NATIONAL INSTITUTE OF PUBLIC ADMINISTRATION KARACHI

STANDARD BID DOCUMENT

DESIGN, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF GRID TIED 150 KWP (BUILDING 1- CAR PARKING AREA) + 100 KWP (BUILDING 2- ROOF-TOP), SOLAR POWER SYSTEM AT NIPA KARACHI

Tender # **Works/Solar/2025/I**

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INVITATION TO BID

The National Institute of Public Administration, Karachi, a constituent unit of the National School of Public Policy, Government of Pakistan, invites electronic bids from original manufacturers, authorized distributors, suppliers, contractors, and service providers registered with the Income Tax and Sales Tax Departments for the "**DESIGN, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF GRID TIED 150 KWP (BUILDING 1- CAR PARKING AREA) + 100 KWP (BUILDING 2- ROOF-TOP), SOLAR POWER SYSTEM AT NIPA KARACHI.**".

1. Bidding Documents

E-bidding documents containing detailed terms and conditions, specifications, and requirements are available for registered bidders on the EPADS portal (www.eprocure.gov.pk).

2. Submission of Bids

Electronic bids must be submitted using EPADS on or before 02.06.2025 at 11:00 AM. Manual bids will not be accepted. Electronic bids will be opened on the same day at 11:30 AM.

Note: Notification of the Grievance Redressal Committee (GRC) constituted under Rule-48 of PPRA Rules, 2004, is available on EPADS (www.eprocure.gov.pk) and on the NIPA Karachi website.

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TERMS AND CONDITIONS

National Institute of Public Administration, Karachi *(hereinafter referred to as "NIPA Karachi" or Client'')* invites bids from eligible and experienced income tax/ sales tax/ PRA registered sole proprietor / firms / companies/ authorized distributor/ supplier *(hereinafter referred to as "Bidder'')* for Design, Supply, Installation, Testing & Commissioning of Grid Tied 150 kWp (Building 1- Car Parking Area) + 100 kWp (Building 2- Roof-Top), Solar Power System At Nipa Karachi for its office located at University Road, Block-11 Gulshan-e-Iqbal, Karachi, as per Annex-A *(hereinafter referred to as "goods'').*

Public Procurement Rules, 2004 will be strictly followed, these may be obtained from PPRA website https://ppra.org.pk/.

In this document, unless otherwise mentioned to the contrary, *"Rule" means a Rule* under the Public Procurement Rules, 2004.

PROJECT OUTLINE

The **National Institute of Public Administration (NIPA), Karachi**, is one of Pakistan's most prestigious public sector training institutions, dedicated to enhancing the capacity of civil servants through quality training, research, and collaborative learning. As part of its commitment to sustainable development and energy efficiency, NIPA is undertaking a comprehensive solarization initiative. The project includes the installation of a **150 kWp on-grid solar PV system mounted on an elevated and single pole parking steel structure**, and **100 kWp on-grid solar PV system installed on rooftop areas**. We will call 150kWp as Building 1 and 100kWp as Building 2. This hybrid deployment is designed to optimize space utilization while significantly reducing the institute's reliance on conventional energy sources, contributing to environmental sustainability and operational cost savings. The location of both buildings (Building 1 and Building 2) is shown in Fig. 1. Building 1 has 5 parts and Building 2 has 4 parts, where solar panels could be installed. In Building 1, part e building is optional, if we will not be able to install 150kWp.

Figure 1: Top view and location of the project - NIPA

The available maximum area of both buildings are shown in Figure 2 and Figure 3 respectively. In Building 1, elevated system is around 102-105kw and single pole parking is around 45-48kw. Please note that the net effective area will be less because of some shading effects, the successful bidder needs to submit the design showing the solar panels and the yearly yield.

