tender Documents V 1** (page number: 31)

Tender Documents V 2

Technical Submission (Vendor)

Document Required

See Form Under Additional Forms and Documents: **Tender Documents V 2** (page number: 131)

Tender Documents V 3

Technical Submission (Vendor)

Document Required

See Form Under Additional Forms and Documents: **Tender Documents V 3** (page number: 288)

Tender Documents V 4

Technical Submission (Vendor)

Document Required

See Form Under Additional Forms and Documents: **Tender Documents V 4** (page number: 313)



Procurement Forms







Additional Forms and Documents

**MINISTRY OF INTERIOR & NARCOTICS CONTROL NATIONAL
POLICE FOUNDATION (NPF), ISLAMABAD**

CONSTRUCTION OF HOUSES FOR ICT POLICE

TECHNICAL BID

**BIDDING DOCUMENTS
VOLUME – I**

AUGUST, 2026



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

NESPAK House, Sector G-5/2, Islamabad, Tel: 051-9221910-13, Fax: 051-9221914.

**MINISTRY OF INTERIOR & NARCOTICS CONTROL
NATIONAL POLICE FOUNDATION (NPF), ISLAMABAD**

CONSTRUCTION OF HOUSES FOR ICT POLICE

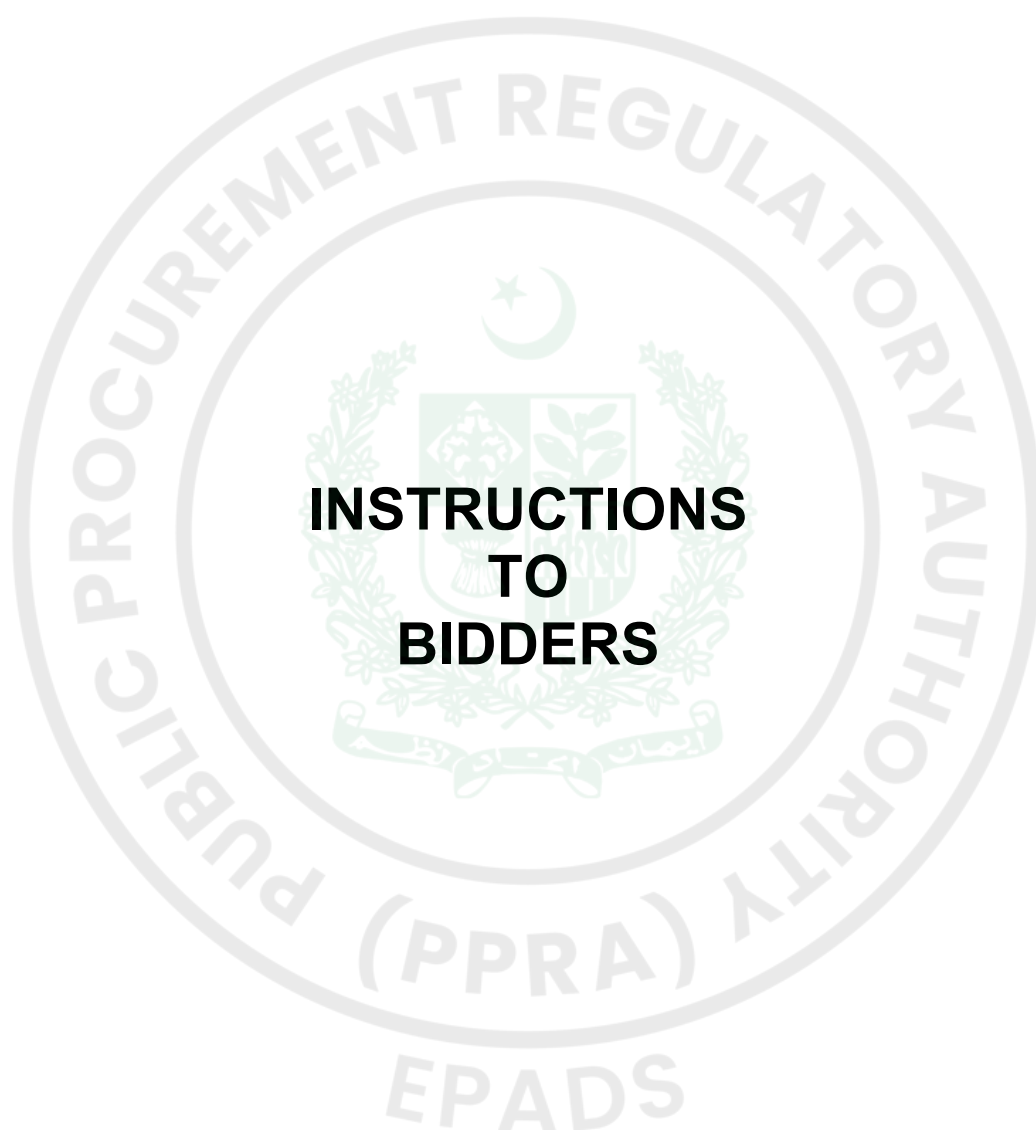
VOLUME – I

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- Bidding Data
- Letter of Technical Bid & Schedules to Bid
- Form of Bid Security, Performance Security, Letter of Acceptance, Form of Contract Agreement, DAAB Agreement, Mobilization Advance Guarantee
- Conditions of Contract, Part-I - General Conditions.
- Conditions of Contract, Part II – Particular Conditions

Part – A: Contract Data

Part – B: Special Provisions



INSTRUCTION TO BIDDERS

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INSTRUCTIONS TO BIDDERS

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

A. GENERAL

- IB.1 Scope of Bid**
- 1.1 The Employer as defined in the Bidding Data hereinafter called “the Employer” wishes to receive bids for the construction and completion of works as described in these Bidding Documents, and summarized in the Bidding Data hereinafter referred to as the “Works”.
- 1.2 The successful bidder will be expected to complete the Works within the time specified in the Bidding Data.
- IB.2 Source of Funds**
- 2.1 The Employer has applied for/received a funding from the source(s) in various currencies towards the cost of the project specified in the Bidding Data and it is intended that part of the proceeds of this funding will be applied to eligible payments under the Contract for which these Bidding Documents are issued.
- IB.3 Eligible Bidders**
- 3.1 This Invitation for Bids is open to all Bidders meeting the following requirements at the time of submission of Bids and thereafter:
- (a) Duly prequalified for this bidding process;
 - (b) Duly licensed by the Pakistan Engineering Council (PEC) in the category relevant to the value of the Works in the relevant field of specialization.
- However, a Foreign Constructor can submit provisional licence with its Bid but the Foreign Constructor will be required to submit standard licence after award of Contract and before start of work.
- Foreign Constructor shall not be eligible to participate in bidding individually. Foreign Constructor shall enter into joint venture with Pakistani Constructor registered with the Pakistan Engineering Council in equivalent/compatible category and submit the joint venture agreement to the Employer before participating in bidding in accordance with PEC Construction and Operation of Engineering Works Bye-laws, 1987;
- (c) Pakistani Constructor must be on Active Taxpayer List of the Federal Board of Revenue and provincial revenue authority/ board where applicable; and
 - (d) All partners constituting the Bidder including proposed subcontractors do not appear in the list of debarred/ blacklisted firms and individuals on the websites of PEC and Federal & Provincial Procurement Regulatory Authorities and have not been declared debarred/ blacklisted by foreign country, international organizations or other foreign institutions.
- IB.4 Eligible Materials, Equipment and Services**
- 4.1 All materials, equipment and services to be supplied under this Contract shall have their origin in eligible countries described under paragraph 4.4 hereunder
- 4.2 For purpose of this Clause, “origin” means the place where the Goods are mined, grown or produced or from where the ancillary services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembling of

components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

- 4.3 The origin of Goods and Services is distinct from the nationality of the Bidder
- 4.4 Eligible countries to participate in this bidding process are those which have been notified by Ministry of Interior, Government of Pakistan as Business Friendly Countries (BVL); information can be accessed through following link:

<http://www.dgip.gov.pk/Files/Visa%20Categories.aspx#L>

IB.5 One Bid per Bidder

- 5.1 Each Bidder shall submit only one Bid either by himself, or as a partner in a joint venture. A Bidder who submits or participates in more than one Bid (other than alternatives pursuant to Clause IB.17) will be disqualified.

IB.6 Site Visit

- 6.1 The Bidders are advised to visit and examine the Site of Works and its surroundings and obtain for themselves on their own responsibility all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. All cost in this respect shall be at the Bidder's own expense.
- 6.2 The Bidders and any of their personnel or agents will be granted permission by the Employer to enter upon his premises and lands for the purpose of such inspection, but only upon the express condition that the Bidders, their personnel and agents, will release and indemnify the Employer, his personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of such inspection.

B. BIDDING DOCUMENTS

IB.7 Contents of Bidding Documents

- 7.1 The Bidding Documents, in addition to Invitation for Bids, are those stated below and should be read in conjunction with any Addenda issued in accordance with Clause IB.9.
1. Instructions to Bidders.
 2. Bidding Data.
 3. Evaluation Criteria and Qualification Updating Forms
 4. General Conditions (GC).
 5. Particular Conditions (PC).
 - Part A - Contract Data;
 - Part B - Special Provisions
 6. Specifications (SP)
 - Part A – Specific Provisions
 - Part B – Technical Provisions
 7. Letter of Bid.
 8. Schedules to Bid
 9. Standard Forms
 - (i) Form of Bid Security;
 - (ii) Letter of Acceptance;
 - (iii) Form of Contract Agreement;
 - (iv) Form of Performance Security;

- (v) DAAB Agreement;
- (vi) Form of Mobilization Advance Guarantee

10. Drawings.

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

IB.8 Clarification of Bidding Documents, Pre-Bid Meeting

- 8.1 Any prospective Bidder requiring any clarification(s) in respect of the Bidding Documents may notify the Employer in writing at the Employer's address indicated in the Invitation for Bids. The Employer will respond to any request for clarification which he receives earlier than the period specified in the Bidding Data, prior to the deadline for submission of bids.
- 8.2 Copies of the Employer's response will be forwarded to all purchasers of the Bidding Documents, including a description of the enquiry but without identifying its source.
- 8.3 The Employer may, on his own or at the request of any prospective Bidder(s), hold a pre-bid meeting to clarify issues and to answer any questions on matters related to the Bidding Documents. The date, time and venue of pre-bid meeting, if convened, are as stipulated in the Bidding Data. All prospective Bidders or their authorized representatives shall be invited to attend such a pre-bid meeting.
- 8.4 The Bidders are requested to submit questions, if any, in writing so as to reach the Employer not later than seven (7) days before the proposed pre-bid meeting.
- 8.5 Minutes of the pre-bid meeting, including the text of the questions raised and the replies given, will be transmitted without delay to all purchasers of the Bidding Documents. Any modification of the Bidding Documents listed in Sub-Clause IB.7.1 hereof which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause IB.9 and not through the minutes of the pre-bid meeting.
- 8.6 Absence at the pre-bid meeting will not be a cause for disqualification of a Bidder.

IB.9 Amendment of Bidding Documents

- 9.1 At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by issuing addendum.
- 9.2 Any addendum thus issued shall be part of the Bidding Documents listed in Sub-Clause IB.7.1 hereof and shall be communicated in writing to all purchasers of the Bidding Documents. Prospective Bidders shall acknowledge receipt of each addendum in writing to the Employer.
- 9.3 Such addendum shall be issued not later than number of days prior to the deadline for submission of bids, specified in the Bidding Data. To afford prospective Bidders reasonable time in which to take an addendum into account in preparing their bids,

the Employer may extend the deadline for submission of bids in accordance with Clause IB.20.

C. PREPARATION OF BIDS

- IB.10 Cost of Bidding** 10.1 The Bidders shall bear all costs associated with the preparation and submission of their respective bids and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
- IB.11 Language of Bid** 11.1 The Bid and all correspondence and documents related to the Bid exchanged by a Bidder and the Employer shall be in the Bid language stipulated in the Bidding Data and Particular Conditions of Contract. Supporting documents and printed literature furnished by the Bidders may be in any other language provided the same are accompanied by duly certified translation of the relevant parts in the Bid language, in which case, for purposes of evaluation of the bid, the translation in Bid language shall prevail.
- IB.12 Documents Comprising the Bid** 12.1 Each bidder shall:
- (a) submit duly filled in, signed and stamped Letter of Bid and completed Schedules to Bid as required, including priced Bill of Quantities, in accordance with Clause IB.18 hereof;
 - (b) submit Bid Security in accordance with Clause IB.16 hereof
 - (c) submit alternative proposal, if permissible in accordance with Clause IB.17
 - (d) submit a written power of attorney authorizing the signatory of the Bid to act for and on behalf of the Bidder. The name and position held by each person signing the authorization must be typed or printed below the signature.
 - (e) submit the Qualification Updating Forms duly filled in, signed and stamped along with requisite attachments, to establish that the Bidder continues to meet the Eligibility and Qualification Criteria set out in the Pre-Qualification Documents and as provided in the Section "Evaluation Criteria and Qualification Updating Forms".
 - (f) furnish a technical proposal taking into account the various Schedules to Bid, specially the following:

Schedule-C to Bid,	Proposed Construction Schedule;
Schedule-D to Bid,	Method of Performing the Work;
Schedule-E to Bid,	List of Major Equipment;
Schedule-F to Bid,	Organization Chart for Supervisory Staff;

 and other pertinent information, such as mobilization programme, etc
- 12.2 Bids submitted by a joint venture of two (2) or more firms specified in **Bidding Data**, shall comply with the following requirements:
- (a) 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;

- (b) one of the joint venture partners shall be nominated as being in-charge; and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the joint venture partners;
- (c) the partner-in-charge shall always be duly authorized to deal with the Employer regarding all matters related with and/or incidental to the execution of Works as per the terms and Conditions of Contract and in this regard to incur any and all liabilities, receive instructions, give binding undertakings and receive payments on behalf of the joint venture;
- (d) all partners of the joint venture shall at all times and under all circumstances be liable jointly and severally for the execution of the Contract in accordance with the Contract terms and a statement to this effect shall be included in the authorization mentioned under Sub-Para(b) above as well as in the Letter of Bid and in the Form of Contract Agreement (in case of a successful bid); and
- (e) a copy of the agreement entered into by the joint venture partners shall be submitted with the bid stating the conditions under which it will function, its period of duration, the persons authorized to represent and obligate it and which persons will be directly responsible for due performance of the Contract and can give valid receipts on behalf of the joint venture, the proportionate participation 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.

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

IB.13 Bid Prices

- 13.1 The price and discount if any quoted by the Bidders in the Letter of Bid and in the Bill of Quantity shall conform to the requirement specified below:
- 13.2 The Bidder shall quote any discounts and the methodology for their application.
- 13.3 If bids are being invited for individual lots (contracts) or for any combination of lots, the Bidders can offer discounts for the individual lots (contracts) as well as for award of more than one Contract and shall specify in their bid.
- 13.4 Unless stated otherwise in the Bidding Documents, the Contract shall be for the whole of the Works as described in Sub-Clause IB.1.1 hereof, based on the unit rates and/or prices.
- 13.5 The Bidders shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by a Bidder will not be paid for by the Employer when executed and shall be deemed covered by rates and prices for other items in the Bill of Quantities.
- 13.6 All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior

to the deadline for submission of bids shall be included in the rates and prices and the total Bid Price submitted by a Bidder.

Additional/reduced duties, taxes and levies due to subsequent additions or changes in legislation shall be reimbursed/ deducted as per Sub Clause 13.6 [*Adjustment for Changes in Laws*] of the Conditions of Contract

- 13.7 The rates and prices quoted by the Bidders are subject to adjustment during the performance of the Contract in accordance with the provisions of Sub-Clause 13.7 [*Adjustments for Changes in Cost*] of the General Conditions of Contract. The Bidders shall furnish the prescribed information for the price adjustment formulae in Schedule-A to Bid, and shall submit with their bids such other requisite supporting information if required under the said Schedule

IB.14 Currencies of Bid and Payment

- 14.1 The unit rates and the prices shall be quoted by the Bidder entirely PKR.
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 PKR.

- 14.2 The rates of exchange to be used by the Bidder for currency conversion shall be the TT Selling Rates published or authorized by the State Bank of Pakistan prevailing on the date twenty eight (28) days prior to the deadline for submission of bids. Such rates shall be notified by the Employer not later than fourteen (14) days prior to the deadline for submission of Bids.

For the purpose of payments, the exchange rates used in Bid preparation shall apply for the duration of the Contract.

IB.15 Bid Validity

- 15.1 Bids shall remain valid for the period stipulated in the Bidding Data after the date of Bid Opening specified in Clause IB.23.
- 15.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Employer may request that the Bidders extend the period of validity for a specified additional period which normally may not be more than the original bid validity period. The request and the responses thereto shall be made in writing. A Bidder may refuse the request without forfeiting his Bid Security. A Bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his Bid Security for the period of the extension, and in compliance with Clause IB.16 in all respects.

IB.16 Bid Security

- 16.1 Each Bidder shall furnish, as part of his bid, a Bid Security in original form in the amount stipulated in the Bidding Data in PKR or an equivalent amount in a freely convertible currency.
- 16.2 The Bid Security shall be, at the option of the Bidder, in the form of Call Deposit Receipt (CDR)/ Pay Order or a Security issued in 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

Company listed in the Bidding Data and rated by PACRA/VIS of rating as provided in Table below in favour of the Employer valid for a period 14 days beyond the Bid Validity date. The Bid Security of Joint Venture shall be in the name of Joint Venture or Lead/either Firm of the JV or in ratio of shares of the individual JV partners, submitting the bid.

Bid Price (In Eq. million PKR)	Minimum Rating Insurance Company
Up to 1000	A (+)
1001 to no limit	AA

[Note: Insurance Company includes Joint Venture Insurance Companies also]

- 16.3 Any Bid not accompanied by an acceptable Bid Security shall be rejected by the Employer as non-responsive.
- 16.4 The Bid Securities of the Bidders except the lowest three will be returned by the Employer within twenty eight (28) days from the opening of Bids, provided a Bidder requests for the return of its Bid Security, or upon the expiry of original validity of Bid Security or as extended, whichever is earlier.
- 16.5 The Bid Security of the lowest three Bidders including the successful Bidder will be returned when the successful Bidder has furnished the required Performance Security.
- 16.6 The Bid Security may be forfeited:
- (a) if the Bidder withdraws his bid except as provided in Sub Clause IB.22.1;
 - (b) if the Bidder does not accept the correction of his Bid Price pursuant to Sub Clause IB.28.2 hereof; or
 - (c) in the case of successful Bidder, fails to furnish the required Performance Security.
- 16.7 In case of annulment, all Bids submitted and specially, Bid securities, shall be returned to the Bidders within 14 days of annulment.

IB.17 Alternate Proposals by Bidder

- 17.1 Unless otherwise specified in the **Bidding Data**, alternative proposal(s) shall not be considered.
- 17.2 Should any Bidder consider that he can offer any advantages to the Employer by a modification to the designs, specifications or other conditions, he may, in addition to his Bid to be submitted in strict compliance with the Bidding Documents, submit any alternative proposal(s) containing (a) relevant design calculations; (b) technical specifications; (c) proposed construction methodology; and (d) any other relevant details/conditions, provided always that the total sum entered on the Letter of Bid shall be that which represents complete compliance with the Bidding Documents.

- 17.3 Alternative proposal(s), if any, of the Bidder having submitted most advantageous Bid only may be considered by the Employer as the basis for the award of Contract to such Bidder.

IB.18 Format and Signing of Bid

- 18.1 Bidders are particularly directed that the amount entered on the Letter of Bid shall be for performing the Contract strictly in accordance with the Bidding Documents.
- 18.2 All Schedules to Bid are to be properly completed and signed.
- 18.3 No alteration is to be made in the Letter of Bid nor in the Schedules thereto except in filling up the blanks as directed. If any such alterations be made or if these instructions be not fully complied with, the Bid may be rejected.
- 18.4 Each Bidder shall prepare by filling in the forms completely and without alterations one (1) original and number of copies, specified in the **Bidding Data**, of the documents comprising the Bid as described in Clause IB.12 and clearly mark them "ORIGINAL" and "COPY" as appropriate. In the event of discrepancy between them, the original shall prevail.
- The Bidder shall also provide complete searchable PDF versions as well as Word, Excel, etc., versions of the Bid if so required in the **Bidding Data**.
- 18.5 The original of the Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder pursuant to Sub-Clause IB.12.1(d) hereof. All pages of the Bid shall be initialled and stamped by the person or persons signing the bid.
- 18.6 The Bid shall contain no alterations, omissions or additions, except to comply with instructions issued by the Employer, or as are necessary to correct errors made by the Bidder, in which case such corrections shall be initialled by the person or persons signing the Bid.
- 18.7 Bidders shall indicate in the space provided in the Letter of Bid their full and proper addresses at which notices may be legally served on them and to which all correspondence in connection with their bids and the Contract is to be sent.
- 18.8 Bidders should retain a copy of the Bidding Documents and the Bid as their file copy.
- 18.9 All documents executed outside Pakistan required to be submitted with the Bid must be certified by Pakistani Embassy in the respective country (ies).

D. SUBMISSION OF BIDS

IB.19 Sealing and Marking of Bids

- 19.1 Each Bidder shall submit his Bid as under:
- (a) ORIGINAL and each copy of the Bid shall be separately sealed and put in separate envelopes and marked as such.
- (b) The envelopes containing the ORIGINAL and copies will be put in one sealed envelope and addressed / identified as

given in Sub Clause IB.19.2 hereof.

- 19.2 The inner and outer envelopes shall:
- (a) be addressed to the Employer at the address provided in the **Bidding Data**;
 - (b) bear the specific identification of this bidding process as specified in the **Bidding Data**; and
 - (c) provide a warning not to open before the time and date for bid opening, as specified in the **Bidding Data**.

19.3 In addition to the identification required in Sub-Clause IB.19.2 hereof, the inner envelope shall indicate the name and address of the Bidder to enable the Bid to be returned unopened in case it is declared "late" pursuant to Clause IB.21.

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

IB.20 Deadline for Submission of Bids

- 20.1 (a) Bids must be received by the Employer at the address specified no later than the time and date stipulated in the **Bidding Data**.
- (b) Bids with charges payable will not be accepted, nor will arrangements be undertaken to collect the bids from any delivery point other than that specified above. Bidders shall bear all expenses incurred in the preparation and delivery of Bids. No claims will be entertained for refund of such expenses.
- (c) Where delivery of a Bid is by mail and the Bidder wishes to receive an acknowledgment of receipt of such Bid, he shall make a request for such acknowledgment in a separate letter attached to but not included in the sealed Bid envelope.
- (d) Upon request, acknowledgment of receipt of Bids will be provided to those making delivery in person or by messenger..

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

IB.21 Late Bids

- 21.1 (a) Any Bid received by the Employer after the deadline for submission of bids prescribed in Clause IB.20 shall be declared late, rejected and returned unopened to such Bidder.
- (b) Delays in the mail, delays of person in transit, or delivery of a Bid to the wrong office shall not be accepted as an excuse for failure to deliver a Bid at the proper place and time. It shall be the Bidder's responsibility to determine the manner in which timely delivery of his Bid will be accomplished either in person, by messenger or by mail.

IB.22 Modification, Substitution and Withdrawal of Bids

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

- 22.2 The modification, substitution, or notice for withdrawal of any Bid shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause IB.19 with the outer and inner envelopes additionally marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" as appropriate.
- 22.3 No Bid may be modified by a Bidder after the deadline for submission of Bids except in accordance with Sub Clauses IB.22.1 and 28.2.
- 22.4 Withdrawal of a Bid during the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified in the Letter of Bid may result in forfeiture of the Bid security in pursuance to Clause IB.16.

E. BID OPENING AND EVALUATION

IB.23 Bid Opening

- 23.1 The Employer will open the Bids including withdrawals, substitution and modifications made pursuant to Clause IB.22, in the presence of Bidders' representatives who choose to attend, at the time, date and location stipulated in the **Bidding Data**. The Bidders' representatives who are present shall sign a register evidencing their attendance.
- 23.2 Envelopes marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" shall be opened and read out first. Bids for which an acceptable notice of withdrawal has been submitted pursuant to Clause IB.22 shall not be opened. Only bids that are opened and read out at Bid opening shall be considered further.
- 23.3 The Bidder's name, total Bid Price and price of any alternative proposal(s), any discounts, Bid modifications, substitution and withdrawals, the presence or absence of Bid security, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening of Bids. Only discounts and alternative proposals read out at Bid opening shall be considered for evaluation. The Letter of Bid and the Summary Bill of Quantities are to be initialled by representative(s) of the Employer attending Bid opening. The Employer shall neither discuss the merits of any Bid nor reject any Bid (except for late Bids, in accordance with Sub-Clause IB 21.1)
- 23.4 The Employer shall prepare minutes of the Bid opening, including the information disclosed to those present in accordance with the Sub-Clause IB.23.3.

IB.24 Process to be Confidential

- 24.1 Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of Contract shall not be disclosed to Bidders or any other person not officially concerned with such process before the announcement of the result of Bid evaluation in the form of final evaluation report giving justification for acceptance or rejection of Bids which shall be done at least fifteen (15) days prior to award of Contract. The announcement to all Bidders will include table(s) comprising read out prices, discounted prices, price adjustments made, final evaluated prices and recommendations against all the Bids evaluated. Any effort by a Bidder to influence the Employer's processing of Bids or Contract award decisions may result in the rejection of such Bidder's Bid. Whereas any Bidder feeling

aggrieved may lodge a written complaint not later than five (5) days after the announcement of the final evaluation report.

IB.25 Clarification of Bids

25.1 To assist in the examination, evaluation and comparison of Bids, the Employer may, at his discretion, ask any Bidder for clarification of his Bid, including breakdowns of unit rates and lump sum prices. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The request for clarification and the response shall be in writing. No change in the price or substance of the Bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids in accordance with Clause IB.28.

25.2 The Employer may, at his discretion, ask any Bidder for confirmation/submission of missing information to clarify its Bid. However, the Employer does not have an obligation to request any additional information or clarification with respect to missing or deficient information in a Bid. The Employer may reject any Bid as non-responsive if found materially incomplete, obscure, irregular or omitting any material information required to be submitted in accordance with the Bidding Documents.

25.3 If a Bidder does not provide clarifications of its Bid by the date and time set reasonably (not less than seven (7) days) in the Employer's request for clarification, the Employer may proceed with the evaluation based on the information submitted in the Bid without waiting for the Bidder's response.

IB.26 Examination of Bids and Determination of Responsiveness

26.1 Prior to the comparison of Bids, the Employer will determine whether each Bid is substantially responsive to the requirements of the Bidding Documents.

26.2 The Employer's determination of a Bid's responsiveness is to be based on the contents of the Bid itself, as defined in Sub- Clause IB.12.

26.3 A substantially responsive Bid is one which meets the requirements of the Bidding Documents, without material deviation, reservation or omission. A material deviation, reservation or omission is one that,

(a) if accepted, would:

- (i) affect in any substantial way the scope, quality or performance of the Works; or
- (ii) limit in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the Bidder's obligations under the proposed Contract; or

(b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.

26.4 During the evaluation of Bids, the following definitions apply:

- (a) "Deviation" is a departure from the requirements specified in the Bidding Documents;
- (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Documents; and
- (c) "Omission" is the failure to submit part or all of the

information or documentation required in the Bidding Documents

- 26.5 The Employer shall examine the technical aspects of the Bid submitted in accordance with Sub-Clause IB.12.1(f), in particular, to confirm that all requirements stated in Specifications have been met without any material deviation, reservation or omission.
- 26.6 If a Bid is not substantially responsive to the requirements of the Bidding Documents, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation, reservation or omission.
- IB.27 Nonmaterial Nonconformities**
- 27.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid.
- 27.2 Provided that a Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.
- 27.3 Provided that a Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component, by adding the average price of the item or component quoted by other lowest two evaluated substantially responsive Bidders. If the price of the item or component cannot be derived from the price of other substantially responsive Bids, the Employer shall use a suitable CSR, adjusted to the date 28 days earlier to the Bid submission date or its best assessment.
- IB.28 Correction of Errors**
- 28.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:
- (a) where there is a discrepancy between the amounts in figures and in words, the amount in words will govern
 - (b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer there is an obviously gross misplacement of the decimal point in the unit rate, in which case the line item total as quoted will govern and the unit rate will be corrected.
 - (c) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected
- 28.2 The amount stated in the Letter of Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and with the concurrence of the Bidder, shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected Bid Price, his Bid will be rejected, and the

Bid security shall be forfeited in accordance with Sub Clause IB.16.6(b) hereof.

IB.29 Evaluation and Comparison of Bids

- 29.1 The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Clause IB.26. The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted.
- 29.2 In evaluating and comparing the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:
- (a) making any correction for arithmetic errors pursuant to Clause IB.28;
 - (b) price adjustment due to discounts offered in accordance with Sub-Clause IB.23.3
 - (c) excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities, but including competitively priced daywork;
 - (d) making an appropriate price adjustment for any quantifiable nonmaterial nonconformities in accordance with Sub-Clause IB.27.3; and
 - (e) the additional evaluation factors are specified in Section Evaluation Criteria and Qualification Updating Forms
- 29.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in Bids' comparison.

IB.30 Abnormally Low Bids

- 30.1 If the Bid Price of the successful Bidder is more than 15% below the lower of the Employer's estimate of the cost of work to be performed under the Contract or average of other lowest two evaluated substantially responsive Bids, 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, the Employer may require an additional Performance Security by 10% of the difference of the Bid Price as determined hereinabove upto issuance of Taking Over Certificate at the expense of the successful Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract. The Bids having Bid Price lower than 25% shall be liable to be rejected.

IB. 31 Unbalanced or Front Loaded Bids

- 31.1 If the Bid of the successful Bidder is seriously unbalanced (Front Loaded) in relation to the average of other evaluated substantially responsive Bids, the Employer during execution of contract may pay against measured quantities of significantly higher quoted line item(s) rate(s) with respect to same line item(s) rate(s) determined from the average of other lowest two evaluated substantially responsive Bids as instructed by the Engineer. The balance line item(s) rate(s) may be paid against the same measured quantities at the time of issuance of Taking Over Certificate or as instructed by the Engineer.

F. AWARD OF CONTRACT

IB.32 Award Criteria

- 32.1 Subject to Clauses IB.33 and IB.39, the Employer will award the

Contract to the Bidder whose Bid has been determined as most advantageous Bid (substantially responsive to requirements of the Bidding Documents with the lowest evaluated Bid Price).

IB.33 Employer's Right to Annul the Bidding Process

33.1 Notwithstanding Clause IB.32, the Employer reserves the right to annul the bidding process and reject all Bids, at any time prior to award of Contract, without thereby incurring any liability to the affected Bidders or any obligation.

The Employer shall upon request communicate to any Bidder who submitted a Bid, the grounds for its rejection of all Bids but is not required to justify those grounds. Rejection of all Bids shall be notified to all Bidders promptly.

IB.34 Notification of Award

34.1 Prior to expiration of the period of Bid validity prescribed by the Employer, the Employer will notify the successful Bidder in writing ("Letter of Acceptance") that his Bid has been accepted. This letter shall name the sum which the Employer will pay the Contractor in consideration of the execution and completion of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Conditions of Contract called the "Accepted Contract Amount").

The Letter of Acceptance will also state the remedies with respect to Sub-Clauses IB.30 & IB.31 if applicable.

34.2 No negotiation with the Bidder having submitted most advantageous Bid or any other Bidder shall be permitted, however, Employer may have clarification meetings before issuing Letter of Acceptance to get clarified any item in the Bid evaluation report.

34.3 The Letter of Acceptance/ notification of award and its acknowledgement/acceptance by the Bidder will constitute the formation of the Contract, binding the Employer and the Bidder till signing of the formal Contract Agreement.

34.4 Upon furnishing by the successful Bidder of a Performance Security, the Employer will promptly notify the other Bidders that their Bids have been unsuccessful and return their Bid securities in accordance with Sub-Clause IB.16.5.

IB.35 Performance Security

35.1 The successful Bidder shall furnish to the Employer a Performance Security in the form and the amount stipulated in the Conditions of Contract and additional Performance Security if applicable under IB.30 as stated in the Letter of Acceptance, within a period of 28 days after the receipt of Letter of Acceptance.

35.2 Failure of the successful Bidder to comply with the requirements of Sub Clause IB.35.1 or Clauses IB.36 or IB.37 shall constitute sufficient grounds for the annulment of the award, forfeiture of the Bid security and to award the Contract to the Bidder having submitted next advantageous Bid.

IB.36 Signing of Contract Agreement

36.1 Within 14 days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Employer will notify the successful Bidder to depute its representative with appropriate Power of Attorney to sign the Contract Agreement in the form provided in the Bidding

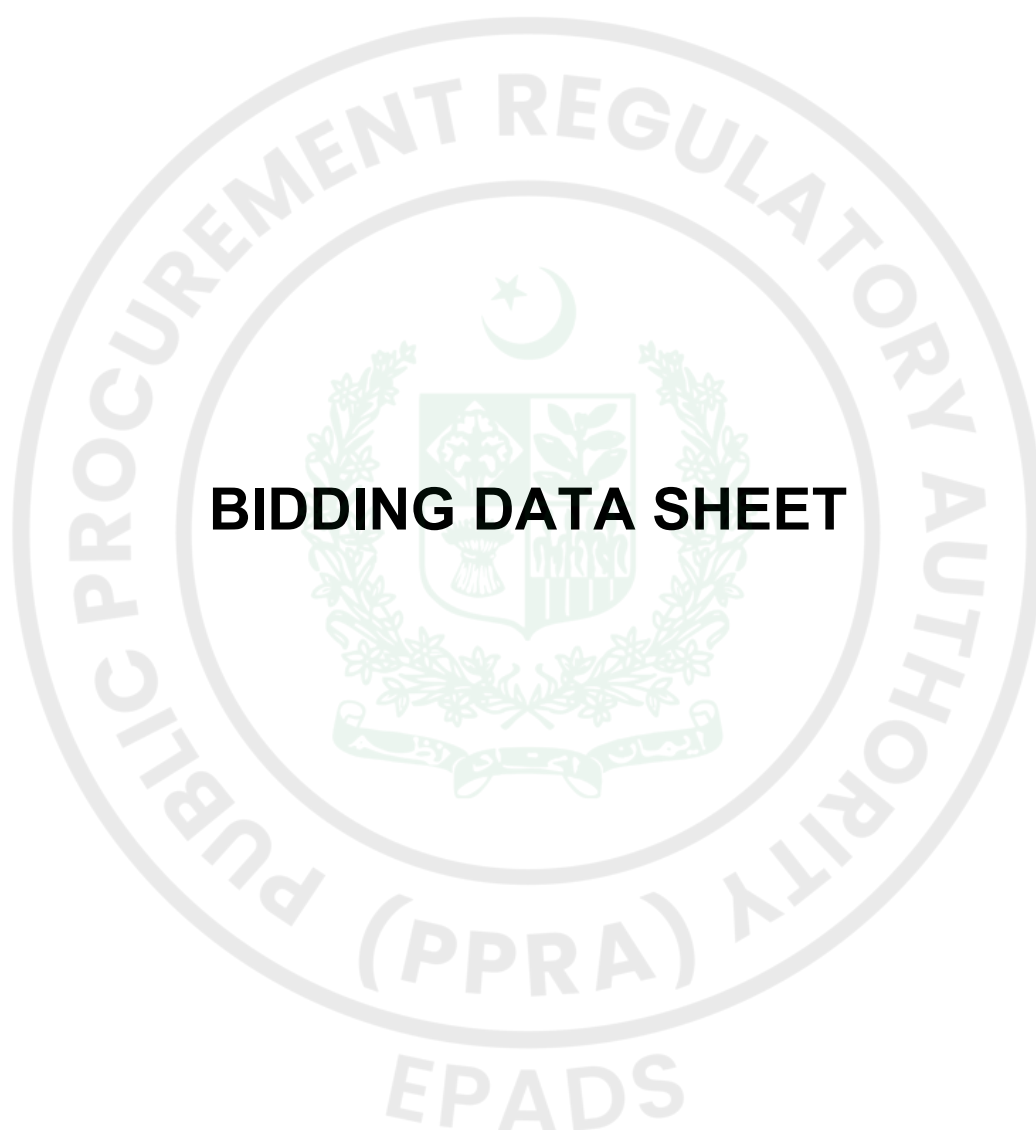
Documents, incorporating all agreements between the parties.

- 36.2 The formal Agreement between the Employer and the successful Bidder shall be executed within 14 days of the receipt of the above stated notification by the successful Bidder from the Employer.

- IB.37 Integrity Pact** 37.1 The Bidder shall sign and stamp the Integrity Pact provided at Schedule-J to Bid in the Bidding Documents for all Federal Government procurement contracts exceeding PKR ten million. Failure to provide such Integrity Pact shall make the Bidder non-responsive.

- IB.38 Instructions not part of Contract** 38.1 Bids shall be prepared and submitted in accordance with the Instructions to Bidders which are provided to assist the Bidders in preparing Bids but do not constitute part of the Contract.

- IB.39 Corrupt and Fraudulent Practices** 39.1 The Employer will reject a Bid if it determines that the Bidder recommended for award, or any of its personnel, or its agents, or its sub-contractors, service providers, suppliers and/or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract under this bidding.
- 39.2 The Employer will blacklist and hence forthwith debar a Constructor or individual, at any time, in accordance with the prevailing Public Procurement Rules 2004



BIDDING DATA

The following specific data for the Works to be bidden shall complement, amend, or supplement the provisions in the Instructions to Bidders. Wherever there is a conflict, the provisions herein shall prevail over those in the Instructions to Bidders.

**Instructions to
Bidders**
Clause Reference

Clause IB.1

Scope of Bid

Sub Clause 1.1

Name and address of the Employer

The Employer is:

National Police Foundation (NPF)

(Hereinafter called "The Employer" Which expression shall include the successors, legal representatives and permitted assignees).

Director Admin

National Police Foundation (NPF),
NPF Head Office, Mauve Area,
G-10, Islamabad
Ph: 051-2350100
Fax: 051-----

Name of the Project and Summary of the Works

The name of the Project is:

"Construction of Houses for ICT Police at Police Lines Headquarters, H-11, Islamabad"

The Summary of Works:

National Police Foundation (NPF) intends to construct Houses for ICT Police at Police Lines Headquarters, H-11, Islamabad.

The scope of works mainly comprises construction of houses, allied external development works and related ancillary works lying 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.

Sub-Clause 1.2

Time for Completion

180 days

Clause IB.2

Source of Funds

Sub-Clause 2.1

Delete the text of Sub-Clause 2.1 and substitute with the following:

The Employer has sufficient funds of its own to cover the Cost of the entire Project for which these Bidding Documents are issued.

Houses for ICT Police – NPF, Islamabad

Clause IB.3 Eligible Bidders

Sub-Clause 3.1 Delete the text of Sub-Clause 3.1 (a) in its entirety.

Clause IB.5 One Bid per Bidder

Sub-Clause 5.1 Delete the text of Sub-Clause 5.1 and substitute with the following:

Each bidder shall submit only one bid. Joint venture of firms is not allowed. A bidder who participates in more than one bid (other than alternatives pursuant to Clause IB.17) will be disqualified.

Clause IB.7 Contents of Bidding Documents

Sub-Clause 7.1 Delete the text of Sub-Clause 7.1 and substitute with the following:

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

Technical Bid**7.1.1 Volume - I**

- Instruction to Bidders;
- Bidding Data;
- Evaluation Criteria and Qualification Updating Forms;
- Letter of Technical Bid;
- Schedules to Bid;
- Form of Bid Security, Form of Performance Security, Letter of Acceptance, Form of Contract Agreement, DAB Agreement, Form of Mobilization Advance Guarantee;
- General Conditions;
- Particular Conditions:
 - Part A – Contract Data;
 - Part B- Special Provisions.

7.1.2 Volume – II

- Specifications:
 - Part A – Specific Provisions;
 - Part B – Technical Provisions.

7.1.3 Volume – III

- Bid Drawings.

Price Bid**7.1.5 Volume – IV**

- Letter of Price Bid;
- Preamble to Bill of Quantities;
- Bill of Quantities.

Clause IB.8 Clarification of Bidding Documents, Pre-Bid Meeting**Sub-Clause 8.1 Time limit for clarification**

03 days

Sub-Clause 8.3**Venue, time, and date of the pre-bid meeting**

The Bidder or his official representative are invited to attend a pre-bid meeting which will take place on the date, time and venue as stated in Notice of Invitation for Bids.

Sub-Clause 8.4

The Bidders are requested to submit questions, if any, in writing so as to reach the Employer not later than five (05) days before the date given for pre-bid meeting in the Notice Inviting Bids.

Clause IB.9**Amendment of Bidding Documents****Sub-Clause 9.3**

Number of days: 03 days

Clause IB.11**Language of Bid****Sub-Clause 11.1**

English.

Clause IB.12**Documents Comprising the Bid****Sub-Clause 12.1**

Delete the text of Sub-Clause 12.1 and substitute with the following:

12.1 (A)

The Bidder shall submit with its **Technical Bid** the following documents:

Volume - I

- (i) Letter of Technical Bid;
- (ii) Bid Security in accordance with Clause IB.16;
- (iii) Written power of attorney authorizing the signatory of the Bid;
- (iv) Original Bidding Documents (Volume – I);
- (v) Dully filled in Appendices to Bid (except Schedules B to Bid);
- (vi) Qualification documents establishing bidders' eligibility as per Section "Evaluation Criteria and Qualification Updating Forms".

Volume – II

- (i) Specifications
 - Part A – Specific Provisions
 - Part B – Technical Provisions

Volume – III

- (i) Drawings

12.1 (B)

The Bidder shall submit with its **Price Bid** the following documents:

Volume – IV

- (i) Letter of Price Bid
- (ii) Preamble to Bill of Quantities
- (iii) Schedule – B to Bid (Bill of Quantities)

Sub-Clause 12.2

Delete the Sub-Clause in its entirety.

Sub-Clause 12.3

The Bidder shall also submit along with the Bid the entire original document issued to him comprising Volume-I to Volume-IV.

Clause IB. 13**Bid Prices****Sub-Clause 13.5**

Delete the text of Sub-Clause 13.5 and substitute with the following:

For Scheduled and Non-Scheduled Items, Bidder Shall Quote Premium in the Form of Percentage Above or Below the estimated price put to bid provided in the Summary of Estimate. Prices provided in the estimate against items are complete inclusive value of the finished work without any hidden technical and/ or financial reservations or implications. Bidders shall not modify, change, nor add any footnotes or any conditions to the Estimate.

Sub-Clause 13.6

The Bidder shall obtain all information as to Pakistan Income Tax, Salaries Tax, Company Taxes, Municipal Octroies, Levies and any other taxes imposed by the Government of Pakistan/Provincial Governments/local bodies, export and import duties and necessary permits and conform the requirements thereof at his own responsibility and include the same in quoted Bid Price. The quoted Bid Price shall also include the cost of accepting the general risks/ liabilities and obligations set forth or implied in the Contract. No claim at any later stage on this account will be entertained.

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

Additional / reduced duties, taxes and levies due to subsequent additions or changes in legislation shall be reimbursed / deducted as per Sub-Clause 13.6 of the Conditions of Contract.

Sub-Clause 13.7

Delete the text of Sub-Clause 13.7 and substitute with the following:

The rates and prices quoted by the bidders are subject to adjustment during the performance of the Contract in accordance with the provisions of Clause 13.7 of the Conditions of Contract.

Clause IB. 14**Currencies of Bid and Payment****Sub-Clause 14.1**

Delete the text of Sub-Clause 14.1 and substitute with the following.

The unit rates and the prices shall be quoted by the Bidder entirely in PKR.

The payments to the Contractor for the works done shall be made in Pakistani Rupees

Sub-Clause 14.2

The Sub-Clause is deleted in its entirety.

Clause IB.15**Bid Validity****Sub-Clause 15.1****Period of Bid validity:**

One hundred and twenty (120) days.

Clause IB. 16**Bid Security****Sub-Clause 16.1****Amount of Bid Security**

Rs. 10,000,000/-

Sub-Clause 16.2 Delete the text of Sub-Clause 16.2 and substitute with the following:

The Bid Security shall be, at the option of the bidder, in the form of Call Deposit Receipt (CDR) / Pay Order in favor of the Employer valid for a period of 28 days beyond bid validity date.

Sub-Clause 16.4 Delete the text of Sub-Clause 16.4 and substitute with the following:

The Bid Securities of the Bidders except the lowest three will be returned by the Employer within twenty eight (28) days from the opening of Price Bids, provided a Bidder requests for the return of its Bid Security, or upon the expiry of original validity of Bid Security or as extended, whichever is earlier.

Clause IB.17 **Alternate Proposals by Bidder**

The Clause is deleted in its entirety.

Clause IB.18 **Format and Signing of Bid**

Sub-Clause 18.4 Delete the text of Sub-Clause 18.4 and substitute with the following:

Each bidder shall prepare and submit the original and two copies of the documents comprising the Bid as described in Clause IB-12 of the Bidding Data and clearly marked them "**ORIGINAL**" and **COPY**. In the event of discrepancy between them, the original shall prevail.

Searchable PDF versions as well as Word, Excel etc. versions of the Bid are not Required.

Sub-Clause 18.5 Delete the text of Sub-Clause 18.5 and substitute with the following:

The Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder pursuant to Sub-Clause 12.1 hereof. All pages of the Bid shall be initialed and stamped by the person or persons signing the Bid. One (1) copy of Power of Attorney must be attached to the Bid submitted to the Employer if this Bid is signed / executed by a person other than the President, Partner or Owner of the Bidder's Company.

Clause IB.19 **Sealing and Marking of Bids**

Sub-Clause 19.1 Delete the text of Sub-Clause 19.1 and substitute with the following:

Each Bidder shall submit his Bid as under:

- (a) The technical bid shall comprise of documents listed in IB-12.1 (A) and the price bid shall comprise of documents listed in IB-12.1 (B) which shall be placed in separate envelopes in accordance with IB-12.1.
- (b) **ORIGINAL** and **COPY** of Bids comprising Volume-I, II, III & IV shall be separately sealed and put in two separate envelopes, sealed and marked as Such.
- (c) The envelopes containing the ORIGINAL and copies will be put in one sealed envelope and addressed / identified as given in Sub Clause IB.19.2 hereof.

Sub-Clause 19.2 (a) Employer's address for the purpose of Bid submission is as follows:

Director Admin
National Police Foundation (NPF),
NPF Head Office, Mauve Area,
G-10, Islamabad
Ph: 051-2350100
Fax: 051-----

19.2 (b) Name & identification number of the Contract is as follows:

Name: "Construction of Houses for ICT Police at Police Lines Headquarters, H-11, Islamabad."

Identification Number : Not Applicable

Provide the following text on the larger outer envelope:

19.2 (c) **WARNING: Not to be opened before _____**
(time) on _____ (date).
(The time and date shall be as provided in the Notice Inviting Bid)

Clause IB.20 **Deadline for Submission of Bids**

Sub-Clause 20.1(a) Time and date of Bid submission and Bid opening shall be as per the data provided in the Notice Inviting Bids.

Clause IB.23 **Bid Opening**

Delete the text of Sub-Clause 23 and substitute with the following:

Sub-Clause 23.1 The Employer will open the Technical Bids in public at the address, date and time specified in the Notice Inviting Bids in the presence of Bidders' designated representatives who choose to attend. The Price Bids will remain unopened and will be held in custody of the Employer until the specified time of their opening.

Sub-Clause 23.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding Withdrawal Notice contains a valid authorization to request the withdrawal and is read out at bid opening.

Sub-Clause 23.3 Second, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with IB 23.1. No envelope shall be substituted unless the corresponding Substitution Notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.

Sub-Clause 23.4 Next, outer envelopes marked "MODIFICATION" shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding Modification Notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Price Bids, both Original and Modification, will remain unopened in accordance with IB 23.1. The Bidders' representatives who are present shall be requested to sign the

Houses for ICT Police – NPF, Islamabad

record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

Sub-Clause 23.5

Other envelopes holding the Technical Bids shall be opened one at a time, and the following read out and recorded:

- (a) the name of the Bidder;
- (b) whether there is a modification or substitution;
- (c) the presence of a Bid Security; and
- (d) Any other details as the Employer may consider appropriate.

No Bid shall be rejected at the opening of Technical Bids except for late bids, in accordance with IB 21.1. Only Technical Bids read out and recorded at bid opening, shall be considered for evaluation.

Sub-Clause 23.6

Preliminary Examination of Technical Bids

- (a) The Employer shall first examine qualification and experience Data as per Section Evaluation Criteria and Qualification Updating Forms submitted by the Bidder. The technical proposal examination of those bidders only shall be taken in hand who meet the minimum requirement as mentioned in Section Evaluation Criteria and Qualification Updating Forms. Only substantially responsive qualification shall be considered for further evaluation.
- (b) The Employer shall examine the Technical Bid to confirm that all the documents have been provided, and to determine the completeness of each document submitted

Sub-Clause 23.7

The Employer shall confirm that all the documents and information have been provided for evaluation of Technical Bid as required under these bidding documents.

Sub-Clause 23.8

At the end of the evaluation of the Technical Bids, the Employer will invite only those bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend the opening of the Price Bids.

The date, time, and location of the opening of Price Bids will be advised in writing by the Employer. Bidders shall be given reasonable notice for the opening of Price Bids.

Sub-Clause 23.9

The Employer will notify Bidders in writing who have been rejected on the grounds of their Technical Bids being substantially non-responsive to the requirements of the Bidding Document and return their Price Bids unopened before inviting others, who are determined as being qualified, to attend the opening of Price Bids

Sub-Clause 23.10

The Employer shall conduct the opening of Price Bids of all Bidders who submitted substantially responsive Technical Bids, publically in the presence of Bidders' representatives who choose to attend at the address, date and time specified by the Employer. The Bidder's representatives who are present shall be requested to sign a register evidencing their attendance.

Sub-Clause 23.11

All envelopes containing Price Bids shall be opened one at a time and the following read out and recorded:

- (a) The name of the Bidder;
- (b) Whether there is a modification or substitution;

- (c) The Bid Prices, including any discounts and alternative offers; and
- (d) Any other details as the Employer may consider appropriate.

Only Price Bids and discounts, read out and recorded during the opening of Price Bids shall be considered for evaluation. The Letter of Bid and the Summary Bill of Quantities are to be initialled by representative(s) of the Employer attending Bid opening. The Employer shall neither discuss the merits of any Bid nor reject any Bid at the time of opening of Price Bids.

Sub-Clause 23.12

The Employer shall prepare minutes of the Bid opening, including the information disclosed to those present in accordance with the Sub-Clause IB.23.1 & 23.10.

Clause 24**Process to be Confidential****Sub-Clause 24.1**

In case of grievance, the address of Grievances Committee is:

Convener Grievance Committee,
National Police Foundation (NPF),
NPF Head Office, Mauve Area,
G-10, Islamabad
Ph: 051-2350100
Fax: 051-----

Clause IB. 26**Examination of Bids and Determination of Responsiveness****Sub-Clause 26.3**

Delete the text of Sub-Clause 26.3 and substitute with the following:

A substantially responsive bid is one which (i) meets the eligibility criteria; (ii) has been properly signed; (iii) is accompanied by the required Bid Security; Includes signed Integrity Pact where required as per clause IB.37 and (v) conforms to all the terms, conditions and specifications of the Bidding Documents, without material deviation or reservation. A material deviation or reservation is one (i) which affect in any substantial way the scope, quality or performance of the Works; (ii) which limits in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the bidder's obligations under the Contract; (iii) adoption/rectification whereof would affect unfairly the competitive position of other bidders presenting substantially responsive bids. Only substantially responsive bid shall be considered for further evaluation

Clause IB-28**Corrections of Arithmetic Errors****Sub-Clause 28.1**

Delete the text of Sub-Clause 28.1 and substitute with the following:

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

- (a) where there is a discrepancy between the amounts in figures and in words, the amount in words will govern; and
- (b) where there is a discrepancy between the unit rate and the line-item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer there is an

obviously gross misplacement of the decimal point in the unit rate, in which case the line item total as quoted will govern and the unit rate will be corrected.

- (c) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.

Clause IB-29

Evaluation and Comparison of Bids

Sub-Clause 29.1

At the end of Sub-Clause 28.1 add the following:

In evaluating the Bids the Employer shall also examine the Construction Schedule (Schedule-C to Bid) and Method of Performing the Work (Schedule-D to Bid) submitted by the Bidder along with the Bid.

Clause IB.35

Performance Security

Sub-Clause 35.1

Delete the text of Sub-Clause 35.1 and substitute with the following:

The successful bidder shall obtain and provide to the Employer a Performance Security and an additional Performance Security (if applicable under IB.30 as stated in Letter of Acceptance) in the prescribed Form annexed to these Bidding Documents. The said Security shall be furnished to the Employer by the successful bidder within twenty-eight (28) days after the receipt of Letter of Acceptance. The Performance Security shall be of an amount equal to ten percent (10%) of the Contract Price in the currency of the Contract and, at the option of the bidder, in the form of Bank Guarantee either from any Scheduled Bank in Pakistan or from a bank located outside Pakistan duly counter-guaranteed by a Scheduled Bank in Pakistan.

Clause IB. 36

Signing of Contract Agreement

Sub-Clause 36.1

Delete the text of Sub-Clause 36.1 and substitute with the following:

The successful Bidder shall submit for approval by the Employer along with the Performance Security within the time period stipulated in clause IB-35.1 a draft copy of Contract Agreement as per the Form of Contract Agreement provided in the Bidding Documents, incorporating all agreements between the parties.

Sub-Clause 36.2

Delete the text of Sub-Clause 36.2 and substitute with the following:

The formal Agreement between the Employer and the successful Bidder shall be executed within 14 days from the date of furnishing of acceptable Performance Security by the successful Bidder from the Employer but not before acceptance by the Employer of the Performance Security as per Sub-Clause 35.1 hereof.

Clause IB. 37

Integrity Pact

Sub-Clause 37.1

Delete the text of Sub-Clause 37.1 and substitute with the following:

The successful Bidder shall sign and stamp the Integrity Pact provided at Schedule-J to Bid in the Bidding Documents for all Federal Government procurement contracts exceeding PKR ten million. Failure to provide such Integrity Pact shall make the Bidder non-responsive.



LETTER OF TECHNICAL BID AND SCHEDULES TO BID

LETTER OF TECHNICAL BID AND SCHEDULE TO BID TABLE OF CONTENTS

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Letter Of Technical Bid	LTB-1 of 1
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Schedule-D To Bid : Method of Performing the Work	BD-1 of 1
Schedule-E To Bid : List of Major Equipment	BE-1 of 3 to BE-3 of 3
Schedule-F To Bid : Organization Chart of the Supervisory Staff and Labour	BF-1 of 1
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Letter of Technical Bid

Name of Contract: **“Construction of Houses for ICT Police at Police Lines Headquarters, H-11, Islamabad ”**

To: **Director Admin**

National Police Foundation (NPF),
NPF Head Office, Mauve Area,
G-10, Islamabad
Ph: 051-2350100
Fax: 051-----

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (IB) 9;
- (b) We offer to execute and complete in conformity with the Bidding Documents the following Works:

Construction of Houses for ICT Police at Police Lines Headquarters, H-11, Islamabad.
- (c) Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of 120 days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (d) As security for due performance of the under takings and obligations of our bid, we submit here with a Bid security, in the amount specified in Bidding Data Sheet, which is valid (at least) 148 days.
- (e) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process, other than alternative offers submitted in accordance with IB16 (as applicable).
- (f) We agree to permit Employer or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors. This permission is extended for verification of any information provided in our Technical Bid which comprises all documents enclosed herewith in accordance with IB.11.1 of the Bidding Data Sheet.

Name

In the capacity of

Signed

Duly authorized to sign the Bid for and on behalf of

Date

Address.....

Houses for ICT Police – NPF, Islamabad



SCHEDULE OF ADJUSTMENT DATA

SCHEDULE OF COST INDEXATION – LOCAL ITEMS

[The formulae for price adjustment shall be of the following general type:]

$$P_n = a + b \frac{L_n}{L_o} + c \frac{E_n}{E_o} + d \frac{M_n}{M_o} + \dots$$

where:

“ P_n ” is the adjustment multiplier to be applied to the estimated Contract value in the relevant currency of the work carried out in period “ n ”, this period being a month;

“ a ” is a fixed coefficient, stated in the relevant table of adjustment data, representing the non-adjustable portion in contractual payments;

“ b ”, “ c ”, “ d ”, ... are coefficients representing the estimated proportion of each cost element related to the execution of the Works as stated in the relevant table of adjustment data; such tabulated cost elements may be indicative of resources such as labour, equipment and materials;

“ L_n ”, “ E_n ”, “ M_n ”, are the current cost indices or reference prices for period “ n ”, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the date 28 days prior to the last day of the period (to which the particular Payment Certificate relates); and

“ L_o ”, “ E_o ”, “ M_o ”, are the base cost indices or reference prices, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the Base Date i.e. prices prevalent 28 days prior to the latest day for submission of Bids.

The weightings (coefficients) for each of the factors of cost stated in the following table(s) of adjustment data shall only be adjusted if they have been rendered unreasonable, unbalanced or inapplicable, as a result of Variation(s).

The source of prices and the weightages for use in the adjustment formula shall be as follows:

SCHEDULE OF ADJUSTMENT DATA

Table I. Local Currency (LC) For Bill Nos _____.

Cost Element	Description	Weightages	Applicable Price
(i)	(ii)	(iii)	(iv)
a	Fixed Portion	0.540	
b	Labour <i>(Labourer (un-skilled) per day, shall be taken as representative of all types of Labour (skilled/unskilled) deployed at site)</i>	0.150	Government of Pakistan (GP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin.
c	Cement <i>(OPC cement per bag shall be taken as representative of all types of cement used at the site)</i>	0.104	- do -
d	Reinforcing Steel <i>(½" Ø round M.S. Bars per tonne shall be taken as representative of all types and diameters of Steel Reinforcement)</i>	0.090	- do -
e	Bricks	0.066	-do-
f	High Speed Diesel (HSD) <i>(HSD shall be taken as representative of all kind of fuels used in connection with the Contract)</i>	0.050	-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 the City where the Site is located. In case the Site is not listed in the monthly statistical Bulletin, the prices for the nearest City listed in the Bulletin shall be used.

- 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.



Authorized Signature and official Seal: _____

Name: _____

Date _____

Houses for ICT Police – NPF, Islamabad

SCHEDULE OF ADJUSTMENT DATA

Table II. Foreign Currency (FC)

NOT USED



Authorized Signature and official Seal: _____

Name: _____

Date: _____

SCHEDULE OF ADJUSTMENT DATA

Table III. Foreign Currency Requirements

NOT USED



Authorized Signature and official Seal: _____

Name: _____

Date _____

Houses for ICT Police – NPF, Islamabad

SCHEDULE OF ADJUSTMENT DATA

Table IV. Summary of Payment Currencies

All payments shall be made in Pakistani Rupees (PKR.)



Authorized Signature and official Seal: _____

Name: _____

Date _____

Houses for ICT Police – NPF, Islamabad

CONSTRUCTION SCHEDULE

Pursuant to Sub-Clause 8.3 of the General Conditions, the whole of the Works, and each Section (if any), shall be completed within the Time for Completion for the Works or Section (as the case may be) stated as hereunder and mentioned in Contract Data.

Description	Time for Completion (days)
Whole Works - Construction of of Houses for ICT Police at Police Lines Headquarters, H-11, Islamabad.	One hundred eighty (180)

The Bidder shall provide, the Construction Schedule in the bar chart (CPM) showing the sequence of work items and the period of time during which he proposes to complete each work item in such a manner that his proposed programme for completion of the whole of the Works may meet Employer's completion targets in days noted above and counted from the Commencement Date (Attach sheets as required for the specified form of Construction Schedule.)

Authorized Signature and official Seal: _____

Name: _____

Date: _____

Houses for ICT Police – NPF, Islamabad

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, in Pakistan, the type of facilities including personnel accommodation, office accommodation, provision for maintenance and for storage, communications, security and other services to be used.
3. The method of executing the Works, the procedures for installation of equipment and machinery and transportation of equipment and materials to the site 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 provided in Contract Data.
 - 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: _____

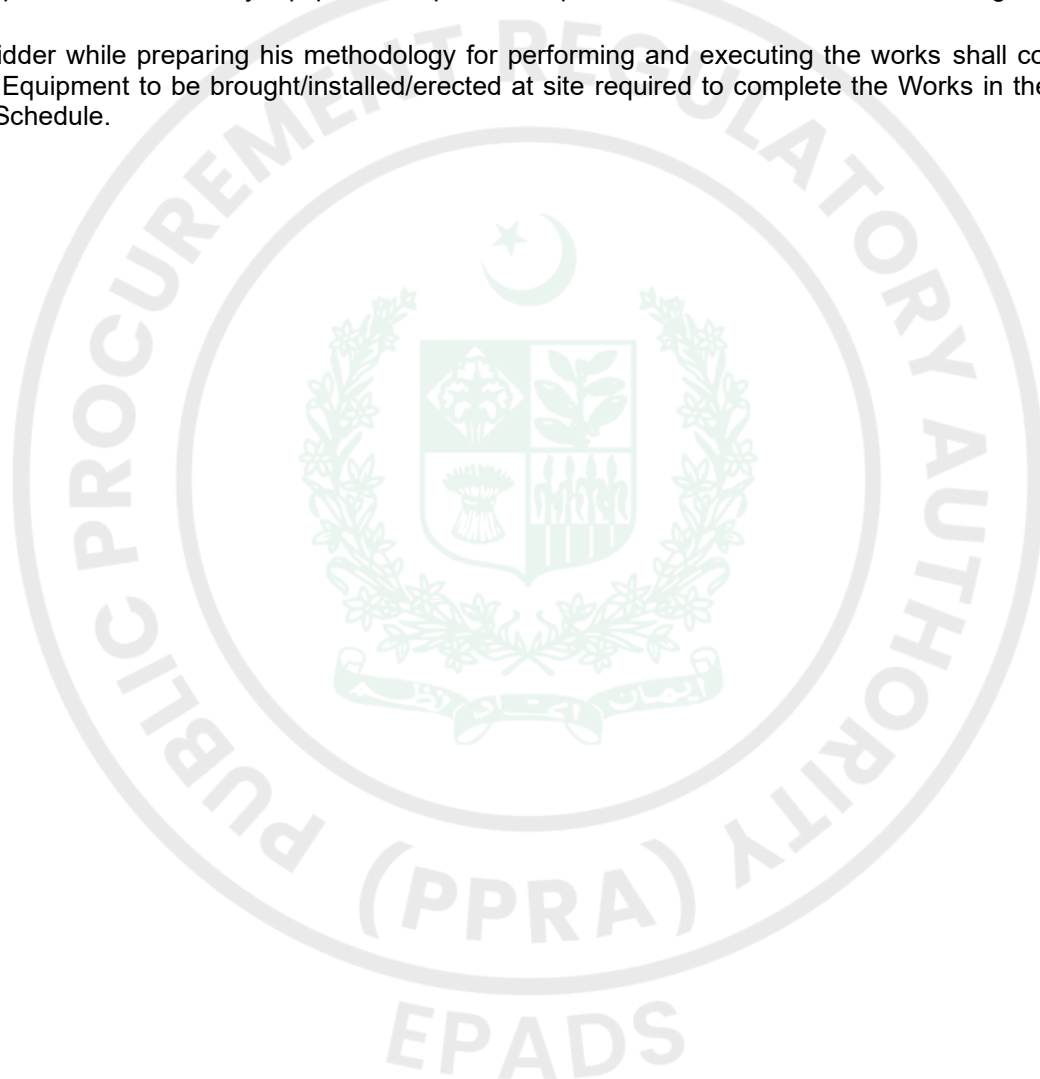
Houses for ICT Police – NPF, Islamabad

LIST OF MAJOR EQUIPMENT

The Bidder will provide on Sheet E-2 of this schedule 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.

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment as per site requirements and instructions of the Engineer.

The bidder while preparing his methodology for performing and executing the works shall consider the Major Equipment to be brought/installed/erected at site required to complete the Works in the specified Time Schedule.



Authorized Signature and official Seal: _____

Name: _____

Date: _____

Houses for ICT Police – NPF, Islamabad

LIST OF MAJOR EQUIPMENT

(Owned, Purchased or Leased)

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: _____

LIST OF MAJOR EQUIPMENT

Equipment details

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	
The following information shall not be applicable 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	

[This Table shall be used for each item of Equipment separately]

Authorized Signature and official Seal: _____

Name: _____

Date: _____

ORGANIZATIONAL CHART FOR THE SUPERVISORY STAFF AND LABOUR

MINIMUM MANDATORY STAFF REQUIREMENT:

The Contractor shall arrange the following staff at site immediately upon commencement of works:

Designation	Nos.	Minimum Qualification	Min. Work Experience
Project Manager	01	B.Sc. Civil Engineer with valid Pakistan Engineering Council Registration	25 years
Site Engineer	01	B.Sc. Civil Engineer with valid Pakistan Engineering Council Registration	15 years
Associate Engineer	01	DAE (Civil)	10 years
Associate Engineer	01	DAE (E/M)	10 years
Quantity Surveyor	01	DAE (Civil)	10 years
Surveyor	01	Survey Certificate	10 years

Authorized Signature and official Seal: _____

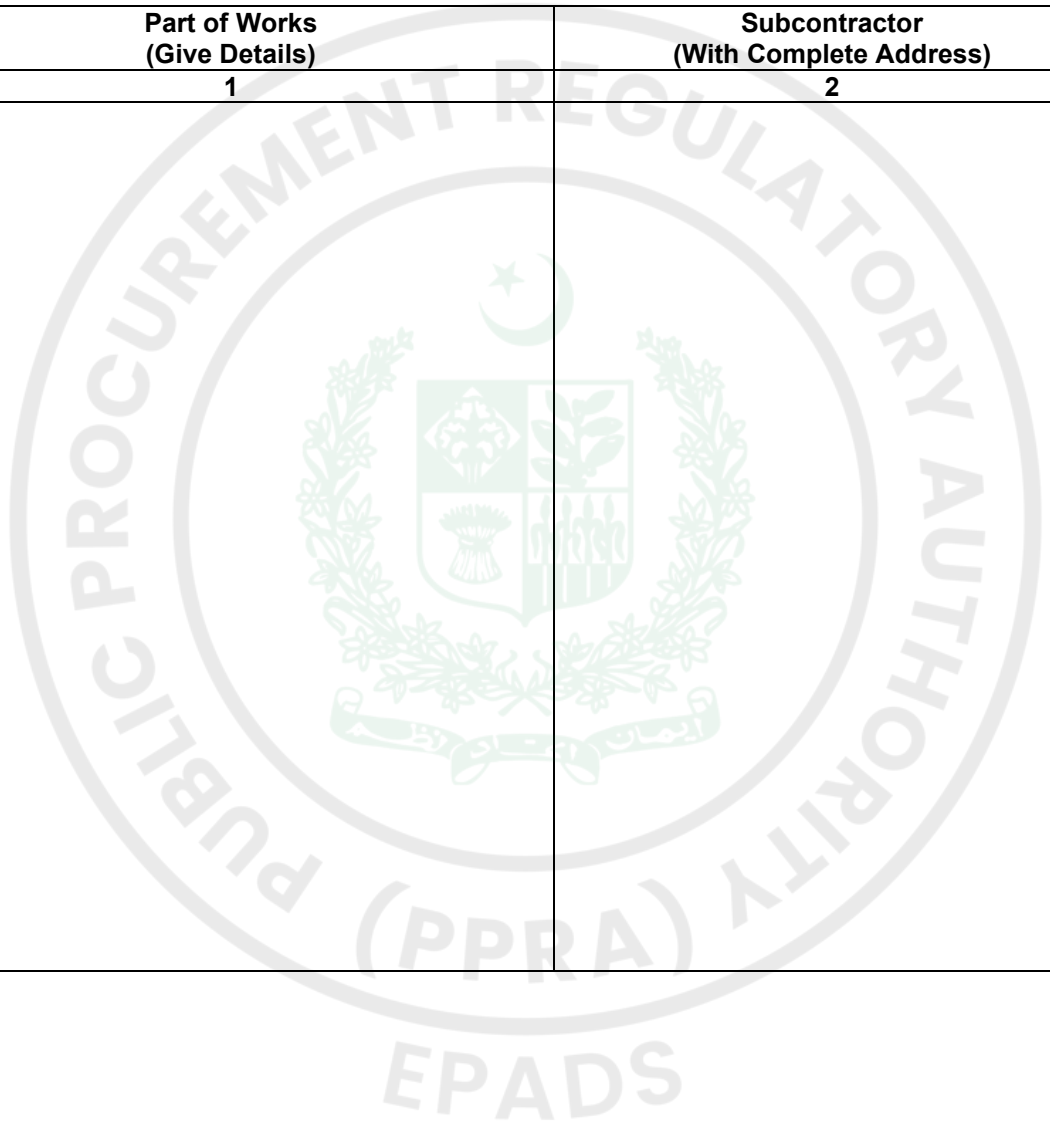
Name: _____

Date: _____

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: _____

Houses for ICT Police – NPF, Islamabad

ESTIMATED PROGRESS PAYMENTS

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

Months	% of Bided Price
(a)	(b)
1 st quarter	
2 nd quarter till completion of project	
Total	100 %

CONSTRUCTION CAMP AND HOUSING FACILITIES

(to be filled and signed by the Bidder)

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

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) Electrical 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.)

Note:

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.

Authorized Signature and official Seal: _____

Name: _____

Date: _____

Houses for ICT Police – NPF, Islamabad

INTEGRITY PACT

**DECLARATION OF FEES, COMMISSION AND BROKERAGE, ETC. PAYABLE BY THE
BIDDERS/CONTRACTORS OF GOODS, SERVICES & WORKS IN CONTRACTS WORTH
PAK. RS. 10.00 MILLION OR MORE**

Contract No. _____

Dated _____

Contract Value: _____

Contract Title: _____

..... [Name of Bidder/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 (GoP) or any administrative subdivision or agency thereof or any other entity owned or controlled by GoP through any corrupt business practice.

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

[Name of Bidder/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, representation or warranty.

[Name of Bidder/Contractor] accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other rights and remedies available to 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 Bidder/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 times the sum of any commission, gratification, bribe, finder's fee or kickback given by [name of Bidder/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.

Name of Employer:

Signature:

[Seal]

Name of Bidder/Contractor:

Signature:

[Seal]

LIST OF RECOMMENDED MANUFACTURERS

(to be signed by the Bidder)

Equipment and materials specified with brand names have been provided in order to establish a standard of performance and do not necessarily indicate a preference for a particular manufacturer or material.

The names of manufacturers given below are to indicate the level of quality and performance anticipated by the Engineer/ Employer. Other makes may be accepted provided that the quality and performance of such equipment, in the sole opinion of the Engineer, are at least equal to or better than the equipment/ product offered by the recommended manufacturer.

The acceptance of equipment/ materials offered by these manufacturers will be subject to compliance of offered models/materials with the specifications, capacity and/or performance requirements.

Onus lies with the Contractor for establishing the genuineness of any material/product for its make and origin.

