PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

TENDER NOTICE

PROCUREMENT OF CONTRACTOR SERVICES FOR INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL-SEZ) PACKAGE-II, KARACHI

Pakistan Industrial Development Corporation (PIDC), the Procurement Agency (PA) invites e-bids for their project **"Internal Electrical Distribution System & Allied Works of Block-A on 500 Acres Land of Phase-I (1500 Acres) of Karachi Industrial Park (Federal-SEZ) Package-II"** in accordance with the bidding documents, ONLY through PPRA's **e-Pak Acquisition & Disposal System (EPADS)** from bidders/firms having similar nature experience, registered with Pakistan Engineering Council in category C-1 (or above) with relevant codes, and must be an active Taxpayer and registered with relevant Tax authorities. **Most Advantageous Bid** will be selected after thorough evaluation of Technical & Financial Proposal.

Bidding documents can be downloaded free of cost from PIDC or PPRA websites i.e., https://pidc.com.pk/tenders/ or https://eprocure.gov.pk/.

S.No	Description of Work	Bid Security
01.	The scope of work includes but not limited to: Internal Electrical Distribution Network, Earthing System, GPON System (Passive only), CCTV System, etc.	20 million PKR

1. A Pre-Bid Meeting will be held on **30th December, 2025 at 11:00 a.m.** at the Project office, Bin Qasim Industrial Park (BQIP), DSIE Pakistan Steel Mill, Bin Qasim Town, Karachi to clarify bidder's queries for the captioned work.
2. Interested bidders are requested to submit their bids (Technical & Financial) electronically through PPRA EPADS on **"Single Stage Two Envelope"** on or before **7th January, 2026** till **11:00 a.m.** to below mentioned address. Technical bids will be opened through PPRA EPADS on the same day at **11:30 am**. Delayed / conditional / telegraphic bids will not be entertained.
3. Bids should be accompanied by a **Bid security** (refundable) in the form of Call Deposit Receipt (CDR)/ Pay Order or a Security issued 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 having at least AA rating from PACRA/VIS, in favor of "Pakistan Industrial Development Corporation (PIDC)". Scanned copy of Bid Security shall be submitted along with the technical bid on EPADS; however, the original bid security shall be submitted to PIDC on the address given below before the deadline of submission.
4. Procuring Agency reserves the right to reject all or any bid(s) subject to the relevant provisions of PPRA Rules.
5. In case any unforeseen situation resulting in closure of office on the date of opening or if Government declares holiday, the tender shall be opened on the next working day at the same time and venue.

HEAD OF TECHNICAL
Pakistan Industrial Development Corporation (PIDC)
2nd Floor PIDC House, Dr. Ziauddin Ahmed Road, Karachi
Telephone: 021-38266666-69
E-mail: wajid.ali@pidc.com.pk, faizan.khan@pidc.com.pk

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL-SEZ) PACKAGE-II

CONDITION OF CONTRACT (VOLUME-I)

ISSUED TO_____

PROCUREMENT NO: PIDC/Tender/Tech/035

Lead Firm

JV-Team

December-2025

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INVITATION FOR BIDS

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

PROCUREMENT OF CONTRACTOR SERVICES FOR INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL-SEZ) PACKAGE-II, KARACHI

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INSTRUCTIONS TO BIDDERS (IB)

INSTRUCTIONS TO BIDDERS
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INSTRUCTIONS TO BIDDERS

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

A. 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 license with its Bid but the Foreign Constructor will be required to submit standard license 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) 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 ofWorks and its surroundings and obtain for themselves on theirown 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)(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 theInvitation 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 ClauseIB.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 personsigning 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, especially 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 andobligate 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 agreementshall 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 in Pak Rupee and shall be paid accordingly in same currency.

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 this request of the Employer without his Bid Security being forfeited. 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 in the form of Call Deposit Receipt (CDR) / Pay Order issued 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 Contract Data and rated by PACRA/VIS of rating as provided in Table below:

Bid Price (In Eq. million PKR)	Minimum Rating of Insurance Companies
Up to 1000	A (+)
1001 to no limit	AA
[Note: Insurance Company includes Joint Ventures of 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 request 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 Alternative 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 **t**o sign on behalf of the Bidder pursuant to Sub-Clause IB.12.1(d) hereof. All pages of the Bid shall be initialed 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, inwhich case such corrections shall be initialed by the personor 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 orwritten 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 initialed by representative(s) of the Employer attending Bid opening. The Employer shall neither discuss the merits ofany 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 maylodge 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 informationsubmitted 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 earlierto the Bid submission date or its best assessment.

IB.28 Correction of Arithmetic Errors

28.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errorswill 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 todemonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, the Employer may require anadditional Performance Security by 10% of the difference of the Bid Price as determined hereinabove up to 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 than25% 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 who's 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 constitutethe 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 (BD)

BIDDING DATA

IB Clause Reference	Bidding Data
1.1	**Scope of Bid:** **1) Name and address of the Employer:** Head of Technical Pakistan Industrial Development Corporation (PIDC) 2nd Floor, PIDC House, Dr. Ziauddin Ahmed Road, Karachi. Telephone: 021-38266666-69, E-mail: wajid.ali@pidc.com.pk, faizan.khan@pidc.com.pk **2) Name of the Project & Summary of the Works: -** Internal Electrical Distribution System & Allied Works of Block-A On 500 Acres Land of Phase-I (1500 Acres) of Karachi Industrial Park (Federal-SEZ) Package-II. The scope of works includes, but not limited to, Internal Electrical Distribution Network, Earthing System, GPON System (Passive only), and CCTV System.
1.2	**Time for Completion for the Works**: 8 Months
2.1	**Name of the Borrower/Source of Funding:** PSDP
8.1	**Time limit for clarification**: Till Pre-bid meeting
8.3	**Venue, time, and date of the pre-Bid meeting:** In order to clarify bidder's queries if any, a pre-bid meeting shall be held on the date, time and venue stated in the Notice for Tender (NIT).
9.3	**Number of days**: Three (03)
11.1	**Bid language**: ENGLISH
12.2	**Maximum Number of JV Partners:** Two (02) [Foreign Constructor must form JV with Local Constructor. Foreign Constructors shall not be eligible to participate in bidding individually. Foreign Constructor shall enter in to joint venture with Pakistani Constructor registered with PEC]. However, the lead partner shall remain responsible for the successful completion of the entire works, as per the defined scope of works, specifications & entire satisfaction of the Client.
14.1	Bidders to quote entirely in Pakistan Rupees (PKR). *[Note: Foreign Currency Requirement are not applicable]*
15.1	**Period of Bid Validity**: 120 days (extendable) as per PPRA rules.
16.1	**Amount of Bid Security**: The Bid Security shall be the same as stated in the Notice for Tender (NIT). The ORIGINAL Bid Security shall be submitted to the Employer any time before the closing time of bid submission.

IB Clause Reference	Bidding Data
16.2	The Bid Security shall be 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 having at least AA rating from PACRA/VIS in favor of Pakistan Industrial Development Corporation (PIDC).
17.1	**Alternative Proposal(s**) by the Bidder shall not be considered.
18.4	**Number of Copies of the Bid to be completed and submitted:** Each Bidder shall prepare by filling in the forms completely and without alterations. The bid, properly filled in, must be submitted **ONLY through e-Pak Acquisition & Disposal System (EPADS)** at or before deadline mentioned in the invitation to bid.
	The Bidder shall submit with its **Technical Bid** the following documents Original Bid Security as per 16.1 and 16.2 (a) Conditions of Contract (b) Specification- (Part A – Specific Provisions) (c) Proposed Construction Schedule (appendix – C-1) (d) Method of Performing the Work (appendix – D-1) (e) Availability of Critical Equipment (appendix – E-1 to 3) (f) Construction Camp and Housing Facilities (appendix – I-1) (g) List of Sub-contractors (as required) (appendix – G-1) (h) Organization Chart for Supervisory Staff (appendix – F-1) (i) Integrity Pact (appendix – J-1) The Bidder shall submit with its **Financial (Price) Bid** the following documents: (j) Letter of Price Bid (k) Schedule of Adjustment data (appendix – A-1 & A-2) (l) Bill of Quantities (appendix – B-1 & B-2) (m) Estimated Progress Payments (appendix – H-1)
19.2(a)	**Submission of Bids:** • The process of e-Procurement will be carried out for this tender on **Single Stage Two Envelope method.** • Each Bidder shall prepare by filling in the forms completely and without alterations. The bid, properly filled in, must be submitted **ONLY through e-Pak Acquisition & Disposal System (EPADS)** at or before deadline mentioned in the invitation to bid.
20.1(a)	**Deadline for submission of Bids:** As stated in Notice for Invitation of Bids.
23.1	**Venue, time, and date of opening:** As stated in Notice for Invitation of Bids.

EVALUATION CRITERIA AND QUALIFICATION UPDATING FORMS

EVALUATION CRITERIA AND QUALIFICATION UPDATING FORMS

This Section contains Eligibility and Qualification Criteria that the Employer shall use to evaluate Bids and qualify Bidders in accordance with Clauses IB.26 of Instructions to Bidders.The Bidder shall provide all the information requested in the relevant forms contained in Bidder's Qualification Updating Forms provided herein.
The information provided in the forms shall be substantiated with valid documentary evidences otherwise the requirement will not be considered as complied.
The Qualification Requirements on the basis of which the Bidders shall be evaluated for the instant project is all as given hereunder. These shall be provided by the Bidders as 'Technical Proposal/ Qualification Documents' of their Bids for Internal Electrical Distribution System & Allied works of Block-A on 500 acres land of Phase-I (1500 acres) of Karachi Industrial Park, if attached documents are proved, wrong, fake or bogus then the client reserves the right to disqualify the firm for further bidding process.
'Financial Proposal/Bid' shall be opened of only those Bidders that have met all the mandatory requirements as well as minimum Scoring Criteria for Qualification as specified hereunder. If quoted price of few bidders is same then, Bidder who get more marks in Technical Bid will be considered.

Evaluation (IB 29.2(e))
The evaluation of Bids will be carried out according to criteria listed in IB 29.2 (a) - (d).
Technical Evaluation will be based on all the criteria given in succeeding paras regarding the Applicant's Financial Soundness, Experience Record, Personnel Capabilities and Equipment Capabilities as demonstrated by the Applicant's responses in the forms attached to this letter. The Employer reserves the right to waive minor deviations, if these don't materially affect the capability of an applicant to perform the contract. Details of the Mandatory and Other Qualification requirements with weightages are tabulated below:

MANDATORY REQUIREMENT	
PEC Registration Certificate	Based on the estimated cost of the project, the bidders must possess valid registration certificate of PEC in the category C–1 (or above), bearing relevant codes.
Project Experience	The bidder must have successfully completed at least 01 similar nature electrical infrastructure work with a minimum project value of PKR 1 billion within the last 10 years.
Tax Registration	Copies of registration with relevant tax authorities.
Blacklisting from any Agency	An affidavit on non-judicial stamp paper of Rs. 100 stating that the firm has never been blacklisted or barred by any Government, Semi-Government, Autonomous or International agency must be submitted.

Note:

- *If the above mandatory is not attended by the prospective firm, then they will not be considered for further evaluation.*

- *In the case of a Joint Venture, each partner must individually meet all the above mandatory criteria. The JV must submit a valid Joint Venture Agreement along with the bid.*

- *In case of JV with foreign firm, foreign firm must be registered with their relevant forums. The foreign firm also need to submit letter of consent in the name of PIDC, showing their interest of work along with local lead firm and foreign firm will get registered with relevant bodies in Pakistan if awarded a work by PIDC.*

- *In case of foreign experience, translation of experience should be done in English, the same should be signed and stamped by the client, or local JV partner should submit an undertaking that the "Translation of the document is genuine. In case of discrepancies or fraud, procuring agency has a right to cancel their bid and take legal action".*

OTHER QUALIFICATION REQUIREMENT	
CATEGORY	**WEIGHTAGE /MARKS**
GENERAL QUALIFICATION	5
GENERAL EXPERIENCE	50
PERSONNEL CAPABILITIES	20
EQUIPMENT CAPABILITIES	10
FINANCIAL SOUNDNESS	10
CONSTRUCTION SCHEDULE	5
TOTAL:	**100**

Note:

- *For the purpose of qualification, the applicant must score at least 50% in each category. The overall score must be 70% to be considered as technically qualified.*
- *In case of JV, cumulative marking will be done. However, General Qualification will be considered on individual basis.*

1. General Qualification

General Qualification signifies the years of establishment of the firm. Documentary evidence (like Memorandum of Association) must be provided for this purpose. Marks for years of establishment shall be awarded on the basis of the following:

S. No.	Category	Weightage / Marks
i	Firm's registration with PEC since last 10 years • 0.5 marks for each year's registration	05
	SUB-TOTAL:	**05**

2. General Experience

S. No.	Category	Weightage / Marks
i)	**Completion / Taking-Over Certificate from Client must be provided.** A project of similar nature electrical infrastructure work of minimum project value of PKR 1 billion completed within last 10 years in an industrial zone. • 1 Project = 10 marks	10
ii)	**Completion / Taking-Over Certificates from Client must be provided.** A project of similar nature electrical infrastructure work of minimum project value of PKR 1 billion completed within last 10 years. • 1 Project = 10 marks	30
iii)	**Performance certificate or latest payment along with latest communication and contract must be provided.** Ongoing similar nature electrical infrastructure work of minimum project value of PKR 500 million, awarded not later than 2025. • 1 Project = 5 marks	10
	SUB-TOTAL:	**50**

3. Personnel Capabilities

Marks will be awarded based on the qualification, experience, and current employment status of key technical personnel. Only individuals currently registered with Pakistan Engineering Council (PEC) or holding valid diplomas/ certifications will be considered. Valid CV alongwith PEC registration and degrees must be required for verification.

S. No.	Description	Maximum Marks
i)	**Graduate Engineers Registered with PEC. PEC details must be provided.** • **Professional Electrical Engineers (1 No.):** ➢ 15 years or above experience ➢ 1 PE = 6 Marks • **Registered Engineers – 1 Electrical, 1 Civil and 1 Mechanical (3 No.)** ➢ 10 years or above experience ➢ 1 RE = 2 Marks ➢ Maximum Marks = 6	12
ii)	**Site Supervisors – 2 Electrical, 1 Civil, and 1 Mechanical. Degree/ PEC details must be provided (4 No.)** ➢ Minimum DAE (relevant) with 15 years' experience/ BE or BS with minimum 8 years' experience ➢ 1 Supervisor = 1.5 Marks ➢ Maximum Marks = 6	6
iii)	**Other Personnel** • **Quantity Surveyor (1 No. – 1 Mark)** ➢ Minimum DAE Civil/ Electrical with 15 years' experience/ BE or BS with 8 years' experience • **HSE Officer (1 No. – 0.5 Marks)** ➢ Engr. or Certified/ Graduate and Registered with a recognized Health & Safety Institution/ Authority with 10 years' experience • **Land Surveyor (1 No. – 0.5 Marks)** ➢ Minimum DAE Civil/ Survey with 10 years' experience	2
	SUB-TOTAL:	**20**

4. Equipment Capabilities

Marks will be awarded based on the availability, ownership status, and condition of equipment required for the execution of the project. Bidders must provide the details as per Schedule-E alongwith documentary evidence such as ownership documents, leasing agreements, or affidavits of availability. Equipment must be in good operational condition, available for immediate deployment, and suitable for industrial infrastructure works.

S. No.	Equipment Type & Characteristics	Min. No. Required	Maximum Marks
1	Forklift	2	2
2	Generator Sets (DG Sets)	2	1
3	Crane	1	1
4	Cable Pulling Winch with force / tension indicator & Rollers	2	1
5	Cable Cutting Tools (Ratchet or Hydraulic)	2	1
6	Tractor with Trolley / Dump Truck / Dumper	2	1
7	Excavator / Hydraulic Excavator	2	2
8	Grader / Scrapers for ground levelling	1	1
		SUB-TOTAL:	**10**

5. Financial Position

Marks shall be awarded on the basis of the following criteria:

S. No.	Category	Weightage / Marks
i)	• Average Annual Turnover in last 3 years (as per last 3 years audited accounts) ➢ Full marks for average turnover of PKR 3,000 million or above. ➢ For values below PKR 3,000 million, marks will be awarded as: (Average Turnover / 3,000) × 5	5
ii)	• Net Worth (as per latest audited balance sheet) ➢ Full marks for positive net worth of PKR 500 million or more ➢ For values below PKR 500 million, marks will be awarded as: (Net Worth / 500) × 5	5
	SUB-TOTAL:	**10**

6. Construction Schedule

i)	Complete work schedule item-wise starting from 1st April 2025, as per Schedule-C to Bid	5

Bidders Qualification Updating Forms

To establish its qualifications to perform the contract in accordance with Section (Evaluation Criteria and Qualification Updating Forms) the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder.

Form ELI -1.1

Bidder Information Form

Date: _____

Bid Reference No. (if any) and title: _____
Page_____of_____ pages

Bidder's name
Bidder's country of registration: *[indicate country of Constitution]*
Bidder's year of incorporation:
Bidder's legal address [in country of registration]:
Bidder's authorized representative information Name:_____ Address:_____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached copies of original documents, in accordance withSub-Clause IB 3.1.

Form ELI -1.2

Bidder's JV Information Form
(to be completed for each member of Bidder's JV)

Date: _____
Bid Reference No. (if any) and title:_____
Page _____of_____pages

Bidder's JV name:
JV member's name:
JV member's country of registration:
JV member's year of constitution:
JV member's legal address in country of constitution:
JV member's authorized representative information Name:_____ Address:_____ Telephone/Fax numbers: _____ E-mail address: _____

Form CON – 1

Pending Litigation

Bidder's Name: _____

Date: _____

Bid Reference No. (if any) and title: _____

Page _____ of _____ pages

Pending Litigation, in accordance with Eligibility and Qualification Criteria			
☐ No pending litigation in accordance with Eligibility and Qualification Criteria, Sub-Factor 2.1.			
☐ Pending litigation in accordance with Eligibility and Qualification Criteria, Sub-Factor 2.1 as indicated below.			
Year of dispute	**Amount in dispute (currency)**	**Contract Identification**	**Total Contract Amount (currency), Eq. PKR (exchange rate)**
		Contract Identification: _____ Name of Employer: _____ Address of Employer: _____ Matter in dispute: _____ Party who initiated the dispute: _____ Status of dispute: _____	
		Contract Identification: Name of Employer: Address of Employer: Matter in dispute: Party who initiated the dispute: Status of dispute:	

Form FIN – 3.1:

Financial Situation and Performance

Bidder's Name: _____
Date: _____

Bid Reference No. (if any) and title: _____
Page _____ of _____ pages

1. Financial data

Type of Financial information in (currency)	**Historic information for last year, (amount in currency, currency, exchange rate*, Eq. PKR)**
Statement of Financial Position (Information from Balance Sheet)	
Total Assets (TA)	
Total Liabilities (TL)	
Total Equity/Net Worth (NW)	
Current Assets (CA)	
Current Liabilities (CL)	
Working Capital (WC)	
Information from Income Statement	
Total Revenue (TR)	
Profits Before Taxes (PBT)	
Cash Flow Information	
Cash Flow from Operating Activities	

*Refer to IB 14.2 for the exchange rate

2. Financial documents

The Bidder and its parties shall provide copies of financial statements for last year pursuant to Eligibility and Qualification Criteria, Sub-factor 3.1. The financial statements shall:

(a) reflect the financial situation of the Bidder, and not an affiliatedentity (such as parent company or group member).

(b) be independently audited or certified in accordance with local legislation.

(c) be complete, including all notes to the financial statements.

(d) correspond to accounting periods already completed and audited.

Attached are copies of financial statements[1] for the last year required above; and complying with the requirements[1]
If the most recent set of financial statements is for a period earlier than 12 months from the date of bid, the reason for this should be justified.

Form FIN – 3.2:

Financial Resources

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as specified in Eligibility and Qualification Criteria.

No.	**Source of financing**	**Amount (Eq. PKR)**
1		
2		
3		

Form FIN – 3.3:

Current Contract Commitments / Works in Progress

Bidders should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

Current Contract Commitments					
No.	**Name of Contract**	**Employer's Contact Address, Tel, Fax**	**Value of Outstanding Work [Current Eq. PKR]**	**Estimated Completion Date**	**Average Monthly Invoicing Over Last Six Months [Eq. PKR /month)]**
1					
2					
3					
4					
5					

LETTER OF BID
AND
SCHEDULES TO BID

LETTER OF BID

Bid Reference No. _____
[Name of Contract/ Works]

To: _____

_____

Gentleman,

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. As security for due performance of the undertakings and obligations of this Bid, we submit herewith a Bid Security in the amount of PKR_____(Pak. Rupees. _____) drawn in your favour or made payable to you and valid for a period of_____days beginning from the date Bids are opened.

7. 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.

8. We agree to abide by this Bid for the period of_____days, inclusive of 14 days beyond Bid validity period (as mentioned at Sr. No. 6 above) and it shall remain binding upon usand may be accepted at any time before the expiration of that period.

9. 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.

10. We do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other Bidder for the Works.

11. We understand that you are not bound to accept the lowest or any Bid you may receive.

12. 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.

Dated this_____day of_____20_____

Signature: _____

in the capacity of_____duly authorized to sign Bids for and on behalf of

_____

(Name of Bidder in Block Capitals)
(Seal)

Address:_____

_____

_____

Witness:

Signature:_____

Name: _____

Address. _____

_____

Occupation_____

A-1
Schedule-A to Bid

SCHEDULE OF ADJUSTMENT DATA

Schedule of Cost Indexation

[The Employer is to engage a professional with experience in construction costs and the inflationary effect on construction costs when preparing the contents of the Schedule of Cost Indexation. In the case of very large and/or complex works contracts, it may be necessary to specify several families of price adjustment formulae corresponding to the different works involved.]

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

Pn= a + b Ln / Lo + c En/ Eo + d Mn/Mo + ...

where:

"Pn" 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;

"Ln", "En", "Mn", 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 49 days prior to the last day of the period (to which the particular Payment Certificate relates); and

"Lo", "Eo", "Mo", 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.

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, unbalancedor inapplicable, as a result of Variation(s).

If the currency in which the Contract price is expressed is different from the currency of the country of origin of the indices, a correction factor will be applied to avoid incorrect adjustments of the Contract price. The correction factor shall be: Z_0 / Z_1, where,

Z_0 = the number of units of currency of the origin of the indices which equal to one unit of the currency of the Contract Price on the Base date, and

Z_1 = the number of units of currency of the origin of the indices which equal to one unit of the currency of the Contract Price on the Date of Adjustment.

A-2
Schedule-A to Bid

SCHEDULE OF ADJUSTMENT DATA

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

[In the Table below, the Bidder shall (a) indicate amount of local currency payment, and the Employer shall (b) enter the Index description and source of indices for the different elements of cost, and (c) derive weightings for local currency payment including nonadjustable fixed portion. PEC Standard Procedure and Formula for Price Adjustment (Second Edition), May, 2022 as amended time to time shall be applied for preparation of the following Table.]

Index code	Index description	Source of index	Bidder's related currency amount	Weightages
(i)	**Fixed Portion**			0.43
(ii)	**Local Labor**	Monthly Statistical Bulletin issued by Federal Bureau of statistics GoP		0.07
(iii)	**Medium Voltage Cables**	Base Rate of Medium Voltage Cables prior 28 days of Bid Submission **Rs._____**		0.33
(iv)	**Ring Main Units (RMUs)**	Base Rate of Ring Main Units (RMUs) prior 28 days of Bid Submission **Rs._____**		0.15
(v)	**High Speed Diesel (HSD)**	Monthly Statistical Bulletin, issed by Federal Bureau of statistics GoP		0.02
	TOTAL =			**1.00**

A-3
Schedule-A to Bid

SCHEDULE OF ADJUSTMENT DATA

Table II. Foreign Currency (FC) For Bill Nos.

[In the Table below, the Bidder shall (a) indicate amount of foreign currency payment, (b)indicate the source and base values of indices for the different foreign currency elements of cost,

(c) derive its proposed weightings of foreign currency payment, except the non-adjustable portion which will be filled in by the Employer.

If the Bidder wishes to incur in more than one foreign currency (up to two currencies permitted)then this table should be repeated for each foreign currency.]

Not Applicable

Index code	Index description	Source of index	Base value and date	Bidder's related source currency in type/amount	Equivalent in FC1	Bidder's proposed weighting
(i)	Non-adjustable	_	_	_		A: _____
(ii)						B: _____
(iii)						C: _____
(iv)						D: _____
(v)						E: _____
				Total		**1.00**

A-4
Schedule-A to Bid

SCHEDULE OF ADJUSTMENT DATA

Table III. Foreign Currency Requirements

[With reference to Sub Clause IB.14.1, the Bidder shall provide information below on the proportion of various currencies in which he requires payment to be made. The Bidders shall also indicate Factors (inputs) related to the requirement of respective currencies.]

Sr. No	Currency (name)	Percentage payable in currency	Factors (inputs) to which the Requirements Refer
1.	**LC** (Pak. Rs.)		* *General Expenses, Manpower, Local Staff, Expatriate Staff, Spare Parts, Fuel & Lubricants, Hydraulic Binder, Timber & Plywood, Additives & Protectives, Joints & Waterstops, Explosives-Fuses-Detonators, Re-Steel & Wire mesh, Metal Pipes & Fittings, Structural Steel, Miscellaneous Metals, Concrete Pipes, PVC Pipes, Build Materials, Sub-Contractor, Drilling & Grouting Sub-Contractor Third Party Supplies, Import Charges, General Expenses, Plants.*
2.	**FC1** *(US $ Dollar)*		* *Expatriate Staff, Spare Parts, Hydraulic Binder, Timber & Plywood, Additives & Protectives, Drilling Materials, Miscellaneous, Sub-Contractor, Import Charges, General Expenses, Plants.*
3.	**FC2** *(EUR € EURO)*		* *Expatriate Staff, Spare Parts, Additives & Protectives, Welding Materials, Miscellaneous, Electrical Sub-Contractor, Import Charges, General Expenses, Equipment, Plants.*
	TOTAL	**100.00**	

*[*The above Factors (Inputs) related to the requirement of respective currencies, are for guidance only, and shall be indicated specific to the Contract.]*

A-5
Schedule-A to Bid

SCHEDULE OF ADJUSTMENT DATA

Table IV. Summary of Payment Currencies

[In the Table below, the Bidder shall list the exchange rates used in the currency conversion with reference to Sub Clause IB.14.2.]

Name of payment currency	a Amount of currency	b Rate of exchange (local currency per unit of foreign)	c Local currency equivalent c =a x b	d Percentage of Total Bid Price (TBP) 100xc / TBP
Local currency (Pak. Rs)		1.00		
FC1				
FC2				
Total Bid Price				100.00
Provisional sums expressed in local currency	*[To be entered by the Employer]*		*[To be entered by the Employer]*	
TOTAL BID PRICE (including provisional sum)				

B-1
Schedule-B to Bid

BILL OF QUANTITIES

A. Preamble:

1. The Bill of Quantities shall be read in conjunction with the Conditions of Contract, Specifications and Drawings.

2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work executed and measured by the Contractor and verified by the Engineer andvalued at the rates and prices as given in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix as per the Contract.

3. The rates and prices as given in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the Contract include all costs of Contractor's plant, labour, supervision, materials, execution, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract. Furthermore,all duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior to deadline for submission of Bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.

4. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the Contractor will have failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.

5. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Bill of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of the Works, or the same shall be determined by the Engineer in accordance with Clause 13, General Conditions.

6. General directions and description of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Bidding Documents shall be made before entering prices against each item in the Bill of Quantities.

7. Provisional sums included and so designated in the Bill of Quantities shall be expended inwhole or in part at the direction and discretion of the Engineer in accordance with Sub- Clause 13.4 of General Conditions of Contract.

8. The following abbreviations for units have been used in Bill of Quantities:

Units		Abbreviations
Cubic Meter	=	cum
Square Meter	=	sqm
Kilogram	=	kg
Provisional Sum	=	PS
Lump-Sum	=	LS

B-2
Schedule-B to Bid

BILL OF QUANTITIES

(Refer Vol-III)

C-1
Schedule-C to Bid

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) mentioned in Contract Data.

Description	Time for Completion
The scope of work includes but not limited to: Internal Electrical Distribution Network, Earthing System, GPON System (Passive only), and CCTV System	
TOTAL	**9 months**

THE BIDDER MUST CAREFULLY EVALUATE THE SCOPE AND QUANTUM OF WORK AND REALISTICALLY PREPARE THE MILESTONE COMPLETION SCHEDULE.

[The Bidder shall provide, the Construction Schedule in the bar chart (CPM, PERT or any other to be specified herein) showing the sequence of work items and the period of time during which he proposes to complete each work item in such a manner that his proposed programme for completion of the whole of the Works and Sections of the Works may meet the completion time for all Works stipulated in the Tender documents (Attach sheets as required for the specified form of Construction Schedule)]

D-1
Schedule-D to Bid

METHOD OF PERFORMING THE WORK

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

1. Organization Chart:

   Shall indicate 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. Method of executing the Works:

   The procedures for installation of equipment and machinery and transportation of equipment and materials to the site.]

E-1
Schedule-E to Bid

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 listed in Sheet E-3.]

E-2
Schedule-E to Bid

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						

E-3
Schedule-E to Bid

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]

F-1
Schedule-F to Bid

ORGANIZATION CHART
FOR THE
SUPERVISORY STAFF AND LABOUR

G-1
Schedule-G to Bid

LIST OF SUBCONTRACTORS

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

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

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

H-1
Schedule-H to Bid

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:

Month	Amounts (PKR)
1st	
2nd	
3rd	
4th	
5th	
6th	
7th	
8th	
9th	
Bid Price	

I-1
Schedule-I to Bid

CONSTRUCTION CAMP AND HOUSING FACILITIES

[The Bidder in accordance with Clause 6 of the Conditions of Contract shall provide 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.

J-1
Schedule-J to Bid

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 time 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: ……	Name of Bidder/Contractor: ……
Signature: ……	Signature: …….
[Seal]	[Seal]

STANDARD FORMS

BS-1

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., up to_____.

(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 toremain in full force and effect.

BS-2

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:

Signature _____

1. _____

Name _____

_____
Corporate Secretary (Seal)

Title _____
Corporate Guarantor (Seal)

2. _____

_____
Name, Title & Address

PS-1

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 Clause11, Defects After Taking Over, of Conditions of Contract are fulfilled.

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

We,_____(the Guarantor), waiving all objections and defense under the Contract, do hereby irrevocably and independently guarantee to pay to the Employer without delay upon the Employer's first written demand without cavil or arguments

and without requiring the Employer to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the Employer's written declaration that the Principal has refused or failed to perform the obligations under the Contract which payment will be effected by the Guarantor to Employer's designated Bank & Account Number.

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

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

Guarantor
(Schedule Bank)

WITNESS:

Signature _____

1. _____

Name _____

_____
Corporate Secretary (Seal)

Title _____
Corporate Guarantor (Seal)

2. _____

_____
Name, Title & Address

LOA-1

Letter of Acceptance

[Letter head paper of the Employer]

NAME OF CONTRACT:_____ CONTRACT

NUMBER:_____

TO:_____

Date:_____

Your Reference:_____

Our Reference:_____

We thank you for your Bid dated_____for the execution and 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:_____

CA-1

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) *[Employer to insert any other documents forming part of the Contract*]

   The addenda/corrigenda, if any, (Excluding part relating to Instructions to Bidders alongwith Bidding Data) shall be deemed to have been incorporated at the appropriate places in the "Documents forming the Contract".

3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy defects therein in conformity and in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of the Contract, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

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

Signature of Contactor	Signature of Employer
(Seal)	(Seal)

Signed, Sealed and Delivered in the presence of:

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

DAAB-1

DAAB Agreement

[*All italicized text and any text within square brackets (except sub-clause headings) in this form of agreement is for use in preparing the form and should be deleted from the final product*].

Name and details of the Contract _____

_____

This Agreement made the_____day of_____[*month*],_____[*year*], between

Name and contact details of the Employer _____(name)

_____(*address*)

_____(*telephone*)

_____(*email / other contact details*);

Name and contact details of the Contractor _____(name)

_____(*address*)

_____(*telephone*)

_____(*email / other contact details*);

Name and contact details of the DAAB Member _____(name)

_____(*address*)

_____(*telephone*)

_____(*email / other contact details*);

("**DAAB Agreement**")

Whereas:

A. the Employer and the Contractor have entered (or intend to enter) into the Contract;
B. under the Contract, the "**DAAB**" or "**Dispute Avoidance/Adjudication Board**" means the sole member or three members (as stated in the Contract Data of the Contract) so named in the Contract, or appointed under Sub-Clause 21.1 [*Constitution of the DAAB*] orSub-Clause 21.2 [*Failure to Appoint DAAB Members*] of the Conditions of Contract;
C. the Employer and the Contractor desire jointly to appoint the above-named DAAB Member to act on the DAAB as:
    a. the sole member of the DAAB, and where this is the case, all references to the "Other Members" do not apply; or
    b. one of three members / chairman [*delete the one which is not applicable*] of the DAAB and, where this is the case, the other two persons are:

DAAB-2

(name)	*(name)*
(address)	*(address)*
(telephone)	*(telephone)*
(email/ other contact details)	*(email/ other contact details)*

the "**Other Members**"; and

D. the DAAB Member accepts this appointment.

The Employer, Contractor and DAAB Member jointly agree as follows:

1. The conditions of this DAAB Agreement comprise:

   (a) Clause 21 [*Disputes and Arbitration*] of the Conditions of Contract, and any other provisions of the Contract that are applicable to the DAAB's Activities; and

   (b) the "General Conditions of Dispute Avoidance/Adjudication Agreement", which is appended to the General Conditions of the "Conditions of Contract for Construction" Second Edition 2017 published by FIDIC ("GCs"), as amended and/or added to by the following provisions.

2. [Details of amendments to the GCs, if any. For example:

   In the procedural rules annexed to the GCs, Rule _ is deleted and replaced by: " … "]

3. The DAAB Member shall be paid in accordance with Clause 9 of the GCs. The currency of payment shall be_____.

   In respect of Sub-Clauses 9.1 and 9.2 of the GCs, the amounts of the DAAB Member's monthly fee and daily fee shall be:

   monthly fee_____per month, and

   daily fee of_____per day

   (or as otherwise set under Sub-Clause 9.3 of the GCs).