S.NO.	ITEM	MANUFACTURER
(a)	CIVIL	
1	Paints	i Nippon Paints ii ICI Paints iii Berger Paints
2	Anti Termite Treatment	i Mirage ii Biflex iii Termidor
3	Construction Chemicals	i Sika ii FEB iii Ultra Chemical iv Faw Chem v Aquafin
4	Anchors for Concrete (Chemical and Mechanical)	i Hilti ii Spit iii Sika iv Fischer
5	PVC Water Stops	i Decora ii Sika iii ATS Synthetics
6	Wall Coatings	i Gritwall ii Rockshield iii Rockwall
7	Façade Tile Cladding	i Ultra Thin Rockslab (H-Verse Kale)

S.NO.	ITEM	MANUFACTURER
8	Porcelain Tiles	i Master Tiles ii Orient Ceramcia Tiles iii Shabbir Tiles
9	Concrete Floor Tile & Pavers	i GrandWorks ii Concrete Wizard iii Envicrete iv Acmecrete
10	False Ceiling	i OWA (Germany) ii Daiken Cooperation (Japan)
11	Aluminium Composite Panels (ACP)	i Alucobond ii Reynobond iii Alubond
12	Epoxy Flooring	i ICI ii Jotun iii Faw Chem iv Berger v Sika
13	Hardware, Hinges and Locks	i Yale ii Mandelli
14	Fire Resistant Doors	i Haseen Habib Trading ii MK Traders
15	Aluminum	i Prime Aluminum ii Chawla Aluminum iii Alcon Aluminum iv Pakistan Cables
16	Glass	i Ghani Glass (Local) ii Tariq Glass (Local) iii Gunj Glass (Local) iv Saint-Gobain Glass (imported) v Cornwall Glass (Imported) vi Guardian Glass (Imported) vii Pelkington (Imported)
(b)	PLUMBING	
1	Sanitary Fixtures	i M/S Porta ii M/S Marachi (or approved equivalent)
2	Sanitary Fittings	i M/S Faisal ii M/S Sonex (or approved equivalent)
3	Kitchen Sinks	i M/S Atlas ii M/S Rashad

S.NO.	ITEM	MANUFACTURER
		iii M/S Porta (or approved equivalent)
4	Bath & Kitchen Specials / Accessories	i M/S Faisal ii M/S Sonex (or approved equivalent)
5	Grab bars	i M/S Porta ii M/S Zilver (or approved equivalent)
6	Water Filters / Filter Plant	i M/S So-Safe ii M/S N-viro Pak iii M/S KSB (or approved equivalent)
7	Electric Water Heaters	i M/S Ariston ii M/S Canon (or approved equivalent)
8	Gas+Electric Dual Water Heaters	i M/S Corona ii M/S Nasgas iii M/S Tesla (or approved equivalent)
9	Galvanized Iron /Mild steel Pipes	i M/S International Industries Ltd. ii M/S Bashir Pipe Industries Pvt. Ltd. iii M/S Jamal Pipe Industries Pvt. Ltd. (or approved equivalent)
10	Galvanized Iron Pipe Fittings	i M/S HE China ii M/S TG China
11	Thermal insulation for pipes	i M/S Kimmco ii M/S Afico (or approved equivalent)
12	PPR Pipes & Fittings	i M/S Dadex (polydex) ii M/S Beta Pipe iii M/S Popular Pipe iv M/S Nepro Pipe (or approved equivalent)
13	UPVC Pipes & Fittings	i M/S Dadex (Nikasi) ii M/S Beta Pipe iii M/S Popular Pipe iv M/S Nepro Pipe (or approved equivalent)
14	Bronze/ Brass/ CI/ DI Valves	i M/S Kitz ii M/S Scon (or approved equivalent)

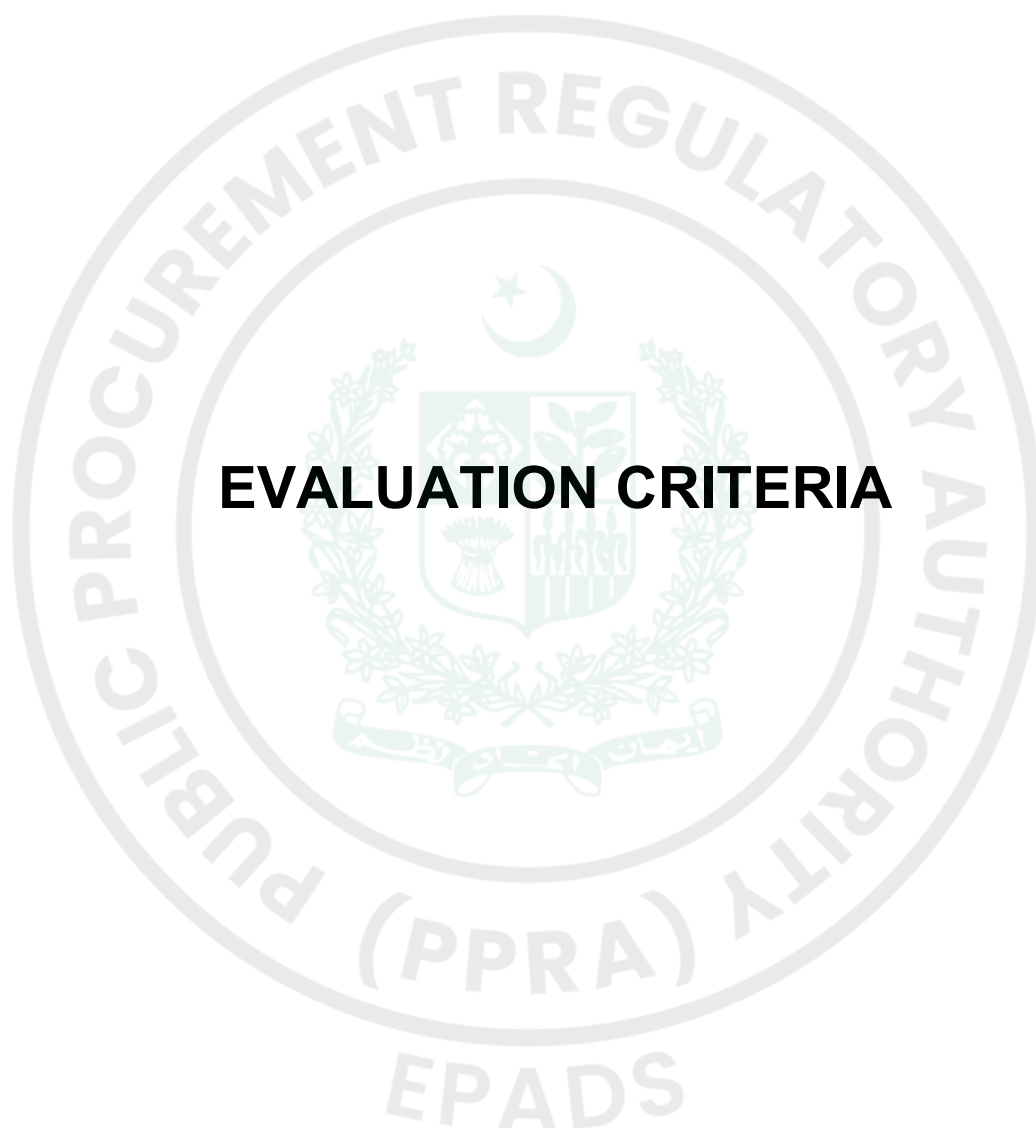
S.NO.	ITEM	MANUFACTURER
15	Cast iron Pipes/traps/Covers/Gratings	i M/S JAWS ii M/S Sandan Engg. Pvt. Ltd (Teepu) iii M/S Super Alpine (or approved equivalent)
16	Fire Equipment	i M/S Naffco ii M/S Sffeco iii M/S Lifeco or approved equivalent
17	Water Transfer & Drainage Pumping Machinery	i M/S KSB ii M/S Grundfos or approved equivalent
18	Hangers & Supports	i M/S Fischer. ii M/S Hilti. iii M/S Sikla or approved equivalent
(c)	ELECTRICAL	
1	DISTRIBUTION BOARDS AND MAIN AND SUB MAIN PANEL BOARDS AND SUB MAIN PANEL BOARDS	i POWER TECH SWITCH GEAR ii SWITCH GEAR SOLUTION LHR iii SUNTECH iv NIBS ENGINEERING v ELECTRICH
2	CABLES AND WIRES	i PAKISTAN CABLES ii NEWAGE CABLES iii FAST CABLES iv GM CABLES
3	MCCBS AND MCBS ELCBS	i SCHNEIDER ii ABB iii TERASAIKI
4	Wiring accessories (SWITCHES, SOCKETS)	i Schneider ii Legrand iii Philips iv ABB
5	LIGHT FIXTURES	i PHILIPS(SIGNIFY) ii OSRAM iii SUNLIGHT iv Britlight v COARTS
6	DATA NETWORKING SYSTEM (PASSIVE COMPONENTS)	i 3M (Corning) ii Schneider
7	DATA NETWORKING SYSTEM (ACTIVE COMPONENTS)	i Cisco ii H3C

S.NO.	ITEM	MANUFACTURER
		iii Huawei
8	PVC CONDUITS, PIPES, DUCTS & ACCESSORIES	i SHAVYL ii DADEX iii ADAMJEE DURABUILT iv BETA
9	LIGHTNING PROTECTION	i LOCAL BRAND BEST QUALITY AS APPROVED BY THE ENGINEER
10	LOW VOLTAGE DG SET (CBU) Foreign Couple Genset With Imported Canopy	i ALLIED ENGINEERING (CATERPILAR) ii S.M.JAFFER (FG WILSON / TEKSEN) iii ORIENT ENERGY (CUMINS POWER GENERATION) iv ENERGY SOLUTIONS PVT LTD. (AKSA POWER GENERATION)
11	CABLE TRAY	i JEI ii ERCON iii Bilal Switch Gear iv LINE MAN
12	FANS	i LAHORE FANS ii GFC FANS iii PAK FANS
13	CCTV	i DAHWA ii HIK VISION
14	PUBLIC ADDRESS SYSTEM	i BOSCH ii TOA

Authorized Signature and official Seal: _____

Name: _____

Date: _____



EVALUATION CRITERIA

Qualification of Bidders shall be evaluated on the basis of mentioned criteria with 70% Cumulative score and at least 50% score in each category regarding the Bidder's experience record, personnel capabilities, equipment capabilities and financial soundness in addition to fulfillment of mandatory requirements.

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:

- Valid registration with PEC in C-3 & above, having CE-01, CE-09, CE-10, EE-02, EE-04, EE-06, EE-07, ME-01 & ME-02 as codes of specialization.
- An affidavit on non-judicial stamp paper of Rs. 100/- duly notarized, to the effect of not being debarred / blacklisted by any organization / department, prepared within the current month of submission of Bids
- Information on any litigation or arbitration resulting from contracts completed or under execution by the Bidder. In case, the firm is involved in any litigation, the details/updated status shall be provided. Any firm involved in litigation and in case majority of decisions went against that firm or if the firm is blacklisted by any Govt./Semi- Govt./Autonomous body, shall be disqualified. In case, the firm has never been involved in litigation, an affidavit to such effect should be provided.
- Security Clearance of firm from AIG General ICT Police.
- Registration with income tax department (Valid NTN).
- Registration with Sales Tax Department (GST/PST).
- On Active Tax Payer's List at the time of submission of Bid.

Provisions listed above and also in the Advertisement Notice are mandatory to be complied with prior to scrutiny of documents.

B. Detailed Requirements:

The detailed qualification evaluation shall be carried out on the basis of the criteria for the different categories and minimum passing marks prescribed hereunder:

Sr. No.	Category	Weightage / Marks	Passing Marks (50%)
1.	Experience Record	40	20
2.	Personnel Capabilities	15	7.5
3.	Equipment Capabilities	15	7.5
4.	Financial Soundness:	30	15

Note: Bidders are required to obtain 50% marks in each category and overall 70 marks for qualification.

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)	Experience as constructor in execution of Building Works Projects completed during last five (05) years.	24	12 marks will be awarded for each completed project having cost $\geq$ 600M up to maximum of 24 marks. 08 marks will be awarded for each completed project having cost from 500M to 599.9M .

Houses for ICT Police – NPF, Islamabad

Sr. No.	Sub-Category	Maximum Marks	Marks Allocation
			• 06 marks will be awarded for each completed project having cost from 400M to 499.9M . • No marks will be awarded for project having cost < Rs. 400M.
b)	Experience as constructor for ongoing/in-hand Building Works Projects.	16	• 08 marks will be awarded for each in-hand project having cost $\geq$ 600M up to maximum of 16 marks. • 06 marks will be awarded for each in-hand project having cost from 500M to 599.9M . • 04 marks will be awarded for each in-hand project having cost from 400M to 499.9M . • No marks will be awarded for having cost < Rs. 400M
	Total Marks Allocated	40	

Note:

- The applicants must provide Work Order, Contract Agreement, and Taking Over/Completion Certificate (if project is completed), project location, contact details of the Employer. No marks will be given to the projects for which above documents are not provided.
- Applicant shall provide complete information of the projects including scope of Constructor and cost of works etc.

B.2. Personnel Capabilities:

Designation	Maximum Marks	Marks Allocation
Project Manager (B.Sc. Civil Engineer registered with Pakistan Engineering Council)	4	• 4 marks will be awarded for B.Sc. Civil Engineer having at least 25 years relevant experience.
Site Engineer (B.Sc. Civil Engineer registered with Pakistan Engineering Council)	3	• 3 marks will be awarded for B.Sc. Civil Engineer having at least 15 years relevant experience.

Designation	Maximum Marks	Marks Allocation
Associate Engineer B-Tech / DAE Civil	2.5	• 2.5 marks will be awarded for each Site Inspector having B-Tech / DAE Civil and at least 10 years relevant experience.
Associate Engineer B-Tech / DAE (E/M)	2.5	• 2.5 marks will be awarded for Site Inspector having B-Tech / DAE (E/M) and at least 10 years relevant experience.
Quantity Surveyor B-Tech / DAE Civil	2	• 2 marks will be awarded for Quantity Surveyor having B-Tech / DAE Civil and at least 10 years relevant experience.
Surveyor Survey Certificate	1	• 1 mark will be awarded for each Surveyor having certificate and at least 10 years relevant experience .
Total Marks	15	

Note:

- The applicant must provide verifiable proof of employment (i.e. appointment letter) of the staff and attach detailed CVs & valid PEC Registration Certificates / Diploma / Certificates of the Engineer, DAEs staff.
- The applicant must also provide an affidavit regarding the availability of nominated staff.

B.3. Equipment Capabilities

Sr. No	Equipment	Minimum Required	Maximum Marks
1.	Ready mix concrete Batching Plant (75 cubic meter/ hour)	3 No.	3
2.	Concrete Pump (capacity 1 cubic meter)	1 No.	1
3.	Ready mix Transit Mixer (capacity 6 cubic meter)	5 No.	3
4.	Mobile Crane (150 Tones)	1 No.	1
5.	Excavator	Chain 2 No. Tyre: 2 No.)	2
6.	Dewatering Pump (3HP)	1 No.	1
7.	Scaffolding	100,000 Rft	1
8.	Shuttering	100,000 Sft	1
9.	Tractor Trolley	3 Nos.	0.5
10.	Steel Cutting / Bending Machine	2 Nos.	0.5
11.	Generator Set (100 KVA)	2 Nos.	0.5
12.	Total Station	1 Nos.	0.5
	Total Marks Allocated		15

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 and will be made available, as and when required, for the Project.

B.4. Financial Capabilities

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

The minimum annual turnover during any of the last three (03) years shall be as under:

Annual Turn Over	Marks
i. Rs. 500 million to Rs. 600 million	7.5
ii. Above Rs. 600 million	15
Maximum Marks Allocated	15

The minimum amount of liquid assets (for the Fy 2024-2025), and Bank Line of Credit (specific in the name of this project), net of other construction commitments shall be as under:

Liquid Assets / Bank Line of Credit	Marks
i. Rs. 100 million to Rs. 200 million	7.5
ii. Above Rs. 200 million	15
Maximum Marks Allocated	15

Note:

- i. Firm / Company must have QCR rated Annual Audit Reports for last three years from Audit Firms registered with Institute of Chartered Accountant Pakistan (ICAP).

Authorized Signature and official Seal: _____

Name: _____

Date: _____

Houses for ICT Police – NPF, Islamabad



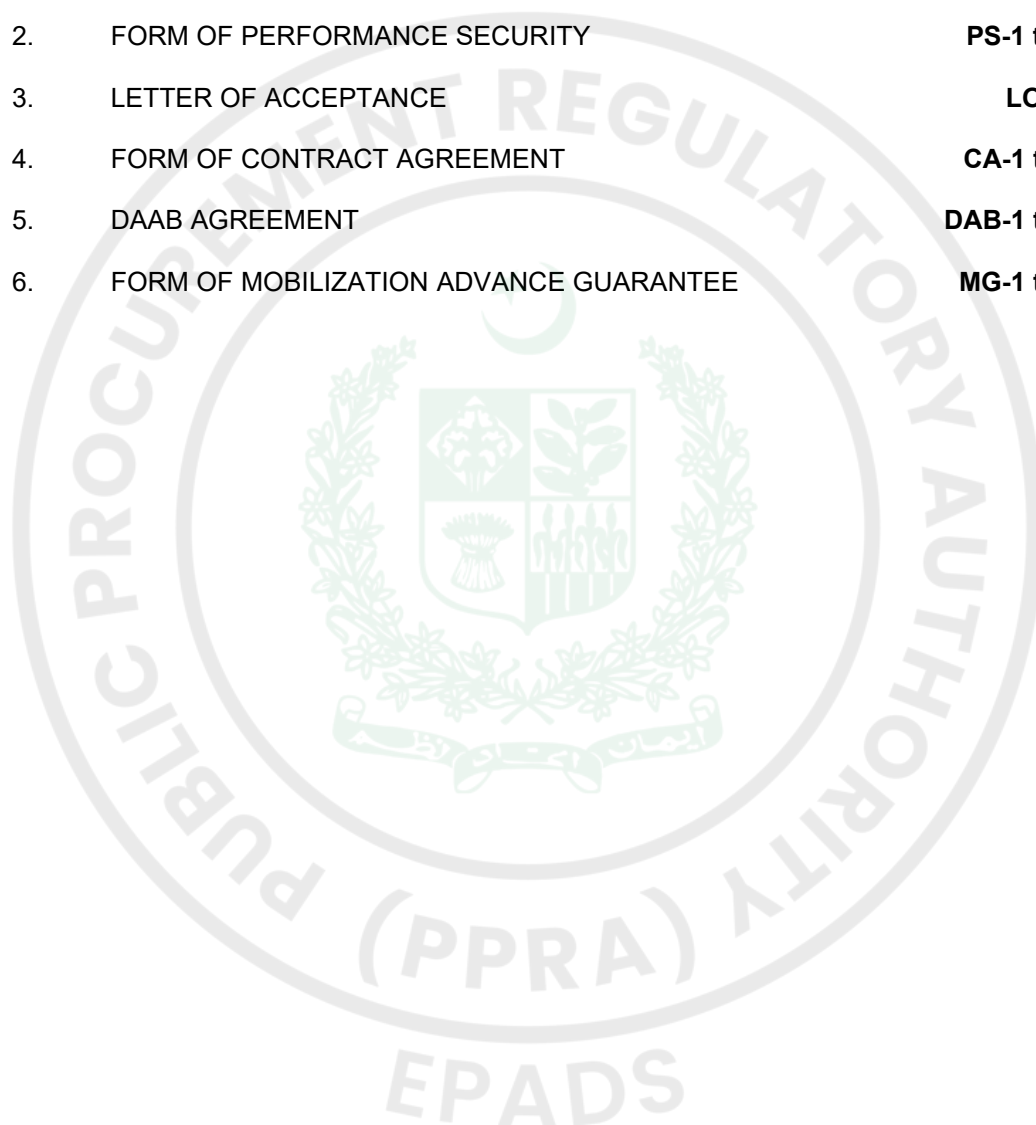
FORMS

- **BID SECURITY**
- **PERFORMANCE SECURITY**
- **LETTER OF ACCEPTANCE**
- **CONTRACT AGREEMENT**
- **DAB AGREEMENT**
- **MOBILIZATION ADVANCE GUARANTEE**

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FORM OF BID SECURITY

Security Executed on _____
(Date)

Expiry on _____
(Date)

Name of Surety with Address: _____

Name of Principal (Bidder) with Address _____

Penal Sum of Security PKR _____ (Pak Rupees _____)

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 _____
(Particulars of Bid) to the said Employer; and

- (1) WHEREAS, the Employer has required as a condition for considering said Bid that the Bidder furnishes a Bid Security in the above said sum to the Employer, conditioned as under: that the Bid Security shall remain in force for a period fourteen (14) days beyond the Bid Validity date i.e., upto _____.
- (2) that the Bid Securities of the Bidders except the lowest three will be returned by the Employer within twenty eight (28) days from the opening of Bids, provided a Bidder request for the return of its Bid Security, or on the expiry of original validity of Bid Security or as extended, whichever is earlier;
- (3) that the Bid Security of the lowest three Bidders comprising the successful Bidder will be returned when the successful Bidder has furnished the required Performance Security; and
- (4) that in the event of failure of the successful Bidder to furnish the required Performance Security, the entire said sum be paid immediately to the said Employer pursuant to IB.16 and IB.35 of the Instructions to Bidders for the successful Bidder's failure to perform.

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

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

PROVIDED ALSO THAT the Employer shall decide, 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
(Schedule Bank)

WITNESS:

1. _____

Corporate Secretary (Seal)

Signature _____

Name _____

Title _____

Corporate Guarantor (Seal)

2. _____

Name, Title & Address

FORM OF PERFORMANCE SECURITY

Guarantee No. _____

Executed on _____

Expiry date _____

[Letter by the Guarantor to the Employer]

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

_____ (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 11, 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.

Houses for ICT Police – NPF, Islamabad

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)

WITNESS:

Signature _____

1. _____

Name _____

Corporate Secretary (Seal)

Title _____

Corporate Guarantor (Seal)

2. _____

Name, Title & Address

Letter of Acceptance*[Letterhead paper of the Employer]*

NAME OF CONTRACT: _____ CONTRACT

NUMBER: _____

TO : _____

Date: _____

Your Reference: _____

Our Reference: _____

for the execution and

We thank you for your Bid dated _____
completion of the Works comprising the above-named Contract and remedying of defects therein, all in conformity with the terms and conditions contained in the Contract.

We have pleasure in accepting your Bid for the Accepted Contract Amount of:

[currency and amount in figures]

[currency and amount in words]

In consideration of you properly and truly performing the Contract, we agree to pay you the Accepted Contract Amount or such other sums to which you may become entitled under the terms of the Contract, at such times and as prescribed by the Contract.

We acknowledge that this Letter of Acceptance creates a binding Contract between us, and we undertake to fulfil all our obligations and duties in accordance with the terms of this Contract.

Signature: _____

Signed by: _____

For and on behalf of: _____

Date: _____

FORM OF CONTRACT AGREEMENT

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

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

NOW this Agreement witnessed as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents, 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 - Special Provisions;
 - f) The General Conditions;
 - g) The Specifications Part A - Specific Provisions;
 - 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 along with 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 sumas 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 Contactor

Signature of Employer

(Seal)

(Seal)

Signed, Sealed and Delivered in the presence of:

Witness

Witness

(Name, Title and Address)

(Name, Title and Address)

DAB AGREEMENT

[for a one-person DAB]

Name and details of Contract _____
 Name and address of Employer _____
 Name and address of Contractor _____
 Name and address of Member _____

Whereas the Employer and the Contractor have entered into the Contract and desire jointly to appoint the Member to act as sole adjudicator who is also called the "DAB" to adjudicate a dispute which has arisen in relation to _____ *

The Employer, Contractor and Member jointly agree as follows:

1. The conditions of this Dispute Adjudication Agreement comprise the "General Conditions of Dispute Adjudication Agreement", which is appended to the General Conditions of the "Conditions of Contract for Plant and Design-Build" First Edition 1999 published by the Fédération Internationale des Ingénieurs-Conseils (FIDIC), and the following provisions. In these provisions, which include amendments and additions to the General Conditions of Dispute Adjudication Agreement, words and expressions shall have the same meanings as are assigned to them in the General Conditions of Dispute Adjudication Agreement.
2. [*Details of amendments to the General Conditions of Dispute Adjudication Agreement, if any.*]
3. In accordance with Clause 6 of the General Conditions of Dispute Adjudication Agreement, the Member shall be paid a daily fee of _____ per day.
4. In consideration of these fees and other payments to be made by the Employer and the Contractor in accordance with Clause 6 of the General Conditions of Dispute Adjudication Agreement, the Member undertakes to act as the DAB (as adjudicator) in accordance with this Dispute Adjudication Agreement.
5. The Employer and the Contractor jointly and severally undertake to pay the Member, in consideration of the carrying out of these services, in accordance with Clause 6 of the General Conditions of Dispute Adjudication Agreement.
6. This Dispute Adjudication Agreement shall be governed by the law of _____

SIGNED by: _____ SIGNED by: _____ SIGNED by: _____

for and on behalf of the Employer
in the presence of

for and on behalf of the Contractor
in the presence of

the Member in the presence of

Witness: _____
 Name: _____
 Address: _____
 Date: _____

Witness: _____
 Name: _____
 Address: _____
 Date: _____

Witness: _____
 Name: _____
 Address: _____
 Date: _____

[*A brief description or name of dispute to be added.]

[for each member of a three-person DAB]

Name and details of Contract _____
 Name and address of Employer _____
 Name and address of Contractor _____
 Name and address of Member _____

Whereas the Employer and the Contractor have entered into the Contract and desire jointly to appoint the Member to act as one of the three persons who are jointly called the "DAB" [*and desire the Member to act as chairman of the DAB*] to adjudicate a dispute which has arisen in relation to _____

*

The Employer, Contractor and Member jointly agree as follows:

1. The conditions of this Dispute Adjudication Agreement comprise the "General Conditions of Dispute Adjudication Agreement", which is appended to the General Conditions of the "Conditions of Contract for Plant and Design-Build" First Edition 1999 published by the Fédération Internationale des Ingénieurs-Conseils (FIDIC), and the following provisions. In these provisions, which include amendments and additions to the General Conditions of Dispute Adjudication Agreement, words and expressions shall have the same meanings as are assigned to them in the General Conditions of Dispute Adjudication Agreement.
2. [*Details of amendments to the General Conditions of Dispute Adjudication Agreement, if any*]
3. In accordance with Clause 6 of the General Conditions of Dispute Adjudication Agreement, the Member shall be paid a daily fee of _____ per day.
4. In consideration of these fees and other payments to be made by the Employer and the Contractor in accordance with Clause 6 of the General Conditions of Dispute Adjudication Agreement, the Member undertakes to serve, as described in this Dispute Adjudication Agreement, as one of the three persons who are jointly to act as the DAB.
5. The Employer and the Contractor jointly and severally undertake to pay the Member, in consideration of the carrying out of these services, in accordance with Clause 6 of the General Conditions of Dispute Adjudication Agreement.
6. This Dispute Adjudication Agreement shall be governed by the law of _____

SIGNED by: _____ SIGNED by: _____ SIGNED by: _____

for and on behalf of the Employer in the presence of for and on behalf of the Contractor in the presence of the Member in the presence of

Witness: _____	Witness: _____	Witness: _____
Name: _____	Name: _____	Name: _____
Address: _____	Address: _____	Address: _____
Date: _____	Date: _____	Date: _____

[*A brief description or name of dispute to be added.]

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 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, 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 _____ (Pak Rupees _____).

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
(Scheduled Bank/ Insurance Company)

WITNESS:

1. _____

Corporate Secretary (Seal)

Signature _____

Name _____

Title _____
Corporate Guarantor (Seal)

2. _____

Name, Title & Address



CONDITIONS OF CONTRACT

The Conditions of Contract comprise two parts:

- (a) General Conditions
- (b) Particular Conditions

General Conditions

These Conditions are the “General Conditions” which form part of the “FIDIC Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer Second Edition (2017 Red book, Reprinted 2022 with amendments)” published by:

International Federation of Consulting Engineers
(Fédération Internationale des Ingénieurs – Conseils) – (FIDIC)
World Trade Center II - Geneva Airport
P. O. Box 311
CH-1215 Geneva 15
Switzerland
Email: fidic@fidic.org, fidic.pub@fidic.org
Website: <https://fidic.org/bookshop>

The successful Bidder after award of Works shall have to provide two (02) copies of above said “General Conditions” for incorporation in the Contract.



PARTICULAR CONDITIONS OF CONTRACT

PART-A: CONTRACT DATA

PART-B: SPECIAL PROVISIONS

Particular Conditions

The Particular Conditions (PC) complement the General Conditions (GC) to specify dates, contractual requirements, and special circumstances related to the Works. The PC 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	Data to be Given	Data
1.1.27	Defects Notification Period (DNP):	365 days
1.1.31	Employer's name and address:	Director Admin National Police Foundation (NPF), NPF Head Office, Mauve Area, G-10, Islamabad Ph: 051-2350100
1.1.35	Engineer's name and address:	National Engineering Services Pakistan (Pvt.) Limited (NESPAK) NESPAK House, G-5/2, Islamabad Ph: 051-9221910-13 Fax: 051-9221914
1.1.73	Sections:	None
1.1.84	Time for Completion:	180 days for whole of the Works
1.3(a)(ii)	agreed methods of electronic transmission:	Not Used
1.3(d)	address of Employer for communications:	Director Admin National Police Foundation (NPF), NPF Head Office, Mauve Area, G-10, Islamabad Ph: 051-2350100
	address of Engineer for communications:	NESPAK House, G-5/2 Islamabad Ph: 051-9221910-13 Fax: 051-9221914
	address of Contractor for communications:	To be inserted at the time of signing of the Contract

Sub-Clause	Data to be Given	Data
1.4	Contract shall be governed by the law of:	Islamic Republic of Pakistan
	ruling language:	English
	language for communications:	English
1.8	number of additional paper copies of Contractor's Documents:	Three (03)
2.1	after receiving the Letter of Acceptance, the Contractor shall be given right of access to all or part of the Site within:	Within 14 days of Signing of Contract Agreement.
2.4	Employer's financial arrangements	The Employer has sufficient funds of its own to cover the Cost of the entire Project.
3.2 (e)(ii)	Engineer's Duties and Authority	Variation resulting in an increase of the Accepted Contract Amount in excess of one percent (1%) subject to accumulative Variations not exceeding five percent (5%) of the Accepted Contract Amount.
4.2	Performance Security (as percentage of the Accepted Contract Amount in Currencies) percent: currency:	Ten percent (10%) of the Accepted Contract Amount Pakistani Rupees (PKR)
4.2.1	List of Insurance Companies	N.A
4.7.2	period for notification of errors in the items of reference	seven (07) days
4.19	period of payment for temporary utilities	Each month
4.20	number of additional paper copies of progress reports	Three (03)

Sub-Clause	Data to be Given	Data
5.1(a)	maximum allowable accumulated value of work subcontracted (as a percentage of the Accepted Contract Amount)	thirty percent (30%)
5.1(b)	parts of the Works for which subcontracting is not permitted	None
6.5	Normal working hours on the Site	Eight (08) hours
6.15	Supply of Water	Contractor will arrange water at its own however, rupees @ 0.5% of work done will be deducted from IPCs.
8.3	number of additional paper copies of programmes	Three (03)
8.8 & 14.15(b)	Delay Damages payable for each day of delay	0.17% of the Accepted Contract Amount for delay in completion of whole of the Works
8.8	maximum amount of Delay Damages	Ten percent (10%) of the Accepted Contract Amount
8.14	Applicability of Incentives for Early Completion	Not Applicable
12.3	Percentage profit	Ten percent (10%)
13.4.(b) (ii)	percentage rate to be applied to Provisional Sums for overhead charges and profit	Twenty five percent (25%)
14.2	total Advance Payment	Ten percent (10%) of the Accepted Contract Amount excluding Provisional Sums payable in the currencies and proportions in which the Accepted Contract Amount is payable
14.2.1	List of Insurance Companies	Not Applicable
14.2.3	percentage deductions for the repayment of the Advance Payment	Deduction shall be made at the amortization rate of 15% of the value of the Works executed of each IPC as provided in paragraph (i) of Sub-Clause GCC 14.3, starting from 1 st IPC against work done provided that the advance payment shall be completely repaid prior to the time when 90% of the Accepted Contract Amount less Provisional

Sub-Clause	Data to be Given	Data
		Sums has been certified for payment. It may be more than 15% in the last instalment to ensure full repayment.
14.3	period of payment	one month
14.3(b)	number of additional paper copies of Statements	Six (06)
14.3 (iii)	percentage of retention	Seven percent (7%)
14.3 (iii)	limit of Retention Money (as a percentage of the Contract Price)	Five percent (5%)
14.5(b) (i)	Plant and Materials for payment when shipped	Not Applicable
14.5(c)(i)	Plant and Materials for payment when delivered to the Site	Plant and Non-Perishable Materials i) Tiles ii) Sanitary Fixtures iii) Lights iv) Ceiling Material v) Doors vi) Electric wires vii) Aluminium windows
14.6.2	minimum amount of Interim Payment Certificate (IPC)	Rupees twenty Million (Rs. 20 million)
14.7(a)	period of payment of Advance Payment to the Contractor	14 days
14.7b(i)	period for the Employer to make interim payments to the Contractor under Sub-Clause 14.6 [<i>Interim Payment</i>]	28 days
14.7b(ii)	period for the Employer to make interim payments to the Contractor under Sub-Clause 14.13 [<i>Final Payment</i>]	28 days
14.7(c)	period for the Employer to make final payment to the Contractor	56 days
14.8	financing charges for delayed payment	Nil

Sub-Clause	Data to be Given	Data
14.11.1 (b)	number of additional paper copies of draft Final Statements	Six (06)
14.15	currencies of payment of Contract Price	Pakistani Rupees (PKR)
14.15(a)(i)	Proportions or amounts of Local and Foreign currencies	Local Currency: 100% Foreign Currency: Nil
14.15(c)	currencies and proportions for payment of Delay Damages	Currency: PKR. Proportion: 100%
14.15(f)	rates of exchange	Nil
17.2(d)	forces of nature, the risks of which are allocated to the Contractor	Nil
19.1	permitted deductible limits: i) insurance required for the Works ii) insurance required for Goods iii) insurance required for liability for breach of professional duty iv) insurance required against liability for fitness for purpose (if any is required) v) insurance required for injury to persons and damage to property vi) insurance required for injury to employees vii) other insurances required by Laws and by local practice	i) Ten percent (10%) of loss amount on each & every loss ii) Nil iii) Nil iv) Nil v) Nil vi) Nil vii) Nil
19.1	Periods for submission of insurance: a) evidence of insurance b) relevant policies	Not later than the Commencement Date Within twenty-eight (28) days from the Commencement Date

Sub-Clause	Data to be Given	Data
19.2.1(b)	additional amount to be insured (as a percentage of the replacement value)	15% of the replacement value (Accepted Contract Amount)
19.2.2	extent of insurance required for Goods amount of insurance required for Goods	From Ex-Works (i.e., works, factory, warehouse, etc.) to delivery at the Site. Full replacement value
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
19.2.3(b)	insurance required against liability for fitness for purpose	Yes
19.2.3	period of insurance required for liability for breach of professional duty	Until the date of issuance of Performance Certificate
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: Rupees one million (Rs. 1,000,000) per occurrence with number of occurrences unlimited.
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.
21.1	time for appointment of the DAB	As and when required (Ad-hoc DAB)
21.1	the DAB shall comprise	Sole Member

Sub-Clause	Data to be Given	Data
21.1	List of proposed DAB Members - proposed by Employer - proposed by Contractor	<i>[to be inserted at the time of signing of the Contract].</i> one sole member to be appointed with mutual consent of both parties
21.2	Appointing entity (official) for DAB members	Chairman Pakistan Engineering Council (PEC) from the list of PEC approved arbitrators published at its website
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

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PARTICULAR CONDITIONS

Part B - Special Provisions

1.1	Definitions	<u>1.1.22 “DAAB or Dispute Avoidance / Adjudication Board”</u> Delete the text of 1.1.22 and replace with the following: “ Dispute Adjudication Board” or “DAB” means the person so named in the Contract, or appointed under Clause 21” <u>1.1.23 “DAAB Agreement”</u> Delete the text of 1.1.23 and replace with the following: “DAB Agreement” means the Agreement signed or deemed to have been signed by both parties and the sole member of the DAB in accordance with Sub-Clause 21.1. [Constitution of DAB] or Sub-Clause 21.2 [Failure to Appoint DAB Member(s)], incorporating by reference the General Conditions of DAB Agreement contained in the Appendix of these General Conditions with such amendments as are agreed. <u>1.1.76 “Specification”</u> Following is added at the end: “and consists of two parts i.e., i) “Part A - Specific Provisions”; and ii) “Part B - Specifications • Technical Provisions”.” Following definitions are added: <u>1.89 “Milestone”</u> “Milestone” means a part of the Plant and/or a part of the Works stated in the Contract Data (if any), and described in detail in the Specification as a Milestone, which is to be completed by the time for completion stated in Sub-Clause 4.24 [Milestones] but is not to be taken over by the Employer after completion. <u>1.90 “Milestone Certificate”</u> “Milestone Certificate” means the certificate issued by the Engineer under Sub-Clause 4.24 [Milestones].”
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 completed Letters of Technical & Price Bid;
- (d) the Particular Conditions Part A - Contract Data;
- (e) the Particular Conditions Part B - Special Provisions;
- (f) the General Conditions;
- (g) the Specification Part A - Specific Provisions;
- (h) the completed Schedules to Bid (except Schedule-B to Bid)
- (i) Bill of Quantities (Appendix-D to Bid)
- (j) Drawings
- (k) The Specification Part B - Technical Provisions
- (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

Delete the text and substitute with the following:

The Parties shall sign a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Contractor. The Contractor shall prepare six (6) copies of the Contract Document (including all the volumes / documents listed in the Contract Agreement) along-with copies of all the bonds/Guarantees/Sureties, at his cost and shall submit the same to the Employer”.

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) Any Change in the payment thereof under Clause 13.6 [*Adjustment for Changes in Law*].
- (j) Extra payment as a result of Contractor's claims under Clause 20 [*Employer's and Contractor's Claim*].

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, issued in 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.

Following paragraph is added at the end of this Sub-Clause:

"The amount of Performance Security shall be reduced to 50% following issue of the Taking-Over Certificate for the whole of the Works under Clause 10 of Conditions of Contract."

The cost of complying with requirements of this Sub-Clause shall be borne by the Contractor.

4.3 Contractor's Representative

In second paragraph the 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 4th paragraph 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 6 copies 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 Shop Drawings

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 of this 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 summary 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

Following Sub-Clause 4.24 is added:

4.24 Milestones

The Contractor shall complete the works of each Milestone (including all work which is stated in the Specification as being required for the Milestone to be considered complete) within the time for completion of the Milestone, as stated in the Contract Data, calculated from the Commencement Date. The Contractor shall include, in the initial programme and each revised programme, under sub-paragraph (a) of Sub-Clause 8.3 [Programme], the time for completion for each Milestone.

Sub-paragraph (d) of Sub-Clause 8.4 [Advance Warning] and Sub-Clause 8.5 [Extension of Time for Completion] shall apply to each Milestone, such that "Time for Completion" under Sub-Clause 8.5 shall be read as the time for completion of a Milestone under this Sub-Clause.

The Contractor may apply, by Notice to the Engineer, for a Milestone Certificate not earlier than 14 days before the works of a Milestone will, in the Contractor's opinion, be complete. The Engineer shall, within 28 days after receiving the Contractor's Notice:

- (a) issue the Milestone Certificate to the Contractor, stating the date on which the works of the Milestone were completed in accordance with the Contract, except for any minor outstanding work and defects (as shall be listed in the Milestone Certificate); or
- (b) reject the application, giving reasons and specifying the work required to be done and defects required to be remedied by the Contractor to enable the Milestone Certificate to be issued.

The Contractor shall then complete the work referred to in sub-paragraph (b) of this Sub-Clause before issuing a further Notice of application under this Sub-Clause.

If the Engineer fails either to issue the Milestone Certificate or to reject the Contractor's application within the above period of 28 days, and if the works of a Milestone are complete in accordance with the Contract, the Milestone Certificate shall be deemed to have been issued on the date which is 14 days after the date stated in the Contractor's Notice of application.

If Delay Damages for a Milestone are stated in the Contract Data, and if the Contractor fails to complete the works of the Milestone within the time for completion of

the Milestone (with any extension under this Sub-Clause):

- (i) the Contractor shall, subject to Sub-Clause 20.1 [Claims], pay Delay Damages to the Employer for this default,
- (ii) such Delay Damages shall be the amount stated in the Contract Data, for every day which shall elapse between the time for completion for the Milestone (with any extension under this Sub-Clause) and the date stated in the Milestone Certificate;
- (iii) these Delay Damages shall be the only damages due from the Contractor for such default; and
- (iv) the total amount of Delay Damages for all Milestones shall not exceed the maximum amount stated in the Contract Data (this shall not limit the Contractor's liability for Delay Damages in any case of fraud, gross negligence, deliberate default or reckless misconduct by the Contractor)."

5.1 Subcontractors

Add the following text at the end of paragraph (ii):

"under Schedule 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

The existing text is substituted with the following:

Personnel

"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 endeavors 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 non discrimination 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 shall be removed from the Site. If it becomes necessary to: (i) remove any item of such Plant from the Site for the purposes of repair, the Contractor shall give a Notice, with reasons, to the Engineer requesting consent to remove the defective or damaged item off the Site. This Notice shall clearly identify the item of defective or damaged Plant, and shall give details of: the defect or damage to be repaired; the place to which defective or damaged item of Plant is to be taken for repair; the transportation to be used (and insurance cover for such transportation); the proposed inspections and testing off the Site; and the planned duration required before the repaired item of Plant shall be returned to the Site. The Contractor shall also provide any further details that the Employer may reasonably require; or (ii) replace any item(s) of such Plant and/or Materials, the Contractor shall give a Notice, with reasons, to the Engineer clearly identifying the item(s) of Plant and/or Materials to be replaced, and giving details of

the due date of delivery to the Site of the replacement item(s).

Where any item of Plant and/or Materials has become the property of the Employer under this Sub-Clause before it has been delivered to the Site, the Contractor shall ensure that such an item is not moved except for its delivery to the Site.

The Contractor shall indemnify and hold the Employer harmless against and from the consequences of any defect in title or encumbrance or charge (except any reasonable restriction arising from the intellectual property rights of the manufacturer or producer) on any item of Plant and/or Materials that has become the property of the Employer under this Sub-Clause."

The following Sub-Clause 7.9 is added after Sub Clause 7.8:

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| 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. |
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| 8.1 | Commencement of Works | The following is added before the first paragraph:
"within 14 days, after signing of the Contract Agreement by both Parties," and thereafter the word "The" is replaced with the word "the". |
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| 8.5 | Extension of Time for Completion | The following is added after paragraph (c):
"for last five years". |
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The following Sub-Clause 8.14 is added after Sub-Clause 8.13:

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| 8.14 | Incentives For Early Completion | Not used. |
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The following Sub-Clause 11.12 is added after Sub-Clause 11.11:

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| 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. |
|--------------|--|---|

- | | | |
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| 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 heads namely; "Schedule of Prices Quantity", "Quantity Executed To-date", "Quantity Certified Previously" and "Net Quantity Executed under this Certificate". |
|-------------|------------------------------|--|

12.3	Valuation of the Works	After sub-paragraph (c) delete the text of 5th paragraph “Each new rate..... relevant matters” and substitute with the following: “ the valuation will be carried out by the Engineer on the basis of similar items covered in the Bill of Quantities, insofar as such rates or prices apply and where such rates or prices do not directly apply, the value shall be based on the rates or prices deduced therefrom so far as it is practicable to do so. If the same is not provided in the Bill of Quantities, then the valuation will be carried out on the basis of actual with the application of current market rates for labour, material etc. No escalation on account of material, labour, POL etc. shall be allowed on such items if the valuation is carried out on the basis of current market rates and the percentage of overheads, taxes & profit, etc. to be allowed in such cases 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 DAB 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 DAB. The Contractor shall submit the DAB 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 paragraphs are 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 [<i>Adjustments for Changes in Cost</i>].”
14.2	Advance Payment	<u>14.2.1 Advance Payment Guarantee</u> The entity issuing the Advance Payment Guarantee and its form shall be as under: The Advance Payment Guarantee 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 Pakistan. <u>14.2.2 Advance Payment Certificate</u> Add the following at the end: “The Engineer shall issue an Advance Payment Certificate for the advance payment in following two equal parts:

- (i) first part within 14 days after signing of the Agreement or the date of receipt of Engineer's Notice to Commence, whichever is earlier; and
- (ii) second part within 42 days from the date of payment of the first part, subject to the satisfaction of the Engineer as to the state of mobilization of the Contractor, bringing/installing/erecting of essential equipment and mobilization of minimum mandatory staff to complete the requirement for the entire work, having fulfilled his obligation under the Contract agreement for provision of facilities for the Engineer such as Site office, transport etc. and his own facilities such as contractor's camp, storage yards, etc. and having completed at least 2% of the permanent works (to be assessed by the Engineer during this time period.)

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

Delete '.' At the end of last paragraph and add the words "or through crossed cheque in favour of the Contractor."

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."

15.2 Termination for Contractor' 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 2004."

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 made available to the Contractor in accordance with Sub-Clause 2.6 [Employer-Supplied Materials and Employer's Equipment], and"

15.4	Payment after Termination for Contractor's Default	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	<u>16.2.1 Notice</u> 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/or Employer'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/or Employer'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" are added 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 with min. rating of AA by PACRA/VIS."
- 21.1 Constitution of the DAAB** Delete the text of Sub-Clause 21.1 in its entirety and replace with the following:
 Disputes shall be adjudicated by a DAB in accordance with Sub-Clause 21.4 [*Obtaining DAAB's Decision*]. The Parties shall jointly appoint a DAB by the date 28 days after a Party gives notice to the other Party of its intention to refer a dispute to a DAB in accordance with Sub-Clause 21.4.
 The DAB shall comprise, as stated in the Contract Data, of one suitably qualified person ("the member"). The members shall be selected from those on the list on PEC Website, other than anyone who is unable or unwilling to accept appointment to the DAB.
 The agreement between the Parties and the sole member ("adjudicator") shall incorporate by reference the General Conditions of Dispute Adjudication Agreement contained in the Appendix to FIDIC Conditions of Contract for Plant Design-Build, First Edition 1999, with such amendments as are agreed between them.
 The terms of the remuneration of the sole member shall be mutually agreed upon by the Parties when agreeing the terms of appointment. Each Party shall be

responsible for paying one-half of this remuneration.

If at any time the Parties so agree, they may appoint a suitably qualified person to replace the member of the DAB. Unless the Parties agree otherwise, the appointment will come into effect if the member declines to act or is unable to act as a result of death, disability, resignation or termination of appointment. The replacement shall be appointed in the same manner as the replaced person was required to have been nominated or agreed upon, as described in this Sub-Clause.

The appointment of the member may be terminated by mutual agreement of both Parties, but not by the Employer or the Contractor acting alone. Unless otherwise agreed by both Parties, the appointment of the DAB (including the member) shall expire when the DAB has given its decision on the dispute referred to it under Sub-Clause 21.4 [*Obtaining DAAB's Decision*], unless other disputes have been referred to the DAB by that time under Sub-Clause 21.4, in which event the relevant date shall be when the DAB has also given decisions on those disputes.

- 21.3 Avoidance of Disputes** Delete the Sub-Clause 21.3 in its entirety.
- 21.4 Obtaining DAAB's Decision** In the 1st paragraph of Sub-Clause 21.4 after the words "if a dispute arises between the parties then, "add the following:
- "after a DAB has been appointed";
- Delete the words " (whether or not any informal discussions have been held under Sub-Clause 21.3 [*Avoidance of Disputes*]); .
- 21.4.1 "Reference of a Dispute to the DAAB"
- Delete Sub-Paragraph (a) of Sub-Clause 21.4.1.
- 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** The Contractor shall be liable to pay custom duty arising out of the Contract. The rates and prices as stated in the contract shall be deemed to cover all such duties.

- 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 :
- 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;
 - terminate the Contract; and
 - 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

**MINISTRY OF INTERIOR & NARCOTICS CONTROL NATIONAL
POLICE FOUNDATION (NPF), ISLAMABAD**

CONSTRUCTION OF HOUSES FOR ICT POLICE

TECHNICAL BID

**BIDDING DOCUMENTS
VOLUME – II**

SPECIFIC PROVISIONS
TECHNICAL SPECIFICATIONS

AUGUST, 2026



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD
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SPECIFICATIONS – SPECIFIC PROVISIONS

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THE SPECIFICATIONS PART A – SPECIFIC PROVISIONS

1. GENERAL

- 1.1 The Specifications Part A – Specific 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 Specific Provisions.

2. DESCRIPTION OF PROJECT, WORKS INVOLVED AND SITE

National Police Foundation (NPF) intends to construct its **Houses for ICT Police at Police Lines Headquarters, H-11, Islamabad.**

The scope of works mainly comprises construction of Houses for ICT Police at Police Lines Headquarters, H-11, Islamabad, allied external development works and related ancillary works lying 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.

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

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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 and 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 increases 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 responsibility 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 AND 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.

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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 and 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

Manufacturer'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 testing of 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.

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 02 No.
- b) Automatic Levels with tripods & staff 02 Nos.
- 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 Employer and 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 23.2 hereof.

23.2 Construction Drawings, Supplementary Drawings

Upon commencement of the works and furnishing by the Contractor stake out survey plan and 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 23.1 and 23.2 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 22 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 seven (7) days before they are required for use. If within a period of seven (7) 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 fire fighting 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/s 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 activity 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 23.6.2 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 MONTHLY PROGRESS REPORT AND PHOTOGRAPHS

- 30.1 During the continuance of the Contract, the Contractor shall submit monthly progress on forms as approved by the Engineer. Such weekly 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 week of construction, and continuing every week 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 as 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 (alongwith 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

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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 Engineer, a site office as per design provided in these documents along with stabilized access road.

The Contractor shall provide a direct telephone with internet connection for the Engineer at site up to an average billing of Rs. 4,000/- per month, one (01) computer (Core I-7, minimum with 500 GB Hard disk, 8 Gb Ram, a DVD writer, 17" Flat Colour monitor, etc.), one flash drive of at-least 8 GB capacity each, an A3 size colour printer, stationery & pantry, a digital camera (12.5 pixel minimum), UPS, stabilizers, air conditioners, 6 cubic feet refrigerators, etc., and the site office shall be connected to the electrical system, potable water supply system and sewage disposal system.

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 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 or twenty one (21) days of the payment of the first half of the Mobilization Advance, whichever earlier.

The site office 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 office 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 and The Engineer / Employer

The Contractor shall provide, operate and maintain 01 No (1,300CC), brand new latest model, air-conditioned Car along with driver for exclusive use of the Employer / Engineer / Engineer's staff, to meet the transportation needs in connection with the project. The vehicle shall be registered in the name of Employer right from start of project.

The Contractor shall furnish supply and provide, as may be necessary without specific direction of the Employer / 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 for running of vehicle not exceeding 4500 km per month and will provide a substitute vehicle in case of any break down.

The Contractor shall provide replacement vehicle, if the vehicle is temporarily or permanently rendered unserviceable for any reason(s) or declared to be beyond repair by the Engineer/Engineer's representative at no additional cost to the Employer.

The Contractor shall maintain the vehicles up to a period of three hundred sixty four (364) days after the Issuance of Taking-Over Certificate (DLP Period) 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

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.

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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

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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.

The cost of all materials, equipment, surveyors and labour required for surveys for the Works and quantity surveys required by this clause shall be deemed to be included in the rates and prices of the various items in the Bill of Quantities and no separate measurement and payment in their respect shall be made.

44.3 Survey Instruments

The Contractor shall maintain at the Site the requisite surveying instruments in perfect working conditions to enable the Engineer's Representative to check levels and lines of the work at all times.

45. PAYMENT OF WORK

No 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.

The cost thereof shall be deemed to have been included in the total price quoted by the Contractor.

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 conform 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.

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SECTION - 0120
CONTRACTOR'S CAMP

1. **SCOPE**
2. **PAYMENT OF WORK**



1. SCOPE

The work to be done under this item consists of construction, erection, installation and maintenance of the Contractor's Project Site Offices or main camp and the Contractor's sub-camps or temporary camps, if any, and shall include all offices, shops, warehouses, and other operational buildings; all housing and related facilities including accommodations for the Contractor's personnel.

The location of the Contractor's camps, including all buildings, utilities and facilities thereof, and of the camps or establishments of all persons/parties in the vicinity operating or associated with the Contractor shall be subject to approval of the Engineer.

The work to be done under this item will terminate upon the actual Completion Date. However, if directed by the Engineer or the Employer, the Contractor shall continue such work to the extent required by the Contractor's personnel during the period of maintenance. No compensation shall be paid for the continued operation and maintenance of the Contractor's Camps during the period of maintenance.

Upon completion of the Works, or at such time within the period of maintenance as directed by the Engineer, the Contractor shall remove all buildings utilities and other facilities from the Site and restore all camp areas to a neat and clean condition.

The construction, operation and maintenance of all camps of the Contractor shall comply with all applicable provisions of current Pakistan Labor Camp Rules.

Adequately equipped and properly staffed portable first aid stations or dispensaries shall be provided by the Contractor at camps and other strategic locations to administer first aid treatment at any time required and free of charge to all persons on the Site, including employees of the Engineer and the Employer.

2. PAYMENT OF WORK

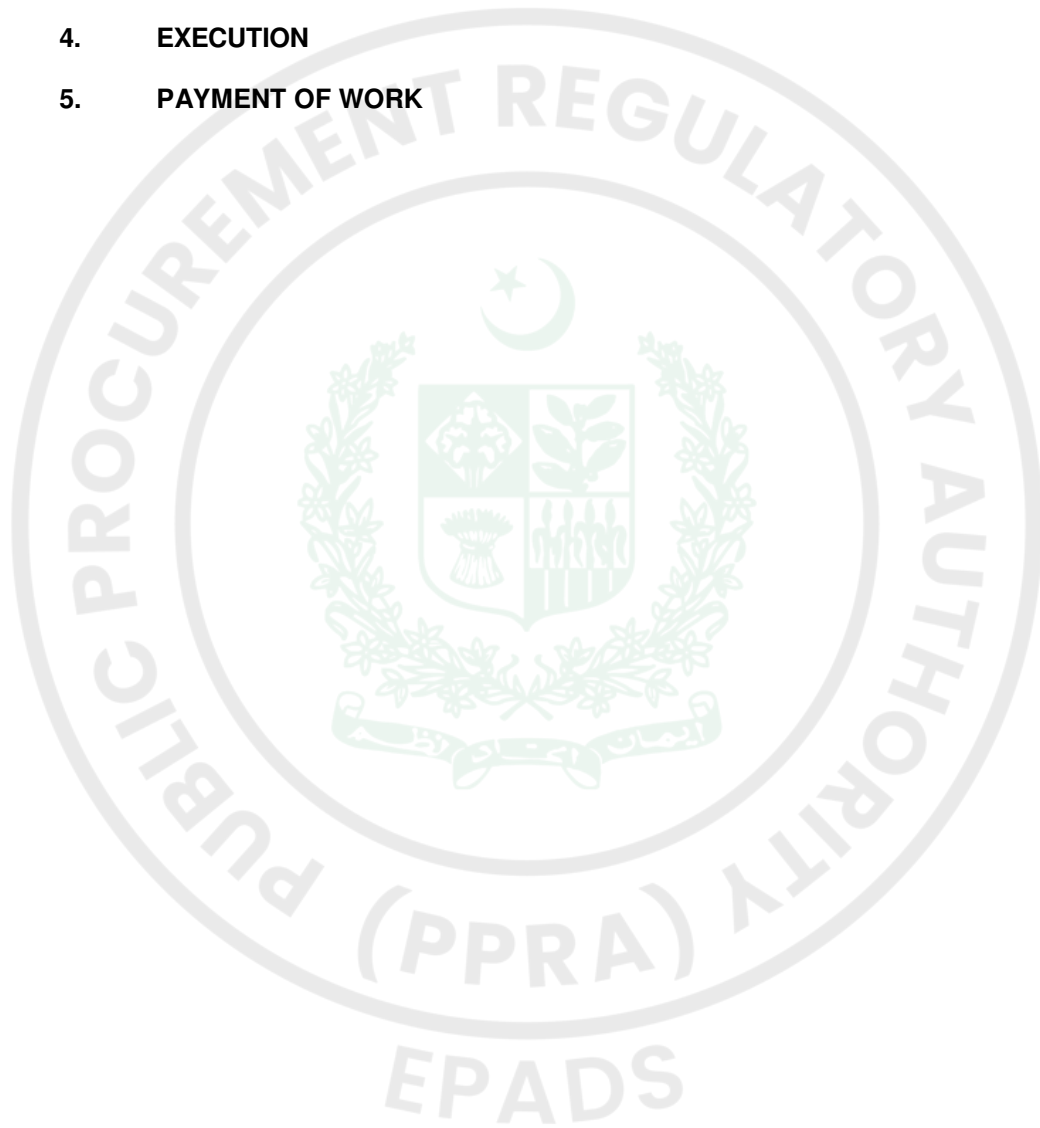
No payment shall be made for the work involved within the scope of this section of Specifications unless otherwise specifically stated in the Bill of Quantities or herein.

The cost thereof is included in the quoted rate of other items of the Bill of Quantities.

*** End of Section 0120 ***

SECTION - 0130
STAKE-OUT SURVEY

1. **SCOPE**
2. **MATERIAL AND EQUIPMENT**
3. **SUBMITTALS**
4. **EXECUTION**
5. **PAYMENT OF WORK**



1. SCOPE

Under this item the Contractor shall make the stakeout survey for construction purposes with competently qualified men, consistent with the current practices. The work shall proceed immediately upon the award of the contract and shall be expeditiously progressed to completion in a manner and at a rate satisfactory to the Engineer. The Contractor shall keep the Engineer fully informed as to the progress of the stakeout survey. The scope of this section of specifications is covered by detailed specifications as laid down herein.

2. MATERIAL AND EQUIPMENT

All instruments, equipment, stakes and other material necessary to perform all work shall be provided by the Contractor. These instruments and equipment shall be available to Engineer at all times for the purpose of checking the work of the Contractor.

All stakes used shall be of a type approved by the Engineer, clearly and permanently marked so as to be legible at all times. It shall be the Contractor's responsibility to maintain these stakes in their proper position and location at all times. Any existing stakes or markers defining property lines and survey monuments which may be disturbed during construction shall be properly tied into fixed reference point before being disturbed and accurately reset in their proper position upon completion of the work.

3. SUBMITTALS

Submit all survey data, computations, field notes, drawings and all other survey records necessary to accomplish the work.

4. EXECUTION

The Contractor shall trim trees, bushes and other interfering objects, not consistent with the plan, from survey lines in advance of all survey work to permit accurate and unimpeded work by his stake-out survey crews and the Engineer's survey crews. The exact position of all work shall be established from control points, which are shown on the plans or modified by the Engineer. Any error, apparent discrepancy in or absence of data shown or required for accurately accomplishing the stakeout survey shall be referred to the Engineer for interpretation or furnishing when such is observed or required.

The Contractor shall be responsible for the accuracy of his work and shall maintain all reference points, stakes, etc. throughout the life of the contract. Damaged, destroyed or inaccessible reference points, bench marks or stakes shall be replaced by the Contractor. Existing or new control points that will be or are destroyed during construction shall be re-established and all reference ties recorded thereon shall be furnished to the Engineer. All stakeout survey work shall be referenced to the centerlines shown on the Plans. All computations necessary to establish the exact position of the work from control points shall be made and preserved by the Contractor. All computations, survey notes and other records necessary to accomplish the work shall be kept neatly and made available to the Engineer upon request and furnished to the Employer upon Contract completion.

The Engineer may check all or any portion of the stakeout survey work or notes made by the Contractor and any necessary correction to the work shall be immediately made. Such checking by the Engineer shall not relieve the Contractor of any of his responsibilities for the accuracy or completeness of his work.

Reference points, base lines, stakes and benchmarks for borrow pits shall be established by the Contractor.

All required right-of-way and easement limits shall be established, staked and referenced by the Contractor concurrent with the construction stakeout survey.

The Contractor shall place at least two offset stakes or references at each centre lines station and at such intermediate stations as the Engineer may direct. From computations and

measurements made by the Contractor, these stakes shall be clearly marked with the correct centre line, station number, offset and cut or fill so as to permit the establishment of the true centre line location during construction. He shall locate and place all cut, fill, slope, line grade or other stakes and points as the Engineer may direct to be necessary for the proper progress of the work.

5. PAYMENT OF WORK

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 is included in the quoted unit rate of other items of the Bill of Quantities.

*** End of Section 0130 ***



SECTION - 0150

CLEARING AND GRUBBING

- 1. SCOPE**
- 2. EXECUTION**
- 3. PAYMENT OF WORK**



1. SCOPE

The clearing and grubbing shall consist of clearing the designated area of all trees, down timber, snags, bush, other vegetation, rubbish and all other objectionable material, and shall include grubbing stumps, roots, and matted roots, and disposal of all spoil material resulting from the clearing and grubbing. It shall also include the removal and disposal of structures that protrude, encroach upon, or otherwise obstruct the work, except when otherwise provided for on the plans or directed by the Engineer to be saved.

2. EXECUTION

2.1 LOCATION OF WORKS

The Engineer will define the limit of areas where clearing and grubbing is to be done. Normally it will include all land within the right of way and all other construction area including ditches, detours, minor road crossings and other areas shown on the plans or as specified or as directed by the Engineer. The Engineer will designate the fences, structures, debris, trees and bushes to be cleared where grubbing is not required. It shall not include clearing and grubbing of borrow or other pit areas from which material is secured. It shall include the leveling or removal of all bunds or mounds within the right of way unless otherwise directed by the Engineer.

2.2 GRUBBING AND CUTTING

All roots and stumps within the limits of the Site shall be grubbed and excavated unless otherwise specified or approved by the Engineer. Unless otherwise directed, holes from grubbing up tress, bushes and other holes from which obstructions are removed, shall be filled with suitable material and compacted in an approved manner.

2.3 DISPOSAL

The Contractor shall be responsible for disposal of any material whatever not to remain on Site within fourteen (14) days after cutting or felling unless otherwise approved. No tree trunks, stumps or other debris shall be left within Site unless approved in writing by the Engineer. The location of disposal areas shall be within or outside the limits of the project or as approved in writing by the Engineer and shall be acquired by the Contractor at his own expense. Any useable material shall remain the property of the Employer, and shall be stockpiled or stored safely by the Contractor.

2.4 BURNING

There shall be no burning on or around the Site area whatever. The Contractor shall ensure that neither his Employees nor anyone whosoever burns anything on or within specified limits around the Site area.

2.5 PROTECTION AND RESTORATION

The Contractor shall prevent all damage to pipes, conduits, wires, cables or structures above or below ground. No land monuments, property markers, or official datum points shall be damaged or removed until the Engineer has witnessed or otherwise referred their location and approved their removal. The Contractor shall so control his operations as to prevent damage to trees and shrubs, which are to be preserved. Protection may include fences and boards lashed to trees to prevent damage from machine operations. The existing covered or open benchmarks should be relocated as directed by the Engineer. In the event that anything specified herein to be saved and protected is damaged by the Contractor; such damages shall immediately be repaired or replaced by the Contractor at his own cost to the satisfaction of the Engineer. All areas cleared and grubbed must be approved by the Engineer or Engineer's Representative before the start of cleaning operations.

3. PAYMENT OF WORK

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 is included in the quoted unit rate of other items of the Bill of Quantities.

*** End of Section 0150 ***



SECTION - 1100

EARTHWORKS

- 1. SCOPE OF WORK**
- 2. APPLICABLE STANDARDS**
- 3. GENERAL**
- 4. SITE PREPARATION**
- 5. CLASSIFICATION OF EXCAVATION**
- 6. EMBANKMENT CONSTRUCTION**
- 7. QUALITY CONTROL**
- 8. EARTH WORK FOR STRUCTURES, STORM WATER DRAINS & CULVERTS**
- 9. MEASUREMENT AND PAYMENT**

SECTION – 1100

EARTHWORKS

1.0 SCOPE OF WORK

The work under this section of the specifications consists of furnishing all plant, labour, equipment, appliances and materials and in performing all operations for excavation, backfilling, construction of embankments and disposal of unsuitable and surplus excavated material as required in accordance with this section of specifications, the applicable drawings and subject to terms and conditions of the Contract.

2.0 APPLICABLE STANDARDS

Materials, construction and testing shall comply with the following codes and standards:

ASTM C 136	Sieve or screen analysis of fine and coarse aggregate
ASTM D 422	Testing for Liquid Limit of Soils
ASTM D 424	Testing for Plastic Limit and Plasticity Index on Soils
ASTM D 596	Water Analyses
ASTM D1556	Density of soil in place by the sand cone method
ASTM D1557	Moisture-Density relation of soils using 4.5kg rammer and 457mm drop
ASTM D 2167	Density of soil in place by the Rubber-Balloon method
ASTM D 2216	Moisture content of soil
ASTM D 4253	Test method for maximum Index Density and unit weight of soils
ASTM D 4254	Test method for minimum Index Density and unit weight of soils
ASTM D 1883	CBR-California Bearing Ratio test

3.0 GENERAL

- 3.1 The Contractor shall acquaint himself with the nature of the ground, existing structures and subsurface materials (soil / rock) which will be encountered during excavation or earthworks. The Employer does not guarantee or warrant in any way that the materials to be found in the excavation will be similar in nature to that of any samples which may have been exhibited or indicated in the Report, Drawings or any other Contract Documents or to material obtained from boring or trial holes. The Contractor shall be deemed to have made local and independent inquiries as to, and shall take whole risk of the nature of the subsurface materials (soil / rock) to be excavated or penetrated and the Contractor shall not be entitled to receive an extra or additional payment nor to be relieved from any of his obligations by reasons of the nature of such ground and subsurface material.
- 3.2 The Contractor shall submit a detailed list of plant and equipment which he shall undertake to bring to the site and to carry out the work. The list shall satisfy the Engineer as to type, size and quantity. The Contractor shall place on the site of the work all of the equipment listed and all subsequent equipment required for approval of the detailed program of work and such equipment which may be directed by the Engineer. All equipment which is proposed to be used on the work shall be sufficient size and in such mechanical condition as to meet requirement of work and produce a satisfactory quality

of work. In no case shall the Contractor remove from the site the plant and equipment without the written approval of the Engineer. The Contractor shall supply all plant and equipment necessary for the construction of each phase of the work and it must be on site, inspected and approved by the Engineer. If after use of the equipment the Engineer determines that the work provided does not meet the Contract requirement, the equipment shall be changed and the deficient work shall be removed and corrected as direct by the Engineer.

- 3.3 All suitable materials from stripping of top soil and excavation shall be used unless otherwise declared unsuitable by the Engineer. The suitable material shall comply with the requirements as specified in the respective clauses for various items.
- 3.4 The Contractor shall jointly survey the area marked for pavements utilities, service lines, buildings or other structures or any area designated by the Engineer and prepare the survey drawings showing natural ground profile and cross-section and submit to the Engineer for approval prior to start of any earthwork operation.

All suitable material from excavations shall be transported to and placed in fill areas or stockpiled at locations designated by the Engineer. Materials from excavation and stripping shall be stockpiled separately.

Existing utilities which are to remain in service or to be relocated and to remain in service until relocation are to be determined by the Contractor. They shall be safeguarded and protected from damage.

If any existing service lines, utilities and utility structures which are to remain in service are uncovered or encountered during the operations, shall be safe guarded, protected from damage and supported as directed by the Engineer.

- 3.5 All excavations, cut and fills shall be constructed to the lines, levels and gradients specified with any necessary allowance for consolidation, settlement and drainage so that at the end of the Period of Maintenance the ground shall be at the required lines, levels and gradients. During the course of the Contract and during the Period of Maintenance any damage or defects in cuts and fills, in structures and other works, caused by slips, falls of wash-ins or any other ground movement due to the Contractor's negligence shall be made good by the contractor at his own cost.

4.0 SITE PREPARATION

- 4.1 The Contractor shall set out the works and shall be responsible for true and perfect setting out of the same and for correctness of the positions, levels, dimensions and alignments of all parts thereof. If at any time any error in this respect shall appear during the progress of the works, the Contractor shall at his own expense rectify such error, to the satisfaction of the Engineer.
- 4.2 The Contractor shall construct and maintain accurate bench marks so that the Lines and Levels can be easily checked by the Engineer.
- 4.3 The Contractor shall construct and maintain such temporary drains in addition to those shown on the plans, as will adequately drain areas during construction.
- 4.4 The Contractor shall perform a joint survey with the Engineer's Representative, of the area where earth work is required, plot the ground levels on the drawings and obtain approval from the Engineer before starting the earth work and shall supply a copy to the Employer duly checked, signed and authenticated by the Engineer before start of work.

5.0 CLASSIFICATION OF EXCAVATION

- 5.1 No classification shall be made of any material excavated / cut as to its class, nature, origin or condition. The excavation will be unclassified as being carried out in all kinds of subsurface material including soil and rock.

Blasting will be permitted only when proper precautions are taken for the safety of all persons, the work, and the property. All damage done to the work or property shall be repaired at the Contractor's expense. All operations of the Contractor in connection with the transportation, storage, and use of explosives shall conform to all state and local regulations and explosive manufacturers' instructions, with applicable approved permits reviewed by the Engineer. Any approval given, however, will not relieve the Contractor of his / her responsibility in blasting operations.

In each distinct blasting area, where pertinent factors affecting blast vibrations and their effects in the area remain the same, the Contractor shall submit a blasting plan of the initial blasts to the Engineer for approval. This plan must consist of holes size, depth, spacing, burden, type of explosive, type of delay sequence, maximum amount of explosive on any one delay period, depth of rock and depth of overburden if any. The maximum explosive charge weights per delay included in the plan shall not be increased without the approval of the Engineer.

The Contractor shall keep a record of each blast fired – its date, time and location; the amount of explosives used, maximum explosive charge weight per delay period, and, where necessary, seismograph records identified by instrument number and location.

The excavation wherever required will be carried out below ground water level by dewatering the area.

The Contractor shall build, maintain and operate all berms, channels, flumes, sumps and other temporary diversion and protective works needed to divert the surface water through or around the required excavation. All excavation shall be dewatered and kept free of standing water, water seeping from the sides and bottom of excavation above, the free level. The Contractor shall furnish, install, operate and maintain all drains, sumps, pumps and other equipment needed to dewater the excavation areas. Dewatering methods that cause a loss of fines from the bottom and slopes of the excavation will not be permitted.

Prior to commencement of the work, the Contractor shall furnish the Engineer for review and comments with complete plans and sketches for diverting surface water if any and dewatering of the required excavation.

Submission for review and comments of the required plans and sketches and any approval from Engineer shall not relieve the Contractor of any of his duties and obligations under the contract.

5.2 Tolerance

In those areas upon which a sub-base or base course is to be placed, the top of the subgrade shall be of such smoothness that when tested with a 4.8 m (15.75 ft.) straight edge applied parallel and at right angles to the centerline, it shall not show deviation in excess of 12 mm (1/2") or shall not be more than 16 mm (5/8") from line grade as established by grade hubs or pins. Any deviation in excess of these amounts shall be corrected by loosening, adding, or removing material; reshaping; and recompacting by sprinkling and rolling.

On graded strips (safety areas) intermediate and other designated areas, the surface shall be of such smoothness that it will not vary more than 30 mm (1-1/4") from true grade as established by grade hubs.

6.0 EMBANKMENT CONSTRUCTION

6.1 General

It shall consist of construction of select embankment for paved areas and common embankment for unpaved areas. Only approved material shall be used in the construction of embankments.

All embankment construction shall be made to the lines, levels, profiles and grades as shown on the drawings or established by the Engineer. During progress of the work it may be found necessary or desirable by the Engineer to vary the levels, elevations and grades from those shown on the drawings. The Contractor shall perform the embankment construction to the revised levels, elevation as established by the Engineer.

Where embankments are to be placed in water logged areas and which are inaccessible to heavy construction equipment, a working platform shall be first established, consisting of a blanket of fill material placed on the water logged area. The thickness of the working platform shall be about 0.5 metres (1.65 feet) unless directed otherwise by the Engineer and the width shall be that of the embankment. The placement and compaction of the working platform shall be performed by use of light equipment as directed by the Engineer. No density requirements are specified for the working platform, however, subsequent layers above shall be compacted to densities specified in the relevant items.

Benching of sufficient width for slope stability and movement of equipment and machinery shall be carried out for embankment formation in areas of steep slopes.

6.2 Select Embankment

The select embankment shall be constructed under all paved areas. The area shall be prepared (after stripping of top soil) by scarifying the surface to a minimum depth of 150 mm (6") and compacting it to densities mentioned in subsection 6.2.2.

6.2.1 Material

The suitable subsurface material obtained from excavation (except top soil) shall be used in the construction of select embankment. The material shall be A-4 or superior as per AASHTO soil classification. The soaked CBR of the material shall be equal to or greater than 6. In the top 30 cm (12 in.) the material shall be A-4 or superior and the $PI \leq 8$. When excavated material consists predominately of rock fragments of such size that the material cannot be placed in layers of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in layers not exceeding 60 cm (2 ft.) in thickness. Each layer shall be leveled and smoothed with suitable leveling equipment and by distribution of spalls and finer fragments of rock. These type lifts shall not be constructed above an elevation 150 cm (5 ft) below the finished sub-grade.

6.2.2 Formation of Embankment

Embankment shall be formed in successive horizontal layers of not more than 200 mm (8 in.) in loose depth for the full width of the cross-section, unless otherwise approved by the Engineer.

The material placed in layers and the sub-grade scarified shall be compacted to the density specified below:

Depth (cm) Below Subgrade Level		Percent of Max. dry Density as per ASTM D1557	
Cohesive Soil	Non-Cohesive Soil	Cohesive Soil	Non-Cohesive Soil
0 to 30	0 to 60	95%	100%
30 to 75	60 to 100	93%	95%
Over 75	Over 100	90%	90%

Sub-grade level is the surface on which the pavement structure will be placed.

The maximum density of sand (granular) material (if used) shall also be determined as per ASTM D4253. The higher of the two values obtained from ASTM D1557 and ASTM D4253 shall be used to check the relative compaction of the in place material.

The moisture content of the material should be controlled to within $\pm 2\%$ of the optimum moisture content. In order to achieve a uniform moisture content throughout, the wetting and drying of the material, and manipulation shall be required when deemed necessary. Also, the California Bearing Ratio test (ASTM D1883) may be conducted on soil if instructed by the Engineer.

The embankment formed by rock fragments of such size that the material can not be placed in layers of thickness prescribed without crushing, pulverizing or further breaking down the pieces, such material may be placed in layers not exceeding 60 cm (2 ft.) of loose measurement and compacted by vibrating roller with mass as specified hereunder:

Mass per metre width of Vibrating roll	Depth of fill layer	Number of passes of the roller on each layer
2300 – 2900 kg/m 1550-1950 lbs./ft.	40 cm 16 in.	5
2900 – 3600 kg/m 1950-2400 lbs./ft.	50 cm 20 in.	5
2600 – 4300 kg/m 1750-2900 lbs./ft.	60 cm 24 in.	5

The material shall be carefully placed in layer so that all larger stones will be well distributed and voids completely filled with smaller stones, small spall and soil to form a solid mass. After placing the rock material, surface shall be covered with fine material having thickness less than 20 cm (8 in.).

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 1% of the layer thickness. When rock to be incorporated in fill is composed largely of weak or friable material, the rock shall be reduced to a maximum size not exceeding 50% of the thickness of the layer being placed.

6.3 Common Embankment

6.3.1 Material

The area requiring common embankment, and other unpaved areas shall be constructed from the excavated soil and rock. The top soil obtained from stripping may be used at deeper level with the approval of the Engineer.

6.3.2 Formation of Embankment

Before placing and compacting the fill material the ground shall be scarified to a depth of 15 cm (6 in.) and compacted to a dry density of 90% as per laboratory compaction test method ASTM D1557. The moisture content of soil during compaction of scarified layer and successive layers shall be within $\pm 2\%$ of optimum moisture content before rolling to obtain the desired density results. The successive horizontal layers shall be formed in loose depth 200mm(8 in.) for the full width of the cross section unless otherwise approved by the Engineer. Each layer will be compacted to dry density of 90% as per laboratory compaction test method ASTM D 1557.

The layer thicknesses and compaction requirements shall be the same as specified under 'Select Embankment' for embankment formed by rock fragments.

No rock larger than 8 cm (3 in.) in any dimension shall be placed in top 30 cm (12 in.) of embankment unless allowed by the Engineer.

6.4 Tolerances

Select Embankment

The grade surface of each layer excluding final layer, shall be smooth and even and tolerance from required grade shall not be more than 19 mm (3/4 in.).

Common Embankment

The grade surface of each layer including the final layer, shall be smooth and even and tolerance from required grade shall not be more than 19 mm (3/4 in.).

6.5 Sub-grade Preparation in Cut

The area shall be prepared (after stripping of top soil) by scarifying the surface to a minimum of 150 mm (6 in.) and compacted to density mentioned in subsection 6.2.3. In case the material below Sub-grade level is not suitable (having PI >8) then a minimum of 30 cm (12 in.) of the soil shall be improved to PI ≤ 8.

The surface of the Sub-grade level (fill & cut) shall have the following tolerances:

- Plus : 0 mm (0 in.)
- Minus : 40 mm (1-5/8 in.)

7.0 QUALITY CONTROL

A testing program shall be submitted by the Contractor. Tests shall be performed by the Contractor to ensure compliance with the specifications as required. A copy of all test reports shall be submitted to the Engineer for approval. The test shall be performed in accordance with the following test procedures and frequency of testing.

Prior to construction of embankment, classification and compaction tests shall be carried out on stock-piled material obtained from stripping of top soil and excavated subsurface material (soil & rock). The tests shall be carried out as per ASTM 422, ASTM 424 and ASTM D 1557. A family of laboratory compaction curves as per ASTM D 1557 representing typical material shall be developed for the fill / backfill material.

The frequency of classification tests shall be for every 1000 cu.m / 35,000 Cft. of fill material. The Engineer may alter the frequency of testing depending on the type of material and variation encountered at site.

The field density tests shall be performed as per ASTM D 1556 or ASTM D 2167. The frequency of testing shall be as under:

Select Embankment

Area requiring 90% to 93% compaction – one test in every 500 m² / 5000 Sft. area in each layer

Area requiring 95% & 100% compaction – one test in every 300 m² / 3000 Sft. area in each layer

Common Embankment

Area requiring 90% compaction – one test in every 1000 m² / 10000 Sft. area

The average of four tests are required to be greater than the required compaction and not more than one test be 1.8% less than required percentage of compaction. This is for 100% compaction. For 95% to 90% compaction the following is required.

%age Compaction

One test not less than

95%
90%

93.5%
89.5%

8.0 EARTH WORK FOR STRUCTURES, STORM WATER DRAINS & CULVERTS

8.1 Excavation

Excavation, including dewatering where required, for building/related structures, culverts, storm water drains etc. shall conform to the elevations and dimensions as shown on the drawings and extend to a sufficient distance to permit placing and removal of concrete formwork or other construction.

When determined by the Engineer to be insufficiently firm, excavation bottoms shall be further excavated to reach firm ground or backfilled with suitable material and compacted to 95% of maximum dry density as per ASTM D-1557.

All excavations in foundations shall be taken as 150 mm (6 in.) above the final excavation elevations shown on the drawings and the last 150 mm (6 in.) shall be trimmed carefully to a smooth surface. Immediately after trimming to final elevation, a layer of blinding concrete shall be placed to thickness shown on the drawings.

8.2 Fill and Backfill for Structures, Storm Water Drains and Culverts:

8.2.1 After completion of foundation footings, foundation walls and other construction below the elevation of the final grades and prior to start of back-filling, forms shall be removed and the excavation shall be cleaned of trash and debris.

8.2.2 The backfilling/fill shall include filling under the floors where shown or required and around the foundations.

8.2.3 The backfilling/fill shall include loading, unloading transporting, placing, stacking, spread of earth, watering, rolling, ramming and compaction etc. complete as specified herein.

8.2.4 Filling in foundations shall be placed in 200mm (8 in.) loose layers and compacted at optimum moisture content by mechanical means or other means as approved by the Engineer.

8.2.5 Material for backfilling shall be as approved by the Engineer and compacted to produce insitu dry density not less than 95% of the maximum dry density as achieved by compaction test as per ASTM D-1557.

9.0 MEASUREMENT AND PAYMENT

9.1 General

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned items related to this section. The cost thereof shall be deemed to have been included in the quoted unit rates of the items of the Bill of Quantities under this section.

9.1.1 Timber shoring, planking, strutting and providing slope for upholding the sides of excavations.

9.1.2 Benching of sufficient width for slope stability and movement of equipment and machinery.

9.1.3 De-watering where required to keep the excavated areas dry for pavements, structures, storm water drains and culverts, during construction.

- 9.1.4 Rolling, leveling, watering and compaction for construction of embankments to required density.
- 9.1.5 Any fill with approved materials necessitated by over excavation due to fault or convenience of the Contractor.
- 9.1.6 Stock piling the excavated materials at approved location within Contract limits and transporting back suitable material to places requiring fill or backfill.
- 9.1.7 Scarifying & compaction of ground.
- 9.1.8 Transporting & backfill the suitable material from stripping.
- 9.1.9 Extra excavation involved in providing adequate working space around sides of foundations and culverts.
- 9.1.10 Rolling, leveling, watering and compacting the fill and backfill to required density.
- 9.1.11 All laboratory and field tests stipulated in these specifications
- 9.1.12 Preparation of sub-grade

9.2 **Embankment (Select)**

9.2.1. Measurement

Measurement of acceptably completed work of constructing select embankment will be made on basis of actual volume in cubic metre / cubic feet of compacted select embankment placed in position in accordance with the lines, levels and grade as shown on drawings or as directed by the Engineer.

9.2.2 Payment

Payment will be made for acceptable measured quantity of select embankment on the basis of unit rate per cubic metre / cubic feet quoted in the relevant items of Bills of Quantities and shall constitute full compensation for all the work related to the item.

9.3 **Embankment (Common)**

9.3.1 Measurement

Measurement of acceptably completed work of constructing common embankment will be made on basis of actual volume in cubic metre / cubic feet of compacted embankment placed in position in accordance with the lines, levels and grade as shown on drawings or as directed by the Engineer.

9.3.2 Payment

Payment will be made for acceptable measured quantity of common embankment on the basis of unit rate per cubic metre / cubic feet quoted in the relevant items of Bills of Quantities and shall constitute full compensation for all the work related to the item.

9.4 **Excavation**

9.4.1 Measurement

The quantities set out for excavation and its subsequent disposal shall be deemed to be the bulk quantity before excavating and no allowance shall be made for any subsequent variations in bulk or for any extra excavation.

Measurement of acceptably completed works of excavation for structures, storm water drains and culverts will be made on the basis of actual volume in cubic metre / cubic foot of earth material excavated to the line, level and grade as shown on the drawings or as directed by the Engineer. It shall be calculated / measured from pre-work levels and levels shown on the drawing.

9.4.2 Payment

Payment will be made for acceptable measured quantity of excavation on the basis of unit rate per cubic metre / cubic foot quoted in the Bills of Quantities and shall constitute full compensation for all the work related to this item.

9.5 Backfill/Fill

9.5.1 Measurement

Measurement of acceptably completed works of backfill/fills for structures, storm water drains and culverts will be made on the basis of actual volume in cubic metre / cubic foot of compacted backfill/fill provided and placed in position in accordance with the lines, levels and grade as shown on the drawings or as directed by the Engineer.

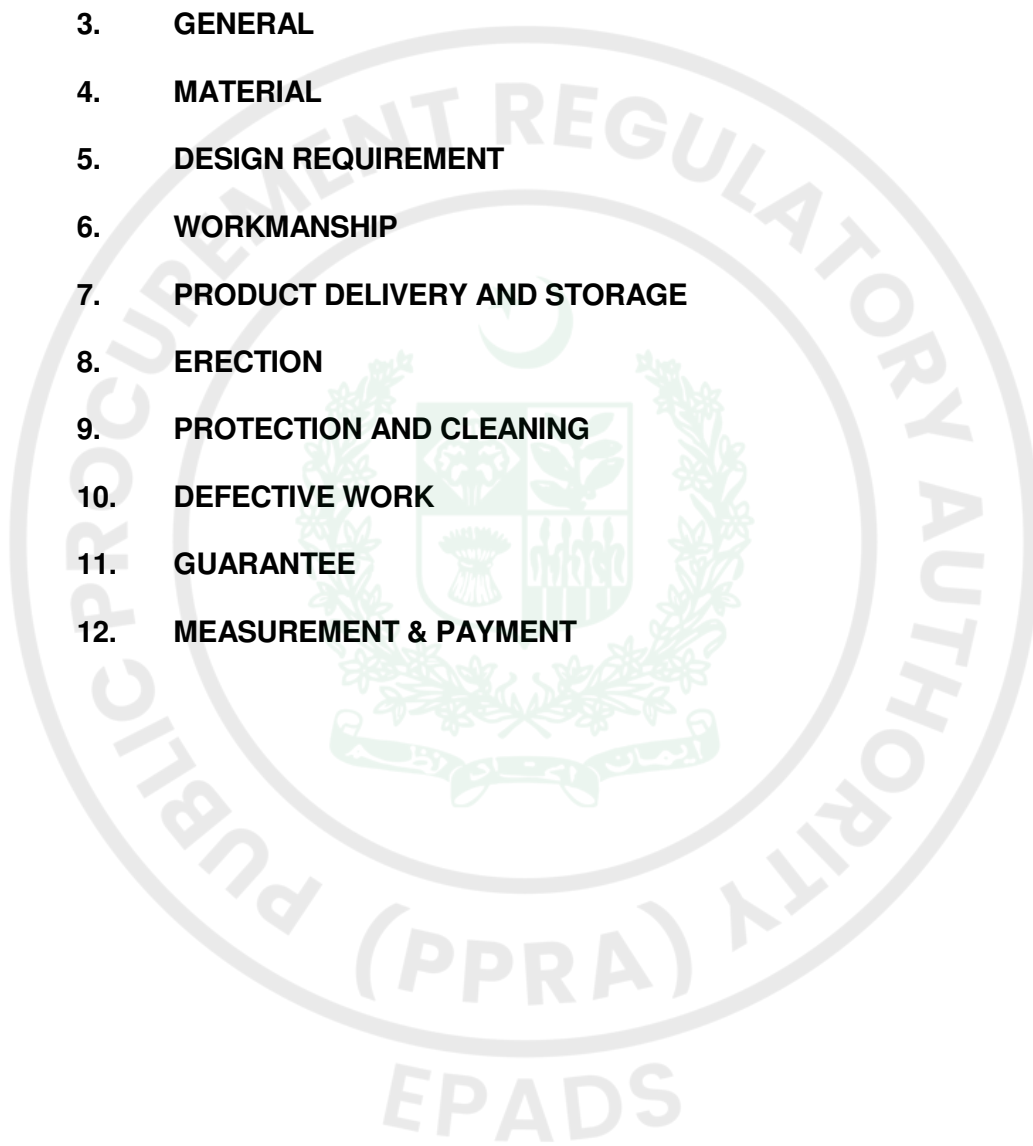
9.5.2 Payment

Payment will be made for acceptable measured quantities of backfill/fills for structures, storm water drains and culverts on the basis of unit rate per cubic metre / cubic foot quoted in the respective items of Bills of Quantities and shall constitute full compensation for all the works related to the item.

*** End of Section 1100 ***

SECTION - 6220
ALUMINUM WORKS

1. **SCOPE**
2. **APPLICABLE STANDARDS**
3. **GENERAL**
4. **MATERIAL**
5. **DESIGN REQUIREMENT**
6. **WORKMANSHIP**
7. **PRODUCT DELIVERY AND STORAGE**
8. **ERECTION**
9. **PROTECTION AND CLEANING**
10. **DEFECTIVE WORK**
11. **GUARANTEE**
12. **MEASUREMENT & PAYMENT**



SECTION - 6220

ALUMINUM WORKS

1.0 SCOPE

The work under this section of specification includes furnishing all labour, equipment, appliances and materials and performing all operations in carrying out the work of aluminium doors, windows, ventilators and louvers. All related items such as sealants, rubber gasket for glazing, fly proofing, rollers, latches, fastenings, glazing, anchor bolts and all items supplied by other trades and customarily built in and/or installed in strict accordance with this section of the specifications and the applicable drawings and subject to the terms and conditions of the Contract.

2.0 APPLICABLE STANDARDS

Latest editions of following ISO and British Standards are relevant to these Specifications wherever applicable.

2.1 ISO (International Organisation for Standardisation)

- 1804 Doors - Terminology
- 6442 Door Leaves - Measurement of defects of general flatness.
- 6443 Door Leaves - Measurement of dimensions and defects of squareness.
- 6444 Door Leaves - Test of behaviour under humidity variations (successive uniform climates)
- 6612 Windows & Doors - wind resistance tests.
- 6613 Windows & Door - Air permeability test.

2.2 BSI (British Standard Institution)

- 1227 Hinges
- 4873 Aluminium alloy windows.

3.0 GENERAL

- 3.1 Doors, windows and ventilators to be provided shall be aluminium doors, windows and ventilators of profile, pattern and design shown on drawings and shop drawings as approved by the Engineer. The Contractor shall provide manufacture literature completely describing the product instructions for installation and maintenance.
- 3.2 All the sections used for doors, windows and ventilators shall be of best quality aluminium products such as equal and unequal angles, channels, tubes, corrugated strips, mouldings etc., in accordance with International standards conforming to ASTM B 308 & B 221.
- 3.3 All doors, windows and ventilators, shall be of type and size indicated on drawings and shall conform to the requirements shown and specified herein.
- 3.4 Contractor shall arrange tests and analysis if directed by the Engineer of scaled models of each doors, windows and ventilators type at the maker's works or any laboratory specified by the Engineer for the material supplied by him to be tested in the presence of the Engineer's Inspector, to whom test certificates, proof sheets, etc. shall be furnished.

The models shall be submitted to the Engineer for approval prior to testing. Nevertheless, neither the fact that the materials have been tested in the presence of the Inspector nor that the Engineer may have been furnished with test certificates in lieu of sending an inspector to the works shall affect the liberty of the Engineer to reject, after delivery of materials found not in accordance with these specifications.

- 3.5 The contractor shall submit shop drawings which shall show full construction details, quantities and locations, fastenings and attachment to adjacent construction and materials. Shop drawings shall be submitted at the proper time to allow for checking, revisions, agreement and to permit manufacturer's product delivery and start of site work to suit the building programme. The Contractor shall submit representative samples of finished doors, windows and ventilators anchoring mechanism, embedded parts, fastenings, glass panes, accessories and other materials for the Engineer's approval.

After approval of shop drawings and tests etc., the Contractor shall submit at his own cost one mock-up sample of each type of aluminium works complete with glazing, all components assembly method and required fittings and accessories prior to the actual fabrication of the bulk. The samples shall be returned to the Contractor for incorporation in the works after installation of at least 80% of the works.

Fabricate and assemble all work in the shop of the approved manufacturer to reduce field fabrication to a minimum unless otherwise directed by the Engineer.

- 3.6 The glass shall conform to specification laid down under chapter 'Glazing' and shall be free from all blemishes, bubbles, distortions and other flaws of any kind and shall be properly cut to size as shown on drawings, so as to fit the grooves in ventilators members. All the glass shall be best quality of approved manufacture or equivalent standard as approved by the Engineer.
- 3.7 The structural shape of the aluminium members shall be of uniform quality, colour and temper, clean, round, commercially straight and free from injurious defects.
- 3.8 All doors, windows and ventilators shall be fabricated as a complete unit, fully airtight and watertight, including rubber gasket for glazing, rollers, latch, anodized in specified colour, inclusive of glass sheet, all as approved by the Engineer.
- 3.9 Contractor shall, on request, get certificate signed by the manufacturer stating that each lot has been sampled, tested and inspected and has met the requirements in accordance with these specifications, and the same shall be furnished to the Engineer.
- 3.10 The shop drawings shall clearly show that there shall be no penetration of rainwater from the exterior to the interior in case of severe wind and rainstorm. This has to be specially ensured in cill section.

4.0 **MATERIAL**

4.1 **Frames/shutters**

The frames of aluminium door, windows and ventilator shall be formed from rolled, strip or extruded aluminium. The thickness of sectional members shall be at least 1.6 mm. All outer / frame sections of openable / fixed windows. Ventilators and louvers curtain wall shall be 3" (75 mm) minimum in width. The Frames for doors and door/windows curtain wall shall be at least 3" (75 mm) in width.

- 4.2 As shown on the drawings, aluminium frames shall be provided as per international standard approved by the engineer.
- 4.3 Fasteners shall be stainless steel of a type selected to prevent galvanic action with the components fastened.

- 4.4 Gaskets shall be vinyl glazing channel gasket to commercial standard CS-230-60.
- 4.5 Hardware shall be manufacturer's standard hardware. Flush to match doors, windows, ventilators and louvers finish. Floor mounted concealed type double action/swing imported door closures shall be provided to all doors. Heavy-duty in-matching finish stays shall be provided to all openable windows, ventilators and louvers. Stays shall be attached to the window frame so as could be replaced easily.
- 4.6 Joint sealant shall be approved elastomer.
- 4.7 All aluminium sections shall be powder coated in accordance with the standards of Aluminium Association of USA. The anodisation shall be of not less than 70-90 microns. The anodic oxide surface shall be properly sealed.
- 4.8 For powder coated finish aluminium sections to be coated shall be mill finish. The sections shall be firstly degreased with a degreasing chemical to remove all/any stains. The sections will then be given a chromating coating and electro static powder coating in the desired colour with a powder-coating machine. After colour coating the sections will be baked at baking temperature of 220 degree Centigrade for 25 minutes.
- 4.9 All sliding/openable windows shall have sliding/openable wire/fly screen shutters in window matching finish with wire/fly screen of size so as not to permit the entry of flies and mosquitoes. The wire mesh shall be 30 SWG. 14 mesh (14 x 14 openings per square inch).
- 4.10 Composite Aluminium Cladding: Composite aluminium cladding material shall be from approved manufacturer.

5.0 **DESIGN REQUIREMENT**

The Contractor shall design the installation to meet or excell the following requirements.

5.1 **Tolerances**

The Contractor shall be responsible for agreeing to all dimensions with the Engineer before proceeding with the manufacture and for making provision to allow for building tolerances required by the Engineer. Contractor shall also take site measurements of the structure completed before manufacturing.

5.2 **Thermal & Seismic Movements**

The window and glazing assemblies are to be constructed and installed in the openings with sufficient tolerance and, where necessary, to provide for joints incorporated in couplings, to provide for expansion and contraction as will be caused by the local seismic and climatic conditions and temperature changes, winter to summer - day to night without buckling, distortion of joints, or other harmful effects.

6.0 **WORKMANSHIP**

The Contractor shall be responsible for the protection and installation of all items furnished. All items shall be installed plumb and square and shall be solidly anchored in a good workman like manner in accordance with the manufacturer's instruction and as specified herein. The Contractor shall be responsible for the protection of installed items from damage by other trades. All items shall be left in operating, neat and clean condition, free from dirt, finger marks, etc. The Contractor shall be responsible for final cleaning before the final acceptance.

The glass panes shall firmly be secured in the rebates with the rubber gasket. Ensure that the beads and grooves are clean, dry and unobstructed at the time of glazing. The complete unit shall be airtight and watertight on completion. No ventilator shall be

considered complete until and unless the fingerprints and other stains and marks have been removed from the surface of glass and aluminium.

7.0 PRODUCT DELIVERY AND STORAGE

- 7.1 Deliver doors, windows and ventilators in a manner preventing damage to units. Store materials off the ground under cover in a manner preventing deterioration or damage.
- 7.2 All embedded parts and anchor bolts shall be delivered to the site carefully and keeping the fabricated shape and configuration. All these parts shall be suitably marked for identification.

8.0 ERECTION

Rawlplugs and anchoring bolts shall be embedded into the concrete or block masonry for holding the doors, windows and ventilators in their correct positions.

Care shall be taken to install the doors, windows and ventilator in line and plumb & solidly anchored in a good workman like manner in accordance with the drawings. Should any scale or scratch appears on the surface of doors, windows and ventilators, the contractor shall at his own expense and at the Engineer's direction have all exposed surfaces cleaned to bare bright specified colour.

All works shall be installed strictly in accordance with the manufacturer's printed instructions.

9.0 PROTECTION AND CLEANING

- 9.1 Temporary protection shall be achieved by applying water soluble protective coating capable of withstanding the action of lime mortar.
- 9.2 Apply coating in the manufacturer's plant to the exposed surfaces of all components.
- 9.3 Before application of coating, remove all fabrication compounds, moisture and dirt accumulations.

10.0 DEFECTIVE WORK

In the event of non-conformance to specifications and drawings the aluminium work shall be rejected by the Engineer and the Contractor shall remove and replace the rejected works by new work of same specifications.

11.0 GUARANTEE

- 11.1 The manufacturer shall furnish his standard written guarantee against leakage of rain, excessive infiltration of dust and air and all defects in materials and workmanship covering all work under this section.
- 11.2 Such guarantee shall be in addition to and not in lieu of all other liabilities which manufacturers and the Contractor may have by law or by other provisions of the Contract Documents.

12.0 MEASUREMENT AND PAYMENT

12.1 General

Except otherwise specified herein or else where in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of Quantities.

- 12.1.1 Providing and fixing glazings.
- 12.1.2 Powder coating of Aluminium works.
- 12.1.3 Anodizing of Aluminium works.
- 12.1.4 Rawlplugs, brackets, rubber gasket, sealants, rollers, vetting latches and any other embedded fixture required for fixing the ventilators.
- 12.1.5 Providing & fixing locks, door closures, and other hardware as approved by the Engineer.
- 12.1.6 Fly proof shutters and screens for Doors & windows.
- 12.1.7 All samples and tests.
- 12.1.8 Insulation, structural steel for framing etc. for cladding.

12.2 **Aluminium Works**

12.2.1 Measurement

Measurement of acceptably completed works of aluminium doors, windows, ventilators and louvers will be made on the basis of actual area in square meter / square foot of door, windows and ventilators provided and installed in position as shown on drawings or as directed by the Engineer.

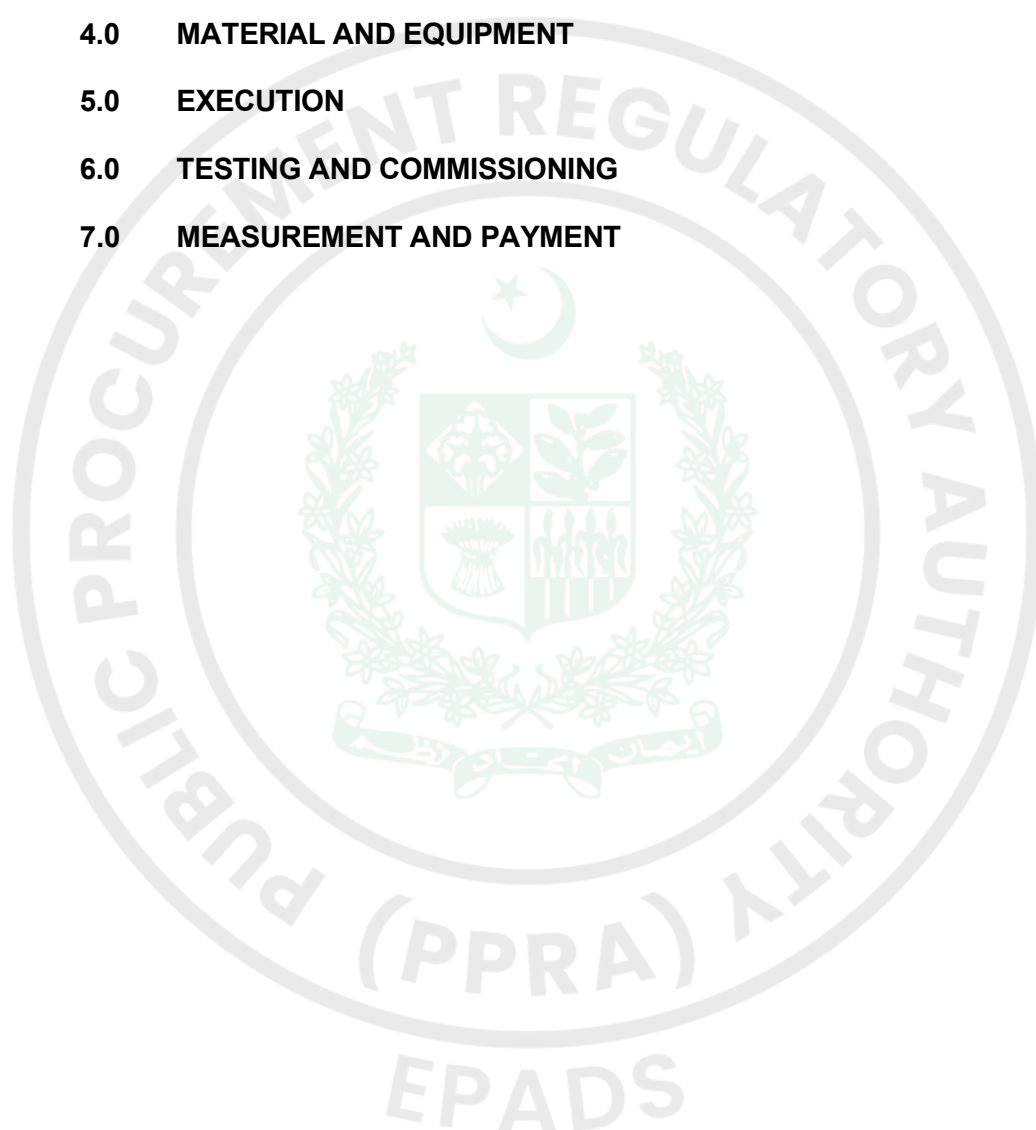
12.2.2 Payment

Payment will be made for acceptable measured quantity of aluminium door, windows, ventilators and louvers on the basis of unit rate per square meter / square foot quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

*** End of Section 6220 ***

SECTION - 5100**PLUMBING**

- 1.0 SCOPE**
- 2.0 APPLICABLE STANDARDS**
- 3.0 SUBMITTALS AND SHOP DRAWINGS**
- 4.0 MATERIAL AND EQUIPMENT**
- 5.0 EXECUTION**
- 6.0 TESTING AND COMMISSIONING**
- 7.0 MEASUREMENT AND PAYMENT**



1.0 SCOPE

The work under this section consists of providing all material and equipment and performing all the work necessary for the complete execution (jointing, clamping, cleaning, painting etc. both above and underground and embedded in walls) and completion, including testing and commissioning of all systems of plumbing works as shown on the Drawings and/or as specified herein and/or as directed by the Engineer. The system includes plumbing works as follows:

- i) Cold and Hot Water Supply
- ii) Building Drainage
- ii) Rain Water Drainage

All the above named systems shall be completed in all respects including extension of these internal systems upto the specified limits outside the building as indicated on the drawings.

2.0 APPLICABLE STANDARDS

Galvanized iron (GI) Pipes threaded	BS- 1387 (1985) Medium duty
Galvanized iron (GI) Pipes welded	ASTM A-53 ERW Schedule 40
Polypropylene Random (PPR) pipes	DIN 8077-78
Cast iron (CI) Pipes	BS- 416 & 2494
uPVC Pipes (Building)	ISO- 3633 & BS- 4514/ 5255. (BS EN-1329)
uPVC Pipes (External)	BS-5481/ BS-4660 (EN-1401)

3.0 SUBMITTALS & SHOP DRAWINGS

All the materials and equipment shall be of the specifications mentioned herein and the Contractor shall submit the sample, necessary catalogues, sketches, the name of manufacturer and guarantee if necessary, before installation. The system shall be installed after the Engineer approves it. All material and equipment shall be new and unused.

It is specifically intended and must be agreed to by each Contractor submitting a bid, that any material or labor which is usually furnished as a part of such equipment and which is necessary for its proper completion and best operation shall be furnished as a part of this Contract without any additional cost whether or not shown in detail on the drawings or described in detail, in the specifications.

Approval of material and equipment by the Engineer shall not absolve the Contractor of the responsibility of furnishing the same of proper size, quantity, quality and all performance characteristics to efficiently fulfill the requirements and intent of the Contract Documents.

Prior to commencement of works on site and at least 3 weeks in advance of all the drawing being required for actual execution the Contractor shall submit on larger scale as approved by Engineer, shop drawings in triplicate for approval to the Engineer. The Engineer shall review the drawing and (i) approve the drawing or, (ii) approve the drawing with comments or, (iii) disapproved the drawings with comments for rectification/revision of the drawing and resubmit 3 copies to the Consultant for approval. On a drawing being approved, the Contractor shall submit 6 copies for formal approval and distribution to relevant offices.

All drawings shall have plan and section and with sufficient details to clearly reflect the installation of the system. All material specifications shall be provided on the drawings. All information required for preparing suitable foundation, for providing suitable access to the system, for making openings in building structure, for coordination with electrical, air-conditioning and other designs etc., shall be clearly provided.

Installation shall not be allowed to commence unless approved shop drawings are in possession of the Contractor, for which purpose shop drawings shall be submitted by the Contractor to the Engineer sufficiently in advance of actual requirements to allow for ample time in checking and approval and no claim for extension of the contract time will be considered by reason of the Contractor's failure to submit the drawings on time.

Each shop drawing submitted by the Contractor shall include a certificate by the Contractor that all related conditions on site relevant to that particular installation have been checked and that no conflict exists.

Any expenses resulting from an error mistake or omission in or delay in delivery of the drawings and information mentioned above shall be borne by the Contractor.

Drawings approved shall not be departed from except on the instructions of the Engineer.

The approval by the Engineer for any submitted data, working drawings, performance curves, test certificates for any items, arrangements and/or layout shall not relieve the Contractor from any responsibility regarding the performance of the Contract. Such approval shall not also relieve the Contractor from responsibility of any error in the submitted data and workings, brought to light at any time subsequent to any approvals.

Relevant specified imported item, model cuts will be available with the authority concern for execution of work for contractor to check the models for fabrication or import.

4.0 MATERIAL & EQUIPMENT

4.1 G.I. COLD, HOT WATER PIPES AND FITTINGS

The galvanized pipes shall be of medium grade and conform to British Standard Specifications 1387 for "Steel Tubes and Tubular suitable for screwing to BS 21 pipe threads".

All screwed tubes and sockets shall have BS pipes thread in accordance with BS 21. In order to prevent damage to the leading thread, the ends of the sockets shall be chamfered internally.

A complete and uniform adherent coating of zinc will be provided for galvanized pipes.

Every tube shall be tested at the manufacturer's works to a hydraulic test pressure of 4.90 MPa (710psi) and shall be maintained at the test pressure sufficiently long for proof and inspection.

Tubes which are bundled shall be secured together by rope or soft iron or other suitable material.

The threads of all tubes shall be effectively covered with a good quality grease or other suitable compound, and each tube above 50 mm nominal bore shall have a protecting ring affixed to the unsocketed screwed end.

All pipe fittings upto 75 mm dia. shall conform to BS 21 and shall be of malleable cast iron. Pipe fittings above 75 mm dia. shall be of approved material and specifications as decided by the Engineer.

4.2 POLYPROPYLENE RANDOM (PPR) PIPES AND FITTINGS

Polypropylene Random Pipes and fittings shall conform to the following standard

DIN	8077-8078	Resistible to all chemical elements
DIN	16961	Smooth inner surface
DIN	19560	Usability for hot water all levels
DIN	4279	Durable to inner pressure
DIN	16962	Conforms to connections by welding process

4.3 SOIL, WASTE, VENT & RAIN WATER DRAINAGE PIPES & PIPE FITTINGS (C.I. & uPVC)

a. Cast Iron (CI) PIPES & FITTINGS

The cast iron pipe shall conform to British Standard Specifications No.416 for "Cast Iron spigot and socket soil, waste and vent pipes and fittings with spigot and socket or hubless ends. The joint shall be lead caulked or elastomeric (Rubber rings) to BS- 2494.

Cast iron pipes shall be centrifugally (SPUN) cast.

The quality of material shall be according to B.S.S. No.1452 for Grade 10.

The contractor shall supply coated pipes and fittings. The coating composition shall be of tar basis or a mixture of natural bitumen with a suitable hardener and natural asphalt. The coatings shall be smooth, tenacious, sufficiently hard, not to flow when exposed to a temperature of 63 Degrees Celsius and not so brittle at zero degrees Celsius that it chips soft when scribed lightly with the point of a pen knife.

Every pipe shall be tested at the manufacturer's work to a hydraulic test pressure of 0.07 MPa (10psi). Every pipe and fitting shall ring clearly when tested for soundness by being struck all over with a light hammer.

b. uPVC PIPES & FITTINGS

The material shall substantially consist of un-plasticized poly vinyl chloride (PVC) as per the requirements of aforesaid standard. Pipes

and fittings shall be sufficiently stabilized against thermal ageing and ultraviolet (UV) light.

uPVC Pipes

- There are two types of pipes and fittings, type A and type B, as per ISO 3633 for drainage systems. Only type B shall be used for soil, waste and venting systems.
- As per BS4514/5255, sanitary pipes and fittings shall be class "A" wall thickness 3.2mm.

uPVC Fittings

All fittings shall be compatible with the pipe material as recommended by the pipe manufacturer. However, there are two types of fittings available as per ISO 3633:

- uPVC fittings with Solvent Cement (SC) socket joint conforming to ISO 3633:1991.
- uPVC fittings with rubber ring socket joint conforming to DIN 19560, which is compatible with ISO 3633/PS 3214.

Rubber Rings

The rubber rings may either be Synthetic or natural conforming to PS 1915:1987 & ISO 4633/1983 (E).

The material shall consist substantially of poly vinyl chloride (PVC) to which may be added only those additives that are needed to facilitate the manufacture of pipes and fittings having good mechanical strength and opacity.

The pipes and fittings shall be tested mechanically and physically in accordance with the relevant Standards as and when directed by the Engineer, before and during installation.

4.4 PLUMBING FIXTURES

4.4.1 General Requirements

Materials shall conform to the latest referenced standard specifications and other provisions stipulated herein and shall be new and unused.

All fixtures shall be of the best quality and finish.

Prior to procurement of the materials, the Contractor shall be required to prepare and submit to the Engineer for his approval, a complete schedule of materials to be used in the works together with a list of the names and addresses of the manufacturers and the trade names of the materials. The schedule shall include diagrams, drawings and such other technical data as may be required by the Engineer to satisfy himself as to the suitability, durability, quality and usefulness of the material to be purchased.

Approval of the schedule shall not be construed as authorizing any deviations from the specifications unless the attention of the Engineer has been invited to the specific changes. If the material or equipment offered under this provision is, in the opinion of the Engineer, equal to or better than specified, it will be given consideration.

Plumbing fixtures shall have smooth impervious surfaces, be free from defects and concealed fouling surface. They shall be true to line, angles, curves and colour etc. Normally they shall be of local make and of the best quality available, provided.

All taps and cocks to be installed with plumbing fixtures shall be chrome plated (CP) and shall be of appropriate class to work without damage or leakage on the specified pressure of potable water system, which is 0.88 MPa (128 psi). The taps and cocks shall be of the best quality locally manufactured.

When any fixture is provided with an overflow, the waste shall be so arranged that the standing water in the fixture cannot rise in the over flow when the stopper is closed or remain in the overflow when the fixture is empty.

Plumbing fixtures shall be installed in a manner to afford easy access for cleaning. The space between the fixture and the wall shall be closely fitted and pointed so that there is no chance for dirt or vermin to collect.

When practical, all pipes from fixtures shall be run to the nearest wall. Where fixture comes in contact with wall and floors, the joint shall be watertight.

Wall hung fixtures shall be rigidly supported by metal supporting members so that no strain is transmitted to the connections. Flush tanks and similar appurtenances shall be secured by approved non-corrosive screws or bolts.

Fixtures shall be set level and in proper alignment with reference to adjacent walls. No water closet shall be set closer than 400 mm from its centre to any side wall. No urinal shall be set neither closer than 300 mm from its centre to any side wall or partition nor closer than 600 mm centre to centre. The supply lines or fittings for every plumbing fixture shall be so installed as to prevent backflow. All cuttings, making holes etc. and making it good shall be included in the work.

Other physical/chemical properties of the fixtures are as below:

S. No.	Physical/Chemical Properties	Pakistan Standards	European Standards
1	Water absorption	Less than 0.50%	Maximum 0.50%
2	Scratch Resistance	Maximum 5.5 MOH's scale	Maximum 5 MOH's scale
3	Resistance to Chemicals	Resistant to acids, alkalies, bases & other household cleaning chemicals	Resistant to chemicals.
4	Crazing Resistance	Crazing "NIL"	Crazing "NIL"
5	Warpage	Maximum 5.5-6mm	Maximum 6mm
6	Strength against bending	More than 700 kg/cm	450kg/cm - 700 kg/cm
7	Thermal shock	More than 10 cycles of thermal shock from hot to cold water 15°C-200°C	More than 2 cycles of thermal shock from hot to cold water 20°C-110°C
8	Durability	Permanently durable	Durable for ever

4.4.2 Wash Basins

Wash basin shall be vitreous China, best quality, local make of colour, size and type as approved by the Engineer. It shall be installed as a complete unit including 15 mm mixer for hot and cold water supply or CP brass faucet for cold water only, 15 mm stop-cocks, C.P brass chain with 32 mm rubber plug, C.P brass bottle trap for individual wash basin and C.P brass P trap for battery of wash basins as applicable, C.P brass strainer, heavy duty cast iron brackets with bolts, screws etc. approved water inlet connection pipe, waste pipe, jointing and sealing material, etc., with all other minor accessories required to complete the job in all respect.

4.4.3 Vanity Wash Basins & laboratory sink

Wash basin Vanity type & Laboratory Sink shall be vitreous China, best quality, local make of colour, size and type as approved by the Engineer. Other necessary fittings shall be same as described for above Wash basin.

4.4.4 Water Closets (European type)

European type water closet shall be best quality local make of colour, size and type as approved by the Engineer. It shall be installed as a complete unit including all accessories. Flush tank (13.5 liters) shall be of low level type - it shall be fitted with either

single push button or double push button type. Trap shall be cast integral with pan. The seat shall be of smooth non-combustible non-absorbent materials like Bakulite and of the open front type fixed to the pan with hinges. The fittings shall also include approved water inlet connection pipe, nuts bolts, 15mm dia stop cock etc. required for complete installation.

4.4.5 Water Closets (Orissa)

Squatting (Asian/Orissa) type water closet shall be vitreous China, best quality local make of colour, size and type approved by the Engineer. It shall be installed as a complete unit including, 15 mm stop cock, approved water inlet connection pipe, low level or high level Flush tank (13.5 liters), as required. All fittings shall be installed at low level, or high level as required including interconnecting flush piping. Foot rests, cast iron P trap, making joints, jointing and sealing materials, 15mm dia stop cock etc. with all other minor accessories for complete installation.

4.4.6 Kitchen Sinks

Kitchen sink shall be stainless steel of best quality local make of colour, and type as approved by the Engineer, single bowl or double bowl with integral drain board of at least 1000 x 500 mm size. It shall be installed as a complete unit with arrangement for both cold and hot water supply, 15 mm C.P. mixer for cold and hot water, approved water inlet connection C.P. brass strainer, waste outlet pipe, heavy duty cast iron brackets with bolts screws etc., jointing & sealing material, etc., with all other minor accessories required for complete installation.

4.4.7 Shower Tray

Shower trays shall be of glass reinforced polyester with hard glass finish best quality local make of colour and type as approved by the Engineer. It shall be installed as a complete unit including C.P. brass strainer, waste outlet pipe, bolts screws, jointing & sealing material, etc.

4.4.8 Shower Head

Shower head shall be installed on the wall at a suitable height including installation of chromium plated extension pipe, C.P. brass Mixer for cold & hot water etc. with all other minor accessories required for complete installation.

4.4.9 Bath Tub

Bath Tub shall be of the approved material such as Fiberglass, cast iron or acrylic. It shall be installed as a complete unit including chromium plated brass overflow sluice 1-1/4" in dia., chromium plated waste 1-1/2" dia. with chromium plated chain & rubber stopper (Plug), etc. complete in all respects for complete installation. Its colour shall match with that of other fixtures in the toilet.

4.4.10 Urinals

Urinals shall be vitreous China of approved make and size and of wall hung type either with integral water seal trap or with separate brass P-Trap. The complete unit shall be installed including 15mm Tee-stop cock, plastic water inlet/outlet connections, CP Flush Valve or 13.5 liters flushing cistern, heavy duty CI brackets, bolts, screws, and all internal accessories or; CP steel flush pipe. CP steel waste pipe, joints, jointing and sealing materials etc. with all other minor accessories.

4.5 MISCELLANEOUS ITEMS

4.5.1 Taps and Cocks

All taps and cocks shall be of brass, gun metal or other equally suitable corrosion resisting alloy conforming to BS 1010 and shall be best quality local make. The nominal size specified shall be the nominal bore of the seating. Washers for cold water cocks shall be of specially selected leather, rubber asbestos composition or other equally suitable material. Washers for hot water cocks shall be of good quality fiber, rubber - asbestos composition or other equally suitable material. Every tap/cock shall be tested, complete with its component parts, to a hydraulic pressure of at least 1.96 MPa (284.4 psi) During test it shall neither leak nor sweat.

4.5.2 Floor traps/drains

Floor traps/drains shall be of cast iron or uPVC or of other anti-corrosive material, compatible with the material of pipe. They shall have minimum water seal of 40 mm and shall be provided with removable metal/uPVC strainers. The traps shall be of self-clearing type. The open area of the strainer shall be greater than the cross section area of the drain line to which it connects. Floor traps shall be well set in position so that there is no leakage at the joint between trap and the floor.

4.5.3 Roof Drains

Roof drains shall be of bitumen coated cast iron, compatible with the material of pipe. They shall have strainers extending at least 15 mm above the roof surface immediately adjacent to them, when installed on flat part. Bottom of strainer shall be flush with the roof surface, when installed on vertical part. Strainer shall have an available inlet area, above roof level, of not less than 1-1/2 times the area of the down-pipe to which the drain is connected.

The connection between roof and roof drain shall be made watertight by the use of proper flashing material.

4.5.4 Cleanouts

Cleanout shall be of the same nominal size as that of the pipe on which it is installed. Cast Iron Cleanout shall consist of tapped

heavy duty cast iron ferrule caulked into cast iron fitting and heavy duty brass tapered even plug. uPVC cleanout shall consist of either two 45° bends or one long radius bend both with a removable end cap and other necessary fittings/material for complete installation in floor. Cleanouts shall be turned up through floors by long sweep fittings, wherever the space so permits. Top finish of cleanout shall be flush with the floor by means of finished metal plate secured in position and screwed firmly to the plug. Cleanout shall be so installed that there is a clearance of at least 300 mm for pipes less than 75 mm diameter and at least 457 mm for pipes of 75 mm and larger diameter, for the purpose of Roding.

Pipe used with cleanout shall be measured and paid under pipe item. All other work of ferrule, plug, concrete work, frame and cover etc. shall be measured and paid under cleanout item.

4.5.5 Grease Trap/Interceptor

a. The grease trap shall be of stainless steel of specified capacity with cover, baffles and strainers to separate grease from water effectively. The grease trap shall be of approved make or equivalent and installed in the position as shown on drawings or as specified by the Engineer.

or

b. The grease interceptor shall be built in masonry or reinforced cement concrete as per relevant drawings including excavation, RCC class "C", steel reinforcement, PCC class "E", 15mm thick cement sand plaster in 1:3 c/s, 15mm thick C.I. trap & plate having holes (screen) 25mm c/c of standard diameter, 20mm G.I. pipe for lifting trap, inlet & outlet connections, 600x600 mm C.I. cover with frame, 25mm legs for supporting screen system, painting three coats to steel works with synthetic enamel paint, nuts, bolts etc. complete in all respects as desired by the engineer.

4.5.6 Glass Mirror

The glass mirror shall be of specified size, 5 mm thick, securely fixed on hard board packing and of best quality Belgium make. The mirror shall be fixed on wall as shown on the drawing or as directed by the Engineer. All accessories required for complete fixing of mirror on wall shall be included in Contractor's scope of work.

4.5.7 Towel Rail, Toilet Paper Holder, Soap Trays, Mirror Trays

The towel rail, toilet paper holder, soap trays & mirror trays shall be of best quality. All accessories for complete installation of towel rail, toilet paper holder, soap tray and mirror tray shall be included in the Contractor's scope of work.

4.5.8 Gully Trap

Gully trap shall be of cast iron with specified size outlet. The inlet shall be provided with cast iron, medium duty grating. The open area of the grating shall be at least 1-1/2 times the area of the outlet. The trap shall be of P-Type with a minimum water seal of 50 mm. It shall be installed as a complete unit including all civil works as shown on relevant details and drawings.

4.5.9 Cast Iron Grating

Cast iron grating shall be of the specified size. The specified size shall mean the clear span. Cast iron grating shall be complete with frame. They shall be of Light/medium duty type to resist normal traffic loads, the casting shall be sound and free from all defects. The frame shall be set in place at the time of pouring of concrete. Openings in grating shall be in approved pattern.

4.5.10 Electric Water Cooler

Cabinet shall be of heavy gauge mild steel construction painted with non-corrosive paint from inside and with special hammer finish paint from outside.

Push button type water taps shall be chrome plated. Drain pot shall be made of hard plastic with stain-less steel tray. Back panel shall be easily remove-able for cleaning and servicing top cover shall be of scratch proof Formica.

Water storage tank shall be either of stainless steel or copper alloy, tinned inside and outside with present insulation to maintain water temperature, with special arrangement for cleaning the tank.

Condensing unit shall be heavy duty, hermetically sealed with thermal overload protection for refrigerant F-12 and capillary expansion with valves for easy gas charging. Thermostat and other control necessary for proper functioning of the unit shall be provided. The thermostat shall control the temperature of cooled water between + 11°C & + 20°C.

4.5.11 Water Filters

Water filters shall be installed on wall near the water coolers. Each filter shall have a crystal housing of a durable material. The flow rate shall be 2 to 6 gpm with a maximum pressure of 70psi and a temperature of 35°F to 100°F.

Stage 1:- Stage 1 shall use a "poly propylene Yarn Indepth Sediment filter cartridge", for removal of dust, rust, silt, scale and unseen suspended particles. It shall have a filtration rating of 5-micron.

Stage 2:- In this stage a "Granular Activated Carbon (GAC) cartridge" equipped with a post-filter of 1-micron is recommended, for removal of chemicals and unpleasant taste and odor.

Stage 3:- This stage must provide 30,000 MW.sec/sq.cm energy to guarantee 100% sterilization and ensure effective control of microbiological contamination.

4.5.12 Gas or Electric Water Heaters

Water heater shall be of automatic storage type Electric or Gas operated, including all necessary fittings for complete installation & operation. The heater shall be of best quality, local make as approved by the Engineer.

The working and test pressure of the heater to be of 6 bar and 10 bar respectively and shall deliver water at 150 °F. It shall be capable to reach the peak demand, storage capacity.

Heater shall be provided with following accessories.

- i) Thermostatic control
- ii) Temperature & pressure relief valve
High limit Control.

Other specifications of **Water Heater** are as given below:

Inner tank shall be extra heavy gauge anti-rust G.I. sheet metal to hold maximum inside water pressure. As an insulation, imported genuine glass wool shall be used to maintain the desired temperature that controls the lighting up of the burner. The outer body shall be made of requisite gauge M.S. sheet shaped into reinforced circumference. Flow and delivery pipes shall be of high quality G.I. pipes fabricated with heavy gauge anti-rust baffle plate. *The thermostat shall be of Robersshaw (U.S.A) make or approved equivalent.* The burner shall be made of cast iron with drilled ports. It shall be easy to be detached. Special anti-rust-baked primer-heavy coated stoved enamel paint with high gloss automotive shine shall be used on sheet metal.

Standard type gas water heaters shall have following specs:

Capacity	Inner Tank	Outer body
8-15 gallons	G.I. sheet 14-16 swg	M.S sheet painted 22 swg
30 gallons	G.I. sheet 10-12 swg	M.S sheet painted 22 swg
50 gallons	G.I. sheet 10-12 swg	M.S sheet painted 22 swg
100 gallons	G.I. sheet 8-10 swg	M.S sheet painted 22 swg

5.0 EXECUTION

5.1 GENERAL

The Contractor shall be responsible for his work until its completion and final acceptance, and shall replace any of those that may be damaged, lost or stolen without any additional cost.

All openings left in floor for passage of lines of water supply, soil, waste, vent, etc. shall be covered and protected.

All open ends of pipes shall be properly plugged to prevent any foreign material from entering the pipe. Misuse of plumbing fixtures to be

installed under this Contract is prohibited during the currency of the contract.

All metal fixture trimmings shall be thoroughly covered with non-corrosive grease which shall be maintained until all work is completed.

Upon the completion of work, all fixtures and trimmings shall be thoroughly cleaned, polished and left in first class condition.

Before erection, all pipes, valves, fittings, etc. shall be thoroughly cleaned of oil, grease or other material.

All special tools for proper operation and maintenance of the equipment provided under this Contract shall be delivered at no additional cost.

The Contractor shall allow in his bid for cost of all cutting, making holes and subsequent making it good to the desired finish as per approval of the Engineer. No separate payment shall be made for this item.

The Contractor shall allow in his bid for the cost of providing protective painting or coating as specified in the relevant sections and no claim shall be entertained for this item.

All pipes shall be properly installed as shown on the drawings and/or as directed by the Engineer, and shall be as straight as possible forming right angles and parallel lines with the walls and other pipelines. The position, gradients, alignment and inverts shall be as shown on the drawings and/or as directed in writing and set out by the Engineer.

The arrangement, positions and connections of pipe fittings and appurtenances shall be as shown on the drawings. The Engineer reserves the right to change the location etc. Special precautions shall be taken for the installation of concealed pipes as shown on the drawings and/or as required. Should it be necessary to correct piping so installed, the Contractor shall be held liable for any injury caused to other works in the correction of piping. The Contractor shall closely coordinate with other works during the entire stage of execution.

A minimum distance between different services shall be maintained as shown on the Drawings and/or as approved by the Engineer.

Pipes should be installed in such a manner that minimum distance should always be maintained between pipe and wall, beams, columns, etc. Pipes shall be supported on hangers and brackets as shown on the drawings or as directed by the Engineer.

Waste-water outlet from each fixture shall be individually trapped. Each vent terminal shall extend to the outer air and be so installed as to minimize the possibilities of clogging and the return of foul air to the building.

When the roughing-in is completed, the plumbing system shall be subjected to test prior to concealing the roughing-in, in order to ascertain that all threads and connections are watertight.

Cast iron soil and drainage fittings for change in direction shall be used as follows:-

*Vertical to horizontal: short sweep or long-turn for diameter 75 mm and larger; long sweep or extra-long-turn for less than 75 mm. dia.

*Horizontal to vertical: quarter bend or short turn.

All fittings with hubs shall be aligned so that the hub faces upstream. No drainage or vent piping shall be drilled.

All exterior openings provided for the passage of piping shall be properly sealed with snugly fitting collars of metal or other approved rodent-proof material securely fastened into place.

Joints at the roof, around vent pipes, shall be made water-tight by the use of lead, copper, galvanized iron, or other approved flashing or flashing material. Exterior wall openings shall be made watertight.

Each length of pipe & each pipe fitting, trap, fixture, & device used in a plumbing system shall have cast, stamped or indelibly marked on it the maker's mark or name, the weight, type & classes of the product, when such marking is required by the approved standard that applies.

Where different sizes of pipes, or pipes and fittings are to be connected, the proper size increasers or reducers or reduced fittings shall be used between the two sizes.

Any fitting or connection which has an enlargement, chamber, or recess with a ledge, shoulder, or reduction of pipe area that offers an obstruction to flow through the drain pipe is prohibited. The vertical distance from the fixture outlet to the trap weir shall not exceed 600 mm. Each fixture trap shall have a water seal of not less than 50 mm and not more than 100 mm.

Full S, bell, crown vented traps and traps/depending for their seal upon the action of movable parts are prohibited. No fixture shall be double trapped. Where fixture comes in contact with wall and floors, the joint shall be water-tight. Piping in ground shall be laid on a firm bed for its entire length.

Piping in the plumbing system shall be installed without undue strains and stresses. Vertical piping shall be securely held to keep the pipe in alignment and carry the weight of the pipe and contents. Horizontal piping shall be supported to keep it in alignment and prevent sagging. Hangers and anchors shall be of metal of sufficient strength to maintain their proportional share of pipe alignments and prevent rattling. Hangers and anchors shall be securely attached to the building under construction. It must be clearly understood that the Contractor shall be fully responsible for hangers and supports and shall obtain prior approval of design as to the shape, material, dimensions, spacing etc.

Piping in concrete or masonry walls or footings shall be placed or installed in sleeves which will permit access to the piping for repair or replacement.

5.2 G.I. COLD, HOT WATER PIPES AND FITTINGS

The run and arrangement of all pipes shall be as shown on the Drawings and as directed during installation. All vertical pipes shall be erected plumb and shall be parallel to wall and other pipes. All horizontal runs of piping shall be kept close to walls. If required to change the location etc. during the currency of the work, the Contractor will do so at no additional cost. Screwed joints in G.I. pipes shall be made perfectly tight, without the use of any filler except approved jointing compound or tape. Wherever required to make flanged joints, they shall conform to BS 10 Table D.

Furnish and install all pipe passing through floors and walls with sleeves of G.I. sheet, 18 gauge, the inside dia. of which shall be at least 1/2" greater than the outside dia of the pipe passing through it. Sleeves in exterior walls and pits shall have anchor flanges and space between pipe and sleeve shall be caulked and sealed watertight. At waterproof locations, an approved water-proof type pipe sleeve shall be provided.

All embedded water supply piping shall be wrapped with approved anti-corrosion polyethylene tape. All exposed piping shall be painted with two coats of enamel paint over a coat of red oxide.

Pipes laid in trenches (external) shall be protected by applying coating of primer grade 10/20 bitumin+hyacinth cloth mopped with bitumen (50% grade 80/100 & 50% grade 10/20).

Insulation

All hot water supply and return piping shall be insulated as specified herein. Prior to insulation the pipes shall be hydraulically tested and cleaned.

Nominal Pipe Dia. (mm)	Thickness of per-form Fiber glass pipe insulation. (mm)
15 (1/2")	25
20 (3/4")	25
25 (1")	25
32 (1-1/4")	25
40 (1-1/2")	25
50 (2")	25
65 (2-1/2")	25
75 (3")	25

Insulation shall consist of pre-formed fiberglass pipe insulation, with factory applied reinforced aluminum vapor barrier, single layer in semi-circular halves, consisting of long, fine glass fibers, bonded with a temperature resistant binder, free from shot or coarse fibers, damage resistant, light in weight, easy to handle, cut and fit. The product shall comply with the requirements of B.S. 3958: Part 4. The insulation shall be rotproof, odorless, non-hygroscopic, and shall not sustain vermin. The fiberglass insulation shall be covered with a layer of approved polyethylene tape in the field. Further reinforcement shall be provided by the use of 20 mm wide soft aluminum bands, generally spaced at 457

mm and on either side of elbows and tees. All butt joints shall be sealed with self-adhesive type of approved quality adhesive tape.

All trimmed sections shall be secured by wrapping of approved type of self adhesive tape to form a complete waterproof seal. All work shall be done in a neat and workmanlike manner, and should reflect recommended practice.

All Hot water and Hot water return lines concealed in walls only, shall be provided with Glass wool blanket insulation.

Pipe work Supports

All supports, clips, steel rods and hangers shall be of mild steel painted with two coats of approved metallic zinc primer. All clips and brackets shall be equipped with 9 mm sectional rubber liners (shore-hardness A 40+5°).

Pipe work supports shall be installed in order to allow free movement due to expansions and contraction. Supports shall be arranged adjacent to joints, changes of direction and branches. Each support shall carry the overall weight of pipe work and water to be borne by it. The intervals between pipe supports shall not exceed the following:

Maximum interval between supports (metres)			
Steel pipes			
Nominal Dia mm	Horizontal	Vertical	
10	1.7	1.7	
15	2.0	2.0	
20	2.4	2.4	
25	2.7	2.7	
32	2.7	2.7	
40	3.0	3.5	
50	3.4	3.9	
65	3.7	4.3	
80	3.7	4.3	
100	4.1	4.6	

Dimensions of Support Materials			
Nominal Dia mm	Flat iron bands mm	Support rods mm	U-bolts mm
10	25 x 3	6	6
15	25 x 3	6	6
20	25 x 3	6	6
25	25 x 3	6	6
32	40 x 5	10	10
40	40 x 5	10	10
50	40 x 5	10	10
65	50 x 6	12	12

80	50 x 6	12	12
100	50 x 6	12	12

Single pipes hung from floor slabs shall be supported on rod hangers. Where two or more pipes are involved a channel or angle from shall be fitted to the underside of slab by two hangers and the pipes shall be supported from the channel iron by rod hangers and flat iron hands.

All hanger rods shall have double nuts and beveled washers to allow the hanger rod to swing.

Multiple pipe runs along walls shall be supported on purpose made substantial angle and channel frames securely fixed to the wall, floor and ceiling as necessary. All pipes shall be arranged to slide on the steel supports and U-bolts shall be provided to form a rigid guide.

Exposed pipe work shall be supported on channel, angle iron or with U-bolts to form a rigid guide.

All U-bolts, except used as anchors, shall have a pair of nut and washers on each leg with the supporting steel flange clamped tight between the pair of nuts to form a rigid guide and allowing the pipe to slide axially,. U-bolts shall be provided on alternate pipe bracket.

Small pipe work running along skirting shall be supported by standard built-in or screw-on type clips.

Pipes shall be individually supported. Pipes shall not hung from other pipes.

Points at which pipes pass through walls, floors, connections to plant, equipment and heat emitters, etc. do not constitute points of supports for the pipes.

Vertical pipes shall be supported at the base or at anchor points to withstand the total weight of the riser. Brackets from risers shall not be used as a means-of support for the riser.

Vibration isolators to be provided with the hangers as approved by the Engineer.

5.3 POLYPROPYLENE RANDOM PIPES & JOINTING

5.3.1 Jointing Techniques

The surfaces of the pipes and fittings must be clean and without impurities. Pipe ends must be clean, cut at right angles. It is recommended to cut 1cm from the pipe ends in order to prevent possible micro-cracking due to incautious handling.

Before carrying out the welding, check that the poly-fusion device operates correctly and that it reaches the required welding temperature ($260^{\circ}\text{C} \pm 5$).

Joining is done by heat fusion (welding) by means of welding machine. Welding is carried out by means of heating simultaneously the male and female parts to be joined together, once the welding temperature is reached the joint is made and held for cooling time. (see table I below)

5.3.2 Welding Instructions Using Socket Welding Machine

- i. Check whether the welding tool corresponds to the size you need to join.
- ii. The welding tool/device has reached the necessary operating temperature of $260^{\circ}\text{C} \pm 10$
- iii. Cut the pipe at right angles to the pipe axis by using cutter or a hack saw.
- iv. Clean the pipe from burrs, cutting and chips
- v. Mark the welding depths at the end of pipe
- vi. Push the end of pipe up to the marked welding depths in the welding tool, at the same time push the fitting, into the welding tool.
- vii. After the stipulated heating time quickly remove pipe and fitting from the welding tools and join them immediately, forcing the pipe into the fitting until the marked welding depth is covered by the bead of Polypropylene from the fitting
- viii. The joint elements have to be fixed and aligned within the specified assembly time.
- ix. After the cooling time the fused joint is ready for use. The heating time starts when pipe and fitting have been pushed to the correct welding depth in the welding tool

Est. Diameter (mm)	Welding Depth (mm)	Heating Time DVS 2207* (sc).		Heating time (sc.)	Cooling Time (min.)
20	14.0	5	8	4	2
25	15.0	7	11	4	2
32	16.5	8	12	6	4
40	18.0	12	18	6	4
50	20.0	18	27	6	4
63	24.0	24	36	8	6

The heating time have to be increased 50% if average temperature is under $+ 5^{\circ}\text{C}$

5.3.3 Welding of PPR Pipes

- i. Cutting of pipe at right angle with a cutter.
- ii. Marking of welding depth on the pipe end.
- iii. Simultaneous heating of both pipe and fittings according to required heating time (as per given data).
- iv. Pushing of pipe end into the fitting and alignment of the assembly within specified time period
- v. Finish joint.

5.3.4 Installation Principles

5.3.4.1 Fastening technique for open installation

The selection of fastening material and its application have to be determined as:-

- Fixed Point
- Sliding Point

Pipe clamps are such as to meet all requirements and ensure that no mechanical damage on the pipe surface can occur.

5.3.4.2 Fixed Point

Valves and connections resisting to bending stresses have to be fastened by means of points. In particular cases the fixed points are to be positioned closed to branches or wall passages. The axial expansion will be compensated between two points. To assess the resistance of the fixed points one has to take into account the stresses to which they will be subjected, caused by linear expansion, weight of the piping and weight of the transportation fluid. Fixed points should be delimited on both sides of the clamp, availing oneself of the rim fittings or valves.

5.3.4.3 Sliding Point

The sliding points must keep the system aligned and support it, and allow the axial sliding of the piping as well. The sliding are to be firmly mounted in order to prevent vibration and transmission of noise.

Distance between the supports points in cm.

Pipe diameter	Temperature in °C		
	20	50	80
20mm	85	70	60
25mm	85	80	70
32mm	100	85	85
40mm	110	100	90
50mm	125	110	90
65mm	140	125	105

5.4 WATER PIPES AND FITTINGS OUTSIDE BUILDING (EXTERNAL WORKS)

5.4.1 Handling

Pipe and accessories shall be handled in such a manner as to ensure their delivery to the trench in sound, un-damaged condition. If any pipe or fitting is damaged, the repair or

replacement shall be made by the Contractor at his expenses in a satisfactory manner. No other pipe or material of any kind shall be placed inside of a pipe or fittings. Pipe shall be carried into position and not dragged. The interior of pipe and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material without additional expense to the Employer. Rubber gaskets that are not to be installed immediately shall be stored in a cool dark place and protected against the direct rays of the sun.

5.4.2 Cutting of Pipe

This shall be done in a neat and workman-like manner without damage to the pipe. Unless otherwise authorized by the Engineer or recommended by the manufacturer, cutting shall be done with a mechanical cutter of approved type. Wheel cutters shall be used wherever practicable.

5.4.3 Location

Where the location of the water pipe is not clearly defined by dimensions on the Drawings, the water pipe shall be located as directed by the Engineer.

5.4.4 Deflection

Maximum allowable deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets will be 2° degrees unless otherwise recommended by the manufacturer. If the alignment requires deflections in excess of the specified limitations, special bends or a sufficient number of shorter lengths of pipe shall be furnished to provide angular deflections within the limit set forth, as approved.

5.4.5 Placing and Laying

Pipe and accessories shall be carefully lowered into the trench by means of derrick ropes, belt slings, or other suitable equipment. Under no circumstances shall any of the water line materials be dropped or dumped into the trench. Care shall be taken to avoid abrasion of the pipe coating. Poles used as levers shall be of wood and shall have broad flat faces to prevent damage to the pipe. Except where necessary in making connections with other lines or authorized by the Engineer pipe shall be laid with the bells facing in the direction of laying. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bell coupling and joints. Pipe that has the grade or the joint disturbed after laying shall be taken out and re-laid. Pipe shall not be laid in water shall be kept out of the trench until the materials in the joints have hardened or until caulking or jointing is completed. When work is not in progress, open ends of

pipe, fittings, and valves shall be securely closed so that no trench water, earth, or other substances will enter the pipes or fittings. Where any part of a coating or lining is damaged, the repair shall be made by the Contractor at his expense in a satisfactory manner. Pipes shall be installed in accordance with recommendations of the pipe manufacturer. Pipe ends left for future connections shall be valved, plugged or capped, and anchored, as shown or as directed, where connections shall be made by using specials and fittings to suit the actual conditions.

5.4.6 Jointing

The joints shall be in accordance with the recommendations of the manufacturer or as approved by the Engineer.

Connections between different types of pipes and accessories shall be made with transition fittings where recommended by the pipe manufacturer.

Service connections shall be made as indicated and in accordance with the recommendations of the pipe manufacturer.

5.4.7 Thrust Blocks

Plugs, caps, tees, bends and fire hydrants shall be provided with concrete thrust blocks. Backing shall be placed between solid ground and the hydrant or fitting to be anchored. The area of bearing shall be as shown on the Drawing. The backing shall be so placed that fitting joints shall be accessible for repair. The concrete shall be class C plain cement concrete.

5.4.8 Pipe Bedding

Fine sand as pipe bedding material shall be used for bedding of pipes and fittings. The sand shall be free from clay, silt, salts, organic impurities and debris. Approval of pipe bedding materials shall be obtained by the site Engineer prior to placing.

5.4.9 Flushing

The Contractor shall provide facilities for flushing the line. Water for flushing the line shall be arranged by the Contractor. Flushing of line shall be done section by section. For each valved section of pipeline the Contractor shall make a temporary hose connection between the water pipeline and the pipeline under test. Water shall be pumped into the section flushed. Other arrangements for storing and pumping of water shall be subject to the approval of Engineer. Due precautions shall be taken by the Contractor for the disposal of water. The pipeline shall be flushed by keeping all the branching pipes open. Flushing shall be continued until clean water starts flowing through the other end. Section by section, the entire pipeline shall be flushed at a minimum flushing velocity of 2.5 ft./sec.

5.4.10 Pipeline Disinfection

The Contractor shall furnish all equipment, labour and material for the proper disinfection of the pipeline. Disinfection shall be accomplished by chlorination after the lines have been tested for leakage but before they have been connected to the main system. Disinfections of the pipelines shall be done in the presence of the Engineer's representative with equipment approved by him.

- **Chlorination** A chlorine and water mixture shall be supplied by means of a solution feed chlorination device. The chlorine solution shall be applied at one end of the pipeline through a trap, in such a manner that as the pipeline is filled with water, the dosage applied to the water entering the pipe shall be at least (25 p.p.m) or enough to meet the requirements given hereinafter.
- **Retention Period** Chlorination water shall be retained in the pipeline for a period of at least 24 hours. After the chlorine treated water has been retained for the required time, the chlorine residual at the pipe extremities and at such other representative points shall be at least 10 parts per million. This procedure shall be repeated until the required residual chlorine concentration is obtained.
- **Chlorination of Valves** During the process of chlorination the pipeline, all valves or other appurtenances shall be operated while the pipeline is filled with the heavily chlorinated water.

5.4.11 Final Flushing

Following complete disinfection of the pipeline, all treated water shall be thoroughly flushed from the pipeline at its extremities. Treated water and water used for flushing the pipelines shall be disposed of in a manner instructed by the Engineer. Fresh treated water shall be filled in the line and water tested from presence of coliform. The test result should indicate negative coliform presence. If the test indicates any positive coliform, the entire process of disinfection shall be repeated or improved upon until coliform free samples are obtained.

5.4.12 Sampling And Testing

Disinfection of the pipeline and appurtenances shall be the responsibility of the Contractor. The first set of samples will be collected for analysis by the Engineer. Should the samples reveal presence of coliform the Contractor shall again disinfect the pipeline and appurtenances at no extra cost to the Employer for sampling and testing for subsequent retests until coliform free samples are obtained? The charges for re-sampling and retesting shall be recovered from the Contractor.