4. In consideration of the above fees, and other payments to be made to the DAAB Member in accordance with the GCs, the DAAB Member undertakes to act as DAAB Member in accordance with the terms of this DAAB Agreement.

5. The Employer and the Contractor shall be jointly and severally liable for the DAAB Member's fees and other payments to be made to the DAAB Member in accordance with the GCs.

6. This DAAB Agreement shall be governed by the law of_____(if not stated, the law that governs the Contract under Sub-Clause 1.4 of the Conditions of Contract).

DAAB-3

SIGNED by:_____	SIGNED by:_____	SIGNED by:_____
Print name:_____	Print name:_____	DAAB Member
Title:_____	Title:_____	Title:_____
for and on behalf of the Employer	for and on behalf of the Contractor	
in the presence of	in the presence of	in the presence of
Witness:_____	Witness:_____	Witness:_____
Name:_____	Name:_____	Name:_____
Address:_____	Address:_____	Address:_____
_____	_____	_____
Date:_____	Date:_____	Date:_____

MG-1

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*)

WITNESS:

Signature _____

1. _____ Name _____

_____ Title _____

Corporate Secretary (Seal) Corporate Guarantor (Seal)

2. _____

_____
Name, Title & Address

CONDITIONS OF CONTRACT

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)" 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

(*Mandatory Provisions not to be amended/substituted except as instructed/permitted by PEC in writing*)

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:	Pakistan Industrial Development Corporation (PIDC) 2nd Floor, PIDC House, Dr. Ziauddin Ahmed Road, Karachi. Telephone: 021-38266666-69,
1.1.35	Engineer's name and address:	The Engineer of project from Project Consultant will be notified later.
1.1.84	Time for Completion:	8 Months for whole of the Works
1.3(d)	address of Employer for communications:	Project Director – KIP Block A Pakistan Industrial Development Corporation (PIDC) BQIP Office, DSIE PSM, near Ayesha Steel Mill, Bin Qasim Town, Karachi Telephone: 0321-8204385 E-mail: javed.Shaikh@pidc.com.pk
	address of Engineer for communications:	The Engineer of project from Project Consultant will be notified later.
	address of Contractor for communications:	_____ *[insert Contractor's address at the time of signing of the Contract]*
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 complete set*

Sub-Clause	Data to be Given	Data
2.1	after receiving the Letter of Acceptance, the Contractor shall be given right of access to all or part of the Site within:	Immediately upon receipt of Notice to Commence.
2.4	Employer's financial arrangements	**PSDP**
3.2 (e)(ii)	Engineer's Duties and Authority	Variations leading to an increase exceeding one percent (1%) of the Accepted Contract Amount shall require prior approval from the Employer, subject to the condition that cumulative variations remain within five percent (5%) of the Accepted Contract Amount. Employer approval is mandatory in all instances.
4.2	Performance Security (as percentage of the Accepted Contract Amount in Currencies) percent: currency:	Ten percent (10%) of Accepted Contract Amount
4.2.1	Acceptable Performance Security	The entity issuing the Performance Security and its form shall be as under: The Performance Security shall be, at the option of the Contractor, issued in the prescribed form included in the Bidding Documents, by (a) a Scheduled Bank in Pakistan or (b) an Insurance Company listed in the Contract Data and rated by PACRA/VIS of rating as provided in Table below: Accepted Contract Amount (In Eq. PKR million) Minimum Rating of Insurance Companies Up to 1000 A (+) 1001 to no limit AA. In case of Joint Venture, the Performance Security shall be in the name of the Joint Venture or in the name of Lead/either firm of the JV or in ratio of shares of the individual JV partners.
4.7.2	Period for notification of errors in the itemsof reference	Twenty-Eight (28) days

Sub-Clause	Data to be Given	Data
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.
4.19	Period of payment for temporary utilities	On monthly basis
4.20	Number of additional paper copies of progress reports	*Four (04) copies*
5.1(a)	Maximum allowable accumulated value of work subcontracted (as a percentage of the Accepted Contract Amount)	Thirty percent (30%) *[Employer may vary this percentage according to the nature and complexity of the Works]*
5.1(b)	Parts of the Works for which subcontracting is not permitted	_____ *[Employer to provide his requirement according to the nature and complexity of the Works or state "None"]*
6.5	Normal working hours on the Site	*Eight (08) hours per day and 6 days in a week*
8.3	Number of additional paper copies of programmes	*Three (03) copies*
8.8 & 14.15(b)	Delay Damages payable for eachday of delay	For each day of delay, delay damages shall be calculated as 10% of the Awarded Contract Amount, apportioned over the total number of days in the agreed contract duration of 8 months
8.8	Maximum amount of Delay Damages	Ten percent (10%) of the Accepted Contract Amount

Not Applicable

Not Applicable

Sub-Clause	Data to be Given	Data
8.14	Applicability of Incentives for Early Completion	No
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".
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	Acceptable Advance Guarantee	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 Scheduled Bank in Pakistan.
14.2.3	Percentage deductions for the repayment of the Advance Payment	A deduction of fifteen percent (15%) shall be made from the amount of each Interim Payment Certificate (IPC) until the recovery of the Mobilization Advance
14.3	Period of Payment	*One month*
14.3(b)	Number of additional paper copies of Statements	*Original plus two hard copies plus one electronic copy*
14.3 (iii)	Percentage of retention	Ten percent (10%)
14.3 (iii)	limit of Retention Money (as a percentage of the Contract Price)	Five percent (5%)
14.5	Plant and Materials intended for the Works	Secure advance is Not Applicable

Sub-Clause	Data to be Given	Data
14.6.1	Issue of IPC	In the first line of the 1st paragraph the words "28 days" are substituted by "14 days"
14.6.2	Minimum amount of Interim Payment Certificate (IPC)	25 million
14.7	Mode of Payment	Through crossed cheque in favor of the Contractor or JV partners. The Payment to JV partners shall be made at the request of the Joint Ventures in the ratio of their shares specified by them" are added at the end of the Sub-Clause
14.7(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 [InterimPayment]	28 days
14.7b(ii)	Period for the Employer to make interim payments to the Contractor under Sub-Clause 14.13 (Final Payment)	56 days
14.11.1(b)	Number of additional paper copies of draft Final Statements	*Three (03) copies*
14.15	Currencies of payment of ContractPrice	Pak Rupees
14.15(a)(i)	Proportions or amounts of Local and Foreign currencies	as stated in the Table IV of Schedule A[*Schedule of Adjustment Data*]
14.15(c)	currencies and proportions for payment of Delay Damages	as stated in the Table IV of Schedule A[*Schedule of Adjustment Data*]
14.15(f)	rates of exchange	as stated in the Table IV of Schedule A[*Schedule of Adjustment Data*]

Not Applicable

Sub-Clause	Data to be Given	Data
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	a) Not later than the Commencement Date b) Within twenty-eight (28) day from the Commencement Date
19.2.1(b)	Additional amount to be insured (as a percentage of the replacement value)	15% of the replacement value (Accepted Contract Amount)
19.2.3(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 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 without limit to the number of incidents
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 DAAB (Dispute Avoidance and Adjudication Board)	Within 56 days from the Commencement Date.

Sub- Clause	Data to be Given	Data
21.1	the DAAB shall comprise	**3 Members**
21.1	List of proposed members of DAAB - Proposed by Employer - Proposed by Contractor	*[to be inserted at the time of signing of the Contract]* 1._____ 2._____ 3._____ 1._____ 2._____ 3._____
21.2	Appointing entity (official) for DAAB 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 Karachi, Pakistan

Summary of Sections of the Works

Section Name/Description of parts of the Works that shall be designated a Section for the purposes of the Contract (Sub-Clause 1.1.73)	Value: Percentage* of Accepted Contract Amount (Sub-Clause 14.9)	Time for Completion (Sub-Clause 1.1.84)	Delay Damages (Sub-Clause 8.8)
A			
B			
C			

* These percentages shall also be applied to each half of the Retention Money under Sub-Clause 14.9.

Section Name/Description (Sub-Clause 1.1.73)	Time for Completion (Sub-Clause 1.1.84)	Incentives for Early Completion (Sub-Clause 8.14)
A		
B		
C		

Particular Conditions

Part B - Special Provisions

1.1	**Definitions**	1.1.76 "Specification" Following is added at the end: "and consists of two parts i.e., i) "Part A - Specific Provisions"; and ii) "Part B - Technical Provisions"."
1.2	**Interpretation**	"and" is deleted from the end of sub-paragraph (i) and added at the end of sub-paragraph (j). Sub-paragraph (k) is added: "(k) The word "tender" is synonymous with "bid" the word tenderer with "bidder", the words "tender documents"with "bidding documents" and "Schedule of Prices" with "Bill of Quantities", as applicable."
1.5	**Priority of Documents**	The documents listed at (a) through (k) of this Sub-Clause are deleted and substituted with the following: (a) the Contract Agreement; (b) the Letter of Acceptance; (c) the Letter of Bid; (d) the Particular Conditions Part A - Contract Data; (e) the Particular Conditions Part B - Special Provisions; (f) the General Conditions; (g) the Specification Part A - Specific Provisions; (h) the Specification Part B - Technical Provisions; (i) the Drawings; (j) the completed Schedules to Bid including Bill of Quantities; (k) the JV Undertaking (if the Contractor is a JV); and (l) any other documents forming part of the Contract. The addenda/corrigenda, if any, shall be deemed to have been incorporated at the appropriate places in the documents forming the Contract.
1.6	**Contract Agreement**	In the last line of the 1st paragraph the text "shall be borne by the Employer" is substituted by "shall be reimbursed by the Employer to the Contractor".
3.1	**The Engineer**	In sub-paragraph (a) the text **"as defined in the Pakistan Engineering Council Act, 1975 (Act No. V of 1976)"** are added after the words **"professional engineer"**.

3.2 Engineer's Duties and Authority

The Engineer shall obtain the consent in writing of the Employer before taking action under the following Sub-Clauses of these Conditions:

(a) Consenting to the subcontracting of any part of the Works under Sub-Clause 5.1 [Subcontractors]

(b) Any action under Sub-Clauses 8.9 [Employer's Suspension] and 8.12 [Prolonged Suspension]

(c) Issuance of "Taking Over Certificate" under Sub-Clause 10.1 [Taking Over the Works and Sections].

(d) Issuing the "Performance Certificate" under Sub-Clause 11.9 [Performance Certificate].

(e) Sub-Clause 13.1 [Right to Vary]: instructing a Variation, except;

(i) in an emergency situation as determined by the Engineer, or

(ii) if such a Variation would increase the Accepted Contract Amount by less than the percentage specified in the Contract Data.

(f) Sub-Clause 13.3 [Variation Procedure]: approving a proposal for Variation submitted by the Contractor in accordance with Sub-Clause 13.3.2 [Variation by Request for Proposal] or 13.2 [Value Engineering].

(g) Certifying release of second half of the Retention Money under Sub-Clause 14.9 [Release of Retention Money].

(h) Issuing Final Payment Certificate under Sub-Clause 14.13 [Issue of FPC].

(i) Sub-Clause_____*

(j) Sub-Clause_____*

**[insert Sub-Clause number (not Sub-Clause 3.7 [Agreement or Determination]*

Any such requirement shall not be applied to any action by the Engineer under Sub-Clause 3.7 [Agreement or Determination], as stated in Sub-Clause 3.2 [Engineer's Duties and Authority] of the General Conditions.

Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Employer.

Following is added after the words "the Employer's consent is required" in 4th paragraph:

stating that "the Employer's consent has been obtained for that specified authority"

4.2 Performance Security

4.2.1 Contractor's Obligations

The entity issuing the Performance Security and its form shall be as under:

The Performance Security shall be, at the option of the Contractor, issued in the prescribed form included in the Bidding Documents, by (a) a Scheduled Bank in Pakistan or (b) a foreignbank duly counter-guaranteed by a Scheduled Bank in Pakistan, or (c) an Insurance Company listed in the Contract Data and rated by PACRA/VIS of rating as provided in Table below:

Accepted Contract Amount (In Eq. PKR million)	Minimum Rating of Insurance Companies
Up to 1000	A (+)
1001 to no limit	AA

In case of Joint Venture, the Performance Security shall be in the name of the Joint Venture or in the name of Lead firm of the JV or in ratio of shares of the individual JV partners.

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

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

4.3 Contractor's Representative

In second paragraph the text "professional engineer as defined in the Pakistan Engineering Council Act, 1975 (Act No. V of 1976) (having temporary license 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"

4.4.2 As-Built Records

4.4 Contractor's Documents

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 asbuilt. 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 summery of daily job record indicating weather conditions, deployment of Contractor's Equipment, labour employment, local material procurement and material import, if any; and

(k) salient contractual and project information.

5.1 Subcontractors

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

"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 endeavor to employ such contractors as Subcontractors."

Not Applicable

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 [*Paymentto nominated Subcontractors*]."

6.1 Engagement of Staff and Labour

The following paragraph is added at the end of the Sub-Clause:

"The Contractor shall, to the extent practicable and reasonable, employ staff (not less than 50%) and labour (not less than 85%) with appropriate qualifications and experience from sources within the Islamic Republic of Pakistan."

6.7 Health and Safety of Personnel

The existing text is substituted with the following:

"In order to provide for the safety, health and welfare of persons, and for prevention of damage of any kind, all operations for the purposes of or in connection with the Contract shall be carried out in compliance with the Safety Requirements of the Government of Pakistan with such modifications thereto as the Engineer may authorize or direct and the Contractor shall take orcause 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 alsoprovide all other medical services and appoint a health and safetyofficer at Site if stated in the Specifications. In case of anyfatality or serious accident, the Contractor shall, in addition, notify the Engineer immediately by the quickest available means."

6.8 Contractor's Superintendence

Insert at the end of sub-paragraph (a) of this Sub-Clause:

"or, if not, the Contractor shall make competent interpreters available during all working hours, in a number sufficient for those persons to properly perform their superintendence duties"

The following text is added at the end of this Sub-Clause:

"The Contractor's authorized representative and his other engineers working at site shall possess valid registration with the Pakistan Engineering Council.

The Contractor's authorized representative at Site shall be authorized to exercise adequate administrative and financial powers on behalf of the Contractor so as to achieve completion of the Works as per the Contract."

6.12 Key Personnel

The following is inserted at the end of the last paragraph:

"If any of the Key Personnel are not fluent in this language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer."

The following Sub-Clauses 6.13 to 6.26 are added at the end of Sub-Clause 6.12:

6.13 Foreign Personnel

The Contractor may bring in to the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, if requested by the Contractor, use all reasonable endeavours in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national, or government permission required for bringing in the Contractor's personnel.

The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.

6.14 Supply of Foodstuffs

The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.

6.15 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.

6.16 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce the danger to their health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

6.17 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal thereto by Contractor's Personnel.

6.18 Arms and Ammunition

The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.

6.19 Festivals and Religious Customs

The Contractor shall respect the Country's recognized festivals, days of rest and religious or other customs.

6.20 Funeral Arrangements

The Contractor shall be responsible, to the extent required by local regulations, for making any funeral arrangements for anyof 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 involuntaryor 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 inthe details to be submitted by the Contractor under Sub-Clause 6.10 [*Contractor's Records*].

6.24 Workers' Organizations

The Contractor shall comply with the relevant labour laws of Pakistan which recognize workers' rights to form and to join workers' organizations/Trade Union of their choosing and to bargain collectively without interference.

6.25 Non-Discrimination and Equal Opportunity

The Contractor shall not make decisions relating to the employment or treatment of Contractor's Personnel on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment of Contractor's Personnel on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to any aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits),working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices.

Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination. The Contractor shall provide protection and assistance as necessary to ensure nondiscrimination and equal opportunity, including for specific groups such as women, persons with disabilities, migrant workers and children (of working age in accordance with Sub-Clause 6.22).

6.26 Epidemics

In the event of any out-break of illness of epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government or the local medical or sanitary authorities for the purpose of overcoming the same.

7.7 Ownership of Plant and Materials

The following is added before the first paragraph:

"Except as otherwise provided in the Contract,"

The following is added at the end of the Sub-Clause:

"No Plant and/or Materials that is the property of the Employer 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 tobe replaced, and giving details of the due date of delivery tothe Site of the replacement item(s).

Where any item of Plant and/or Materials has become the 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:

7.9 Use of Pakistani Materials and Services

The Contractor shall, so far as may be consistent with the Contract, make the maximum use of materials, supplies, plant and equipment indigenous to or produced or fabricated in Pakistan and services available in Pakistan provided such materials, supplies, plant, equipment and services shall be of required standard.

8.1 Commencement of Works

The following is added before the first paragraph:

"After signing of the Contract Agreement by both Parties," and thereafter the word "The" is replaced with the word "the".

8.5 Extension of Time for Completion

The following is added after paragraph (c):

"for last five years".

The following Sub-Clause 8.14 is added after Sub-Clause 8.13:

8.14 Incentives For Early Completion

If Contract Data does not state applicability of incentives for early completion, this Sub-Clause shall not apply.

The Contractor shall be entitled subject to Sub-Clause 20.2 [*Claims for Payment and/or EOT*] to bonus payment if the Works and/or each Section is completed earlier than the Time for Completion for the Works or Section (as the case may be). The amount of bonus for early completion of the Works and/or each Section shall be upto a limit and on a rate to 50% of the relevant limit and rate of delay damages prescribed in Contract Data and shall be paid for every day which shall elapse between the relevant Date of Completion of the Works or Section and therelevant Time for Completion.

Not Applicable

For the purposes of calculating any bonus payment, the applicable Time for Completion stated in the Contract Data is fixed and no adjustments of this time by reason of granting an EOT will be allowed.

The following Sub-Clause 11.12 is added after Sub-Clause 11.11:

11.12 Supervisory Assistance During DNP

If provided under the Schedule of Prices, the Contractor shall provide supervisory assistance to the Employer during the DNP for the Works. Such supervisory assistance shall be as described in the Specification for the purpose of supporting the Employer's operation and maintenance of the Plant for the period specified in the Schedule of Prices after the Date of Completion.

12.2 Method of Measurement

The following paragraph is added at the end of the Sub-Clause:

"Summary of measured quantity for payment shall be delineated item-wise under four 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

The following text is added at the end of fifth paragraph of the Sub-Clause:

"Sum of overhead charges and profit for sub-paragraph (a) shall be Twenty Five percent (25%)".

13.4 Provisional Sums

The following paragraph is inserted as the penultimate paragraph:

"The Provisional Sum shall be used to cover the Employer's share of the DAAB members' fees and expenses, in accordance with Clause 21. No prior instruction of the Engineer shall be required with respect to the work of the DAAB. The Contractor shall submit the DAAB members' invoices and the satisfactory evidence of having paid 100% of such invoices as part of the substantiation of those Statements submitted under Sub-Clause 14.3.

13.6 Adjustments for Changes in Laws

The following 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 [*Adjustments for Changes in Cost*]."

14.1 The Contract Price

The following is added at the end of the Sub-Clause:

"Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts,imported by the Contractor for the sole purpose of executing the Contract shall be temporarily exempt from the payment of import duties and taxes upon initial importation, provided the Contractor shall post with the customs authorities at the port of entry an approved re-export bond or bank guarantee, valid until the Time for Completion plus six months, in an amount equal to the full import duties and taxes which would be payable on the assessed imported value of such Contractor's Equipment andspare parts, and callable in the event the Contractor's Equipment is not re-exported from the Country on completion of the Contract. A copy of the bond or bank guarantee endorsed by the customs authorities shall be provided by the Contractor to the Employer upon the importation of individual items of Contractor's Equipment and spare parts. Upon re-export of individual items of Contractor's Equipment or spare parts, or upon the completion of the Contract, the Contractor shall prepare, for approval by the customs authorities, an assessment of the residual value of the Contractor's Equipment and spare part to be re-exported, based on the depreciation scale(s) and other criteria used by the customs authorities for such purposes under the provisions of the applicable Laws. Import duties and taxes shall be due and payable to the customs authorities by the Contractor on (a) the difference between the initial imported value and the residual value of the Contractor's Equipment and spare parts to re-exported; and (b) on the initial imported valueof the Contractor's Equipment and spare parts remaining in the Country after completion of the Contract. Upon payment of suchdues within 28 days of being invoiced, the bond or bank guarantee shall be reduced or released accordingly; otherwise,the security shall be called in the full amount remaining."

14.2 Advance Payment

14.2.1 Advance Payment Guarantee

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.

In case of Joint Venture, the Performance Security shall be in the name of the Joint Venture or in the name of Lead firm of the JV or in ratio of shares of the individual JV partners.

14.6 Issue of IPC

14.6.1 The IPC

In the first line of the 1st paragraph the words "28 days" are substituted by "14 days".

14.7 Payment

The words "or through crossed cheque in favour of the Contractor or JV partners. The Payment to JV partners shall be made at the request of the Joint Ventures in the ratio of their shares specified by them" are added at the end of theSub-Clause.

15.2 Termination for Contractor's Default

15.2.1 Notice

Following text is added at the end of sub-paragraph (h) of this Sub-Clause:

"For the purposes of this Contract, corrupt and fraudulent practices have been defined in Public Procurement Rules 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

The following text is added at the end of this Sub-Clause:

"The Employer shall be entitled to sell any of the Contractor's Equipment, Temporary Works and unused materials and apply the proceeds of sale towards payment of any debt due from the Contractor to the Employer under this Clause including any outstanding payments to the Subcontractors.

16.2 Termination by Contractor

16.2.1 Notice

The sub-paragraph (j) is deleted in its entirety.

At the end of sub-paragraph (i) "; or" is replaced with "." and at the end of sub-paragraph (h) ";" is replaced with "; or".

In sub-paragraph (f) "84 days" are replaced with "180 days" and text "for reasons not attributable to the Contractor" is added at the end.

16.3 Contractor's Obligations After Termination

Sub-paragraph (c) is deleted and replaced with:

"(c) deliver to the Engineer all Employer-Supplied Materials and/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 atime while the Contractor is responsible for its care, arising fromany 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

If the Contractor is the affected Party and suffers delay and/or incurs Cost by reason of the Exceptional Event of which he/she gave a Notice under Sub-Clause 18.2 [Notice of an Exceptional Event], the Contractor shall be entitled subject to Sub-Clause 20.2 [Claims For Payment and/or EOT] to:

(a) EOT; and/or

(b) If the Exceptional Event is of the kind described in sub-paragraphs (a) to (e) of 18.1 [Exceptional Events] and, in the case of sub-paragraphs (b) to (e) of that Sub-Clause, occurs in the Country, payment of such Cost.

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 fourth line of firstparagraph:

The Contractor shall effect and maintain insurance against liability for claims, damages, losses and expenses (including legal fees and expenses) arising out of the execution of the Works in respect of injury, or death of any person employed by the Contractor or any of the Contractor's other personnel.

The Employer and the Engineer shall also be indemnified under the policy of insurance, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Employer or of the Employer's Personnel.

The insurance shall be maintained in full force and effect during the whole time that the Contractor's Personnel are assisting in the execution of the Works. For any person employed by a Subcontractor, the insurance may be effected by the Subcontractor, but the Contractor shall be responsible for the Subcontractor's compliance with this Sub-Clause.

The following Sub-Clause is added after Sub-Clause 19.2.6:

19.2.7 Insurance Company

The Contractor shall be obliged to place all insurances described in this Clause with insurers listed in the Contract Data and rated by PACRA/VIS of rating as provided in Table below:

Accepted Contract Amount (Million PKR)	Minimum Rating of Insurance Companies
Up to 1000	A (+)
1001 to no limit	AA

The following Sub-Clause is added after Sub-Clause 19.2.7:

19.2.8 Workman Compensation Policy

The Contractor must secure a proper Workmen's Compensation Policy exclusively from M/s National Insurance Company Limited (NICL). This policy should enable the Contractor to compensate their employees for work-related injuries, as well as provide suitable compensation to the dependents in case of unfortunate death or permanent and total disablement of an employee. The Client bears no

liability in this regard. For all publicly financed CAR/EAR projects, the Contractor must engage M/s NICL, ensuring compliance with Section-166 of the Insurance Ordinance, 2000. This applies specifically to Contractors All Risk/Erection All Risk Policies related to the construction, renovation, or maintenance of 'public property'. Additionally, the Contractor is responsible for indemnifying the Client as well as the Consultant staff against any third-party claims arising from accidents or injuries that occur at the site during the execution of works.

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

23 Taxes

The Contractor, Subcontractors and their employees shall beliable to pay income tax, withholding tax, super tax and other taxes on income arising out of the Contract. The rates and prices as stated in the contract shall be deemed to cover all such taxes.

24 Integrity Part

If it is found and established at any stage that the Contractor or any of his Subcontractors, agents or servants have violated or involved in violation of the Integrity Pact signed by the Contractor then the Employer shall be entitled to:

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

(b) terminate the Contract; and

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

The termination under sub-paragraph (b) of this Sub-Clause shall proceed in the manner prescribed under Sub-Clause 15.1 to 15.4 and the payment under Sub-Clause 15.4 shall be made after having deducted the amounts due to the Employer under sub-paragraph (a) and (c) of this Sub-Clause.

SPECIFICATIONS
PART A - SPECIFIC PROVISIONS

TABLE OF CONTENTS OF SPECIFIC PROVISIONS

Sp. No.	Description
SP-25	Unit Price Breakdown
SP-26	Transport and Handling of Cargo
SP-27	Directed and Required
SP-28	Communications to the Engineer
SP-29	Any Other Provision
SP-30	Measurement and Payment – General
SP-31	Measurement and Payment

*[**Note:***

The above Sections of Specifications, are for guidance only, and shall be indicatedappropriate to the work/project.

The Employer may adopt the above format. However, if any section is not applicable, it may be mentioned as "Not Used".]

1. THE SITE

Site of Works is the area for construction lying within the line of 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 be comprised in the site defined in clause 1 Conditions of Contract.

The Employer will give to the contractor, possession of the area designated and defined as "the site" and shown on the drawings as may be required to implement as much of the works when The Engineer' Notice to Commence the Work is given.

2. WORK UNDER THE CONTRACT

The contract comprises the execution and completion of the works, remedying of any defects therein maintenance of utility services and the provisions of all labor, materials equipment plant and everything whether of a temporary or permanent nature required in the such execution, completion, remedying and maintenance so far as the necessity for providing the same is specified or can reasonably be inferred from the Contract.

The carrying out of all work included in the Contract is to be supervised by a sufficient number of qualified representatives of the Contractor and full facilities and assistance are to be afforded by the Contractor for the Engineer or his Representative to check 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.

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.

Submission of the proposals & plans, methodology and procedure for execution of works and approval thereof by the Engineer shall not relieve the Contractor of his responsibilities and duties under the Contract.

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.

3. PROJECT FEATURES

The scope of work includes but not limited to:

1. Internal Electrical Distribution Network,
2. Earthing System,
3. GPON System (Passive only), and
4. CCTV System

4. DRAWINGS

- **Tender Drawings**

  Tender Drawings issued with the Tender Documents called Tender Drawings; show scope of the work to be performed by the contractor. The Drawings are generally in sufficient details so as to be used as a basis for construction and fabrication.

- **Construction Drawings, Supplementary Drawings**

  After award of Contract, the Engineer will issue Construction Drawings to the Contractors.

  The Engineer shall have authority to issue 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 defect therein. The Contractor shall follow these drawings.

  The Contractor shall give notice to the Engineer regarding the part of the Drawings which is in his opinion contains discrepancies or are not clear. The Engineer shall issue necessary clarification or supplementary Drawing in greater details as required to execute the works. These supplementary Drawings shall be reviewed by the Engineer for his determination of adjustment of the Contract Price under Clause 51 and 52 of Conditions of Contract.

- **Definition of Term Drawings**

  The term used in the specifications means the Drawings referred in Clause 5.1 and 5.2 hereof.

- **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.

- **Copies of Drawings**

  Drawings will be issued to the contractor as described below.

- **Tender Drawings**

  Contractor shall receive one (1) set of the Tender Drawings along with the Tender Documents.

Additional sets will be made available upon written request from the Contractor, with the cost of reproduction borne by the Contractor. The Employer shall be provided with two (3) sets of each Tender Drawing for official use

- **Construction Drawings/ Supplementary Drawings**

  The Contractor shall be provided, free of charge, with one (1) print of each Construction Drawing and any associated Supplementary Drawings. Four (4) copies of each of these drawings shall be issued to the Employer for their use and official records.

- **Drawings to be furnished by the Contractor/As-Built Drawings**

  The contractor shall submit to the Engineer for review of such drawings as required under the contract sufficient in advance of the work intended to be executed.

  The contractor shall, at all times, keep on site a separate set of prints on which all significant changes between the work shown on the drawings and the which is actually constructed, shall be noted neatly, accurately and promptly as the work progresses. The Sub-contractor(s) for plumbing, mechanical and electrical shall at all times, keep in 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 progress. 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 Taking-Over Certificate for whole of the Works furnished 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-BULIT Drawings.

  The Contractor shall submit to the Engineer six (6) complete sets of all As-Built Drawings, along with a soft copy in AutoCAD format, within thirty (30) days of receiving the relevant drawings from the Engineer. Upon review and approval, the Engineer shall forward the complete set of As-Built Drawings to the Employer.

5. PHYSICAL AND OTHER DATA AVAILBLE TO CONTRACTOR

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 Contractors are encouraged to visit the project site to assess the existing site conditions.

6. LAYOUT OF WORKS AND SURVEY

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 labor 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.

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 labor 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 labor 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.

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.

7. APPROVAL OF MATERIALS AND EQUIPMENT

- **Quantity 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 manufacturer or Supplier.

- **Submission of Samples and Data.**

  As soon as practicable after the award of Contract, the Contractor shall submit for the approval of the Engineer drawings, Catalogues diagrams and other descriptive data for all mechanical, electrical, architectural and such other materials and plant designated by the Engineer, which the contractor proposes for use under this Contract. For certain materials and plant, data may be required to be submitted in accordance with a detail form furnished by the Engineer. Samples of materials (2 Sets) shall be submitted by the Contractor to the Engineer at Contractor's Cost for approval sufficiently in advance of the materials intended to be incorporated in the Works. **Finally, The engineer shall consent from the employer before approval of material/samples etc.**

- **Testing**

  Testing, except as otherwise specified herein shall be performed by a testing agency as proposed by the Contractor and approved by the Engineer at no extra cost to the Employer. The Engineer may require all testing to be carried out under his supervision **and the Engineer shall inform/ brief time to time to the employer. Satisfaction of employer is necessary.**

  The quality control testing shall be performed by the contractor's competent personnel in accordance with a site testing as approved by the Engineer.

  The contractor shall keep a complete record of all quality tests programme performed on site.

- **Testing Laboratory Certificates.**

  The Engineer may accept a certificate **after consent of employer** 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.

- **Inspection**

  All materials and Plant furnished and all work performed under this contract will be subject to inspection by the Engineer at all times and in all states of completion both off-site and on-site. The contractor shall furnish promptly without additional charge, all facilitate, and labor and materials reasonably needed for performing such inspection and testing as may be required by the Engineer.

- **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.

- **Site laboratory.**

  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.

- **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. The Engineer shall brief

the employer before the approval of BBS.

- **Submissions**

  Schedule submission at least thirty days before the dates when reviewed submittals will be needed.

  Shop drawings of activities, as deemed necessary by the Engineer, shall be submitted for review and approval by the Engineer as stipulated within the contract terms. Submit Shop Drawings and number of copies of Product Data which the Contractor requires for distribution plus four copies which will be retained by the Engineer.

  Submit three samples unless otherwise specified.

  Accompany submittals with transmittal letter, in duplicate, containing:
  - Data
  - 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.

- **Re- Submissions 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.

8. CONTRACTOT'S QUALITY ASSURANCE PLAN/ SPECIFICATIONS

- **Specification or as specified**

  Specification or as specified refers to the specifications outlined in these Documents and where no specifications are available for any work or where the same are found not applicable then the relevant applicable ASTM or BSS specifications or equivalent standards shall apply in the same order. Any time for which no specifications are outlined but which are identified in drawings shall be completed accordingly to the standards as per ASTM/BSS these include items that may be added in the future. The Employer/ Employer's representative may supplement such specifications during the progress of work. All materials and processes used for these items shall be subject to standard testing and if found below the pertinent ASTM/BSS standards, shall be removed from the site immediately at the contractor's expense.

- **Standards and codes**

  Wherever reference is made in the specifications to the respective standards codes in accordance to the which goods and materials are to be furnished and work is to be performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise expressly set forth in the contract.

- **Material and process**

  All goods and materials to be incorporated in the works shall be new, unused of the most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the contract.

- **Equivalent Material, Process etc.**

  Where specific materials, processes etc. are specified and the same are not available other alternative material and processes which ensure an equal or higher quality than those specified will be accepted subject to the Employer prior review and written approval. Differences between the specified and the proposed alternatives must be fully described in writing by the contractor and submitted to the Employer's approval who may give such approval after determining that the

alternative proposed ensures equal or higher quality.

- **Approved, Directed, Instructed**

  Approved, directed, instructed means the approval etc. of the Employer unless otherwise stated.

- **Alternatives**

  Where alternative materials process etc., are specified the selection will depend on local conditions and discretion rest with the Employer/ Employer's Representative whose decision shall be final and binding.

- **Catalogues/Standards/Manufacturer's Instructions, etc.**

  Wherever the manufacturer's/supplier's instructions, Manuals, guarantees and ASTM/BSS standards are referred to in the specifications and details of BOQ; all such literature shall be submitted by the contractor to the Employer/ Employer's Representative for due checking, approval and record.

- **Applicability**

  Unless stated or specified else-where to the contrary these General Rules shall apply to all sections of work irrespective of their sequences, location and description.

  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 and 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.

  Manufacture's standard schematic drawings shall be modified or deleted to indicate only information which is applicable to the project. Such standard information shall be supplemented to provide all additional applicable information.

  Manufacturer's catalogue sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive literature shall be clearly marked to identify pertinent materials products or models. Dimensions and required clearances shall be indicated. Shop performance characteristics and capacities shall be noted.