5.4.13 Clean-Up

Upon completion of the installation of the water supply lines, distribution system and appurtenances, all debris and surplus materials resulting from the work will be removed and disposed off in a manner satisfactory to the Engineer

5.5 SOIL, WASTE, VENT & RAIN WATER DRAINAGE PIPES & PIPE FITTINGS (C. I. & uPVC)

All cast iron soil pipes and fittings shall be installed to the lines and grades shown on the drawings or as directed by the Engineer. When required to be installed above ground floor level, suitable and substantial number of hangers and supports of approved type and make shall be provided. No piping shall be hung from the piping of other systems. Clamps shall be provided on not more than 1.5 meter centres or a minimum of one hanger per each length of pipe whichever is smaller. Where excessive numbers of fittings are installed, additional clamps will be provided.

All steel clamps, hangers and support etc. shall be given one coat of red oxide primer and two coats of synthetic enamel paint. All exposed C.I. soil/vent pipes shall be given two coats of synthetic enamel paint. Materials for painting shall be high quality product of well-known manufacturer and will be approved by the Engineer before using. The instructions of the manufacturer regarding all painting work shall strictly be adhered to. Pipes passing through walls, floors, etc. shall be provided with sleeves of approved design. All vent pipes to be installed in the system shall be provided with approved cowl and will rise at least 0.70 meter above the roof.

Caulked joints for cast iron bell-and-spigot soil pipe shall be firmly packed with oakum or kemp and filled with molten lead not less than 22 mm deep and not to extend more than 3 mm below the rim of the hub. Rubber ring joints shall also be allowed. No paint, varnish, or other coatings shall be permitted on the jointing material unit after the joint has been tested and approved

Pipes passing through walls, floors, etc. shall be provided with sleeves of approved design. All vent pipe to be installed in the system shall be provided with approved cowl and will rise at least 0.70 meter above the roof.

Special requirements for uPVC pipes and fittings are as under:

Maximum Interval between Supports (m)
(Support centers for uPVC pipe work systems)*

Nominal Diameter, d_e	Pipe Works	
	Horizontal (10 $\times d_e$)	Vertical
(mm)	(m)	(m)
40	0.40	1.2
50	0.50	1.5
75	0.75	2.0
110	1.10	2.0

* The values shown are for general installations only. Attention is drawn to special requirements that may be needed in more demanding applications.

All steel clamps, hangers, supports etc. shall be given one coat of red oxide primer and two coats of synthetic enamel paint.

All exposed uPVC pipes shall be given two coats of approved colour water based emulsion paint (note that oil based paints must be avoided).

PRECAUTIONS

Following points describe how an uPVC must be cared of:

- a. The depth of concrete cover above uPVC pipe depends on the pipe gradient. However, a minimum of 1 (one) inch concrete cover must be provided.
- b. When using cemented joints, the adhesive should be given sufficient opportunity to harden before the pipe is concreted in.
- c. Horizontal lines that are concreted-in should be anchored against upward movement and should be adequately secured while the concrete is being poured.
- d. During the pouring and setting of concrete, necessary care shall be taken to prevent physical damage to the pipes.
- e. When using heated concrete or when steaming the concrete, the sensitivity of uPVC material to temperature changes should be borne in mind.
- f. Concrete mortar that is used before concreting-in shall include no sharp-edged material.
- g. Avoid excessive misalignment of the pipes.
- h. Avoid excessive tightness of joints.
- i. Provide sufficient expansion joints to allow thermal movement or regression.
- j. Use only allowed cleaning & descaling techniques for different situations & locations (as described in ISO/TR 7024-1985E) when a pipeline gets choked or blocked.

DELIVERY CONDITIONS

The internal and external surfaces of pipes and fittings shall be smooth and free from grooving, blistering and any other surface defect. The materials shall not contain visible impurities or pores. Pipe ends shall be cleanly cut, and the ends of pipes and fittings shall be square with the axis of the pipe

MARKINGS

Pipes, fittings and sealing rings shall be marked clearly and indelibly so that legibility is maintained for the life of products under normal conditions of storage, weather and use.

The markings may be integral with the product or on a label. The markings shall not damage the product.

PIPES

Pipes shall be marked with at least the following information:

- a. Manufacturer's name or trade mark;
- b. Pipe material;
- c. Nominal diameter of pipe;
- d. Nominal wall thickness of pipe
- e. Manufacturing information, in plain text or in code, providing tractability of the production period to within the year and month and the production site if the manufacturer is producing at several national or international sites.
- f. The number of this International Standard.

Pipes with a nominal laying length up to and including z_2 meters shall be marked with at least once. Pipes with a nominal laying length greater than z_2 meters shall be marked at intervals of z_3 meters at the most. The values of z_2 and z_3 shall be as specified by the authorities in each country.

FITTINGS

Fittings shall be marked with at least the following information:

- a. Manufacturer's name or trade mark;
- b. Fitting material (may be given on packing only in the case of PVC, provided this information is not required on each article by national authorities);
- c. Nominal diameter of fitting;
- d. Classification (where applicable)
- e. Values of angles, if any;
- f. Manufacturing information, in plain text or in code, providing tractability of the production period to within the year and month and the production site if the manufacturer is producing at several national or international sites (may be given on packing only, provided this information is not required on each article by national authorities);
- g. The number of this International Standard (may be given on packing only, provided this information is not required on each article by national authorities).

SEALING RINGS

Sealing rings shall be marked with at least the following information:

- a. Manufacturer's name or trade mark;
- b. Nominal diameter of ring;
- c. Manufacturing information, in plain text or in code, providing traceability of the production period to within the year and month and the production site if the manufacturer is producing at several national or international sites.

6.0 TESTING AND COMMISSIONING

6.1 G.I. & PPR COLD AND HOT WATER PIPES

All water distribution system shall be tested whole or in part to 2 times the working pressure with a minimum test pressure of 100psi. The contractor shall pay for all device, materials, supplies, labor and power required for the test. The test will be run for two hours at the specified pressure and there should be no leakage in the system. Defects revealed by the test shall be repaired and the whole test rerun until the system proves to be satisfactory.

After all the pipes and fixtures have been properly laid and tested, they shall be flushed clean with water and then disinfected with water solution of chlorine of at least 50 ppm strength for a contact period of 6 hours. The system will be finally flushed with clean water.

6.2 SOIL, WASTE, VENT & RAIN WATER DRAINAGE PIPES & PIPE FITTINGS (C. I. & uPVC)

The entire system of drains, waste, and vent piping inside the building shall be tested by this Contractor under a water test. Every portion of the system shall be tested to a hydrostatic pressure equivalent to at least 3-meter head of water. After filling this Contractor shall shut off water supply and shall allow it to stand two hours, under test during which time there shall be no loss or leakage.

The Contractor shall furnish and pay for all devices, materials, supplies, labor and power required in connection with all tests. All tests shall be made in the presence of and to the satisfaction of the Engineer.

The Contractor shall also be responsible for the repair of this work & other trades work that may be damaged or disturbed by the tests. Defects disclosed by the tests repaired. Work shall be replaced with new work without extra cost to the Employer. Tests shall be repeated as directed, until all work is proven satisfactory.

All fixtures shall be tested for soundness, stability, support and satisfactory operation.

7.0 MEASUREMENT AND PAYMENT

7.1 COLD & HOT WATER PIPE

7.1.1 Measurement

Measurement for acceptably completed works of supply and installation of cold and hot water pipes shall be in running meter length.

- a. In building works, no measurement shall be made for earthworks, pipe fittings, jointing, hangers, clamps, brackets, sleeves, insulation, cutting and breaking concrete and then making it good, applying protective painting, coating, cleaning, testing and disinfecting etc. and the measurement will be for the full work specified herein.

- b. In external works, no measurement shall be made for pipe fittings, jointing, insulation, cutting and breaking concrete and then making it good, applying protective painting, coating, cleaning, flushing, testing and disinfecting etc. and the measurement will be for the full work specified herein. However, earthworks (excavation, backfilling, sand bedding), and thrust blocks shall be paid separately as specified in Bill of Quantities.

7.1.2 Payment

Payment for acceptable measured quantity will be made at the unit rate per running Foot length of cold and hot water pipes quoted in the Bill of Quantities. The amount bid shall be the full payment for completion of the work in all respects as specified herein.

7.2 uPVC and C.I. SOIL, WASTE & VENT PIPES

7.2.1 Measurement

Measurement for acceptably completed works of supply and installation of uPVC & C.I. pipes, will be in running Feet length and the work to be done shall include all pipe fittings, jointing, hangers, clamps, brackets, sleeves, cutting and breaking concrete and then making it good, applying protective painting, coating, cleaning and testing.

7.2.2 Payment

Payment will be made at the unit rate of bid per running Feet length of pipe acceptably supplied and installed. The amount bid shall be full payment for the work specified herein.

7.3 PLUMBING FIXTURES

7.3.1 Measurement

Measurement for plumbing fixtures will be made as per actual number acceptably installed. The Contractor's bid against these items shall include installation of complete unit as specified herein, inclusive of all work from inlet connection of water supply to outlet connection with the sanitary system, complete as per Contract Documents and/or as directed by the Engineer.

7.3.2 Payment

Payment for plumbing fixtures shall be made at the applicable unit price per number bid for the respective item in the Bill of Quantities. The amount bid shall be full payment for the work specified herein.

7.4 MISCELLANEOUS ITEMS

7.4.1 Measurement

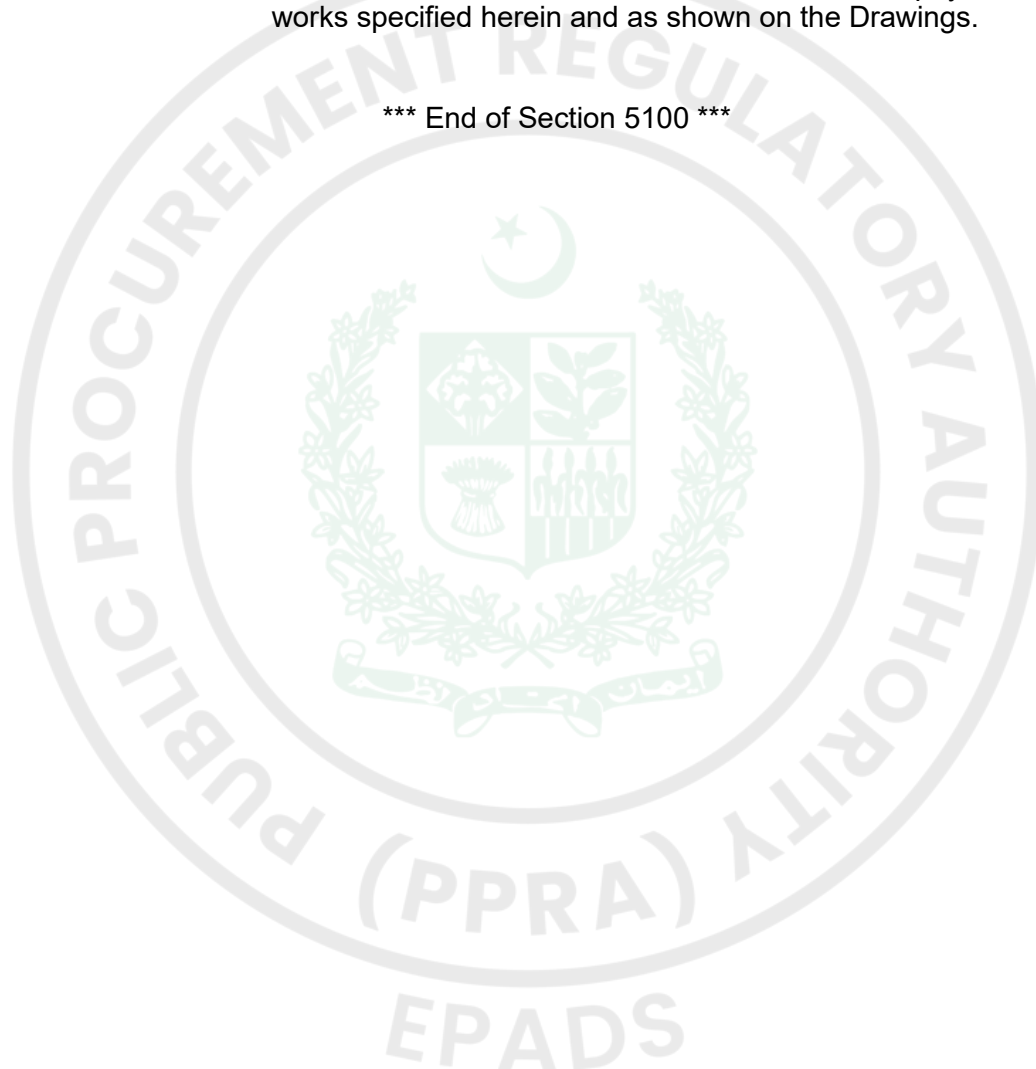
Measurement for acceptably completed works of floor drains, roof drains, cleanouts, glass mirror, towel rail, toilet paper holder, soap

trays, mirror trays, water coolers, water heaters, etc. shall be made on the basis of actual number acceptably installed in position. The Contractor's bid against these items shall include installation complete as specified herein and/or as shown on the Drawings.

7.4.2 Payment

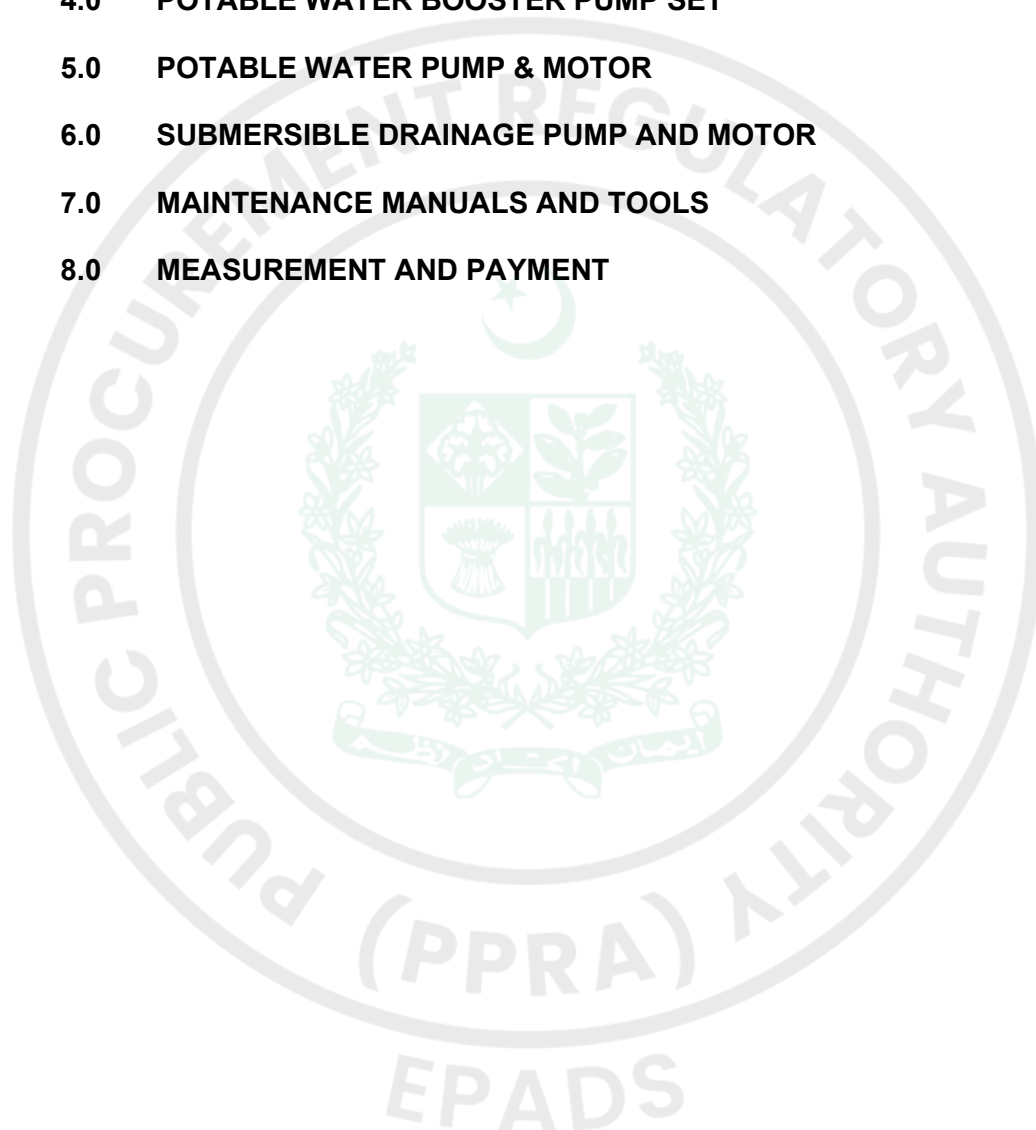
Payment for acceptably measured quantity of floor drains, roof drains, cleanouts, glass mirrors, towel rails, toilet paper holders, soap trays, mirror trays electric water coolers, water heaters, etc. shall be made at the applicable unit rate per number quoted in the Bill of Quantities. The bid amount shall be full payment for the works specified herein and as shown on the Drawings.

*** End of Section 5100 ***



SECTION - 5240**PUMPING MACHINERY**

- 1.0 SCOPE**
- 2.0 MATERIALS AND PRODUCTS**
- 3.0 SPECIAL REQUIREMENTS OF PUMPS**
- 4.0 POTABLE WATER BOOSTER PUMP SET**
- 5.0 POTABLE WATER PUMP & MOTOR**
- 6.0 SUBMERSIBLE DRAINAGE PUMP AND MOTOR**
- 7.0 MAINTENANCE MANUALS AND TOOLS**
- 8.0 MEASUREMENT AND PAYMENT**



1.0 SCOPE

The work to be done under this section of the specifications includes furnishing all plant, labour, equipment, appliances and materials and in performing all operations required in connection with the installation of pumping machinery including all accessories as specified herein or shown on the Drawings or as directed by the Engineer.

2.0 MATERIALS AND PRODUCTS

Materials and machinery shall conform to the latest referenced specifications and other provisions specified herein and shall be new and unused. In case where manufacturers are specified, materials and equipment will be of the same manufacturers. In all other cases the Contractor shall submit the names and addresses of the Manufacturers and trade names of the materials and equipment that he intends to buy. Other information such as diagram, drawing and descriptive data will be supplied if so desired by the Engineer. Approval of materials and all the machinery under this provision shall not be construed as authorising any deviations from the specifications. The approval of machinery of manufacturer other than that specified will be purely on the discretion of the Engineer. The Engineer will fully ascertain the facts and satisfy himself as to the performance of the machinery offered by the Contractor.

3.0 SPECIAL REQUIREMENTS OF PUMPS

The Contractor shall furnish with each pump properly identified characteristic curves prepared and certified by the manufacturer showing capacity, head, efficiency and brake horsepower throughout the entire range of the pump.

The pumps shall have stable throttling curves and be suitable for unrestricted parallel operation.

All pumps shall be electric driven.

The pumps and their drives shall not overload or trip when operating against zero pressure.

The design, construction and materials shall be such that damage as a result of cavitation is completely eliminated.

Pumps shall have bearings and be suitable for continuous as well as intermittent operation without external sealing or cooling water. The pumps shall be such that they shall come into operation at once after a prolonged shutdown period without having to take special measures. Pumps shall be capable of delivering specified quantity of water at the specified pressure.

Pumps shall be tested at site before their final acceptance.

Pumps shall be installed at positions shown on the Drawings and/or as directed by the Engineer.

Pumps and their drives shall be in perfect alignment when installed in position.

Pump set shall be provided with reducer/enlarger if necessary on pump discharge pipe and suction pipe.

4.0 POTABLE WATER BOOSTER PUMP SET

Skid mounted potable water booster pump set shall comprise centrifugal pump and a pressure tank provided with the following accessories:

One number PVC/polypropylene/rubber/epoxy lined steel hydro-pneumatic pressure tank of specified capacity with neoprene rubber diaphragm between the water and air sections. The tank shall be complete skid mounted boosting system with automatic motor control unit for dry run protection and auto operation system shall be provided with stainless steel piping. The unit shall be furnished ready for installation L/C flexible pipe gate valve, non return valve, pressure switch & pressure gauge and shall be ready for operation when connected to the piping & electricity supply. The tank shall be rated for a working pressure of 16 kg/cm² and test pressure of 25kg/cm² and shall comply with all the relevant clauses of "ASME Code for Pressure Vessel".

Pump sleeve, intermediate chamber/guide vanes, impeller, suction inter-connector spline shaft cover plates etc. shall be of stainless steel with mechanical seal of approved material. Base plate shall be painted steel.

Pressure gauge, pressure switch gate and check valve on pump discharge pipe. Pressure switch will be adjustable between specified maximum and minimum pressure levels and shall be wired to motor control panel.

- Gate valve and check valve on pump discharge pipe.
- Gate valve, on pump suction pipe.
- Minimum run timer adjustable from 0-6 minutes.
- Low water level cut-off switch.
- Reducer/enlarger, if necessary on pump discharge and suction pipe.
- Alternator with manual over-ride.
- Alarm shall sound at low water level.

Duty of the pump shall automatically alternate between the two pumps (if available) with manual override. In failure of any of the duty pump the standby pump will automatically come into operations within 30 second.

5.0 POTABLE WATER PUMP & MOTOR

The pump will be vertical centrifugal pump of specified capacity, head and duty, totally enclosed, fan cooled, squirrel cage induction motors of specified power.

Pump material shall be as under:

Body:	Fine grained grey cast iron
Impeller:	Bronze
Shaft:	Bronze or stainless steel

Pumps shall have mechanical seal. The suction and discharge flanges shall be rated for a working pressure of 10 kg/cm² for potable water pumps. The flanges shall be drilled to BS 19 (Table 'D' or 'E') or BS 4504.

Motors shall run on 3-phase, 400 volts + 10%, 50 c/s A/C power motors shall be

protected from low voltage, overload, overheating and phase failure.

Potable water pumps and motors shall be installed on concrete foundation with anchor bolts.

Potable water pumps will be automatically operated at pre-set levels in overhead tanks with help of level switches installed in respective overhead water tanks.

In case a pump fails to start automatically, an alarm will be automatically sounded at preset minimum water level in overhead water tank.

6.0 SUBMERSIBLE DRAINAGE PUMP & MOTOR

The pump shall consist of submersible drainage pump and motor with duckfoot bend/auto coupling, guide rails and chain etc of the specified capacity and head and shall be integral sealed unit with strainer.

Pump material shall be as under:

Casting:	Cast Iron
Impeller / Bowl:	Cast Iron
Shaft:	Stainless steel
Bearing:	Pre-lubricated bearing
Motor:	Air filled water tight

The pumps shall be installed inside the pit as shown on drawing. The discharge flange shall be threaded to BS 21 and shall be rated for working pressure of 10 kg/cm².

6.1 INSTALLATION

The submersible drainage/ sewage pumps shall be installed in the sump pits at the locations shown on the drawings.

6.2 PUMP ACCESSORIES

Pumps shall be provided inclusive of the following accessories:

- i. Duck foot Bend, Guide rails and pulling chain etc.
- ii. Pressure gauge, level switches, flow switches etc.
- iii. Reducer/enlarger is necessary if the pump discharge size is different from discharge piping.

6.3 MOTOR PROTECTION

Motors of 3kw or less power shall be started direct on line. Larger motors shall be started by star-delta starter.

Motor shall be protected against under voltage over voltage, overload, over-heating and phase failure.

Motor shall be rated for normal operation against a voltage fluctuation of + 10% and frequency fluctuation of + 2Hz.

6.4 CONTROL

Submersible Drainage Pump

Operation of pumps shall be controlled by level switches installed inside the sump pit.

- i. One pump shall be duty and one shall be standby.
- ii. Pumps shall start and stop at the designated water levels inside the sump.
- iii. If duty pump fail to start, the standby pump shall automatically come into operation.
- iv. If standby pump fails to start, an alarm shall be sounded at high water level.

6.5 LEVEL SWITCH

Level switches shall be electric actuating device, which will close/open the circuit at preset lower/higher pressures. The device shall be housed in diecast aluminium casing with enamel finish. The switch shall be adjustable. The pressure switch shall be rated for a working pressure of 16 Bar. The switch shall be wired to control panel.

6.6 WATER LEVEL INDICATOR

The water level indicator for high and low water level cut off shall operate on 230 Volt AC, 50 Hz and supplied complete with float, float chains, counter-weights, chain clamps, steel mounting brackets, chain guide roller and any other equipment and material necessary for installation and satisfactory operation.

The level indicator shall have at least 5 switch-contacts or as required for sensing the required water levels within the specified range. The level indicator shall be suitable to match with the specific gravity of the fluid in which it is intended to be installed. All operational, constructional and installation details shall be furnished by Contractor for approval.

The Contractor may quote for non-mechanical type of water level indicator to give equivalent performance. Technical literature and data of the indicator is to be furnished along with the bid documents.

7.0 MAINTENANCE MANUALS AND TOOLS

- 7.1 A book or books containing the complete information in connection with the assembly, operation, lubrication, adjustment and repair of the pumping equipment, electric motor, together with detailed parts list with drawings or photographs shall be furnished in duplicate.
- 7.2 For the pump room, special tools necessary for maintenance and repair of the pumps and electric motors including tools kits, grease guns etc. with accessories shall be furnished.

- 7.3 The manufacturer's recommended list of spare parts to be stocked by the CLIENT shall be submitted by the Contractor to the Engineer for approval. Such spare parts will also be furnished by the Contractor.
- 7.4 All the maintenance manuals, tools, spare parts etc., shall be supplied by the Contractor at no cost of the CLIENT and all cost shall be deemed to be included by the Contractor in his bid against item of pumping set.

8.0 MEASUREMENT AND PAYMENT

8.1 Pumping Machinery

6.1.1 Measurement

Measurement for payment of pumping machinery pressure gauge, brass strainer, pressure switch and water level indicator shall be the actual number acceptably provided and installed in position; the Contractor's bid against these item shall include cost of providing and installing the pumping machinery including the pumps, electric motors, all accessories, manuals, tools, spare parts, etc., as shown on the Drawings, as specified herein or as directed by the Engineer.

6.1.2 Payment

Payment will be made for acceptable measured quantity of pumping machinery pressure gauge, brass strainer, pressure switch and water level indicator on the basis of unit rate per number quoted in the Bill of Quantities. The amount bid shall be full payment for the work specified.

*** End of Section 5240 ***

SECTION – 8001**GENERAL SPECIFICATIONS FOR ELECTRICAL WORKS**

- 1.0 SCOPE OF WORK**
- 2.0 RULES & REGULATIONS**
- 3.0 AMBIENT CONDITIONS**
- 4.0 STANDARDS**
- 5.0 SYSTEM DATA**
- 6.0 EQUIPMENT**
- 7.0 DRAWINGS AND DATA TO BE FURNISHED BY THE CONTRACTOR**
- 8.0 MANUFACTURER'S INSTRUCTIONS**
- 9.0 GUARANTEE**
- 10.0 DANGER BOARDS WITH SIGNS, DESIGNATION AND SHOCK / FIRST AID CHARTS AND FIRE FIGHTING EQUIPMENT**
- 11.0 ASSOCIATED CIVIL WORKS**
- 12.0 INSTALLATION INSTRUCTIONS - GENERAL**
- 13.0 FACTORY TESTS**
- 14.0 TESTING - GENERAL**
- 15.0 APPENDICES TO BE FILLED IN BY THE BIDDER**
- 16.0 PAYMENT**

1.0 SCOPE OF WORK

The works related to the electrical system which is included in the Scope of this Contract as shown on the Drawings, stated in the Specifications and Bill of Quantities and explained in these Specifications. The works shall broadly include but not limited to the following:

- General Specifications for Electrical Works
- Power Transformer
- LT Distribution Boards
- Light Fixtures
- Low Tension Cables
- Wiring Accessories
- Conduits and Pipes
- Earthing
- Lightning Protection System
- Miscellaneous Items
- Structured Cabling Network
- Fire Alarm System
- Closed Circuit Television System
- Public Address System
- Cable Antenna TV System

The Contractor shall also be responsible to supply any other equipment not specifically mentioned in these Documents but which is necessary for proper operation of the works/system included in the scope of this Contract. The Contractor shall solely be responsible for ensuring proper functional requirements of different equipment. He shall also be responsible for furnishing any additional piece of equipment and for making modification in the equipment as desired and/or approved by the Engineer to achieve proper co-ordination with various equipment offered in the bid and also with those installed by others.

2.0 RULES & REGULATIONS

The entire electrical installation/work shall be carried out by licensed Contractor, authorised to undertake such work under the provisions of the Electricity Act 1910 and The Electricity Rules 1937 as adopted and modified upto date by the Government of Pakistan.

All works shall be carried out in accordance with the latest edition of the Regulations of the Electrical Equipment of Buildings issued by the Institute of Electrical Engineers-London, the Contract Documents, The Electricity Rules 1937 and bye-laws that are in force from time to time. Any discrepancy between these Specifications and any other rules and regulations shall be brought to the notice of Engineer for his instructions and the discussion of the accepting/controlling shall be final and conclusive.

The Contractor shall be responsible for completing all formalities and submitting

the test certificates as per prevailing rules and regulations, and shall have the installation passed by the Government Electric Inspector of that region. All requirements of the Electric Inspector and the WAPDA / DISCO shall be complied with.

3.0 AMBIENT CONDITIONS

All material and equipment supplied and installed shall be designed, manufactured and tested to meet the following ambient conditions unless specifically stated otherwise for any material/ equipment.

Maximum indoors ambient temperature	:	45-Degree Celsius
Minimum indoors ambient temperature	:	Zero Degrees Celsius
Maximum outdoors-ambient temperature	:	50-Degree Celsius
Minimum outdoors-ambient temperature	:	Zero Degrees Celsius
Maximum Relative humidity	:	100 Percent
Maximum Altitude of project	:	220 meters above the mean sea level

The atmospheric conditions are tropical and highly humid.

4.0 STANDARDS

The latest standards and codes of reputable organisations shall be applicable for the material and equipment specified herein and for installation work. Such organisations to be BSS, VDE, NFPA 99, NEC Article 517 etc. In case the Specifications laid down herein differ from those given in the standards, then the equivalent or better specifications shall govern. Wherever applicable the equipment shall also conform to the requirements of Pakistan Standard Institution (PSI).

Contractor shall maintain at the site office one copy of the standards / codes applicable to the works.

5.0 SYSTEM DATA

Unless otherwise specified elsewhere, all equipment and material shall be designed to operate satisfactorily with the following minimum requirements without any de-rating.

- a) Voltage rating of equipment : HT : 11 kV, 3 phase, +/- 10%
LT : 400 V, 3 phase, +/- 10%
230 V, 1 phase, +/- 10%
- b) Frequency : 50Hz + 2Hz

In general, the electrical colour coding of switchgear cubicles, control panels, desks etc., shall be in accordance with the respective IEC Recommendations.

Live parts of electrical connections shall be colour coded according to IEC 446 as follows:

	Conductor Designation	Coding Alphanumeric	Colour
A.C. Network	Phase 1	L 1	red
	Phase 2	L 2	yellow
	Phase 3	L 3	blue
	Neutral	N	black
D.C. Network	Positive	L+	white
	Negative	L-	black
Earthing	Protective Earth	PE	green/yellow
	Earth	E	green/yellow

The colour coding for the secondary circuits of isolated power panel board is as follows:

Orange-Isolated Phase Conductor
Brown- Isolated Neutral Conductor
Green-Isolated Ground Conductor

Conductor insulation of secondary circuits of isolated power panel board shall be XLPE and PVC sheathed.

Control Cables

The Control Cables shall be manufactured according to specifications for L.T. Cables. The Control Cables shall be of multi-core, PVC insulated type withstanding without deterioration the conditions prevailing at the place of installation. The cross section of cable shall be as per the requirement of the system.

All the cores should be numbered and/or colour coded or otherwise properly identified. At-least 20% spare cores shall be provided in all Control Cables.

No separate payment is admissible for supplying, installing, testing and commissioning of control cables and is deemed to have been included in the BOQ rates of the respective equipment.

Distance in between power, communication and control cables shall be kept as per requirements laid down by NEC800, NFPA 70 and EN50174-2.

6.0 EQUIPMENT

6.1 IP Degree of Protection

The equipment shall have IP degree of protection as follows, unless mentioned other wise:

- IP 20 for indoor areas
- IP 42 for indoor damp areas
- IP 54 for outdoor areas

If properly rated equipment is not available, the Contractor shall provide field enclosures to attain the required IP degree of protection. If necessary cooling/exhaust fans and / or anti condensate heaters shall also be provided. No separate payment shall be made to attain the required IP degree of protection.

6.2 Identification & Labelling

All devices, meters, cabling, wiring and auxiliaries shall be properly labeled for identification. Labeling of equipment shall be done by means of flameproof material using indelible ink/markings. The labeling shall be such as to ensure uniformity and shall facilitate study of control diagrams/ drawings during operation and maintenance.

All labeling shall be of suitable size to be visible from the operating conditions/positions at site.

6.3 Lamp Test Facility

All equipment / switchboards, etc. shall be provided with common lamp test facility.

7.0 DRAWINGS AND DATA TO BE FURNISHED BY THE CONTRACTOR

The shop drawings, as-built drawings and/or technical data to be furnished by the Contractor for each electrical equipment, LT cable distribution layout & shall include, but not limited to the following:

- (a) Structural drawings showing foundations, RCC details dimensional plans, elevation and sections on a suitable scale.
- (b) Electrical drawings showing:
 - Line diagrams of Switchboards, Motor Control Centres, distribution boards and isolated power panels with detailed wiring diagrams, elevations/internal component layout and other

standard details.

- LT Cabling, Grounding/Earthing including all cable routing and support details.
- Necessary execution details such as no. of cable/wires, size of conduits, cable routes, cable trays and cable trenches, etc.
- Substation and Generator Room Equipment installation detail.
- Manhole/Duct works.

(c) Layouts of all LT cable routes with coordinates and levels.

(d) Technical literature and manufacturer's characteristic data with the description of materials and weights of all equipment as instructed by the Engineer.

At least three (3) copies of the shop drawings and/or technical data of the equipment shall be submitted to the Engineer for checking and approval.

8.0 MANUFACTURER'S INSTRUCTIONS

The Contractor shall supply to the Engineer in properly bound form six (6) copies of manufacturer's instruction manuals for installation, testing, commissioning, operation and maintenance of the specified equipment including manuals of spare parts and tools of the equipment. At least two copies of the documents shall be submitted in original. The installation instructions shall be submitted 2 weeks prior to commencement of installation of each equipment, and operation and maintenance instruction at the time of commissioning. If the Contractor fails to provide the documents the Engineer shall withhold issuance of requisite certificates and deduct suitable amount from the payments to the Contractor.

9.0 GUARANTEE

The Contractor shall furnish written guarantee of the manufacturer or supplier with respect to satisfactory performance of each equipment. Guarantee shall be given for replacement and repair of part or whole of the equipment, which may be found defective in material or workmanship. The guarantee shall cover the duration of Maintenance Period as defined in the Conditions of Contract. This guarantee shall not relieve the Contractor of his obligations and he will be fully responsible for the repair or replacement of any defective material in time, so as not to cause any undue delay in carrying out the repairs and/or replacements.

10.0 DANGER BOARDS WITH SIGNS, DESIGNATION AND SHOCK / FIRST AID CHARTS AND FIRE FIGHTING EQUIPMENT

Danger Boards having signs and designation of the room shall be installed on the external door of HT, LT, Power transformer, Low Voltage DG Set Rooms. Shock/First Aid Charts shall be installed in H.T, L.T and Low Voltage DG Set Rooms.

Potable fire fighting extinguisher suitable to control electrical fire shall be provided in H.T, L.T, Power Transformer and Low Voltage DG Set Rooms.

All the above items shall also be provided, wherever required to comply the requirements of the Pakistan Electricity Rules/Electric Inspector.

Laminated single line and adequate detail drawings on proper boards highlighting the main system features shall be displayed/ fixed in respective electrical and communication rooms.

11.0 ASSOCIATED CIVIL WORKS

Except where separately stated in the Bill of Quantities the cost of all civil works associated with any BOQ item of electrical works, such as excavation and back filling of earth, compaction of the earth, foundation pads, chiselling, making openings, etc. shall be included in the price quoted against respective items. No separate payment for such works will be made. Such works will also include repair of any damage to civil works caused by the Contractor during electrical installation.

12.0 INSTALLATION INSTRUCTIONS - GENERAL

The Contractor shall furnish all labour, materials, tools and equipment required to install, connect, test and commission all electrical equipment specified herein, whether or not such equipment is furnished by him or by others.

For all equipment to be installed by the Contractor, the Contractor shall supply and install all erection materials such as foundation bolts, washers, nuts, etc. as required and without any additional costs.

The Contractor shall set out the works himself as per Specifications and Drawings and shall properly position the equipment on specified foundation/location. In general, the manufacturer's instructions for installation shall be followed. Any defect or faulty operation of equipment due to the Contractor not following the manufacturer's instructions shall be corrected and repaired by the Contractor at his own cost.

For any deviation from the working drawings or specification that are deemed necessary by the Contractor due to site conditions, he shall submit the details and obtain the Engineer approval before starting such works.

13.0 FACTORY TESTS

All type and routine tests on Low Voltage D.G Set, Power Transformer, H.T Switchboards, LT Switchboards, Motor Control Centre, H.T Cables, LT Cables, and all other equipment shall be performed at the manufacturer's works in the presence of the Engineer or his Representative. Type tests may be waived off in case test certificates are submitted as certified by an Engineer approved standard laboratory of international repute; but merely producing the test type certificates will not relieve the manufacturer to carry out the required standard/routine tests.

The Contractor shall inform the Engineer about the date and time of test of each equipment at least two weeks in advance. This shall, however, be done after the Contractor has got the test procedures duly approved by the Engineer. The witnessing of test by the Engineer and the Employer shall not absolve the Contractor from his responsibility for the proper functioning of the equipment, and for furnishing the guarantees referred to in clause 9.0. All test results shall be supplied in quadruplicate. All expenses for carrying out the tests as incurred by the Engineer and the Employer to witness it shall be borne by the Contractor and deemed to have been included in the bid. Provision for at least two person's visit for Factory Acceptance Tests shall be made to include one representative each from the Employer and the Consultant/Engineer. The contractor shall undertake all formalities as may be required for the Engineer or his representative to enable him make the visit.

14.0 TESTING - GENERAL

14.1 Scope

Upon completion of the installation, the Contractor shall perform field tests on all equipment, materials and systems. All tests shall be conducted in the presence of the Engineer for the purpose of demonstrating equipment or system compliance with Specifications. The Contractor shall submit for Engineer's approval complete details of tests to be performed describing the procedure, test observations and expected results.

The Contractor shall furnish all tools, instruments, test equipment, materials, etc., and all qualified personnel required for the testing, setting and adjustment of all electrical equipment and material including putting the same into operation.

All tests shall be made with proper regard for the protection of the personnel and equipment and the Contractor shall be responsible for adequate protection of all personnel and equipment during such tests. The cost of any damages or rectification work due to any accident during the tests shall be the sole responsibility of Contractor.

The Contractor shall record all test values of the tests made by him on all equipment. Four (4) copies of all test data and results certified by the Engineer shall be given to the Engineer for record purposes. These shall also include details of testing method, testing equipment, diagrams, etc.

The witnessing of any tests by the Engineer does not relieve the Contractor of his guarantees for materials, equipment and workmanship, or as any other obligations of Contract.

14.2 Low Voltage D.G. Set

Prior to the tests, the contractor shall submit manufacturer's recommended detailed description of the test procedures to be conducted for Engineer's approval.

The Contractor shall carry out full site load and no load tests in accordance with IEC, ISO or BS Specifications for site commissioning. The inspection and tests shall include but not be limited to:

Basic Tests:	Insulation Resistance Earth Continuity Earth Loop Impedance Polarity Phase Rotation Voltage and Frequency Starting System Protection Equipment
Battery:	Nominal Voltage Discharge Voltage Specific Gravity of Electrolyte Level of Electrolyte Charging System
Lubrication:	Check as required by manufacturer
Operational Check at Start-up	Oil Pressure Fuel Oil Leaks Operation of Safety Devices Operational Speed Automatic Control Instrument Check Exhaust Check Undue Vibration
Operational Check After one hour's run:	Oil Pressure Oil Leaks Cooling System Oil Temperature

Commissioning Test:	25% of full load	2 hrs.
	50% of full load	5 hrs.
	75% of full load	8 hrs.
	100% of full load	8 hrs.
	110% of full load	1 hr.

All commissioning and test results shall be recorded and compared with design data. A retest/commissioning shall take place if results are not satisfactory. All the tools, labour, POL, required for the testing and commissioning shall be provided by the Contractor at no extra cost. If required load is not available at site for testing the generators, the Contractor shall provide dummy load at site at no extra cost to the Employer. The correct functioning of the control equipment shall also be proved.

Battery Charger

Battery charger shall be static type and shall provide for both trickle and boost charging of the batteries when the engine is not in operation. The charger shall be of suitable capacity to fully recharge the completely discharged batteries within four hours at boost charge.

Control Panel

The Control Panel shall provide all the necessary control and monitoring devices of the Diesel Generating Sets. All the control and monitoring of the safety devices, alarms, protections, meters, lamps, etc. as mentioned in this Specifications and required as per good engineering practices for such an installation shall be provided in the Control Panel.

14.3 Transformer Tests

In addition to the insulation resistance test of the transformer, a polarity and phase rotation test shall also be made. Buchholz relay shall be tested for proper operation. Di-electric test shall be carried out on transformer oil prior to putting the same in operation.

14.4 HT / LT Switchboards

Each circuit breaker shall be operated electrically and mechanically. All interlocks and control circuits shall be checked for proper connections in accordance with the wiring diagrams given by the manufacturer.

The Contractor shall properly identify the phases of all switchgear and cables for connections to give proper phase sequence.

Trip circuits shall be checked for correct operation and rating of

equipment served. The correct size and function of fuses, disconnect switches, number of interlocks, indicating lights, alarms and remote control devices shall be in accordance with approved manufacturer drawings. Nameplates shall be checked for proper designation of equipment served. Protective relays shall be tested and set at site prior to commissioning of the equipment.

14.5 Insulation Resistance Test

Insulation resistance test shall be made on all electrical equipment by using a meggar of 500 volts for circuits upto 250 volts and 1000 volt for circuits between 250 and 500 volts. For testing of 11 kV circuits, upto 5 kV meggar shall be used; the exact voltage shall be as advised by the equipment manufacturer unless otherwise advised by the Engineer.

The insulation resistance values of cables, transformer, switchgears, etc., shall be as per BSS, IEEE, NEC, ICEA and Pakistan Electricity Rules.

Before making connections at the ends of each cable run or joint between cables, the insulation resistance test of each cable section shall be made. H.T. cables shall be subjected to high voltage test as per recommendations of standard to which the cable is manufactured. Each conductor of a multi-core cable shall be tested individually with each of the other conductor of the group and also with earth. If insulation resistance test readings are found to be less than the specified minimum in any conductor, the entire cable shall be replaced and tests repeated on new cable. If cable joint is provided, then each cable section shall be tested, and joint made only after the tests have been made satisfactorily. Finally the completed cable length including the joints shall be tested.

The transformer and switchgears shall be given an insulation resistance measurement test after installation, but before any wiring is connected. Insulation tests shall be made between open contacts of circuit breakers, switches and between each phase and earth.

If the insulation resistance of the circuit under test is less than the specified value, the cause of the low reading shall be determined and removed. Corrective measures shall include dry-out procedure by means of heaters, if equipment is found to contain moisture. Where corrective measures are carried out, the insulation resistance readings shall be taken after the correction has been made and repeated twice at 12 hours interval. The maximum range for each reading in the three successive tests shall not exceed 20% of the average value. After all tests have been made, the equipment shall be reconnected as required. Polarity test shall be made on single pole switching devices.

14.6 Earth Resistance Test

The Contractor shall make Earth resistance tests on the Earthing system, separating and reconnecting each earth connection.

If it is indicated that soil treatment or other corrective measures are required to lower the ground resistance values, the Engineer will determine the extent of such corrective measures.

The electrical resistance of the ECC together with the resistance of the Earthing leads measured from the connection with earth electrode to any other position in the complete installation shall not exceed one ohm.

Earth resistance test shall be performed as per Electrical Inspector's requirements. Where more than one earth electrodes are installed, the earth resistance test of each electrode shall be measured by means of resistance bridge instrument.

The complete lightning protection system shall be tested for continuity and earth resistance. The combined earth resistance at any point in the lightning protection system shall not exceed 10 ohms.

14.7 Completed Tests

After any equipment has been tested, checked for operation, etc., and is accepted by the Engineer the Contractor shall be responsible for the proper protection of that equipment so that subsequent testing of other equipment do not cause any damage to the already tested equipment.

14.8 Expenses

All expenses, i.e., travelling, boarding and lodging for carrying out the tests and witnessing by the Engineer shall be borne by the Contractor and are deemed to have been included in the BOQ rates of the respective equipment(s) by the Contractor.

14.9 Spare Parts

Contractor shall provide spare parts as identified in relevant appendix. The cost of each spare parts shall be carried over to relevant BOQ item and no extra payment shall be admissible in this regard.

14.10 Special Tools

Contractor shall provide special tools as indicated in Appendix-IV and as may be deemed essential for assembly, adjustment, dismantling, installation and maintenance reasons.

No separate payment shall be made for any special tools and cost shall be deemed to be included in the cost of the Contract.

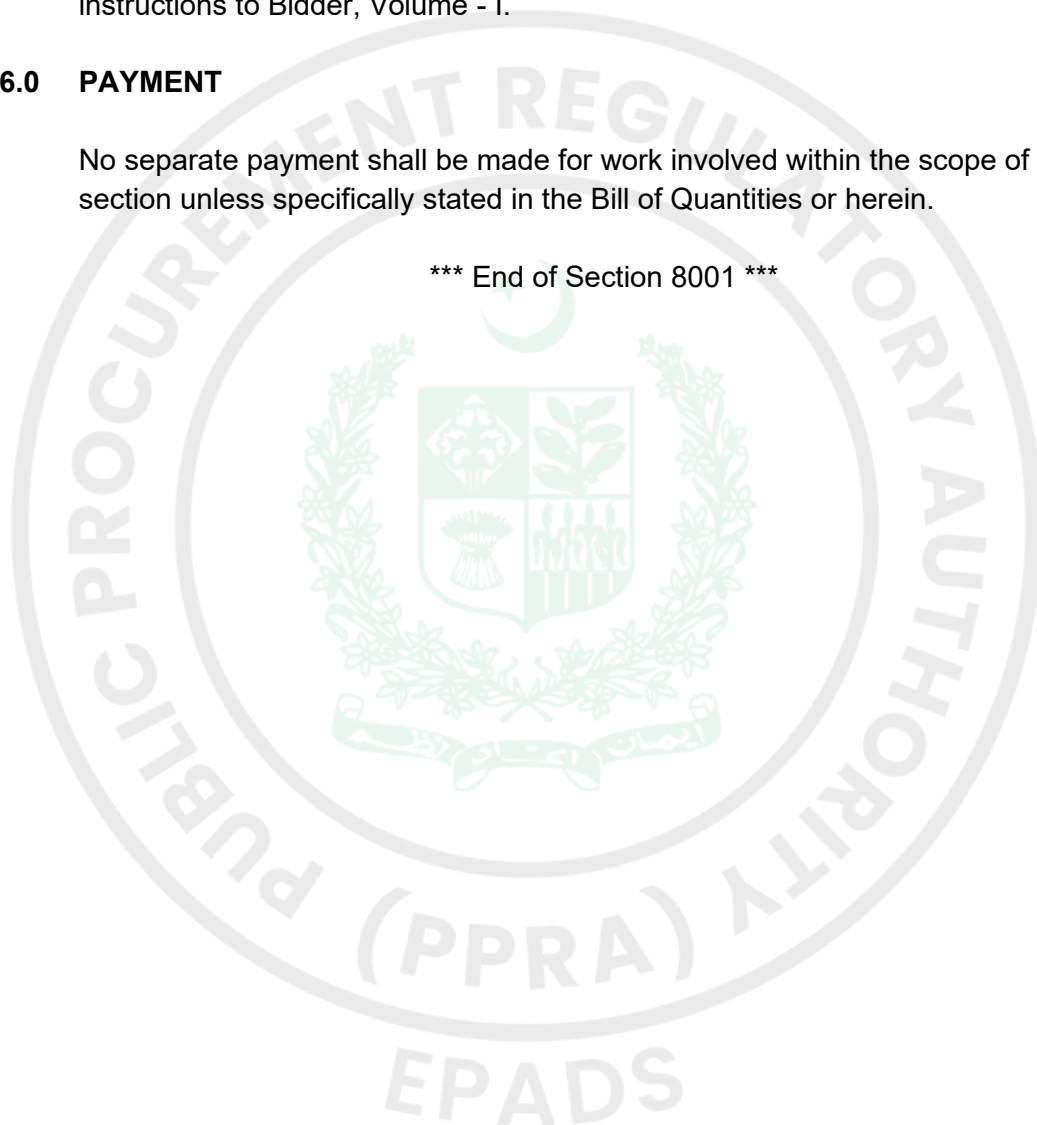
15.0 APPENDICES TO BE FILLED IN BY THE BIDDER

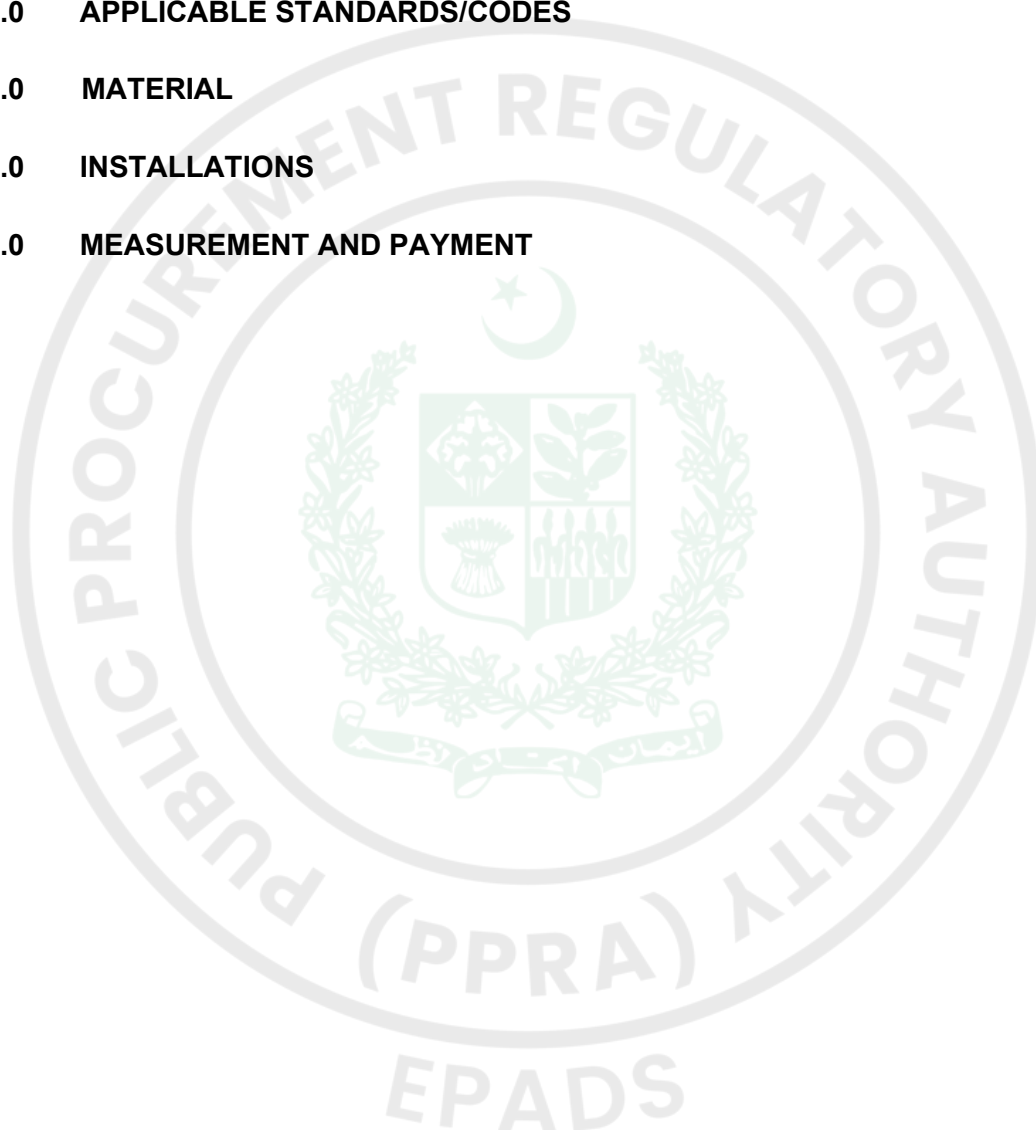
The details regarding equipment manufacturers, deviations, etc., are to be furnished in the appendices attached with form of Bids, in accordance with the provisions of the clause "Requirements of Electrical Works" given in the instructions to Bidder, Volume - I.

16.0 PAYMENT

No separate payment shall be made for work involved within the scope of this section unless specifically stated in the Bill of Quantities or herein.

*** End of Section 8001 ***



SECTION – 8132**LT SWITCHBOARDS****1.0 SCOPE OF WORK****2.0 GENERAL****3.0 APPLICABLE STANDARDS/CODES****4.0 MATERIAL****5.0 INSTALLATIONS****6.0 MEASUREMENT AND PAYMENT**

1.0 SCOPE OF WORK

The work under this section consists of supplying, installing, testing, connecting, commissioning of all material and services of the complete LT Switchboards as specified herein and/or shown on the Bidding Drawings and given in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and coordinate at site with other services for exact route, location and position of the LT Switchboards.

The LT Switchboards shall also comply with the General Specifications for Electrical Works Section-8001 and with other relevant provisions of the Bidding Documents.

2.0 GENERAL

The LT Switchboards shall be of sheet steel fabricated, floor mounting, cubicle type, totally enclosed, dust tight and vermin proof. It shall be complete in all respect with material and accessories, factory assembled, tested and finished all according to the specifications and to the normal requirements. The IP rating of LT Switchboards shall be at least IP54.

The switchboard with all components and accessories shall be suitable for front operation only and shall:

- have a rated service short circuit breaking capacity, (Ics) at 415 V AC conforming to IEC 60947-2 as shown on the drawings.
- be provided with adequate clearance from live parts so that flashovers cannot be caused by switching, vermin, pests, etc.
- have all components rated for insulation class of 600-volt minimum.
- be designed for flush mounting of all instruments on the front side.
- have all incoming and outgoing connection from the top or bottom as required.
- have the components mounted so as to facilitate ease of maintenance from the front.
- have common lamp test facility for all lamps.
- have wiring diagram in the pocket on the inside of each door of the panel.
- be suitable for 415 volts AC, 3 phase 4 wire, 50 Hz system.

- be labeled with stainless steel nameplate on the front side of door for each incoming and outgoing circuit.
- have doors grounded by flexible copper cable/strip.
- have arrangements for extension of panel in future.

3.0 APPLICABLE STANDARDS/CODES

The latest editions of the following standards and codes shall be applicable for the materials specified within the scope of this Section:

- IEC 60947-3 - Low Voltage Switchgear and Control Gear-Switches, Disconnect, Switch-disconnector and Fuse Combination Units.
- IEC 60947-2 - Low Voltage Switchgear and Control Gear-Circuit Breakers
- IEC 60831 - Power Capacitors
- IEC 60439 - Low Voltage Switchgear and Control gear Assemblies
- IEC 60073 - Colours for indicator lights and push buttons
- BS EN 60529 - Specifications for degrees of protection provided by enclosures (IP Code).
- IEC 60044-1 - Instrument Transformers - Current Transformers
- IEC 60044-2 - Instrument Transformers – Inductive Voltage Transformers
- IEC 60051-1, - Direct acting indicating analogue electrical measuring
2, 3, 5 & 8 instruments and their accessories
- BS 88 - Cartridge fuses for voltage upto and including 1000 V a.c and 1500 V d.c

4.0 MATERIAL

4.1 Sheet Metal Work

The LT Switchboards shall be fabricated, welded, grinded, finished with angle iron framework and clad with 14/16 SWG MS sheet. It shall be suitably divided into panels and compartments for accommodating the required number of circuit components, instruments and accessories.

The switchboard shall be supplied complete with foundation bolts and other installation materials as recommended by the manufacturer. Proper size cable clamping channels with galvanized steel clamps and brass

cable glands respectively for unarmoured and armoured cables shall be provided. All holes, cutout shall be tool or jib manufactured and free from burrs and rough edges. An earth bar of appropriate cross section shall be provided and connected to the bodies of all sections of the switchboard. Two external earth terminals shall be provided for main earth connection to the body of switchboard. The doors shall be earthed by means of flexible copper strip. Means shall be provided to limit the opening angle of doors to about 100°.

The cabling inside the switchboard shall be suitably numbered and harnessed by means of straps or cords. Wiring to door mounted components shall be in flexible PVC conduit. All indicating, selecting and control equipment shall be suitably arranged and clearly labelled by means of flame proof material using indelible ink/markings indicating the rating of fuse, switches, etc. The nameplates provided on the front of panel shall be of flame retardant material preferably stainless steel. Use of plastic or any inflammable material shall not be permitted for nameplates.

All metalwork of the switchboards shall be cleaned down to bare shining metal phosphated and the surfaces chemically prepared for powder coating. Then these shall be coated with powder of colour RAL 7032 and then baked in oven. The thickness of powder coating shall not be less than 100 microns.

4.2 Components

The switchboards shall be provided with all components as specified or shown on the Drawings and as necessary for the satisfactory operation of the switchboard and of the electrical system. Typical specifications are given hereunder.

4.2.1 Bus Bars

The bus bars shall be made of 99.99% pure high conductivity electrolytic tinned copper and shall be completely isolated and mechanically braced for the specified fault level according to relevant IEC standard. The phase identification of bus bars shall be by providing colours sleeves on bus bars ends and these shall be red, yellow and blue for phase and black for neutral. The earth bus bar shall be green.

The bus bars shall be triple pole, neutral & earth and shall be of appropriate size to meet the electrical and mechanical requirements of the system. The temperature rise shall not exceed 30°C at rated current.

Neutral bus bar shall be of the same cross section as phase bus bars. Earth bus bar shall be of half cross section area as phase bus bars.

4.2.2 Circuit Breakers

The circuit breaker shall be triple pole, current limiting type, manually operated or motor operated, spring charged type as shown on the drawings with front drive grip handle. ON-TRIP-OFF indication shall be provided on circuit breakers. The all circuit breakers shall have the following protections and setting range unless otherwise shown on the drawings:

- Adjustable three pole, manual reset thermal overload release of setting range 80 to 100% of rated current.
- Magnetic triple pole short circuit release having range according to manufacturer's standard range.

The incoming circuit breakers of main LT panel (normal and emergency) shall be air circuit breakers whereas outgoing circuit breakers shall be moulded case type, unless stated otherwise on the drawings.

The incoming circuit breaker shall have two numbers normally open and two numbers normally closed auxiliary contacts rated for 2 Amp, 230 VAC. The incoming circuit breaker shall also have ON-TRIP-OFF indicating lamps. Where shown on the drawings indication lamps shall also be provided for outgoing circuit breakers. The circuit breaker shall have specified rupturing capacity without the use of back-up fuses. Auxiliary release and trip coils shall be provided for desired operation and/or interlockings as stated on the drawings.

The motor operated, spring charged type circuit breakers shall be provided with anti-pumping circuit to prevent repeating cycle of TRIP reset and ON even if the close command is given while the circuit breaker has tripped due to fault.

4.2.3 Switch - Fuse Units

The switch-fuse unit shall comprise a triple pole on load isolating switch with HRC fuses. The fuse shall be supplied complete with the fuse base and shall conform to BS-88 Class Q1 with a fusing factor of 1.5.

4.2.4 Ammeters and Voltmeters

All meters shall be flush mounting, moving iron, spring controlled. The front dimensions shall be 96 x 96 mm for meters.

The meters shall be of accuracy class 1.5 according to relevant IEC standard. The ammeter shall be suitable for connection to 5 Amps secondary of current transformers or directly through shunt as shown on drawings. The ammeters and voltmeters shall have measuring range as indicated on the drawings.

4.2.5 Current Transformers

Air-cooled, ring type current transformers shall be provided having transformation ratio as indicated on the drawings. The current transformers shall be of suitable burden having accuracy class 1.0 according to relevant IEC standard. The current transformers shall have 5 amps secondary.

4.2.6 Selector Switches

Ammeter and voltmeter selector switches shall be complete with front plate and grip handle. R-Y-B and OFF position for ammeters and RY-YB-BR-RN-YN-BN and OFF position for voltmeters shall be marked on the respective selector switches.

The selector switches for controls shall be rotary cam type, having required number of positions. It shall be provided complete with knob and front plate showing all positions as required.

4.2.7 Air Break Contactors

The contactors shall be air break, triple pole 400 VAC type and suitable for the AC3 type of duty to be performed. The main contacts shall be silver tipped, butt type with double break per pole. Each contactor shall be provided with single phase 230 VAC operating coil and minimum one spare normally open and one normally closed auxiliary contact. The number of working auxiliary contacts shall be provided according to the system requirements.

4.2.8 Push Buttons

The push buttons shall be illuminating momentary make/break contact type (normally open/normally close) and suitable for flush mounting. The push button for on and off switching shall be red and green respectively.

4.2.9 HRC Fuses

HRC fuses shall be provided complete with fuse bases, fuse etc. The fuses shall have a fusing factor as specified for class Q1 in accordance with BS 88.

4.2.10 Indicating Lamps

Indicating lamps shall be suitable for flush mounting, complete with base, 230 volt AC incandescent lamp and shall have rosettes of suitable colour.

4.2.11 Line up Terminals

Line up terminals wherever provided for control and power circuits shall be suitable for voltage and size of conductors as indicated on drawing.

The line-up terminals for controls shall be suitable for channel mounting. All necessary accessories such as end plates, fixing clips, transparent label holder caps and label sheets with marking shall be provided.

4.2.12 Power Factor Improvement Plant

The power factor improvement plant shall be used for improving the power factor of the system on 415 Volts side. The plant shall be automatic-cum-manual.

The power factor improvement plant shall be aligned with the Main LT Switchboard. The control panel for the plant shall be a part of Main LT Switchboard, whereas the power factor correction capacitors shall be mounted in a separate ventilated panel. The capacitors shall be suitable for three phase, 440/415 volts, 50 Hz system and shall be self cooled, designed for indoor use in tropical climate for maximum ambient temperature as specified in section - 8001, General Specifications for Electrical Works. The capacitors shall be in the form of banks divided for required stages. Each capacitor bank unit shall be of kVar capacity as shown on drawings. Each capacitor unit shall be complete with discharge resistors and internal fuses and shall be connected with control panel with proper size of single core PVC insulated cables.

The control panel of the plant with all accessories shall be installed within LT Switchboard. The panel shall be supplied complete with a set of 3-phase, full capacity, insulated copper busbars, interconnections, risers, designation labels, cable

sockets, holdings down bolts, wiring with cleats and ferrules, earthing sockets and studs, etc. The control panel shall at least accommodate, but not limited to the following:

- 1 No. Multi-stage power factor correction relay for automatic/manual control.
- 1 No. 3-phase, 4 wire, 415 volts, unbalanced load power factor indicator.
- 1 No. Current transformer with 5 amps secondary current, having suitable output burden and accuracy.
- 3 Nos. Instrument potential fuses.

Following equipment shall be provided for every capacitor bank:

- 1 No. triple pole 415 volts air break contactor with auxiliary contacts (125/63/40 amps for 50/25/12.5 kV Air bank respectively).
- 1 Set 3 Nos. HRC back-up fuses with base and carrier having the fuse factor as required for capacitors in accordance with BS- 88 (125/63/40 amps for 50/25/12.5 kVA bank respectively).
- 1 No. Auto-Off-Manual selector switch.
- 1 No. Red lamp for 'ON' indication of the contactor.

The cost of control panel and power factor connection capacitors panel shall deemed to be included in relevant BOQ item for LT Switchboard and no extra payment shall be admissible in this regard.

5.0 INSTALLATION

The LT Switchboards shall be installed at location shown on the drawing or as advise by the Engineer. The concrete pedestal shall be constructed as per relevant specifications for civil works. The Contractor shall be responsible to ensure co-ordination with the civil works for providing any openings, holes, etc., to avoid any breakage to completed works. In case the provisions in civil works for installation of electrical equipment are not made or made incorrect the same shall be rectified by the Contractor at his own cost and to the satisfaction of Engineer.

The Contractor shall provide foundation bolts and grout them in cement concrete floor using non-shrinkable material with the approval of Engineer.

All installation materials for physically erecting the switchboard, such as bolts, nuts, washers, supporting steel, etc., shall be provided and installed by the Contractor. The switchboard shall be installed upright and in level and shall be firmly and rigidly bolted to the floor and concrete supports.

The switchboard shall be completely erected as per manufacturer's instructions and as approved by the Engineer. Loose parts dispatched by the manufacturer shall be installed and connected as per assembly drawing provided by the manufacturer. Any safety locking of meter, relays, etc., provided by the manufacturer for safe transport shall be released only after the switchboard is erected in position. The incoming and outgoing cables shall be connected as recommended by cable manufacturer. The cable armour shall be connected effectively to ground.

The switchboard body shall be connected to earth as per instructions given in section "Earthing" of these Specifications. The switchboard shall be tested and commissioned in the presence of the Engineer.

The LT Switchboards shall be tested before energizing as per instructions contained in article "Testing" of General Specifications for Electrical Works, Section-8001 of these Specifications.

6.0 MEASUREMENT AND PAYMENT

6.1 General

The Contractor's bid amount against Bill of Quantities item as given below shall include design, fabrication, supply, installation, testing, commissioning and completion for all works specified herein and as shown on the Bidding Drawings related to the item.

6.2 LT Switchboards

6.2.1 Measurement:

Measurement shall be made for the number of each LT Switchboards given in BOQ acceptably supplied and installed by the Contractor as a complete job.

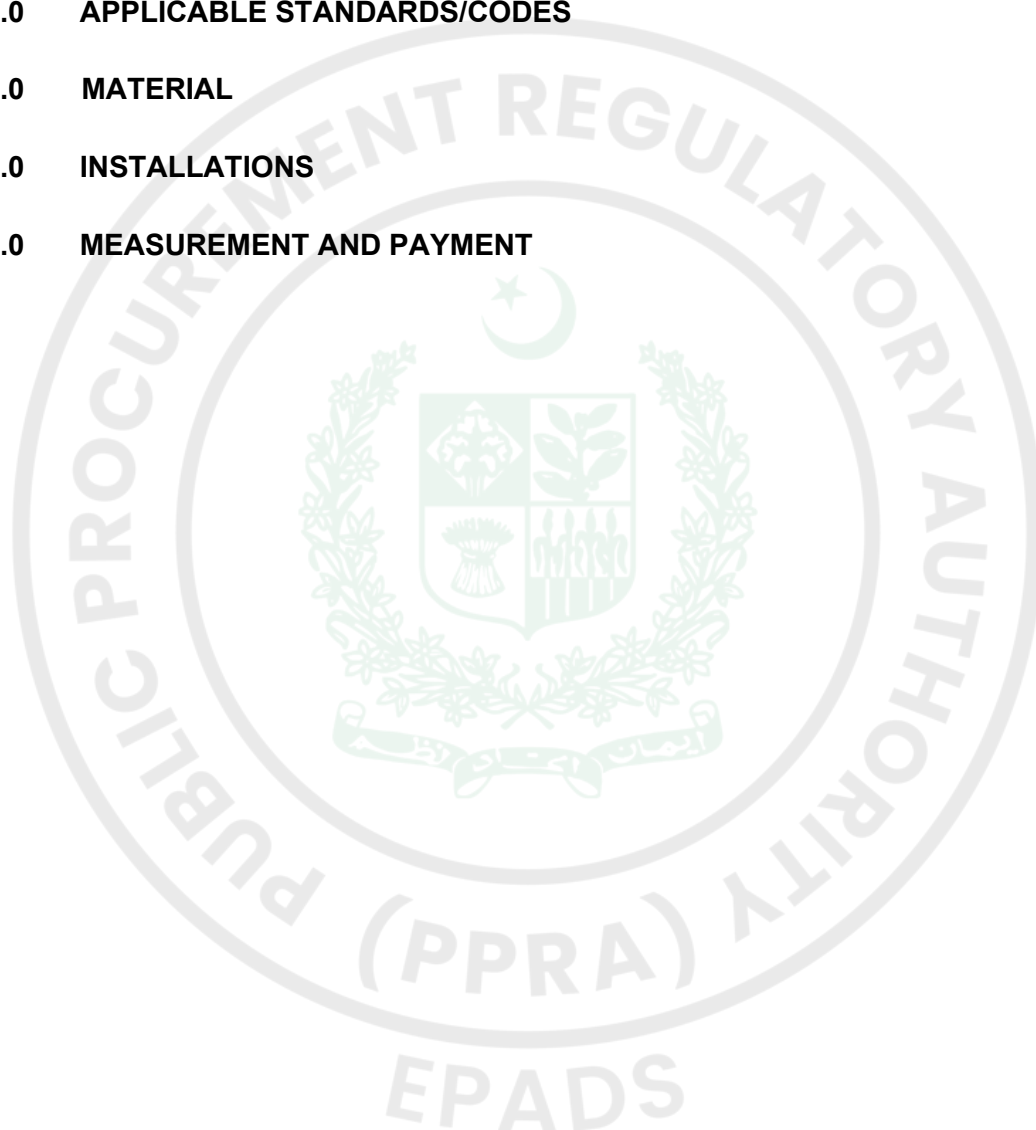
6.2.2 Payment:

Payment shall be made for the total number of each type of job measured, as provided above, at the Contract unit price each and shall constitute full compensation for design, fabricating, supplying, installing, connecting, testing and commissioning of the LT Switchboards as per single line diagram shown on the drawing including Power Factor Improvement Plant (including complete control panel and power factor connection capacitor's

panel), all erecting material such as foundations bolts, supporting steel channels, nuts, washers, cable glands etc., complete with foundation and all related Civil works.

*** End of Section 8132***



SECTION – 8133**LT DISTRIBUTION BOARDS****1.0 SCOPE OF WORK****2.0 GENERAL****3.0 APPLICABLE STANDARDS/CODES****4.0 MATERIAL****5.0 INSTALLATIONS****6.0 MEASUREMENT AND PAYMENT**

1.0 SCOPE OF WORK

The work under this section consists of supplying, installing, testing, and commissioning of all material and services of the complete Low Tension (LT) Distribution Boards as specified herein and/or shown on the Bidding Drawings and stated in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and co-ordinate at site with other services for exact location and position of the each L.T. Distribution Board.

The Low Tension Distribution Board with accessories shall also comply with the General Specifications for Electrical Works, Section - 8001 and with other relevant provisions of the Bidding Document.

2.0 GENERAL

The Low Tension Distribution Board (DB) shall be sheet steel fabricated suitable for surface/recessed mounting on wall or floor standing totally enclosed, dust tight and vermin proof. It shall be complete in all respect with material and accessories, factory assembled and finished according to the Specifications and to the normal requirements. The LT Distribution Board shall have protection class IP-20 for indoor installation, class IP-42 for indoor damp areas and class IP-54 for outdoor area.