  Except as otherwise provided by these Specifications or the Drawings, all materials, equipment and fabrication and testing thereof shall conform to the latest applicable standards and codes referred in the Specifications by use of the abbreviations explained below:
  - ASCE - American Society of Civil Engineers
  - ASA- American Standard Association
  - ACI- American Concrete Institute (USA)
  - AISI- American Iron and Steel Institute (USA)
  - AISC- American Institute of Steel Construction (USA)
  - ANSI - American National Standard Institute (USA)
  - ASTM - American Society for Testing and Materials (USA)
  - AASHTO - American Association of State Highway & Transportation Officials
  - AWS - American Welding Society (USA) BS - British Standards (UK)
  - CP - Codes of Practice (UK)

- ICAO - International Civil Aviation Organization BSICP - British Standard Institute Code of Practice PS - Pakistan Standards (Pak)
- PCA - Portland Cement Association PSI - Pakistan Standard Institute
- SSPC - Steel Structures Painting Council (USA) UBC - Uniform Building Code (USA)
- USBR - United States Bureau of Reclamation (USA)

If the Contractor, at any time and for any reason, wishes to deviate from the above standards or desires to use material or equipment not covered by the above standards, he shall state the exact nature of the changes, the reason for making the change and shall submit complete specifications of the materials and equipment to the Engineer for approval.

9. CONSTRCUTION SCHEDULE

- **Submittal Date**

  The programme of works submitted by the Contractor, in accordance with the contract, in the form of a detailed schedule based on a computerized network analysis covering all construction activities indicating critical activities with critical patch resource scheduling for contractor's equipment material and labor within the period stated in the Appendix A to Tender. All the milestones shall be clearly identified.

- **Requirements**

  The detailed submittal shall consist of schedule, network analysis tabulations and narrative descriptions of the proposed construction programme.

  Each summary or detailed schedule shall consist of a bar chart and time scaled network. The schedule start and finish times for all activities on the bar charts shall agree with those in the network. All inter-relationships and inter-dependencies between structures shall be clearly indicated on the schedules. The network shall show the order and interdependences of activities planned by the contractor and shall be time – scaled accordingly to calendar dates.

- **Monthly Reports.**

  Each month the Contractor shall submit a report consisting of:

  - Copies if the bar charts for the current phase with both actual progress and scheduled progress shown.
  - Network analysis tabulations reflecting actual start date and finish dates where applicable.
  - A narrative report discussing any significant deviations from the schedule and, if necessary, explaining the steps proposed to be taken to maintain the approved schedule.

10. FACILITIES PROVIDED BY THE EMPLOYER

(Not Used)

11. OTHER FACILITIES FOR PROJECT

The Contractor shall construct a Site Office as per directions of the Employer on a land to be specified by the Employer. The said office shall be fully furnished / equipped with fittings and fixtures like fans, AC units, furniture, utilities (including backup power i.e Generator and or/Solar Plant) etc. The Contractor shall also be responsible for the maintenance of the said office till end of the Defect Liability Period.

The Contractor shall provide following facilities in the site offices of the Employer and the Engineer:

1. Setup a furnished meeting room, with seating capacity of 10 persons, with multimedia arrangements.

2. Two (02) workstations including Computer / Laptop (latest generation Core I-5 (atleast), minimum with 500 GB SSD, 16 Gb Ram, a DVD writer, 17" Flat Color monitor, etc.), flash drive (at least 8 GB capacity) and stationery for the use of the Engineer and his/her staff.

3. A3 size color printers

4. Air conditioners

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-five (365) 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.

The Contractor shall provide operate and maintain within one month to the issuance of Letter to Commence, 01 No. car (latest model) or equivalent with driver and fuel.

They shall furnish supply and provide, as may be necessary without specific direction of the Employer/Employer's staff, all fuels, lubricants, tyres and other supplies, all maintenance, repairs, comprehensive insurance cover and running costs and suitability qualified drivers at all times for running of vehicles and will provide a substitute vehicle in case of break down exceeding two days.

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 Employer/ Employer's representative at no additional cost to the Employer. The Contractor shall maintain the vehicles till the issuance of Defects Liability Certificate.

In case above facilities are not provided within stipulated time (within one month from the issuance of Letter to Commence), the Employer / Engineer may have the facilities developed/provisioned on their own and the actual expenditure will be deducted from the interim payment certificate submitted by the contractor.

No 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.

12. EQUIPMENT FURNISHED BY THE EMPLOYER

(Not Used)

13. COOPERATION 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.

14. SAFETY AND HEALTH

Due precautions shall be taken by the Contractor, and at his own cost, to ensure the safety of his staff and labor at all times throughout the period of the Contract. The Contractor shall further ensure that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements

15. CONSTRUCTION UTILITIES

The Contractor shall search for, find, locate and protect any wiring, cable, duct, pipework, etc., within or immediately adjoining the site area.

The Contractor shall take full responsibly for safety of existing service lines, utilities and utility structures uncovered or encountered during excavation and construction operations. The Contractor shall take full responsibility for damaging any such service lines, utility/utility structure and any cost and/or expense that arises or issues from any such damage shall be borne directly by himself. Should any damage to any such service occur the Contractor shall forthwith take remedial action, initiate safety precautions, install temporary services and carryout repair all at his own cost and expense and inform the Engineer and notify all relevant authorities.

Existing utilities which are to remain in service for or after the works are to be determined by the Contractor. If any existing service lines, utilities and utility structures which are to remain in service are uncovered or encountered during these operations, they shall be safeguarded, protected from damage, and supported. The Contractor shall preserve, maintain and keep in perfect working conditions, any existing facilities required to be preserved by the Employer/the Engineer.

16. TRAFFIC, ROADS, BRIDGES

(Not Used)

17. ROCK QUARRIES

(Not Used)

18. FLOOD WARNING SYSTEM

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.

Additionally, the Contractor shall be deemed to have taken all weather, flood, inundation, seismic, traffic, vibrations conditions, arising from any cause whatsoever, into account when preparing his Tender and he shall not be entitled to extra payment by reason of the occurrence or effect of excessive traffic vibrations, rain fall, floods, temperature or humidity, high winds, earthquakes or an, other heavier flood inundation, seismic or environmental conditions.

Without limiting his liabilities under the Contract, the Contractor shall make suitable arrangements to protect the works, Including temporary Works, and Constructional Plant against the effects of weather flood inundation seismic and traffic vibrations conditions.

No work shall be performed when; in the opinion of the Engineer such work is liable to be injuriously affected by the weather, flood, inundation seismic or traffic vibrations conditions. The Contractor shall not be entitled to extra payment on account of loss alleged to have been sustained directly or indirectly by reason of the Engineers declining to permit such work to start or continue or ordering any work damaged by the weather flood inundation seismic or traffic vibrations conditions to be made good or removed and re-executed.

The Contractor shall be responsible for obtaining and acting upon all relevant weather flood inundation and seismic information during the period of the Contract. The Contractor shall promptly supply copies of all-weather flood inundation and seismic forecasts to the Engineer.

19. ENVIRONMENTAL PROTECTION

The Contractor shall exercise care to protect the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of works. Except where clearing is required for the Permanent works, approved construction roads and the Temporary Works, and for excavation operations, all trees and native vegetation shall be preserved and shall be protected from damage which may be caused by the Contractor's construction operations and equipment. On completion of the works, all work areas shall be smoothed and graded in a manner to confirm to the natural appearance of the landscape. Where unnecessary destruction, scarring, damage or defacing may occur as a result of the Contractor's operations, it shall be repaired, replanted, or otherwise.

20. STANDARDS OF COUNTRIES OTHER THAN ORIGION

(Not Used)

21. PROGRESS REPORTS AND PHOTOGRAPHS

During the continuance of the Contract, the Contractor shall submit weekly 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 work, tests with regard to the agreed contract programme.

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.

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.

During the period of the Contract, the Contractor shall submit to the Engineer not later than the 8th day of the following month, 5 hard copies and soft editable format each of Monthly Progress Reports covering:

- A Construction Schedule indicating the monthly progress in percentage;
- Description of all work carried out since the last report;
- Description of the work planned for the next 56 days sufficiently detailed to enable the Engineer to determine his programme of inspection and testing;
- Monthly summary of daily job record;
- Photographs to illustrate progress; and
- Information about problems and difficulties encountered, if any, and proposals to overcome the same.

During the period of the Contract, the Contractor shall keep a daily record of the work progress, which shall be submitted to the Engineer at the end of each day. The daily record shall include particulars of weather conditions, number of men working, deliveries of materials, quantity, location and assignment of Contractor's equipment

As soon as work commences on Site, the Contractor shall provide at least 10 to 12 photographs (along with soft copy) of the works from positions to be selected by the Engineer. Each photographic print shall not be less than 297mm x 210mm and shall bear a printed description, a serial number and the date when taken.

The negatives /soft copy of all photographs shall be held at the Contractor's Site Office, numbered and handed over to the Employer at the completion of the Contract.

22. UNIT PRICE BREAKDOWN

The FPS System of Units shall be used throughout the Project.

23. TRANPORT AND HANDLING OF CARGO

If, notwithstanding Sub-Clause 30.1 any damage occurs to any bridge or road communicating with or on the routes to the Site arising from the transport of materials or Plant, the Contractor shall notify the Engineer with a copy to the Employer, as soon as he becomes aware of such damage or as soon as he receives any claim from the authority entitled to make such claim.

The Employer shall not be liable for any costs, charges or expenses in respect of any damage occurs to any bridge or road arising from the transport of Material or Plant by the Contractor. The Contractor shall keep indemnified the Employer against all such claims. The Contractor shall negotiate the settlement of claim with the authority and pay all sums due in respect of all claims, proceeding, damages, costs, charges and expenses.

The Contractor shall notify the Engineer and Employer about the negotiations, in-respect of settlement of claim. In case of failure in payment of claimed amount by the Contractor, the Employer shall recover the amount of claim from the Contractor by making deduction from any monies due or to become due to the Contractor and shall notify the Contractor accordingly

24. DIRECTED AND REQUIRED

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.

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.

25. COMMUNICATION TO THE 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.

26. ANY OTHER PROVISION

(Not Used)

27. MEASUREMENTS AND PAYMENTS

The measurement of the Works shall be performed on the basis of the Specifications. All work completed under the Contract shall be measured according to the metric system for all items, unless otherwise provided herein or in the Special Provisions. All longitudinal measurements for area or volume will be made horizontally along the road center line, and no deduction will be made for individual fixtures in the pavement having an area of 1 sq. meter or less. All transverse measurements for area or volume of pavement courses will be made horizontally in accordance with the dimensions indicated on the plans, or the dimensions ordered by the Engineer. In computing volume of excavation, embankment and borrow material, the average end area method will be used. Where no items are provided in the Bill of Quantities for work required under the Contract, costs shall be deemed to be distributed among the quoted rates and prices entered for other items of work in the Bill of Quantities. The Works shall be measured net notwithstanding any general or local custom except where otherwise specifically described or prescribed in the Contract.

SPECIFICATIONS
PART B - TECHNICAL PROVISIONS

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

TECHNICAL SPECIFICATION – ELECTRICAL WORKS

NOVEMBER 2025

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TECHNICAL SPECIFICATION – ELECTRICAL WORKS

SECTION E-1
GENERAL ELECTRICAL REQUIREMENTS

FOREWORD

This document is to describe the minimum requirements for the equipment and installations and to ensure that the Contractor is fully aware of his duties to perform the required works, in accordance with the terms of the Contract.

1. SCOPE OF WORK

The works related to the electrical system which are included in the scope of this Contract are shown on the Drawings, stated in the Particular Specifications, Bill of Quantities and explained in these specifications. The works shall broadly include but not limited to the following:

1	Conductors and Cables	SECTION E-4
2	Conduits and Pipes	SECTION E-5
3	Ring Main Units (RMU)	SECTION E-6
4	ICT Communications (GPON)	SECTION E-7
5	Security System	SECTION E-8
6	Earthing System	SECTION E-9

All material and equipment supplied by the Contractor shall be new and in all respects conform to the high standards of Engineering design, workmanship, performance and function as here in specified and fully meet the quality level and rugged requirements of the specifications.

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, shall be considered to have been so specified and accordingly shall be provided by the Contractor as part of the Contract.

The Contractor shall be solely responsible for ensuring proper functional requirements of various equipment and 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 Owner or his representative, to achieve proper coordination with various equipment offered in the bid and also those installed by others.

Approval of the Contractor's supplied equipment / installation works shall not relieve the Contractor of any of his obligations or liabilities under the Contract, except insofar as provided under the conditions of the Contract.

2. RULES AND REGULATIONS

The entire electrical installation / work shall be carried out by licensed contractor, authorized to undertake such work under the provisions of Electricity Act 1910 and The Electricity Rules 1937 as adopted and modified up to 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 Owner or his representative, and his decision 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 Electric Company shall be complied with.

3. STANDARDS

All works, equipment and materials shall conform to the specification, recommended practices, official standards and codes, the non - restrictive list of which is given below.

- International Electro-technical Commission (IEC) Standards
- British Standards (BS)
- National Electric Code (NEC)
- National Fire Protection Association (NFPA) Codes
- CIBSE Code for Lighting
- K-Electric Standards & Regulations
- WAPDA / PEPCO Standards & Specification
- NEPRA Regulations / Standards
- Building Code of Pakistan
- Pakistan Standards
- Any other code or standard mentioned elsewhere in the specification

In the event of conflict between standards, the most stringent shall prevail.
Whenever the electrical equipment to be installed, does not hold national standards, the Contractor shall take into account the specific standards chosen by the Owner and make sure that the equipment he has to install, meets these standards.
In addition, even if no mention is stipulated in this specification, it is implied that the equipment be tropicalized, if required, by the conditions of the site of installation.

In any case, the standards and codes to be taken into consideration are those in force at the date of delivery.

4. INSTALLATION AND SERVICE CONDITIONS

4.1 Site Conditions

All material and equipment supplied and installed shall be designed, manufactured and tested to meet the harsh and rusty environment of the coastal area. Following ambient conditions shall be met unless specifically stated otherwise for any material / equipment:

a. Maximum outdoor ambient temperature : 50 degree C
b. Minimum Indoor ambient temperature : 5 degree C
c. Maximum relative humidity : 90 %
d. Minimum relative humidity : 10 %

4.2 Service Conditions

Equipment shall be designed and built for continuous service with a minimum of supervision and maintenance.

5. MAIN ELECTRICAL CHARACTERISTICS

5.1 Power Supply System

Unless otherwise specified elsewhere, all equipment and material shall be designed to operate and function satisfactorily with the following minimum requirements without any de-rating:

- Medium Voltage 15 kV $\pm$ 10%
- Low Voltage 415 V $\pm$ 10%
- Phase 3, 4 wire system
- Frequency 50 Hz $\pm$2 Hz

5.2 Degree of Protection of Enclosures

For indoor applications, minimum IP31 degree of ingress protection of the enclosures against contact with line or moving parts and against ingress of solid foreign bodies or liquids, shall be selected, in accordance with IEC 60529.

For outdoor applications, minimum IP65 (or more as shown) degree of ingress protection of the enclosures shall be provided.

6. GUARANTEE

The Contractor shall furnish written grantee which should clearly state that the works he will carry out as well as the materials he will supply, meet with this specification and that compliance thereto constitutes an official clause, added by implication to the general conditions of his offer when signing the Contract.

Guarantee shall also be for replacement and repair of part or whole of the equipment which may be found defective in material or workmanship. The grantee shall cover the duration of Maintenance Period as defined in the conditions of the Contract. This guarantee shall not relieve the Contractor of his obligations and he will fully be 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.

The Contractor shall acquaint himself fully with the existing conditions and limitations at site and all works necessary to complete the project under the Contract, to be carried out by the Contractor.

7. EXCEPTIONS TO SPECIFICATION

Any exception or deviation from this specification or the codes and standards shall be listed separately in the Contractor's "List of Deviations". Any exception, which shall not be listed, shall not be considered later.

8. AVAILABILITY OF SPECIFICATIONS, DRAWINGS AT SITE

The Contractor shall assume at his own cost the permanent availability of this specification and drawings on site where applicable.

9. DISCREPANCIES IN TENDER DOCUMENTS AND DRAWINGS

The Contractor shall carefully examine the documents and drawings and if he finds any discrepancies or omissions from the specifications, bill of quantities or drawings, or is in doubt as to the meaning, he shall at once notify the Owner or his representative for receiving his instructions before proceeding with the works. If such defective or modified work is carried out by the Contractor on his own, he shall rectify the same at his own cost.

10. MEASUREMENT OF WORKS

The quantities set out in the bill of quantities are the estimated quantities and they shall not be taken as actual and correct quantities of work to be executed by the Contractor. The Contractor shall carry out actual measurement of works at the site.

11. INSTALLATION DETAILS

The locations, routings, and other installation details for electrical equipment are indicated on the drawings. If any information is not stated on the drawings or wherever modifications are required the Contractor shall obtain prior instructions from the Owner or his representative.

12. DRAWINGS AND DATA

The Contractor shall provide dimensional outline drawings, arrangement drawings and technical data for the equipment offered, for the approval of Owner or his representative.

13. PRIOR APPROVAL OF SHOP DRAWINGS, MATERIALS AND EQUIPMENT

The Contractor shall provide shop drawings for the electrical installations showing the exact routes of all underground cables and ducts, the exact run of all conduits and trunking, draw-in and junction boxes, the number and size of wires in each conduit, the final connection arrangements at distribution boards and the details of ducts for the approval of consultant / Owner's representative before commencing any portion of the works. All such working drawings shall be submitted in suitable number of copies as indicated in the particular conditions and within the periods stipulated below:

a. **Cable entry ducts into buildings**:
Working drawings shall be submitted within two weeks of handing over the site.

b. All other working drawings shall be submitted to the Engineer against signed receipt and dated within two months of signing the Contract. Should however the Contractor be obliged to install electrical conduits prior to this period then he shall submit the relevant working drawings at least two weeks prior to the proposed date of commencement of the work. The Contractor shall submit the program indicating the dates on which coordination in different sections will take place, together with the submission of the working drawings. The Engineer shall arrange to return to the Contractor at least one week prior to the commencement of concreting of the section, his comments or approval of the working drawings.

The Contractor shall supply detailed specifications, dimensional drawings, etc., of equipment that he proposes to supply and install.

Where this Contract requires the approval of Engineer to material and goods, the Contractor must seek to obtain this approval within eight weeks after signing of the Contract. No extension of time will be granted for non-availability of material or goods if this clause is not complied with. Approval of the Engineer does not relieve the Contractor of placing his orders in due time for the materials he needs to complete the Contract on time. The approved samples shall be retained on site for comparison with commodities used in works and removed when no longer required.

14. MATERIAL ORIGIN AND QUALITY

The material and equipment shall be purchased from Consultant / Owner's agreed suppliers.

The consultant / owner shall retain the right to at any time demand the indication of origin of the materials, and to eventually refuse products, the origin of manufacturing of which have not been previously agreed to without consideration of quality.
On specific agreement of the Owner, the materials may be delivered progressively to the field, but in such a manner as to allow sufficient time for their reception.

When choice of manufacturer is allowed for any particular commodity the Contractor shall obtain the whole quality required to complete the work from one manufacturer or obtain approval of any change in source of supply. He shall produce written evidence of sources of supply when requested to do so by the Engineer.

15. IDENTIFICATION OF EQUIPMENT

For each piece of equipment, identification label shall be fitted in front of the casing. The labels shall have block letters with sufficient height (font size) to meet K-Electric / WAPDA specification and as approved by the Engineer. The letters shall be black on white back ground of trifoliate and fixed with screws.

16. MARKINGS

The contractor shall provide "Danger Boards" and "Shock Charts" wherever required to comply with the requirements of local Electricity Rules. Standard industry practice and as approved by the Engineer.

17. FACTORY TESTS

All equipment supplied by and installed as part of the Contract such as distribution boards and like shall be fully tested at the manufacturer's works to the requirements of appropriate standards called for later in the particular specification.

The Contractor shall inform the Engineer in writing about the date and time of test of each equipment at least two weeks in advance. The witnessing of test by the Owner or his representative shall not absolve the Contractor from his responsibility for the proper functioning of the equipment and for furnishing the guarantees referred to in Clause 6.0. All test results in the form of certificate of test / test record certificates, signed by all the witnesses, for each item in the scope of Contractor's supply shall be supplied to the Engineer within seven days of the test date, and in any event before delivery to the site.

All expenses for carrying out the tests and witness by the Owner or his representative shall be borne by the Contractor and deemed to have been included in the tender bid.

18. STORAGE

The Contractor shall cover the equipment properly, store in a dry warehouse and keep in such conditions that it shall not be damaged due to environmental or other accidental conditions expected to occur on site. As particular concerns; fragile components, these shall be stored on shelves in their original packing, fitted with identification labels so as to avoid unnecessary manipulation or handling.

The Contractor shall handle, store and fix each commodity in accordance with the manufacturer's recommendations. He shall inform the Engineer if these conflicts with any other specified requirement and submit copies of manufacturer's recommendations to the Engineer when requested to do so.

19. LABOR AND STAFF OF CONTRACTOR

The Contractor shall provide / furnish and arrange for:

- Skilled and unskilled labor required for performing the works in accordance with the technical specifications and drawings within the agreed time schedule.
- Supervisory technical staff with appropriate experience and requisite expertise to ensure quality of work performed.
- Supervisory administration and clerical staff to ensure smooth functioning of the activities at site.
- Construction equipment, meggers, tools, etc.

The Contractor shall supply all labor, materials and equipment necessary for the installation of low voltage distribution boards, cables, lighting and power equipment, together with all other apparatus shown on the drawings and as detailed in the Particular specification.

20. SMALL INSTALLATION MATERIAL

The Contractor shall supply all small installation and consumable materials such as nuts, bolts, washers, shims, angles, leveling materials, insulation tape, solder, PVC strap-on or heat shrinkable type cable tags, cable ties, bushes, sealing compound, Avometer, electrical testing and measuring instruments, etc., and all such other material not listed in BOQ, required for complete installation as intended by the specification and scope of works.

21. INSTALLATION INSTRUCTIONS - GENERAL

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 Contractor not following the manufacturer's instructions shall be corrected and repaired by the Contractor at his own cost.

22. ASSOCIATED CIVIL WORKS

The expression `Associated Civil Works' shall mean civil work to be carried out by the Contractor under the direction of the Engineer in connection with the Electrical Service.

The Contractor shall prepare accurate drawings giving details of all holes, fixings, bases and other civil work requirements and shall be responsible for their accuracy. The cost of preparing shop drawings shall be considered to have been so specified in the tender price.

In general, the following Civil works (but not limited to) may require to be carried out by the Contractor on site:

a. The cutting and forming of holes for conduits or pipes, or conduit or pipe fixings through walls, floors, ceilings, partitions, roofs, etc., and making good after the work is sufficiently advanced.
b. The building of concrete and / or brick ducts in floors, walls, etc.
c. The formation of concrete bases, etc., for equipment
d. Excavation forming for underground services of ducts and courses and then covers it.
e. The cutting or forming of chases, recesses, etc., in floors, walls, etc., for conduits and fittings in and making good.
f. Excavation for and laying of cable carrying pipes.
g. The building in of brackets and supporting bars or other form of conduit or pipe suspensions.
h. The painting of all pipes, tube and conduits etc. after fixing unless specified to the contrary.
i. The providing and building in of sleeves through slabs and walls.

All required holes through walls, floors and beams for pipes and ducts will be left out by the Contractor during the process of building.

Where conduits, pipes or fittings are fixed to concrete or woodwork by means of saddles or clips, the Contractor shall himself execute the work necessary and

the cost of such work shall be considered to have been so specified in the price.

Cutting, fitting, repairing, patching or plastering and finishing of carpentry work shall be done by craftsmen skilled in their respective trades, when cutting is required it shall be done in such a manner as not to weaken structure, partitions or floors. The holes required to be cut must be directed without breaking out around the holes. Where patching is necessary in finished areas of building, the Engineer shall determine the extent of such patching or refinishing.

23. TESTING - GENERAL

Upon completion of installation, at least seven days' notice is to be given of intention to perform any test. The Contractor shall perform all static, semi-dynamic (by simulation), and dynamic field testing on all the equipment 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 test 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 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 obligations of Contract.

In addition to installation testing, the Contractor is to carry out operation testing of all sections and is to clean, set, calibrate and fully commission, demonstrate and hand over to the Owner the entire Contract works in a thoroughly complete and operational state to the satisfaction of the Engineer.

The acceptance - provisional or final- shall be made by the Owner. This reserves him the right to be represented or assisted by a representative or an organization (whether official or not) of his choice, which may decide on his behalf any repairs deemed necessary resulting from lack of observations of this specification, or of the rules and standards. In addition, he may judge the quality of the works and the materials supplied.

This remains in force in case of sub-contracting.

The Contractor shall formally engage his direct responsibilities to the Owner or his representative, and likewise, shall assume all responsibility for work performed by sub-contractors and materials he has supplied and installed.

23.1 Hi-Pot Test

All MV Switchgear including RMUs and Cables shall be subject to Hi-Pot test on site as per relevant IEC standards and K-Electric / WAPDA specification. Prior approval of the Engineer is a must for the value of voltage level and duration for Hi-pot testing of all required equipment.

23.2 Insulation Resistance Test

Insulation resistance test shall be made on electrical equipment by using a megger of 1000 volts for circuits between 250 and 500 volts. The insulation resistance of distribution boards, cables, etc., shall be as per IEC, IEEE, BSS and Pakistan Electricity Rules.

The distribution boards 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 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.

23.3 Earth Resistance Test

Earth resistance tests shall be made by contractor on the earthing system, separating and reconnecting each earth connection as may be required by the Engineer. 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 E.C.C. together with the resistance of the earthing lead measured from the connection with earth electrode to any other position in the completed installation shall not exceed one ohm.

Earth resistance test shall be performed as per Electrical Inspector's requirements. Where more than one earthing sets are installed, the earth resistance test between two sets shall be measured by means of Resistance Bridge Instrument. The earth resistance between two sets shall not exceed one ohm.

23.4 Switchgear Tests

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 and alarms 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.

23.5 Special Systems Tests

The special systems such as telephone, intercom, etc., shall be tested according to the procedures laid down in the respective sections of the technical specifications. However, any specific tests recommended by the manufacturer shall also be carried out as approved by the Engineer.

23.6 Complete 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.

24. AS BUILT DRAWINGS AND SERVICE MANUALS

A record shall be kept as the work proceeds of any work not in accordance with the working drawings, and upon completion of the work, the Contractor shall prepare the following drawings and forward them to the Engineer for approval:

a. Duplicate prints of as built single line diagram of the main and sub main distribution network, indicating all cables, their size and type, and the rating of all protection devices such as circuit breakers, fuses, etc.
b. Duplicate prints of as built drawings of lighting, power, telephone, fire alarm, as applicable.
c. Duplicate prints of as fixed control and wiring diagrams for the equipment installed as part of the Electrical Contractor works.

After these drawings have been approved, the Contractor shall supply two prints on paper of each and insert these in the operating and maintenance manual specified below.

The Contractor shall submit to Engineer for approval a sample of manufacturer instructions for installation, testing, commissioning, operation and maintenance manuals including manuals of spare parts and tools of the equipment. Upon acceptance, the Contractor shall supply three copies to the Engineer for forwarding to the Owner. These manuals should be in properly bound form. At least two copies of the documents shall be submitted in original. The installation instruction shall be submitted two 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.

25. WORK COMPLETION

The Contractor shall further make good, repair, replace all defective works and clear away on completion and leave all installations in perfect working order and to the satisfaction of the Owner or his representative.

26. 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 -

SECTION E-2

ELECTRICAL IDENTIFICATION

1.0 SUMMARY

A. Electrical Identification Materials and Devices shall include, but not limited to, the following:

1. Identification for raceway and metal-clad / armored cable.
2. Identification for conductors and communication and control cable.
3. Underground-line warning tape.
4. Warning labels and signs.
5. Instruction signs.
6. Equipment identification labels.
7. Miscellaneous identification products.

2.0 QUALITY ASSURANCE`

A. Comply with ANSI A13.1 and ANSI C2.

3.0 PRODUCTS

A. Raceway and Metal-Clad Cable Identification: Adhesive labels, wraparound plastic sleeves, colored adhesive tape and underground-line warning tape.

B. Conductor and Cable Identification: Colored adhesive tape, marker tape, write-on tags and brass or aluminum tags.

C. Equipment Labels: Printed adhesive film, printed adhesive film with clear protective overlay, engraved plastic and stenciled legend.

D. Warning Signs: Baked enamel or metal backed butyrate.

E. Instruction Signs: Engraved, laminated acrylic or melamine plastic.

4.0 INSTALLATION

A. The Electrical Identification including labels, signs, cable markers, etc. shall be provided as per the requirements of Local power supply authority and Engineer's approval.

B. Labelling and Identification of all MV equipment including cables shall be provided in accordance with K-Electric / WAPDA specification.

C. Contractor shall provide all kind of warning signs, shock charts, labels, etc. as required by the Engineer for the safe and satisfactory operation of the entire installation as per Life safety code.

- END OF SECTION -

SECTION E-3

TESTING AND COMMISSIONING

1.0 DESCRIPTION OF WORK

Prior to acceptance, inspect, operate and test all electrical equipment, materials and components, whether such tests are detailed in this specification or not. Tests will be witnessed by THE CONSULTANT/ PROJECT MANAGER, to ensure that the operation of the systems and components satisfies the requirements of the Contract Documents.

Include any specific testing required by the Authorities, or any other body having jurisdiction over the installation, and as directed by THE CONSULTANT/ PROJECT MANAGER.

Provide all tools, equipment, labour and materials required to perform the electrical testing. Provide three copies of the test reports to THE CONSULTANT/ PROJECT MANAGER.

2.0 GENERAL

The testing and commissioning shall be carried out in accordance with contract requirements, by a firm specializing in this work, under no circumstances shall the Contractor be allowed to use his own staff or affiliated companies for the Capital plant such as switchboards, power factor correction equipment, fire alarm system, lighting control and dimming system, central emergency lighting system and lifts.

The contractor shall submit for approval, a detailed method statement for each testing and commissioning activity.

The contractor shall maintain written records of all tests.

Successful test records shall be counter signed by the consultant and bound into the operation and maintenance manual. upon completion of the testing and commissioning the contractor shall demonstrate to the consultant the following:

A. Voltage within correct tolerances in accordance with the contract documents.

B. Power factor and harmonics in accordance with the Contract Documents.

C. Earthing in accordance with the contract Documents.

D. Illumination levels in accordance with the Contract Documents.

E. Correct control of all plant.

F. Structured cabling of telephone and data communication system

G. Fire alarm system.

H. Correct functioning of all the specialist systems and their integration.

An audit inspection at factory before dispatch and at site after receipt of the switchgear for any manufacturing / transit defects.

3.0 PRECOMMISSIONING AND COMMISSIONING CHECKS

Pre-commissioning and Commissioning check sheets for the following shall be submitted for the CONSULTANT review:

A. DB / Final Light & Power Points

B. Specified Lighting Controls

C. Power And Control Cables

D. Fire Alarm System

E. Emergency Lighting System

F. Programmable lighting control system

Once the procedures are agreed up on, the Inspection and testing reports for the above systems shall be submitted for CONSULTANT review/approval.

The following inspections have to be carried out for any manufacturing defects/transit damages and inform the supplier immediately if found any defects.

4.0 TESTING AND COMMISSIONING

Upon completion of the installation the Contractor shall perform field tests on all equipment, material and systems all tests shall be conducted in the presence of the Consultant/client's Engineer for the purpose of demonstrating equipment or system compliance with specifications. The contractor shall submit test protocol for approval at least two weeks before conducting the test.

The Contractor shall furnish, install and maintain all tools, instruments, test equipment, material, connections, etc. and furnish all personnel including supervision and "Standby" labour required for the testing, setting and adjustment of all electrical facilities and their component parts, including putting the same into operation.

All tests shall be made with the proper regard for the protection of the equipment and the Contractor shall be responsible for adequate protection to all personnel during such tests.

The Contractor shall record all test values of the tests made by him on all equipment, giving both "as found" and "as left" conditions. Three (3) copies of all test result shall be given to the Engineer In charge for record purposes.

The witnessing of any test by the Engineer In charge does not relieve the Contractor of his guarantees for materials, equipment and workmanship as specified in the Conditions of Contract.

4.1 Insulation Resistance Tests

Insulation resistance tests shall be made on all electrical equipment, using a self-contained instrument such as the direct indicating ohm-meter of the generator type Direct current potentials shall be used in these tests and shall be as follows:

- Circuit under 230 volts – 500 volts test
- Circuit 230 volts to 400 volts – 1000 volts test

The minimum acceptable insulation resistance value will be 5 Mega ohms.

The test equipment for insulation testing will be furnished by Contractor.

Before making connections at the ends of each cable run, the insulation resistance test of each cable shall be made. Each conductor of a multicore cable shall be tested individually to each other conductor of the group and also to 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 the new cable shall installed/laid.

All switchgear shall be given an insulation resistance measurement test to ground after installation but before any wiring is energized 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 that specified above the cause of the low reading shall be determined and removed. Corrective measures shall include dry out procedure by means of heaters of equipment is found to contained measure. Where corrective measures have been necessary and the insulation resistance reading taken after the correction has been made it should satisfy the requirements specified herein. Repeated insulation resistance test shall be made twice and at least 12 hours apart. The maximum range for each reading on the 3 successive tests shall not exceed 12 hours apart and 20% of the average value. After all tests have been made successfully, the equipment shall be reconnected.

4.2 Earth Resistance Tests

Earth resistance tests shall be made by the Contractor on the earthing system, separating and reconnecting each earth connection as may be required by the Engineer In charge. If it is indicated that soil treatment or other corrective measures are required to lower the ground resistance values, the Engineer In charge will determine the extent of such corrective measures.

The electrical resistance of the ECC together with the resistance of the earthing lead measured from the connection with earth electrode to any other position in the completed installation shall not exceed one ohm.

Earth resistance test shall be performed as per Electrical Inspector's requirements. Where more than one earthing sets are installed, the earth resistance test between two sets shall be measured by means of Resistance Bridge Instrument. The earth resistance between two sets shall not exceed one ohm.

4.3 Operating Tests

Current load measurement shall be made on all electrical equipment.

The current reading shall be taken in each wire and in each neutral wire while the circuit or equipment is operating under actual load conditions Clip-on ammeters may be used to take current readings.

All light fittings shall be tested electrically and mechanically to check whether they comply with the standard of specifications. Light fittings shall be tested so that when functioning properly no flickering is observed or choke noise is heard.

After any equipment has been tested, checked for operation etc., and is accepted by the Project Engineer's representative the Contractor shall be responsible for the proper protection of such equipment for assurance that subsequent testing of other equipment of systems do not disturb the completed work.

4.4 Visual Inspections

Carry out Visual Inspections to verify that the Electrical equipment has been correctly installed in accordance with the design with correctly rated protection devices and bonding that no visible damage exists.

END OF SECTION

SECTION E-4

LV CONDUCTORS AND CABLES

1.0 SUMMARY

A. The scope of works include Main LV Feeders, building wires, cables, connectors, splices, and terminations for wiring systems rated 600/1000 V and less. Also include sleeves and sealing of all openings and sleeve for the cables.

2.0 CODES & STANDARDS

A. Latest editions and amendments of the below mentioned standards and codes:

- IEC 227 : Power and Lighting PVC insulated cable.
- IEC 228 : Conductors of insulated cables
- IEC 502 : Extruded solid dielectric insulated power cables for rated voltages from 1 kV up to 30 kV.
- IEC 331 : Fire resisting characteristics of electrical cables (where specified)
- IEC 332 : Tests on electric cables under fire conditions.
- IEC 811 : Common test methods for insulating and sheathing of electrical cable.
- IEC 287 : Calculation of the continuous current rating of cables.
- BS 4066 : Test on electric cables under fire conditions.
- BS 6346 : PVC insulated cables for electricity supply.
- BS 6004 : PVC insulated cables (non armoured) for electric power and lighting.
- BS 801 : Composition of lead and lead alloy sheaths of electric cables.
- EEMUA 133 : Underground cable protected against solvent penetration and corrosive attack.
- BS 5467 : XLPE insulated armoured cables for electrical supply.
- BS 6724 : XLPE insulated armoured Single Core PVC Insulated Copper Conductor sheathed cables.
- BS 7211 : Single Core PVC Insulated Copper Conductor non armoured cables / wires.

3.0 MATERIAL

A. Conductors and Cables:

1. Conductors: Copper (or Aluminium - only when specifically mentioned on drawings and BoQ).
2. Conductor Insulation:

- Multi-core cables – XLPE
- Single-core cables – XLPE (PVC – only when specifically mentioned on the drawings and BoQ).
- Single-core building wires up to 6 sq. mm - PVC

3. Single and Multi conductor Cable: Armoured/ Unarmoured cable, Type AC, Metal-clad cable, Type MC, Mineral-insulated, metal-sheathed cable, Type MI, Nonmetallic-sheathed cable, Type NM, Type SO and Type USE with ground wire.

B. Connectors and Splices: Factory fabricated.

C. Sleeves for Raceways and Cables:

1. Steel pipe sleeves.
2. Cast-iron pipe sleeves.
3. PVC and uPVC sleeves
4. Sleeves for rectangular openings.

D. Sleeve Seals: EPDM, NBR sealing elements, plastic, carbon-steel, stainless/steel pressure plates, and carbon, stainless/steel connecting bolts and nuts.

4.0 MV CABLES

A. Scope

The work under this Section consists of supplying, installing, testing and commissioning of Medium Voltage (MV) Cable and related accessories as specified herein or as stated on the Drawings or the Bill of Quantities.

B. Reference Standards

Following standards shall be applicable:

- IEC 60502-2 for Cables for rated voltage from 6kV to 30kV
- IEC 60228 for resistance of conductors.
- IEC 60332-1 for vertical flame propagation.
- IEC 60332-3 for fire resistant test on fire resistant cables.
- IEC 60227 for core identification by colors.

C. Cable Type

The cable shall be multi-core, suitable for nominal service Voltage or 11 kV, have stranded aluminum conductors XLPE insulation and PVC over-sheath. The cable shall be a standard product.

Basic Data:
The cable shall meet the following specifications:

-	Nominal System Voltage	:	11 kV
-	Highest System Voltage	:	12 kV
-	Frequency	:	50 Hz
-	System	:	3 - Phase with solidly grounded star point of Transformer LV side

-	Conductor Size	:	As shown on drawings or stated in Bill of Quantities
-	No. of cores	:	3
-	Rated Voltage	:	11/6.35 kV Phase to Phase/Phase to Ground
-	Continuous Operating Temperature of Conductor Material	:	90 deg C
-	Conductor Material	:	Aluminum
-	Insulation	:	Cross-linked Poly Ethylene
-	Shielding	:	Copper tape
-	Jacket	:	PVC
-	Over-sheath	:	Extruded PVC
-	Phase Identification	:	Red, Yellow, Blue

Conductor:
The conductor shall be of high conductivity electrolytic aluminum, stranded in accordance with specified strand.

Insulation:
The insulation shall be Cross-linked polyethylene extruded over the conductor. The insulation shall be laid to avoid any gap or air pockets between the conductor and insulation. The insulation shall be easy to strip from individual conductors and to separate for jointing/termination purposes.

Shielding:
Each core shall be shielded by a layer of semi-conducting material applied directly over insulation.

Assembly:
The three insulated conductors shall be assembled with PVC or any non-hygroscopic filler and bounded with tape. The tape binder shall then the covered with extruded PVC jacket. If the cable has armour, the PVC jacket shall be padded with suitable material before application of armor.

Over-sheath:
The entire cable assembly shall be covered with a PVC jacket of thickness not less than 2.5 mm. The color of the jacket shall be black. The size of cable and voltage grade shall be given on the over sheath at every 3 meter interval along with other standard markings.

Factory Tests:
Physical and electrical acceptance tests in accordance with applicable standards shall be carried out at the manufacturer's works. Three copies of test reports will be furnished to the Employer's Representative or the Consultant for review and approval. The report shall include brief description of tests, test records and results.

D. Cable Reels

The cable shall be supplied in mechanically strong, rail/road worthy, wooden or metallic cable drums, protected against weather. The cable drum should bear the marking for cable type, cable size, voltage grade, year of manufacture, any

other additional marking normally provided by the manufacturer. Cable ends on cable reels shall be protected by means of suitable seal.

E. Cable Cut Length

The exact cut lengths for each cable reel shall be confirmed by the Contractor by actual measurements at site prior to the commencement of manufacturing. The cable lengths where shown on the drawings or Bill of Quantities are indicative and need confirmation by the Contractor. The Contractor shall be solely responsible for furnishing correct lengths of cable to avoid joints in cable length except where necessary and for which prior approval of the Employer's Representative or the Consultant has been taken.

F. MV Cable Installation

All installation material, labour, tools and accessories for cable installation shall be furnished by the Contractor.

The cable and accessories shall be installed in strict accordance with manufacturer recommendations and generally in accordance with the installation instructions given in these specifications and drawings.

During installation, the minimum cable bending radius shall, in general, be restricted to 15 times the cable OD

The cable shall be supported on cable reels which unwinding from the drum to avoid twist or tension on cable. The cable shall be pulled trough the existing ducts taking all necessary steps and strictly complying with manufacturer's recommendations.

During installation, the minimum cable bending radius shall, in general, not exceed 15 times the cable OD

The cable shall be supported on cable reels which unwinding from the drum to avoid twist or tension on cable. The cable shall be pulled trough the existing ducts taking all necessary steps and strictly complying with manufacturer's recommendations.

A cable joint has to be avoided. In case a joint becomes necessary and has been approved by the Employer's Representative or the Consultant, it shall be of cold-shrink or heat-shrink type manufactured by 3M, USA; Raychem, Germany or an approved equivalent manufacturer. The joint shall be made strictly in accordance with the instructions of the joint manufacturer by a duly trained and experienced person. Full details of jointing shall be furnished for the review and approval of Employer's Representative or the Consultant

Terminations of MV cables at the MV Switchgear and transformers shall be made with cold-shrink or heat-shrink type termination kits manufactured by 3M, USA; Raychem, Germany or an approved equivalent manufacturer.

After the installation the entire lengths of cable shall be tested according to cable manufacturer's instructions.

5.0 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper, Solid for 4.0 sq. mm and smaller; stranded for 6.0 sq. mm and larger.

B. Branch Circuits: Copper, Solid for 4.0 sq. mm and smaller; stranded for 6.0 sq. mm and larger.

6.0 CONDUCTOR AND INSULATION APPLICATIONS

A. Service Entrance: Single conductors in raceway, Mineral-insulated, metal-sheathed cable, multi-conductor cable in raceway.

B. Exposed Feeders: Single conductors in raceway, Unarmored cable, Metal-clad cable, Mineral-insulated, metal-sheathed cable, Nonmetallic-sheathed cable.

C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Single conductors in raceway, Unarmored cable, Metal-clad cable, Mineral-insulated, metal-sheathed cable, Nonmetallic-sheathed cable.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Single conductors in raceway, Underground feeder cable.

E. Feeders in Cable Tray: Single conductors in raceway, Armored/Unarmored cable, Metal-clad cable, Mineral-insulated, metal-sheathed cable, Nonmetallic-sheathed cable.

F. Exposed Branch Circuits, Including in Crawlspaces: Single conductors in raceway, Unarmored cable, Metal-clad cable, Mineral-insulated, metal-sheathed cable, Nonmetallic-sheathed cable

G. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Single conductors in raceway, Unarmored cable, Metal-clad cable, Mineral-insulated, metal-sheathed cable, Nonmetallic-sheathed cable.

H. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and underground: Single conductors in raceway, Underground branch-circuit cable.

I. Branch Circuits in Cable Tray: Single conductors in raceway, Unarmored cable, Metal-clad cable, Mineral-insulated, metal-sheathed cable.

J. Cord Drops and Portable Appliance Connections: Hard service cord with strain relief device at terminations to suit application.

K. Class 1 Control Circuits: In raceway.

L. Class 2 Control Circuits: In raceway, Power-limited cable, concealed in building finishes and in raceway/cable tray.

7.0 FIELD QUALITY CONTROL

A. Testing: Contractor is responsible to perform all testing as per applicable standards, mentioned in Testing and Commissioning or required by the Engineer or utility company (K-Electric).

END OF SECTION

SECTION E-5

CONDUITS AND PIPES

1.0 SUMMARY

A. The extent of works shown on the drawing does not indicate the exact position of conduit 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.

B. The quality and material for the accessories of conduits and pipes such as sockets, elbows, bushings, bends, inspection / pull boxes, round boxes, etc., necessary for the completion shall be similar to that of conduit 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.

2.0 CODES & STANDARDS

A. Pipes and Conduits shall comply with following codes and standards:

- BS 31 Steel Conduit and accessories
- BS 1378 Galvanized Iron Pipes and accessories.
- BS 3595 PVC Pipes and accessories.
- BS 4607 PVC Conduits and accessories.
- Any other standard referred to in above standards or Contract Documents.

END OF SECTION

SECTION E-6

RING MAIN UNITS (RMU)

1.0 SCOPE

A. This specification covers manufacturing and testing of 11 KV Outdoor RMU (Ring Main Unit) / Pad Mounted Switches (Three Way and Four Way type) to be used in 11 KV Distribution system. The RMU shall comply with K-Electric specification.

2.0 MAIN FEATURES

2.1 Foreword

This specification has been prepared by Technical Process Re-Engineering Department.

This specification is intended for the purpose of technical specification only for the procurement of material and does not include provisions of contract, unless otherwise provided in the contract.

This specification is subject to revision as and when required.

2.2 Scope

This standard specifies SF6 insulated metal enclosed ring-main unit designed for outdoor use for alternating current of 630A at rated voltage of 12kV and 50Hz frequency. The equipment is required for KE MV distribution network for ring and T-Off.

The ring main unit shall conform to the following standard specifications and IEC publications 62271-102, 62271-103, 62271-200 (latest applicable).

2.3 Service Conditions

a.	Maximum ambient temperature	50°C
b.	Average value measured over a period of 24 hours	45°C
c.	Minimum ambient temperature	0°
d.	Altitude	1000 Meter
e.	Maximum relative humidity	95%
f.	Condensation, heavy pollution and corrosion shall be considered while designing.	
g.	Location:	Sea-coast

It may be assumed that the air is normally heavily polluted by dust, smoke, aggressive gasses, vapor or salt spray. However, at certain times of the year, severe dust storms may be experienced

Outer and inner surface of the unit should be protected with the above climatic conditions as per clause 2.0 & 2.1.

3.0 RMU Reference and Standard:

The switches shall be designed, manufactured and tested in accordance with the following standards amended to date;

IEC 62271	1High voltage switchgear and control gear, Part 1: Common specification,
IEC 62271	200 High voltage switchgear and control gear – Part 200: AC Metal enclosed switchgear and control gear for rated voltages above 1kV and upto and including 52kV
IEC 62271-100	High-voltage switchgear and control gear - Part 100: High Voltage Alternating Current Circuit Breakers
IEC 62271-102	High voltage switchgear and control gear, Part 102: Alternating current disconnectors and earthing switches
IEC 62271-103	High-voltage switchgear and control gear - Part 103: Switches for rated voltages above 1 kV up to and including 52 kV
IEC 60255	Measuring relays and protection equipment
IEC 61243-5	Voltage Detecting Systems (VDS)
IEC 62271-206	High-voltage switchgear and control gear - Part 206: Voltage presence indicating systems for rated voltages above 1 kV and up to and including 52 kV

4.0 General Requirements:

- The ring main unit should be prefabricated, filled with SF6 gas, & should be tested in accordance to IEC 62271-100 and 62271-200 (latest applicable) or equivalent / updated standards. It should be ready for operation on delivery.
- The offer must have the following features:
- Compact construction
- High operator safety
- Maximum reliability
- Maintenance free
- Possibility of various cable sizes for connections
- Recommended spares with separate prices
- The complete RMU shall be outdoor type, complying with IP 54 (with or without enclosure).
- The RMU unit can be housed in a hot dip galvanized sheet steel enclosure with paint thickness of 90 - 100 microns or stainless-steel housing with paint thickness of 50 – 60 microns, having 2 mm thickness with rubber gasket, confirming with IP 54 protection.
- In case of enclosure, IP54, Internal Arc and Temperature rise tests shall be performed on complete unit (RMU with enclosure) or test reports from any independent lab along with complete type test reports shall be submitted.
- The loss of service continuity class shall be LSC2 for RMU.
- The partition class shall be PM.

- For internal arc (IAC-AFLR) test requirements, the direction of escaping gases shall be upward and same should be verified by drawings and type test reports submitted with bid.
- In addition to door handle lock with key, padlock arrangement shall also be provided.

5.0 **Ring Main Unit Types:**

The ring main unit shall be of following combinations:

A) 3 Way RMU with one side protection

- The configuration shall be Load break switch, VCB and Load break switch.
- Ring-main feeders with Vacuum Circuit Breaker (630 Amps each side) shall be provided with protection relay.
- Ring-main feeder with Load Break Switch (630 Amps) shall be without protection
- Bus-bar side shall be isolated.
- Feeder's side shall be earthed.
- FPI shall be provided on switch side

B) 3 Way RMU with 2 Side Protection

- The configuration shall be Load break switch, VCB, VCB.
- The incoming feeder shall be terminated at the LBS side and the outgoing shall be taken out from circuit breaker units.
- Ring-main feeders with Vacuum Circuit Breaker (630 Amps each side) shall be provided with protection relay.
- Ring-main feeder with Load Break Switch (630 Amps) shall be without protection
- Bus-bar side shall be isolated.
- Feeder's side shall be earthed.
- FPI shall be provided on switch side

C) 4 Way RMU with 2 side protection

- The configuration shall be LBS, LBS, VCB, VCB.
- The incoming feeder shall be terminated at the LBS side and the outgoing shall be taken out from circuit breaker units.
- Ring-main feeders with Vacuum Circuit Breaker (630 Amps each side) shall be provided with protection relay.
- Ring-main feeder with Load Break Switch (630 Amps) shall be without protection.
- Bus-bar side shall be isolated.
- Feeder's side shall be earthed.
- FPI shall be provided on switch side.

5.1 The relay shall confirm to KE Specification # K-TPRE-Numerical Relay-418 (latest applicable). The relay shall be dual powered & have the features of OC, SC, EF &

Wire Broken.

5.2 The current transformers (CTs) shall be provided with manufacturer design, as per IEC- 61869-2 (latest applicable).

5.3 The CT ratio shall be 600/5-1A, 400/5-1A or as specified in tender enquiry documents.

5.4 The manufacturer can offer their own design for HT CTs if other than of KE Specifications for consideration.

5.5 The CTs shall be easily approachable and replaceable in case of fault.

5.6 RMU shall be with either heat/cold shrink or slip on type cable boots.

6.0 Enclosure (SF6 Gas Tank & Pressure Relief Device)

6.1 The ring main unit shall be metal enclosed and SF6 insulated. The design should be such that normal service, inspection and maintenance operations including the usual checking of phase sequence, earthing of connected cables, locating of cables faults, voltage tests on connected cables or other apparatus and the elimination of dangerous electrostatic charges, can be carried out safely.

6.2 For replenish gas system, a non-return valve for refilling of SF6 gas shall be provided on main tank. The valve shall be protected and sealed with a removable cap.

6.3 The gas pressure gauge shall be provided to monitor the gas pressure of SF6 tank and should be temperature compensated & visible from front.

6.4 The container must be equipped with a suitable pressure relief device as per requirement of IAC AFLR.

6.5 Four or three number of counters (one on each side, CB/LBS) shall be provided for counting/monitoring number of mechanical operations performed on RMU and should be visible from front.

6.6 Lifting lugs are to be fitted on the top of each RMU such that the lugs do not hinder the operation and maintenance of the RMU.

7.0 High Voltage Switch

The high voltage switch shall comply with IEC 62271-103 & IEC 62271-10 updated
standards and shall be of spring assisted / stored-energy mechanism.

8.0 Earthing Switch

The earthing switch shall comply with IEC 62271-102 and shall be spring operated and of
independent manual operation type.

9.0 Internal Wiring

Control wiring shall be with single core PVC insulated copper conductor of sizes 1 mmsq. (minimum). All control wiring shall be through channels with removable covers to provide ease in inspection/replacement. The end of wires shall

have permanent fiber or plastic identification ferrules, dully marked with appropriate corresponding end - terminals.

10.0 Operation

The switching shall be actuated by a three-position switch capable of performing all the functions specified in IEC 62271-103 (latest applicable). The three positions shall be "CLOSED, OPEN" and "EARTHED".

11.0 Earthing

Earthing shall be as specified in IEC 62271-102 (latest applicable).

12.0 SF6 Gas in Ring Main Unit

12.1 The SF6 shall be in accordance with IEC 60376 (latest applicable). The tank shall be hermetically sealed and pressure of SF6 gas should be maintained for a service life of 30 years (minimum).

12.2 Switching functions as general purpose switch disconnector shall be according to IEC 62271-103 & IEC 62271-102 (Latest applicable).

12.3 Each switch shall be provided with an integral earthing device to earth the live parts of the switch during maintenance. During the operation the integral earthing device shall not endanger the operator.

12.4 The below mentioned accessories will be provided with RMU if and only if mentioned in
the tender enquiry, otherwise no accessories are to be provided with the offered
RMU/included in the bidding documents.

a) Complete set of gas filling device along with SF6 gas cylinder with 50 Kg SF6 gas
and gas filling pipe with sufficient length
b) SF6 hand leak detector
c) Spare boots
d) CTs of appropriate ratings

13.0 Interlocking System

The switchgear must be equipped with a comprehensive interlocking system, which prevents any inadmissible control process and does not allow any mal-operations. The following interlocks should be possible:

a) Direct operation of the three-position switch from 'OPEN' to 'EARTHED' position and vice versa.
b) The opening of covers of each cables compartments unless the appropriate feeders have been isolated and earthed.
c) The closing of the transformer switch when the CB compartment is open.
d) The closing of the feeder switches when the appropriate compartments are opened.

14.0 Cable Connection

14.1 The cable connections shall be of conventional cable sealing ends such as shrink-on or push-on types. The connections should be suitable for 3-core 95 to 400 mm2 XLPE cables for ring main and transformer feeders.
14.2 In case of enclosure, all the cable termination shall be front access.
14.3 The front cover must be integrated in the comprehensive interlocking system.
14.4 The cable doors should be removable / detachable type so as to facilitate easy connection of cables and not to allow any hindrance to the maintenance staff while doing maintenance.
14.5 The RMU shall be equipped with supporting adjustable clamps (95 to 400 mm Sq 3-core arm cable) for cable terminations to avoid loading at the bushing of the Ring Main Unit.
14.6 Additional adjustable supports shall be provided for holding the HT cables in order to reduce stresses on HT bushing (where ever required).

15.0 Cable Testing Facilities

15.1 The cable testing must be possible without dismounting the cable plugs and cables.
15.2 Separate test bushing for test of cable is to be provided along with each unit.
15.3 The cable testing for transformer feeder should even be possible when the busbars are live.
15.4 There should be facilities for fault location and D.C. voltage testing cables. In case a test adapter is to be used it should be assumed to be a part of ring main unit & should be supplied with each unit.

16.0 16.0 Pad Locking

16.1 Provision shall be made for padlocking the load break switches and the earthing switches in either OPEN or CLOSED position, a parking position for the padlock shall be provided for each padlocking device.

17.0 17.0 Operating Handle, Mimic Diagram

17.1 One common operating handle for high voltage and earthing switch shall be provided with each switchgear.
17.2 There must be a user-friendly control panel with a single line diagram and integrated position indicators for all switching devices at the front side of the RMU.
17.3 The following operations must be possible from the front of RMU:
a) Inspection of gas pressure
b) Switching
c) Mechanical position indictors
d) Mechanical operation
e) Voltage indication

18.0 Secondary Equipment:

The ring main unit should be equipped with the following control and operating devices:

18.1 Voltage Detecting System

18.1.1 Every cable feeder and transformer feeder must be equipped with a three-phase integrated voltage detection system.

18.1.2 The energy for the system should be from the coils present at the outer cone of connection bushings

18.2 Fault Passage Indicator (only for feeder/T-Off without protection or transformer)

18.2.1 Fault passage indicator is to be provided with every cable feeder (LBS), which can easily be watched on the front panel.

18.2.2 The transducers for the short circuit indicators have to be mounted onto the outer cone of the connection bushings or on the incoming cables to the RMU. The display of the FPI should be LEDs/LCD. It should be capable of indicating the phase and ground faults.

19.0 Name Plate

19.1 The name plates shall be in accordance with IEC-62271-200 and IEC-62271-1.

20.0 Finish

20.1 The switchgear as a whole unit shall be designed / constructed for use in a hot and damp coastal climate conditions and shall be maintenance free.

20.2 Oven baked painting having durable weather resistant properties or outdoor powder coat paint shall be preferred with all the properties & qualities as mentioned above.

20.3 The finish color shall be grey having shade RAL 7032.

20.4 Bolts and nuts used in construction shall be of stainless steel and in conformance with ISO Standard (metric).

20.5 QR code shall be pasted on each RMU to easily access product information and following information is required to be linked with item codes.

a. Complete set of drawings

b. Installation/Operation manuals (both in English & Urdu) along with video tutorials

c. Safety precautions

d. Manufacturer service team contact details in case of emergency/fault etc

21.0 Technical Specification for RMU

A. 11KV Busbar		
i.	Material	Copper
ii.	Current carrying capacity	
	a) @ 40 deg C	630 A
	b) @ 50 deg C	570 Amps
iii.	Short time rating current	20kA for 3 Sec
iv.	Busbar insulation	SF6

B. High Voltage Switch		
i.	Nominal system voltage	11 kV
ii.	Highest system voltage	12 kV
iii.	Highest voltage for equipment	12 kV
iv.	Rated impulse withstand voltage	95 kV
v.	One minute power frequency withstand voltage	38 kV
vi.	Rated frequency	50 Hz
vii.	Rated normal current	630 Amps
viii.	Rated short-time current	20 kA for 3 sec
Ix.	Rated peak withstand current	50 kA
X	Rated short circuit making capacity	50 kA
Xi	Insulating gas	SF6
Xii	Endurance Class (As per IEC 62271-103 latest publication)	
	a.) Mechanical Endurance (As per clause 3.4.103.4)	M2 (5,000)
	b) Electrical Endurance (As per clause 3.4.103.3)	E3

C. High Voltage Switch		
i.	Nominal system voltage	11 kV
ii.	Highest system voltage	12 kV
iii.	Highest voltage for equipment	12 kV
iv.	Rated insulation level	
	- Rated lightning Impulse withstand voltage.	95 kV
	- Rated one minute power frequency voltage	38 kV
v.	Rated frequency	50 Hz
vi.	Rated Current	630 Amps
vii.	Rated short Circuit withstand current.	20 kA for 3 Sec
viii.	Rated short-current making current	50 kA
ix.	Operating sequence	O - 3 min – CO - 3 min - CO

x	Endurance Class (As per IEC 62271-100 latest publication)	
	a) Mechanical Endurance	M2 (10,000)
	b) Electrical Endurance	E2

D. Earthing Switch		
i.	Nominal system voltage	11 kV
ii.	Highest system voltage	12 kV
iii.	Highest voltage for equipment	12 kV
iv.	Rated insulation level	
	- Rated lightning Impulse withstand voltage.	95 kV
	- Rated one minute power frequency voltage	38 kV
v.	Rated frequency	50 Hz
vi.	Rated duration of short circuit	3 Sec
vii.	Rated short-time withstands current.	20 kA
viii.	Rated peak withstand current.	50 kA
ix.	Rated short-current/making current	50 kA
x	Endurance Class (As per IEC 62271-102 latest publication)	
	a) Mechanical Endurance	M0 (1,000)
	b) Electrical Endurance	E2

22.0 Type and Routine Tests (Ref. IEC 62271-200 & IEC 62271-1)

22.1 Type Tests

22.1.1 The tests shall be made on complete switchgear and control gear (filled with gas at specified pressure) on their operating devices and their auxiliary equipment.

22.1.2 The following type tests will be conducted on one of the representative units separately on switch as per IEC-62271-200 & IEC 62271-1 (latest applicable) standard:

S. No.	Tests	Test Values*
1.0	**Mechanical endurance**	
1.1	Switch manual	
1.2	Earthing Switch	
2.0	**Dielectric test**	
2.1	Lightening impulse	
2.2	Power frequency on minute	
2.3	PD measurement	
3.0	**Short circuit test**	
3.1	Main circuit switch	
3.2	Earthing Switch	
4.0	**Make break test**	

4.1	Active load	
4.2	Closed loop	
4.3	Capacitive	
4.4	Earth fault	
4.5	Cable charge	
5.0	**Making test**	
5.1	Switch	
5.2	Earthing switch	
6.0	**Temperature rise test**	
6.1	Main circuit / switch on sealed switch (without enclosure)	
6.2	Main circuit / switch on sealed switch (with enclosure)	
7.0	**Mech. Operating tests**	
7.1	Gas leakage test	0.25% p.a.
7.2	Interlock	
8.0	**Measurement of resistance of the Main circuit**	
9.0	**Arc fault test**	
9.1	IAC classification AFLR	20 kA for 1s
10.0	**Design and visual check**	
10.1	Paint thickness	
11.0	**IP 54 test**	
11.1	Without enclosure	
11.2	With enclosure	

22.1.3 The above tests shall be conducted at KEMA High Powered Testing Laboratories or any other International Independent Testing Laboratory of world repute. The tests should be witnessed by KE engineers

22.1.4 Validity of type test reports of RMU shall be ten years from the date of testing.

22.1.5 If type tests already carried out at an independent laboratory of international repute for the same RMU and supplied in reasonable quantity to KE or other utility, the reports shall be attached with the bid, for evaluation.

22.1.6 Type test reports for individual components as Relay, CTs, FPIs, earthing switch and other components shall be submitted with the bid as per requirements of related specifications.

22.1.7 The results of all type tests shall be recorded in type-test reports containing sufficient data to prove compliance with this specification, and sufficient information shall be included so that the essential parts of the ring main unit tested can be identified.

22.2 <u>Routine Tests (as per IEC-62271-200)</u>

22.2.1 The following routine tests shall be carried out on all the ordered units at the manufacturer's work & will be witnessed by one of KE Engineer.

a). Withstand voltage at power frequency for all current carrying parts including wiring

b). Measurement of resistance of the main circuit

c). Gas leakage test
d). Partial discharge test
e). Withstand voltage on auxiliary circuit.

f). Operation of function locks, interlocks, signaling devices and auxiliary devices.
g). Suitability & control operation of protection, control instruments and electrical connections of the circuit breaker operating mechanism (primary & secondary injection).
h). Suitability and correct operation of protections, control instruments and electrical
connections of the circuit breaker operating mechanism.
i) Verification of wiring
j) Visual inspection

23.0 23.0 Transport, Storage, Erection and Maintenance

23.1 The RMU unit shall be supplied in assembled form from the factory. The RMU shall be packed so as to avoid any damage due to rain, weather and jerks during transit from factory to warehouse. Packing shall be suitable for storage in outdoor area for up to 6 months. Each RMU shall be securely wrapped with thick plastic sheet and in case of longer distance (more than 100km) from manufacturer place to K.E central store, wooden box packing shall be provided.

23.2 Proper identification marks shall be stamped on the packing so as to know the type, make and rating of the equipment. It shall also show in bold, "PROPERTY OF KE". Proper transportation and unpacking instructions (center of gravity, lifting direction, total weight etc.) shall also accompany the equipment besides information on maintenance requirements after installation including overhaul of operating mechanism and lubrication of any part.

23.3 The complete unit shall be delivered with seaworthy packing.

24.0 Data Sheet and Documentations

24.1 Documentation

24.1.1 The following documents are to be submitted with the bid.
a). Report of type tests
b). Detailed color dimensional drawings
c). Technical leaflets of all the components used in unit along with type test reports
where applicable.

25.0 Training and Operating / User Manual

25.1 Successful bidder shall arrange comprehensive training program intended for guidance of concerned KE field staff for proper installation, maintenance and repair of offered outdoor type SF6 Insulated RMU if mentioned in TE/PO.

25.2 Colored User Manual for proper handling instruction shall be provided with each RMU.

26.0 Warranty

26.1 The supplier shall provide warranty for replacement of any fault / damaged part solely due to transportation to KE store or otherwise. The RMU shall be under warranty for two (02) years after delivery to KE specified store. Manufacturer is responsible to replace any
damage part and provide service without any extra cost during the warranty period.

27.0 Dimensional Limitation

The dimension limitations for 3 Way & 4 Way RMU design shall be as per the following table with ±10% tolerance.

S. No	RMU Design	Depth(mm)	Width(mm)	Height(mm)
01	3 Way	750	1150	1700
02	4 Way	750	1550	1700

Technical Data Sheet

The bidder to fill-in the data sheets in triplicate.

S. No.	Description	High Voltage Switch	Earthing Switch	Circuit Breaker
01	Sr. Number			
02	Manufacturer			
03	Single Line Diagram			
04	Type Designation			
05	Rated Voltage, kV			
06	Highest Voltage for Equipment			
07	Rated One Min. Power Frequency Voltage, kV			
08	Rated Frequency, Hz			
09	Rated Normal Current, Amps			
10	Rated Breaking Capacity, Amps			
11	Rated 3 Sec. Short Time Current, kA			
12	Rated Peak Withstand Current, kA			
13	Rated Short Circuit Making Capacity, kA			
14	Mechanical Endurance Class			
15	Electrical Endurance Class			
16	Loss of Service Continuity Class			
17	Partition Class			
18	Dimensions (Ring Main Unit)			
	a) Width, mm			
	b) Height, mm			
	c) Depth, mm			
19	Details of Relay			

20	Details of CTs			
21	Details of Indicating Instruments			

The submission of documentations and completely filled-in data sheets is a mandatory requirement of the specification. In case of non-submission, the bid is liable to be rejected.

28.0 SUSTAINABILITY REQUIREMENTS

A. The MV Ring Main Units shall comply with all the sustainability requirements with high quality products as per applicable standards and the details given below:

1. All materials used in the manufacture and installation of MV ring main units shall be of high quality and of proven suitability for the functions they will perform and the conditions they will meet in service
2. Compact design with efficient use of space
3. Highest supply security due to maintenance free equipment design
4. Ensuring personal safety through encapsulation, earthing, interlocking, etc.
5. Possibility of proper and environmentally friendly disposal
6. Environmental product declaration according to ISO 14021, based on a full-scale lifecycle assessment (LCA) study according to ISO 14040/44.

30.0 APPLICABLE STANDARDS

A. The RMUs and the associated components shall fully comply with all applicable National and International standards as well as the requirements of the utility company (K-Electric). The list of standards mentioned below is for reference only and the Contractor is responsible to comply with all applicable standards whether included below or not. The associated verifications must be submitted with the offer.

B. The RMU manufacturer has to run and furnish evidence of a certified quality management system according to EN/ISO 9001 and a certified environmental management system according to EN/ISO 14001.