The Low Tension Distribution Board shall be front operation type and shall:

- have a rated service short circuit breaking capacity (Ics), conforming to IEC 60947-2 and as shown on the drawings.
- be provided with adequate clearance from live parts so that the flashovers can not be caused by switching, vermin, pests etc.
- be suitable for 400 Volts, 3 phase 4 wire, 50 Hz system.
- be designed for flush mounting of all instruments on the front side.
- have incoming and outgoing cable termination arrangement, terminal block/line up terminals.
- be provided with stainless steel name plate on the front side of door.
- have all incoming and outgoing connections from top or bottom as per requirement of site conditions.
- have door grounded by flexible copper strip/cable.
- have wiring diagram in the pocket inside the door of Distribution Board

3.0 APPLICABLE STANDARDS/CODES

The latest editions of the following standards and codes shall be applicable for the materials specified within the scope for this section:

IEC 60051	-	Direct setting electrical measuring instruments
IEC 60073	-	Colours for indicator lights and push buttons
IEC 60947-2	-	Low voltage switchgear and control gear
IEC 60439	-	Low Voltage Switchgear and Control gear Assemblies.
BS 4752	-	Circuit Breaker
BS 3871	-	Miniature & Moulded Case Circuit Breakers
BS 88	-	HRC fuses
BS 89/90	-	Ammeters and Voltmeters
BS 3938	-	Low voltage current transformers
BS 1432	-	Bus Bars

4.0 MATERIAL

4.1 Sheet Metal Work

The Low Tension Distribution Board (DB) shall be fabricated with 16 SWG/14SWG sheet steel recess / surface mounting as approved by the Engineer. All the components shall be installed on a common component mounting plate inside the enclosure and protected from the front with screwed sheet steel front plate. The enclosure shall be provided with rubber gasketing and a lockable hinged door with cam fastener.

The distribution board shall be supplied complete with all installation materials as recommended by the manufacturer. The incoming and outgoing cable connections shall be according to the wiring requirements. If required, an adapter box for accommodating the cables and conduits may be provided. The box shall be of the same material and finish as the DB. All holes, cut-out etc. shall be tool and free from burrs and rough edges.

The cabling inside the DB shall be suitably harnessed by means of straps or cords. Colour sleeves shall be provided on each cable lugs connected to the bus bars, circuit breakers or terminals for phase identification. An

earth bar shall be provided for connection of incoming and outgoing earth conductors. The earth bar shall be permanently connected to the body of DB at two points. Flexible copper strip shall be provided for earthing of the door of DB.

Circuit numbers/ designation on all circuits shall be conspicuously marked to facilitate connection and maintenance.

All metal work of the DB shall be cleaned down to bare shining metal phosphated and the surfaces chemically prepared for powder coating. Then these shall be coated with powder of colour RAL 7032 and then baked in oven. The thickness of powder coating shall not be less than 120 microns.

4.2 Components

The Low Tension Distribution Boards (DB) shall be provided with components as specified, as shown on the Bidding Drawings and required for the satisfactory operation of the distribution board and of the electrical system.

Typical component specifications are given below:

4.2.1 Bus Bars

The Bus bars shall be made of 99.99% pure high conductivity electrolytic tinned copper and shall be completely isolated and mechanically braced for the specified fault level. The identification of bus bars shall be by providing colours sleeves on bus bar ends and these shall be red, yellow and blue for phases and black for neutral. The earth bus bar shall be green.

The bus bars shall be for three phase, neutral and earth and shall be of appropriate size to meet the electrical and mechanical requirements of the system. The temperature rise shall not exceed 30°C at rated current.

4.2.2 Moulded Case Circuit Breaker (MCCB)

The MCCBs shall be moulded case triple pole 440 Volts or single/double pole 250 Volts of current ratings as shown on the drawings. These shall have fixed magnetic short circuit and adjustable/fixed thermal overload protection.

Under voltage and shunt trip etc. shall also be provided when so required for safe operation and interlock.

The MCCBs shall be installed such that their switching levers are

accessible through the front plate for operation.

The single and triple pole MCCBs shall have short circuit rupturing capacity suitable for the distribution system as approved by the Engineer or as shown on the drawings. The MCCBs shall be suitable for working on lighting and power circuits.

4.2.3 Ammeters and Voltmeters

All meters shall be flush mounting, moving iron, spring controlled. The front dimensions shall be 96 x 96 mm for meters.

The meters shall be of accuracy class 1.5 according to BS-89 and 90. The ammeter shall be suitable for connection to 5 Amps secondary of current transformers or directly through shunt as shown on drawings. The ammeters and voltmeters shall have measuring range as indicated on the drawings.

4.2.4 Current Transformers

Air cooled, ring type current transformers shall be provided having transformation ratio as indicated on the drawings. The current transformers shall be of suitable burden having accuracy class 1.0 according to BS 3938. The current transformers shall have 5 amps secondary.

4.2.5 Selector Switches

The ammeter and voltmeter selector switches shall be complete with front plate, grip handle, R-Y-B and OFF position for ammeters, and RY-YB-BR-RN-YN-BN and OFF position for voltmeters shall be marked on the respective selector switches.

4.2.6 Air Break Contactors

The contactors shall be air break, triple pole 400 VAC type and suitable for the type of duty (at least utilization Category AC3) to be performed. The main contacts shall be silver tipped, butt type with double break per pole. Each contactor shall be provided with single phase 230 VAC operating coil and minimum one spare normally open and one normally closed auxiliary contact. The number of working auxiliary contacts shall be provided according to the system requirements.

4.2.7 Push Buttons

The push buttons shall be illuminated, momentary make/break

contact type or latch type (push-on/push-off) as required and approved by the Engineer and suitable for flush mounting. The push button for ON and OFF switching shall be red and green respectively. They shall be provided as shown on the drawing.

4.2.8 Indicating Lamps

Indicating lamps shall be LED type suitable for flush mounting, complete with base. They shall be suitable for operation on 230 V AC and it shall have rosettes of suitable colours as approved by the Engineer. These shall be provided for R, Y, B phases on each distribution board.

4.2.9 Impulse Relay

Impulse Relay shall be 1 or 2 pole, 250 V rated and be provided with latching mechanism.

4.2.10 Line up Terminals

Line up terminals wherever provided for control or power circuits shall be suitable for voltage and size of conductors as indicated on drawing.

The line-up terminals for controls shall be suitable for channel mounting. All necessary accessories such as end plates, fixing clips, transparent label holder caps and label sheets with marking shall be provided.

5.0 **INSTALLATION**

The location of low tension distribution boards (DB) are shown diagrammatically on the drawings. The actual location shall be determined at site, keeping in view the site conditions and in co-ordination with other equipment, as approved by the Engineer.

Low tension distribution board for recessed mounting in wall shall be installed such that the door shall finish flush with the surface of wall. The recess mounted distribution board shall be installed before the plastering of walls. The DB shall be protected to avoid any damage due to the civil work. Any cuttings, dismantling of the existing wall required for fixing the DB shall be coordinated at site with the approval of Engineer. Any damage done to civil structure shall be made good by the Contractor.

All loose parts dispatched separately with the DB shall be installed as per manufacturer instructions and all adjustments or setting shall be made as required. All screws, nuts and bolts used for fixing the distribution board shall be

galvanized.

The distribution boards' installation shall include connecting all incoming and outgoing cables. The cable entry in the boards shall be provided from top or bottom as required and/or as approved by the Engineer.

The distribution boards shall be tested as per instructions contained in article "Testing" of General Specifications for Electrical Works, Section-8001 of these Specifications.

6.0 MEASUREMENT AND PAYMENT

6.1 General

The Contractor's bid amount against each item of Bill of Quantities as given below shall include design, fabrication, supply, installation, testing, commissioning and completion for all works specified herein and/or as shown on the Bidding Drawings related to the item.

6.2 LT Distribution Boards (DBs)

6.2.1 Measurement:

Measurement shall be made for the number of each LT Distribution Board acceptably supplied and installed by the Contractor as a complete job.

6.2.2 Payment:

Payment shall be made for the number of jobs measured, as provided above, at the Contract unit price each and shall constitute full compensation for design, fabricating, supplying, installing, connecting, testing and commissioning of the LT Distribution Boards, including fixing arrangement, adapter box and other components/accessories for complete installation.

*** End of Section 8133 ***

SECTION – 8150**LIGHT FIXTURES****1.0 SCOPE OF WORK****2.0 GENERAL****3.0 APPLICABLE STANDARDS/CODES****4.0 MATERIAL****5.0 INSTALLATIONS****6.0 MEASUREMENT AND PAYMENT**

1.0 SCOPE OF WORK

The work under this section consists of supplying, installing, testing and commissioning of all material and accessories of the complete Light fixtures as specified herein and/or shown on the Tender drawings and given in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and co-ordinate at Site with other services for exact locations and positions of the light fixtures.

The lighting fixtures with accessories shall also comply with the General Specifications for Electrical Works, Section-8001 and with other relevant provisions of the Tender Document.

2.0 GENERAL

The description of light fixtures is given in the bill of quantities, and stated on the drawings, and all relevant material is described in this Section. The determination of quality is based on certified photo-metric data covering the coefficient of utilisation, light distribution curves, construction material, shape, finish, operation, etc.

The Contractor shall submit at least two samples of each and every light fixture specified and obtain approval of the Engineer before purchasing. The quality and finishes of the local make light fixtures (if mentioned in BOQ) shall be same as that of standard manufacturer. The accessories such as ballast, LED drivers, lamps, ignitors, etc., for all type of light fixtures shall be of make as stated in list of approved manufacturers. Approved equivalent against those specified will be accepted if the specified one is/will not be available. For any substitution the Engineer's approval is necessary.

All fixtures shall be finished in standard colour schemes as mentioned in the manufacturer's catalogue for respective fixtures, unless specifically stated in the Specifications, Drawings or Bill of Quantities or directed by the Engineer.

3.0 APPLICABLE STANDARDS/CODES

The latest editions of the following standards/codes shall be applicable to the material specified within the scope of this section:

IEC 60598-2-1-	Particular requirement- Fixed general purpose luminaire
IEC 60598-2-2-	Electrical Insulation Class I
IEC 62471 -	Photo biological Safety of lamps and lamps system
IEC 62031 -	LED modules for general lighting – Safety specifications

IESNA LM80	-	Testing report for LED Chips with TM21 extrapolation graph
IEC 61048 & 61049	-	Capacitors for use in TL, HP mercury and LP sodium vapour discharge lamp circuits.
IEC 60598 & BS EN 60598	-	Luminaires
BS 2560	-	Exit Signs
ISO 7010	-	Signs for the purposes of accident prevention, Fire protection, health hazard information and Emergency evacuation.

4.0 MATERIAL

4.1 LED Essential/Waterproof Batten Light Fixture:

The Contractor shall furnish and install the complete LED Batten luminaires replacement for complete single conventional 1x18W TL-D/1x36W TL-D & double 2x36W TL-D fluorescent batten. The batten light fixtures shall be of proper rating as shown on the drawings. The LED batten light fixture shall be 1200mm long for 36/28watts and 600mm long for 14watts respectively as specified.

The luminaire shall be cool white, with colour rendering and light colour of 840 characteristics. The luminaire shall have such distribution to achieve general lighting application parameters. The luminaire shall use high efficiency diffuser to achieve at least 50% energy savings compared to conventional fluorescent and waterproof light fixture. The luminaire shall offer a composite system efficiency of at least 100 Lumen/Watt for Essential LED batten and at least 100 Lumen/Watt for Waterproof LED batten having an average lumen package of up to:

3800 lumens ($\pm 5\%$) in 36W replacement for 2x36W waterproof TL-D Batten

2700 lumens ($\pm 5\%$) in 28W replacement for 2x36W fluorescent TL-D Batten

1350 lumens ($\pm 5\%$) in 14W replacement for 1x36W fluorescent TL-D Batten

The LED luminaire shall be designed for lumen maintenance of L70 or 70% at the end of useful life at ambient temperature of 25 deg. C. The complete luminaire shall have a useful life of 40,000 burning hours. The luminaire shall be suitable for ambient temperature range of between -20 to +40 degrees Celsius. Third party IEC 60598 Test Report shall be

measured/corrected for $T_a = 25$ degrees Celsius. The luminaire including the driver will include a warranty of at least 3 years against manufacturing defects.

The housing of Essential LED Batten light fixture will include integrated heat sink and optical system. The housing will be made of galvanized sheet having white Powder coated & suitable for indoor & semi-indoor environment. The optical cover made up of Polycarbonate with UV Protected Shielding cover. The fixing mechanism will be through clip made of Stainless steel. Appropriate size bushed wire entry holes, fixing holes, and earth terminal shall be provided. The driver shall be integrated within the luminaire.

The housing of Waterproof LED Batten light fixture will be made of Polycarbonate & extrusion process & suitable for outdoor environment. The optical cover made up of Polycarbonate with UV Protected Shielding cover. The product shall be protected against harsh industry environments IP65 rating for dust & water protection. The luminaire shall have no harmful effect against water projected from any direction. The luminaire shall have impact protection classified as IK07 operating temperature. The driver shall be integrated with the luminaire in a separate gear compartment with similar Index protection.

The internal wiring of LED batten light fixtures shall be done with heat resistant wires at the manufacturer's factory. The internal wiring shall be clipped properly and heat resistant sleeves be provided on cables passing near driver. Connectors suitable for connecting 2.5 sq.mm cable conductors shall be provided for supply connections. An earth terminal for connection to 2.5-sq.mm cable conductor shall be provided.

The light fixtures shall be furnished with Perspex diffusing panels "040 opal acrylic" (minimum sheet thickness 3mm) etc. as specified on the drawings or in BOQ. The luminaire shall have provision of both surface, Suspended mounting with dimension compatible to conventional florescent fixture. Mounting Clips for installation must be available.

IP degree of Protection shall comply with the requirements laid down in Section 8001. Standard luminaires with manufacturer's recommended modifications, such as additional gasket, etc., shall be provided to attain required protection level.

4.2 **LED Smart Panel Light Fixture:**

The Contractor shall furnish and install the complete LED Panel luminaires as replacement for complete double conventional 2x36W TL-D fluorescent light fixture. The Smart Panel shall be of proper rating as shown on the drawings. The LED Panel shall have dimensions of 297 x 1197 x 75mm/595 x 595 x 75mm for 36 watts respectively as specified.

The luminaire shall be cool white, with colour rendering and light colour of 840 characteristics. The LED shall have a colour consistency preferably within 5 SDCM (standard deviation of colour matching) as defined by McAdam. The colour temperature variation should be restricted as per ANSI C78.377A with CCT variation limiting within 500K for nominal CCT of 4000K / 6500K.

The luminaire shall offer a composite system efficiency of at least 110 Lumen/Watt and a lumen package of up to 3,800 lumens ($\pm 5\%$) in 36W replacement for 2x36W conventional TL-D fluorescent fixture. The luminaire shall use high efficiency diffuser and reflector to achieve at least 50% energy savings compared to conventional fluorescent light fixture.

The system should be designed for fully office lighting & possess higher uniformity to have a smooth white light of high colour consistency & high system efficiency. For the better UGR control one, the luminaire optics should fully comply with lighting norms with UGR value (Unified Glare Rating) < 25. The beam angle of the optic should be around 140°.

The LED luminaire shall be designed for lumen maintenance of L70 or 70% at the end of useful life at ambient temperature of 25 deg. C. The complete luminaire shall have a useful life of 50,000 burning hours. The luminaire shall be suitable for ambient temperature range of between -20 to +40 degrees Celsius. Third party IEC60598 Test Report shall be measured/corrected for $T_a = 25$ degrees Celsius. The luminaire including the driver will include a warranty of at least 3 years against manufacturing defects.

The housing will include integrated heat sink and optical system. The housing will be made of electrogalvanized cold rolled steel sheet, pre-treated, painted and stove enamelled in white colour & the fixture will be provided with a plastic cover that is aesthetical for the environment. The heat sink will design in such way to create better air-flow for better heat transfer. The light cover is made up of PMMA optics lens with PS diffuser & a suitable reflector for the best uniformity. Appropriate size bushed wire entry holes, fixing holes, and earth terminal shall be provided. The driver shall be integrated within the luminaire.

The internal wiring of LED batten light fixtures shall be done with heat resistant wires at the manufacturer's factory. The internal wiring shall be clipped properly and heat resistant sleeves be provided on cables passing near driver. Connectors suitable for connecting 2.5 sq.mm cable conductors shall be provided for supply connections. An earth terminal for connection to 2.5-sq.mm cable conductor shall be provided.

The luminaire shall have provision of recessed, surface or suspended mounting etc. as specified on the drawings or in BOQ with dimension

compatible to conventional florescent fixture. Mounting Clips for installation must be available. Shop drawings shall be submitted by contractor for approval of Engineer.

4.3 **LED Down Light Fixtures**

The Contractor shall furnish and install the surface mounted LED Downlight luminaires as replacement for single 1x18W or double conventional 2x18W PL-C incandescent/ compact fluorescent light fixture. The LED downlights shall be of proper rating as shown on the drawings. The LED Downlights shall have dimensions of 122/167/218mm dia. for 7/11.5/16 watts respectively as specified.

The luminaire shall be cool white, with colour rendering index greater than 80 and light colour of 840 characteristics. The Downlighter must be provided with a polycarbonate diffuser having high haze and light transmission for uniform light output. The beam angle must be in the ranges in between 95 to 100 degrees for better illumination.

The LED downlights shall have minimum system efficacy of at least 100 lm/W with 55% energy-saving as compared with conventional compact fluorescent lamp downlight fixtures and shall have a useful life of 50,000 burning hours for 70% lumen maintenance at the end of useful life at ambient temperature of 25 deg. C.

The downlighter shall have high reflectance white painted polycarbonate front element or High purity aluminium with high reflectance coated reflector along with tempered glass on the front cover. The housing will include integrated heat sink and optical system. The heat sink made with Die Cast Aluminum should be design in such way to create better air-flow for better heat transfer as furnished by the manufacturer or as specified in the drawings or BOQ. The fixing mechanism of recessed down light will be through spring fasteners.

Where surface mounted downlights are used, the housing will be made of Plastic and enclosed in white powder coated die-cast aluminium body for surface mounting installation. The body shall have fins as heat sink.

The types of fixtures with manufacturer's catalogue reference are given on the fixture schedule and in bill of quantities. Equivalent fixture may be acceptable provided that the contractor submits for review all necessary data indicating photometric curves to show that the fixture proposed are of the same type, construction and quality.

4.4 **Compact Fluorescent Light Fixtures**

The compact fluorescent light fixtures shall be as stated on drawings and bill of quantities. The light fixture shall be finished in standard colours

unless otherwise stated on drawings or directed by Engineer. All compact fluorescent light fixtures shall be of international standard and quality.

The lamps for compact fluorescent light fixtures shall be CFL type with normal or electronic control gear and shall be supplied and installed according to the wattage/type as indicated on drawings.

Weatherproof bulkhead incandescent/compact fluorescent light fixture shall comprise of plastic body and gasketed clear glass cover secured to the body by means of wing nuts/screws to give a weatherproof and watertight fit. The gasket shall be weather resistance type. The lamp holder shall be of bi-pin brass having porcelain outer ring or 2/4-pin base for compact fluorescent lamps with normal control gear as per requirements.

The glass shade of the light fixtures shall be opal white or clear as furnished by the manufacturer with the light fixture unless specified and free from any air bubbles or voids. The shade may be spherical, cylindrical, flattened bottom or any other shape as specified in the drawings or BOQ.

4.5 Exit Sign – Emergency Light Fixture

The exit sign emergency light fixture shall be maintained type with self contained, polycarbonate body, Gear Type and sealed nickel metal hydride batteries providing a backup of at least 3 hours if not mentioned otherwise elsewhere. The light fixture shall have steel body powder coated in perma white finish, complete with screen printed acrylic legend panel. 2 X High Power 1W LED lamp and give 20 m route space. Legend panel shall be bottom entry for case of installation near walls. The legend pictogram shall be green colour and as approved by the Engineer.

4.6 LED Flood Light Fixture

The Contractor shall furnish and install the complete Boundary Wall luminaires maintaining avg. 30 lux for existing outdoor mixed traffic area, fully IP 66 with corrosion resistant die cast aluminum housing, silicon gas kit, thermally hardened glass complete with LED drivers, surge protection and all accessories/ components required for the proper operation of the system. The luminaries shall be fully flexible for future upgrades and easy replacements for maintenance purposes.

The luminaire shall have such distribution to achieve flood lighting application parameters. The luminaire shall offer a composite system efficiency of at least 100 Lumen/Watt and a lumen package of up to 13,000 for 120W+/-5W. The light fixture has three different optical beam angles Symmetric Wide Beam & Asymmetric Medium Beam & Narrow Beam optics according to application.

The LED light fixture should be designed for lumen maintenance of L70 or 70% at the end of useful life at ambient temperature of 45 °C and shall be capable to operate efficiently within the temperature limit of -40 °C to 50 °C. The complete light fixture should have useful life of 50,000 burning hours.

4.7 High Pressure Sodium Lamp

The high-pressure sodium SON-T plus lamp shall be of increased output tubular of rating 70 Watt and 400 watt as shown on the drawings. The base of the lamp shall be E40 with 6600 and 55,000 lumens output for 70 Watt and 400 Watt lamps respectively. The colour-rendering index Ra shall be 23. These lamps shall comply with EN60662.

4.8 Ballast for High Pressure Sodium Lamps

The ballast for high pressure Sodium lamps shall be polyester resin filled, totally encapsulated electromagnetic of copper / iron construction with leak proof body for use in combination with an external ignitor. The ballast shall fully comply with international Standards on Safety and performance, design compliance to IEC 60922/60923. The ballast shall be suitable for application in luminaires or poles under normal humid conditions. The ballast shall conform to the characteristics and wattage of the lamps. The wattage of lamp and ballast and a wiring diagram and other relevant data shall be printed on the body of the ballast. The power loss of the ballast shall not be more than 13.5-Watts for 70-Watts lamp and 28-Watts for 400-Watts lamp. The ballast shall be provided with insulated block of terminals for connecting up to 6 sq.mm cable with separate earth terminal.

4.9 Electronic Ignitors for High Pressure Sodium Lamps

The electronic ignitors for high-pressure sodium lamps shall be compact and light in weight with reliable and smooth starting behaviour. The ignitors shall be suitable for specified wattage of high-pressure sodium lamps and other requirements. The ignitors shall fully comply with IEC 60662 and EN 60926 regulations. The ignitors shall be provided with screw terminal / blocks and simple stud or screw mounting arrangement.

4.10 Capacitors for High Pressure Sodium Lamps

The capacitors for use in combination with high-pressure sodium lamp circuits shall be high-quality electrolytic capacitors for correction of power factor. The capacitors shall be of appropriate rating and type for the relevant lamp wattage. All capacitors shall be fitted with an internal discharge resistor, have a fuse fitted and be of self-healing type. Capacitor shall conform to IEC 61048/61049.

4.11 Flood Light Lanterns

The flood light lanterns shall have lamps of ratings specified in BOQ/ Drawings and shall be fully equipped with high grade reflector, corrosion proof housing with integral gear box, (Double insulation Class-II), compensated electrical control gear etc. complete with all internal wiring.

The flood light lanterns shall have non-corrosive, injection moulded, heat and UV-stabilized body, hammered aluminium reflector brightened and anodised, thermally – hardened 5 mm minimum glass, stainless steel snap-on hinged-clips, stainless steel protractor, hot dipped galvanized steel mounting brackets and stainless steel fixing accessories.

The housing shall be dust proof and jet proof to IP66, such that no internal cleaning shall be required.

4.12 LED Street Light Fixture

The road light fixture shall be an attractive modern appearance, high performance lantern suitable for 90W or 200W LED lamp as given in the BOQ/drawing.

Light fixture shall be provided with solid die cast aluminium housing, heat resistant silicon rubber gasket in optical LED compartment, DME type optic, tampered glass cover and shall be coated with powder of colour RAL 7040 ensuring no discoloration when exposed to UV light.

The light fixture shall be designed to receive power either from the battery or from the AC source. The light fixture shall have the following characteristics:

Voltage	=	220-240 VAC
Surge Protector	=	10 kV
Power Factor	>	0.9 (nominal power)

The light fixture shall have IP 66 protection to ensure long reliable performance and minimize maintenance requirement and an Impact resistance of IK 08 with insulation Class I. Use of chemical glue shall NOT be allowed to avoid probable breakdown of water-proof and dust-proof seal.

The light fixture should have a minimum color rendering index (Ra) of 70 + 5 and a color temperature of 4000K for maximum efficacy with an average output of at least 10,000 lumens for 90 Watt and 22,000 lumens for 200 Watt LED Fixture. The LED should have a color consistency within 5 SDCM (Standard Deviation of Color Matching). The color temperature variation of the LEDs should be restricted as per ANSI

C78.377A with CCT variation limiting within 500K for nominal CCT of 4000K.

The LED light fixture should be designed for lumen maintenance of L70 or 70% at the end of useful life at ambient temperature of 45 °C and shall be capable to operate efficiently within the temperature limit of -40 °C to 55 °C. The complete light fixture should have useful life of 50,000 burning hours.

The light fixture shall be fully compatible with future LED upgrades when they become available. It shall have a modular design to upgrade / replace with new LED modules or LED drivers at site conveniently with minimum effort. All electronic components/drivers shall be mounted on a separate removable gear tray. Light fixture housing shall have a tool less access by opening the cover.

The proposed LED road lighting light fixture shall be provided with in-built surge protection system to protect the electronic driver and LED system. Minimum surge protection rating is 10kV.

The housing shell, under the circuit board, shall be specially designed to ensure perfect contact between the circuit board and the light fixture housing for efficient heat dissipation. Only Metal Core PCBs shall be used to maximize heat transfer process and to offer reinforced electrical insulation via di-electric layer. The Metal Core PCB should be mounted on the housing using a highly efficient thermal interface material.

The optical LED compartment shall have a thermally hardened glass cover and high quality silicon gasket. The Glass cover will be tightly secured with the housing. The light fixture should have flexible optical system to achieve lighting parameters for required class of roads. The light fixture should offer a composite system efficiency of at least 100 lumen/Watt.

Specially designed lens system with unique inner and outer profile for high efficiency LED shall be provided to ensure maximum spacing between the poles and cover higher road widths. Multi layer optics design to ensure adequate luminance and luminance uniformity in the unlikely event of individual LED failure. The light fixture should offer choice of narrow, medium and wide beam light distribution.

The lamp position shall be adjustable to at least three positions to facilitate the changing of photometric distributions.. The photometric data of the lantern shall be authenticated by an Internationally Accredited Lighting Organisation.

Luminance level calculation with average luminance of the road surface, overall uniformity of road luminance, threshold increment, longitudinal

uniformity of road surface luminance and surround ratio achieved shall be submitted by the Contractor / manufacturer for verifying conformance to international lighting standards and approval of the Engineer.

4.13 LED Chips and Driver

The LED chip shall be from Cree / Nichia / Lumileds make or approved equivalent. The LED driver shall be designed to operate large array of high power LED's through current controlled output. The driver shall be suitable for operate up to 250VAC 50/60Hz mains supply. The LED driver shall have an efficiency of at least 90%. Fixed Output LED Driver (PSU) shall be integrated within each LED luminaire. The Driver compartment cavity and gear tray shall be designed with tool-less access for maintenance and replacement.

The light fixtures including the driver will include a warranty of at least 3 years against manufacturing defects. The cost of such provision will deemed to have been respective BOQ item of light fixture and no separate payment shall be admissible in this regard.

The LED driver shall fully conform to following specifications:-

- 1) BS-EN 61347-1 - General and safety requirements.
- 2) BS-EN 61347-2-13 - Particular requirements for DC or AC supplied electronic control gear for LED modules.
- 3) BS EN 55015: 2013 – Emission – Electrical lighting and similar equipment
- 4) BS EN 61547: 2009 – Immunity – Equipment for general lighting purpose
- 5) BS EN 61000-3-2: 2009 – Limits for harmonic currents emissions.
- 6) BS EN 61000-3-3: 2008 – Limits for voltage fluctuation and flicker.
- 7) BS EN 62493 – Assessment of lighting equipment related to human exposure to electromagnetic fields

5.0 INSTALLATION

5.1 General

The mounting heights of light fixtures are indicated on the drawings, and positions of fixtures are according to the mentioned scale.

The Contractor must ensure that the light fixtures are installed uniformly with respect to the dimensions of the area. Any modifications due to site conditions may be made with the approval of Engineer. All fixtures shall be carefully aligned before fixing in position.

The wiring between ceiling rose or terminal box and the fixture shall be carried out with 3-core 1.0 sq.mm and 1.5-sq.mm flexible copper

conductor PVC/PVC cable respectively for circuits protected by 10 amps and 15/20 amps MCBs. The wiring inside light fixture body shall be done with heat resistant cables or PVC insulated cable in heat resistant sleeves as approved by the Engineer.

Glasses, shades, reflectors, diffusers, etc., must be in a clear condition after installation. All light fixtures shall be earthed by an earth wire connected to the earth terminal in the fixture.

5.2 **Street Light / Flood Light Fixture**

The proposed street light fixture / flood light fixture shall be installed on the light pole/mast as per manufacturer's installation instructions. The road light fixture shall be properly levelled and the lamp adjusted to the appropriate position and all screws, bolts checked for tightness, etc. The light fixture shall be connected to the supply and earth at the proper terminals in the fixture.

5.3 **Flood Light Lanterns**

The flood light lanterns shall be installed on truss/G.I. bracket as per details shown on the drawing. Manufacturer's installation instructions shall be followed. The G.I. bracket shall be installed on column as shown on drawing. The exact location, rating and tilt/pan angles of light fixtures shall be finalized at site to suit the flood lighting requirements. Engineer's decision will be binding and final.

5.4 **LED Batten / Panel Light Fixture:**

LED Batten or Panel light fixtures on the surface of ceiling shall be installed with the back of the body flush with the ceiling surface, and in a manner so as to facilitate wiring. Nylon plugs and galvanized steel bolts or screws shall be used for fixing the light fixture to the ceiling. For light fixtures installation on false ceiling the installation method/detail shall be coordinated with ceiling design and submitted for approval of Engineer. Care shall be taken to prevent the weight of the fixture from being transferred to the false ceiling.

Pendant light fixtures shall have two holes in the top of each casing for supporting to the ceiling by a 3/4" dia. galvanized pipe or any other standard method as approved by the Engineer. Wiring from ceiling rose to the fixture shall be done through the pipe. Proper arrangements such as long threads with check nuts, etc. for minor adjustment in the mounting heights of the fixtures shall also be provided.

5.5 **LED Down Light Fixture**

LED downlight fixtures shall be installed on the surface of ceiling or wall by means of nylon plugs and galvanized steel screws, such that their

back finish flush with the surface for exposed conduits and flush with outlet box for concealed conduit system. Wherever convenient, screws for fixing light fixtures shall be screwed into the holes of the outlet box. The lights on false ceiling shall be installed in a manner as described for LED Panel light fixture.

6.0 MEASUREMENT AND PAYMENT

6.1 General

The Contractor's bid amount against each Bill of Quantities item as given below shall include supply, installation, testing, commissioning and completion for all work specified herein and/or shown on the Bidding Drawings related to the item.

6.2 LED Batten / LED Smart Panel / LED Downlight / LED Exit Light / CFL Bulkhead / LED or Conventional Flood Light/ LED Street Light Fixture

The Contractor's bid amount against each Bill of Quantities item as given below shall include supply, installation, testing, commissioning and completion for all work specified herein and/or shown on the Bidding Drawings related to the item.

6.2.1 Measurement

Measurement shall be made for each type of light fixture including all accessories acceptably supplied and installed by the Contractor as complete unit.

6.2.2 Payment

Payment shall be made for the number of units measured as provided above at the contract unit price each and constitute full compensation for supplying, installing, connecting, testing and completion of LED Battens / LED Smart Panel / LED Downlight / LED Exit Sign / compact fluorescent Bulkhead including all accessories such as capacitors , LED drivers, LED Chips, LED optics, connecting cables & connectors, suspension rods and pendent arrangement, GI pipe bracket, ceiling supports, internal wiring, nuts, bolts, screws, etc., as required and complete in all respects.

6.3 High Pressure Sodium Flood Light/ LED Flood Light / LED Street Light Fixture

The Contractor's bid amount against each Bill of Quantities item as given below shall include supply, installation, testing,

commissioning and completion for all work specified herein and/or shown on the Bidding Drawings related to the item.

6.3.1 Measurement

Measurement shall be made for each type of light fixture including all accessories acceptably supplied and installed by the Contractor as complete unit.

6.3.2 Payment

Payment shall be made for the number of units measured as provided above at the contract unit price each and constitute full compensation for supplying, installing, connecting, testing and completion of High Pressure Sodium Flood Light / LED Flood Light Fixtures/ LED Street lights including all accessories such as ballasts, capacitors, igniters, LED drivers, nuts, bolts, screws, etc., including PVC pipe, foundation etc., as required and complete in all respects.

*** End of Section 8150***

SECTION – 8212**LOW TENSION CABLES****1.0 SCOPE OF WORK****2.0 GENERAL****3.0 APPLICABLE STANDARDS/CODES****4.0 MATERIAL****5.0 INSTALLATIONS****6.0 MEASUREMENT AND PAYMENT**

1.0 SCOPE OF WORK

The work under this section consists of supplying, installing, testing and commissioning of all material and services of low tension (LT) cables and the accessories as specified herein or as shown on the Bidding Drawings and stated in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and coordinate at site with other services for exact route, location and position of the L.T. cables.

The LT cables with accessories shall also comply with the General Specifications for Electrical Works, Section-8001 and with other relevant provisions of the Bidding Document.

2.0 GENERAL

All multi-core and single core PVC insulated and sheathed cables LSZH for light circuits, socket outlets and circuits operating upto 250 volts shall be 300/500 volts grade. All single core PVC insulated, non-sheathed cables shall be of 450/750-volt grade. Power cables for main feeders, main to sub main feeders, power equipment, etc., armoured or unarmoured shall be of 600/1000 volt grade/XLPE. Armouring of multi-core/ single core cables shall be done with appropriate size galvanized steel/aluminium wire as per relevant codes.

The conductors shall be stranded high conductivity, soft annealed copper. Conductors of single core cables shall be circular, whereas of multi-core cables may be circular or shaped according to standard practices and codes. The PVC insulation, bedding and overall sheath shall be of extruded PVC compound having good flexibility, resistance to ageing and ability to withstand deformation at high temperatures. Non-hygroscopic filler shall be provided in multicore cable to fill empty gaps between the cores to make the cable a smooth round finish. In all shaped cables a non-hygroscopic high strength binding tape shall be provided on the core assembly. All cables shall be treated for vermin proofing and be protected against rodents during storage, laying and all protective pipe/sleeves shall be plugged to attain the same after installation.

Embossed marking on the oversheath at 3 meters intervals shall give the following information:

- name of Manufacturer
- year of Manufacture
- No. of cores and size of cable in sq.mm.
- voltage grade
- type of cable i.e. Cu./PVC/SWA/PVC

3.0 APPLICABLE STANDARDS/CODES

The latest editions of the following standards and codes shall be applicable for the materials specified within the scope of this section:

- BS 6004 - Electric cables PVC insulated, non armoured cables for voltages upto and including 450/750 volts for electric power, lighting and internal wiring
- BS 6346 - Electric cables PVC insulated, armoured cables for voltages of 600/1000 V and 1900/3300 V
- BS 6746 - PVC insulation for electrical cables
- BS 60228 - Copper conductors of insulated cables
- BS 6500 - Insulated flexible cords
- BS 7846 - Electric cables 600/1000 V armoured fire resistant cables having thermosetting insulation and low emission of smoke and corrosive gases when affected by fire
- BS 7889 - Electric cables. Thermosetting insulated, unarmoured cables for a voltage of 600/1000 V
- BS EN 50266 - Common test methods for cables under fire conditions

4.0 MATERIAL

4.1 General

The power, lighting and control cables shall be furnished and installed in accordance with the routes and requirements shown on the drawings.

All cables shall have phase identification colours on insulation of each core. The colour code for three phase circuits shall be red, yellow and blue for phase conductors and black for neutral conductor. Where insulated earth conductor is installed, it shall have green or green-yellow colour insulation.

Single-phase circuits shall have insulation of red colour for phase/line, black colour for neutral and green or green-yellow colour for earth conductor. All DC circuits shall have insulation of white colour for positive, black colour for negative and green or green-yellow colour for earth conductor.

The ends of each length of multi-core armoured or unarmoured cables shall be properly marked for clock-wise and anti clock-wise sequence of core colours.

4.2 Cables for Conduit or Channel Wiring

All cables/wiring in concealed or surface mounted PVC conduits or in covered channel shall be single core PVC insulated LSZH of specified grade and size, unless specifically shown on the drawings or given in BOQ.

The contractor shall wire all power receptacles/points from the panels using copper stranded conductor having proper insulation and PVC sheathing. Under no circumstances shall wire pulling compound be used when pulling the wire for isolated circuits. All wiring shall be color-coded in accordance with applicable standards.

4.3 Cables on surface/concrete trenches/cable trays

Cables for distribution system to be installed on surface, in cable ducts, in concrete trenches or on trays shall be single or multi-core PVC insulated and PVC sheathed of specified voltage grade and size, unless specifically shown on the drawings or given in BOQ.

4.4 Cable Accessories

All cable accessories shall be provided for the complete cabling and wiring system without any additional cost unless specifically mentioned in BOQ. These shall include but not limited to the items such as saddles, clamps, fixing channels, connectors, cable joints (where necessary and as approved by the Engineer), clips, lugs, colour sleeves, identification tags, bushes, glands, etc.

5.0 INSTALLATION

5.1 General

All installation material, labour, tools, cable rollers and accessories for cable installation shall be furnished by the Contractor. The cable and accessories shall be installed as described in accordance with these Specifications, drawings and manufacturer's instructions.

The Contractor shall confirm the exact cut lengths for cable by actual measurements at site prior to the ordering. The cable lengths where shown on the drawings or in BOQ are tentative and only for general guidance. The Contractor shall be solely responsible for furnishing

correct lengths of cable to avoid joints in cable length except where necessary, after obtaining approval of the Engineer.

No separate payment for such joints is admissible.

Necessary precautions for safety of cables shall be taken during the laying of cables to avoid scratches/ cuts to the cable surface. Pulling force on cable at all times shall remain well within the manufacturer's recommended limits.

Prior to installation of jointing and termination kits, the cable lengths shall be checked and tested to ensure that the cables are in sound condition, and no damage has been done during handling and installation. After installation, these shall again be tested prior to commissioning as per recommendations of the standards according to which the cable is manufactured.

5.2 Conduit or Channel Wiring

The wiring through conduit shall be started only after the conduit and channel system is completely installed and all outlet boxes, junction boxes, etc., are fixed in position.

The wires shall be pulled in conduit or channel with care, preferably without the use of any lubricant. Where necessary and if approved by the Engineer, the cable manufacturer's recommended lubricant may be used. Where several wires are to be installed in the same conduit, they shall be pulled together along with the earth conductor. All wires of same circuit shall be run in one conduit.

The wires shall not be bent to a radius less than ten times the overall diameter of the wire, if otherwise recommended by the manufacturer.

The wiring shall be continuous between terminations and looping-in system shall be followed throughout. Any joint in wires shall not be allowed. The use of connectors shall only be allowed at locations where looping-in is rendered difficult. The consent of the Engineer shall be required for using connectors. The connector shall be of suitable rating having porcelain body with sunk-in screw terminals. The connector shall be wrapped with PVC insulation tape after its installation. A minimum of 150 mm extra length of cable/wire shall be provided at each termination to facilitate repairs in future.

5.3 Cables on Surface/Trenches/Cable Trays

All cables for installation on surface of wall, column, ceiling, trenches, etc., shall be fixed to the surface by means of galvanized steel clips secured to a steel channel using suitable stud plate, nuts and washers. The distance between each cable clip shall be such so as to support the

entire weight of the cable and that distance between the cable & surface and also the vertical clearance between two adjacent cables at any point is 50mm minimum. Common mounting channels are to be furnished for cable along the same route. The Contractor can offer alternate cable fixing arrangement, which shall be approved by the Engineer before commencement of installation.

6.0 MEASUREMENT AND PAYMENT

6.1 General

The Contractor's bid amount against each Bill of Quantities item as given below shall include supply, installation, testing, commissioning and completion for all work specified herein and/or as shown on the Bidding Drawing related to the item.

6.2 Light Circuit Wiring

6.2.1 Measurement

Measurement shall be made for the total number of light circuit wiring from LT distribution board to point/switch/push button including wiring between switches/push buttons on the same circuit, acceptably carried out by the Contractor as a complete unit.

6.2.2 Payment

Payment shall be made for the total number of units measured, as provided above, at the Contract unit price each and shall constitute full compensation for supplying, installing, connecting, testing, commissioning and completion of the circuit wiring from the LT distribution board to point/switch/push button including wiring between switches/push buttons on the same circuit complete with specified type of surface mounted/concealed conduit, (PVC or steel) required No. specified size single core PVC insulated cable, earth continuity conductor, accessories, etc.

6.3 Wiring of Light/Fan Point (Point to Switch/ Impulse Relay, Point to Point, or Group Controlled Light Points)

6.3.1 Measurement

Measurement shall be made for the total no. of wiring of light/fan points (point to switch, point to point, or group controlled light point), acceptably carried out by the Contractor as a complete unit.

6.3.2 Payment

Payment shall be made for the total number of units measured, as provided above, at the Contract unit price each, and shall constitute full compensation for supplying, installing, connecting, testing, commissioning and completion of the wiring between light point to switch/ impulse relay, point to point or group controlled points including required no. of specified size single core PVC insulated cable, specified type of surface mounted/concealed conduit (PVC or Steel), earth continuity conductor, flexible cable, ceiling rose, one way or two way 10A light control switch, sheet steel box and other accessories, etc.

6.4 **Wiring of Power Circuits (Distributor to socket outlets & between sockets)**

6.4.1 Measurement

Measurement shall be made for the total number of each type of wiring acceptably carried out by the Contractor as a complete unit.

6.4.2 Payment:

Payment shall be made for the total number of units measured, as provided above, at the Contract unit price each and shall constitute full compensation for supplying, installing, connecting, testing, commissioning and completion of wiring of socket outlets etc. from distributor to sockets or between sockets with specified size and number of single core PVC cables LSZH cables including specified type of surface mounted / concealed conduit (PVC or Steel), ECC and all other accessories etc.

6.5 **LT Cables**

6.5.1 Measurement:

Measurement shall be made for the total running feet for each size and type of LT cable acceptably supplied and installed by the Contractor.

6.5.2 Payment:

Payment shall be made for the total running feet of each size and type of LT cable measured, as provided above, at the Contract unit price each and shall constitute full compensation for supplying, installing, connecting, testing and commissioning of the LT cables including all accessories such as cable joints, lugs,

colour sleeves, glands, bush, etc. complete with plugging of protective pipe/ sleeve ends for water tightening.

*** End of Section 8212 ***



SECTION – 8220**WIRING ACCESSORIES****1.0 SCOPE OF WORK****2.0 GENERAL****3.0 APPLICABLE STANDARDS/CODES****4.0 MATERIAL****5.0 INSTALLATIONS****6.0 MEASUREMENT AND PAYMENT**

1.0 SCOPE OF WORK

The work under this Section consists of supplying, installing, and commissioning of all material and services of the complete Wiring Accessories including switches, switch sockets, etc., as specified herein and/or shown on the Bidding drawings and stated in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and coordinate at Site with other services for exact location and position of all wiring accessories.

The wiring accessories such as switches, switch socket outlets, socket outlets and ceiling roses, etc. shall also comply with the General Specifications for Electrical Works Section 8001 and with other relevant provisions of the Bidding Documents.

2.0 GENERAL

The locations of the wiring accessories such as switches, sockets, etc. are tentatively shown on the drawings. The Contractor shall ensure the exact positions and locations of wiring accessories in coordination with other services drawings, as per site requirements and as directed by the Engineer. The Contractor shall be responsible for proper functioning of wiring accessories after installation and commissioning.

The description of switches, switch sockets, socket outlets etc. are given in the Bill of Quantities, stated as drawings and in this section. The Contractor shall submit sample of each and every item of wiring accessories for the approval of the Engineer.

3.0 APPLICABLE STANDARDS/CODES

The latest edition of following standards & codes shall be applicable for the materials specified within the scope of this section :

BS 3676	-	Switches for domestic and similar purposes.
BS 4343	-	Industrial plugs, socket outlets and couplers for AC and DC supplies.
BS 2135	-	Capacitors for radio interference suppression.
BS 67	-	Ceiling roses.
BS 546	-	2-pole and earthing pin plugs, socket outlets and socket outlet adaptors.
BS 1362	-	Specification for general purpose fuse links for domestic and similar purposes.

- BS 1363
(Part 4-1995) - Specification for 13A fused connection units: switched and unswitched.
- BS 5733
(1995) - Specification for general requirements for electrical accessories.
- DIN EN
60669-1 - Switches for household and similar fixed electrical installations.

4.0 MATERIAL

4.1 Switches/Blank Face Plates

Switches for controlling light and fan points shall be single pole, rated for 10 Amps, 250 volts AC. The body of the switches shall be of thermoplastic with faceplate suitable for flush mounting and colour as approved by the Engineer. The switches shall be gang type having silver tipped contacts and shall operate with snap action.

Unless otherwise specified wherever switches control only the light points, these shall be plate type gang switches installed on common outlet boxes. Where only sheet steel back box is indicated on drawings, blank face plates shall be provided of same make and model as that of switches.

Where specified weather proof or metal front plates shall be used with single grid type switches. The plate shall be finished in specified colour or as otherwise directed by the Engineer.

The bell push switches shall be spring loaded type with the identification symbol embossed on it.

Two-way and intermediate switches shall be used to control lights from two or more different locations particularly in staircase as shown on the drawings.

4.2 13A Switch-Socket/Socket Outlets

Switch socket/Socket units shall be 3 pin, 13 A 250V, AC with faceplate of colour as approved by Engineer. The outlets shall be heavy-duty type suitable for mounting on sheet steel outlet box. The 13 Amps Switch socket/Socket outlets shall have sheltered live contacts and designed such that the earth pin of plug is engaged to socket earth before making of live contacts.

Where metal plate switches are installed, the switch socket units shall also be provided with front plate of similar design.

4.3 **15A Socket Outlets**

15 Amps Socket Outlets shall be 2 pin + earth, 250V AC socket outlets with faceplate of colour as approved by the Engineer.

The outlets shall be heavy-duty type suitable for mounting on sheet steel outlet box. The 15 Amps Socket Outlets shall be designed such that the earth pin of plug is engaged to socket earth prior to making contact to the live contacts.

4.4 **32A Industrial Socket Outlet**

The 32A, industrial socket outlet shall be weather proof conforming to the standard and requirements of relevant IEC codes.

The socket outlets shall be of heavy-duty type suitable for outdoor installation. The socket outlet shall be mounted on polycarbonate enclosure and have gasketed cover and window, captive cover screw type. All socket outlets shall be supplied with matching plugs.

4.5 **64A Industrial Socket Outlet**

The 64A, industrial socket outlet shall be weather proof conforming to the standard and requirements of relevant IEC codes.

The socket outlets shall be of heavy-duty type suitable for outdoor installation. The socket outlet shall be mounted on polycarbonate enclosure and have gasketed cover and window, captive cover screw type. All socket outlets shall be supplied with matching plugs.

4.6 **Connection Unit**

Connection Unit shall be used to supply to appliances where so specified or shown on drawings. (Air conditioner/Hand drier / Water heaters etc.).

It shall be rated for 20A, 250V AC or as shown on drawings/BOQ. The body shall be of thermoplastic material. Installation shall be surface/concealed as required.

Face plate and colour to be as per approval of Engineer.

Connectors shall be of best quality (for Phase, Neutral and Earth) and suitable for the size of wiring.

The connection unit shall have the following features as per requirement in B.O.Q or as shown on drawing.

- 20 A Double Pole Switch
- Fuse – Rating as per requirement of appliance
- Neon Indication light
- Grommetted outlet on face plate suitable for flexible wiring connection to appliance

4.7 Fan Dimmers

The fan regulator/dimmer shall be made of low voltage electronic components with essential radio frequency compressor and shall be designed for smooth speed control/variation of fans. The regulators/dimmer and fan control switches shall be of same make and colour as that of the approved wiring accessories. The regulator/dimmer and fan-controlling switch shall preferably be mounted on same face plate. They shall be suitable for flush mounting on a sheet steel outlet back box.

4.8 Sheet Steel Back Boxes

The sheet steel boxes for installation of switches, fan dimmers, socket, outlets and blank face plates shall be made of 16 SWG sheet steel having appropriate dimensions. The box shall have suitable arrangement for receiving the conduit(s). An earth terminal shall be provided for connecting at least three earth wires of 4-sq.mm size. The outlet box shall be finished in powder-coated paint. The sheet steel back box shall be as approved by the Engineer.

4.9 Ceiling Roses

The ceiling roses shall be suitable for 5 amps 250 volts single-phase ac. It shall have white plastic moulded base plate and copper or brass terminals suitable for connecting at least two wires of 2.5 sq. mm size. The ceiling rose shall have a cover with cable inlet hole suitable for multicore PVC insulated and PVC sheathed cable.

5.0 INSTALLATION

5.1 General

The mounting heights of all wiring accessories are stated on the drawings. In case the mounting height is not mentioned, the instructions of the Engineer shall be obtained before fixing.

5.2 Wiring Accessories Installation

All wiring accessories such as Switches, Blank Face Plates, 13/15A Switch Socket, 32/64/125A Industrial Socket Outlet, Connection Units & ground jack modules shall be installed on 1.63 mm (16 SWG) thick sheet steel box recessed in wall/column/floor. The faceplate shall be fixed on sheet steel box by means of flat head galvanized or brass screws sunk in the faceplate so as to finish flush with the surface. Matching screw caps shall be installed on the opening for screw in faceplates.

6.0 MEASUREMENT AND PAYMENT

6.1 General

The Contractor's bid amount against each Bill of Quantities item as given below shall include supply, installation, testing, commissioning and completion for all work specified herein and/or as shown on the Bidding Drawing related to the item.

6.2 13A Switch Socket/Socket Outlets, 15 Amps Switch Socket/Socket Outlets, 32/64/125A Industrial Socket Outlet & Connection Units

6.2.1 Measurement:

Measurement shall be made for the total number of each type of socket outlet complete with sheet steel back boxes, polycarbonate enclosure and all accessories acceptably supplied and installed by the Contractor as a complete unit.

6.2.2 Payment:

Payment shall be made for the total number of units measured, as provided above, at the Contract unit price each and shall constitute full compensation for supplying, installing, connecting, testing and completion of each type and rating of outlet including screws, screw caps, sheet steel box, polycarbonate enclosure, nuts, bolts and other accessories as required.

*** End of Section 8220***

SECTION - 8230**CONDUITS AND PIPES**

- 1.0 SCOPE OF WORK**
- 2.0 GENERAL**
- 3.0 APPLICABLE STANDARDS/CODES**
- 4.0 MATERIAL**
- 5.0 INSTALLATION**
- 6.0 MEASUREMENT AND PAYMENT**



1.0 SCOPE

The work under this section consists of supplying, installing and commissioning of all material and services of the complete Conduits and Pipes as specified herein and/or shown on Tender Drawings and stated in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and co-ordinate at Site with other services for exact route, location and position of the conduits and pipes.

The conduits and pipes with accessories shall also comply with the General Specifications for Electrical Works, Section-8001 and with other relevant provisions of the Tender Document.

2.0 GENERAL

The extent of works shown on the drawing does not indicate the exact position of conduits and pipes. The Contractor shall ensure exact location and route of conduit and pipes in coordination with other services drawings, as per site requirements and as directed by the Engineer.

The conduit system shall be continuous with manufacturer's recommended accessories.

The quality and material for the accessories of conduits and pipes such as sockets, end cap, elbows, bushings, bends, inspection/pull boxes, round boxes, etc., necessary for the complete installation shall be similar to that of conduits or pipes. All the accessories shall be supplied by the Contractor without any extra cost and deemed to have been included in the price of conduits/pipes.

Pull wire shall be laid in all empty conduits.

3.0 APPLICABLE STANDARD/CODES

The latest edition of the following standards and codes shall be applicable for the materials specified within the scope of this section:

BS 31	-	Steel conduits and fittings for Electrical Wiring.
BS 4607	-	Non-metallic conduits and fittings for electrical installations.
BS 1387	-	Galvanized Iron (GI) pipes and fittings.
BS 3505	-	uPVC pressure pipe and fittings.

4.0 MATERIAL

4.1 PVC Conduit and Accessories

The PVC conduits and accessories for lighting and power circuits shall be furnished by the Contractor as shown on the drawings or given in BOQ. The PVC bends shall have enlarged ends to receive conduit without any reduction in the internal diameter at joint. Manufactured smooth bends shall be used where conduit changes direction. Bending of conduits by heating or otherwise will be allowed in special situations only for which the consent of the Engineer shall be required. The use of sharp 90 degree bends and tees will not be allowed for concealed wiring.

The round PVC junction boxes for ceiling light or fan points shall have minimum dimensions of 63 mm diameter and depth. The junction boxes for wall light points shall have minimum dimensions of 63 mm diameter and 38 mm deep. Round junction boxes shall be provided with one piece PVC cover plate fixed to the box by means of brass screws.

4.2 Inspection/Pull and Adaptable Boxes

Inspection/Pull boxes and adaptable boxes shall be provided in conduit runs wherever required to facilitate pulling operation. The drawings are diagrammatic and do not indicate the position and spacing of inspection/pull boxes or adaptable boxes. However, these shall be as per Engineer's approval.

4.3 uPVC Pipes and fittings

Unplasticised PVC pressure pipes and fittings shall conform to BS 3505:1968 and shall be of class-D (working pressure - 12 bars). The buried uPVC pipes should be able to withstand the external load acting upon it by continuous movements of heavy duty vehicles such as trucks, cranes, forklift etc. where pipe changes direction, manufacturer smooth bend shall be used.

Fittings and accessories for use with uPVC pressure pipes shall be of the same class and manufacture as the pipe and shall have the required shapes and dimensions of turned ends to fit the uPVC pressure pipes. uPVC pipes and accessories shall be suitable for jointing with rubber rings or solvent.

Bending of pipes by heating or otherwise will not be allowed. The use of sharp 90 degree bends and tees will not be allowed. The bends shall conform to same specifications as given for PVC conduits. For joining of pipe all precautions and procedures recommended by manufacturer shall be allowed.

Hard PVC or reinforced concrete pipe range spacers shall be used if there is more than one pipe running in parallel. The distance between range spacers shall be maximum 2 meters. Range spacers shall be prefabricated/precast and decay resistant.

Flexible pipes shall be used as deemed essential or as approved by the Engineer.

5.0 INSTALLATION

5.1 PVC Conduits and Accessories

5.1.1 Concealed Conduit

Where concealed conduit system is shown on drawings/ mentioned in BOQ, the conduit shall be installed concealed in roof, wall, column, etc. Conduits shall be laid under floor only where specifically stated. The entire conduit system shall be installed and checked before wiring is carried out. Any obstruction found shall be cleared before the installation of cable.

When concealed, the conduit shall have a minimum of 32mm cover of concrete measured from the top of conduit to finished surface. In the reinforced cement concrete (RCC) work the conduit shall be laid before pouring of concrete. Under no circumstances shall chases be made in the RCC structure for concealing conduit and accessories after pouring of concrete. The conduit shall be supported on top of bottom reinforcement of slab. All outlet boxes to be firmly supported and installed such that they finish flush with the soffit of slab or beam.

Where conduits have to be concealed in cement concrete (CC) work after concreting or in block masonry, chase shall be made with appropriate tools and shall not be made deeper than required. The conduit shall then be fixed firmly in the recess and covered with cement concrete mixture. The work of cutting in the cement concrete work or block masonry work shall be coordinated with the civil work. The Contractor shall obtain approval from the Engineer before starting chasing and cutting.

The termination of conduits at or near the equipment / switchboard is shown diagrammatically on the drawings. The exact locations of the termination shall be coordinated with the equipment/switchboard to be installed. Any extension of conduit to suit the site condition shall be made without any extra cost.

Conduit ends pointing upwards or downwards shall be properly plugged in order to prevent the entry of foreign materials. All openings through which concrete may leak shall be carefully plugged in order to prevent the entry of foreign materials. All opening through which concrete may leak shall be carefully plugged and boxes shall be suitably protected against filling with concrete. At all terminations of conduit, sharp edges of conduit ends shall be prevented to avoid the cutting or damaging of wires or cables during pulling through the conduits.

Under floor conduit shall be installed at a minimum depth of 2 inch from the finished floor level or as shown on the drawings. The conduits shall be installed empty, before finishing of floor or in RCC work, with an 18 SWG steel wire drawn through the conduit for pulling cable. No conduits shall be laid under floor in bathroom.

5.1.2 Surface Conduits

The surface conduits shall be installed where shown on drawings mentioned in BOQ. The conduits shall be installed parallel or perpendicular to the surface of wall, structural members, ceiling, etc., by means of PVC saddles and clamps of approved design. The conduits shall be kept at least 150 mm away from parallel runs of flues, steam pipes and hot water pipes.

The saddles shall be installed on surface by means of nylon or wooden plugs and galvanized screws. Appropriate size of holes in structure shall made by drilling, the thickness of saddles and clamps shall be at appropriate thickness and prime quality. The surface conduits shall be supported at maximum of one meter spacing along horizontal and vertical runs. The Contractor shall provide all accessories for complete installing of conduit system. The pull boxes, etc. as stated for concealed conduits shall also be applicable for surface conduit system.

5.2 uPVC Pipe and Fittings

uPVC pipes shall be installed as shown in the drawings. The depth of the pipe shall vary according to the conditions at site, and approval of Engineer shall be obtained prior to installation. In general the pipes shall be installed underground at the following depths measured from the top of the pipe.

- Under roads/pavement : 900 mm below finished surface.
- When crossing other services : 250/500 mm vertical/horizontal.

The trench of required dimensions shall be excavated and the bottom of trench cleaned and leveled. A 100 mm bed of fine sand shall be provided over which the PVC pipes installed after proper alignment. Where two or more pipes are installed in the same trench the clearance between pipes shall not less than 50 mm. This shall be done by the provision of pipe range spacers as per Engineers approval. After laying of pipe the trench shall be backfilled with clean screened sand at least 100 mm above the top most pipes. The remaining portion of trench shall be backfilled with selected earth in layers well compacted.

After installation, the ends of the pipe shall be plugged with manufactured end cap impervious to water and chemicals. All joints shall be sealed adequately not only to prevent entry of foreign elements but water tightness shall be ensured.

The installation of pipes shall be completed in all respects including its fixing at terminations, before cabling work is started. All sharp edges and burrs shall be removed by using reamer or any approved device. The pipe shall be through cleaned of dirt and dust from inside, the pipes shall be installed in proper co-ordination with other works.

The protective PVC pipe for cable entering building shall be installed so as to lead cable into the cable trench. The required number of pipes shall be fixed before completing the work in the plinth. If an opening is provided to the cable trench from outside, the required number of pipes shall be installed and part of the opening remained unutilized shall be properly packed and sealed using suitable packing material impervious to water and chemical to make it completely water-tight.

Spare pipes shall be provided with 5 mm dia rope pulled from end to end and plugged with manufactured end cap.

Flexible pipes of compatible material and size shall be used wherever deemed essential.

6.0 MEASUREMENT AND PAYMENT

6.1 General

The Contractors bid amount against each item of Bill of Quantities as given below shall include supply, installation, testing, commissioning and completion for all work specified herein and/or as shown on the Tender Drawings related to the item.

6.2 Conduits PVC / Pipes PVC and Accessories

6.2.1 Measurement: Measurement shall be made for the total running feet of each type and size of conduits / pipes and accessories acceptably supplied and installed by the Contractor according to specification and as shown on drawings.

6.2.2 **Payment:** Payment shall be made for the total running feet of each type and size of conduits or pipes measured as provided above at the contract unit price each and shall constitute full compensation for supplying, installing and completion of the laying of the conduits and pipes including all accessories related to the item.

No separate payments shall be made for the under mentioned specified work related to the supply and installation of conduit and pipe. The cost thereof shall be deemed to have been included in the quoted rates of above work.

- Excavation and backfilling.
- Dewatering during excavation and backfilling.
- Providing and filling of fine sand in trenches.
- Providing pipe range spacers.
- Providing flexible pipes and accessories, jointing material/ compound, saddles, sockets, elbows, bend, junction boxes reducers, 16SWG GI pull wire for empty conduit, and 5 mm rope for empty pipe, soft metal bush, making threads and plugging of pipe with manufactured end cap etc. whether used or left spare.
- Compacted backfilling of trenches with specified material and disposal of surplus and rejected material.
- Watertight sealing of any unutilized opening to the buildings after installing the protective pipes entering the buildings.

*** End of Section 8230 ***

SECTION - 8240

EARTHING

1.0 SCOPE OF WORK

The work under this section consists of supplying, installing, testing and commissioning of all material and services of the complete Earthing system as specified herein, as shown on the Tender Drawings and given in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and co-ordinate at Site with other services for exact route, location and position of the earth electrode and ECC etc.

The Earthing system shall also comply with the General Specifications for Electrical Works Section - 8001 and with other relevant provisions of the Tender Documents.

2.0 GENERAL

The earthing system consists of earth electrodes, earthing leads, earth connecting points, earth continuity conductors and all accessories necessary for the satisfactory operation of the associated electrical system.

3.0 APPLICABLE STANDARDS/CODES

The latest editions of following standards / codes shall be applicable for the materials specified within the scope of this section:

- BS 951 - Earthing clamps
- CP 1013 - Earthing
- BS 2874 - Nuts, bolts, washers, screws and rivets fixing for use on copper
- BS 6346 - PVC insulated cables

4.0 MATERIAL

4.1 Earth Electrode

4.1.1 Plate Type

The plate type earth electrode shall comprise a 600 x 600 x 3mm electrolytic copper plate. The surface of the plate shall be tinned for protection. The plate shall have four terminals for connecting the earthing leads. Nuts bolts and washers shall be either of brass or tinned copper. A 50mm dia. G.I. pipe shall be provided from inspection chamber to earth plate for watering purpose. This pipe shall have 10mm dia. holes at 500mm centre to centre all along the length.

At the ground level an inspection chamber with cast iron cover shall be constructed having dimensions as shown on the drawings. The inspection chamber shall have a cover supported on angle iron frame. The cover shall be hinged type, as approved by the Engineer and shall finish flush with the ground level.

4.1.2 Copper Clad Steel Rod Type

This type of earth electrode shall comprise a 3 meter long, 20 mm dia. copper clad steel rod having flat head at drive end and pointed conical tip at the driven end. The tip shall be hardened to facilitate driving. At the top of the rod, a brass clamp for bolted connections shall be provided suitable for connection to the down conductor or earthing lead as required.

The inspection chamber with C.I. cover shall be provided as instructed by the Engineer.

4.2 **Earthing Lead**

The earthing lead shall connect the earth electrode to earth connecting point or equipment in the building. It shall be of stranded bare electrolytic copper of size shown on the drawings. The cost of earthing leads deemed to have been included in the price of earth electrode and no separate payment shall be made for it.

4.3 **Earth Continuity Conductor**

Earth continuity conductor (ECC) shall be stranded bare copper wire or single core PVC insulated copper conductor cable of sizes indicated on the drawings. All thimbles, lugs, sockets, nuts, washers & other accessories necessary for the complete installation of ECC shall be provided by the Contractor without any extra cost.

The specifications for single core PVC insulated cables used as ECC shall be same as those given in section "LT Cables" of the technical specifications. PVC insulated cables when used as ECC shall be green or green/yellow.

4.4 **Earth Connecting Point**

Earth connecting points shall comprise tinned copper bar, rectangular in shape, having dimensions of 300 x 50 x 6 mm. At least six terminals for connection shall be arranged on the bar, which can be increased or decreased as required by the Engineer.

The terminals shall have brass or tinned copper bolts, nuts and washers for protection against corrosion. Two holes shall be provided off centre of the copper bar for fixing to the wall by means of 10 mm dia. nut and bolt and shall be insulated by means of rubber gaskets/washers.

5.0 INSTALLATION

5.1 General

Complete earthing systems as shown on the drawing shall be installed by the Contractor. The earthing system shall give earth resistance, including the resistance of soil, earth leads and ECC equal to or less than one ohm.

At all connections of earth continuity conductor to Generator, Transformer, LT Switch Board, LT Distribution Board, or any other metallic body, proper size copper or brass sockets, thimbles or lugs shall be used to which the copper wire shall be connected by copper brazing. The soldering of copper wire at joints or terminations shall not be allowed. All tee-off connections shall be by copper brazing using suitable socket and clamps. After brazing, the jointed surface shall be protected by oxide inhibiting compound of low electrical resistance. For connections to metallic body, the surface shall be thoroughly cleaned before bolting the lug or socket.

The earth continuity conductor shall in general run in cable trench or in conduits/pipes as shown on the drawings. For under floor runs, these shall be installed in pipe/conduit of appropriate sizes. Where laid along underground cables, these shall be laid directly underground in unpaved areas and in pipes under paved areas.

The earthing system shall be tested after complete installation of earth electrodes.

5.2 Earth Electrode

5.2.1 Plate Type

The electrode plate shall be installed at a minimum depth of 5 meters from finished ground level or 1 meter below permanent water level whichever is less. The minimum horizontal distance between earth electrodes shall be 3 meters. Proper mixture of lime and charcoal shall be made and buried along with the copper plate in the ground to increase the soil conductivity. The electrode shall be installed as per details shown on the drawings. The inspection chambers shall be constructed at locations approved by the Engineer.

5.2.2 Copper Clad Steel Rod Type

In case the soil conditions at site permit and approved by the Engineer this type of earth electrode may be installed by hammering the electrode in soil, until the top of the rod is about 300 mm below the proposed finished ground level. If hammering down of rod is not possible due to site conditions, a pit shall be first excavated in bare ground upto the required depth and electrode shall be installed upright in the pit. The excavated pit shall be backfilled in layers of 500 mm, each layer tamped and compacted.

5.3 Earth Continuity Conductor

The earth continuity conductor of sizes shown on the drawing shall be installed all along the cable runs and connected to the earthing bar/terminals provided in equipment. The body of generator, transformer and all switchboards shall also be connected to earth by specified size of ECC. All other metal work shall also be connected to earth by specified size of ECC.

At any joint or terminations, the ECC shall be connected using proper accessories. No connection shall be made by twisting of earth conductors.

5.4 Earth Connecting Point

The earth connecting point shall be installed at locations shown on the drawings. It shall be fixed on wall surface by means of brass screws with nuts, washers and other insulating material as instructed by the Engineer.

6.0 MEASUREMENT AND PAYMENT

6.1 General

The Contractor's bid amount against each Bill of Quantities item as given below shall include supplying, installation, testing, and commissioning of all work specified herein, as shown on the Tender drawing related to the item.

6.2 Earth Electrode

6.2.1 Measurement

Measurement shall be made for the total no. of each type of earth electrode acceptably supplied and installed by the Contractor as a complete unit.

6.2.2 Payment

Payment shall be made for the number of units measured, as provided above, at the Contract unit price each, and shall constitute full compensation for supplying, installing, testing, commissioning and completion of earth electrodes including copper plate or copper clad steel rod, earthing leads, excavation, backfilling, lime and charcoal, inspection chamber with cover, GI pipes for earthing leads/watering, nuts, bolts, washers, lugs, brazing and all related civil works.

6.3 Earth Continuity Conductor (ECC)

6.3.1 Measurement

Measurement shall be made for the total running feet of each size and type of earth continuity conductor (ECC) acceptably supplied and installed by the Contractor.

6.3.2 Payment

Payment shall be made for the total running feet of each size and type of ECC measured, as provided above, at the Contract unit price and shall constitute full compensation for supplying, installing, connecting, testing and completing of ECC including all accessories such as sockets, thimbles, lugs, bolts, nuts, washers, brazing, etc.

6.4 Earth Connecting Point

6.4.1 Measurement

Measurement shall be made for the total no. of earth connecting points acceptably supplied and installed by the Contractor as a complete unit.

6.4.2 Payment

Payment shall be made for the total number of units measured, as provided above, at the Contract unit price each and shall constitute full compensation for supplying, installing and completion of earth connecting point and all other associated accessories such as nuts, bolts, washers, lugs, etc.



SECTION – 8310**TELEPHONE SYSTEM****1.0 SCOPE OF WORK****2.0 GENERAL****3.0 APPLICABLE STANDARDS/CODES****4.0 EQUIPMENT****5.0 INSTALLATIONS****6.0 MEASUREMENT AND PAYMENT**

1.0 SCOPE OF WORK

The work under this section consists of supplying, installing, testing, and commissioning of all material and services of complete telephone system as specified herein, as shown on the Tender Drawings and stated in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and co-ordinate at site with other services for exact route, location and position of the system.

The telephone system with accessories shall also comply with the General Specifications, Section 8001 and with other relevant provisions of the Tender Document.

The work shall be undertaken in accordance with applicable rules and regulations of Pak Telecomm Corporation Limited. Any approval/NOC required from PTCL shall be contractors' responsibility.

2.0 GENERAL

The system shall comply with the general requirements for telephone system as specified by the Pakistan Telecommunication Authority (PTA). The system shall be capable of accepting analog as well as digital incoming signals. The system shall be capable of connecting tele fax / tele text etc.

3.0 APPLICABLE STANDARDS AND CODE

The latest editions of the following standards/codes shall be applicable for the materials covered within the scope of this section:

DIN 47614	-	Terminal Strips
DIN 40040	-	Class and Reliability of units in Telecommunication
DIN 57800	-	Regulations for installation and operation of telecommunication.
DIN 57804	-	Telecommunications, Manufacture and Test of Apparatus.
		CCITT recommendations for ISDN system and Local PTCL/PTA regulations.
ISO 9000-Series Certified	-	Manufacturer for quality control

4.0 EQUIPMENT

4.1 Telephone Cable

Cat-5 cable shall be provided for telephone network.

4.2 Telephone Socket Outlet (RJ11)

The telephone socket outlet back boxes shall have appropriate dimensions made of 16 SWG (1.63mm) sheet steel and suitable arrangement for termination of conduits or of teak wood for installation in dry partitions.

The telephone outlet shall be type RJ11 single/two/three ports as required. The outlet shall be of Clipsal Australia or 'MK' UK make or approved equivalent.

4.4 Distribution Box

Telephone distribution box shall be made of 16 SWG (1.63mm) sheet steel having required dimensions to accommodate the terminal strips with adequate space available for wiring. The terminal strips shall have provision for tag numbers for telephone extension and with suitable capacity for terminating all incoming and outgoing cables including direct lines. The strip shall be installed on insulated material sheet inside the sheet steel boxes. The termination strip shall provide Insulation Displacement Contact (IDC) technique for easy and quick connection for 0.6 mm. wire size. The termination strip shall have following minimum specifications:

Insulation Resistance	> 105 ohm
Dielectric Strength	> 2 kVrms
Termination Resistance	< 1 ohm
Capacitance between adjacent Contacts.	< 5 pF
Current Carrying Capacity	Disconnection Contact 5 kA 8/20U Sec. Connection Contact 10 kA 8/20U Sec.
Contacts	Silver plated brass alloy
Material	Self extinguishing plastic Component according to UL94

The steel box shall be provided with a lockable hinged door. The distribution box shall be suitable for recess mounting.

The distribution box shall be of Krone make or approved equivalent.

4.5 EPABX

The EPABX shall initially be provided with minimum 100 subscriber lines and 10 trunk lines. Future extension lines shall be possible for 200 subscriber lines and 20 truck lines. The system shall allow simultaneous voice and data communication over one pair telephone cable. The system shall be capable of connecting tele fax and tele text etc.