Component	**IEC / EN standard**	**VDE standard**
Switchgear	62271 62271-101 62271-200 62271-304	0671-1 0671-200 0671-304

Switching devices	62271-100 62271-102 62271-103 62271-105	0671-100 0671-102 0671-103 0671-105
Voltage detecting System	62271-213 62271-206	0671-213 (Draft)
HV HRC fuses	60282 60787	0670-4 0670-402
Surge arresters	60099	0675
Degree of protection	60529 62262	0470-1 0470-100
Insulation	60071	0111
Instrument transformers	61869-1 61869-2 61869-3	0414-9-1 0414-9-2 0414-9-3
Installation	61936-1	0101
Operation	EN 50110	0105-100

31.0 TECHNICAL DATA

A. The RMU shall be 3-way or 4-way switch type and must at least meet the following technical data. The switches shall be either vacuum or SF_6 type:

1. Rated voltage Ur: 17.5 kV, 3-phase
2. Nominal Operating voltage UB: 11 kV, 3-phase
3. Rated frequency fr: 50 Hz
4. Rated short-duration power-frequency withstand voltage Ud: 38 kV (1 min)
5. Rated DC withstand voltage for cables: 42 kV for 10 min
6. Rated lightning impulse withstand voltage Up: 95 kV
7. Rated short-time withstand current Ik: 21 kA, 1 sec
8. Rated short-time Making capacity (r.m.s.): 40 kA (Peak)
9. Rated continuous current of the bus-bars Ir: 630 A
10. Rated continuous current of Ring-main Dis-connector Switches Ir: 630 A
11. Rated continuous current of Vacuum Circuit Breakers Ir: 630 A

12. Rated continuous current of Transformer feeders (if required) Ir: Depends on HV HRC fuse link
13. Internal arc classification: IAC A FLR 21 kA/1 s
14. Color: RAL 7035 (light gray or as approved by the Engineer)
15. Ambient air temperature: 50°C
16. Type of installation: Pad mounted
17. Selectable auxiliary and control voltages: 24/48/60/110/220 V DC, 110/230 V AC
18. Mechanical Endurance for disconnectors at 630 A: 1000 operating cycles
19. Number of electrical operations at full current: 100 operating cycles
20. Rated cable charging breaking capacity: 10 Amps
21. Rated short circuit making capacity and rated short time current for earthing devices shall be the same as for main contacts

B. If the offer is based on another type than stipulated, the "technical inquiries" must be completely filled in upon submission of the offer in order to evaluate the equivalency of the offered make.

32.0 LOAD BREAK SWITCHES

The load break switches shall have the following ratings:

(1)	Nominal Voltage	11kV
(2)	Rated Voltage	12kV
(3)	Frequency	50HZ
(4)	Rated Continuous Current	630A Max
(5)	Rated Symmetrical interrupting Current (Load break) r.m.s	630A Max
(6)	Short circuit making current	31.25 kA Peak
(7)	Rated impulse withstand Voltage (1 .2x50u sec)	95 kV
(8)	Rated, Power frequency withstand voltage	
	Dry, one minute	34 kV
	Wet, 10 seconds	28 kV
(9)	Short time withstand current (r.m.s)	12.5 kA, Max for 1 Sec
(10)	Mechanical Endurance	5000, Operating
(11)	insulation	SF6/Vacuum
(12)	Operating mechanism	Manual

(13)	Protection category	IP4X
(14)	Maximum Ambient Temperature	60° C

33.0 MV CIRCUIT BREAKERS

A. The MV Circuit Breakers (if required) must fulfill the following technical requirements as a minimum:

1. 3-pole Vacuum Circuit Breakers (VCB), fully withdrawable (Provide SF6 type circuit breakers when specifically shown on drawings or mentioned in BoQ).
2. The MV Circuit Breakers shall be designed as a three-position switch for "CLOSED" - "OPEN" - "EARTHED", according to IEC 62271-100.
3. Mechanical interlocks to move the shutters before the draw-out and draw-in operations of circuit breaker.
4. Possible to operate and lock individually the shutter plates in both closed and opened positions.
5. Independent manual operation of shutters shall be possible.
6. Provide Interlocking device such that the MV circuit breaker can be closed only when it is in fully plugged-in or fully withdrawn position. Withdrawal of circuit breaker shall only be possible in the open or isolated position.
7. Voltage monitoring / indicators
8. Provide MV Circuit breaker as Cable feeder with make-proof earthing switch when shown on the drawings or mentioned in the BoQ.
9. Each circuit breaker shall have a device to register the number of closing operations.
10. MV circuit breakers shall be provided with ON-OFF push buttons fitted with hinged covers to prevent accidental operation
11. Provide Earth switch with all accessories with each MV circuit breaker.
12. Provide suitably rated long life low burden LED type indication lamps to indicate the status of each circuit breaker and earth switch as follows:
    a. Green lamp: Circuit breaker "OFF".
    b. Red lamp: Circuit breaker "ON".
    c. Yellow Lamp: Circuit breaker "TRIPPED".
    d. Orange Lamp: Earth Switch "ON".
13. Provide required number of 10 Amps, 230V AC normally closed and normally open potential free auxiliary contacts for various functions with sufficient spare contacts in each MV circuit breaker.
14. A test position to facilitate testing operation of MV circuit breakers manually and by protective relays. Test sockets with plugs shall be provided for testing the relays.
15. Provide a three position, trip/normal/close switch for local tripping and closing of each MV circuit breaker.

16. Each MV circuit breakers complete with necessary secondary control wiring using ferrules to indicate the circuit. Protection MCBs shall also be provided for all control circuits

17. MV Circuit breakers shall have automatic discharging of spring charged mechanism while withdrawing or inserting the circuit breaker in the compartment.

34.0 INSTRUMENT TRANSFORMERS, PROTECTION AND MEASUREMENTS

A. The RMUs shall be provided with all required protections and instruments as per these specification, applicable standards as well as in accordance with the requirements of utility company (K-Electric). It shall meet following minimum requirements:

1. Provide suitably rated, high quality instrument transformers (CTs and PTs) as required for the satisfactory operation of the MV switchgear and in accordance with applicable IEC standards and K-Electric requirements.

2. Provide exchangeable ring-core type Current Transformers (CTs) with 5A secondary, suitable burden and 5P20 accuracy for protection and 1.0 for measuring circuits with security factor 5.

3. Provide dry type cast encapsulated epoxy resin Potential transformers (PTs) with primary and secondary voltage as per the system characteristics and accuracy class 1.0.

4. Each MV circuit breaker shall be provided with Inverse Definite Minimum Time (IDMT) directional or non-directional over-current relays for phase and earth fault protection and differential protection relays.

5. The relays shall preferably be triple pole type and have positive action without chatter.

6. Provide all required Voltmeters, Ammeters, kWh and kVARh meters suitable for 3-phase, 3-wire, 50 Hz, balanced and un-balanced loads. All meters and instruments shall be flush mounted.

35.0 TYPE TESTS

(1) Mechanical endurance

(2) Dielectric test

(3) Short circuit test

(4) Make-Break test

(5) Making tests

(6) Temperature rise test

(7) Mechanical-operating test

(8) ARC fault test

END OF SECTION

SECTION E-7

ICT COMMUNICATIONS (GPON)

1.0 GENERAL

The scope shall cover the complete Gigabit capable Passive Optical Network (GPON) system including all kind of components and accessories for the satisfactory installation, operation and maintenance of the ICT Communications system required for the complete project on site. The system shall adhere to the standard ITU G.984.1. It describes a flexible optical fiber access network capable of supporting the bandwidth requirements of infrastructure services and covers systems.

2.0 STANDARDS

Following ITU standards shall be used as recommendation for the system:

[ITU-T G.652] Recommendation ITU-T G.652 (2003), Characteristics of a single mode optical fiber cable.

[ITU-T G.808.1] Recommendation ITU-T G.808.1 (2006), Generic protection switching – Linear trail and subnetwork protection.

[ITU-T G.902] Recommendation ITU-T G.902 (1995), Framework Recommendation on functional access networks (AN) – Architecture and functions, access types, management and service node aspects.

[ITU-T G.982] Recommendation ITU-T G.982 (1996), Optical access networks to support services up to the ISDN primary rate or equivalent bit rates.

[ITU-T G.983.1] Recommendation ITU-T G.983.1 (1998), Broadband optical access systems based on Passive Optical Networks (PON).

[ITU-T G.983.2] Recommendation ITU-T G.983.2 (2002), ONT management and control interface specification for B-PON.

[ITU-T G.983.3] Recommendation ITU-T G.983.3 (2001), a broadband optical access system with increased service capability by wavelength allocation.

[ITU-T G.984.2] Recommendation ITU-T G.984.2 (2003), Gigabit-capable Passive Optical Networks (GPON): Physical Media Dependent (PMD) layer specification.

[ITU-T G.984.3] Recommendation ITU-T G.984.3 (2008), Gigabit-capable Passive Optical Networks (GPON): Transmission convergence layer specification.

[ITU-T G.984.4] Recommendation ITU-T G.984.4 (2008), Gigabit-capable Passive Optical Networks (GPON): ONT management and control interface specification.

[ITU-T G.984.5] Recommendation ITU-T G.984.5 (2007), Gigabit-capable Passive Optical Networks (GPON): Enhancement band.

[ITU-T I.112] Recommendation ITU-T I.112 (1993), Vocabulary of terms for ISDNs

DEFINITIONS, ABBREVIATIONS AND ACRONYMS

A. **Differential fiber distance**: An OLT is connected to several ONU/ONTs. The differential fiber distance is the difference in the distance between the nearest and farthest ONU/ONT from the OLT.

B. **Optical line termination (OLT)**: A device that terminates the common (root) endpoint of an ODN, implements a PON protocol, such as that defined by [ITU-T G.984], and adapts PON PDUs for uplink communications over the provider service interface. The OLT provides management and maintenance functions for the subtended ODN and ONUs.

C. **Optical network termination (ONT)**: A single subscriber device that terminates any one of the distributed (leaf) endpoints of an ODN, implements a PON protocol, and adapts PON PDUs to subscriber service interfaces. An ONT is a special case of an ONU.

D. **Optical network unit (ONU)**: A generic term denoting a device that terminates any one of the distributed (leaf) endpoints of an ODN, implements a PON protocol, and adapts PON PDUs to subscriber service interfaces. In some contexts, an ONU implies a multiple-subscriber device.

E. **Physical reach**: Physical reach is defined as the maximum physical distance that can be achieved for a particular transmission system.

F. **Service**: Service is defined as a network service required by operators. Service is described by a name that is clearly recognized by everyone, regardless of whether it is a frame structure name or a general name.

G. **Configuration:** The interface at reference points S/R and R/S is defined as IFPON. This is a PON-specific interface that supports all the protocol elements necessary to allow transmission between OLT and ONUs.

H. **Logical Reach:** Logical reach is the maximum distance between ONU/ONT and OLT except for the limitation of the physical layer. In GPON, the maximum logical reach is defined as TCC area.

I. **Physical Reach:** Physical reach is the maximum physical distance between the ONU/ONT and the OLT. In GPON, two options are defined for the physical reach: area define for TCC. It is assumed that maximum distance over which FP-LD can be used in the ONU for high bit rates such as 1.25 Gbit/s or above.

J. **Differential Fiber Distance:** In GPON, the maximum differential fiber distance is 20 km. This affects the size of the ranging window and provides compliance with [ITU-T G.983.1].

K. **Split Ratio:** the larger the split ratio is for GPON, the more attractive it is for operators. However, a larger split ratio implies greater optical splitting which creates the need for an increased power budget to support the physical reach. Split ratios of up to 1:64 are realistic for the physical layer, given current technology. However, anticipating the continued evolution of optical modules, the TC layer must consider split ratios up to 1:128.

L. **Service Overlay:** An overlay wavelength may be used to provide enhanced services to the subscriber. Accordingly, GPON must vacate the Enhancement Band defined in [ITU-T G.983.3].

M. **Abbreviations and Acronyms**

BRI	Basic Rate Interface
DSL	Digital Subscriber line
FTTB	Fiber to the Building
FTTH	Fiber to the Home
FTTC	Fiber to the Curb
FTTCab	Fiber to the Cabinet
ONT	Optical Network Termination
OLT	Optical Line Termination
ONU	Optical Network Unit
OpS	Operation Systems
PDH	Plesiochronous Digital Hierarchy
PRI	Primary Rate Interface
PON	Passive Optical Network

3.0 NETWORK ARCHITECTURE

The optical section of a local access network system can be either active or passive and its architecture can be either point-to-point or point-to-multipoint. The optical access network (OAN) is common to all architectures; hence the commonality of this system has the potential to generate large worldwide volumes.

4.0 FTTB SCHEME

The FTTB scheme can be divided into two scenarios, one for multi-dwelling units (MDUs) and the other for businesses. Each scenario may have the service categories as defined under FTTH below.

5.0 COPPER & FIBRE OPTIC CABLE AND CONNECTORS

Unshielded twisted-pair copper & fiber optic cables shall be approved & recommended by component manufacturer. This is to enable the component manufacturer to give the necessary product and application warranties for the system.

Provide unshielded twisted-pair copper cable, fiber optic cable and connectors, in sizes and types as recommended by the active equipment manufacturer for indicated applications. Mate and match connector materials to factory-installed equipment.

Computer cabling System Accessories: Provide computer accessories, including modular wall and floor jacks, junction boxes, connecting blocks and pre-wired boxes.

The selection and type of material required for the Services shall conform to the specifications given herein and items or matters not specified herein shall conform to ISO/IEC 11801, EN 50173 and TIA / EIA 568B Category 6 Standards as applicable. The Contractor shall also ensure that the materials utilized to complete the Cabling System installation are capable of supporting the minimum expected performance requirements for emerging applications such as ATM services (1.2 GPS), including 10 Gbps Ethernet. The complete system shall guarantee a minimum of 250 MHz & 100 MHz bandwidth performance and the products shall be from an internationally reputable manufacturer. The selection of materials shall be subject to approval by The Company.

The cables that are used to complete the installation shall be Category 6 UTP, capable of carrying high bit rate signals for extended distances in building distribution systems over frequency ranges up to and potentially beyond 250 or 600MHz, designed to work on an ISO 11801 Class "E" link.

The cable shall be composed of 23 or 24 AWG bare, solid-copper conductors. The insulated conductors shall be twisted into individual pairs and four such pairs twisted together.

The cables shall be fully color coded as provided hereunder, colour contrast being such that each pair in the cable is easily distinguishable from every other pair.

Conductor Identification	Colour Code	Abbreviation
Pair 1	White – Blue Blue – (White)	WT – BL BL
Pair 2	White – Orange Orange – (White)	WT – OR OR
Pair 3	White – Green Green – (White)	WT – GN GN
Pair 4	White – Brown Brown – (White)	WT – BR BR

5.1 SPECIFICATIONS OF UTP CABLES:

Cable Type	Category 6 UTP
Conductor Size(mm)	23 or 24 AWG
Number of Pairs	4
Nominal Outer Diameter (mm)	6.0
Impedance (Ohm)	100+/-15
Velocity of propagation (% speed of light)	69
Frequency (MHz)	250
Max. Attenuation @ 250 MHz (dB)	32.1
Worst case NEXT @ 250 MHz (dB)	38.3

5.2 HORIZONTAL CABLING DISTANCES

The maximum horizontal portion of a cabling system from work area information outlet to a mechanical termination at the patch-panel in the wiring closets must not be more than 90 meters. The cable run must be free of bridges, taps and splices.

Both ends of the cable shall be labeled for identification, i.e., at the patch panel and work area information outlet according to EIA/TIA 606 administration standards for the Data cabling of commercial buildings.

The horizontal cabling system shall be correctly designed and the work area outlets in each shown or required location shall be correctly mapped to an appropriate wiring closet. The star topology shall be applicable to every individual unit of the transmission media.

5.3 FIBRE OPTIC & UTP CABLING

The backbone cabling interconnecting distribution cabinets to the main Central distribution cabinet shall be of multimode OM3 fiber cable 50/125 microns; 8-core cable with color-coded fibers. All fiber optic cables shall be laid in straight run without intermediate splices and all fibers shall be terminated at either end using suitable fiber cable patch panels mounted on the wiring closets.

All fiber optic backbone links between the main cross connect and the Telecommunication rooms have a backup link using a different route from the main fiber optic link. Each of these links shall be 6-core fiber optic cable as described in this document.

The Contractor shall be responsible for the supply, installation, testing and commissioning of the complete fiber cable backbone interconnection/cross connection requirements of the "building/complex" LAN Cabling System.

The Contractor shall install suitable fiber optic pigtails/connectors needed to complete the entire fiber cable installation as per the manufacturer's recommendation and shall ensure that the backbone is capable to handle the traffic and provide error- free universal data transport for the foreseeable future.

All of the fibers in the backbone shall be terminated with LC type connectors at the time of the installation. The Contractor shall ensure proper testing of the fibers and make them available whenever they are needed. No fibers shall leave unterminated; all fibers must be terminated. A document with fiber cable test results for every fiber cable link shall be provided by the Contractor.

The Contractor shall observe the manufacturer's specifications for maximum tension and minimum bend radius for each fiber optic cable. The contractor shall provide a copy of the manufacturer's specifications to company prior to the commencement of the work.

Care must be taken when mechanical pulling devices are used, that maximum tension limits are not exceeded. Minimum bend radius specification shall not be violated when the cables are routed through walls or around corners. The

contractor shall ensure that all installation personnel are aware of these limitations.

The Contractor shall follow an intelligent numbering system based upon the destination and channel number. The numbering system shall have a prefix 'F' to indicate it is a fiber optic cable, followed by the destination IDF, then a hyphen and the channel within the cable.

4 Pair, CAT 6, 250 MHz UTP cable shall be installed as redundant backbone between the main patch panel (Server Rack) to Each building patch panel (IDF) at each floor/location as indicated in the drawings.

Logical labeling should be as per ANSI/TIA/EIA-606. Labels should be ring and printed type. No labels should be written by hand.

5.4 OPTICAL FIBRE CABLE TECHNICAL SPECIFICATION

Fiber optic cables within the premises shall use multimode, graded-index.

Fibers must comply with TIA/EIA 492 specifications and OM3 or OM2 fiber specification as in ISO 11801 standard.
Fibers will have dual wavelength capability; transmitting at 850 and 1300nm ranges.
All fibers shall be colour coded to facilitate individual fiber identification. The coating shall be mechanically strippable.

Core	50 μm ± 3 μm
Core Non-Circularity:	<6%
Core/Cladding Concentricity Error:	<3.0 μm
Numerical Aperture:	0.200 ± 0.015
Cladding diameter:	125 μm ± 1 μm
Cladding Non-Circularity:	<2.0%
Coloured Fiber Diameter:	250 μm ± 15 μm
Buffering Diameter:	890 mm ± 50 mm
Minimum Tensile Strength:	100,000 psi
Fiber Minimum Bending Radius:	.75 in. (1.91 cm)
Cable Minimum Bending Radius: During Installation: After Installation:	 20 times cable diameter 10 times cable diameter
Operating Temp. Range:	32°F to 122°F (0°C to 50°C)
Storage Temp. Range:	-40°F to 149°F (-40°C to 65°C)
Maximum Fiber Loss:	3.5 dB/km at 850 NM 1.5 dB/km at 1300 NM
Minimum Bandwidth:	1500 MHz. km at 850 nm (OFL) 500 MHz .km at 1300 nm (OFL) 2000 MHz. km at 850 nm (DMD, laser) 500 MHz. km at 1300 nm (DMD, laser)

6.0 FTTH

Within this scenario, the following service categories may be considered:

1. Asymmetric broadband services (e.g., digital broadcast services, VOD, file download, etc.).
2. Symmetric broadband services (e.g., content broadcast, e-mail, file exchange, distance learning, telemedicine, online-gaming, etc.).
3. POTS and ISDN. The access network must be able to provide, in a flexible way, narrow-band telephone services with the appropriate timing for the introduction.

7.0 SERVICES, USER NETWORK INTERFACE AND SERVICE NODE INTERFACE

7.1 Services:

GPON is required to support all currently known services and new services being discussed for TCC subscribers and business customers, because of such a broadband capability.

What specific services should be provided is clearer to some operators than to others and depends heavily on the particular regulatory conditions of each operator's markets, as well as on the market's own potential. How these services are delivered in a cost-effective way is a function not only of legal conditions, but also of factors including existing telecommunication infrastructure, dwelling distribution and business customer's mix.

7.2 User Network Interface and Service Node Interface:

ONU/ONT has UNI, as well as OLT, has an SNI. UNI/SNI depends on which services are provided by the service operator.

8.0 BIT RATE

Basically, GPON aims at transmission speeds greater than or equal to 1.2 Gbit/s. Accordingly, GPON identifies two transmission speed combinations as follows:

- 1.2 Gbit/s up, 2.4 Gbit/s down;
- 2.4 Gbit/s up, 2.4 Gbit/s down.

The most important bit rate is 1.2 Gbit/s up, 2.4 Gbit/s down, constituting nearly all of the deployed and planned deployment of the GPON systems.

9.0 MAXIMUM MEAN SIGNAL TRANSFER DELAY

GPON must accommodate services that require a maximum mean signal transfer delay of 1.5 ms.

Specifically, GPON system must have a maximum mean signal transfer delay time of less than 1.5 ms between T-V (or (a)-V, depending on the operator's preference). See clause 12 of [ITU-T G.982]. Delays introduced by the adaptation functions such as circuit emulation are not included in this value.

Although a section of the delay measurement is T-V for FTTH system, or (a)-V for

the other application in [ITU-T G.982], in a GPON system the reference points are not restricted by the system configuration.

10.0 PROTECTION ON THE PON SECTION

From the viewpoint of administration of the access network, the protection architecture of GPON is considered to enhance the reliability of the access networks. However, protection shall be considered as an optional mechanism because its implementation depends on the realization of economical systems. Further information on protection switching can be found in [ITU-T G.808.1].

10.1 Possible Protection Switching Types

There are two types of protection switching, both of which are analogous to those of SDH systems:

i) Automatic switching.

ii) Forced switching.

The first type is triggered by fault detection, such as loss of signal, loss of frame, signal degrade (BER becomes worse than the predetermined threshold), and so on. The second type is activated by administrative events, such as fiber rerouting, fiber replacement, etc. Both types should be possible in a GPON system, if required, even though they are optional functions. The switching mechanism is generally realized by the OAM function; therefore, the required OAM information field should be reserved in the OAM frame.

The relevant part of the protection in the GPON system in this scheme should be a part of the protection between the ODN interface in the OLT and the ODN interface in the ONU via the ODN, excluding the SNI redundancy in the OLT. The relevant part of the protection in the GPON system should be a part of the protection between the ODN interface in the ONU and each ODN interface in the two OLTs via the ODN, plus the signaling required to implement protection functions upstream from the SNI.

10.2 Possible Duplex GPON Configuration Examples

The control protocols for each configuration should be specified independently from one another. No switching protocol is required since the switching is carried out only in the OLT. The possible configuration examples are detailed below:

Type A: A deprecated configuration that duplicated only the optical fibers.

Type B: The second configuration doubles the OLTs and the optical fibers between the OLTs and the optical splitter, and the splitter has two input/output ports on the OLT side. This configuration reduces the cost of duplexing the ONUs, although only the OLT side can be recovered.

Type C: The third configuration doubles not only the OLT side facilities but also the ONU side. In this configuration, recovery from failure at any point is possible by switching to the standby facilities. Therefore, the full duplex cost enables high reliability.

Type D: A deprecated configuration that allowed the mixing of duplicated and non-duplicated ONUs, essentially providing a combination of types B and C protection.

It shall be noted that in both of these types of protection schemes, the PON line terminations do not need to reside in a single OLT equipment. In fact, they may be located in physically diverse locations (dual parenting).

10.3 Possible Duplex GPON Characteristics

Type B: This configuration requires cold standby of the spare circuit in the OLT side. In this case, signal loss or even frame loss is, in general, inevitable in the switching period. However, all the connections supported between the service node and the terminal equipment should be held after this switching.

Type C: In this case, the hot standby of the spare receiver circuits is possible in both ONU and OLT sides. In addition, hitless switching (without frame loss) is also possible in this configuration.

10.4 Requirements

1. The protection switching function should be optional.
2. Both automatic protections switching and forced switching are possible in the GPON system, if required, even though they are optional functions.
3. All the configuration examples of clause 14.2 will be possible, even though they are optional functions.
4. The switching mechanism is generally realized by the OAM function; therefore, the required OAM information field must be reserved in the OAM frame.
5. All the connections supported between the service node and the terminal equipment should be held after switching.

Regarding the last requirement, one implementation of the POTS service node (exchange) requires the frame loss period to be less than 120 ms. if the frame loss period becomes longer than that, the service node disconnects the call, and the call set-up is required again after the protection switching. Since GPON supports the emulation of conventional services, such as POTS and ISDN, this value should be taken into consideration.

T1 and E1 services require 50 ms protection times, so for these services to be provided as protected, the GPON should support 50 ms protection times.

10.5 Required Information Fields for OAM Frame

Protection switching requires less than ten codes to be used for both upstream and downstream, which will be realized by the field of the OAM frame. The field mapping of the OAM frame for the protection will be required to be defined.

11.0 SECURITY

Due to the multicast nature of the PON, GPON needs a security mechanism adapting the following requirements:

1. To prevent other users from easily decoding the downstream data.
2. To prevent other users from masquerading as another ONU/ONT or user.

3. To allow cost-effective implementation.

12.0 QUALITY ASSURANCE

Manufacturer's Qualifications: Firms regularly engaged in manufacture of signal transmission media and accessories of types required, whose products have been in satisfactory use in similar service for not less than 25 years.

Installer's Qualifications: Firms with at least 25 years of successful installation experience with projects utilizing systems and equipment similar to that required for this project.

Co-ordinate with other electrical work including wires/cables, electrical boxes and fittings, and raceways, to properly interface installation of data system with other work.

Sequence installation of system with other work to minimize possibility of damage and soiling during remainder of construction.

13.0 SUBMITTALS

Product Data: Submit manufacturer's data on signal transmission media and components.

Shop Drawings: Submit layout drawings of telephone cable distribution system and accessories.

Wiring Diagrams: Submit data transmission wiring diagrams for overall system.

END OF SECTION

SECTION E-8
SECURITY SYSTEM

PART-1 GENERAL

1.01 SUMMARY

A. This Section includes IP Based CCTV system and Access Control System for the building.

1.01.1.1.1 IP CCTV System includes the following:
- 1.01.1.1.1.1 Network Video Recorder (NVR)
- 1.01.1.1.1.2 IP CCTV Cameras
- 1.01.1.1.1.3 CCTV LED Display
- 1.01.1.1.1.4 Gigabit Switch
- 1.01.1.1.1.5 Associated Cabling

1.01.1.1.2 IP Access Control System includes the following:
- 1.01.1.1.2.1 Card Readers (BIO/proximity type)
- 1.01.1.1.2.2 Push Button
- 1.01.1.1.2.3 Door Controllers
- 1.01.1.1.2.4 Master Control Panel/work Station
- 1.01.1.1.2.5 Associated Wiring

1.02 QUALITY ASSURANCE

B. Comply with relevant standards of BS, NEMA and NEC.

PART-2 PRODUCTS

2.01 IP CCTV SYSTEM:

The system shall provide IP CCTV surveillance system for specified area by means of IP color CCD cameras. The Control Room shall house the surveillance through LED display and workstation through Network video recorder placed in Main IT room first floor.

2.02 FIXED TYPE IP CAMERA:

The camera shall be compact rugged, 2 MP IR 1/3 image format digital color CCD having the horizontal resolution of 1280x960 TVL or above with outstanding picture quality. The camera shall provide easy installation, digital signal processing, on screen displays, superior picture quality reliability. The camera shall accept AC or DC and POE. The camera shall provide auto-detection of lens type with lens wizard.

2.03 NETWROK VIDEO RECORDER:

- NVR shall support minimum 100 channel and the direct analog cameras.
- NVR shall provide 6 to 10 Mbps for recording of IP video stream, play back and export.
- NVR shall support recording of H.264, JPEG, and MPEG-4 IP Stream.
- NVR shall support third party H.264 Megapixel video stream up to 10Mps resolution with total system throughout recording of all IP & analog streams, playback and export.
- The NVR shall have fully open architecture with support for both IP Specific Cameras and as well as ONVIF Compliance.
- The NVR shall support 0.264 compression, CIF 4CIF resolution at maximum 100 IPS, 16 audio input and RS422/485 PT2 Control with supplied system/ third party compatible protocol.

2.04 CCTV LED:

Color LED is multi standard compatibility 32 inch with a built-in loud speaker and in puts able to accept NTSC, PAL and S-video standard in 1280P TV line or above of horizontal resolution is housed in a compact, space- saving metal cabinet for rugged reliability.

2.05 VIDEO CABLE:

Ethernet cat 6 cable is to be used for all IP based CCTV cameras.

2.06 TESTING & COMMISIONING:

The entire normal test as recommended by the manufacturer shall be carried out on the system. The system shall be commissioning by the authorized personnel only.

PART-3 IP BASED ACCESS CONTROL SYSTEM

1.2 STANDARDS

Materials and workmanship shall conform to the latest issue of all industry standards, publications, or regulations referenced in this section and with the following references as applicable.

NFPA 70 – National Electrical Code
UL294 – Standard for Access Control Systems
NFPA 101 - Life Safety Code.

1.01.1.2 SYSTEM DESCRIPTION

The System shall be a modular and network capable access control system. The System shall have the ability of handling controlled access with various reader technologies supported simultaneously, alarm monitoring with text and graphics based annunciation.

SUBMITTALS

A. Manufacturer's Data:

1. Submit three (3) copies of:

   a. Product Data Sheets
   b. Installation Instructions

2. Authorized Dealer Certificate and Certified Training Certificates of installers who will be working on this project.

B. Shop Drawings

1. Submit three (3) copies and digitally in Auto-Cad 14 or later format on a CD (3 copies), shop drawings, including:

   a. Layout of equipment on supplied Auto-Cad drawings.
   b. Security Console elevation drawings.
   c. Field Controller equipment location wall layouts, including size requirements.

C. As-Built Drawings

1. Update Shop Drawings to create final As-Built Drawings. Submit 3 copies and digitally in AutoCAD or later format on a CD (3 copies).

D. Stand Alone Operation

1. All database information required for stand-alone operation shall be stored at the main workstation of the system.
2. Proprietary software programs and control logic information used to coordinate and drive system hardware shall be stored in Flash Downloadable Read Only Memory.
3. Relay for lock control, and one input for monitoring a status switch, a request-to-exit device, and a tamper switch. There shall be status indicator lights for active relays, as well as diagnostic indicator lights to aid in system troubleshooting. There shall be dedicated alarm output relay/s for external reporting of the following conditions: Alarm; Duress; Tamper; and Trouble.

END OF SECTION

SECTION E-9

EARTHING SYSTEM

1.0 GENERAL

The work covered under this section of the specifications consist of furnishing all labour, equipment, appliances and materials and in performing of all operations in connection with providing, installing, connecting, testing the earthing system complete in accordance with this section of specifications and drawings. The earth pits on the drawings are only indicative and these will be located as directed by the Engineer.

2.0 APPLICABLE STANDARDS AND CODES

- BS 951 - EARTHING CLAMPS
- BS 7430 - EARTHING
- BS 2874 - NUTS,BOLT,WASHER,SCREW & RIVETS FOR USE ON COPPER
- BS 1433 - HARD DRAWN BARE COPPER CONDUCTOR FOR EATHING.
- BS 6346 - PVC INSULATED CABLES.

The maximum values of resistance of equipment earthing systems to the body of earth shall be as follow**:**

- General Electrical Earthing : 1 'Ω
- Earthing For Static Discharge : 1000 'Ω
- Earthing For Lightning Protection : 10 'Ω
- Instrument Clean Earth : 1 'Ω

3.0 EARTHING ACCESSORIES

The Earthing system shall be consist of Earth electrodes, Earthing leads, Earth connecting point, Earth continuity conductor and all accessories necessary for the satisfactory operation of the associated electrical system.

3.1- Earthing by Copper Plates

The earth electrode Copper plate shall consist of 600mm x 600mm x 3mm thick 99.9% high conductivity electrolytic tinned copper plate. The plate shall have four terminals for connecting the earthing leads as shown on the drawings.

3.2- Earthing by Copper Rods

The earth copper rod shall be installed for lighting poles as indicated in drawings. The copper rods shall be of 3m length and 20mm dia with high conductivity electrolytic copper. This shall be driven into the ground to the full length as shown in drawing.

3.3- Double Flange Earth Electrode Seal

Provide waterproof Double Flange Earth Electrode Seals for use in constructions where internal earths are specified to be installed in concrete slabs in basements or any other location where ingress of water specifically sub-soil water is expected. These double flange seals shall at least comply with following specification:

- Nominal thickness: 300mm (Provide extended seal tubes if concrete slab thickness is more).
- Withstand maximum pressure: 80 psi (5.5 bars).
- Material: High Density Plastic unless otherwise approved by the Engineer.
- Standard: BSEN 62561-5 (2011) and an extended 5 day test following BSEN 62561-5 test conditions.

3.4- Earthing Lead

The earthing lead shall connect the earth electrode to earth connecting point or equipment. It shall be round hard drawn 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 & no separate pavement shall be made for it.

3.5- Earth Continuity Conductor

Earth continuity conductor (E.C.C) shall be hard drawn bare copper wire or single core PVC insulated copper conductor cable of sizes indicated on the drawings or BOQ. All thimbles, lugs, sockets, nuts, washers and other accessories necessary for the complete installation of ECC shall be provided by the Contractor without any extra cost. PVC insulated cables when used as E.C.C. shall be green or green yellow.

3.6- Earth Connecting Points

When copper plates or copper rods are used as earth electrodes, the earthing leads from the plate or rod shall terminate at the earth connecting points which shall be of tinned copper bar, rectangular in shape, having dimensional 500mm x 50mm x 10mm, installed in the wall of the inspection chamber at the ground level. Further connections to respective locations shall be made from this bar by earth conductors of various sizes as shown on the drawings.

3.7- Inspection Chamber

At the ground level an inspection chamber shall be provided size shown on the drawing. The inspection chamber shall have 50mm x 50mm angle iron frame at the top to accommodate an approved quality heavy duty cast iron or concrete cover with handle. The cover shall have "EARTH BELOW" inscribed on its top. The Contractor shall provide and install the cover flush with the ground level.

4.0 EARTHING INSTALLATIONS

Complete earthing systems as shown on the drawing shall be installed by the Contractor. The earthing system shall give earth resistance, including resistance of soil, earth leads and E.C.C. equal to less than one ohm, this without ground pits water spraying.

The earthing system shall be loop connected with earthing cables at least 300 mm away from telephone cables. The concept of the main loops and the way they are connected shall be such that equipment / apparatus can be easily removed without requiring a complex disconnection operation nor risking interruption of / or damage to the loop itself. The fastening of the earthing conductors shall be made on a sufficient length so as to prevent crushing or cross section weakening. The parts on which they are connected shall be conveniently cleansed and surface.