The system shall operate on single phase 230 Volt, 50Hz supply. Power supply of the system shall be based on modular components and shall use low power dissipation. The system shall operate without the need of forced cooling. Back –up batteries shall be of sufficient size to keep the system fully operational per an hour in case of power failure.

The system shall be able to operate in the following environmental operating conditions.

- Temperature : 0 to 49C.
- Humidity : 5 to 95%

The system shall make use of Stored Program Control (SPC) and pulse code modulated signaling and meet the latest ISDN standard. The system shall be capable of accepting analog as well as digital incoming signals.

The EPABX system shall be able to manage internally:

- Analog telephone extensions
- Digital telephones (2B+D)
- Operator consoles
- Ethernet connection

The system shall be of modular design with plug-in cards for simple installation, maintenance and up gradation. The system shall be customer programmable, with user friendly operating procedures, so that operation, maintenance and servicing of the system can be easily out.

The system shall have the following minimum features

- General System features:
 - o Trunk direct inward dialing
 - o Call data recording with customized report option
 - o Night service
 - o Dial/call by name
 - o Pass word for up/down grading of traffic class.
- Attendant Console Features:
 - o Call grouping by origin and preference

- Parallel call or single call signaling
- Timer
- monitoring
- Overriding
- Trunk queuing
- Attendant console charge metering

- Station Features:

- Direct connecting between stations
- Direct access of stations to trunks
- Automatic dialing
- Call hold
- Voice/data transmission and reception

- Software requirement:

The equipment shall be supplied with a facility for metering, operational maintenance and traffic analysis. The tax metering system shall offer cost statistics and assist in managing charging per user group. On termination of a call a "ticket" i.e. a call record shall be generated.

Provision shall be provided for recording of following minimum parameters:

- Calling party: operator, trunk group and trunk line
- Called party : group & ;line of outgoing truck
- User group code
- Cost-centre code
- Start data and time
- Duration and number of meter pulses.

It shall be possible to generate hourly cost reports per user or other selection as chosen by the system operator.

The system shall have following maintenance features:

- Fault identification
- Diagnostic tests
- Manual controlled tests

5.0 INSTALLATION

5.1 Conduit

Telephone and data conduit shall be laid 150mm away from the electrical conduits or cables, and wherever electrical conduits or cables, and telephone and data conduits cross each other, they shall do so at right angles.

Identification marking shall be given at the termination or free end of conduit so that it may not be confused with the electrical conduits. The marking shall be both by colour and by attaching an approved brass tag using brass or bronze tie wire. Each tag shall be clearly stamped with "T" for telephone conduit.

5.2 Telephone Distribution Box

Distribution boxes for telephone cables shall generally be recessed type. The frame of the telephone distribution box shall finish flush with the surface of wall. However, surface type telephone distribution box shall also be acceptable with the approval of the Engineer.

All screws, nuts and bolts used for fixing the box shall be galvanized. Soft metal bushes shall be used at conduit entries in the box.

5.3 Telephone Socket Outlet

These shall be installed on the outlet box fixed in the wall, partition and floor.

5.4 Telephone Cable

The telephone cable shall be installed as outlined in section 'L.T. Cables' of these specifications. All cables shall be provided with plastic identification tags at termination, which shall be clearly shown on the As-Built drawings. The complete wiring shall be checked for continuity, identification and insulation before connections are made.

5.5 EPABX

The telephone exchange shall be installed as per manuals provided by the manufacturer and as per the Engineer's instructions. The EPABX shall be checked for proper working before connections are made.

5.6 Training

The Contractor shall provide the services of competent instructors who will give full instruction to the designated personnel in the operation, maintenance of the telephone system. Training manuals shall be provided for each trainee, which shall describe in detail the information and data imparted in the training programmed.

6.0 MEASUREMENT AND PAYMENT

6.1 General

The Contractor's bid amount against each Bill of Quantities item as given below shall include supply, installation, testing, commissioning and completion for all works specified herein and/or as shown on the Tender Drawings related to the item.

6.2 Telephone Set

6.2.1 Measurement:

Measurement shall be made for the number of each type of telephone sets including 3m extension cable acceptably supplied and installed by the Contractor as a complete unit.

6.2.2 Payment:

Payment shall be made for the number of units measured as provided above at the contract unit price each and shall constitute full compensation for supplying, installing, testing and commissioning of each type of telephone sets, including 3m extension cable and accessories.

6.3 Conduits / Pipes

6.3.1 Measurement:

Measurement shall be made for the total running feet of each size of conduits/pipes acceptably supplied and installed by the Contractor.

6.3.2 Payment:

Payment shall be made for the total running feet of conduit measured as provided above at the Contract unit price and shall constitute full compensation for supplying, installing & completion of the laying of the conduits/pipes including jointing materials and accessories, cutting chasing of civil works, excavation and backfilling of ground for underground PVC conduits, painting, plugging, tagging, etc., as applicable for each type of work.

6.4 Telephone Cable

6.4.1 Measurement:

Measurement shall be made for each size and type of telephone

cable including earth wire as shown on drawing and given in BOQ acceptably supplied and installed by the Contractor between MDF and telephone distribution box as a complete unit.

6.4.2 Payment:

Payment shall be made for the total number of each type of unit measured as provided above at the Contract unit price each and shall constitute full compensation for supplying, installing, testing and commissioning of the required pair of telephone cables including earth wire installed between MDF and telephone distribution box as shown on the drawing and all accessories.

6.5 **Telephone Socket Outlet**

6.5.1 Measurement:

Measurement shall be made of the total number of telephone socket outlet acceptably supplied and installed by the Contractor as a complete unit.

6.5.2 Payment:

Payment shall be made for number of units measured as provided above at the contract unit price each and shall constitute full compensation for supplying, installing, testing, and commissioning of the telephone socket outlet including civil works and all accessories.

6.6 **Telephone Distribution Box**

6.6.1 Measurement:

Measurement shall be made of the total number of each type of telephone distribution box as given in BOQ acceptably supplied and installed by the Contractor as a complete job.

6.6.2 Payment:

Payment shall be made for the number of job measured as provided above at the Contract unit price each and shall constitute full compensation for supplying, installing and completion of the telephone distribution box including civil works and all accessories.

6.7 **Wiring of Telephone Outlet/Distribution Boxes**

6.7.1 Measurement:

Measurement shall be made for the total number of each type of wiring of telephone outlet/distribution boxes, acceptably carried out by the Contractor as a complete unit.

6.7.2 Payment:

Payment shall be made for the total number of units measured, as provided above at the contract unit price each, and shall constitute for supplying, installing, connecting, testing, commissioning and completion of the wiring between telephone outlet, telephone outlet and distribution box and between distribution boxes including required pair of multi-core telephone cable and appropriate size conduit and all accessories.

6.8 **EPABX:**

6.8.1 Measurement:

Measurement shall be made for the number of EPABX acceptably supplied and installed by the Contractor as a complete unit.

6.8.2 Payment:

Payment shall be made for the unit measured as provided above at the Contractor unit price and shall constitute full compensation for supplying, installing and commissioning of EPABX along with all accessories.

*** End of Section 8310 ***

CONSTRUCTION OF HOUSES FOR ICT POLICE

TECHNICAL BID

**BIDDING DOCUMENTS
VOLUME – III**

DRAWINGS

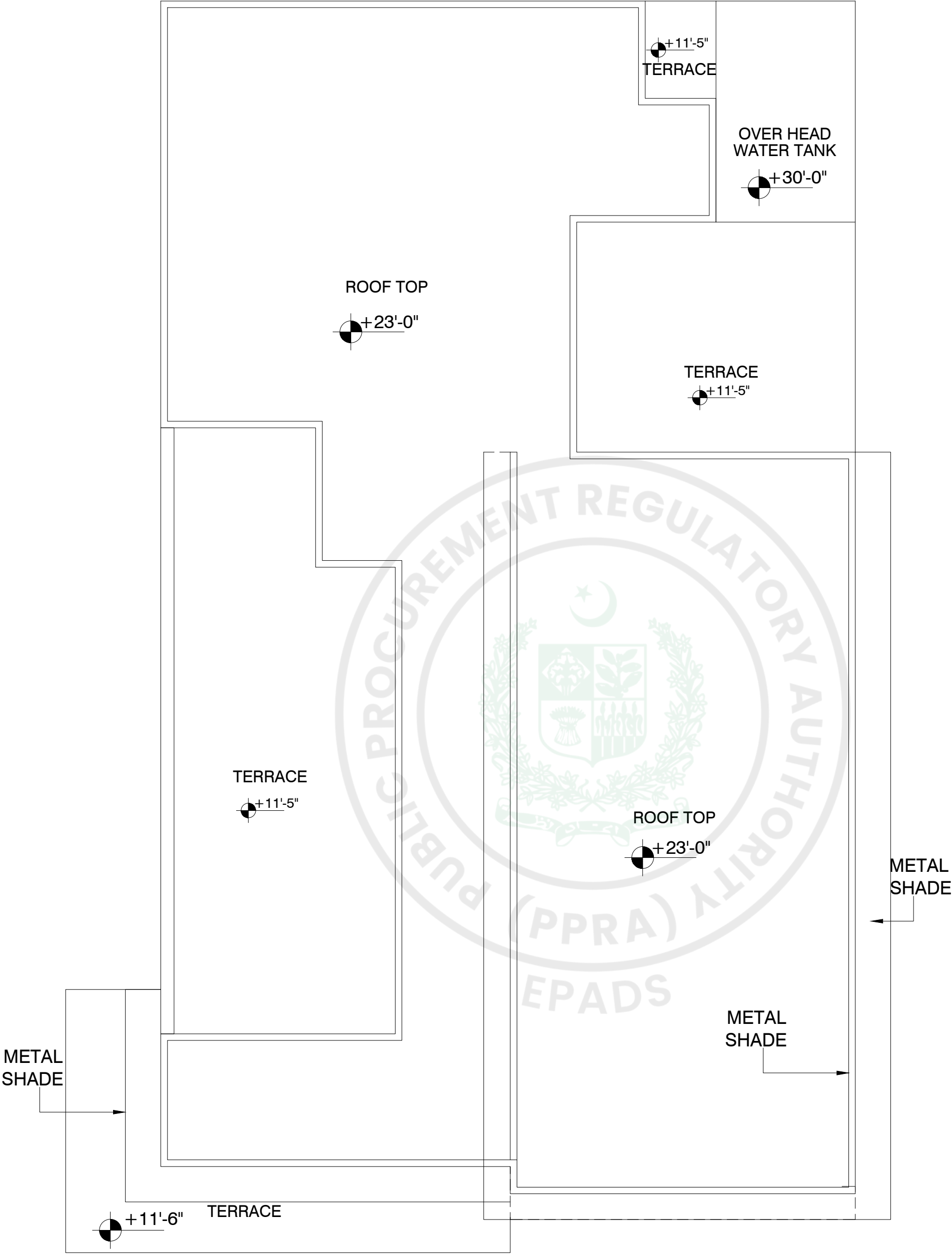
AUGUST, 2026



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

NESPAK House, Sector G-5/2, Islamabad, Tel: 051-9221910-13, Fax: 051-9221914.



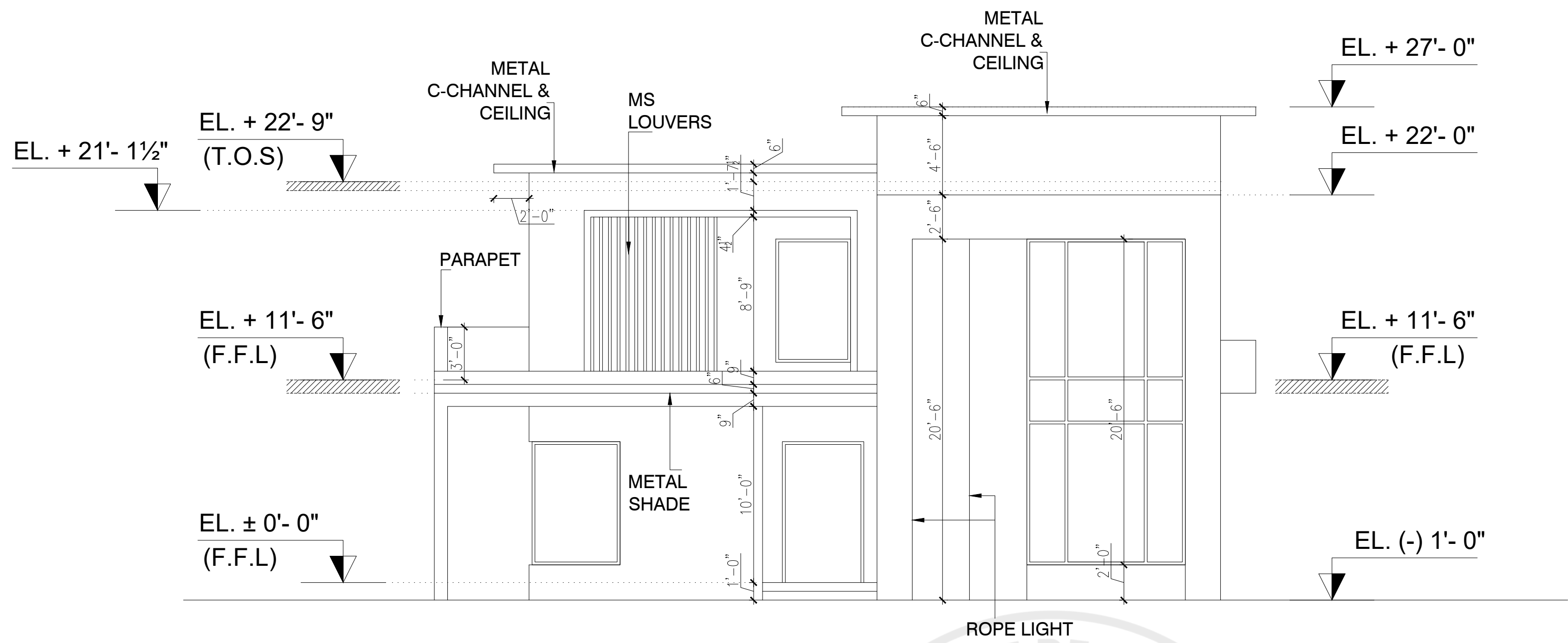


ROOF TOP PLAN

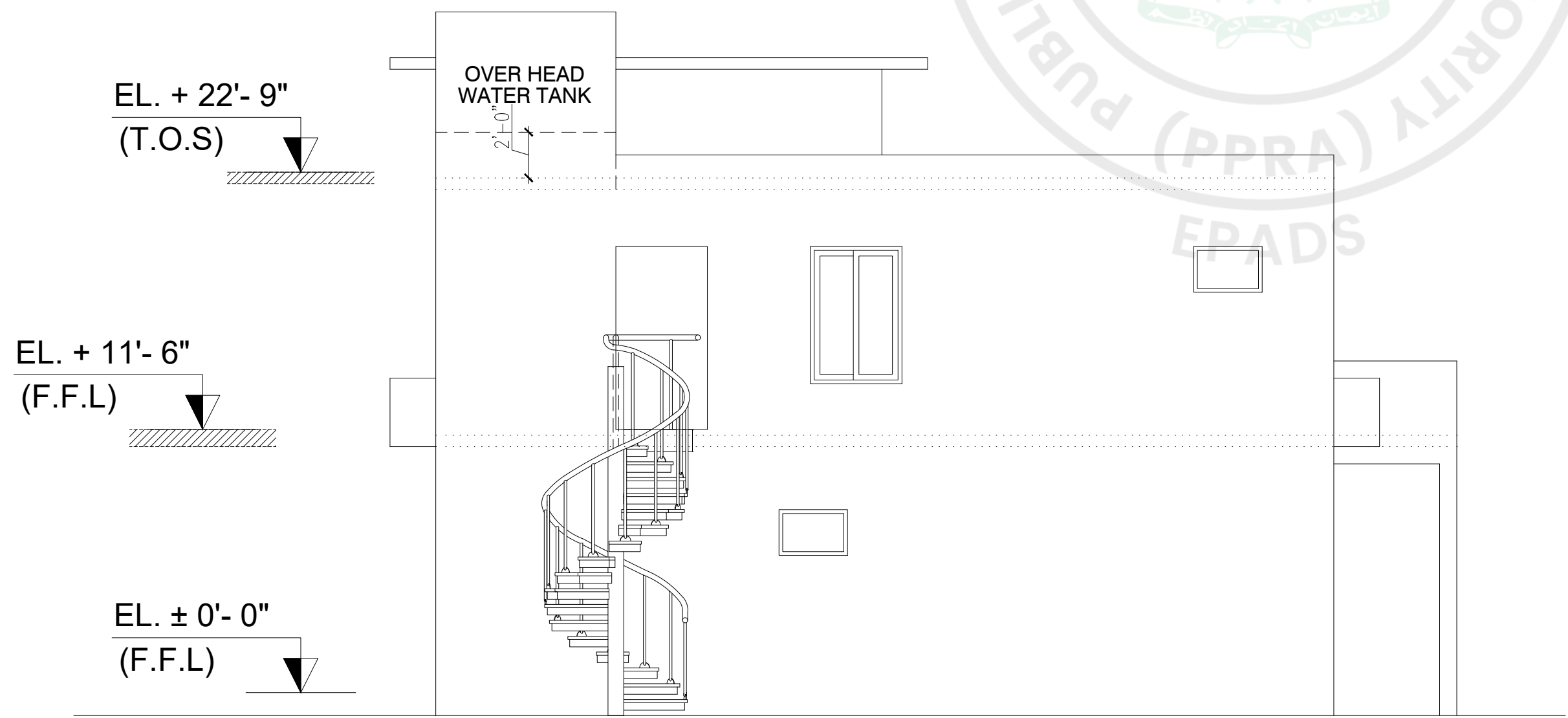
SCALE: 3/32" = 1'-0"

ISLAMABAD CAPITAL TERRITORY POLICE			
ICT POLICE ACCOMMODATION PROJECT ISLAMABAD			
ROOF TOP PLAN			
		NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD. ISLAMABAD	
DESN. <u>NESPAK</u>	RECOMMENDED	VER./CKD.	APPROVED
DWN. <u>M. SALEEM</u>			
FILE	DATE	DRAWING NO.	REV.
CKD.		156/322/BD/01B04	
SUBM.	<u>JUL, 2026.</u>		

REFERENCE DRAWINGS		REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.



FRONT ELEVATION



REAR ELEVATION

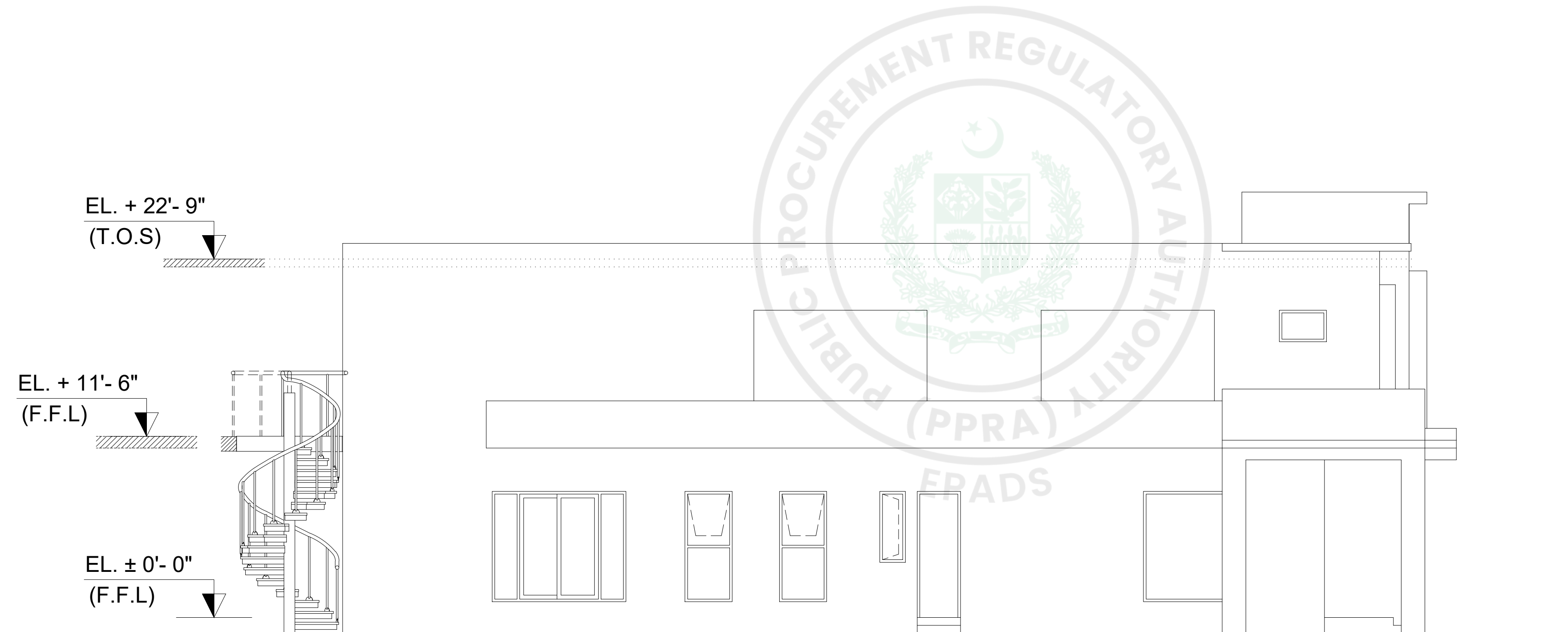
SCALE: 3/32" = 1'-0"

ISLAMABAD CAPITAL TERRITORY POLICE			
ICT POLICE ACCOMMODATION PROJECT ISLAMABAD			
ELEVATIONS			
NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD. ISLAMABAD			
DESIGNER: NESPAK	RECOMMENDED	VER./CKD.	APPROVED
DRAWN BY: M. SALEEM			
FILE	DATE	DRAWING NO.	REV.
CKD.		156/322/BD/01B05	
SUBMITTAL	JUL, 2026		

REFERENCE DRAWINGS	REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.	



RIGHT SIDE ELEVATION

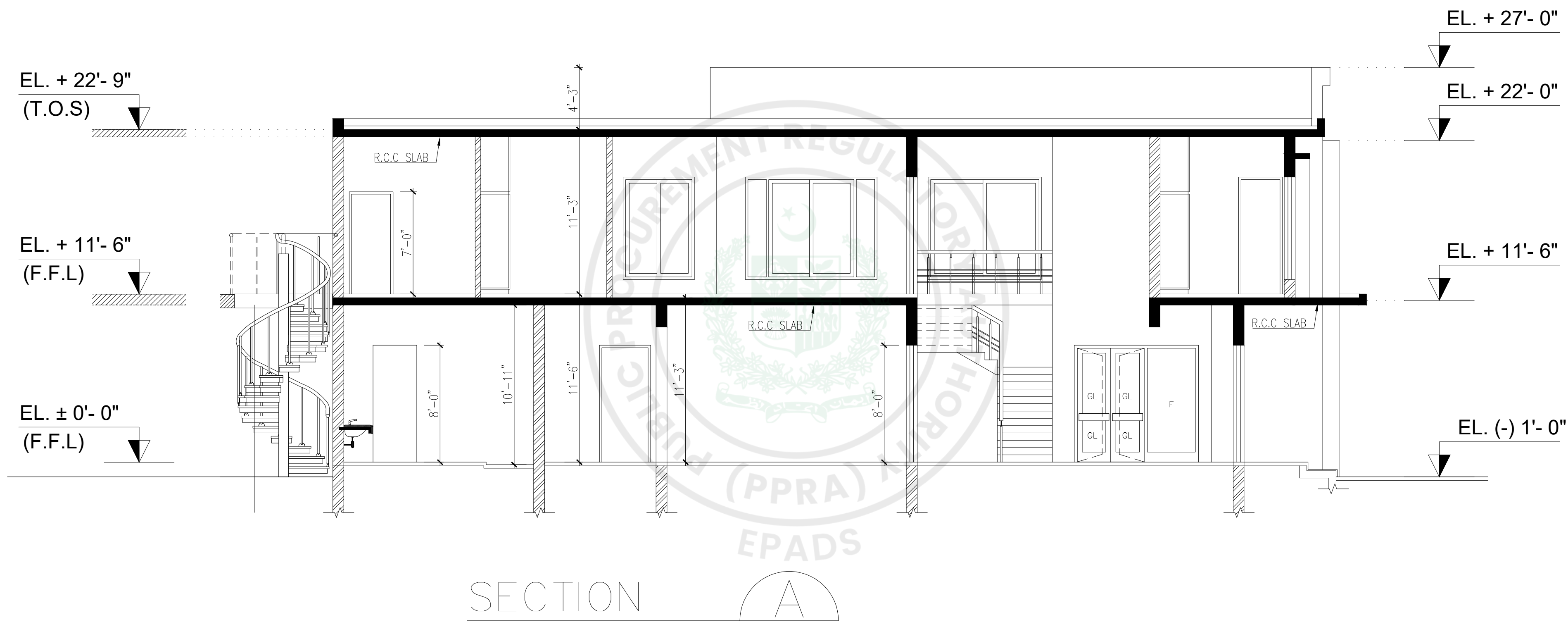


LEFT SIDE ELEVATION

SCALE: 3/32" = 1'-0"

ISLAMABAD CAPITAL TERRITORY POLICE			
ICT POLICE ACCOMMODATION PROJECT ISLAMABAD			
ELEVATIONS			
NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD. ISLAMABAD			
DESN. <u>NESPAK</u>	RECOMMENDED	VER./CKD.	APPROVED
DWN. <u>M. SALEEM</u>			
FILE	DATE	DRAWING NO.	REV.
CKD.		156/322/BD/01B06	
SUBM.	<u>JUL, 2026.</u>		

REFERENCE DRAWINGS		REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.



SCALE: 3/32" = 1'-0"

ISLAMABAD CAPITAL TERRITORY POLICE

ICT POLICE ACCOMMODATION PROJECT
ISLAMABAD

SECTION-AA



NATIONAL ENGINEERING SERVICES
PAKISTAN (PVT.) LTD. ISLAMABAD

DESN. NESPAK

DWN. M. SALEEM

FILE

CKD.

SUBM.

RECOMMENDED

VER./CKD.

APPROVED

DATE

DRAWING NO.

REV.

JUL, 2026.

156/322/BD/01B07

REFERENCE DRAWINGS	REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.	

A. GENERAL

1. NOTES GIVEN ON THIS DRAWING ARE APPLICABLE TO ALL STRUCTURAL DRAWINGS UNLESS OTHERWISE NOTED. NOTES WRITTEN ON ANY OTHER DRAWING SHALL BE APPLICABLE TO THAT PARTICULAR DRAWING ONLY UNLESS OTHERWISE CROSS REFERRED.
2. SYSTEM OF UNITS IS FPS.
3. ALL LEVELS MARKED ON THE DRAWINGS ARE LEVELS OF STRUCTURAL ELEMENTS. FINISH LEVELS SHALL BE IN ACCORDANCE WITH THE ARCHITECTURAL DRAWINGS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY AND STABILITY OF THE STRUCTURE AND ALL TEMPORARY WORKS DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL INFORM THE ENGINEER ABOUT ANTICIPATED CONSTRUCTION LOADS IN THE STRUCTURE AND OBTAIN ENGINEER’S APPROVAL THEREOF BEFORE COMMENCING THE WORK.
6. THE CONTRACTOR SHALL CO-ORDINATE ALL DRAWINGS OF ALL DISCIPLINES FOR ALL ITEMS INCLUDING BUT NOT LIMITED TO SIZES AND LOCATION OF ALL OPENINGS REQUIRED FOR DUCTS, PIPES AND PIPE SLEEVES, ELECTRICAL CONDUITS AND OTHER ITEMS TO BE EMBEDDED IN CONCRETE OR OTHERWISE INCORPORATED IN STRUCTURAL WORK AND SHALL BRING TO THE NOTICE OF THE ENGINEER DISCREPANCIES, IF ANY, FOR HIS INSTRUCTIONS, PRIOR TO THE START OF WORK.
7. THE CONTRACTOR SHALL VERIFY LAYOUT, CONFIGURATION, ALL DIMENSIONS AND LEVELS PERTAINING TO EXISTING WORKS BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL ADOPT ADEQUATE AND APPROPRIATE MEASURES SO AS NOT TO DAMAGE THE EXISTING WORKS.
8. THE CONTRACTOR SHALL EXERCISE UTMOST CARE AND PRECAUTION DURING THE WORKS, AGAINST ANY MISHAPS OR ACCIDENTS, FOR WHICH THE CONTRACTOR SHALL BE WHOLLY AND SOLELY RESPONSIBLE. THE CONTRACTOR SHALL INDEMNIFY THE OWNER AGAINST ANY ACCIDENTS AND ANY LOSSES THEREFROM AND SHALL REPAIR AND RECTIFY THEM AT HIS OWN COST AND TIME.
9. THE CONTRACTOR SHALL COORDINATE SCHEDULE OF CONSTRUCTION WITH SUPPLY AND INSTALLATION OF EQUIPMENT.
10. PROVISIONS SHALL BE MADE FOR INSTALLATION OF EQUIPMENT AS PER MANUFACTURER’S RECOMMENDATIONS.
11. ANY DEPARTURES/DEVIATIONS DESIRED FROM THE DESIGN OR SPECIFICATIONS, OR SOLUTIONS TO ANY PROBLEMS ENCOUNTERED, SHALL BE GOT APPROVED FROM THE ENGINEER PRIOR TO IMPLEMENTATION. UNAPPROVED DEPARTURES/DEVIATIONS MAY LEAD TO REJECTION/REPLACEMENT OF THE ENTIRE WORK AT THE CONTRACTOR’S COST.
12. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO SPECIFICATIONS OF THE CONTRACT. IN ABSENCE OF ANY EXPRESS OR IMPLIED SPECIFICATION IN THE CONTRACT, ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO RELEVANT AMERICAN STANDARDS AND SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
13. THE CONTRACTOR SHALL PREPARE AND SUBMIT SHOP DRAWINGS AND BAR BENDING SCHEDULES FOR ENGINEER’S APPROVAL AND OBTAIN HIS APPROVAL BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE ACCURACY OF SHOP DRAWINGS AND BAR BENDING SCHEDULES. THE ENGINEER’S APPROVAL SHALL NOT RELIEVE THE CONTRACTOR FROM HIS RESPONSIBILITY.

B. FOUNDATION AND EARTHWORK

1. THE CONTRACTOR SHALL STUDY THE AVAILABLE GEOTECHNICAL INVESTIGATION REPORT BEFORE COMMENCING THE WORK.
2. FOUNDATION DESIGN IS BASED ON PARAMETERS PROVIDED IN GEOTECH. INVESTIGATION REPORT.
3. FOUNDATION IS TO BE PLACED 4’–0” BELOW N.S.L.
4. TERMITE CONTROL TREATMENT SHALL BE CARRIED OUT AS PER SPECIFICATIONS.
5. THE TYPE AND COMPACTION OF SOIL BELOW GRADE SLAB SHALL BE AS PER JOB SPECIFICATIONS.

NO FOOTING SHALL BE PLACED ON FILL. HOWEVER, AREAS WHERE FILLING BELOW THE FOOTINGS BECOMES INEVITABLE DUE TO OVER–EXCAVATION (IF ANY), SHALL BE FILLED WITH P.C.C. (1:4:8) WITH PRIOR APPROVAL OF TH ENGINEER, AT NO EXTRA COST.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING SYSTEM IF AND WHERE SO REQUIRED DURING CONSTRUCTION.
7. ALL STRUCTURAL CONCRETE SURFACES AGAINST WHICH EARTH IS TO BE FILLED SHALL BE COATED WITH TWO COATS OF HOT BITUMEN (10/20 GRADE) APPLIED AT THE RATE OF 0.49 kg/sqm PER COAT, EXCEPT FOR P.C.C. (1:3:6) AND P.C.C. (1:4:8).
8. BACKFILLING AND COMPACTION SHALL BE CARRIED OUT EQUALLY ON BOTH SIDES OF PLINTH BEAMS TO AVOID IMBALANCE OF LATERAL EARTH PRESSURE.
9. THE CONTRACTOR SHALL SUPPLY AND ERECT ADEQUATE SHORING AND SUPPORT THE SIDES OF ALL EXCAVATIONS WHERE REQUIRED TO SAFEGUARD WORKMEN AND PROTECT ANY ADJACENT STRUCTURES.
- 10.EXISTING UNDERGROUND SERVICES, REQUIRED TO BE LEFT IN POSITION, SHALL BE CAREFULLY PROTECTED DURING EXCAVATION AND BACKFILLING OPERATIONS.
- 11.EXCAVATIONS ADJACENT TO EXISTING STRUCTURES AND/OR UNDERGROUND SERVICES SHALL BE MADE BY HAND.

C. REINFORCED CONCRETE

1. ALL CONCRETE SHALL BE TESTED IN ACCORDANCE WITH ASTM STANDARDS C31, C39, C172 & SPECIFICATIONS AND THE MINIMUM CUBE CRUSHING STRENGTH OF CONCRETE AT 28 DAYS SHALL BE AS FOLLOWS. TESTING OF CLASS D & E CONCRETE SHALL BE PERFORMED IF SO DIRECTED BY THE ENGINEER.

CLASS	CYLINDER STRENGTH AT 28–DAYS (psi.)
A	4,000
B	3,000
C	2,400
D	1,200
E	800

C. REINFORCED / PLAIN CEMENT CONCRETE (CONTINUED)

2. CLASS OF CONCRETE FOR DIFFERENT COMPONENTS OF THE STRUCTURE SHALL BE AS FOLLOWS UNLESS NOTED OTHER WISE:

COMPONENT	CONCRETE CLASS
MASONRY WALL FOUNDATION	B
FOUNDATION OF RCC COLUMNS	B
COLUMNS, SLABS & BEAMS	B
P.C.C. STEPS	D
LEAN CONCRETE	E

3. ORDINARY PORTLAND CEMENT SHALL BE USED FOR ALL CONCRETE WORKS.
4. AN INTEGRAL WATER PROOFING AGENT SHALL BE USED IN CONCRETE THAT IS CONSTANTLY OR INTERMITTENTLY IN CONTACT WITH WATER AS PER MANUFACTURER’S RECOMMENDATIONS
5. CONCRETE CLEAR COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

STRUCTURAL MEMBER / ELEMENT	MINIMUM COVER (INCHES)
FOUNDATIONS (ALL TYPES)	2”
COLUMNS & BEAMS	1½”
RETAINING WALLS	1½”
SLABS	¾”
PLINTH / LINTEL BAND	¾”

6. ALL REINFORCING STEEL BARS SHALL BE DEFORMED, HOT ROLLED BILLET STEEL BARS CONFORMING TO ASTM A–615/A–706, GRADE–60 WITH SPECIFIED YIELD STRENGTH OF NOT LESS THAN 60,000 psi. NOR MORE THAN 78,000 psi, AND RATIO OF ULTIMATE STRENGTH TO YIELD STRENGTH SHALL NOT BE LESS THAN 1.25.
7. GRADE–60 STEEL BARS ARE REPRESENTED USING PREFIX SYMBOL “#”. WHEREAS, THE NUMBER INDICATES THE BAR DIAMETER/SIZE, AS UNDER:

BAR NUMBER	DIAMETER (INCHES)
3	⅜”
4	½”
5	⅝”
6	¾”
8	1”

C. REINFORCED / PLAIN CEMENT CONCRETE (CONTINUED)

8. ALL DETAILING SHALL BE DONE AS PER ACI STANDARDS ACI–315, ACI–318 & ACI–350R.
9. 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.

D. CONCRETE CONSTRUCTION

1. THE CONTRACTOR SHALL SUBMIT CONCRETE POURING SCHEDULE FOR ENGINEER’S APPROVAL. NO CONCRETE SHALL BE POURED UNTIL ITS FORMWORK AND REINFORCEMENT HAS BEEN INSPECTED AND APPROVED BY THE ENGINEER.
2. DURING CONSTRUCTION, STACKING OF CONSTRUCTION MATERIALS, BLOCKS ETC. SHOULD BE AVOIDED ON SLAB PANELS.
3. BEFORE CASTING OF ANY STRUCTURAL MEMBER, THE CONTRACTOR SHALL ENSURE THAT ALL EMBEDDED ITEMS FOR ELECTRICAL, MECHANICAL, HVAC, PLUMBING, STRUCTURAL STEEL AND OTHER WORKS, AND DOWELS FOR STRUCTURAL MEMBERS AND/OR MASONARY ARE PROPERLY LOCATED IN PLACE.

E. CONSTRUCTION JOINTS

1. JOINTS, NOT SHOWN ON THE DRAWING, SHALL BE SO MADE AND LOCATED AS TO LEAST IMPAIR THE STRENGTH OF THE STRUCTURE AND SHALL NEED PRIOR APPROVAL OF THE ENGINEER. THEY SHALL BE LOCATED NEAR THE MIDDLE OF THE SPANS OF SLAB & BEAMS. JOINTS IN WALLS & COLUMNS SHALL BE AT THE UNDER–SIDE OF FLOORS, SLABS OR BEAMS AND AT THE TOP OF FOOTINGS OR FLOOR SLABS.
2. JOINTS SHALL BE PERPENDICULAR TO MAIN REINFORCEMENT. ALL REINFORCING STEEL SHALL BE CONTINUED ACROSS THE JOINTS.
3. JOINTS IN BASE SLAB & WALLS AND ROOF SLAB, IN ADDITION TO THOSE SHOWN ON THE DRAWINGS SHALL BE BORNE BY THE CONTRACTOR. BEAMS & BRACKETS SHALL BE PLACED AT THE SAME TIME AS SLABS.

F. ELECTRICAL CONDUITS

1. CONDUITS, FOR ELECTRICAL WORKS, SHALL BE PLACED WITHIN THE REINFORCED CONCRETE. THEY SHALL BE PLACED WITHIN THE MIDDLE THIRD OF THE SECTION IN BEAMS & SLABS AND WITHIN THE MIDDLE HALF OF THE THICKNESS. SPACING BETWEEN PARALLEL CONDUITS SHALL NOT BE LESS THAN 6”(150 MM).

SCALE = 1/8" = 1'-0"

REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.

CONSTRUCTION OF HOUSES FOR ICT POLICE

GENERAL NOTES & TYPICAL DETAILS
(SHEET 1 OF 2)

NES NATIONAL ENGINEERING SERVICES
PAK PAKISTAN (PVT.) LTD. ISLAMABAD

DESN. NESPAK	RECOMMENDED	VER./CKD.	APPROVED
DWN. MUNIR KHATTAK			
FILE	NIDA AFZAL	TALHA AFZAL	AAMIR RASHEED
CKD. NIDA AFZAL	DATE	DRAWING NO.	REV.
SUBM. AAMIR RASHEED	JULY 2026	156/323/TD/01G01	0

G. PROPS, FORMWORK & CURING

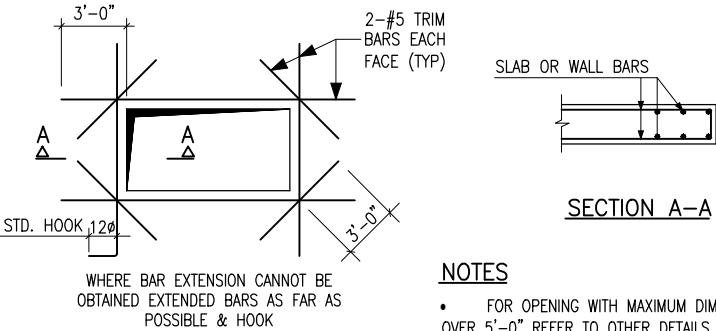
1. SHORE & BRACE ALL PARTS OF THE BUILDING DURING CONSTRUCTION, TO THE EXTENT NECESSARY TO ENSURE COMPLETE SAFETY, STRENGTH & SERVICEABILITY OF ALL STRUCTURAL ELEMENTS UNDER ALL CONDITIONS OF LOADS WHICH MAY OCCUR DURING CONSTRUCTION. SUCH SHORING & BRACING IS THE CONTRACTOR'S SOLE RESPONSIBILITY AND IS NOT SHOWN ON STRUCTURAL DRAWINGS OR SPECIFIED IN THE PROJECT.
2. SEQUENCE OF REMOVAL OF FORMWORK SHALL BE APPROVED BY THE ENGINEER.
3. AT LEAST ONE LOWER FLOOR SHALL REMAIN PROPPED UNTILL THE UPPER FLOOR IS CAST AND CURED.

H. BRICK MASONRY WORKS

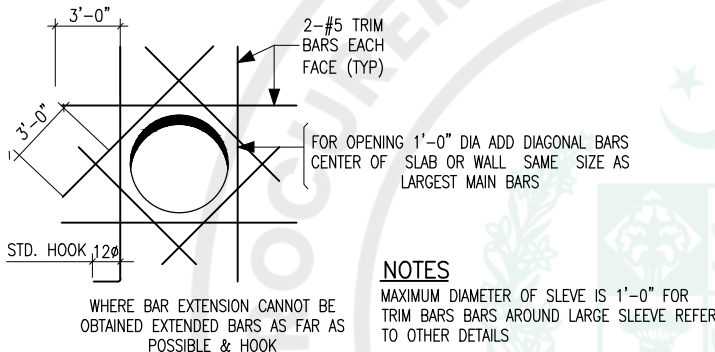
1. ALL BRICK WORKS SHALL CONFORM TO THE REQUIREMENTS OF SPECIFICATIONS FOR BUILDING AND ROAD WORKS GOVERNMENT OF PAKISTAN, PAKISTAN PUBLIC WORKS DEPARTMENT, BEING REFERENCE SPECIFICATIONS FOR SCHEDULE OF RATES-2022.

J. STRUCTURAL STEEL WORKS

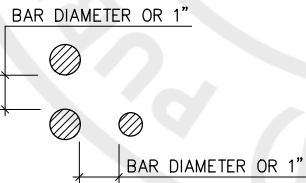
1. ALL STRUCTURAL STEEL WORKS SHALL CONFORM TO THE REQUIREMENTS OF SPECIFICATIONS FOR BUILDING AND ROAD WORKS GOVERNMENT OF PAKISTAN, PAKISTAN PUBLIC WORKS DEPARTMENT, BEING REFERENCE SPECIFICATIONS FOR SCHEDULE OF RATES-2022.
2. ALL FABRICATION, PAINTING, ERECTION AND QUALITY CONTROL IS TO BE DONE IN ACCORDANCE WITH THE LATEST AISC SPECIFICATIONS.
3. ALL STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-36 OR EQUIVALENT.
4. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF AMERICAN WELDING SOCIETY, AWS, SPECIFICATIONS USING ELECTRODES E70XX.
5. ALL BOLTS SHALL CONFORM TO ASTM A307 OR A325.
6. SURFACE PREPARATION OF ALL STRUCTURAL STEEL FOR PAINTING SHALL BE IN ACCORDANCE WITH THE LATEST ISSUE OF "STEEL STRUCTURES PAINTING COUNCIL" SPECIFICATIONS SSPC-SP6 FOR COMMERCIAL BLAST CLEANING.
7. ALL STEEL SHALL BE GIVEN ONE SHOP COAT OF RED LEAD OXIDE PRIMER AND FIELD TOUCHUP EXCEPT FOR SURFACES TO BE EMBEDDED IN CONCRETE OR CONTACT SURFACES OF FRICTION BOLTED CONNECTIONS.



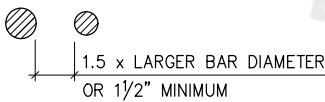
REINFORCEMENT DETAIL AT OPENING
IN SLAB & WALLS (TYP.)



REINFORCEMENT AROUND SLEEVE IN
SLABS & WALLS (TYP.)



BAR SPACING IN BEAM



VERTICAL BAR SPACING

K. ABBREVIATIONS & SYMBOLS

- @ AT THE RATE OF
B BOTTOM
BC BRICK COLUMN
BW BOTHWAYS
c/c CENTRE TO CENTRE
CL CLEAR
D,d DEPTH, THICKNESS
EF EACH FACE
EJ EXPANSION JOINT
EL. STRUCTURAL ELEVATION
EQ EQUAL
FF FAR FACE
FFL FINISHED FLOOR LEVEL
FGL FINISHED GROUND LEVEL
GS SLAB ON GRADE
H HORIZONTAL
NF NEAR FACE
NSL NATURAL SURFACE LEVEL
NSP NOT SHOWN ON PLAN
NTS NOT TO SCALE
SOP SURVEY OF PAKISTAN
ST STIRUPPS
T TOP
TH. THICK
TYP TYPICAL
UNO UNLESS NOTED OTHERWISE
V VERTICAL
≥ GREATER THAN OR EQUAL TO
≤ LESS THAN OR EQUAL TO
Ø DIAMETER IN INCHES
● LEVEL ON PLAN
CL CENTRE LINE
L ANGLE
C CHANNEL

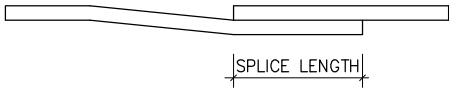
SPLICE LENGTH (LS) *

fc' = 2,500 PSI		
BAR SIZES	(LS1) TOP BARS	(LS2) OTHER BARS
#3 TO #6	57db	44db
#7 TO #18	72db	55db

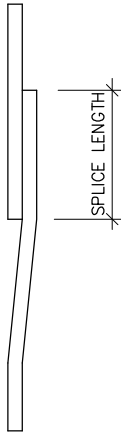
* ALL LAP SPLICE SHALL BE STAGGERED BY AT LEAST 50 %

DEVELOPMENT LENGHT (LD)

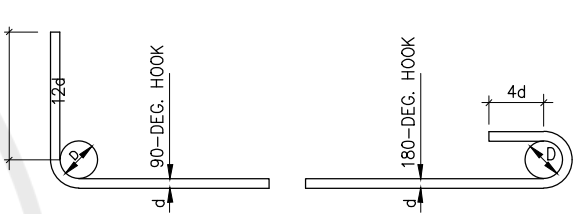
LD = LS



BEAM SPLICE (TYP.)

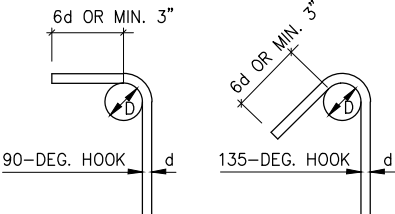


COLUMN SPLICE (TYP.)



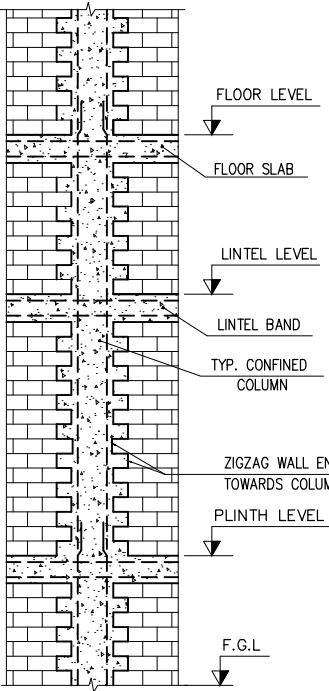
STANDARD BAR HOOKS (MAIN BARS)

BAR DIA	D
Ø3	2 1/2"
#4	3"
#5	4"
#6	4"
#8	6"
#9	7"
#11	8 1/2"



STIRRUPS AND TIE HOOKS

BAR DIA	D
Ø3	1 1/2"
#4	2"
#5	2 1/2"



TYPICAL ELEVATION OF CONFINED COLUMN
(SHOWING TOOthing)

SCALE = 1/8" = 1'-0"

REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.

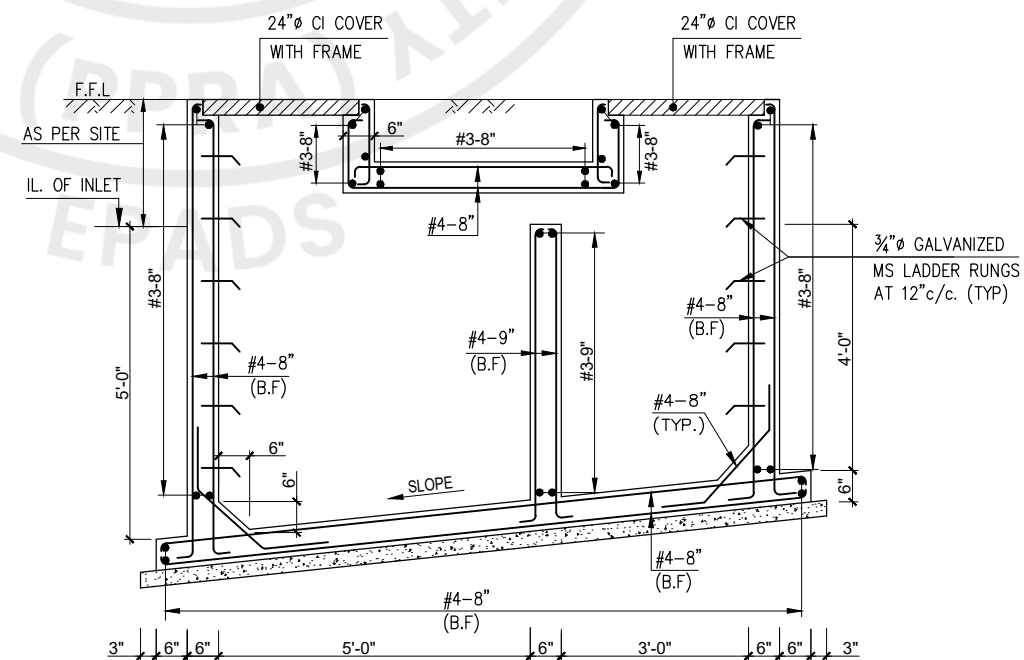
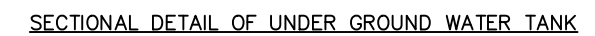
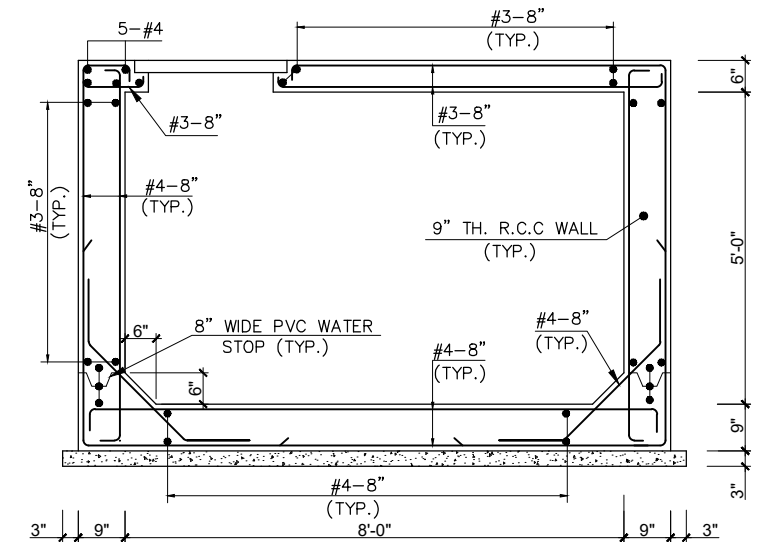
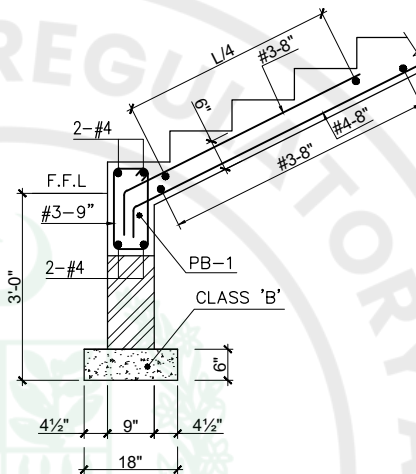
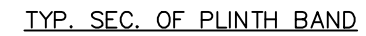
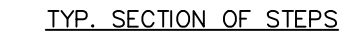
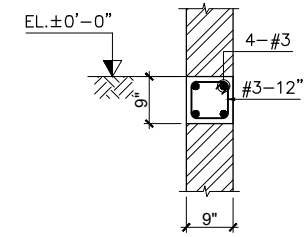
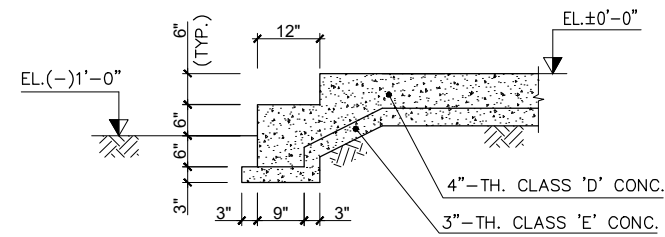
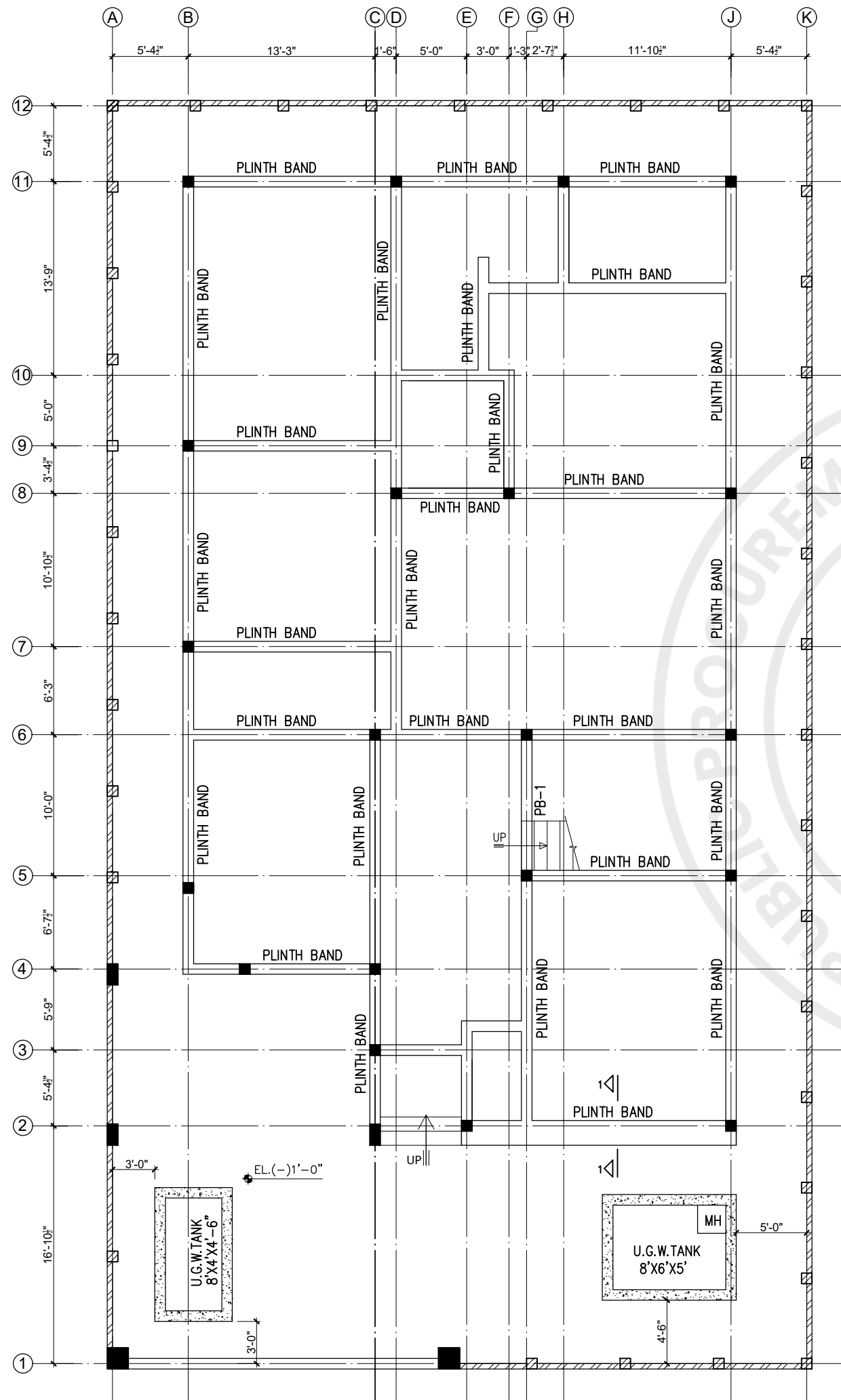
CONSTRUCTION OF HOUSES FOR ICT POLICE

GENERAL NOTES & TYPICAL DETAILS
(SHEET 2 OF 2)

NES NATIONAL ENGINEERING SERVICES
PAR PAKISTAN (PVT.) LTD. ISLAMABAD

DESN. NESPAK	RECOMMENDED	VER./CKD.	APPROVED
DWN. MUNIR KHATTAK			
FILE	NIDA AFZAL	TALHA AFZAL	AAMIR RASHEED
CKD. NIDA AFZAL	DATE	DRAWING NO.	REV.
SUBM.AAMIR RASHEED	JULY 2026	156/323/TD/01G02	0





NOTES: –

- 1-FOR GENERAL NOTES REFER DWG. NO. 156/323/C/01G01 & 02.
2-READ THIS DRAWING IN CONJUNCTION WITH ALL RELEVANT
PROJECT DRAWINGS.
3-ALL UNITS ARE IN 'FPS' EXCEPT NOTED OTHERWISE.
4-DESIGN OF FOUNDATION IS BASED ON ALLOWABLE BEARING
CAPACITY OF 0.75 TSF.

SCALE = 1/8" = 1'-0"

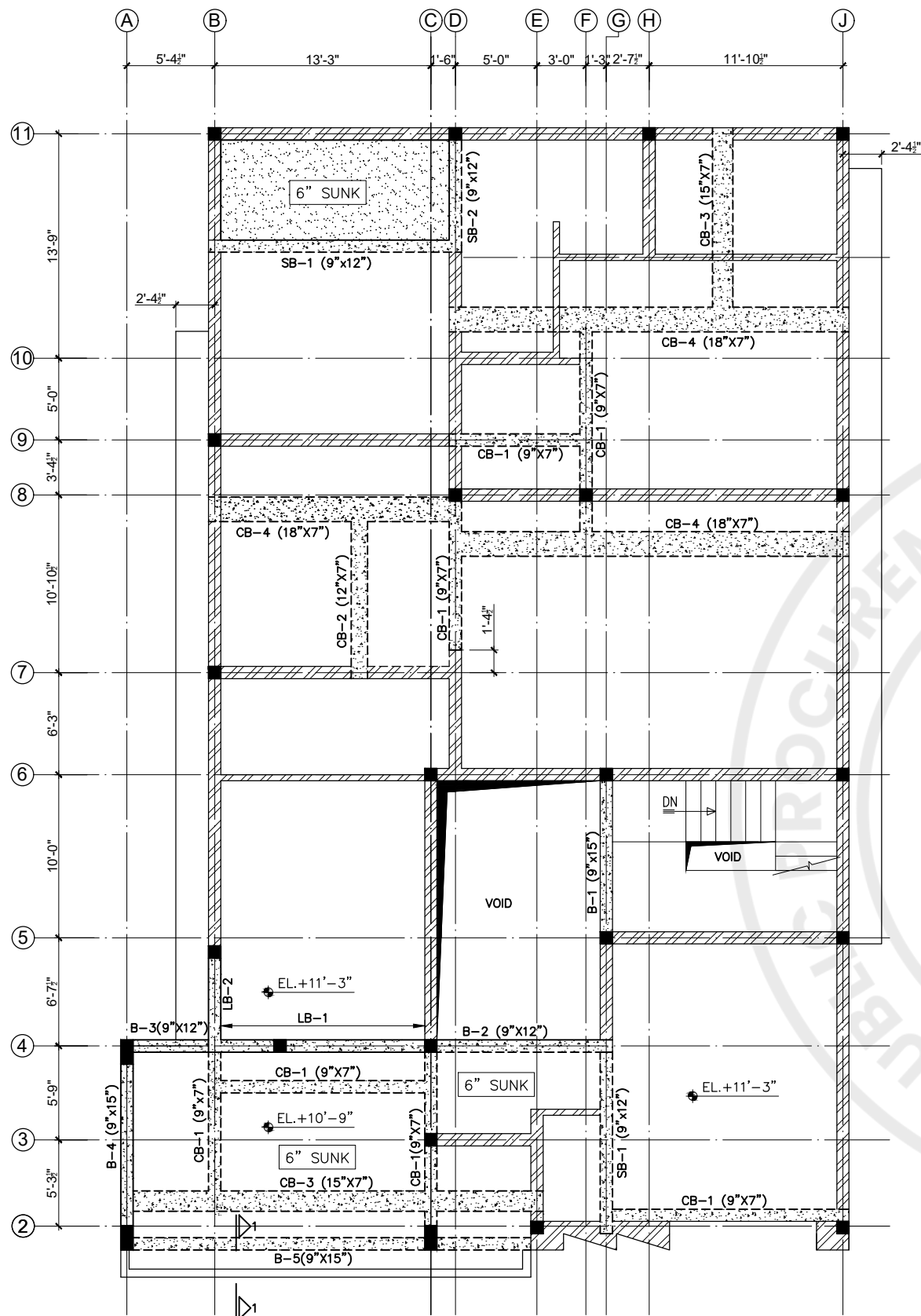
REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.

CONSTRUCTION OF HOUSES FOR ICT POLICE

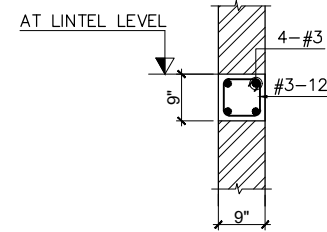
PLINTH BEAM & PLINTH BAND PLAN

NEE NATIONAL ENGINEERING SERVICES
PAK PAKISTAN (PVT.) LTD. ISLAMABAD

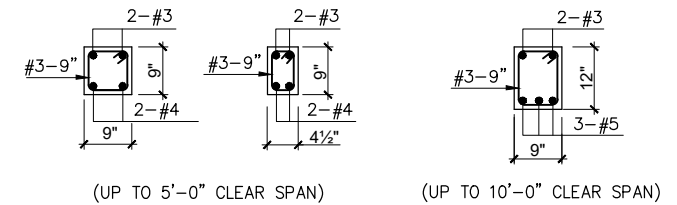
DES. _____	RECOMMENDED	VER./CKD.	APPROVED
DWN. MUNIR KHATTAK			
FILE _____	NIDA AFZAL	TALHA AFZAL	AAMIR RASHEED
CKD. NIDA AFZAL	DATE	DRAWING NO.	
SUBM. AAMIR RASHEED	JULY '2026	156/323/TD/01G04	
			REV. _____
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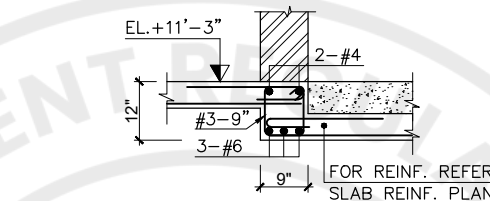
FRAMING PLAN AT EL.+11'-3"
(ALL SLABS ARE 6"-TH. EXCEPT NOTED OTHERWISE)



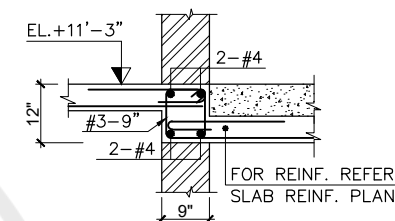
TYP. SECTION DETAIL OF LINTEL BAND



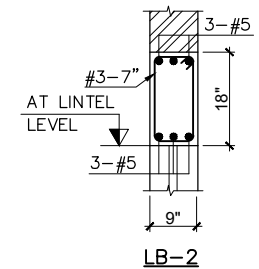
TYPICAL DETAIL OF LINTELS



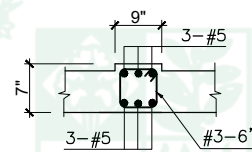
SB-1



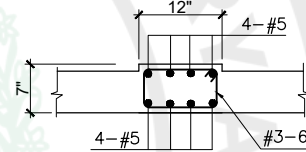
SB-2



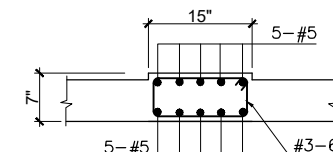
LB-2



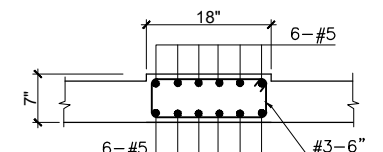
CB-1



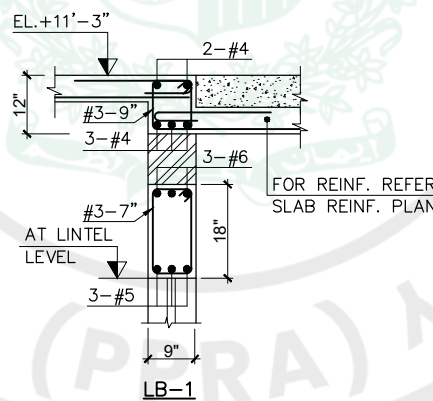
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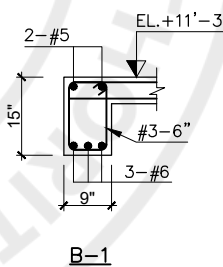
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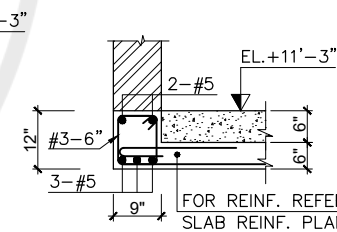
CB-4



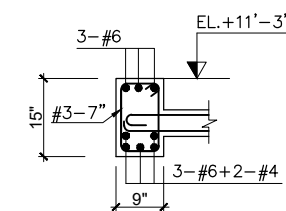
LB-1



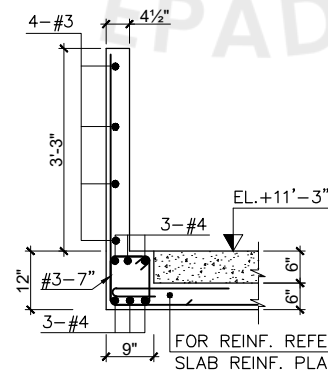
B-1



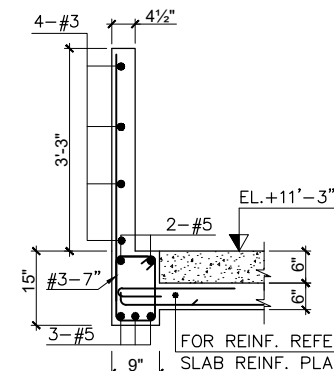
B-2



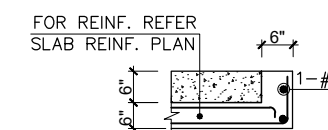
B-5



B-3



B-4



SECTION 1-1

NOTES:-

- 1-FOR GENERAL NOTES REFER DWG. NO. 156/323/C/01G01 & 02.
2. READ THIS DRAWING IN CONJUNCTION WITH ALL RELEVANT PROJECT DRAWINGS.
3. ALL UNITS ARE IN 'FPS' EXCEPT NOTED OTHERWISE.
4. R.C.C LINTEL SHALL BE PLACED WITH ITS BOTH ENDS EXTENDING 9" IN BRICK MASONRY ON BOTH SIDES IN WALL.
5. TYPICAL LINTEL BANDS SHALL BE REPLACED WITH LINTEL BEAM AT DOOR AND WINDOWS LOCATION.
6. ALL SLABS ARE 6" TH. EXCEPT NOTED OTHERWISE.
7. FOR SLAB TOP & BOTTOM REINFORCEMENT REFER, RESPECTIVE SLAB REINF. PLANS.

SCALE = 1/8" = 1'-0"

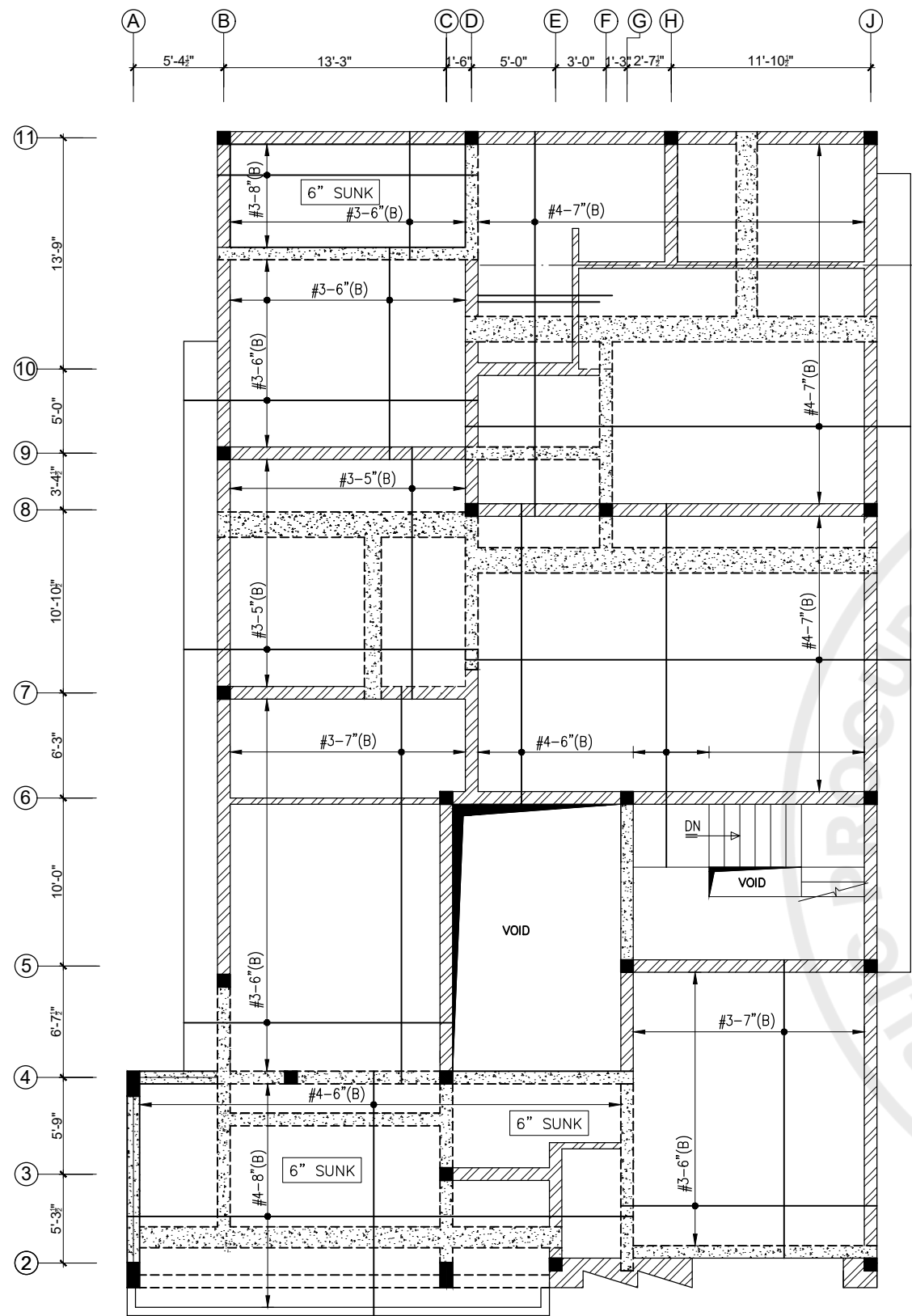
REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.