Leads sheaths or steel tape armours are not permitted as grounding conductors. The earthing system shall be installed to ensure that when any part of the earthing system is disconnected for the purpose of carrying out periodic testing an alternative path to earth is available.

At all connections of earth continuity conductor to MV/LV Switchboard, LV Distribution Board or any other metallic body, proper size 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 termination 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 be in general run in cable trench or in conduits / pipes as shown on the drawings. Where laid along underground cables these shall be laid directly under ground in unpaved areas and in pipes under paved areas.

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.

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 the equipment. The body of all Switchboards shall be connected to earth by specified size of E.C.C. All metal work shall also be connected to earth by specified size of E.C.C.

At any joint or termination, the E.C.C. shall be connected using proper accessories. No connection shall be made by twisting of earth conductors.

4.1- Installation of Earth Electrodes (Copper Plate)

The installation of earth electrode (copper plate), a pit of appropriate diameter and up to the depth of 4 m or (as directed at site) shall be first excavated in the bare ground. The earth electrode shall be installed upright in the pit and shall be surrounded by **mixture of lime and charcoal** around the electrode as shown on the drawings and packed hard. From the plate earthing leads of 2x70mm² bare Cu. Conductor shall be taken to the bus bar in the inspection chamber through 50mm G.I pipe for watering purpose.

4.2- Installation of Earth Electrode (Copper Rod)

The earthing system by copper rod shall consist of 20mm dia and 3 meter long copper rods. These shall be of 99.9% purity copper. These shall have screw able head to accommodate other rods in series with the help of

dowel as is shown in the drawings. The driven head shall consist of a hardened tip. These rods shall be connected to the earthing lead whose other end shall be connected to the earth connecting points to be provided in the inspection chamber. From the earth connecting point's earth connection shall be made to individual point as marked in drawing.

4.3- Installation of Double Flange Earth Electrode Seals

The Double Flange Earth Electrode Seals must be installed fully in accordance with the manufacturer's instructions and under the supervision of manufacturer's trained and certified staff. Earth electrode seal flange and components must be free from dust/ debris/ grease/ paint before pouring the concrete to achieve highest quality and fully compacted to ensure full sealing from water. It shall be possible that additional Earth Rods can be driven at a later date, with no additional parts or causing damage to the Earth Rod Seal. The main concrete slab must not be shuttered out and the Earth Rod Seal fitted later.

4.4- Installation of Earth Electrode where condition not suitable for Earthing

Where the rock lie just below the surface or water table are very deep then earth electrode shall be installed through drilling or digging method. Due to certain ground conditions make it difficult to obtain a reliable earth resistance, whilst particular installations may require a very low resistance. In such cases, **Marconite concrete** shall be used as backfill for a conventional earth rod achieve a lower earth electrode resistance.

5.0 EQUIPMENT GROUNDING

5.1- Non-current carrying metal parts

Bond and ground non-current carrying metal parts of electrical apparatus and equipment provided under work of any section of specifications.

5.2- Grounding of Fence

All metallic fences shall be grounded by driving earth rods at a distance of 50 meter.

6.0 INSPECTION AND TESTS

Earth resistance tests shall be made by the Contractor on the complete earthing system in the presence of the Engineer. The test result shall conform to BS 7430 (formerly CP 1013) and BS 6651 (Formerly CP 326). To obtain the desired result more earth rods shall be provided.

END OF SECTION

SECTION E-10
LIST OF APPROVED MANUFACTURERS

1. GENERAL

All Equipment shall be procured from Principal Authorized agents / distributors / resellers

The Bidder shall fill name of only one manufacturer for each equipment/material on which the tender is based. He shall be bound to supply the equipment from the same manufacturer. In case, the Bidder gives names of more than one manufacturer against any equipment, the Engineer / Owner can ask the Bidder supply the equipment from any one of them.

At the evaluation stage if it is noted that any material offered by the bidder does not meet the specification requirements, the Engineer / Owner reserves the right to ask the bidder to replace his choice of equipment supplier meeting the required quality and specification requirement.

During the execution stage if the material from any supplier is found defective / substandard the Engineer / Owner reserves the right to ask the successful bidder to replace his choice of manufacturer / supplier for that particular equipment.

Any change in manufacturer / supplier shall only be entertained if there is sufficient reason that adhering to the original choice of manufacturer / supplier shall be detrimental to either the project quality or project timeline. Proper approval shall have to be sought for change in the choice manufacturer / supplier at least 1 month before the equipment is to be procured.

Samples of all equipment shall have to be got approved prior to their procurement. Any deviation from the BoQ / Specification shall be listed in a separate sheet to be labeled as Annexure-1 containing the details of the deviation including the deviating BoQ item number.

2. LIST OF APPROVED MANUFACTURERS

A standard list of approved manufacturers for the project is given below for the guidance of the bidder. Any additional manufacturer(s) or products mentioned here, which are found irrelevant to the project can be ignored. In case, if any manufacturer for a specified products is missed from this list, the bidder shall raise the query during bidding stage and get it clarified from the client/consultant.

S.No.	Manufacturer / Supplier	Country of Origin	Vendors Details
MEDIUM VOLTAGE (MV) PRODUCTS			
MV Switchgear / RMUs / PMUs / Transformer			
a.	Pak Electron Limited (PEL)	Pakistan	Mr. Ahmed Hassan Ph: 021-32200951-4, Mob: 0300-2140257
b.	Siemens	Pakistan	Mr. M. Yasir Arshad Siddiqui Ph: 021-32592705, Mob: 0322-2224588
c.	Schneider Electric	Pakistan	Mr. Ali Asghar, Sh. Wilayat Ahmed & Sons. Ph: 021-32624011, 32624012 Mob: 0309-8298294
d.	ABB	Pakistan	Mr. Ubaid ur Rehman Ph: 021-37130725, Mob: 0316-8221817
LV Load Break Switches, Changeover Switches & Isolators			
a.	Gewiss	Italy	Mr. Amail Alvi Global Lighting Technologies, Mob: 0333-8279791
b.	Kraus & Naimer	New Zealand	Jubilee Corporation, Mr. Abuzar Ph: 021-111-000-520 / 021-32602200-7, Mob: 0300-2390577
c.	Legrand	Italy	Mega Plus, Mr. Mukhtar Ahmed Ph: 021-111-003-355, Mob: 0303-2480739
d.	Breter	Italy	Mr. Ali Asghar, Sh. Wilayat Ahmed & Sons Ph: 021-32624011, 32624012 Mob: 0309-8298294
e.	Clipsal	Australia	Mr. Jahanzaib Inam Ph: 021-111-081-081 Ext 115, Mob: 0308-2229597
Contactors			
a.	Telemechanique (Schneider) Electric)	France	Mr. Ali Asghar, Sh. Wilayat Ahmed & Sons. Ph: 021-32624011, 32624012 Mob: 0309-8298294
b.	Legrand	France	Mega Plus, Mr. Mukhtar Ahmed Ph: 021-111-003-355, Mob: 0303-2480739
c.	ABB	Italy	Mr. Raheel Ahmed ABB Power and Automation Pvt. Ltd. Ph: 021-37130702, Mob: 0316-4777076
Push Buttons, Switches, etc.			
a.	Schneider Electric	France / Italy	Mr. Ali Asghar, Sh. Wilayat Ahmed & Sons. Ph: 021-32624011, 32624012 Mob: 0309-8298294
b.	Maruyasa	Japan / Malaysia / Indonesia	Jubilee Corporation, Mr. Abuzar Ph: 021-111-000-520 / 021-32602200-7, Mob: 0300-2390577
MV/LV Cables & Wires			
a.	Pakistan Cables	Pakistan	Mr. Aurangzeb Ubaid Ph: 021-111-222-537, Mob: 0300-8953394
b.	Newage Cables	Pakistan	Mr. Adnan, Mr. Shahzad Ph: 021-35837577, Mob: 0300-8230970, 0301-8472264

S.No.	Manufacturer / Supplier	Country of Origin	Vendors Details
c.	FAST Cables	Pakistan	Mr. Awais Hassan Mob: 0321-6698976
Cable Glands, Lugs, Terminals and Accessories			
a.	Cembre	UK	
b.	Hubbell / Hawke	UK	Clipsal Pakistan, Mr. Jahanzaib Inam Ph: 021-111-081-081 Ext 115, Mob: 0308-2229597
c.	Hensel	Germany	Mr. Shahzad Mob: 0301-8472264
PVC/UPVC Conduits and Accessories			
a.	Jeddah Polymer	Pakistan	Ph: 021-3634-3666
b.	Dadex	Pakistan	Ph: 021-111-000-789, 021-3431-3881
c.	Galco	Pakistan	Galaxy Corporation, Ph: 36934660, 36958826, 36991789, 32029322
d.	Civic	Pakistan	S. Mohsin H. Naqvi, Pelikan Pipe Industries (Pvt) Ltd. Ph: 021-3257-1593, 3258-1390 Mob: 0300-3945580
e.	Beta	Pakistan	Mr. Dilawaiz Ahmed Ph: 042-35172409-44, Mob: 0301-8492060
GI Conduits			
a.	IIL	Pakistan	International Industries Ltd. Ph: 021-111-019-019
b.	Steelex	Pakistan	Steelex (Pvt.) Ltd. Ph: 021-111-019-019, 36880620
Back Boxes / Pull Boxes / Junction boxes / Floor Boxes			
a.	Hensel	Germany	Mr. Shahzad Mob: 0301-8472264
b.	Clipsal (Schneider)	Australia	Clipsal Pakistan, Mr. Jahanzaib Inam Ph: 021-111-081-081 Ext 115, Mob: 0308-2229597
c.	Davis	Malaysia	Clipsal Pakistan, Mr. Jahanzaib Inam Ph: 021-111-081-081 Ext 115, Mob: 0308-2229597
Switches & Socket Outlets			
a.	Clipsal (Schneider Electric)	Australia	Clipsal Pakistan, Mr. Jahanzaib Inam Ph: 021-111-081-081 Ext 115, Mob: 0308-2229597
b.	MK Electric	UK	Safe and Sound, Mr. M. Shoaib Khan Mob: 0311-8972136

S.No.	Manufacturer / Supplier	Country of Origin	Vendors Details
d.	ABB	Italy	Dynamic Engineering, Mr. Aown Muhammad Ph: 051-5514707, 051-5513470, Mob: 315-5291248
Lightning Protection & Earthing Systems			
a.	Erico	USA	Equipment Supplies & Workshop (ESW), Mr. Hammad, Mr. Athar Ph: 021-34322716, Mob: 0334-3638481, 0312-0291136
b.	Furse	UK	Britlite Engineering, Mr. Rizwan Mirza Ph: 021-35341732-6, Mob: 0300-2090702
c.	Dhen	Germany	Jubilee Corporation, Mr. Abuzar Ph: 021-111-000-520 / 021-32602200-7, Mob: 0300-2390577
EXTRA LOW VOLTAGE (ELV) PRODUCTS			
Data Communication Systems & IPTV			
a.	Vivanco	UK	Valued Engineering Solutions, Mr. Anwer Ellahi Mob: 0320-1315709
b.	Clipsal (Schneider Electric)	Australia	Schneider Electric, Mr. Ibad Ph: 021-111-081-081 Ext 115, Mob: 0308-2229597, 0332-2264919
c.	Panduit	USA	MB Communication Ph: 021-+9221322709267
Telephone Cables			
a.	Vivanco	UK	Valued Engineering Solutions, Mr. Anwer Ellahi Mob: 0320-1315709
b.	Clipsal (Schneider Electric)	Australia	Schneider Electric, Mr. Jahanzaib Inam Ph: 021-111-081-081 Ext 115, Mob: 0308-2229597
c.	Panduit	USA	Valued Engineering Solutions, Mr. Anwer Ellahi Mob: 0320-1315709
Communication Racks & PDUs			
a.	Schneider	France	Clipsal Pakistan, Mr. Jahanzaib Inam Ph: 021-111-081-081 Ext 115, Mob: 0308-2229597
b.	Panduit	USA	MB Communication, Ph: 021-32270926-7
c.	Vivanco	UK	Valued Engineering Solutions, Mr. Anwer Ellahi Mob: 0320-1315709

S.No.	Manufacturer / Supplier	Country of Origin	Vendors Details
IP CCTV System			
a.	Honeywell	UK	Mr. Abdur Rehman Safe and Sound, Mob: 0300-3321122
b.	DAHUA	China	Mr. Rahat M. Jan Mansha Brothers Ph: 021-111-500-111, Mob: 0321-2596622
c.	ACTI	Taiwan	Mr. Anwer Ellahi Valued Engineering Solutions Mob: 0320-1315709

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

TENDER DOCUMENT

(Volume- III)

BILL OF QUANTITIES

NOV 2025

Lead Firm | SURBANA | JV-Team

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

BILL OF QUANTITIES SUMMARY

S.NO:	DESCRIPTION	AMOUNT
A	**SCHEDULE ITEMS**	
1	SCHEDULE ITEMS	-
	Total of Schedule Items	-
	Add 0 % Premium on Electrical Works of MES Schedule 2025	-
	Total of Schedule Items with Premium - A	**-**
B	**NON-SCHEDULE ITEMS**	
1	RING MAIN UNITS (RMU)	-
2	MEDIUM VOLTAGE CABLES	-
3	CABLE CONTAINMENT	-
4	EARTHING SYSTEM	-
5	GPON SYSTEM (Passive Equipment Only)	-
6	CCTV SYSTEM	-
	Total of Non-Schedule Items - B	**-**
	TOTAL AMOUNT (A+B)	**-**

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

BILL OF QUANTITIES

S.No	MES Schedule 2025 Ref.No	DESCRIPTION	QTY	UNIT	RATE (Pak Rs.)	AMOUNT (Pak Rs.)
A		**SCHEDULE ITEMS**				
1	1-1	Excavation as in Ordinary Soil upto 1.5 M depth, in foundation and pipe trenches upto 1.5 M wide, in shafts, wells and independent holes upto 30 sqm each and throw earth clear of edges of excavations with in 10m. Timbering to be paid extra (Foundation and Trench over 1.5 M widths will be treated as Areas).	27,597	Cum		
2	1-2	Same as item 1-1, but in Hard Soil.	9,199	Cum		
3	1-16	Earth filling as in Ordinary or hard soil, filling in foundation, pipe trenches, shafts, wells, independent holes, under floors or around plinths etc., 1.5 M below or above Ground Level (GL), with spoil obtained from excavation in trenches/over areas within 50M including watering and compaction in 150 mm layer and dressing to required profile and shape.	13,471	Cum		
4	25-677	Cable marker, supply and fixing.	269	Each		
		Amount Carried to Electrical Summary				**-**

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

BILL OF QUANTITIES

S.No	MES Schedule 2025 Ref.No	DESCRIPTION	QTY	UNIT	RATE (Pak Rs.)	AMOUNT (Pak Rs.)
B		**NON-SCHEDULE ITEMS**				
1		**RING MAIN UNITS (RMU)**				
a)		Supply, installation, testing and commissioning of following outdoor type 11kV, Ring Main Units (RMUs), Breaking Capacity 21KA / 1 sec, consisting of 11kV 630A TP Load Break Switches and 11kV 630A TP Circuit Breakers (CB) as per the combination given as under. The RMU will be complete with enclosure, LBS, CB, bus bars, protections, earth switches, interlocking system, cable compartment, and all other components required for the satisfactory installation and operation as per K-Electric Specification including RCC foundation pad and all related civil works.				
i		3-Way RMU with 2 Side protection (LBS + CB + CB)	6	No.		
ii		4-Way RMU with 3 Side protection (LBS + CB + CB + CB)	32	No.		
		Amount Carried to Electrical Summary				

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

BILL OF QUANTITIES

S.No	MES Schedule 2025 Ref.No	DESCRIPTION	QTY	UNIT	RATE (Pak Rs.)	AMOUNT (Pak Rs.)
2		**MEDIUM VOLTAGE CABLES**				
a)		Supply, laying, termination, tagging, testing and commissioning of following size Aluminum conductor, multi core, AL/XLPE/SWA/PVC, armoured, 15kV voltage grade cables, directly buried in already excavated trenches / laying in already provided uPVC road crossing sleeves including lugs, cable glands, cable ID marker, fresh sand 6" above and 6" under cable, laying protection A class bricks on sand, warning tape (before backfilling) etc. Complete in all respects, as per drawing and specifications and to the entire satisfaction of the engineer and employer. Note: Contractor is advised to confirm the actual lengths as per site conditions before commencement of work / ordering of cables.				
i		3 CORE -400 Sq.mm Al.XLPE/SWA/PVC 15kV Cable	24,055	Rm.		
b)		MV Straight Joint Kits for 15kV 3 Core, 400 Sq.mm AL/XLPE/SWA/PVC cable	8	No.		
c)		MV termination kit for 15kV 3 Core, 400 Sq.mm AL/XLPE/PVC/SWA/PVC Cable (Outdoor)	82	No.		
		Amount Carried to Electrical Summary				

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

BILL OF QUANTITIES

S.No	MES Schedule 2025 Ref.No	DESCRIPTION	QTY	UNIT	RATE (Pak Rs.)	AMOUNT (Pak Rs.)
3		**CABLE CONTAINMENT**				
		CONDUIT & PIPES				
a)		Supply and installation of following size internal diameter PVC Conduit / uPVC Class-D Pipe / Flexible PVC Conduit as race ways with all accessories, recessed / surface on wall / column / under floor, as per drawings and specifications, complete in all respect.				
i		50 mm dia uPVC Class-D Pipe	50	Rm.		
ii		25 mm dia Flexible PVC Conduit	30	Rm.		
iii		25 mm dia Flexible Steel Conduit	100	Rm.		
b)		Supply and Construction of RCC foundation (PAD) for RMUs, including excavation and backfilling, construction with class "B" concrete used water resistance chemical, water proofing material applied on structure surfaces are concealed below FGL / FFL, Pad size as per specification and as directed by the consultant, complete in all respect.	38	Job.		
		Amount Carried to Electrical Summary				

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

BILL OF QUANTITIES

S.No	MES Schedule 2025 Ref.No	DESCRIPTION	QTY	UNIT	RATE (Pak Rs.)	AMOUNT (Pak Rs.)
4		**EARTHING SYSTEM**				
		Supply, installation, testing and commissioning of following items for complete earthing system including all connecting / fixing accessories as per drawings, specifications and as mentioned in General Notes, complete in all respects.				
a)		Supply, installation, testing and commissioning of Earth pit with Rod type earth electrode, 3/4" dia and 9 Ft. long copper bonded rod to achieve the required earth resistance for complete Power Earthing system, including Bentonite chemical, other all required materials and connecting accessories, boring as required to achieve the target earth resistance (at least 20 ft deep), labor, tools, transportation etc., as per drawings and specifications, complete in all respects with detailed test reports. (for RMUs)	38	No.		
b)		Supply, laying, termination, tagging, testing and commissioning of following size PVC insulated single core Cu. Conductor cable as earth continuity conductor (ECC) installed on surface / in already installed raceway / in already excavated trench / in already laid pipe, complete in all respect.				
i		1 Core, 120 Sq.mm Cu/PVC	380	Rm.		
		Amount Carried to Electrical Summary				

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

BILL OF QUANTITIES

S.No	MES Schedule 2025 Ref.No	DESCRIPTION	QTY	UNIT	RATE (Pak Rs.)	AMOUNT (Pak Rs.)
5		**GPON SYSTEM (Passive Equipment Only)** Supply, installation, testing and commissioning of following items for GPON System, including all material, labor, tools, accessories etc. Complete in all respects.				
a)		Supply, installation, testing and commissioning of following Floor standing, Data Cabinets to accommodate patch panel, Fiber panels, adapter, PDU's, Fans and space for active switches as it may require to complete the entire passive and active network including all material, labor, tools, accessories etc. as per the single line diagram, drawings and specifications, complete in all respect.				
i		42U Data Rack with PDU's	6	No.		
b)		Supply, laying, termination, testing and commissioning of 2 Core Single mode outdoor Fiber Optic Cable in already laid uPVC pipe including termination and tagging at both ends, as per drawings and standard specifications with all termination accessories up to entire satisfaction of IT Engineer. Note: Contractor is advised to confirm the cable running length before commencement of work and termination as per site requirements.	75,250	Rm.		
c)		Supply, installation, testing and commissioning of Cable Cassete Enclosure to accommodate main Fiber 8 core and out 2 core, IP-65 rated, including all material, labor, tools, accessories etc. as per the single line diagram, drawings and specification, complete in all respect.	6	Job.		
d)		Supply, installing, testing and commissioning of 24 port Single Mode Fiber Patch Panel fully loaded with pigtails, rear cable manager etc., as per drawing and specification, complete in all respect.	2	No.		
e)		Supply, installing, testing and commissioning of 24 port shutter type Cat-6, RJ 45 UTP Patch Panel fully loaded with tool less jacks and rear cable manager, as per drawing and specification, complete in all respect.	1	No.		
f)		Supply, installing, testing and commissioning of 19" front/rear (as required) cable organizer between patch panels and active equipment to provide patch cable management including with all necessary accessories, as per drawing & specification, complete in all respect.	3	No.		
g)		Supply, installation, testing and commissioning of following Fiber Optic Patch Cords (certified) of specified color at both ends for communication with SC/LC/APC connector. (As per requirement depends on active part)				
i		3m Long Patch Cord	6	No.		
h)		Supply, installing, testing and commissioning of Single RJ-45, Cat-6 outlet for Camera with shutter type and 16 SWG back box including tagging, as per drawing and specification, complete in all respect.	460	No.		

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

BILL OF QUANTITIES

S.No	MES Schedule 2025 Ref.No	DESCRIPTION	QTY	UNIT	RATE (Pak Rs.)	AMOUNT (Pak Rs.)
j)		Installation, testing, commissioning and programming by Manufacturer Authorized Agent / Dealer and handing over complete GPON System to Owner with providing Training fuke & OTDR Testing, as build drawing, Rack layouts and certification's Principal, complete equipment's Manual and Warranty Documents to Owners representative.	1	Job.		
		Amount Carried to Electrical Summary				

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

BILL OF QUANTITIES

S.No	MES Schedule 2025 Ref.No	DESCRIPTION	QTY	UNIT	RATE (Pak Rs.)	AMOUNT (Pak Rs.)
6		**CCTV SYSTEM** Supply, installation, testing and commissioning of following items for CCTV System, described below including all accessories, as per the single line diagram and specification, complete in all respect.				
a)		Supply, installing, testing and commissioning of IP based Pole / Wall Mounted 4MP CCD outdoor camera with 4.3mm to 55mm varifocal lens, including power adopter, material, labor, tools, accessories etc, as per the drawings, specifications and up to entire satisfaction of IT Engineer, complete in all respect.	92	No.		
b)		Supply and installation of Pole / Wall mounted Bracket housing (IP-65 rated), including material, labor, tools, accessories etc. as per the drawings, specifications and up to entire satisfaction of IT Engineer, complete in all respect.	50	No.		
c)		Supply, installation, tagging, testing and commissioning of 64 Channel NVR with RAID 1+0 configuration based, built-in VMS built-in 20TB HDD for 24/7 recording with integral access slots for HDD suspension bays & 10 client Licenes, including material, labor, tools, accessories etc. as per the drawings, specifications and up to entire satisfaction of IT Engineer, complete in all respect.	2	No.		
d)		Supply, installation, tagging, testing and commissioning of Media Converter Box including 6 Port PoE Switch, 24mA Battery for 2 hours and Power supply with Weather proof IP-65 rated housing including material, labor, tools, accessories etc. as per the drawings, specifications and up to entire satisfaction of IT Engineer, complete in all respect. (To be installed on already installed lighting poles)	50	No.		
e)		Supply, laying, termination, tagging, testing and commissioning of CAT 6 - 4 pair cable for Camera in already laid PVC/Flexible conduit from camera to pole mounted Media Converter box, including material, labor, tools, accessories etc. as per the drawings, specifications and up to entire satisfaction of IT Engineer, complete in all respect.	100	Rm.		
f)		Supply, laying, termination, tagging, testing and commissioning of 8 Core Single mode outdoor Fiber Optic Cable for CCTV System in already laid uPVC pipe including material, labor, tools, accessories etc. as per the drawings, standard specifications and up to entire satisfaction of IT Engineer, complete in all respect. Note: Contractor is advised to confirm the cable running length before commencement of work and termination as per site requirements.	5,465	Rm.		

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

BILL OF QUANTITIES

S.No	MES Schedule 2025 Ref.No	DESCRIPTION	QTY	UNIT	RATE (Pak Rs.)	AMOUNT (Pak Rs.)
g)		Supply, laying, termination, testing and commissioning of 2 Core Single mode outdoor Fiber Optic Cable for CCTV System in already laid uPVC pipe including material, labor, tools, accessories etc., as per drawings and standard specifications up to entire satisfaction of IT Engineer. Note: Contractor is advised to confirm the cable running length before commencement of work and termination as per site requirements.	19,800	Rm.		
h)		Supply, installation, testing and commissioning of 27U CCTV Rack (Wall/Floor mounted), equipped with power distribution units (PDUs), imported power sockets, proper ventilation system, fan including material, labor, tools, accessories etc. as per the drawings, specifications and up to entire satisfaction of IT Engineer, complete in all respect.	1	No.		
j)		Supply, installation, testing and commissioning of 32" LED Screen, including all mounting accessories etc., including material, labor, tools, accessories etc. as per the drawings, specifications and up to entire satisfaction of IT Engineer, complete in all respect.	6	No.		
k)		Supply, installation, testing and commissioning of 55" LED Screen, including all mounting accessories etc., including material, labor, tools, accessories etc. as per the drawings, specifications and up to entire satisfaction of IT Engineer, complete in all respect.	1	No.		
l)		Supply, installation, testing and commissioning of Core i7 Work Station, 6/7th Generation, complete with Dual VGA Card, Licensed windows 10, Mouse & Keyboard etc., as per the drawings, specifications and up to entire satisfaction of IT Engineer, complete in all respect.	2	No.		
m)		Supply, installation, testing and commissioning of variable speed desktop keyboard with all fixing accessories, as per drawing and specifications, complete in all respect.	1	No.		
n)		Installation, testing, commissioning, programming by Manufacturer Authorized Agent / Dealer and handing over complete CCTV System to Owner with providing training, SOP, complete equipment's manual and warranty documents to owners representative.	1	Job.		
		Amount Carried to Electrical Summary				

Lead Firm

JV-Team

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

TENDER DRAWINGS

VOLUME IV

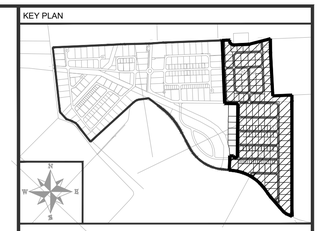
NOVEMBER, 2025

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION
(PIDC)

ELECTRICAL

S.#	DRAWING NO.	DRAWING TITLE
	GE - GENERAL DRAWINGS	
1	EA-01098-KIP-GE-EL-0001	LIST OF DRAWINGS
2	EA-01098-KIP-GE-EL-0002	ELECTRICAL STANDARD DETAILS SHEET-1
3	EA-01098-KIP-GE-EL-0003	MV POWER DISTRIBUTION - SINGLE LINE DIAGRAM - 1
4	EA-01098-KIP-GE-EL-0004	MV POWER DISTRIBUTION - SINGLE LINE DIAGRAM - 2
5	EA-01098-KIP-GE-EL-0005	MV POWER DISTRIBUTION - SINGLE LINE DIAGRAM - 3
6	EA-01098-KIP-GE-EL-0006	ICT INFRASTRUCTURE LAYOUT SINGLE LINE DIAGRAM
	MV - MV CABLE LAYOUT PLAN	
1	EA-01098-KIP-MV-EL-0001	MASTER PLAN (OVERALL) MV CABLE ROUTE LAYOUT
2	EA-01098-KIP-MV-EL-0002	MASTER PLAN (SHEET-1 OF 4) MV CABLE ROUTE LAYOUT
3	EA-01098-KIP-MV-EL-0003	MASTER PLAN (SHEET-2 OF 4) MV CABLE ROUTE LAYOUT
4	EA-01098-KIP-MV-EL-0004	MASTER PLAN (SHEET-3 OF 4) MV CABLE ROUTE LAYOUT
5	EA-01098-KIP-MV-EL-0005	MASTER PLAN (SHEET-4 OF 4) MV CABLE ROUTE LAYOUT
6	EA-01098-KIP-MV-EL-0006	MASTER PLAN (OVERALL) MV FEEDER CABLES ROUTE TO BQIP GRID STATION
	IT - FO CABLE ROUTE LAYOUT PLAN	
1	EA-01098-KIP-IT-EL-0001	MASTER PLAN (OVERALL) FO CABLE ROUTE LAYOUT
2	EA-01098-KIP-IT-EL-0002	MASTER PLAN (SHEET-1 OF 4) FO CABLE ROUTE LAYOUT
3	EA-01098-KIP-IT-EL-0003	MASTER PLAN (SHEET-2 OF 4) FO CABLE ROUTE LAYOUT
4	EA-01098-KIP-IT-EL-0004	MASTER PLAN (SHEET-3 OF 4) FO CABLE ROUTE LAYOUT
5	EA-01098-KIP-IT-EL-0005	MASTER PLAN (SHEET-4 OF 4) FO CABLE ROUTE LAYOUT
	SC - CCTV LAYOUT PLAN	
1	EA-01098-KIP-SC-EL-0001	MASTER PLAN (OVERALL) CCTV LAYOUT
2	EA-01098-KIP-SC-EL-0002	MASTER PLAN (SHEET-1 OF 4) CCTV LAYOUT
3	EA-01098-KIP-SC-EL-0003	MASTER PLAN (SHEET-2 OF 4) CCTV LAYOUT
4	EA-01098-KIP-SC-EL-0004	MASTER PLAN (SHEET-3 OF 4) CCTV LAYOUT
5	EA-01098-KIP-SC-EL-0005	MASTER PLAN (SHEET-4 OF 4) CCTV LAYOUT

KEY PLAN



NOTES:

LEGEND:

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

PIDC

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

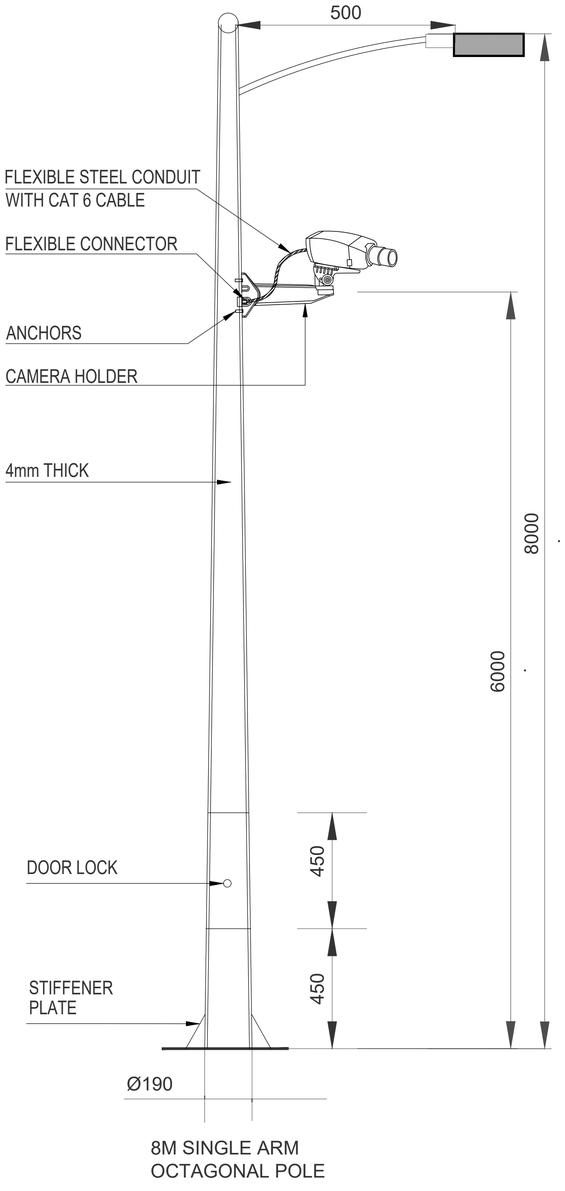
INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	Z.N	SCALE	N.T.S
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

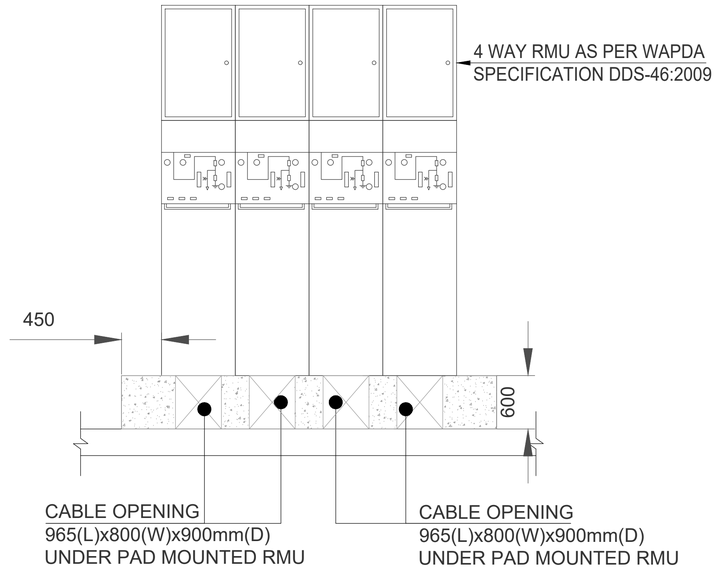
LIST OF DRAWINGS

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-GE-EL-0001	00

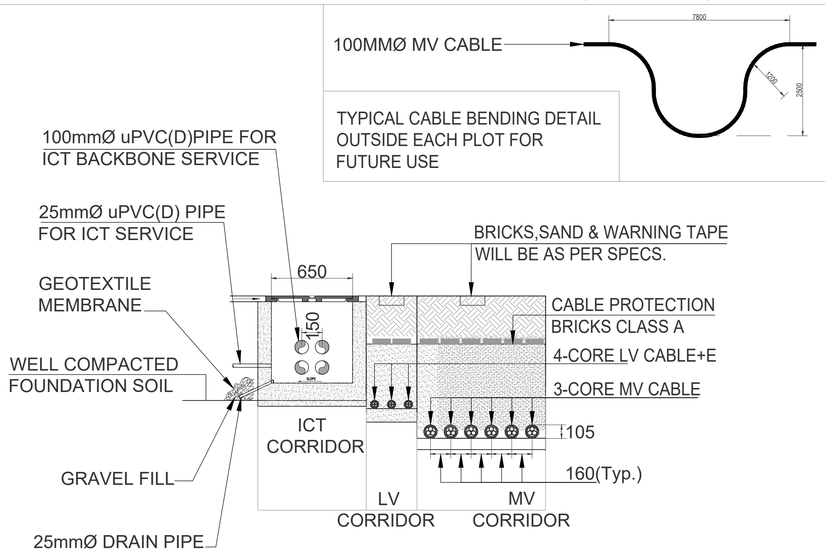


8M SINGLE ARM
OCTAGONAL POLE

TYPICAL CAMERA MOUNTING DETAILS ON STREET LIGHTING POLES

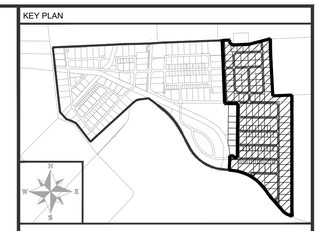


4WAY RING MAIN UNIT (TYPICAL)



ELECTRICAL CORRIDOR DETAIL

KEY PLAN



NOTES:

1. The drawing is for illustration purposes only. Contractor shall submit shop drawing with actual site coordination for approval.
2. The Plot boundaries, road alignment, road reserves, service reservations and all other dimensions and areas are subject to:
   - Further refinement during the detailed Infrastructure Planning stage
   - Approval from relevant authorities and services providers.
   - Final engineering survey by the contractor
3. All dimensions are in meters unless specified otherwise.
4. The RMUs (Ring Main Units) will be configured as a 4-way unit as per WAPDA specifications DDS-46:2009.
5. The RMU (Ring Main Unit) will be housed within a Kiosk. Refer to Detail "A" for specific enclosure details.
6. Contractor's Scope is till RMUs only. Further MV Cable and Transformer for the plot will be part of consumer.