CONSTRUCTION OF HOUSES FOR ICT POLICE

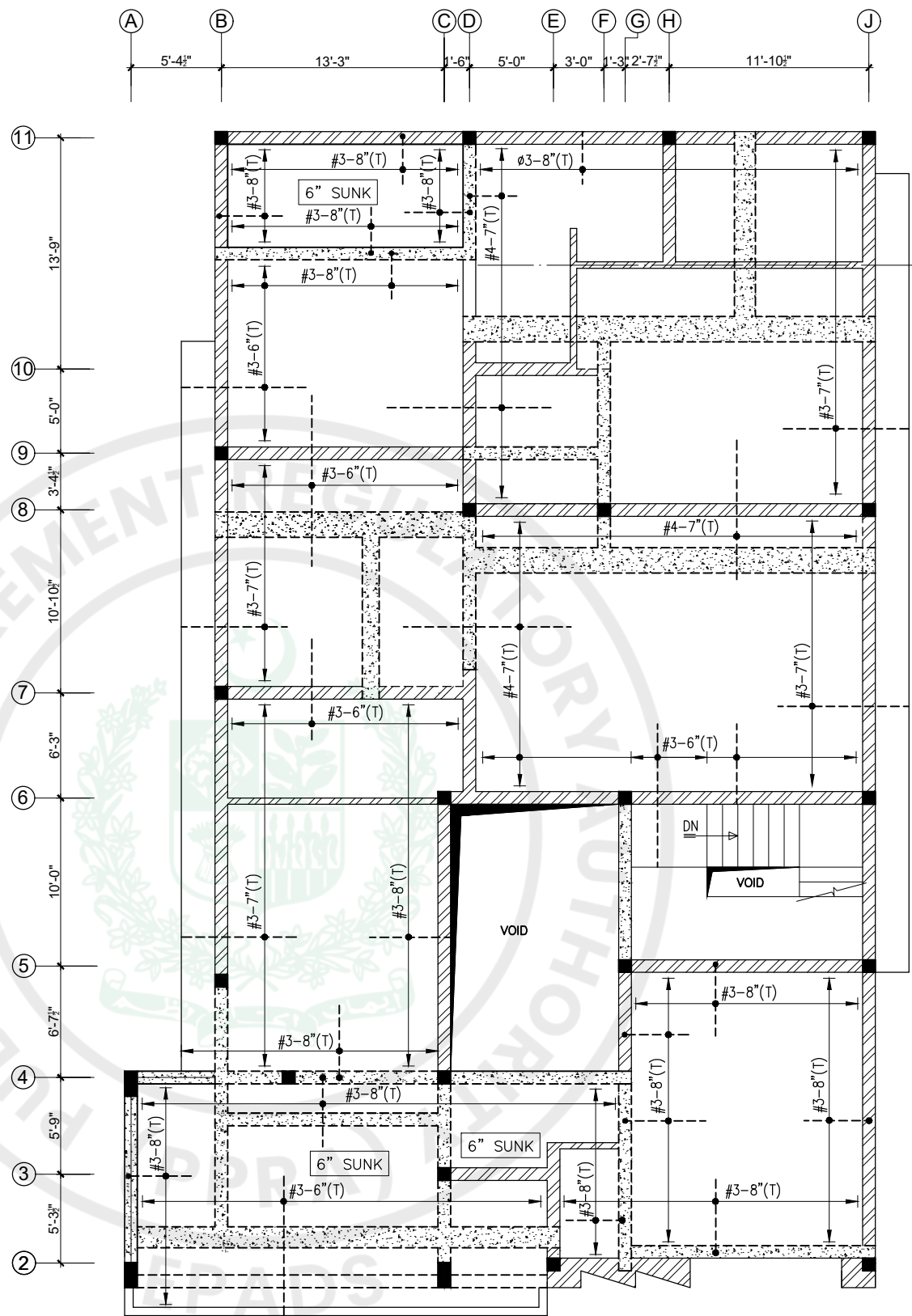
FRAMING PLAN AT EL.+11'-3"

NES NATIONAL ENGINEERING SERVICES
PAK PAKISTAN (PVT.) LTD. ISLAMABAD

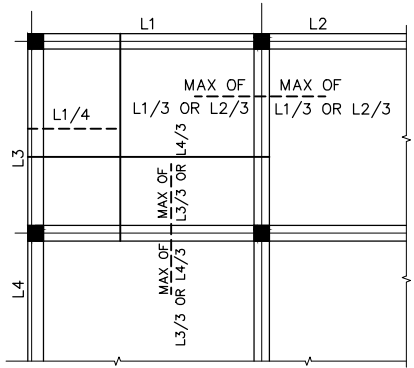
DESN. NESPAK	RECOMMENDED	VER./CKD.	APPROVED
DWN. MUNIR KHATTAK			
FILE	NIDA AFZAL	TALHA AFZAL	AAMIR RASHEED
CKD. NIDA AFZAL	DATE	DRAWING NO.	REV.
SUBMAAMIR RASHEED	JULY 2026	156/323/TD/01G05	0



BOTTOM SLAB REINFORCEMENT PLAN AT EL.+11'-3"
(ALL SLABS ARE 6"-TH. EXCEPT NOTED OTHERWISE)



TOP SLAB REINFORCEMENT PLAN AT EL.+11'-3"
(ALL SLABS ARE 6"-TH. EXCEPT NOTED OTHERWISE)



TYP. SLAB REINFORCEMENT PLAN

- NOTES: -**
- 1. FOR GENERAL NOTES REFER DWG. NO. 156/323/C/01G01 & 02.
 - 2. READ THIS DRAWING IN CONJUNCTION WITH ALL RELEVANT PROJECT DRAWINGS.
 - 3. ALL UNITS ARE IN 'FPS' EXCEPT NOTED OTHERWISE.
 - 4. R.C.C LINTEL SHALL BE PLACED WITH ITS BOTH ENDS EXTENDING 9" IN BRICK MASONRY ON BOTH SIDES IN WALL.
 - 5. TYPICAL LINTEL BANDS SHALL BE REPLACED WITH LINTEL BEAM AT DOOR AND WINDOWS LOCATION.
 - 6. WALLS THAT ARE NOT SHOWN IN FRAMING PLANS SHALL BE CONSTRUCTED AFTER THE SLAB ABOVE HAS GAINED ITS FULL STRENGTH AND SHUTTERING IS REMOVED.
- NOTES FOR SLAB REINF.**
- 1. ALL BINDERS BARS SHALL BE $\phi 3-12"$ c/c.
 - 2. TOP REINF. AT EACH CONTINUOUS EDGE SHALL BE EXTENDED ON BOTH SIDES UPTO MAX. SPAN/3.
 - 3. TOP REINF. AT EACH DISCONTINUOUS EDGE SHALL BE PROVIDED UPTO SPAN/4.
 - 4. ALL SLABS ARE 6" TH. EXCEPT NOTED OTHERWISE.

SCALE = 1/8" = 1'-0"

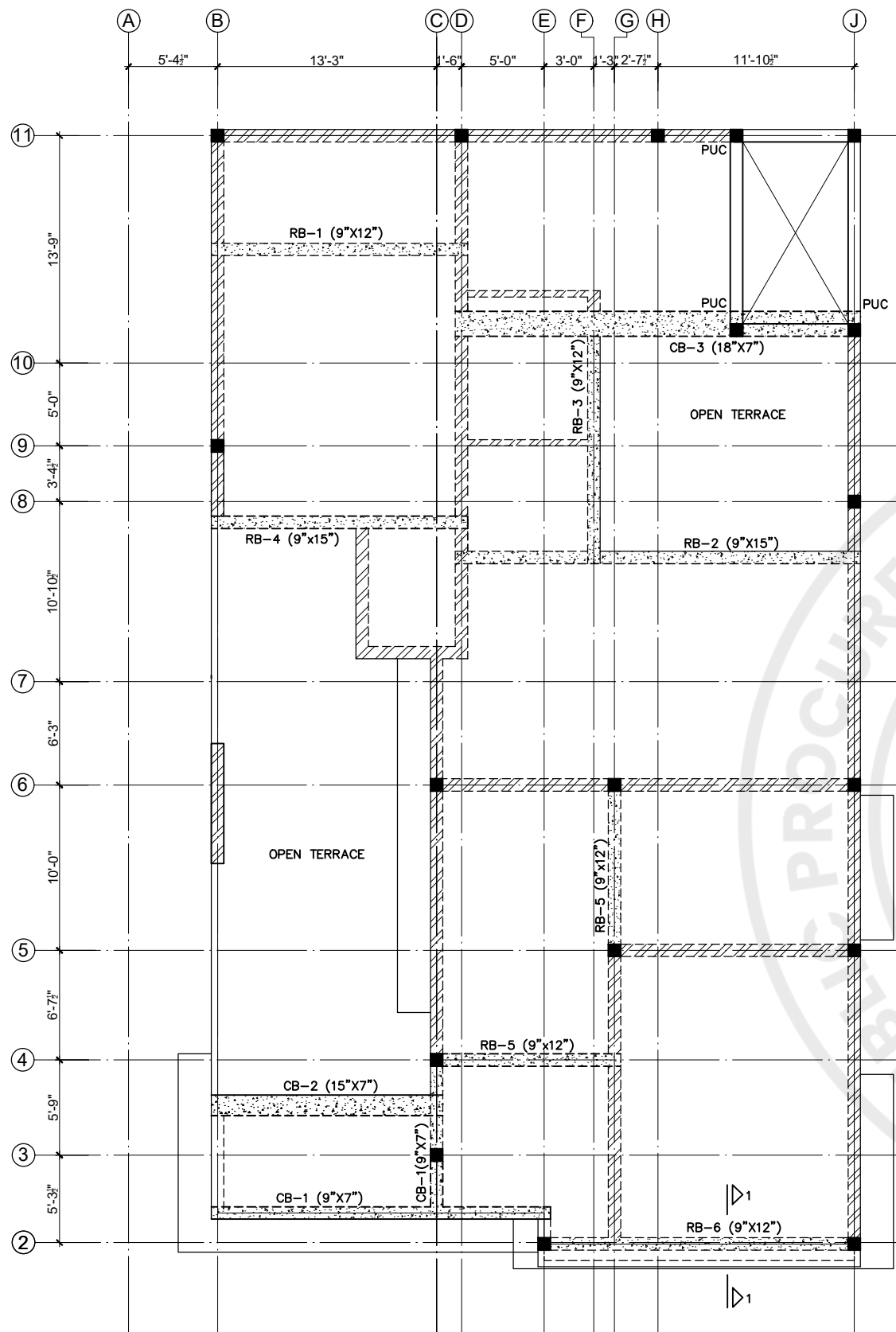
REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.

CONSTRUCTION OF HOUSES FOR ICT POLICE

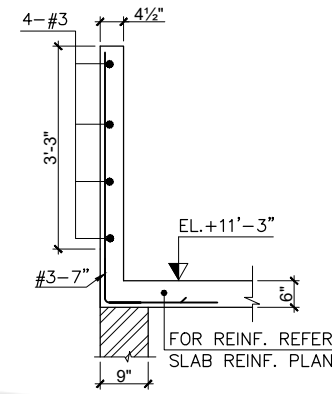
BOTTOM & TOP REINF. PLAN AT EL.+11'-3"

NES NATIONAL ENGINEERING SERVICES
PAK PAKISTAN (PVT.) LTD. ISLAMABAD

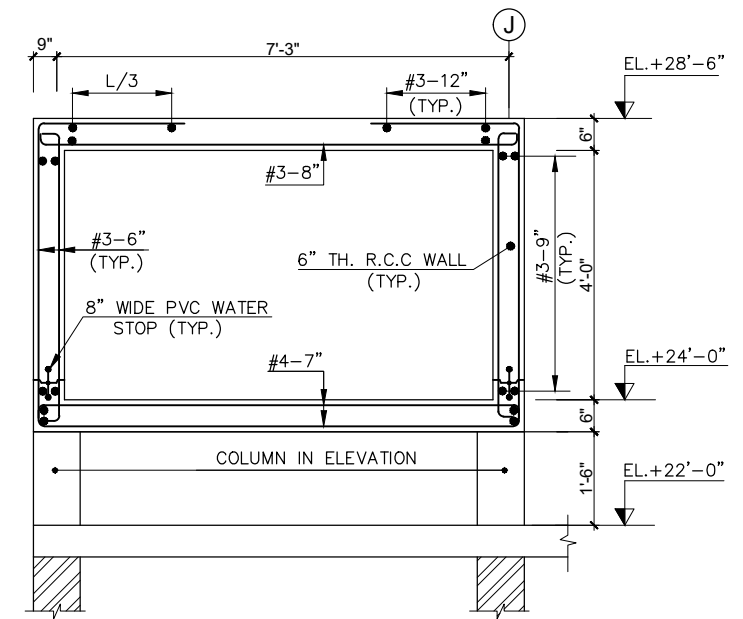
DESN. NESPAK	RECOMMENDED	VER./CKD.	APPROVED
DWN. MUNIR KHATTAK			
FILE	NIDA AFZAL	TALHA AFZAL	AAMIR RASHEED
CKD. NIDA AFZAL	DATE	DRAWING NO.	REV.
SUBM. AAMIR RASHEED	JULY 2026	156/323/TD/01G06	0



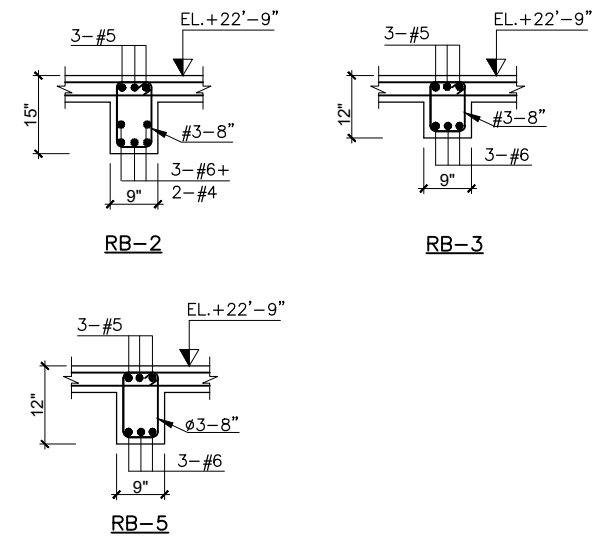
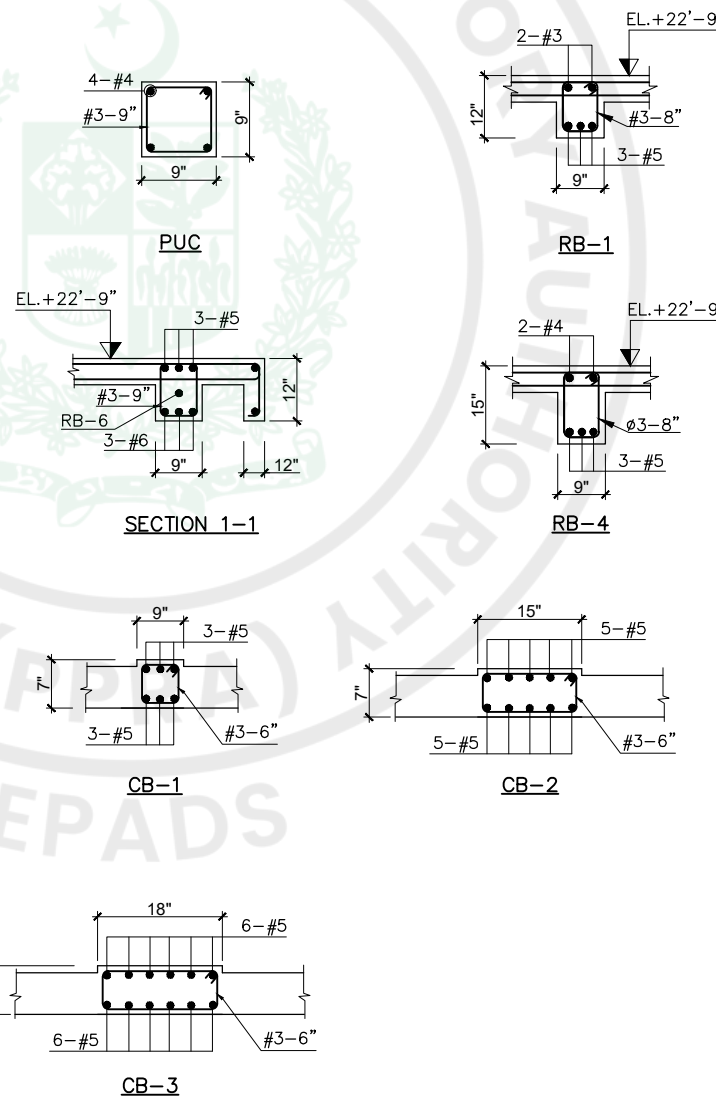
FRAMING PLAN AT EL.+22'-9"
(ALL SLABS ARE 5" TH. EXCEPT NOTED OTHERWISE)



TYP. SEC. OF PARAPET WALL



TYP. SECTION OF O.H.W.T



NOTES:-

1. FOR GENERAL NOTES REFER DWG.
2. READ THIS DRAWING IN CONJUNCTION WITH ALL RELEVANT PROJECT DRAWINGS.
3. ALL UNITS ARE IN 'FPS' EXCEPT NOTED OTHERWISE.
4. R.C.C LINTEL SHALL BE PLACED WITH ITS BOTH ENDS EXTENDING 9" IN BRICK MASONRY ON BOTH SIDES IN WALL.
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6. ALL SLABS ARE 5" TH. EXCEPT NOTED OTHERWISE.

SCALE = 1/8" = 1'-0"

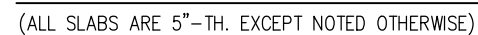
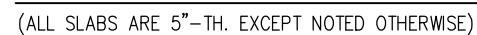
REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.

CONSTRUCTION OF HOUSES FOR ICT POLICE

FRAMING PLAN AT EL.+22'-9"

NES NATIONAL ENGINEERING SERVICES
PAK PAKISTAN (PVT.) LTD. ISLAMABAD

DESN. NESPAK	RECOMMENDED	VER./CKD.	APPROVED
DWN. MUNIR KHATTAK			
FILE	NIDA AFZAL	TALHA AFZAL	AAMIR RASHEED
CKD. NIDA AFZAL	DATE	DRAWING NO.	REV.
SUBM.AAMIR RASHEED	JULY 2026	156/323/TD/01G07	0



1. FOR GENERAL NOTES REFER DWG. NO. 156/323/C/01G01 & 02.
2. READ THIS DRAWING IN CONJUNCTION WITH ALL RELEVANT PROJECT DRAWINGS.
3. ALL UNITS ARE IN 'FPS' EXCEPT NOTED OTHERWISE.
4. R.C.C LINTEL SHALL BE PLACED WITH ITS BOTH ENDS EXTENDING 9" IN BRICK MASONRY ON BOTH SIDES IN WALL.
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6. WALLS THAT ARE NOT SHOWN IN FRAMING PLANS SHALL BE CONSTRUCTED AFTER THE SLAB ABOVE HAS GAINED ITS FULL STRENGTH AND SHUTTERING IS REMOVED.

1. ALL BINDERS BARS SHALL BE $\phi 3-12"$ c/c.
2. TOP REINF. AT EACH CONTINUOUS EDGE SHALL BE EXTENDED ON BOTH SIDES UPTO MAX. SPAN/3.
3. TOP REINF. AT EACH DISCONTINUOUS EDGE SHALL BE PROVIDED UPTO SPAN/4.
4. ALL SLABS ARE 6" TH. EXCEPT NOTED OTHERWISE.

REV. NO.	DATE	DESCRIPTION	BY	CKD. APPR.

NES NATIONAL ENGINEERING SERVICES
PAK PAKISTAN (PVT.) LTD. ISLAMABAD

REV.
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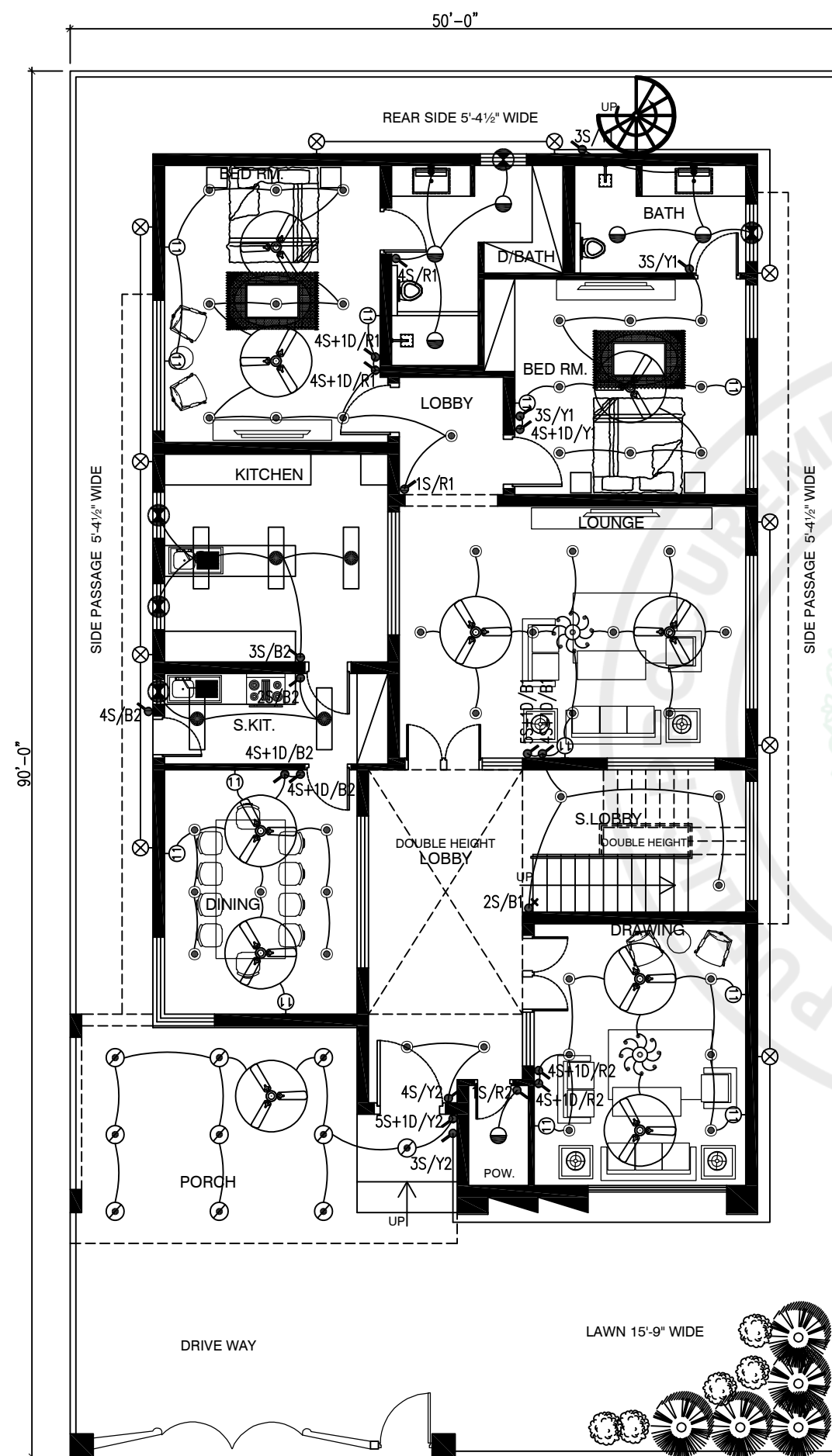
SYMBOLS AND DESCRIPTIONS GENERAL NOTES

ELECTRICAL WORKS		
S. #	SYMBOL	DESCRIPTION
1		MSB --- MAIN SWITCH BOARD
2		LDB --- LIGHTING DISTRIBUTION BOARD
3		INSTRUMENTS PROTECTION FUSES (THREE NOS.)
4		PDB --- POWER DISTRIBUTION BOARD
5		TRIPLE POLE, 500 VOLTS, MOULDED CASE CIRCUIT BREAKER (RATING CAPACITY INDICATED ON THE DRAWINGS & MENTIONED IN THE RELEVANT BOQ ITEM)
6		TRIPLE POLE, 500 VOLTS, MINIATURE CIRCUIT BREAKER (RATING CAPACITY INDICATED ON THE DRAWINGS & MENTIONED IN THE RELEVANT BOQ ITEM)
7		SINGLE POLE, 250 VOLTS, MINIATURE CIRCUIT BREAKER (RATING CAPACITY INDICATED ON THE DRAWINGS & MENTIONED IN THE RELEVANT BOQ ITEM)
8		THREE NOS. SINGLE PHASE CURRENT TRANSFORMERS (TRANSFORMATION RATIOS INDICATED ON DRAWINGS)
9		PHASE INDICATION LAMPS R - RED Y - YELLOW B - BLUE
10		CEILING FAN 56 INCH
11		EXHAUST FAN WITH METALLIC BLADES (10" DIA)
12		WALL BRACKET FAN
13		VSS - VOLTMETER SELECTOR SWITCH (RY-YB-BR-OFF-RN)
14		ASS - AMMETER SELECTOR SWITCH (R-Y-B-OFF)
15		AC AMMETER (MEASURING RANGE INDICATED ON DRAWING) (DIGITAL)
16		AC VOLTMETER (MEASURING RANGE INDICATED ON DRAWING) (DIGITAL)
17		EXHAUST FAN WITH METALLIC BLADES & MOUNTING RING (12" DIA)
18		CCTV CAMERA POINT
19		LIGHT CONTROL SWITCHES AND FAN DIMMERS
20		13 AMPS 250 VOLTS COMBINED 2 + 3 PIN SWITCH SOCKET UNIT
21		15 AMPS 250 VOLTS COMBINED 3 PIN SWITCH SOCKET UNIT
22		20 AMPS FLEX OUTLET 250 VOLTS FOR AC
23		

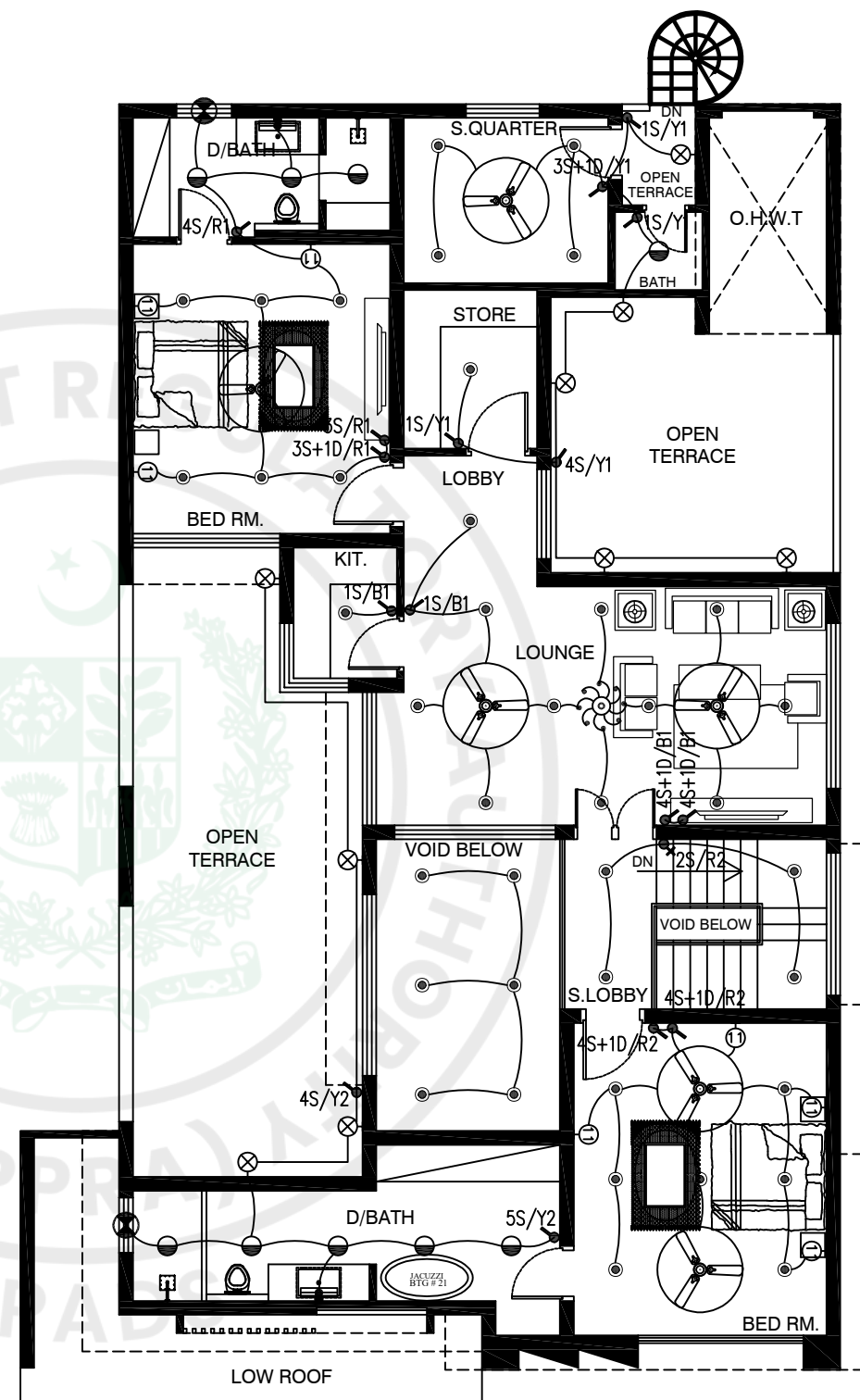
LIGHTING FIXTURES		
S. #	SYMBOL	DESCRIPTION
1		SURFACE MOUNTED 20W LED BATTEN, 2 FEET
2		BULKHEAD OUTDOOR LIGHT 12W
3		SURFACE/ CEILING MOUNTED LED DOWNLIGHT 7W
4		10W SURFACE/ RECESSED MOUNTED LED DOWN LIGHT
5		CEILING MOUNTED LED DOWNLIGHT 15W
6		SURFACE MOUNTED LIGHT FIXTURE WITH 3800 LUMENS
7		PLANTER LIGHT
8		

COMMUNICATIONS SYSTEMS		
S. #	SYMBOL	DESCRIPTION
1		RJ 45 OUTLET FOR VOICE (DIRECT LINE)
2		RJ 45 OUTLET FOR VOICE (EXT LINE)
3		TV POINT
4		SMOKE DETECTOR
5		HEAT DETECTOR
6		MANUAL CALL POINT WITH SOUNDER
7		FACP
8		RJ 45 SOCKET OUTLET (FOR NETWORKING)

ELECTRICAL SYSTEMS		
1.	FOLLOWING NOTES SHALL IN GENERAL APPLY TO ALL ELECTRICAL DRAWINGS. THE INSTRUCTIONS IN THESE NOTES SHALL BE FOLLOWED UNLESS STATED OTHERWISE.	
2.	THESE NOTES SHALL BE APPLICABLE TO THE ENTIRE ELECTRICAL WORKS. IF THE SITE CONDITIONS NECESSITATE ANY ALTERATIONS OR DEVIATIONS THE DIRECTIONS OF THE ENGINEER SHALL BE OBSERVED AS FINAL INSTRUCTIONS.	
3.	ALL ELECTRICAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH BOQ, TECHNICAL SPECIFICATIONS, ARCHITECTURAL, STRUCTURAL, PLUMBING AND HVAC DRAWINGS & ALL OTHER RELEVANT DETAILS.	
4.	DIMENSIONS/MEASUREMENTS GIVEN IN LAYOUT AND DETAILED DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE TO CALCULATE THE ACTUAL DIMENSIONS/MEASUREMENTS ACCORDING TO STRUCTURAL AND ARCHITECTURAL DRAWINGS.	
5.	THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS WITH ALL RELEVANT DETAILS TO THE ENGINEER FOR APPROVAL ACCORDING TO THE GENERAL CONDITIONS OF CONTRACT WELL IN TIME BEFORE COMMENCEMENT OF THAT WORK.	
6.	PROPER CO-ORDINATION OF ELECTRICAL WORKS WITH OTHER SERVICES SHALL BE CARRIED OUT AT SITE.	
7.	ALL NON-CURRENT CARRYING PARTS I.e. OUTER CASINGS OF EQUIPMENT SUCH AS HT & LT PANELS, DISTRIBUTION BOARDS, CABLE TRAYS, AUXILIARY CONSTRUCTIONS FOR EQUIPMENT ETC. SHALL BE CONNECTED TO THE GROUNDING/EARTHING SYSTEM AT REQUIRED NUMBER OF POINTS WITH SPECIFIED SIZES OF CONDUCTORS. WATER PIPES ALONG ELECTRICAL LINE SHALL BE BONDED TO THE EARTHING SYSTEM WITH 10mm ² SINGLE CORE, COPPER CONDUCTOR PVC CABLE.	
8.	ELECTRICAL POINTS FOR EQUIPMENT SHALL BE INSTALLED IN CO-ORDINATION WITH THE RELEVANT DRAWINGS OF OTHER SERVICES, SUCH AS COMMUNICATION SYSTEMS, HVAC, PLUMBING ETC. THE LOCATION ON ELECTRICAL DRAWINGS IS ONLY INDICATIVE.	
9.	ARRANGEMENT OF ELECTRICAL EQUIPMENTS ON ELECTRICAL DRAWINGS ARE TENTATIVE. EXACT ARRANGEMENT OF EQUIPMENTS SHALL BE MADE IN VIEW OF ITS PHYSICAL DIMENSIONS AND EASE OF MAINTENANCE.	
10.	LOADS ON ALL PHASES SHALL BE BALANCED AT THE TESTING/ COMMISSIONING STAGE.	
11.	CONDUIT/DUCT RUN UNDER FLOOR SHALL HAVE A MINIMUM COVER OF TWO INCHES FROM TOP OF CONDUIT/DUCT TO FINISH FLOOR LEVEL.	
12.	RUN GREEN-YELLOW OR GREEN SINGLE CORE PVC INSULATED COPPER CONDUCTOR CABLE OF SPECIFIED SIZES AS PROTECTIVE EARTH CONDUCTOR (ECC) ALL ALONG LIGHT AND POWER WIRING. WHEREVER THE SIZE IS NOT SPECIFIED THE FOLLOWING CRITERIA SHALL BE OBSERVED TO DETERMINE MINIMUM CROSS SECTIONAL AREA OF EARTH CONTINUITY CONDUCTOR(ECC) IN RELATION TO THE AREA OF ITS PHASE CONDUCTORS. RUN SEPARATE ECC FOR EACH CIRCUIT. ECC & PHASE CONDUCTOR OF SAME SIZE FOR UP TO AND INCLUDING 16mm ² CABLES. - 16mm ² ECC FOR PHASE CONDUCTOR OF 16mm ² , 25mm ² & 35 mm ² CABLES. FOR CABLES OF 50mm ² AND ABOVE SIZES, ECC IS HALF SIZE OF PHASE CONDUCTOR. - MAXIMUM SIZE OF ECC IS 70mm ² .	
13.	THE MAXIMUM CAPACITY OF PVC CONDUITS FOR SIMULTANEOUS DRAWING OF PVC INSULATED CABLES SHALL BE DETERMINED AS PER BS 4807. THE FOLLOWING TABLE SHALL BE USED TO DETERMINE THE MAXIMUM NUMBER OF CABLES.	
S. #	NOMINAL CROSS SECTIONAL AREA OF CABLES (mm ²)	NOMINAL OVERALL DIA. (mm)
1	1.5	1/1.38
2	2.5	1/1.78
3	2.5	7/0.87
4	4	7/0.85
5	6	7/1.04
6	10	7/1.35
7	16	7/1.70
8	25	7/2.14
9	35	19/1.53
10	50	19/1.53
11	70	19/1.53
12	95	19/1.53
13	120	19/1.53
14	150	19/1.53
15	185	19/1.53
16	240	19/1.53
17	300	19/1.53
18	350	19/1.53
19	400	19/1.53
20	450	19/1.53
21	500	19/1.53
22	550	19/1.53
23	600	19/1.53
24	650	19/1.53
25	700	19/1.53
26	750	19/1.53
27	800	19/1.53
28	850	19/1.53
29	900	19/1.53
30	950	19/1.53
31	1000	19/1.53
32	1050	19/1.53
33	1100	19/1.53
34	1150	19/1.53
35	1200	19/1.53
36	1250	19/1.53
37	1300	19/1.53
38	1350	19/1.53
39	1400	19/1.53
40	1450	19/1.53
41	1500	19/1.53
42	1550	19/1.53
43	1600	19/1.53
44	1650	19/1.53
45	1700	19/1.53
46	1750	19/1.53
47	1800	19/1.53
48	1850	19/1.53
49	1900	19/1.53
50	1950	19/1.53
51	2000	19/1.53
52	2050	19/1.53
53	2100	19/1.53
54	2150	19/1.53
55	2200	19/1.53
56	2250	19/1.53
57	2300	19/1.53
58	2350	19/1.53
59	2400	19/1.53
60	2450	19/1.53
61	2500	19/1.53
62	2550	19/1.53
63	2600	19/1.53
64	2650	19/1.53
65	2700	19/1.53
66	2750	19/1.53
67	2800	19/1.53
68	2850	19/1.53
69	2900	19/1.53
70	2950	19/1.53
71	3000	19/1.53
72	3050	19/1.53
73	3100	19/1.53
74	3150	19/1.53
75	3200	19/1.53
76	3250	19/1.53
77	3300	19/1.53
78	3350	19/1.53
79	3400	19/1.53
80	3450	19/1.53
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91	4000	19/1.53
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96	4250	19/1.53
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104	4650	19/1.53
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106	4750	19/1.53
107	4800	19/1.53
108	4850	19/1.53
109	4900	19/1.53
110	4950	19/1.53
111	5000	19/1.53
112	5050	19/1.53
113	5100	19/1.53
114	5150	19/1.53
115	5200	19/1.53
116	5250	19/1.53
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126	5750	19/1.53
127	5800	19/1.53
128	5850	19/1.53
129	5900	19/1.53
130	5950	19/1.53
131	6000	19/1.53
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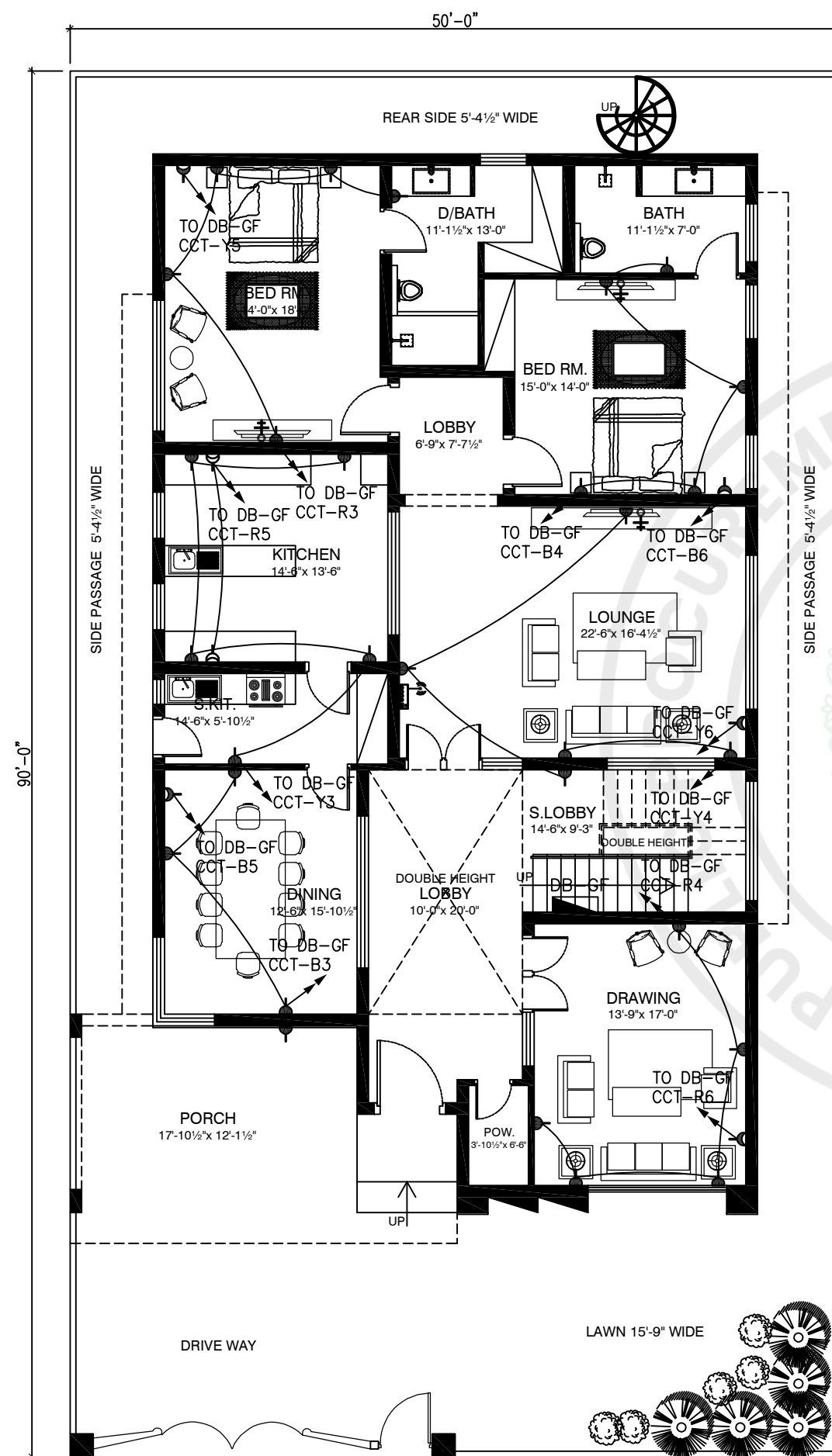
GROUND FLOOR PLAN



FIRST FLOOR PLAN

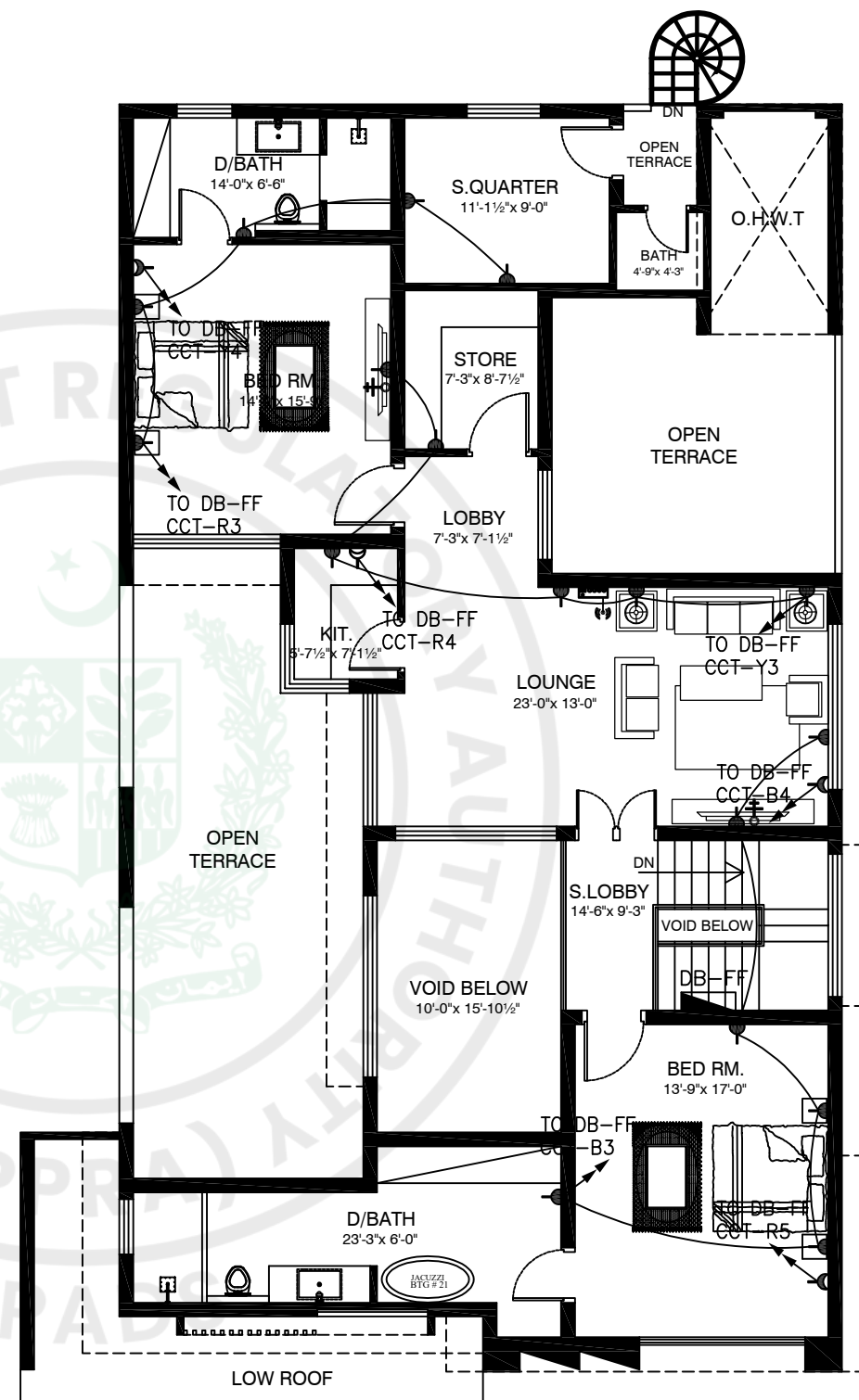
- NOTES:—
1. FOR GENERAL NOTES REFER DWG. NO.
 2. READ THIS DRAWING IN CONJUNCTION WITH ALL RELEVANT PROJECT DRAWINGS.
- SCALE = 1/8" = 1'-0"

REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.
CONSTRUCTION OF HOUSES FOR ICT POLICE					
GROUND & FIRST FLOOR PLAN LIGHTING LAYOUT					
NES PAK NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD. ISLAMABAD					
DESIGNER	RECOMMENDED	VER/CKD.	APPROVED		
DWN.					
FILE					
CKD.	DATE	DRAWING NO.	REV.		
SUBM.	JULY 2026	156/325/BD/01E02	0		



GROUND FLOOR PLAN

2496.35 S.FT



FIRST FLOOR PLAN

1748.95 S.FT

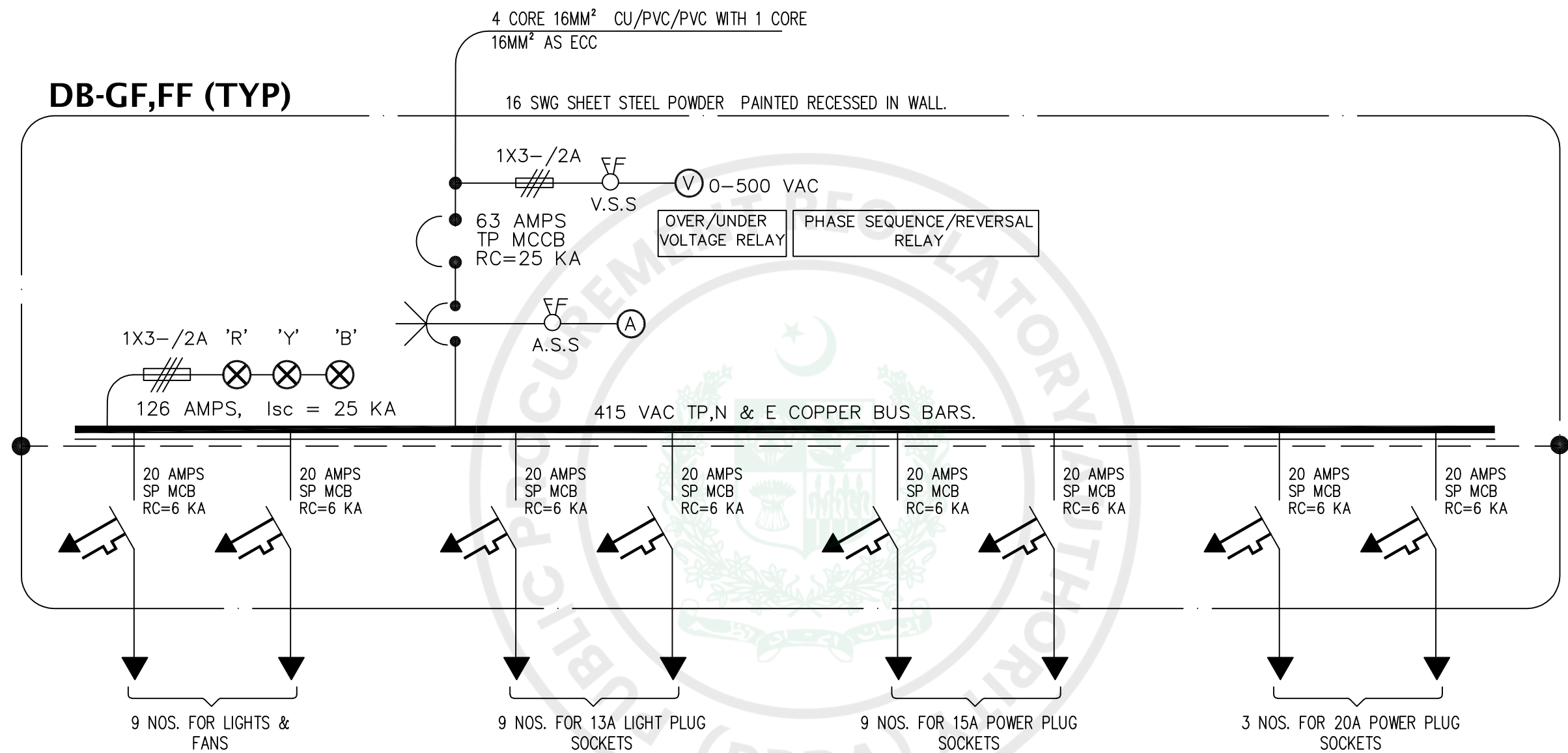
NOTES: –

- NOTES:**
1. FOR GENERAL NOTES REFER DWG. NO.
 2. READ THIS DRAWING IN CONJUNCTION WITH ALL RELEVANT PROJECT DRAWINGS.

SCALE = 1/8" = 1'-0"

REV. NO.	DATE		DESCRIPTION		BY	CKD.	APPR.		
CONSTRUCTION OF HOUSES FOR ICT POLICE									
GROUND & FIRST FLOOR PLAN POWER LAYOUT									
 NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD. ISLAMABAD									
DESIGN _____ NESPAK		RECOMMENDED		VER./CKD.		APPROVED			
DWN. _____		_____		_____		_____			
FILE _____									
CKD. _____									
SUBM. _____		DATE		DRAWING NO.				REV.	
		JULY' 2026		156/325/BD/01E03				0	

DB-GF,FF (TYP)



SCALE = 1/8" = 1'-0"

REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.
CONSTRUCTION OF HOUSES FOR ICT POLICE					
SINGLE LINE DIAGRAM					
NES NATIONAL ENGINEERING SERVICES PAK PAKISTAN (PVT.) LTD. ISLAMABAD					
DESN. NESPAK	RECOMMENDED	VER./CKD.	APPROVED		
DWN. _____	_____	_____	_____		
FILE _____	_____	_____	_____		
CKD. _____	DATE	DRAWING NO.		REV.	
SUBM. _____	JULY' 2026	156/325/BD/01E04		0	

ABBREVIATION	DESCRIPTION
Ø	DIAMETER OF PIPE
CW	COLD WATER PIPE
HW	HOT WATER PIPE
HWR	HOT WATER RETURN PIPE
SP	SOIL PIPE
WP	WASTE PIPE
VP	VENT PIPE
S/S	SOIL STACK
W/S	WASTE STACK
V/S	VENT STACK
T/A	TO ABOVE
T/B	TO BELOW
F/A	FROM ABOVE
F/B	FROM BELOW
U/G.	UNDER GROUND
U/F.	UNDER FLOOR
CWH	GAS WATER HEATER
SH	BATH SHOWER
MS	MUSLIM SHOWER

GENERAL NOTES

- 1 – PIPE PASSING THROUGH WALL, FLOOR OR ROOF SHALL BE PROTECTED WITH SLEEVES
- 2 – CLEANOUT OR ACCESS DOOR SHALL BE PROVIDED AT THE BASE OF ALL DRAINAGE STACK AND AT EACH FLOOR LEVEL.
- 3 – DRAINAGE STACKS SHALL BE CONNECTED TO HORIZONTAL FIXTURE DRAIN PIPES BY 90° SWEEP TEE OR Y AND 45° BEND.
- 4 – DRAINAGE STACKS SHALL BE CONNECTED TO UNDERGROUND DRAIN PIPE BY EITHER 90° LARGE/LONG RADIUS BEND OR TWO 45° BENDS.
- 5 – PIPE SIZES ARE IN INCHES.
- 6 – PLUMBING SERVICES, SHALL BE CO-ORDINATED WITH OTHER SERVICES SUCH AS ELECTRICAL, HVAC ETC. TO AVOID CONFLICT OR INTERFERENCE WITH THEM.
- 7 – SIZE OF FLOOR DRAIN UNLESS OTHERWISE STATED SHALL BE SAME AS THE SIZE OF OUTLET DRAIN PIPE.
- 8 – WHEREVER FLOOR DRAIN/TRAP IS SHOWN, SLOPE FLOOR TOWARDS DRAIN/TRAP.
- 9 – HORIZONTAL DRAINAGE PIPING OF 3 INCH DIAMETER & LESS SHALL BE INSTALLED WITH A SLOPE OF NOT LESS THEN 1/4 INCH PER FOOT, LARGER ONES WITH A SLOPE OF NOT LESS THEN 1/8 INCH PER FOOT.
- 10 – VENT PIPES SHALL BE EXTENDED ONE METER ABOVE ROOF FINISHED LEVEL AND VENT COWLS SHALL BE PROVIDED ON EACH VENT OUTLET.
- 11 – THE "VERTICAL DISTANCE" FROM FIXTURE OUTLET TO THE TRAP WEIR SHALL PREFERABLY BE NOT MORE THAN 12 INCHES. HOWEVER, THIS "VERTICAL DISTANCE" FROM THE FIXTURE OUTLET TO THE TRAP WEIR SHALL NOT EXCEED 24 INCHES.

ABBREVIATION	DESCRIPTION
RWP	RAIN WATER PIPE
WMH	WASTE MANHOLE
SMH	SOIL MANHOLE
CP	CATCH PIT
GI	GALVANIZED IRON
GV	GATE VALVE
CV	CHECK VALVE
WC	WATER CLOSET
AF/C	ABOVE FALSE CEILING
(TYP)	TYPICAL
FT	FLOOR TRAP
H/L	HIGH LEVEL
U/F	UNDER FLOOR / LOW LEVEL
WC	WATER CLOSET
N.T.S.	NOT TO SCALE

GENERAL NOTES

- 12 – WHERE THE CHANGE OF DIRECTION IS 45° OR LESS, IT IS NOT NECESSARY TO PROVIDE A CLEAN OUT. BUT WHEN THE CHANGE IN DIRECTION IS MORE THAN 45°, A CLEAN OUT SHOULD BE REQUIRED.
- 13 – CLEANOUTS SHALL BE SO INSTALLED THAT THERE IS A CLEARANCE OF NOT LESS THAN 18 INCHES FOR THE PURPOSE OF RODDING.
- 14 – ALL TRAPS AND FLOOR DRAINS SHALL HAVE A WATER SEAL NOT LESS THAN 2 INCHES.
- 15 – NO T-CONNECTION IS ALLOWED IN SOIL AND WASTE PIPING.
- 16 – ALL PLUMBING DUCTS MUST HAVE ACCESS PANELS AT EACH FLOOR.
- 17 – ALL PLUMBING DUCTS MUST BE PLASTERED WITH 1:3 C/S WATER PROOF PLASTER BEFORE INSTALLATION OF PIPES ETC.
- 18 – TYPICAL OUTLET SIZE OF FIXTURES SHALL BE AS FOLLOWS;

WATER CLOSET	4"
FLOOR DRAIN	3"
SHOWER / TUB	2"
- 19 – MINIMUM SIZE OF WATER SUPPLY DISTRIBUTION PIPE SHALL BE 25mm.
- 20 – MINIMUM SIZE OF SOIL PIPE DIAMETER FOR SHALL BE 100mm.
- 21 – WATER FILTERS SHALL BE PROVIDED AT EACH WATER COOLER LOCATION, WITH THE SOURCE LINE.

NOTE:

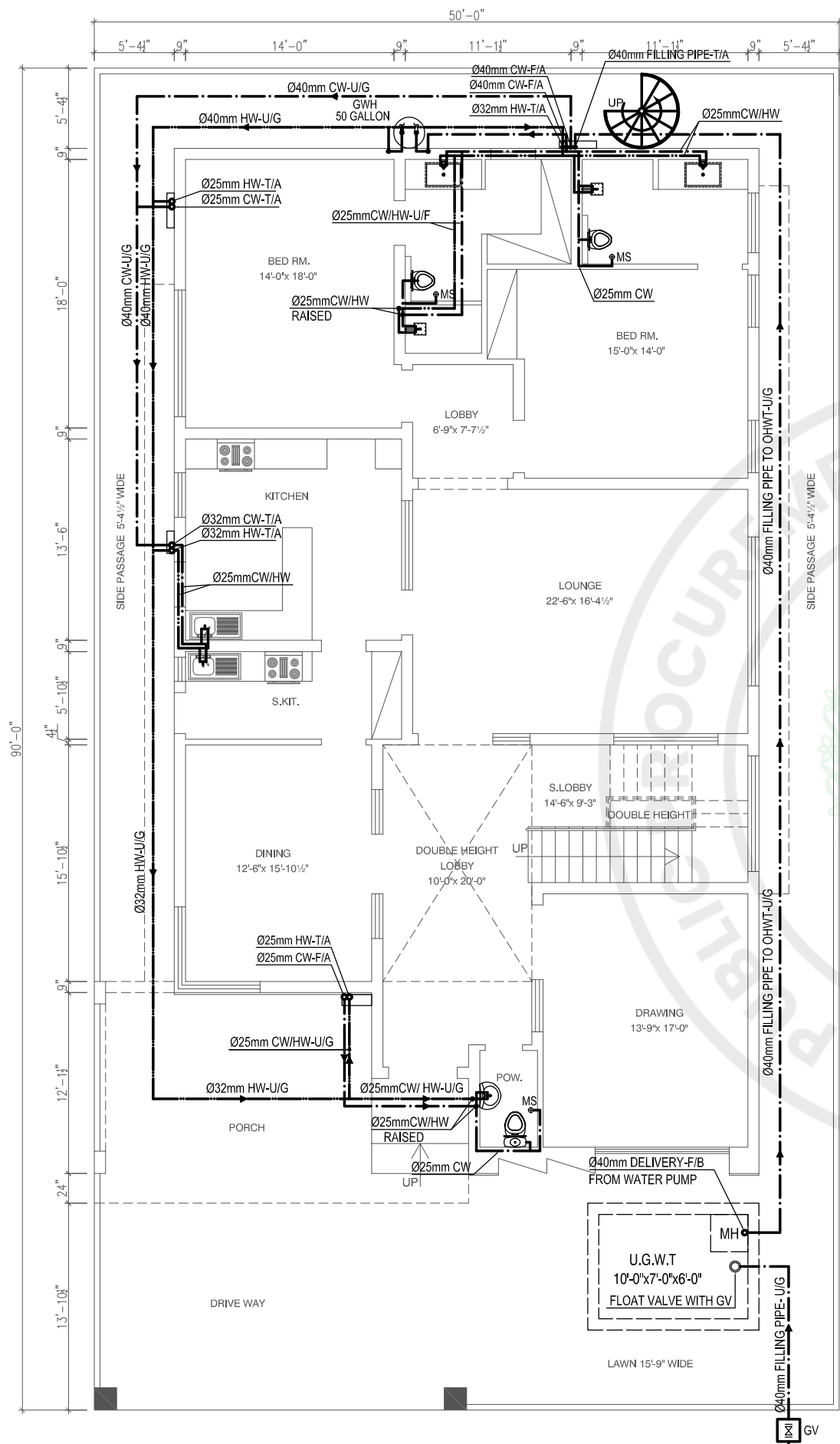
1. READ THIS DRAWING IN CONJUNCTION WITH ALL RELEVANT PROJECT DRAWINGS.

REFERENCE DRAWINGS		REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.		

SYMBOL	DESCRIPTION
	COLD WATER PIPE
	HOT WATER PIPE
	SOIL PIPE
	WASTE PIPE
	VENT PIPE
	GATE VALVE ON HORIZONTAL PIPE
	GATE VALVE ON VERTICAL PIPE
	CHECK VALVE OR NON-RETURN VALVE
	FLOOR CLEAN OUT
	FLOOR CLEAN OUT PLUG
	MULTI FLOOR TRAP
	FLOOR TRAP
	DIRECTION OF FLOW
	MUSLIM SHOWER
	GREASE TRAP
	GULLY TRAP
	GAS /ELECTRIC WATER HEATER
	SHOWER
	WATER COOLER
	FIRE HYDRANT
	FIRE HOSE CABINET
	ASIAN WATER CLOSET
	ENGLISH WATER CLOSET
	VANITY
	WASH HAND BASIN

SCALE: 3/32" = 1'-0"

ISLAMABAD CAPITAL TERRITORY POLICE			
ICT POLICE ACCOMMODATION PROJECT ISLAMABAD GENERAL NOTES, SYMBOLS & ABBREVIATIONS (PLUMBING WORKS)			
NESPAK NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD. ISLAMABAD			
DESN. <u>NESPAK</u>	RECOMMENDED <u>BW</u>	VER./CKD. <u>M.A.JAVED</u>	APPROVED <u>M.A.JAVED</u>
DWN. <u>HASNAT</u>	BUSHRA	M.A.JAVED	M.A.JAVED
FILE	DATE	DRAWING NO.	REV.
CKD. <u>M.A.JAVED</u>		156/326/BD/01F01	
SUBM. <u>M.A.JAVED</u>	<u>AUG, 2026</u>		



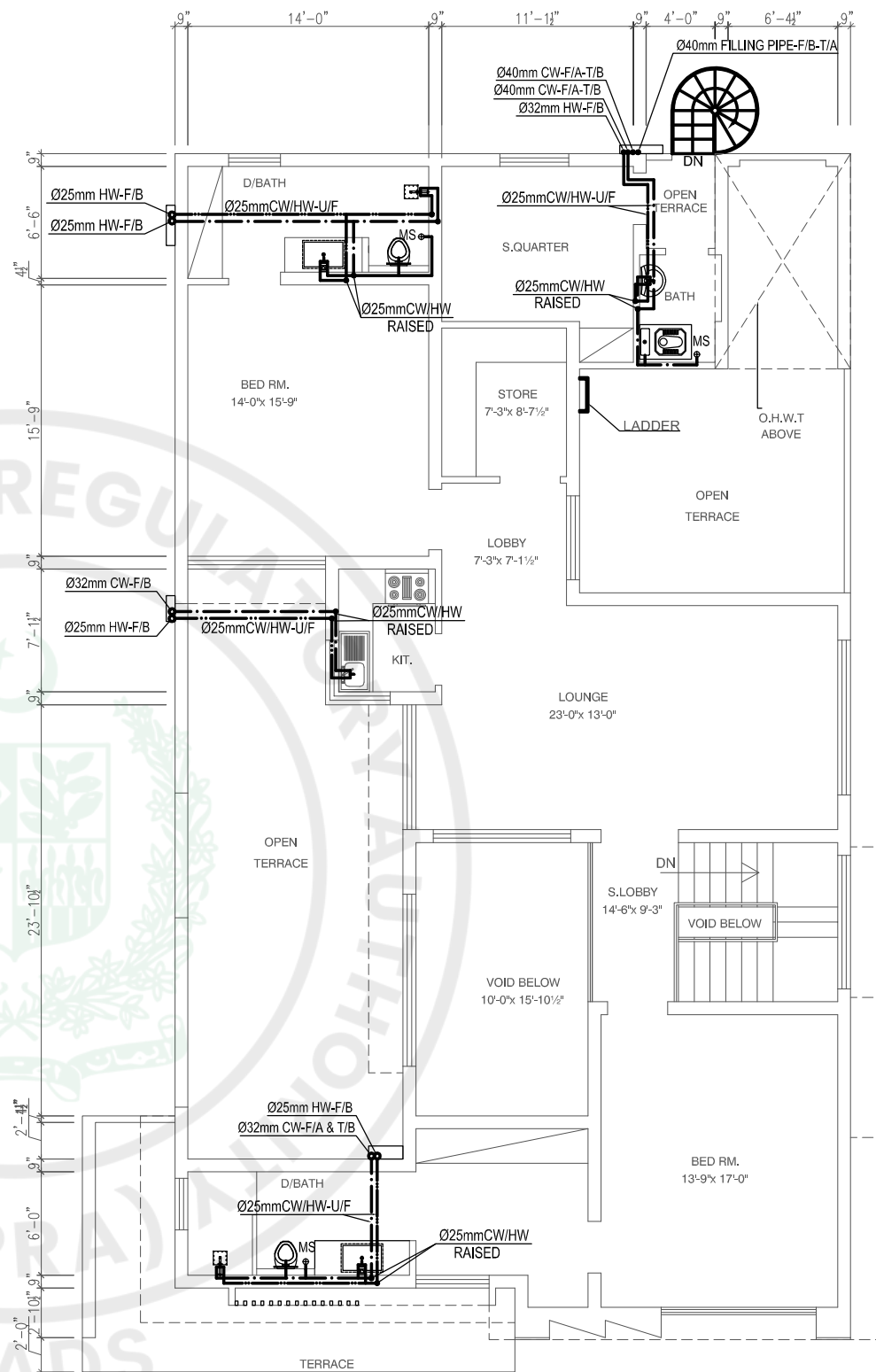
GROUND FLOOR PLAN

Ø40mm SUPPLY LINE
FROM WATER SOURCE
AS PER SITE

NOTE:

1. READ THIS DRAWING IN CONJUNCTION WITH ALL RELEVANT PROJECT DRAWINGS.

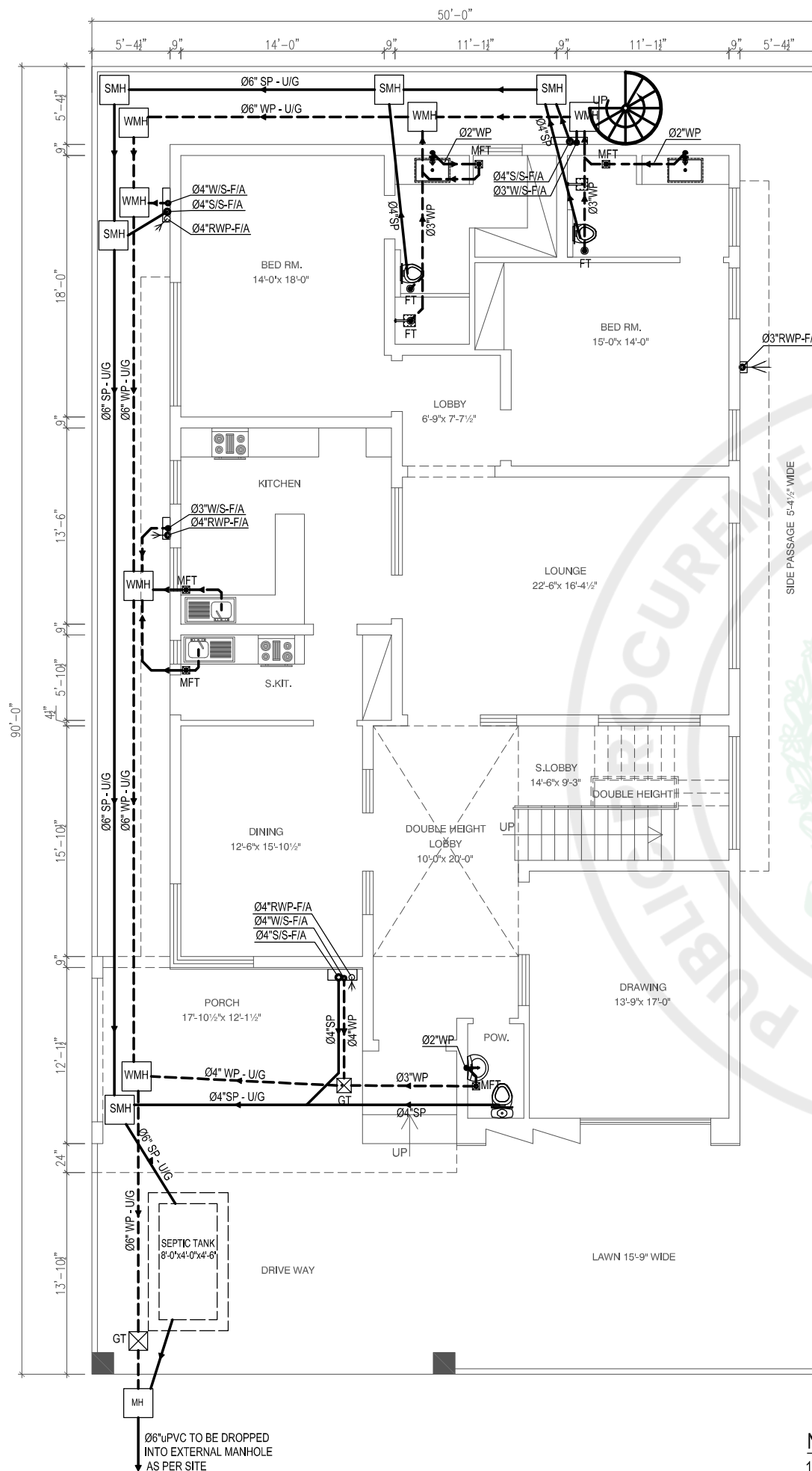
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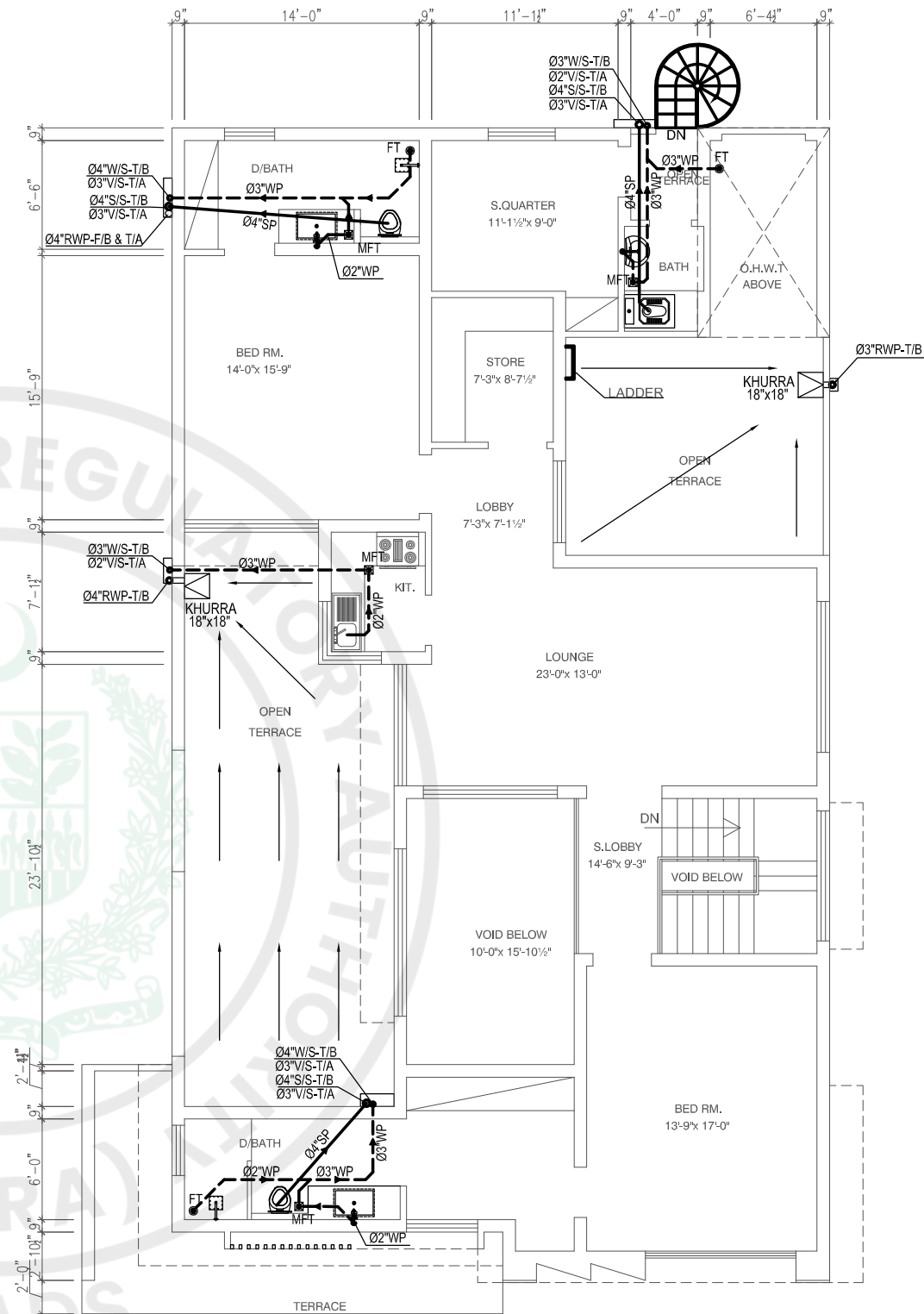
FIRST FLOOR PLAN

SCALE: 3/32" = 1'-0"

ISLAMABAD CAPITAL TERRITORY POLICE						
ICT POLICE ACCOMMODATION PROJECT ISLAMABAD GROUND & FIRST FLOOR PLAN PLUMBING (WATER SUPPLY LAYOUT)						
DESIGNER: NESPAC		RECOMMENDED: BUSHRA		VER./CKD.: M.A.JAVED		APPROVED: M.A.JAVED
DWN.: HASNAT		DATE: AUG. 2026		DRAWING NO.: 156/326/BD/01F02		REV.: .
FILE: M.A.JAVED		SUBM.: M.A.JAVED				



GROUND FLOOR PLAN



FIRST FLOOR PLAN

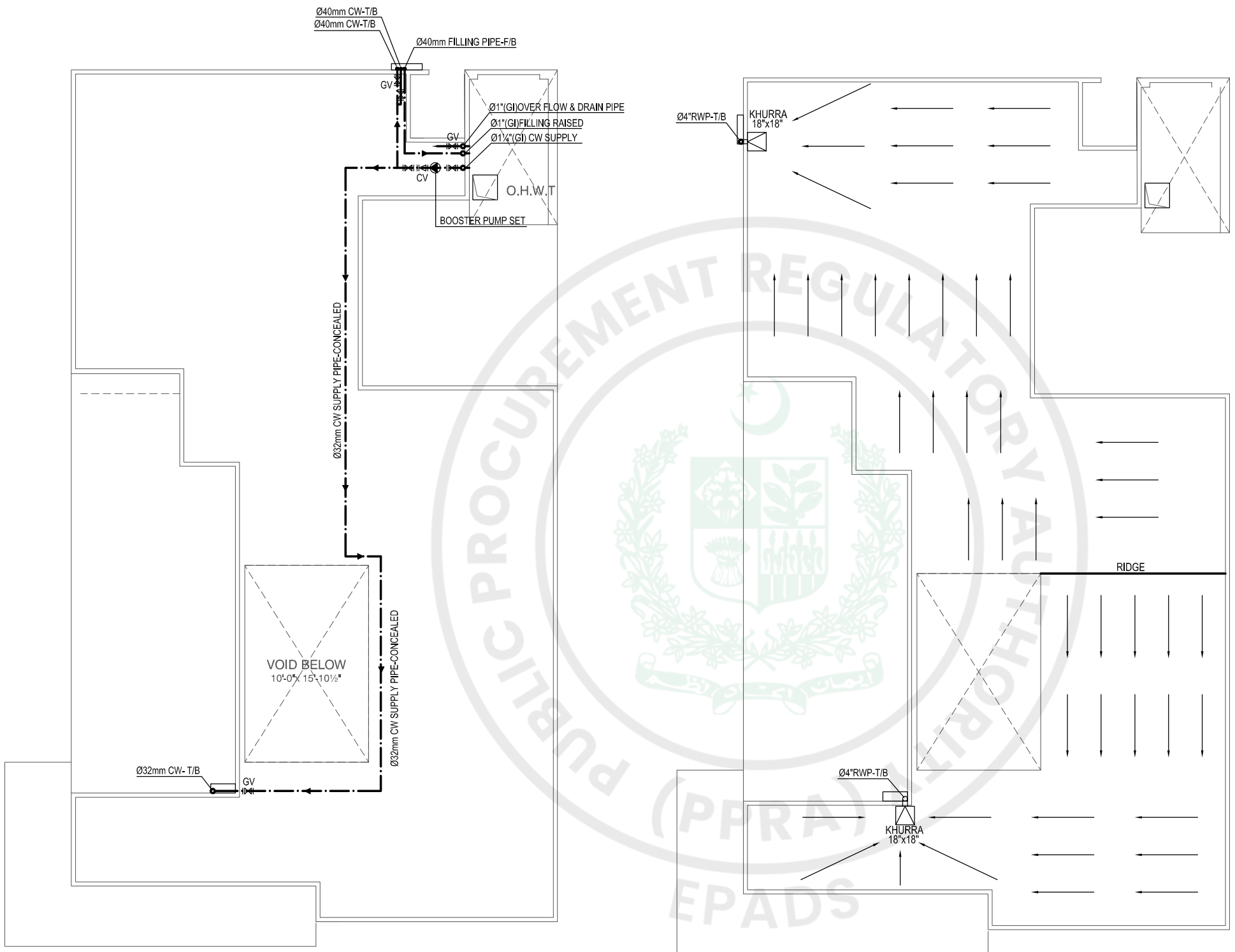
SCALE: 3/32" = 1'-0"

NOTE:

1. READ THIS DRAWING IN CONJUNCTION WITH ALL RELEVANT PROJECT DRAWINGS.

REFERENCE DRAWINGS	REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.