LEGEND:

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

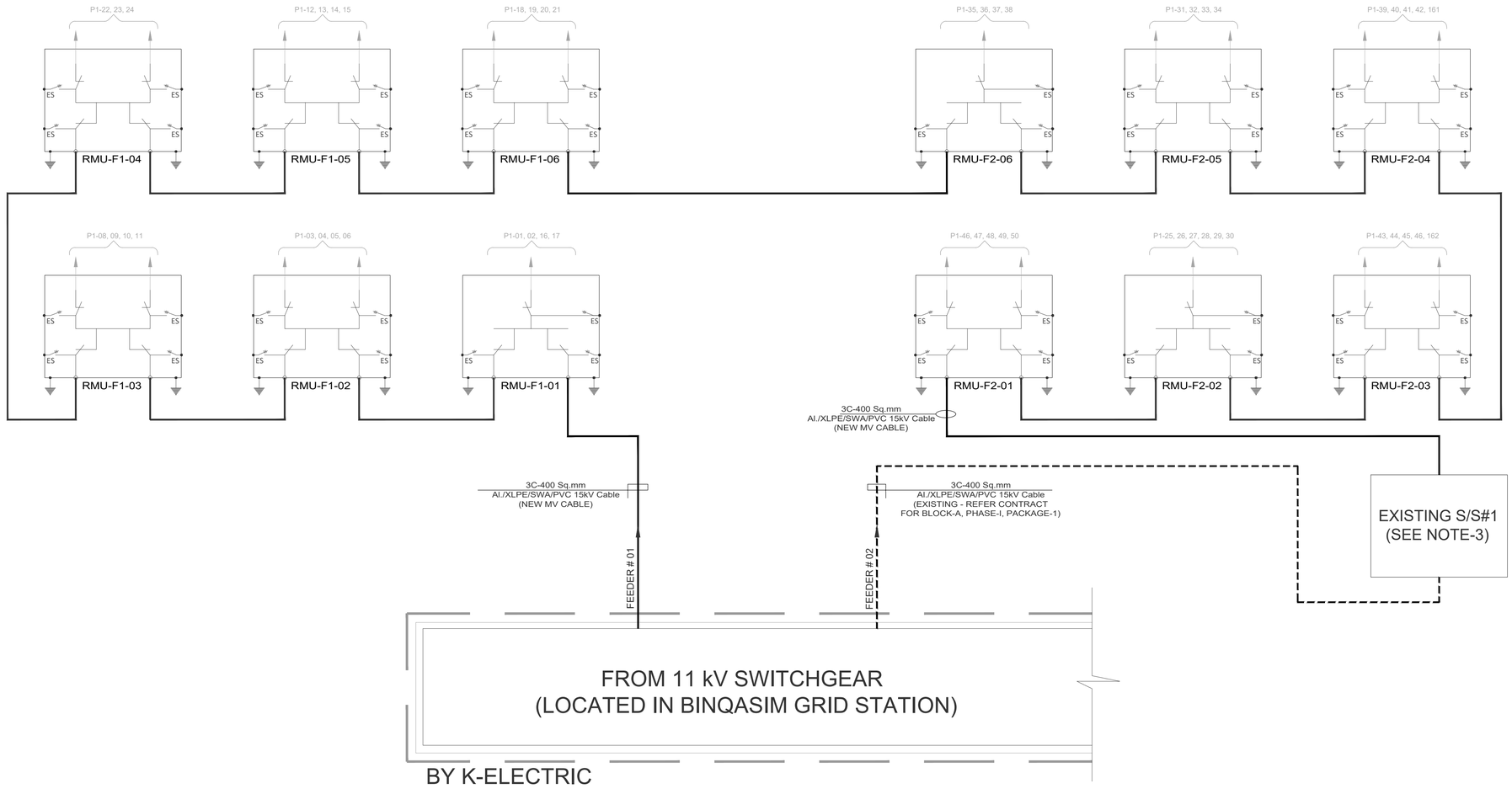
INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	M.R	SCALE	N.T.S
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

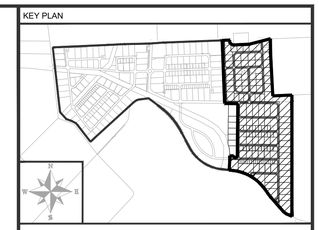
DRAWING TITLE:

ELECTRICAL STANDARD DETAILS SHEET - 1

PROJ CODE	DRAWING NO.	REV.
01098	**EA-01098-KIP-GE-EL-0002**	00



KEY PLAN



NOTES:

1. All RMUs shall be provided in accordance with WAPDA specification DDS-46.2009 and MES Specification para 25.11.

2. For Clarity, the protection Relays, CTs, Indication, Meters, etc. are not shown. However, the RMUs shall be equipped with all indications, relays, instruments, protections and accessories as required.

3. For existing S/S#1, refer existing contract of Block-A, Phase-1, Package-1.

LEGEND:

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

PIDC

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV. 2025

PROJECT:

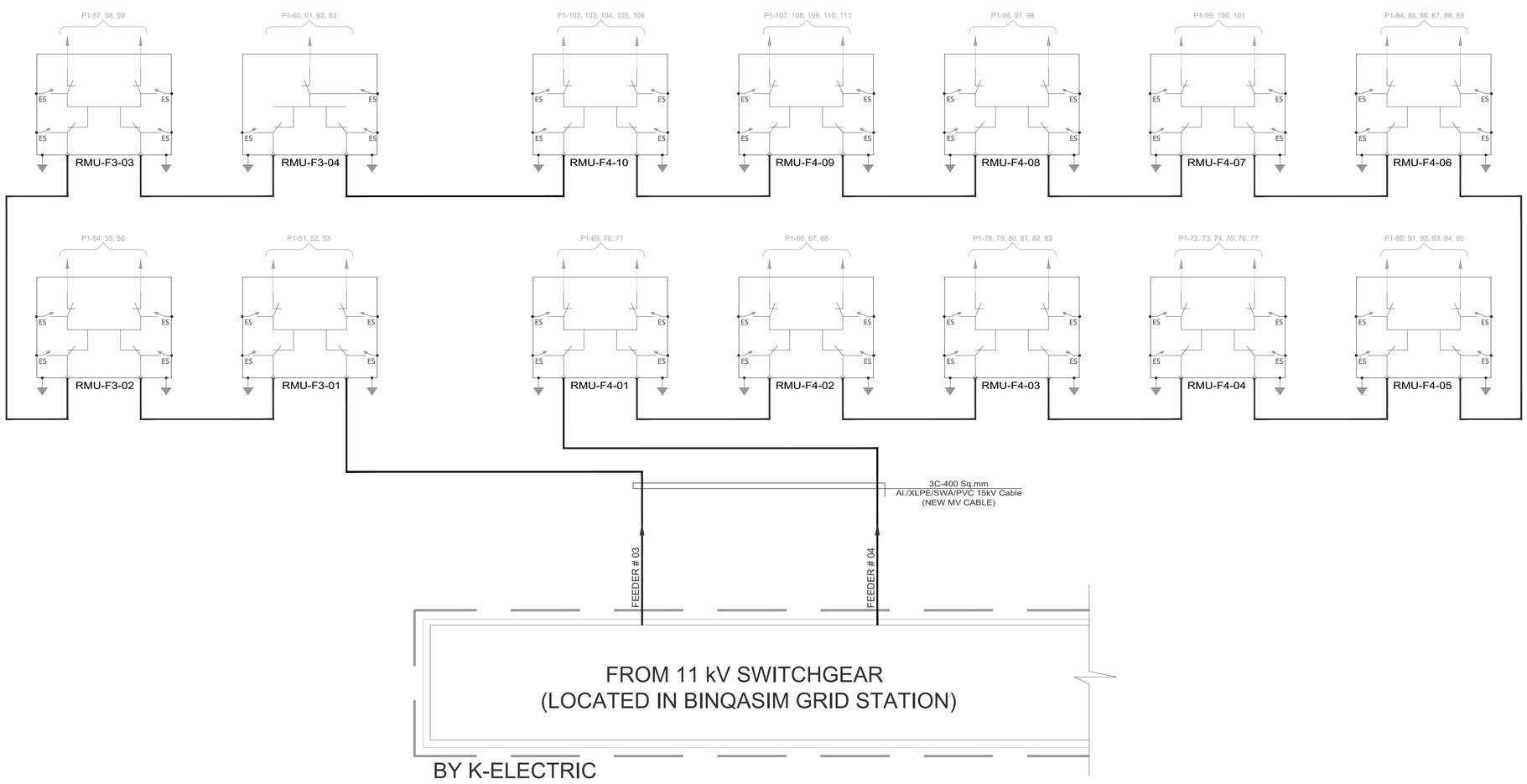
INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	F.A	SCALE	N.T.S
DESIGN	F.A	DATE	NOV. 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

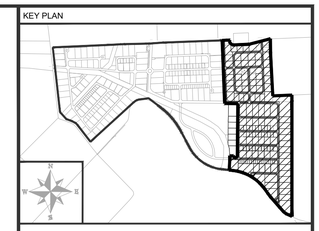
DRAWING TITLE:

MV SINGLE LINE DIAGRAM SHEET-1

PROJ CODE	DRAWING NO.	REV.
01098	**EA-01098-KIP-GE-EL-0003**	00



KEY PLAN



NOTES:

1. All RMUs shall be provided in accordance with WAPDA specification DDS-46.2009 and MES Specification para 25.11.

2. For Clarity, the protection Relays, CTs, Indication, Meters, etc. are not shown. However, the RMUs shall be equipped with all indications, relays, instruments, protections and accessories as required.

LEGEND:

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

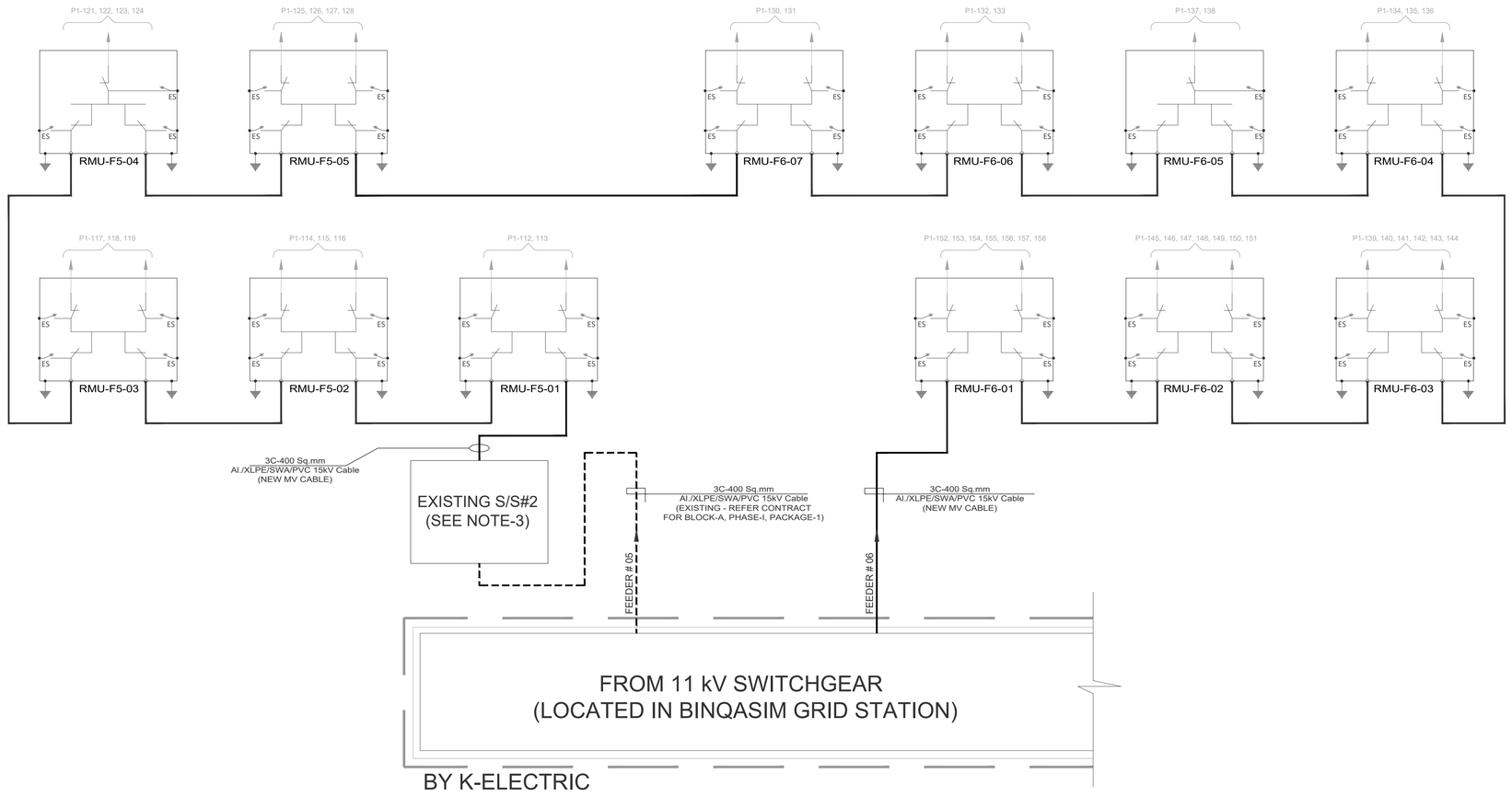
INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	Z.N	SCALE	N.T.S
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

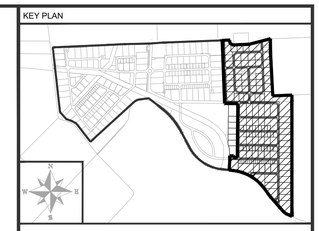
DRAWING TITLE:

MV SINGLE LINE DIAGRAM SHEET-2

PROJ CODE	DRAWING NO.	REV.
01098	**EA-01098-KIP-GE-EL-0004**	00



KEY PLAN



NOTES:

1. All RMUs shall be provided in accordance with WAPDA specification DDS-46.2009 and MES Specification para 25.11.

2. For Clarity, the protection Relays, CTs, Indication, Meters, etc. are not shown. However, the RMUs shall be equipped with all indications, relays, instruments, protections and accessories as required.

3. For existing S/S#2, refer existing contract of Block-A, Phase-1, Package-1.

LEGEND:

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

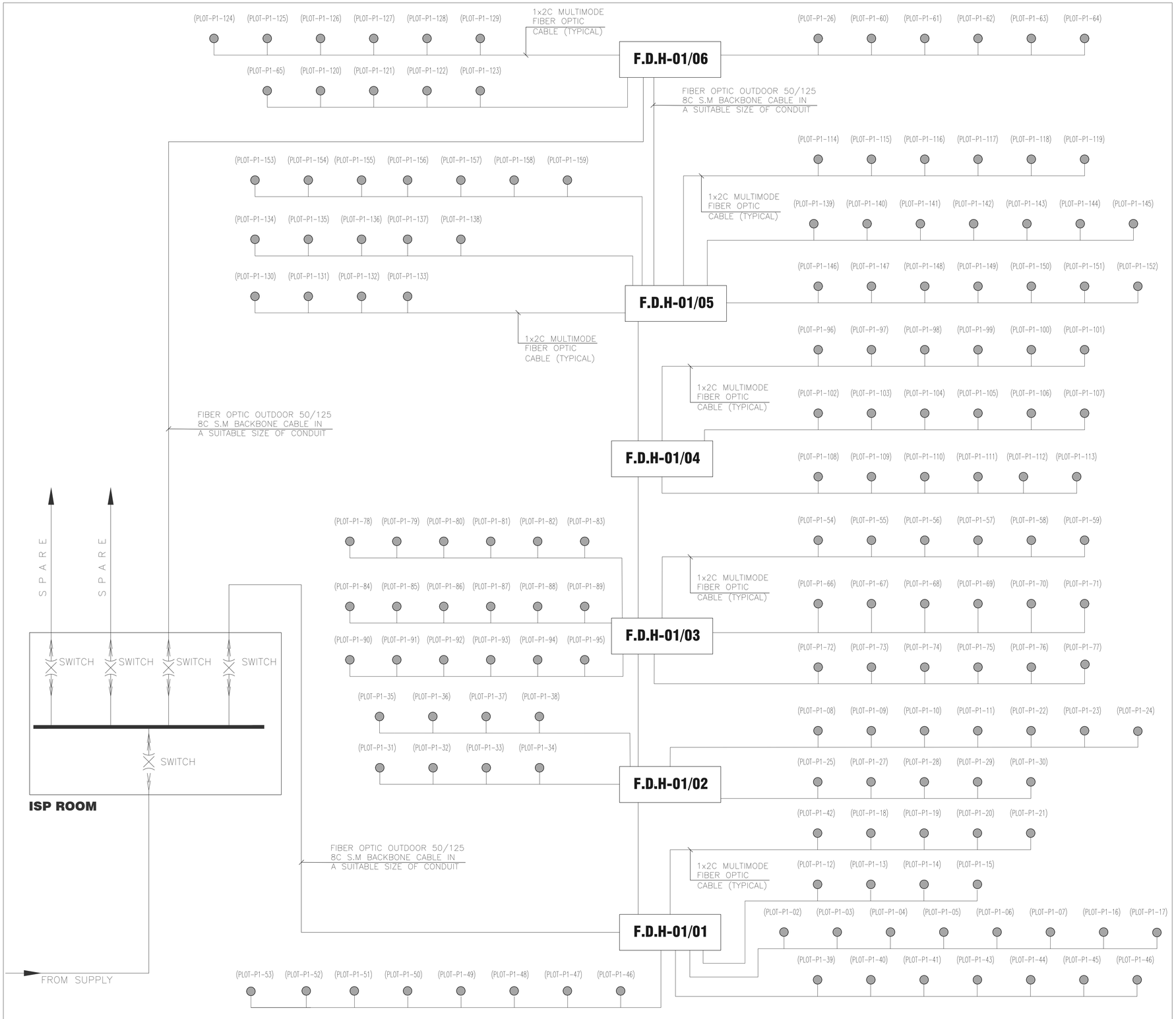
INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	Z.N	SCALE	N.T.S
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

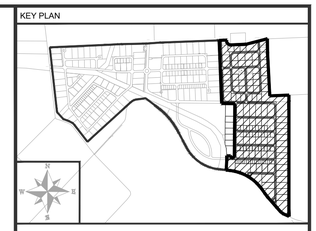
DRAWING TITLE:

MV SINGLE LINE DIAGRAM SHEET-3

PROJ CODE	DRAWING NO.	REV.
01098	**EA-01098-KIP-GE-EL-0005**	00



KEY PLAN



NOTES:

LEGEND:

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

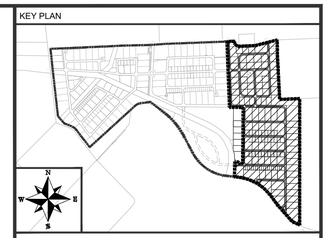
DRAWN		SCALE	
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

ICT INFRASTRUCTURE LAYOUT
SINGLE LINE DIAGRAM

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-GE-EL-0006	00

KEY PLAN



NOTES:

LEGEND:

LEGEND

SYMBOLS	DESCRIPTION
FDH	FEEDER DISTRIBUTION HUB
	8C-SINGLE MODE FIBER OPTIC CABLE
	2C-MULTIMODE FIBER OPTIC CABLE
	2x150mmØ uPVC ROAD CROSSING SLEEVES
	600mm(L) x 600mm(W) x 600mm(D) HANDHOLE

CLIENT:

PIDC

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

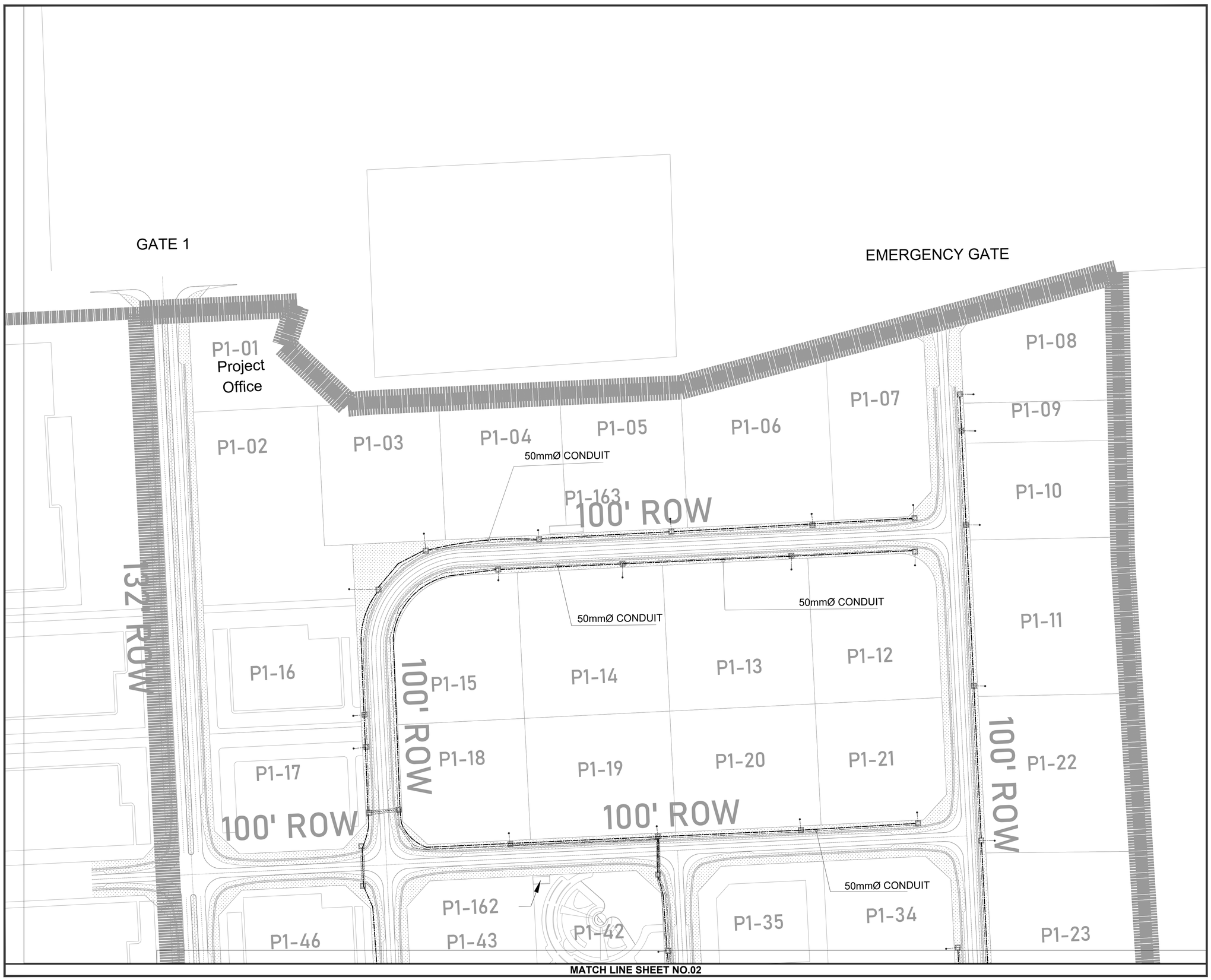
INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	Z.N	SCALE	N.T.S
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

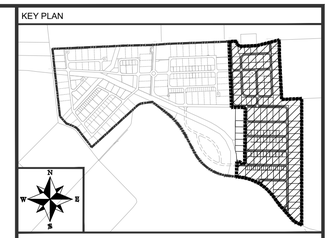
MASTER PLAN (OVERALL)
FO CABLE ROUTE LAYOUT
SHEET INDEX PLAN

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-IT-EL-0001	00



MATCH LINE SHEET NO.02

KEY PLAN



NOTES:

LEGEND:

LEGEND

SYMBOLS	DESCRIPTION
FDH	FEEDER DISTRIBUTION HUB
	8C-SINGLE MODE FIBER OPTIC CABLE
	2C-MULTIMODE FIBER OPTIC CABLE
	2x150mmØ uPVC ROAD CROSSING SLEEVES
	600mm(L) x 600mm(W) x 600mm(D) HANDHOLE

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm — JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	Z.N	SCALE	1 : 1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

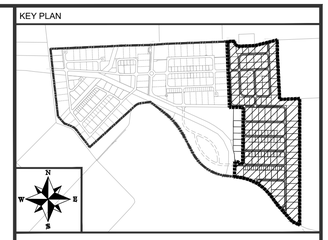
MASTER PLAN (Sheet 1 OF 4)
FO CABLE ROUTE LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-IT-EL-0002	00

MATCH LINE SHEET NO.01

MATCH LINE SHEET NO.03

KEY PLAN



NOTES:

LEGEND:

LEGEND

SYMBOLS	DESCRIPTION
FDH	FEEDER DISTRIBUTION HUB
	8C-SINGLE MODE FIBER OPTIC CABLE
	2C-MULTIMODE FIBER OPTIC CABLE
	2x150mmØ uPVC ROAD CROSSING SLEEVES
	600mm(L) x 600mm(W) x 600mm(D) HANDHOLE

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

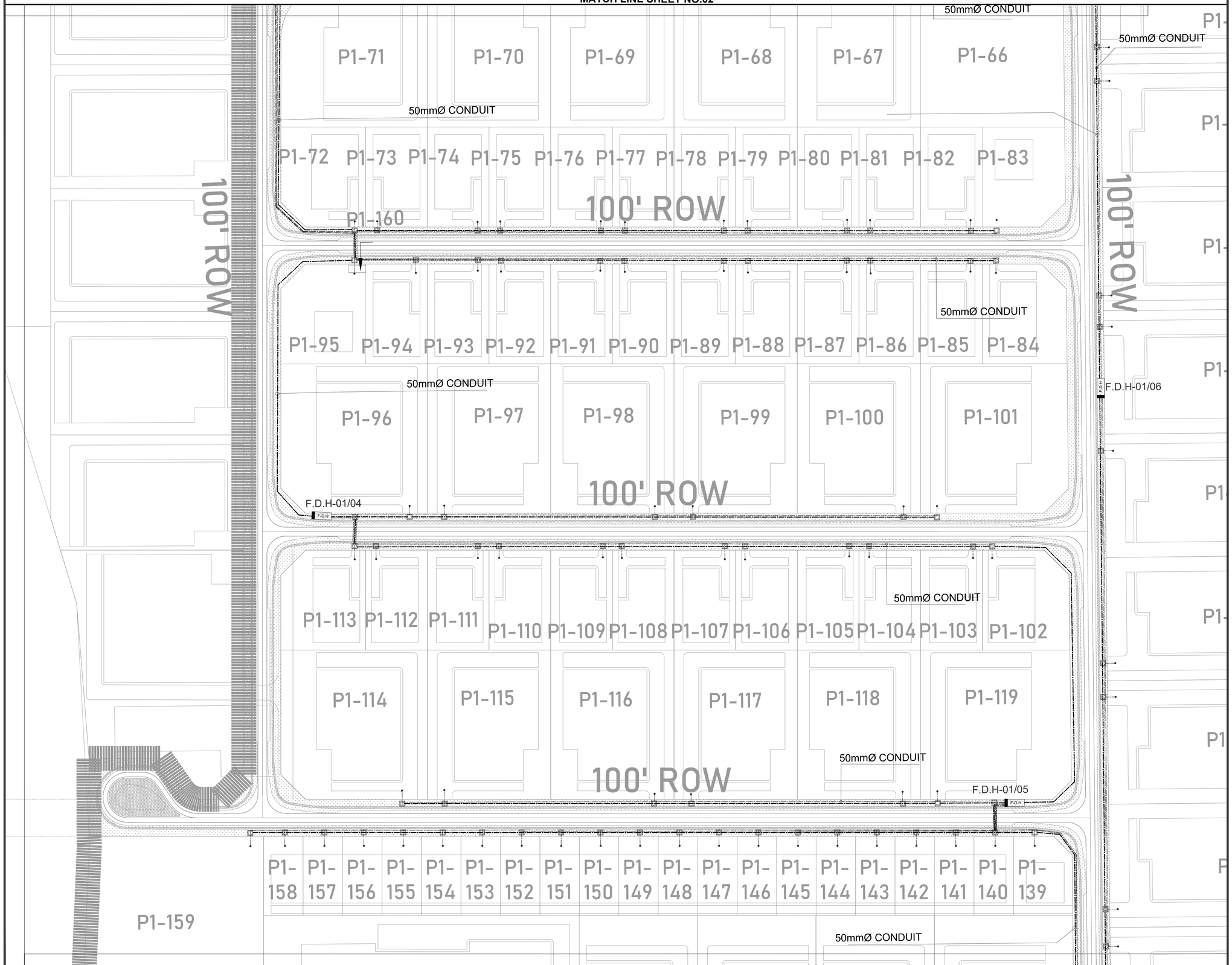
DRAWN	Z.N	SCALE	1 : 1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

MASTER PLAN (Sheet 2 of 4)
CCTV LAYOUT

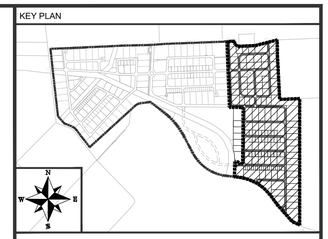
PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-IT-EL-0003	00

MATCH LINE SHEET NO.02



MATCH LINE SHEET NO.04

KEY PLAN



NOTES:

LEGEND:

LEGEND

SYMBOLS	DESCRIPTION
F.D.H	FEEDER DISTRIBUTION HUB
	8C-SINGLE MODE FIBER OPTIC CABLE
	2C-MULTIMODE FIBER OPTIC CABLE
	2x150mmØ uPVC ROAD CROSSING SLEEVES
	600mm(L) x 600mm(W) x 600mm(D) HANDHOLE

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

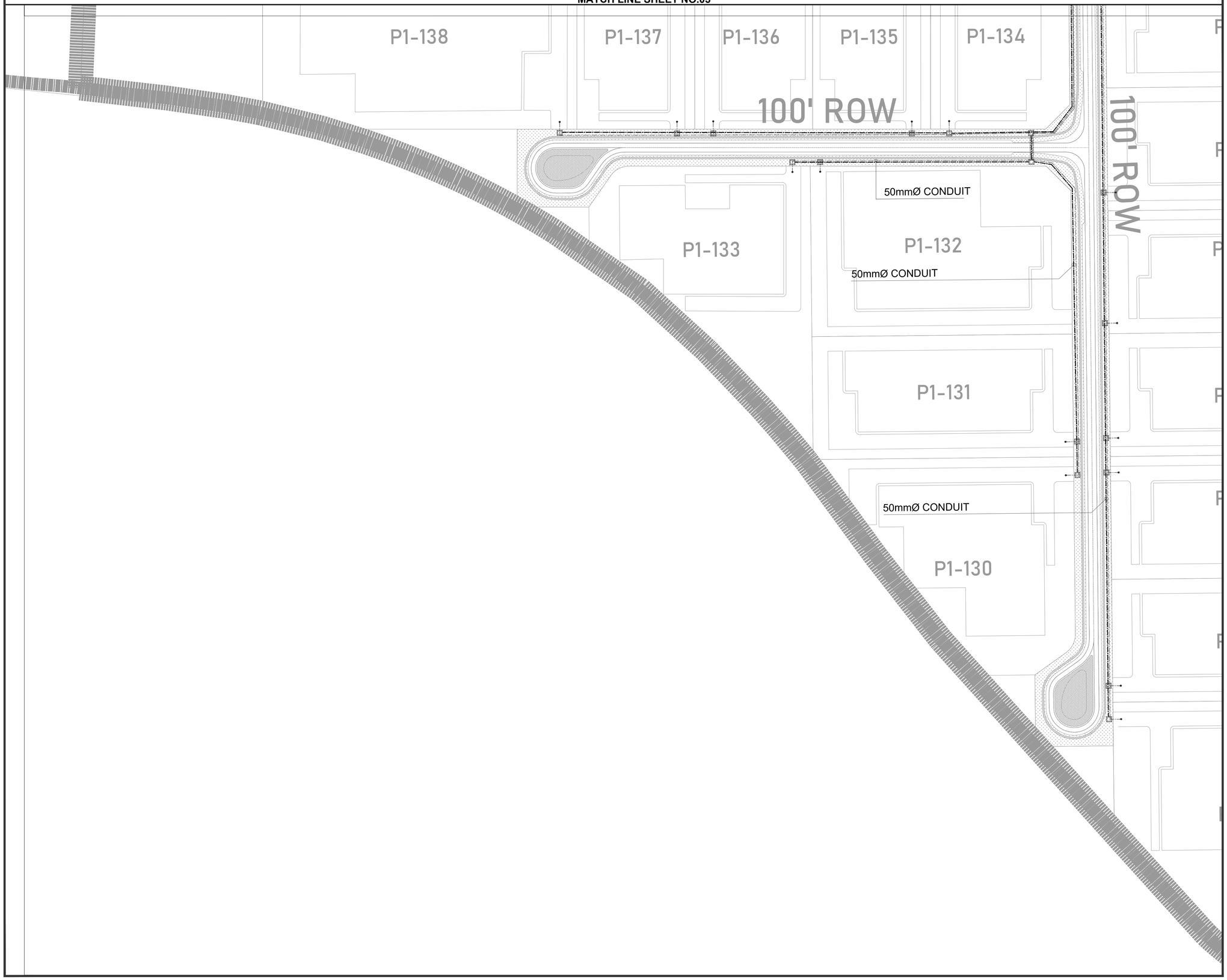
DRAWN	Z.N	SCALE	1 : 1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

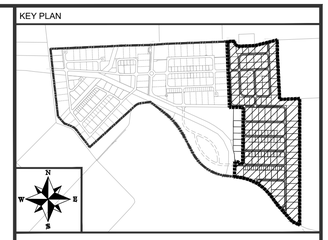
MASTER PLAN (Sheet 3 OF 4)
FO CABLE ROUTE LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-IT-EL-0004	00

MATCH LINE SHEET NO.03



KEY PLAN



NOTES:

LEGEND:

LEGEND

SYMBOLS	DESCRIPTION
FDH	FEEDER DISTRIBUTION HUB
	8C-SINGLE MODE FIBER OPTIC CABLE
	2C-MULTIMODE FIBER OPTIC CABLE
	2x150mmØ uPVC ROAD CROSSING SLEEVES
	600mm(L) x 600mm(W) x 600mm(D) HANDHOLE

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

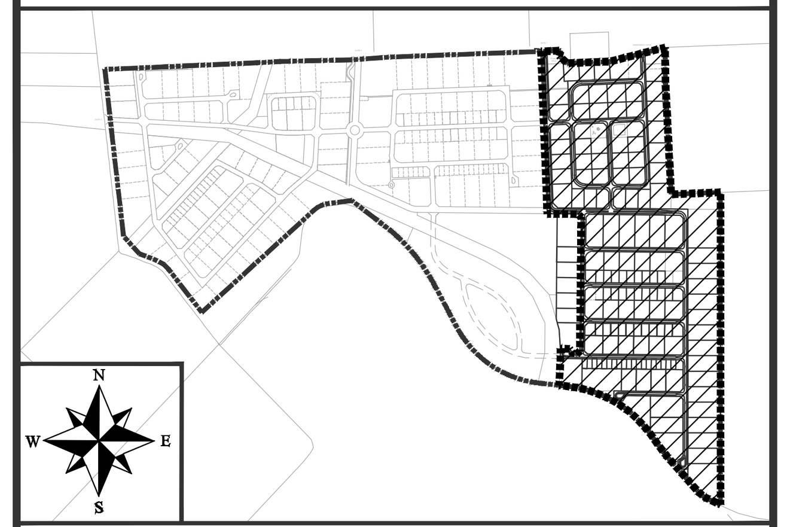
DRAWN	Z.N	SCALE	1 : 1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

MASTER PLAN (Sheet 4 OF 4)
FO CABLE ROUTE LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-IT-EL-0005	00

KEY PLAN



NOTES:

1. The drawing is for illustration purposes only. Contractor shall submit shop drawing with actual site coordination for approval.
2. The Plot boundaries, road alignment, road reserves, service reservations and all other dimensions and areas are subject to:
   - Further refinement during the detailed Infrastructure Planning stage
   - Approval from relevant authorities and services providers.
   - Final engineering survey by the contractor
3. All dimensions are in meters unless specified otherwise.
4. The RMUs (Ring Main Units) will be configured as a 3-way / 4-way unit as per KE specifications.
5. The RMU (Ring Main Unit) will be housed within a Kiosk. Refer to Detail "A" for specific enclosure details.
6. Contractor's Scope is till RMUs only. Further MV Cable and Transformer for the plot will be part of consumer.
7. The Contractor shall provide a 5-meter spare MV cable loop in front of each industrial plot for future power connections.
8. Subsequently, each individual plot owner (consumer) will bear the cost of establishing the electrical power connection to their plot. This includes, but not limited to, cable joints, switchgear/RMU, additional MV cable, substation or pole-mounted transformer (PMT), and any other requirements as per KE standards and the applied load.

LEGEND:

SYMBOLS	DESCRIPTION
● ● ● ●	17.5 kV, 4-WAY RING MAIN UNIT (RMU), OUTDOOR KIOSK TYPE, EXTENSIBLE TYPE.
◧	PAD MOUNTED UNIT, OUTDOOR, 11kV/0.415 kV, COMPACT TYPE WITH MV SWITCHGEAR, TRANSFORMER & LV COMPARTMENT.
—·—·—·—	3C-400 Sq.mm Al./XLPE/SWA/PVC 15kV MV Cable

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

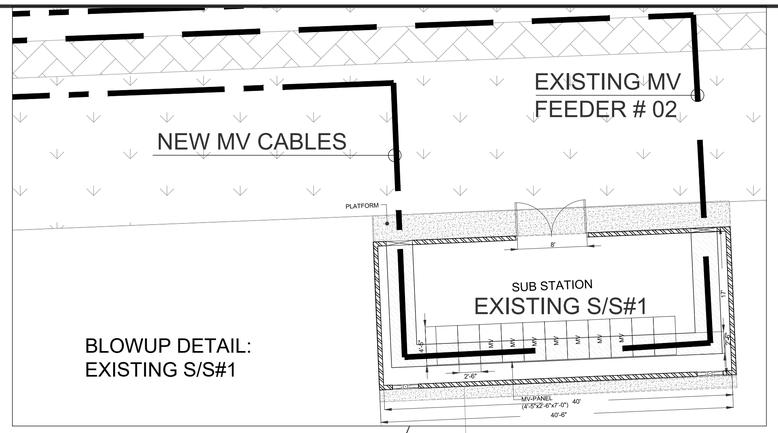
INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

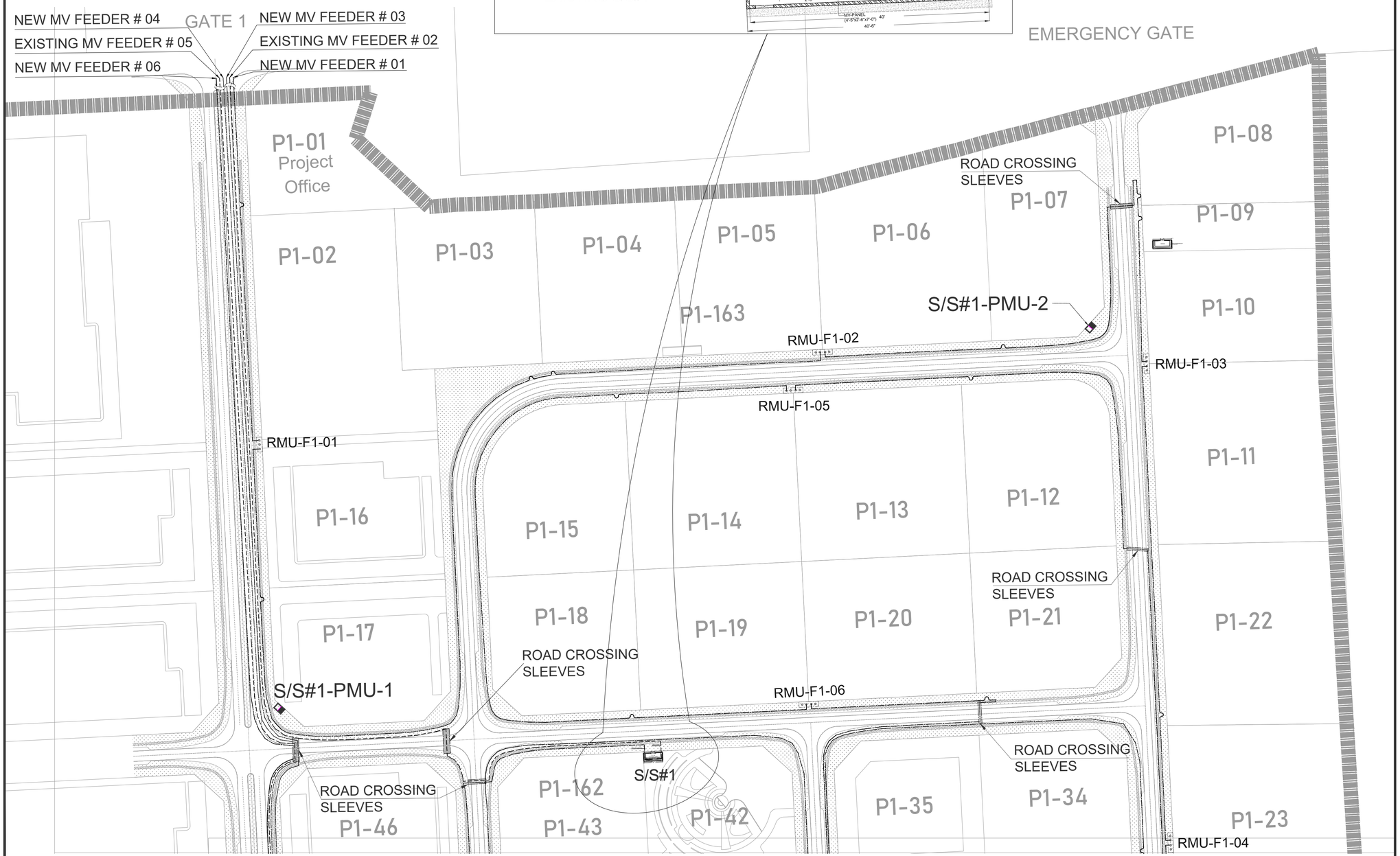
DRAWN	A.K	SCALE	1:1800
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

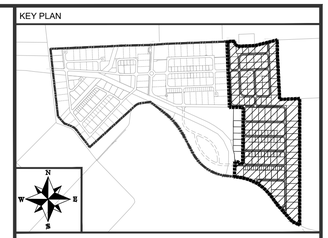
MASTER PLAN (OVERALL)
MV CABLE ROUTE LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-MV-EL-0001	00





KEY PLAN



NOTES:

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2. The Plot boundaries, road alignment, road reserves, service reservations and all other dimensions and areas are subject to:
   - Further refinement during the detailed Infrastructure Planning stage
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3. All dimensions are in meters unless specified otherwise.
4. The RMUs (Ring Main Units) will be configured as a 3-way / 4-way unit as per KE specifications.
5. The RMU (Ring Main Unit) will be housed within a Kiosk. Refer to Detail "A" for specific enclosure details.
6. Contractor's Scope is till RMUs only. Further MV Cable and Transformer for the plot will be part of consumer.
7. The Contractor shall provide a 5-meter spare MV cable loop in front of each industrial plot for future power connections.
8. Subsequently, each individual plot owner (consumer) will bear the cost of establishing the electrical power connection to their plot. This includes, but not limited to, cable joints, switchgear/RMU, additional MV cable, substation or pole-mounted transformer (PMT), and any other requirements as per KE standards and the applied load.

LEGEND:

SYMBOLS	DESCRIPTION
	17.5 kV, 4-WAY RING MAIN UNIT (RMU), OUTDOOR KIOSK TYPE, EXTENSIBLE TYPE.
	PAD MOUNTED UNIT, OUTDOOR, 11kV/0.415 kV, COMPACT TYPE WITH MV SWITCHGEAR, TRANSFORMER & LV COMPARTMENT.
	3C-400 Sq.mm Al./XLPE/SWA/PVC 15kV MV Cable

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm — JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

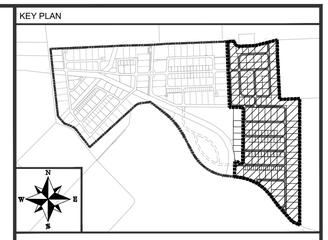
DRAWN	J.A	SCALE	1:1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

MASTER PLAN (Sheet 1 OF 4)
MV CABLE ROUTE LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-MV-EL-0002	00

KEY PLAN



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SYMBOLS	DESCRIPTION
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	PAD MOUNTED UNIT, OUTDOOR, 11kV/0.415 kV, COMPACT TYPE WITH MV SWITCHGEAR, TRANSFORMER & LV COMPARTMENT.
	3C-400 Sq.mm Al./XLPE/SWA/PVC 15kV MV Cable

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

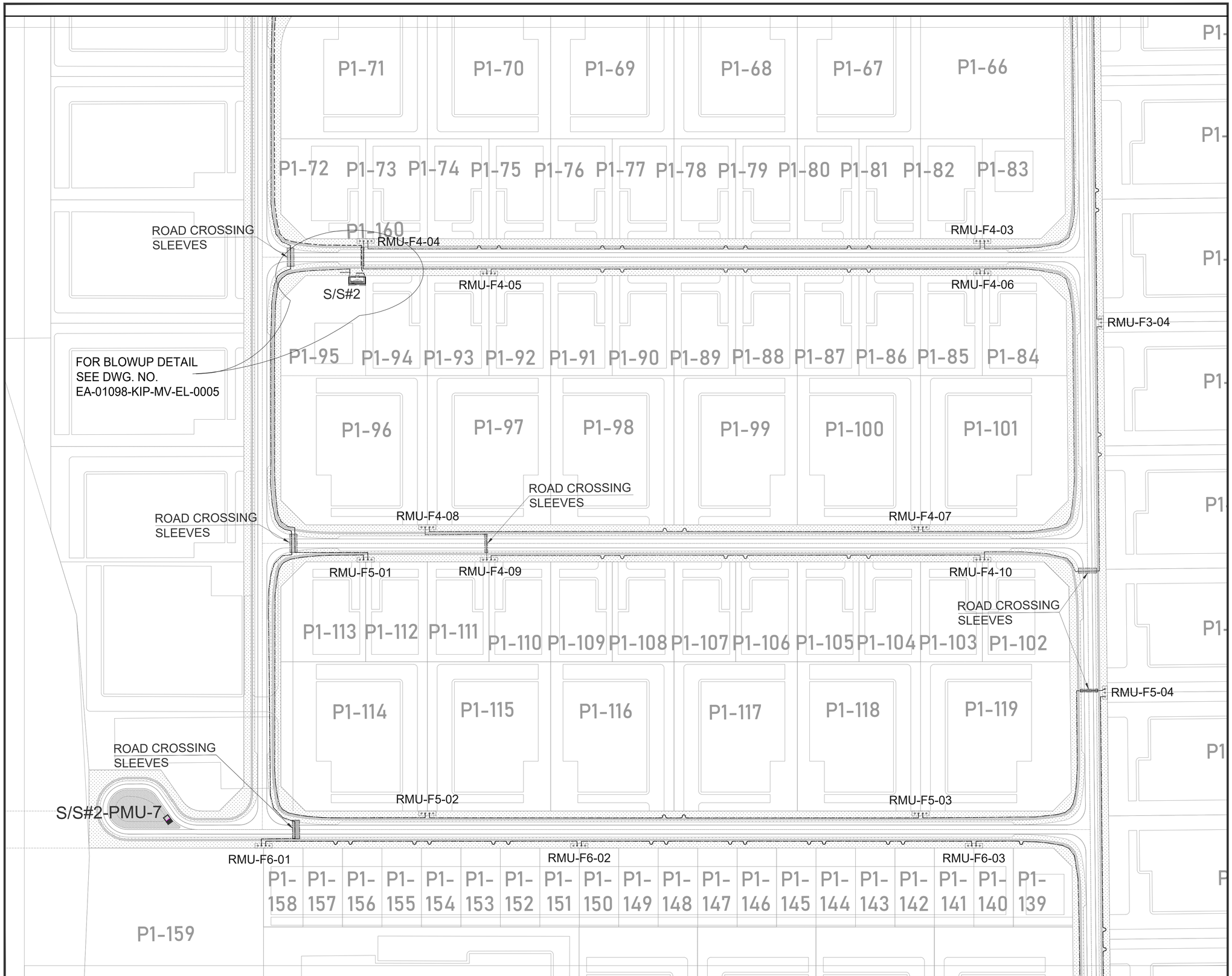
INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	J.A	SCALE	1:1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

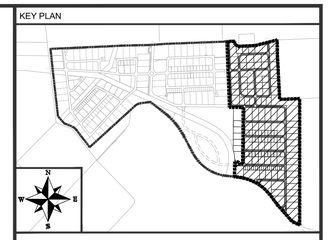
DRAWING TITLE:

MASTER PLAN (Sheet 2 OF 4)
MV CABLE ROUTE LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-MV-EL-0003	00



KEY PLAN



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LEGEND:

SYMBOLS	DESCRIPTION
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	PAD MOUNTED UNIT, OUTDOOR, 11kV/0.415 kV, COMPACT TYPE WITH MV SWITCHGEAR, TRANSFORMER & LV COMPARTMENT.
	3C-400 Sq.mm Al./XLPE/SWA/PVC 15kV MV Cable

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

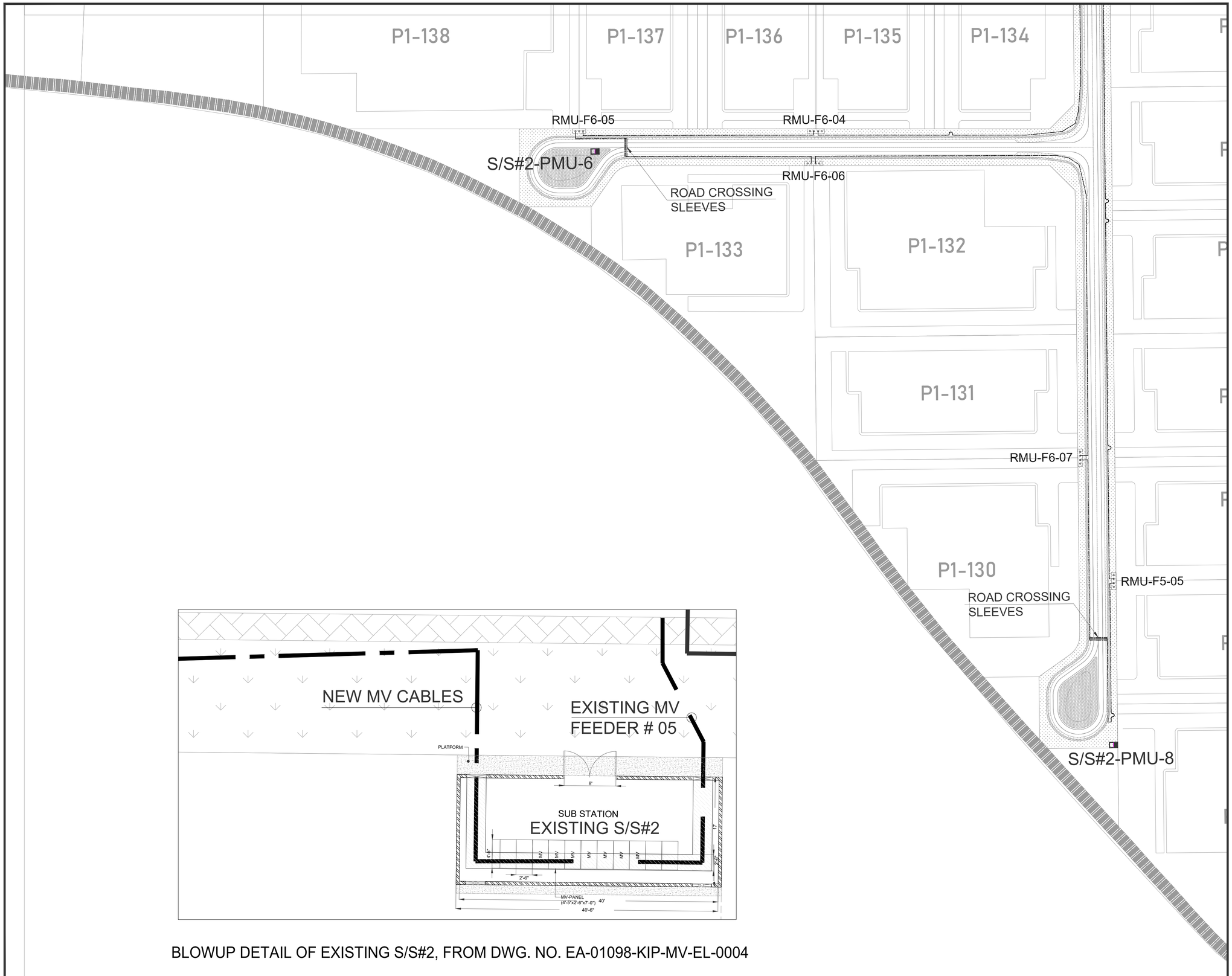
INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	J.A	SCALE	1:1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

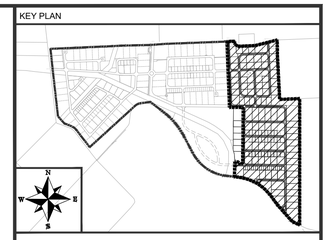
MASTER PLAN (Sheet 3 OF 4)
MV CABLE ROUTE LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-MV-EL-0004	00



BLOWUP DETAIL OF EXISTING S/S#2, FROM DWG. NO. EA-01098-KIP-MV-EL-0004

KEY PLAN



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	PAD MOUNTED UNIT, OUTDOOR, 11kV/0.415 kV, COMPACT TYPE WITH MV SWITCHGEAR, TRANSFORMER & LV COMPARTMENT.
————	3C-400 Sq.mm Al./XLPE/SWA/PVC 15kV MV Cable

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm — JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

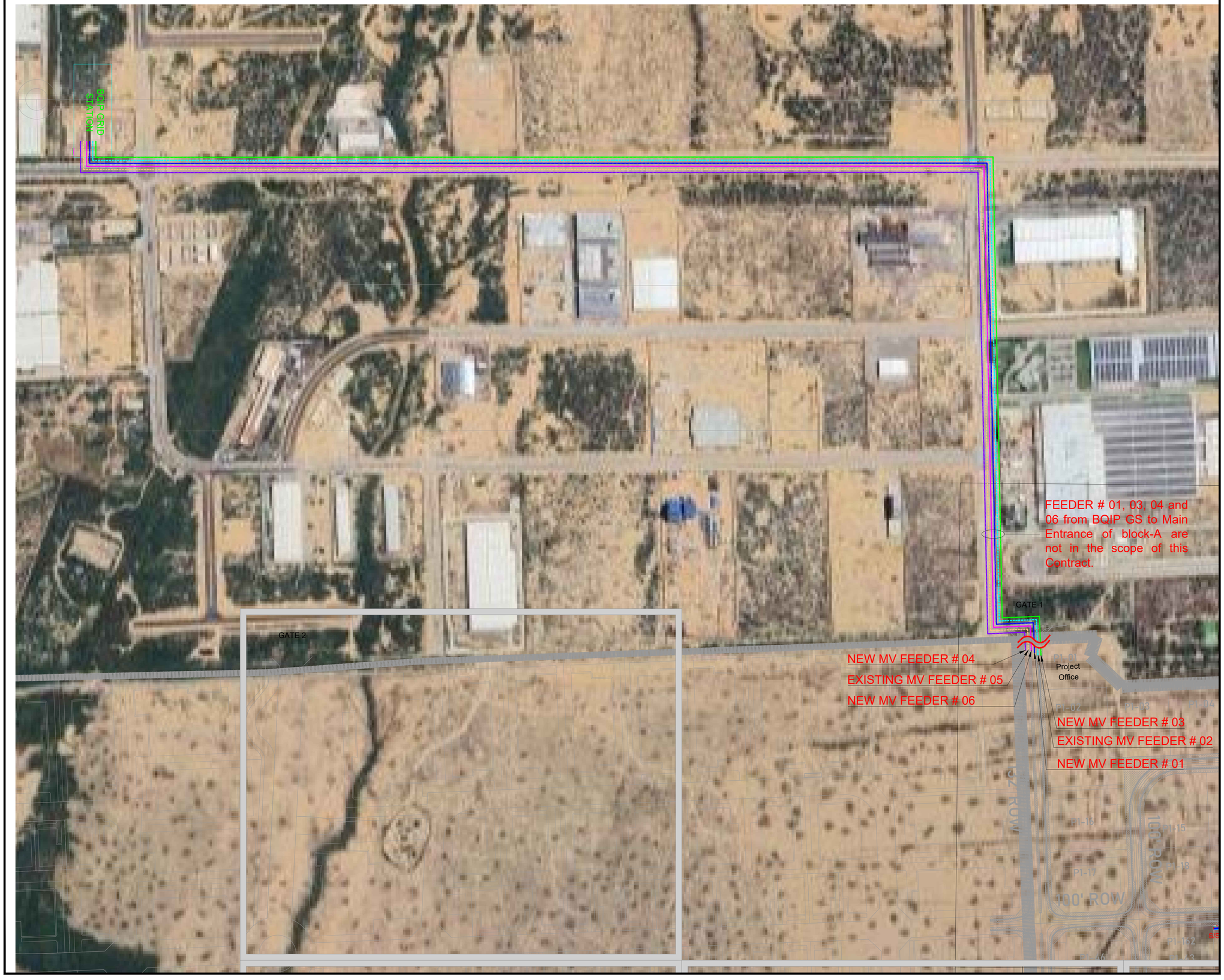
INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	J.A	SCALE	1:1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

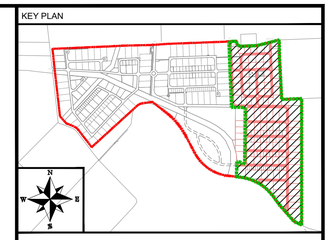
DRAWING TITLE:

MASTER PLAN (Sheet 4 OF 4)
MV CABLE ROUTE LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-MV-EL-0005	00



KEY PLAN



NOTE:
NOTES:

1. The Main Feeder Cable route shown beyond the project boundary is tentative and the contractor to conduct a detailed site survey for the cable route, identify obstacles, and assess alignment feasibility of all 11 kV Main feeder Cables ensuring compliance with project requirements and relevant standards.
2. Contractor to coordinate with the relevant grid station authorities to obtain necessary approvals for electrical power connections of the six (6) nos. 11 kV Main feeders, ensuring adherence to technical and safety regulations, submitting all required documentation, and following up until approvals are secured.
3. Contractor to coordinate with all concerned authorities to secure approvals for the proposed six (6) nos. 11 kV Main feeders cable route beyond the project boundary, obtain necessary permits before commencing works and execute to the satisfaction of Engineer in charge and all concerned authorities including reinstatement as required.
4. Contractor to prepare and submit shop drawings with complete routing details, trenching specifications, and cable laying methodology for engineer's approval.
5. Contractor to submit as-built drawings of all six (6) nos. 11 kV Main feeder cables for engineer's approval including proper records of all approvals for compliance and documentation.

LEGEND:

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
01	ISSUED FOR CONSTRUCTION	OCT, 2025
00	ISSUED FOR TENDER	JUN,2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

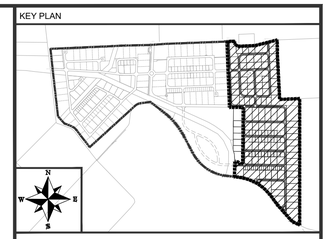
DRAWN	A.K	SCALE	1:1800
DESIGN	F.A	DATE	OCT, 2025
CHECKED	F.A	DESIGN STAGE	CONSTRUCTION
APPROVED	M.I.A	ISSUE	CONSTRUCTION
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

MASTER PLAN (OVERALL)
MV FEEDER CABLE ROUTE
TO BQIP GRID STATION

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-MV-EL-0006	01

KEY PLAN



NOTES:

LEGEND:

CCTV FIXED CAMERA (POLE MOUNTED) IP65

CCTV CONDUIT

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	Z.N	SCALE	N.T.S
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

MASTER PLAN (OVERALL)
CCTV LAYOUT SHEET INDEX PLAN

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-SC-EL-0001	00

GATE 1

EMERGENCY GATE

P1-01
Project
Office

P1-02

P1-03

P1-04

P1-05

P1-06

P1-07

P1-08

P1-09

P1-10

P1-11

P1-12

P1-13

P1-14

P1-15

P1-16

P1-17

P1-18

P1-19

P1-20

P1-21

P1-22

P1-23

P1-34

P1-35

P1-42

P1-43

P1-46

P1-162

P1-163

FIBER OPTIC CABLE FOR CCTV
IN 50MMØ CONDUIT

FIBER OPTIC CABLE FOR CCTV
IN 50MMØ CONDUIT

FIBER OPTIC CABLE FOR CCTV
IN 50MMØ CONDUIT

100' ROW

100' ROW

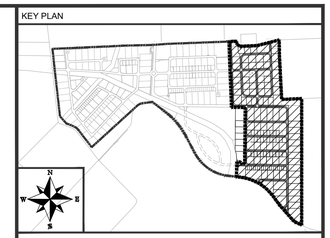
100' ROW

100' ROW

132' ROW

MATCH LINE SHEET NO.02

KEY PLAN



NOTES:

LEGEND:

CCTV FIXED CAMERA (POLE MOUNTED) IP65

CCTV CONDUIT

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

PIDC

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	Z.N	SCALE	1 : 1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

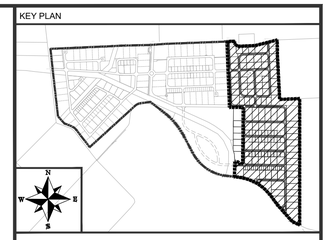
MASTER PLAN (Sheet 1 of 4)
CCTV LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-SC-EL-0002	00

MATCH LINE SHEET NO.01

MATCH LINE SHEET NO.03

KEY PLAN



NOTES:

LEGEND:

CCTV FIXED CAMERA (POLE MOUNTED) IP65

CCTV CONDUIT

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	Z.N	SCALE	1 : 1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

MASTER PLAN (Sheet 2 of 4)
CCTV LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-SC-EL-0003	00

MATCH LINE SHEET NO.02

P1-71 P1-70 P1-69 P1-68 P1-67 P1-66

P1-72 P1-73 P1-74 P1-75 P1-76 P1-77 P1-78 P1-79 P1-80 P1-81 P1-82 P1-83

100' ROW

FIBER OPTIC CABLE FOR CCTV
IN 50MMØ CONDUIT

P1-160

100' ROW

100' ROW

P1-95 P1-94 P1-93 P1-92 P1-91 P1-90 P1-89 P1-88 P1-87 P1-86 P1-85 P1-84

P1-96 P1-97 P1-98 P1-99 P1-100 P1-101

FIBER OPTIC CABLE FOR CCTV
IN 50MMØ CONDUIT

100' ROW

FIBER OPTIC CABLE
FOR CCTV
IN 50MMØ CONDUIT

P1-61 P1-62 P1-63 P1-64 P1-6

FIBER OPTIC CABLE FOR CCTV
IN 50MMØ CONDUIT

P1-113 P1-112 P1-111 P1-110 P1-109 P1-108 P1-107 P1-106 P1-105 P1-104 P1-103 P1-102

P1-114 P1-115 P1-116 P1-117 P1-118 P1-119

FIBER OPTIC CABLE FOR CCTV
IN 50MMØ CONDUIT

100' ROW

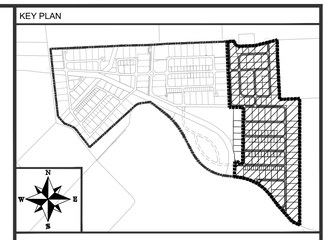
P1-12 P1-12 P1-

P1-158 P1-157 P1-156 P1-155 P1-154 P1-153 P1-152 P1-151 P1-150 P1-149 P1-148 P1-147 P1-146 P1-145 P1-144 P1-143 P1-142 P1-141 P1-140 P1-139

P1-159

MATCH LINE SHEET NO.04

KEY PLAN



NOTES:

LEGEND:

CCTV FIXED CAMERA (POLE MOUNTED) IP65

CCTV CONDUIT

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

PIDC

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	Z.N	SCALE	1 : 1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

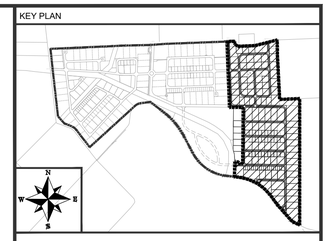
DRAWING TITLE:

MASTER PLAN (Sheet 3 of 4)
CCTV LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-SC-EL-0004	00

MATCH LINE SHEET NO.03

KEY PLAN



NOTES:

LEGEND:

CCTV FIXED CAMERA (POLE MOUNTED) IP65

CCTV CONDUIT

CLIENT:

PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION (PIDC)

Lead Firm

JV-Team

REV.	DESCRIPTION	DATE
00	ISSUED FOR TENDER	NOV, 2025

PROJECT:

INTERNAL ELECTRICAL DISTRIBUTION SYSTEM & ALLIED WORKS OF BLOCK-A ON 500 ACRES LAND OF PHASE-I (1500 ACRES) OF KARACHI INDUSTRIAL PARK (FEDERAL SEZ) PACKAGE-II

DRAWN	Z.N	SCALE	1 : 1200
DESIGN	F.A	DATE	NOV, 2025
CHECKED	F.A	DESIGN STAGE	TENDER
APPROVED	S.M.I	ISSUE	TENDER
ACTUAL SHEET SIZE			A1

DRAWING TITLE:

MASTER PLAN (Sheet 4 of 4)
CCTV LAYOUT

PROJ CODE	DRAWING NO.	REV.
01098	EA-01098-KIP-SC-EL-0005	00