ISLAMABAD CAPITAL TERRITORY POLICE						
ICT POLICE ACCOMMODATION PROJECT ISLAMABAD GROUND & FIRST FLOOR PLAN PLUMBING (SANITARY DRAINAGE LAYOUT)						
NESPAN NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD. ISLAMABAD						
DESIGN. NESPAN	RECOMMENDED	VER./CKD.	APPROVED			
DWN. HASNAT	BUSHRA	M.A.JAVED	M.A.JAVED			
FILE	DATE	DRAWING NO.		REV.		
CKD. M.A.JAVED		156/326/BD/01F03				
SUBM. M.A.JAVED	AUG. 2026					



ROOF PLAN

ROOF PLAN

SCALE: 3/32" = 1'-0"

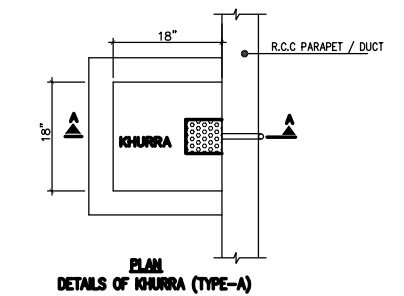
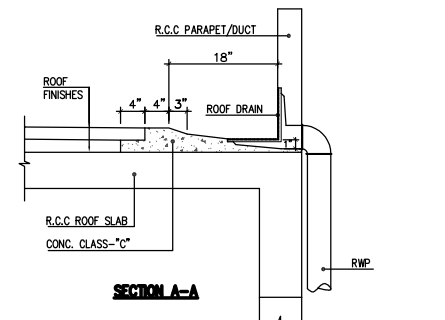
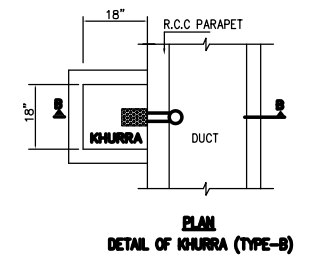
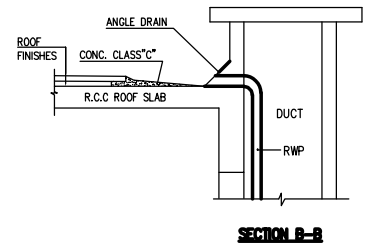
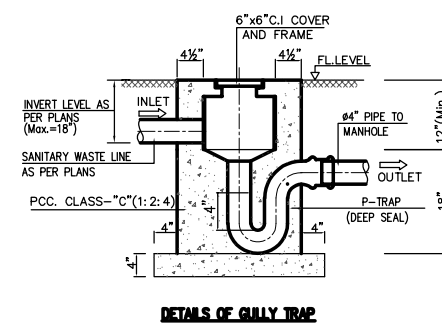
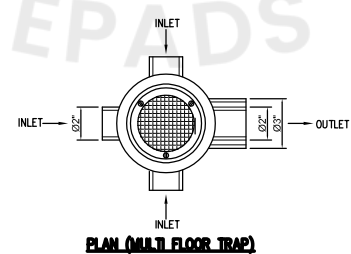
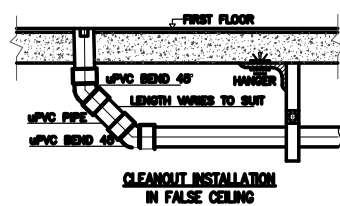
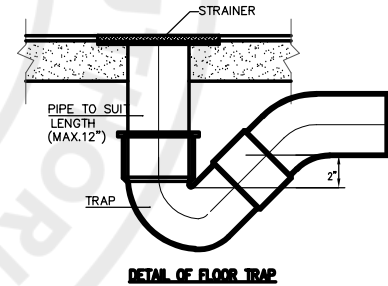
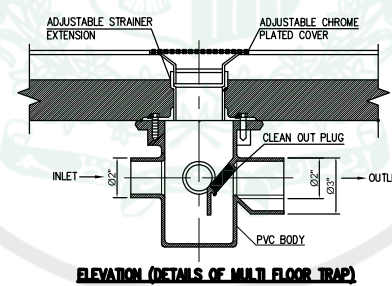
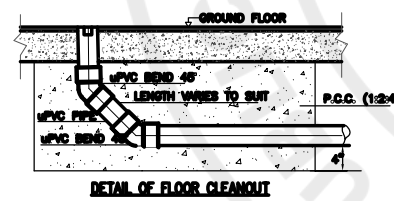
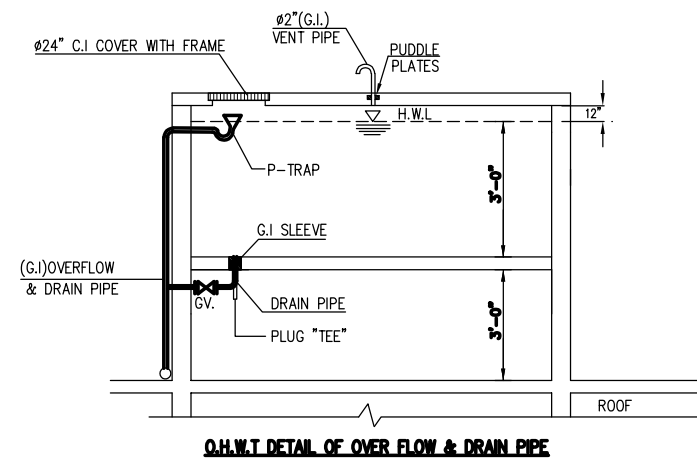
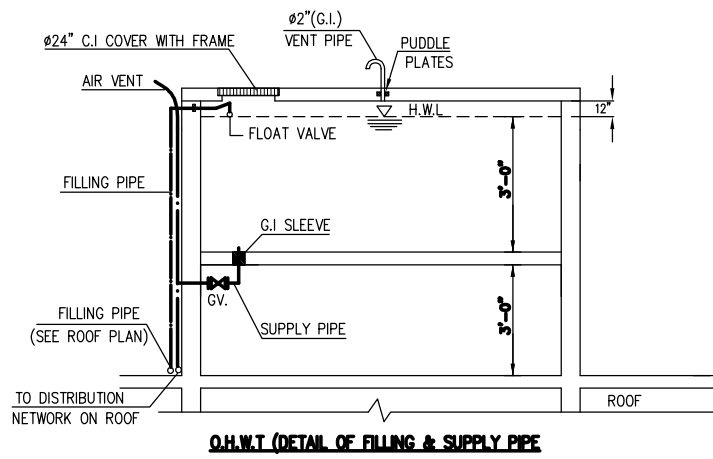
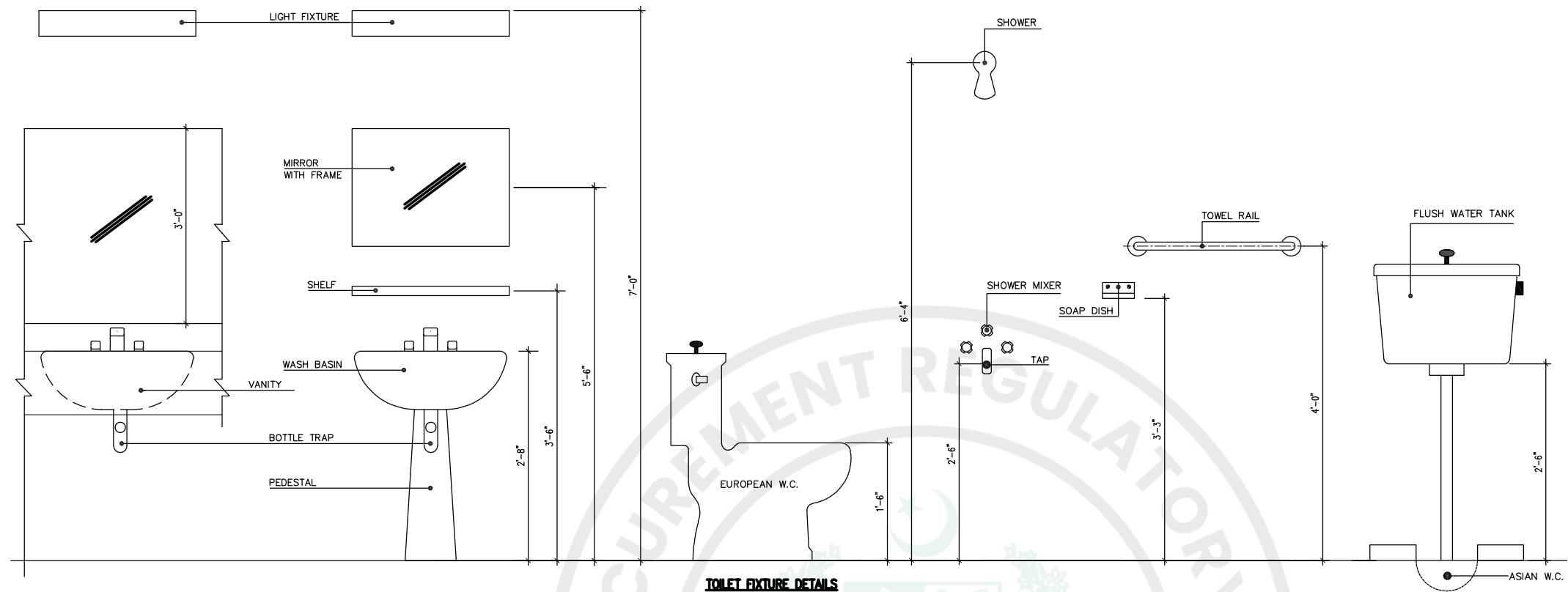
ISLAMABAD CAPITAL TERRITORY POLICE

ICT POLICE ACCOMMODATION PROJECT
ISLAMABAD
GROUND & FIRST FLOOR PLAN
(WATER SUPPLY & STORM DRAINAGE LAYOUT)

NESPAK		NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD. ISLAMABAD	
DESN. NESPAK	RECOMMENDED	VER./CKD.	APPROVED
DWN. HASNAT	BW	BUSHRA	M.A.JAVED
FILE	DATE	DRAWING NO.	
CKD. M.A.JAVED		156/326/BD/01F04	
SUBM. M.A.JAVED	AUG. 2026		

NOTE:
1. READ THIS DRAWING IN CONJUNCTION WITH ALL RELEVANT PROJECT DRAWINGS.

REFERENCE DRAWINGS	REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.



SCALE: 3/32" = 1'-0"

ISLAMABAD CAPITAL TERRITORY POLICE				
ICT POLICE ACCOMMODATION PROJECT ISLAMABAD MISCELLANEOUS DETAILS (PLUMBING WORKS)				
NES PAK		NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD. ISLAMABAD		
DESIGN. NESPAK	RECOMMENDED BW	VER./CKD. M.A.JAVED	APPROVED M.A.JAVED	
DWN. HASNAT	BUSHRA	M.A.JAVED	M.A.JAVED	
FILE	DATE	DRAWING NO.		REV.
CKD. M.A.JAVED		156/326/BD/01F05		
SUBM. M.A.JAVED	AUG. 2026			

NOTE:
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REFERENCE DRAWINGS	REV. NO.	DATE	DESCRIPTION	BY	CKD.	APPR.

**MINISTRY OF INTERIOR & NARCOTICS CONTROL NATIONAL
POLICE FOUNDATION (NPF), ISLAMABAD**

CONSTRUCTION OF HOUSES FOR ICT POLICE

PRICE BID

**BIDDING DOCUMENTS
VOLUME – IV**

LETTER OF PRICE BID
PREAMBLE TO BOQ
ESTIMATES

AUGUST, 2026

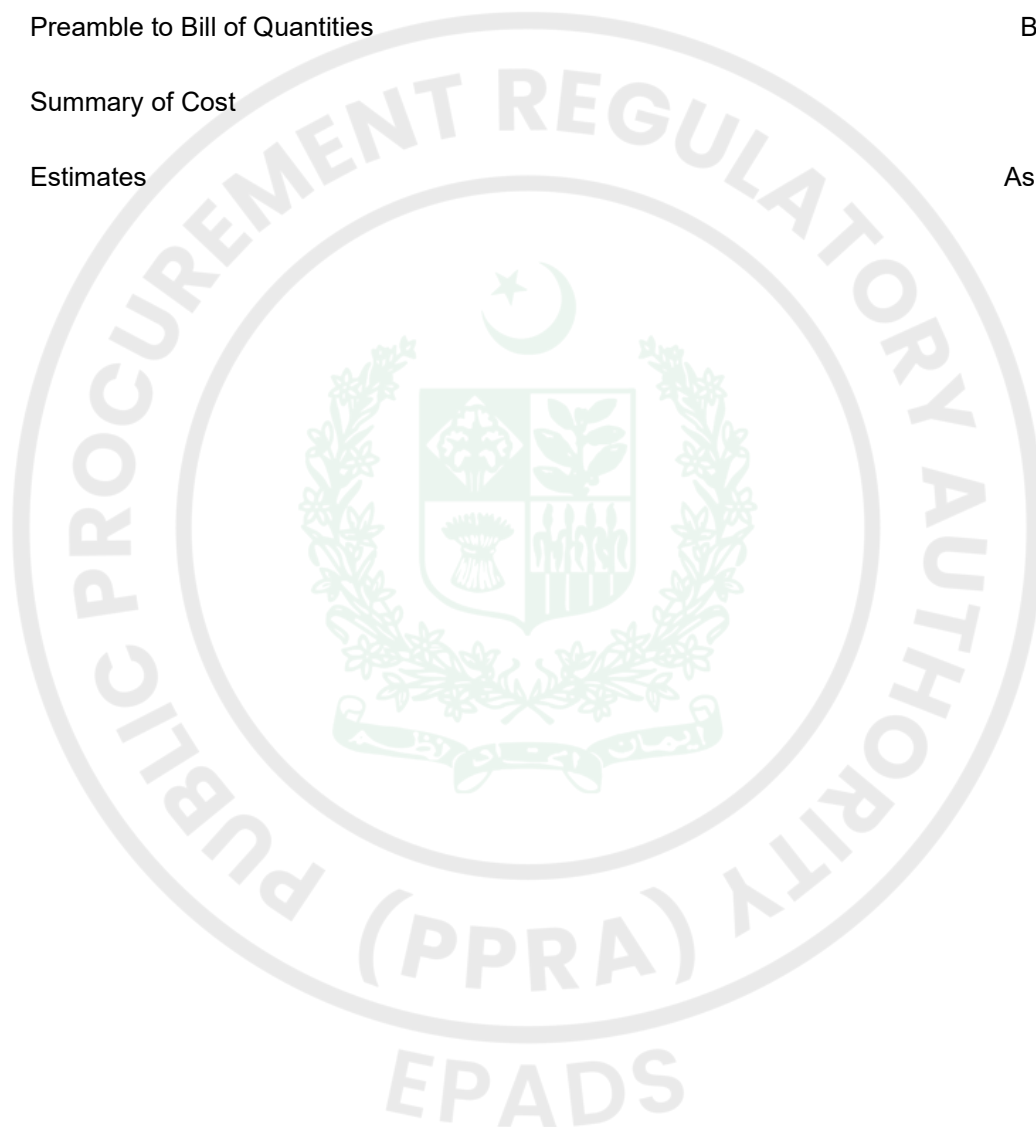


NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD
NESPAK House, Sector G-5/2, Islamabad, Tel: 051-9221910-13, Fax: 051-9221914.

LETTER OF PRICE BID AND BILL OF QUANTITIES

TABLE OF CONTENTS

BID AND APPENDICES	Page No.
Letter of Price Bid	LPB-1
Preamble to Bill of Quantities	BD-1 to BD-2
Summary of Cost	BD-5
Estimates	As per Contents



Letter of Price Bid

Name of Contract: "Construction of Houses for ICT Police at Police Lines Headquarters, H-11, Islamabad"

To: **Director Admin**

National Police Foundation (NPF),
NPF Head Office, Mauve Area, G-10, Islamabad
Ph: 051-2350100

We, the undersigned, declare that:

1. Having examined the Bidding Documents including Instructions to Bidders, Bidding Data, Conditions of Contract, Specifications, Schedules to Bid including Bill of Quantities, Drawings and Addenda Nos. _____ for the execution of the above-named Works, we, the undersigned, offer to execute and complete such Works and remedy any defects therein in conformity with the said Bidding Documents and Addenda for the sum of Equivalent PKR _____ (Eq. Pak Rupees _____) or such other sum as may be ascertained in accordance with the said conditions.
2. We meet the eligibility requirements in accordance with IB.3.
3. We, including any Subcontractors for any part of the Contract, are not debarred/ blacklisted by the Employer, any Government/Semi Government/Public Department in Pakistan or foreign country, international organizations or other foreign institutions.
4. Our subcontractors or suppliers for any part of the Contract, if any, shall have nationalities from eligible countries, in accordance with IB.4.4.
5. We understand that all the Schedules attached hereto form part of this Bid.
6. We undertake, if our Bid is accepted, to commence the Works and to complete the whole of the Works comprised in the Contract within the time stated in Contract Data.
7. We agree to abide by this Bid for the period of 120 days, exclusive of 28 days beyond Bid validity period and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
8. Unless and until a formal Agreement is prepared and executed, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
9. We do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other Bidder for the Works.
10. We understand that you are not bound to accept the lowest or any Bid you may receive.
11. We undertake that all the information and documents submitted with the Bid are genuine, and in case of incorrect information of fake documents we shall be liable for punitive action under the Applicable Law.

Name

In the capacity of

Signed

Duly authorized to sign the Bid for and on behalf of

Date

Address.....

BILL OF QUANTITIES

(to be signed by the bidder)

PREAMBLE

1. **FOR SCHEDULED & NON-SCHEDULED ITEMS, THE BIDDER SHALL QUOTE PERCENTAGE ABOVE OR BELOW ON THE AMOUNT PUT TO BID AND GIVEN IN THE SUMMARY 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 Bill of Quantities are estimated and provisional quantities and are given to provide a common basis for bidding. The basis for payment will be the actual quantities of work executed and measured by the Contractor and verified by the Engineer and valued at the rates and prices entered in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix as per 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. A rate or price shall be entered against each Non-Scheduled item in the priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the Contractor will have failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
6. 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.
7. 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 Pak. PWD Schedule of Rates 2022, the description and unit of item as provided in Pak. PWD Schedule of Rates 2022 shall prevail.
8. General directions and description of work and materials are not necessarily repeated nor summarised in the Priced BOQ. References to the relevant sections of the Bidding Documents shall be made.
9. 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.
10. Pak. PWD Specifications and the Technical Specifications shall be applicable for schedule Items and the non-schedule items, respectively. "Ref Spec. No. indicates the specification section number which as a whole or part (for which the Engineer shall be the sole judge) of these specifications are to be followed during execution of the item of work in accordance with the applicable drawings.
11. 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.

12. 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.
13. Notwithstanding provision of Clause 51 of the General Conditions of Contract Part-I, 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.
14. The following abbreviations for units have been used in Bill of Quantities:

Units	Abbreviations
Running feet	Rft.
Square feet	Sft.
Cubic feet	Cft.
Kilogram	Kg.
Per Number	Each, Number, No.
Lump Sum Job	Job, Lot

Authorized Signature and official Seal: _____

Name: _____

Date: _____

**CONSTRUCTION OF HOUSES FOR ICT POLICE AT POLICE LINES
HEADQUARTERS, H-11, ISLAMABAD**

BILL OF QUANTITIES

TABLE OF CONTENTS

BILL No.	BILL DESCRIPTION	PAGE No.
1	Civil Works	C-1 of 7 to C-7 of 7
2	Plumbing Works	P-1 of 7 to P-7 of 7
3	Electrical Works	E-1 of 5 to E-5 of 5

Authorized Signature and official Seal: _____

Name: _____

Date: _____

**CONSTRUCTION OF HOUSES FOR ICT POLICE AT POLICE LINES
HEADQUARTERS, H-11, ISLAMABAD**

SUMMARY OF COST

A. COST OF WORKS:

BILL NO.	BILL DESCRIPTION	SCHEDULED ITEMS	NON-SCHEDULED ITEMS
1.	Civil Works	25,934,678.52	989,330/-
2.	Electrical Works	1,359,360/-	844,395/-
3.	Plumbing Works	2,973,626.3	817,500/-
TOTAL (FOR 1 HOUSE) (SCHEDULED & NON- SCHEDULED)		30,267,664.57	2,651,225/-
TOTAL (FOR 10 HOUSES) (SCHEDULED & NON- SCHEDULED)		302,676,645.66	26,512,250/-
PREMIUM IN THE FORM OF %AGE ABOVE / BELOW THE ESTIMATED PRICE PUT TO BID			
AMOUNT OF PREMIUM QUOTED (Rs.)			
QUOTED BID PRICE AFTER ADDING PREMIUM AMOUNT			
TOTAL QUOTED BID PRICE (SCHEDULED + NON-SCHEDULED) (Rs.)			

(Total Rupees in Words)

Total A+B (Scheduled + Non-Scheduled)

C: Sales Tax @ = Rs.

Total A+B+C (Scheduled + Non-Scheduled + Sales Tax)

In Words:

(_____)

Note: The Bidder shall carry over the quoted percentage to Letter of Price Bid page **LPB-1**.

B. PROVISIONAL SUM:

- | | | |
|---------------------------|---|-----------------|
| i. Earth Retention System | } | Rs. 1,000,000/- |
| ii. DAB | | |

Note-2: The Bidder shall not consider the amount stated against the Provisional Sum while quoting his Bid. All Provisional Sums amount are to be expended in whole or, in part at the direction and discretion of the Engineer in accordance with Sub- Clause 13.4 of the General Conditions except with respect to DAB fees and the expenses in accordance with GC Clause 21.

Authorized Signature and official Seal: _____

Name: _____

Date: _____

Houses for ICT Police – NPF, Islamabad

MINISTRY OF INTERIOR & NARCOTICS CONTROL NATIONAL POLICE FOUNDATION (NPF), ISLAMABAD

CONSTRUCTION OF HOUSES FOR ICT POLICE, ISLAMABAD

CIVIL WORKS

ENGINEER'S ESTIMATE

S. No.	MRS RWP 2nd-2026	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)

SCHEDULED ITEMS**EARTH WORK (EXCAVATION & EMBANKMENT)**

C-01	03-21	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) lift upto 5 ft (1.5m) 2) a) By Excavator (iii) Hard soil or Soft murum	1000 Cft	9.76	12,788.20	124,812.83
C-02	03-15	Filling, watering and ramming earth under floors. i) with surplus earth from foundation, etc.	1000 Cft	6.89	8,155.50	56,191.40
C-03	ii)	ii) With new earth excavated from outside lead upto one chain (30 m).	1000 Cft	2.55	17,545.50	44,741.03
C-04	03-54	Compaction of natural ground	1000 Sft	2.47	3,479.60	8,577.21

CONCRETE

	06-05	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate) including all lead and lift.				
C-05	(f)	Ratio 1:2:4	100 Cft	2.09	49,107.58	102,634.84
C-06	(h)	Ratio 1:3:6	100 Cft	0.63	41,565.38	26,186.19
C-07	(i)	Ratio 1:4:8	100 Cft	17.55	36,053.08	632,731.55
	06-06	Providing and laying reinforced cement concrete (including prestressed concrete), using 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.) (i) 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. including all lead and lift.				
C-08		(2) Type B (nominal mix 1:1½: 3)	Per Cft	3,688.00	874.23	3,224,160.24
C-09		(3) Type C (nominal mix 1: 2: 4)	Per Cft	62.00	795.63	49,329.06
		(b) (ii) Reinforced cement concrete in retaining/ Shear walls laid in situ or precast laid in position, or prestressed members cast in situ (Formwork on both sides) , complete in all respects:including all lead and lift. (2) Type B (nominal mix 1:1-1/2:3)				
C-10		(i) Upto 9" thick (Avg)	Per Cft	557.00	840.73	468,286.61

S. No.	MRS RWP 2nd-2026	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
		(c) (iii) Reinforced cement concrete in 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) (i)&(ii) above not requiring form work (i.e. horizontal shuttering) complete in all respects:- including all lead and lift.				
C-11		(2) Type B (nominal mix 1: 1½: 3)	Per Cft	1,274.00	718.58	915,470.92
	06-12	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				
C-12		i) Grade-40	100kg	117.10	30,148.15	3,530,348.37
	06-32	Providing and embedding 10" (250mm) wide PVC water stopper in expansion joints of RCC structures (Retaining walls, water tanks, Slabs) complete in all respect.				
C-13		ii) 10 mm thick	Rft	82.00	816.00	66,912.00
	06-37	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:				
C-14		ii) 2" thick (50 mm)	100Sft	2.43	14,064.30	34,176.00
		BRICK WORK				
C-15	07-04(i)	Pacca brick work in 1:4 C/S mortar in foundation and upto plinth top:-	100Cft	19.44	42,355.65	823,393.84
C-16	07-05 (i)	Pacca brick work in 1:4 C/S mortar in Ground floor	100 Cft	58.82	43,384.35	2,551,867.47
C-17	07-06-i	Pacca brick work in 1:4 C/S mortar.'Add extra labour on item No. 5 for brickwork in (i) first floor:-	100 Cft	24.94	1,793.45	44,728.64
		ROOFING				
C-18	09-15	Khuras on roof 2'x2'x6" (600 x 600 x 150 mm)	Each	6.00	1,240.85	7,445.10
C-19	09-35 (iii)	Providing and laying roof insulation, comprising of single layer of tiles 9"x4½"x1½" (225x113x40 mm) grouted with cement sand mortar 1:3 laid over 2" (50 mm) thick earth (including mud plaster) over thermopore sheet, over polythene sheet 300 gauge over a layer of bitumen, complete in all respects:- iii) Thermopore sheet 1" (25 mm) thick	100 Sft	20.03	18,654.85	373,656.65

S. No.	MRS RWP 2nd-2026	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
	09-46	Providing and applying torch-on plain water proofing bitumenous membrane of specified thickness (made of Roof-Grip/ Euro Bit) duly lapped/connected by heating with Torch over ps-6 primer i/c preparation/smoothen the surface complete in all respect as approved and directed by the Engineer Incharge				
		a) Plain				
C-20		i) 3 mm thick	Per Sft	2,003.00	126.35	253,079.05
C-21	09-51	P/L false ceiling comprising of 5/8" thick plaster of paris sheet of required size in approved design with one line of 6" wide niche all around , hanging with Copper wire (16 SWG) duly enriched with POP and flaxen i/c the cost of making space for rope light/screws/jute/making holes for lights and rawal plugs complete in all respects as approved and directed by the Incharge.(Measurement will be made as per carpet Area).	Per Sft	2,573.00	130.90	336,805.70
FLOORING						
C-22	06-02	Dry rammed brick or stone ballast, 1½" to 2"(40 mm to 50 mm) gauge.	100Cft	12.79	14,076.50	180,038.44
C-23	10-14	Cement concrete tiles laid in 1:2 cement mortar, over ¾" (20 mm) thick bed of cement mortar 1:2:- (a) 12"x12"x1" (300 x 300 x 25 mm)	100 Sft	2.70	21,784.90	58,819.23
C-24	10-25	Rubbing and polishing old grit/ mosaic floor, including repairing voids, uneven surface, complete in all respects b) New Grit / Mosaic Floor	100 Sft	25.94	4,838.65	125,514.58
C-25	10-34	Mosaic dado or skirting with one part of cement and marble powder in the ratio of 3:1 and two parts of marble chips, laid over ½"(13 mm) thick cement plaster 1:3, including rubbing and polishing, complete with finishing: (a) using grey cement: i) 1/2"(13 mm) thick	100 Sft	6.33	20,227.25	128,038.49
	10-35	Providing and laying superb quality Porcelain glazed tiles of Master/ Stile brand or approved equivalent manufacturer, skirting/dado of specified size, Color and Shade with adhesive/ bond over 1/2"thick (1:2) cement plaster i/c the cost of and sealer for finishing the joints, cutting grinding complete in all respect as approved and directed by the Engineer Incharge a) Full body Glazed tiles				
C-26		(iii) 600mm x 600 mm (24"x24")	Per Sft	2,598	459.75	1,194,430.50
C-27		(iv) 600mmx 1200 mm (24"x48")	Per Sft	776	510.15	395,876.40
C-28	10-38	Providing and laying 1" thick terrazo tile for specified colour & size full body, best quality with minimum 5000 PSI in approved design with adhesive bond over ¾" thick 1:3 cement plaster i/c the cost of sealer for finishing the joints i/c cutting, grinding, rubbing, filling Complete in all respect as approved and directed by the Engineer incharge. (Without Polishing) b) Size 24"x24"x1" ii) Coloured	Sft	2,594.00	451.45	1,171,061.30

S. No.	MRS RWP 2nd-2026	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
	10-46	Providing and laying superb quality Porcelain glazed tiles flooring of Master/ Stile brand or approved equivalent manufacturer of specified size in approved design, Color and Shade with adhesive/bond over 3/4" thick (1:3) cement plaster i/c the cost of sealer for finishing the joints i/c cutting grinding complete in all respect as approved and directed by the Engineer Incharge. a) Full body Glazed tiles				
C-29		(iii) 600mm x 600 mm (24"x24")	Per Sft	487	459.60	223,825.20
C-30		(iv) 600mmx 1200 mm (24"x48")	Per Sft	2,957	510.00	1,508,070.00
C-31	10-48	Providing and laying 3/4" thick full width Prepolished Marble slab for Vanities / Shelves / Treads/Risers/Window Cills , having Uniform texture (Spotless) with adhesive bond over 3/4" thick (1:2) cement sand mortar i/c the cost of matching sealer complete in all respects as approved and directed by the Engineer Incharge i) 3/4" thick China Verona	Per Sft	336	642.50	215,880.00
C-32	10-50	Extra for Bevelling charges of marble edge in approved design complete in all respects i/c the cost of Carborandum disc as approved and directed by the Engineer Incharge.	Per Rft	138.00	39.90	5,506.20
C-33	10-51	Extra cost for making hole in Marble slab for fixtures, Sink, burners, basin Vanities i/c cost of bevelling of internal edge as approved and directed by the Engineer Incharge.	Each	7.00	980.70	6,864.90
C-34	10-47	Providing and laying Marble flooring / Skirting of required size and specified thickness, with adhesive bond over 3/4" thick bedding of (1:2) cement sand mortar i/c the cost of matching sealer, cutting, grinding and chemical polishing, complete in all respect as approved and directed by the Engineer Incharge. viii) China Verona uniform texture (Spotless) 3/4" thick (size 12"x24"/12"x36")	Per Sft	44.00	539.30	23,729.00
C-35	10-19	Extra labour for each storey above ground, for mosaic, conglomerate, tiles, stone and wooden floor. (First floor)	100 Sft	29.00	1,218.10	35,324.90
SURFACE RENDERING						
C-36	11-9(b)	Cement plaster 1:4 upto 20' (6.00 m) height: b) 1/2" (13 mm) thick	100 Sft	79.92	4,958.80	396,307.30
C-37	11-9(c)	Cement plaster 1:4 upto 20' (6.00 m) height: c) 3/4" (20 mm) thick	100 Sft	57.48	6,641.30	381,741.92
C-38	11-29	Extra for lime, mud or cement plaster and pointing from 20' (6.00 m) and above for each additional 10' (3.00 m) height or part thereof. (20'~30')	100 Sft	17.50	659.45	11,540.38

S. No.	MRS RWP 2nd-2026	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
C-39	11-12	Cement plaster 3/8" (10 mm) thick under soffit of R.C.C. roof slabs only, upto 20' height. b) 1:3	100 Sft	12.27	5,676.55	69,651.27
C-40	11-29	Extra for lime, mud or cement plaster and pointing from 20' (6.00 m) and above for each additional 10' (3.00 m) height or part thereof. (20'~30')	100 Sft	5.99	659.45	3,950.11
C-41	11-39	Preparing surface and applying Graffiato Weather Coating (Co-polymer emulsion) of approved colour & shade with weather resistant pigment, highly water repellant with Metallic Spatula having top class finish by smoothing with a plastic Spatula, on a base coat (Primer) over well cleaned plastered surface complete in all respect as approved and directed by the Engineer Incharge.	Per Sft	5,748.00	86.45	496,914.60
PAINTING AND VARNISHING						
C-42	13-9	Bitumen coating to plastered or cement concrete surface:- i) 20 lbs. per 100 Sft. (9.07 Kg per Sq.m)	100 Sft	23.70	2,825.10	66,954.87
	13-31	Preparing surface and painting emulsion paint :				
C-43		a) 1st coat	100 Sft	92.19	1,791.60	165,168.00
C-44		b) 2nd & each subsequent coat.	100 Sft	184.38	1,395.55	257,312.00
C-45	13-46	Providing and applying wall putty of 2mm thickness over plastered surface (new surface) to prepare the surface even and smooth complete in all respect.	100 Sft	92.19	576.25	53,124.00
DOORS AND WINDOWS						
	12-23	Providing and fixing wooden box type wardrobe 22" (550mm) deep including 3/4" (20 mm) thick boxing and shelves, hanger rods hard board back drawers, brass fittings, locking arrangements, handles, internal bolts, shoe rods, etc. including three coats of enamel paint:-				
C-46		i) Partial wood boxing and deodar wood shelves and leaves, etc.	Per Sft	381	2,651.40	1,010,183.40
C-47	12-59	Providing & fixing box type kitchen cabinets consisting of 3/4" thick both side Laminated MDF sheet shutter and boxes and back of 3 mm thick laminated MDF sheet i/c the cost of PVC edge binding duly hot pressed on all edges of the shutters /panels etc., with machine i/c the cost of self closing blum type hinges S.S, handles, screws, Glue and rawal plugs, locking arrangement complete in all respect as approved and directed by Engineer Incharge.	Per Sft	186	1,651.30	307,141.80
C-48	12-64	Providing and fixing Imported Mortise Lever Handle Lock with back plate (Machine, Cylinders, Lever Handles (Pair) and backplate (Pair) of approved quality, design & finish, including the cost of all accessories to complete the job as shown on drawing and as per specification, complete in all respect, as approved and directed by the Engineer Incharge	Each	1	4,569.55	4,569.55

S. No.	MRS RWP 2nd-2026	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
C-49	25-51	Providing and fitting all types of glazed aluminium windows of anodised/ powder coated partly fixed and partly sliding using delux sections of approved manufacturer having frame size of 100 x 30 mm (4"x1-1/4") and leaf frame sections of 50 x 20 mm (2"x3/4"), all of 1.6mm thickness including 5 mm thick imported tinted glass with rubber gasket using approved standard latches, hardware etc., as approved by the Engineer in-charge	Per Sft.	1,114	1,290.60	1,437,728.40
C-50	25-52	Providing and fixing Aluminum Fly screen comprising of fiber/ Aluminum wire guaze (Malasian) fixed in aluminum frame of approved manufacturer / powder coated of size 1-1/2"x1/2" and 1.6mm thick with rubber gasket i/c cost of Hardwares as approved and directed by the engineer incharge. complete in all respect.	Per Sft.	557	538.30	299,833.10
C-51	12-05	Providing and fixing 1st class solid wood wrought joinery in panelled or panelled and glazed doors and windows of specified thickness with 1" thick solid wood panels with step and 1-1/2"x2-1/2" beadings all around the panels i/c the cost of Tower bolt and handles complete in all respect (Excluding the cost of sliding bolt, lock and chowkats (frame), etc.) as approved and directed by the Engineer Incharge b) Ash wood Door (i) 2" thick (50 mm)	Sft	39	3,753.45	146,384.55
C-52	12-13	P/F 1-1/2" thick solid flush door comprising of 2.5 mm thick Deodar/Ash/Oak ply with grooves , compressed over 2.5 mm thick commercial ply over 1" thick packing wood in style and rails under proper pressure i/c the cost of nails, tower bolt , handles, glue, sawing charges and lacquar polishing to show the grains of ply properly, sand papering and 3/8" thick matching wooden lipping as approved and directed by the Engineer Incharge.	Per Sft	533.00	909.20	484,604.00
C-53	12-18	Providing and fixing 3"x4-1/2" chowkat for doors, windows and C. windows, including holdfast, etc b) Deodar wood	Per Sft	572.00	1,075.45	615,157.00
C-54	12-30	Providing and fixing approved quality rim lock adjustable over the style surface	Each	20	1,680.00	33,600.00
IRON WORKS						
C-55	25-31	Making and fixing steel grated door with 1/16" thick (1.5mm) sheeting, including angle iron frame 2"x2"x3/8" (50x50x10 mm) and 3/4" (20 mm) square bars 4" (100 mm) centre to centre, with locking arrangement.	Per Sft	140	2,648.10	370,734.00
C-56	25-38	Providing and fixing 2'-9" high stair railing comprising of non magnetic (304) Stain less steel 2" dia pipe railing of 18 SWG welded with vertical posts of 2" dia stainless steel round/ Squar pipe/ Tong (chimta) @ 2-ft c/c fixed on alternate steps with 3" long steel screws and brass rawal plugs , 3-Nos diagonal stainless steel pipes of 1/2" dia passes through goties fixed on vertical post, i/c staines steel welding, fixing & polishing complete in all respects as approved and directed by the Engineer Incharge	Per Rft	36	3,387.45	121,948.20

S. No.	MRS RWP 2nd-2026	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
C-57	25-63	Providing and fixing 5 ft dia MS Spiral Stair comprising of triangular steps made of 1-1/4"x1-1/4"x3/16" duly welded with 3/8"MS squar bars steps, supported/welded with main vertical post of 4" dia GI pipe (Medium Quality) embeded in PCC in ground i/c the cost of pipe railing comprising of 2" dia MS pipe of 16 SWG supportrd with 2 no 5/8" squar bars in each step, i/c fixing & painting complete in all respects as approved and directed by the Engineer Incharge(Measurement will be made above ground level).	Per Rft	25	7,664.35	191,608.75
MISCELLANEOUS						
C-58	26-43	Spraying termite proofing by using liquid FMC/ Biflex/ Terminex Exin/ Ms Hextar or equivalent @ specified suspension concentrate (SC), Mixing Ability-HEXTAR with Ratio (1:250) = 540 Sft or equivalent approved liquid applying with shower and certificate will be provided by the contractor for 10-years complete in all respect .as approved by the Engineer Incharge	Sft	4,725	12.70	60,007.50
Total of Scheduled Items (Rs.)						25,934,678.52
NON-SCHEDULED ITEM						
ALUMINUM & IRON WORKS						
C-59	NSI-01	Provide & fix expended metal 1/2" to 3/4", 22 guage fixed walls or on area as required and specified on drawings with steel nails with washers complete in all respects.	Sft.	1,343.00	110.00	147,730.00
C-60	NSI-02	Structural/glazing system with 2 mm thick and 100mm wide powder coated (in approved colour) base frame system as per the recommendations of the specialized facade designer and agreed by the approved manufacturer and stainless steel fittings using insulated glazing unit (IGU) system comprising of 6mm thick imported Low-E glass of approved color/shade having Low-E coating on surface no. 2 (inside the outer glass) and 6mm thick clear tempered glass (inner glass), with 12 mm wide aluminum spacers Low-E glass shall have a maximum of 3.7 U-factor with 0.45 solar heat gain coefficient. The glass to be used shall be from Pilkington/Guardian or an approved equivalent manufacturer. Doors in the curtain wall shall be of 12 mm thick Low-E tempered glass of approved color/shade, having handles 1500 mm long with 38mm dia & 2 mm wall thickness pipes of SS-316 brushed finish. All joints between the panels shall be sealed with minimum clear silicon sealant from Dow Corning of an approved equivalent. The Contractor shall submit shop drawings for the approval of the Engineer.	Sft	180.00	3,800.00	684,000.00
C-61	NSI-03	Providing and laying Structural Back fill using Granular Material brought from out site including compaction complete in all respects.	Cft	1,970.00	80.00	157,600.00
TOTAL OF NON-SCHEDULED ITEMS (Rs.)						989,330.00
TOTAL SCHEDULE AND NON-SCHEDULED COST Rs.						26,924,008.52

MINISTRY OF INTERIOR & NARCOTICS CONTROL NATIONAL POLICE FOUNDATION (NPF), ISLAMABAD

CONSTRUCTION OF HOUSES FOR ICT POLICE, ISLAMABAD

PLUMBING WORKS

ENGINEER'S ESTIMATE

Sr. No.	MRS, 2nd Bi Annual-2026 Chapter/item	DESCRIPTION	UNIT	QTY.	RATE (Rs.)	AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)

SCHEDULED ITEMS:**SANITARY FIXTURES AND FITTINGS**

	19 / 3	Providing and fitting imported floor mounted European coupled set of Water Closet (WC) and flushing Cistern of PORTA/ Marachi brand (full size) manufacturer i/c the cost of CP/rubber connection, thimble, seat cover and rawal bolts complete in all respects as approved and directed by the Engineer Incharge.				
BP-01	B iii.	One Piece PORTA HD 102N Toilet Cito with Hydraulic Seat Cover	Each	5	59,851.10	299,256
BP-02	19 / 5	Providing and fitting white glazed earthen ware water closet, squatter type, with separate foot rest.	Each	1	8,761.75	8,762
BP-03	19/12/b-i	Providing and fitting plastic made low down flushing cistern 13.63 litre (3 gallons) capacity, including bracket set, copper connection, etc. complete , white	Each	1	5,804.95	5,805
	19/46	Providing, fixing, testing and commissioning of µ-PVC (Unplasticized polyvinyl Chloride) Nikasi/ waste pipe Fittings make of Dadex /Popular/Beta or approved equivalent manufacturer, conforming to BS 4514 / BS 5255 including the cost of Solvents complete in all respect as approved and directed by the Engineer Incharge.				
	a)	P-Trap				
BP-04		(i) 4" dia	Each	1	960.20	960
BP-05	19 / 4 / ii page 118	Providing and fixing, flushing bend of PVC , 4cm (1-1/2")	Each	1	394.65	395
	19 / 7	Providing and fitting glazed earthen ware wash hand basin/vanity 56x40 cm (22"x16") including bracket set, waste pipe and waste coupling, etc.				
BP-06	(i)	white with pedestal	Each	2	12,051.55	24,103
BP-07	(v)	Under Counter Vanity Basin	Each	4	13,047.55	52,190
BP-08	19 / 8	Providing and fixing stainless steel sink with drain board, size 120x60 cm (48"x24") including bracket set, waste pipe and waste coupling.	Each	2	15,809.45	31,618.90
BP-09	19 / 27	Providing and fixing, chromium plated mixing valve, for wash hand basin, sink or shower.	Each	2	3,950.00	7,900.00
BP-10	19 / 13	Providing and fixing, chromium plated soap dish.	Each	6	981.60	5,890

Sr. No. (a)	MRS, 2nd Bi Annual-2026 Chapter/item (b)	DESCRIPTION (c)	UNIT (d)	QTY. (e)	RATE (Rs.) (f)	AMOUNT (Rs.) (g)
BP-11	19 / 15	Providing and fixing, chromium plated toilet paper holder.	Each	5	1,271.85	6,359
BP-12	19 / 16 / i	Providing and fixing, chromium plated towel rail, 60 cm (24") long, and 2 cm (3/4") dia	Each	6	1,337.20	8,023
BP-13	19 / 17	Providing and fixing looking glass 55x40 cm (22"x16") size and minimum 5 mm thick, first quality.	Each	6	1,546.20	9,277
BP-14	19 / 24/ ii	Providing and fixing chromium plated bib cock 1.5cm (1/2")	Each	5	1,588.00	7,940
BP-15	19 / 25	Providing and fixing chromium plated Tee stop cock 15mm (1/2")	Each	19	2,068.00	39,292
	19 / 49	Providing and fixing CP bath Room Set made of Sonex / Master / Faisal comprising of 3-No Tee stop cocks, lever type Basin Mixer, double Bib Cock, open wall shower, Muslim shower, waste coupling and bottle trap etc. complete in all respect as approved and directed by the Engineer incharge				
BP-16	ii	Lever Type Basin Mixer	Each	6	6,707.00	40,242
BP-17	iii	Double Bib Cock	Each	6	1,907.00	11,442
BP-18	iv	Open Type Wall Shower	Each	5	18,707.00	93,535
BP-19	v	Muslim shower	Each	6	2,387.00	14,322
BP-20	vii	Bottle Trap	Each	6	1,487.00	8,922
BP-21	19 / 7 / i page 121	Providing and fixing 1.5 cm (1/2") dia connection, including check nuts, etc, (plastic rubber connection)	Each	6	388.80	2,333
	19 / 53	Supply & Installation of Duel (Electric and Gas Water Heaters) with factory-installed pressure relief valve, adjustable water temperature control thermostate, Copper connections for specific capacity having leaving waterr temprature 140 deg F & working pressure 15 PSI, Ambassador/Canon or approved manufacturer i/c cost of all accessories to complete the job as per specifications and standards & making connection, complete in all respect as approved and directed by Engineer Incharge.				
BP-22	ii	55 Gallons	Each	1	83,161.50	83,162

Sr. No. (a)	MRS, 2nd Bi Annual-2026 Chapter/item (b)	DESCRIPTION (c)	UNIT (d)	QTY. (e)	RATE (Rs.) (f)	AMOUNT (Rs.) (g)
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WATER SUPPLY PIPES AND FITTINGS

	23 / 33 / b	Providing, laying, testing and commissioning of POLYPROPYLENE RANDOM COPOLYMER (PPRC) water supply pipe (Dadex / Popular / Beta or equivalent) with specified pressure rating PN (PRESSURE NOMINAL) and conforming to DIN 8077 - 8078 code i/c cost of solvent, specials, making jharries complete in all respect as approved and directed by Engineer Incharge. (Internal / External Diameters mentioned). PN20				
BP-23	ii	25mm dia	Rft	300	101.85	30,555
BP-24	iii	32mm dia	Rft	200	162.10	32,420
BP-25	iv	40mm dia	Rft	350	247.30	86,555
	23 / 38	Providing and fixing CP heavy duty brass Ball valve with CP handle of specified diameter made of Faisal/Sonex / Master best quality or equivalent complete in all respect as approved and directed by the Engineer Incharge.				
BP-26	i	1/2" dia	Each	3	1,248.00	3,744
BP-27	ii	3/4" dia	Each	1	1,524.00	1,524
	23 / 42	Providing and fixing heavy duty Gate valve of specified diameter and material for pressure rating PN-16 mde of Crane (USA), Hatersly (UK) or Scon (Pakistan) or approved equivalent manufacturer, i/c the cost of all accessories flanges, nut/bolt and gasket where required complete in all respect as approved and directed by the Engineer Incharge.				
BP-28	a-ii	3/4" dia Brass Threaded Valves	Each	8	3,510.00	28,080
BP-29	a-iii	1" dia Brass Threaded Valves	Each	5	5,025.60	25,128
BP-30	a-iv	1-1/4" dia Brass Threaded Valves	Each	2	7,039.20	14,078
	23 / 44	Providing and fixing heavy duty Check Valve of specified diameter and material for pressure rating PN-16 made of Crane (USA), Hatersly (UK), Scon (Pakistan) or approved equivalent manufacturer i/c the cost of all accessories flanges,nut/bolt and gasket where required complete in all Providing and fixing heavy duty Check Valve of specified diameter and respect as approved and directed by the Engineer Incharge				
BP-31	a-iii	1" dia Brass Threaded Valves	Each	1	5,269.20	5,269
BP-32	a-iv	1-1/4" dia Brass Threaded Valves	Each	2	7,212.00	14,424
	23 / 45	Supply & installation of heavy duty Brass PN-16 air Vents of specified size provided at the highest points (Pipe Risers) to expel air as approved and directed by the Engineer Incharge, Automatic				
BP-33	a-ii	3/4 inches	Each	2	1,896.00	3,792

Sr. No. (a)	MRS, 2nd Bi Annual-2026 Chapter/item (b)	DESCRIPTION (c)	UNIT (d)	QTY. (e)	RATE (Rs.) (f)	AMOUNT (Rs.) (g)
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19 / 8
page 121

BP-34 iii 2.5 cm (1") dia Each 1 1,550.00 1,550

SOIL, WASTE AND VENT PIPES & FITTINGS

19 / 45 Providing, fixing, testing and commissioning of (Unplasticized Polyvinyl Chloride Nikasi /SWV pipe, Dadex /Popular /Beta or approved equivalent manufacturer ,plain/Bell Ended/ ZJoints conforming to BS4514/ BS5255- EN1329 including the cost of specials and Solvents complete in all respects ,as per drawings & specifications and /or as approved and directed by the Engineer Incharge.

BP-35 iii 50mm Rft 60 103.95 6,237

BP-36 iv 82mm Rft 150 160.60 24,090

BP-37 v 110mm Rft 100 254.30 25,430

BP-38 vi 160mm Rft 150 493.40 74,010

19 / 46 Providing, fixing, testing and commissioning of μ-PVC (Unplasticized polyvinyl Chloride) Nikasi / waste pipe Fittings make of Dadex / Popular / Beta or approved equivalent manufacturer, conforming to BS 4514 / BS 5255 including the cost of Solvents complete in all respect as approved and directed by the Engineer Incharge.

BP-39 b-i Multi-Trap 4" Each 12 1,436.10 17,233

BP-40 c-ii Vent Cowel 3" Each 5 386.10 1,931

BP-41 d-i Clean out 4" Dia Each 1 441.40 441

BP-42 d-ii Clean out 3" Dia Each 1 354.30 354

19 / 12
page 122 Providing and Fixing of SS 304 Floor Drain, complete in all respect as approved and directed by Engineer Incharge.

BP-43 (i) 4" Diameter Each 5 1,254.95 6,275

21 / 5 Constructing gully grating chamber, 12"x12", (300x300 mm) complete in all respects:

BP-44 a) with C.I. gully trap, weighing 81 lbs. (36.75 Kg.) frame hinged safety type. Each 5 17,360.10 86,801

Sr. No. (a)	MRS, 2nd Bi Annual-2026 Chapter/item (b)	DESCRIPTION (c)	UNIT (d)	QTY. (e)	RATE (Rs.) (f)	AMOUNT (Rs.) (g)
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STORM DRAINAGE PIPES & FITTINGS

19 / 45 Providing, fixing, testing and commissioning of (Unplasticized Polyvinyl Chloride Nikasi /SWV pipe, Dadex /Popular /Beta or approved equivalent manufacturer ,plain/Bell Ended/ ZJoints conforming to BS4514/ BS5255- EN1329 including the cost of specials and Solvents complete in all respects ,as per drawings & specifications and /or as approved and directed by the Engineer Incharge.

BP-45	v	110mm	Rft	50	254.30	12,715
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19 / 13 Providing and Fixing of SS 304 Roof / scupper
page 122 Drain, complete in all respect as approved and directed by Engineer Incharge.

BP-46	(i)	4" Diameter	Each	2	1,284.80	2,570
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FIREFIGHTING

23 / 54 Providing and fixing of fire extinguishers of following type and capacities complete in all respect as approved and directed by the Engineer Incharge:

BP-47	i)	Dry Chemical Powder capacity 6 Kg	Each	1	13,329.60	13,330
BP-48	iv)	K-Type wet chemical capacity 6 Liters.	Each	1	48,232.80	48,233

MISCELLANEOUS

19 / 37 Supply and fitting of cast iron manhole cover square / circular with frame, etc. complete.

BP-49	i)	30 cm (12")	Each	6	2,532.00	15,192
BP-50	ii)	45 cm (18")	Each	1	3,492.00	3,492
BP-51	iii)	60 cm (24")	Each	2	6,089.85	12,180

Total of Scheduled Items (Rs.) 1,359,360

NON-SCHEDULED ITEMS:

(Ref. Specs 5100, 5240)

GENERAL NOTE

Supply, installation, testing and commissioning of the following items of work, including all labour, tools, plant, accessories, etc. required for completion of each item as per drawings, specifications and as approved by the Engineer.

SANITARY FIXTURES AND FITTINGS

BP-52	NS-01	Triple water filter (10") including inlet and outlet connections, power supply, and all accessories for complete installation	Each.	1	32,450	32,450
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Sr. No. (a)	MRS, 2nd Bi Annual-2026 Chapter/item (b)	DESCRIPTION (c)	UNIT (d)	QTY. (e)	RATE (Rs.) (f)	AMOUNT (Rs.) (g)
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WATER SUPPLY PIPES AND FITTINGS

G.I. water pipes conforming to BS-1387, Medium Grade, l/c all fittings, wrapping polythene tape, giving anticorrosion treatment, applying protective painting, clamps, hangers & supports, making holes in concrete or masonry and then repairing holes, flushing, disinfecting, testing and commissioning etc. of approved make, of the following diameters, complete in all respects.

BP-53	NS-01	3/4 inch	Rft	10	515	5,150
BP-54	NS-02	1 inch	Rft	20	755	15,100
BP-55	NS-03	1-1/4 inches	Rft	20	825	16,500

NATURAL GAS PIPES AND FITTINGS

G.I. pipes for gas works conforming to BS-1387, Medium Grade, l/c all fittings, wrapping polythene tape, giving anticorrosion treatment, applying protective painting, clamps, hangers & supports, making holes in concrete or masonry and then repairing holes, flushing, disinfecting, testing and commissioning etc. of approved make, of the following diameters, complete in all respects.

BP-56	NS-04	1/2 inch	Rft	30	425	12,750
BP-57	NS-05	3/4 inch	Rft	200	515	103,000

MISCELLANEOUS

BP-58	NS-07	3/4" diameter Galvanised MS ladder rungs for water tanks; each rung of 18" width, 6" projected outside the wall and 6" embedded in RCC on both ends; including all necessary works for complete installation.	Each	10	1,490	14,900
BP-59	NS-08	Dia 2" u-turned G.I. vent pipes, puddle plate, with insect proof mesh at open end etc., complete in all respects.	Job	1	7,545	7,545

PUMPING MACHINERY

BP-60	NS-09	Automatically operated submersible stainless steel centrifugal pump set (in UGWT) for lifting water from Underground water tank to Overhead water tank for potable water, comprising pump with electric motors, Head=03 Bars and discharge=20 gpm, including all accessories, level switches to be installed in overhead & under ground water tank for automatic operation of pumps at set levels, dry running protection, motor control unit, Gate valve, check valve etc manual tools, spare parts etc, complete in all respects as shown in drawings and as directed by the Engineer. Capacity = 20gpm Head = 3 Bar	Job	1	283,000	283,000
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Sr. No. (a)	MRS, 2nd Bi Annual-2026 Chapter/item (b)	DESCRIPTION (c)	UNIT (d)	QTY. (e)	RATE (Rs.) (f)	AMOUNT (Rs.) (g)
BP-61	NS-10	Skid mounted, automatically operated fully integrated self priming Pressure Booster pump set for potable water supply comprising 02 pumps (01 working & 01 standby) with electric motors and integrated parts (intelligent controller, speed-controlled drive (VFD), integrated pressure tank, sensors, gate valves, non return valves, strainer etc) including all accessories, Motor control unit, Pressure switches, pressure gauges, manual, tools, spare parts etc, Each pump of the following Capacity and Pumping head. Capacity = 10-30 US gpm Head =02-03 Bars	Job	1	354,000	354,000
TOTAL OF NON-SCHEDULED ITEMS (Rs.)						844,395
TOTAL SCHEDULE AND NON-SCHEDULED COST Rs.						2,203,755

MINISTRY OF INTERIOR & NARCOTICS CONTROL NATIONAL POLICE FOUNDATION (NPF), ISLAMABAD

CONSTRUCTION OF HOUSES FOR ICT POLICE, ISLAMABAD

ELECTRICAL WORKS

ENGINEER'S ESTIMATE

Sr. No.	Ref: MRS-2026 (2nd BI Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g

Schedule Items

Conduits & Pipes

Supply and erection of PVC pipe for wiring recessed in walls, including inspection boxes, pull boxes, hooks, cutting jharries, and repairing surface, etc., complete with all specials.

	2					
E-01	ii	20 mm i/d	Rft.	5,000	120.45	602,250.00
E-02	iii	25 mm i/d	Rft.	2,500	140.15	350,375.00
E-03	vi)	50 mm i/d	Rft.	30	241.95	7,258.50
E-04	viii)	100 mm i/d	Rft.	150	385.55	57,832.50
	105	P/F PVC doublelayer Switch kit Faceplate with specified switch holes i/c the cost of switches / sockets / dimmer made of Hi-Life / Bush / Schenider or approved equivalent manufacturer, screws complete as approved and directed by the Engineer Incharge				
	a)	One way Gange Switch (Small)				
E-05	(i)	01 Gange	Each	5	463.20	2,316.00
E-06	(ii)	02 Gange	Each	10	704.40	7,044.00
E-07	(iii)	Three pin Light Plug 10/13 Amp	Each	46	754.45	34,704.70
E-08	(iv)	Telephone / TV/Datacable socket	Each	6	662.45	3,974.70
E-09	(vi)	Fan Dimmer	Each	16	740.60	11,849.60
E-10	(vii)	Bell push	Each	1	598.20	598.20
E-11	(viii)	Three Pin Power Plug 15-32 Amp	Each	11	924.55	10,170.05
	b)	One way Gange Switch (Large)		0		
E-12	(i)	04 Gange	Each	10	981.25	9,812.50
E-13	(ii)	05 Gange	Each	10	1,151.35	11,513.50
E-14	(iii)	06 Gange	Each	2	1,405.85	2,811.70
	c)	Two way Gange Switch Small				
E-15	(i)	01 Gange One Way/ Two Way	Each	2	775.85	1,551.70

Sr. No.	Ref: MRS-2026 (2nd BI Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g

Wiring

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 an capping/G.I. wire/trenches (rate for cables only):-

	8					
	c)	450/750 volts, PVC insulated:				
E-16	ii)	1.5 mm sq (3/0.029")	Per Rft.	15,000	42.75	641,250.00
E-17	iii)	2.5 mm sq (7/0.029")	Per Rft.	3,000	63.10	189,300.00
E-18	iv)	4 mm sq (7/0.036")	Per Rft.	3,000	83.40	250,200.00

LT Cables

Supply and erection of single core PVC insulated, PVC sheathed copper conductor, 600/1000 volts grade cable, in prelaid G.I. pipe/M.S. conduits/PVC pipe/G.I. wire/trenches, etc (rate for cable only):-

E-19	v)	6 mm sq (7/0.044")	Per Rft.	30	102.60	3,078.00
E-20	vi)	10 mm sq (7/0.052")	Per Rft.	150	159.50	23,925.00

Supply and erection of copper conductor cables for service connection, in prelaid pipe/G.I. wire/trenches, etc. (rate for cable only):-

	11					
	c)	PVC insulated, PVC sheathed 4 core, 600/1000 volt non armoured cable:-				
E-21	v)	6 mm sq (7/0.044")	Per Rft.	30	391.45	11,743.50
E-22	vi)	10 mm sq (7/0.052")	Per Rft.	150	621.90	93,285.00
E-23	vii)	16 mm sq (7/0.064")	Per Rft.	10	951.05	9,510.50

Fans and Exhaust Fans

Providing and fixing Copper winded Exhaust fan with louver and shutter made of Pak/Younas/G.F.C. i/c the cost of necessary cable and hardware for connection from ceiling rose complete as approved and directed by Engineer Incharge.

	102					
E-24	a)-i	Plastic body - 10" dia	Each	5	5,235.50	26,177.50
E-25	a)-ii	Plastic body - 12" dia	Each	1	5,685.50	5,685.50

b) Steel body

E-26	i	12" sweep	Each	1	5,516.75	5,516.75
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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.

	103					
E-27	ii)	24" Sweep dia	Each	1	10,703.00	10,703.00

Providing and fixing Pakistan Energy Label NEECA approved Copper winded Ceiling Fan i/c the cost of necessary cable and hardware for connection as approved and directed by Engineer Incharge.

	104					
E-28	(iii)	56" dia	Each	16	10,180.20	162,883.20

Sr. No.	Ref: MRS-2026 (2nd BI Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g

DATA NETWORK & WIFI SYSTEM**Data Cabling System**

E-29	123	Supply, Installation and commissioning of wiring with 4-pair data Cable, 23AWG UL/ EN listed cable *Conforming to following standards: TIA/EIA568/ISO/IEC11801, in prelaidd conduit/ cable tray from including all accessories, Manufacturer/ OEM Authorization, Make: Schneider/ i-connect UK/ 3M Corning USA/ D-Link/ Pollo Australian or equivalent complete in all respect as approved and directed by Engineer Incharge.				
E-30	a-ii)	UTP (Unshielded Twisted pair) CAT-6A (Min.1G/ 10G @ 500MHz or higher)	P.Rft	1,000	69.60	69,600.00
E-31	131	Supply and installation of Cable Metal Organizer, 19" Rack mounted with high graded epoxy powder coating and slideable top-UL Listed. Made of Schneider/ i-Connect UK/ 3M Corning :Pollo Australia or equivalent approved manufacturer and directed by the Engineer Incharge.	Each	1	4,108.80	4,108.80
	85	Suppling,Installation and comissioning of MCB (Miniature Circuit Breaker) of specified rating made of LEGRAND FRANCE/ GE U.S.A / SCHNEIDER GERMANY /SIEMEN GERMANY/TERASAKI JAPAN/ SWITZERLAND or approved equivalent manufacturer in prelaidd DBs and Panels i/c the cost of screws,necessary wire complete in all respect as approved and directed by the Engineer Incharge				
E-32	a) (iii)	Single Pole 6-63 Amp (10 KA)	Each	35	1,459.05	51,066.75
E-33	b)	Double Pole iii) 6-63 Amp (10 KA) 63 Amp (Incoming Breaker)	Each Each	2 2	5,621.55 5,621.55	11,243.10 11,243.10
	90	P/F wall mounted DB (Distribution Board) made with 16SWG sheet (Recessdded/Surface mounted Type), Powder coated Paint, i/c the cost of Lock, Indication lights,Thimble, Copper Comb, Wiring, Natural & Earth Bar, Door Earthing, Digital Voltmeter,Digital Ammeter,Volt Selector Switch,Ammeter selector switch,Current Transformers and Controles Complete in all respect as approved and directed by the Engineer P/F wall mounted DB (Distribution Board) made with 16SWG Sheet Incharge (Breakers will be Paid Separately).				
E-34	(a) (i)	6" deep 20~60A	P.CFT	100	2,436.70	243,670.00

Sr. No.	Ref: MRS-2026 (2nd BI Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
	94	Providing and fixing DB/Panel accessories of required rating and size i/c copper screws of approved brand Complete in all respect as approved and directed by the Engineer Incharge				
E-35	i)	Selector Switch	Each	2	1,228.80	2,457.60
E-36	(iii)	Digital Voltmeter (0-600 Volt)	Each	2	1,012.80	2,025.60
E-37	(iv)	Digital Ammeter (0-9999 Amp)	Each	2	1,228.80	2,457.60
E-38	(v)	LED Phase Indicator	Each	6	622.80	3,736.80
E-39	(vi)	Push Button ON/OFF (Make: Schneider/Himal/Eqv.)	Each	6	631.15	3,786.90
E-40	76	Supply and erection of electric energy meter, including meter testing fee, etc b) Three phase, 4 wires: i) 3x50 Amp, 400 volts	Each	1	20,909.45	20,909.45
Total of Scheduled Items (Rs.)						2,973,626.30

Non - Schedule Items

Light Fixtures

Ref. Specs Sec. 8001, 8150

Supply, installation, testing & commissioning of following LED Light fixtures complete with Electronic ballast (unless mention otherwise), lamps, lamp holders, SPD, Earth Protection and mounting accessories etc., as per specification, complete in all respects, as per drawings and specification, complete in all respect. Lighting fixtures sample must be submitted to consultant for approval. PF> 0.9, CRI>80, 110 Lumens/watt. Operating Life 30,000hrs, IEC Certified.

Note: Refer light fixtures drawings/Schedule for complete light fixtures details.

E-41	NS-01	40 watt Surface mounted Damp proof LED Light Fixture with 4400 lumens min., 30000 Life Hrs. fixed output LED driver, IP20 rated, PF=.95 complete in all respects.	No.	19	9,500.00	180,500.00
E-42	NS-02	(16-20) Watt Surface mounted LED batten Light Fixture with 2000 lumens min., 30000 Life Hrs. fixed output LED driver, IP20 rated, complete in all respects.	No.	15	2,500.00	37,500.00
E-43	NS-03	15-20 W Surface/ ceiling Mounted LED downlight with built in integrated driver and frosted glass diffuser	No.	86	3,500.00	301,000.00
E-44	NS-04	7-10 W Surface/ ceiling Mounted LED downlight with built in integrated driver and frosted glass diffuser	No.	10	1,950.00	19,500.00
E-45	NS-05	Outdoor type LED bulkhead wall light of minimum 1500 lumens light output, IP-55 or better rated	No.	19	6,500.00	123,500.00
E-46	NS-07	Schliender as approved by the Engineer/Architect	No.	3	20,000.00	60,000.00

Sr. No.	Ref: MRS-2026 (2nd BI Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g

EARTHING SYSTEM
(Ref. Spec. Sec. 8001 , 8240)

E-47	NS-08	305 mm long, 50 mm wide and 6mm thick copper busbar as ECP (Earth Connecting Point) complete with insulators, washers, nuts, bolts mounting installation and operational accessories as per site requirements.	Job	1	95,500	95,500
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TOTAL OF NON-SCHEDULED ITEMS (Rs.) 817,500.00

TOTAL SCHEDULE AND NON-SCHEDULED COST Rs. 3,791,126.30