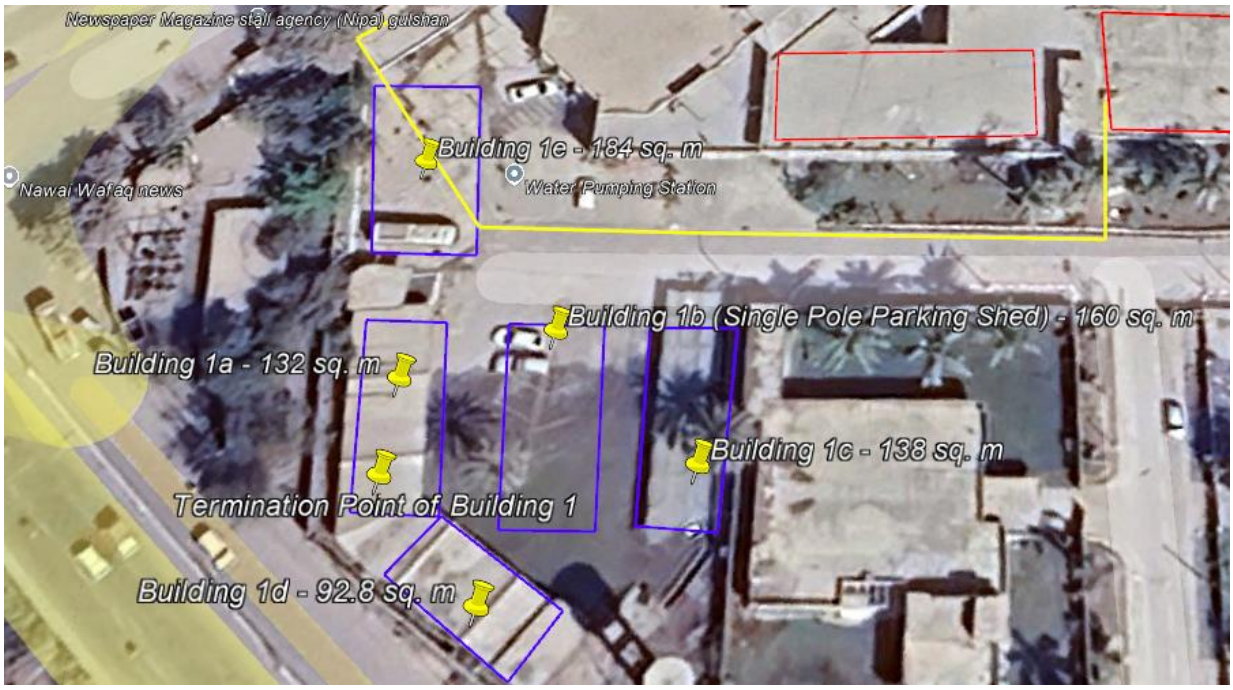

Figure 2: Building 1 Details

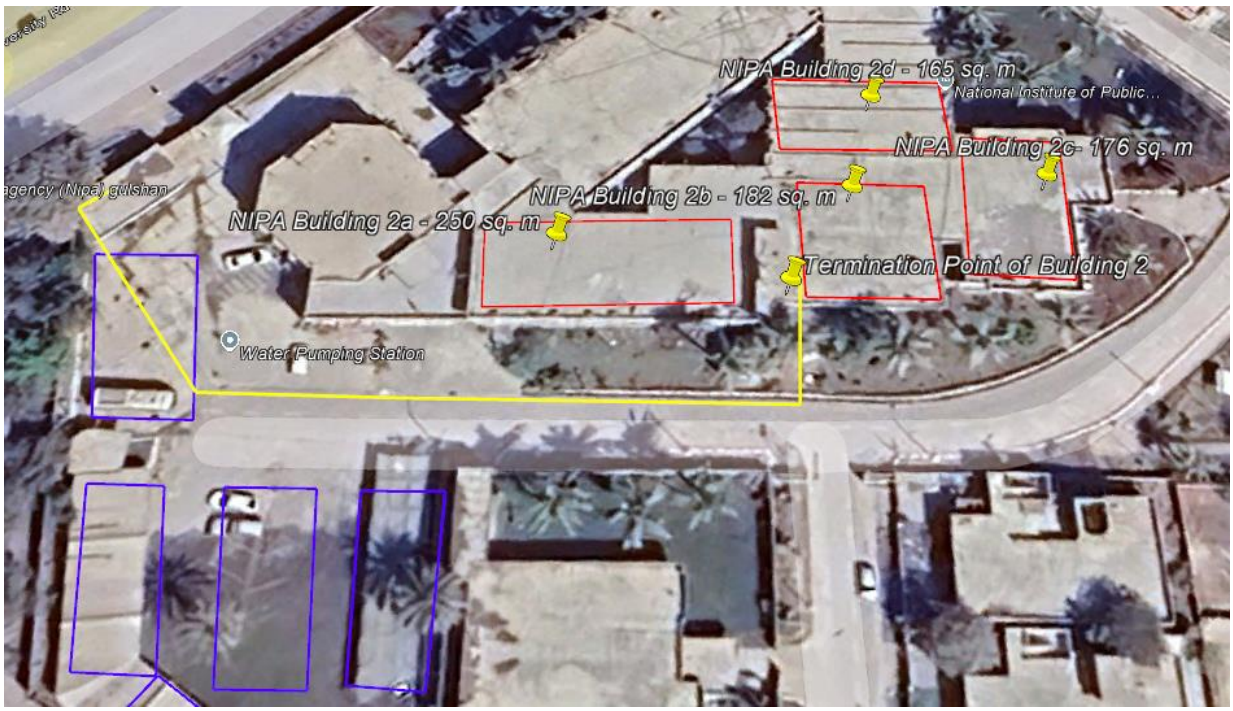

Figure 3: Building 2 Details

The termination point of building 1 and building 2 is shown in Figure 4. Here this is to be noticed that a 120 sq. mm cable need to be laid from the substation to the building 2, the current cable is quite weak for 100kW solar system. Additional circuit breakers needs to be added at both ends of the line. All the excavation and backfilling needs to be done by the successful bidder.

Figure 4: Termination Point of Both Buildings and Additional Cable Details

1.0 GENERAL:

1.1 Any offer not received as per terms & conditions of the tender enquiry is liable to be ignored. No offer shall be considered if:

a. received without bid security
b. received after the time and date fixed for its receipt
c. the offer is ambiguous
d. the offer is incomplete
e. the offer is received by fax or e-mail
f. the offer is from a black listed firm
g. offer received with shorter validity than required
h. the offer is not conforming to the specifications mentioned in the tender document
i. there is any conditional offer
j. bids not compliant with any of the terms and conditions listed in the tender document will be liable to be rejected.

1.2 Bid will remain valid for a period of 120 days from the date of opening the tender. All the prices will be quoted in Pak Rupees (inclusive of all applicable taxes) and no change in price will be made in any case. No additional amount over and above the quoted price will be paid.

1.3 Technical and Financial Proposals will be opened online on EPADS (eprocure.gov.pk)

1.4 Purchase Order(s) will be issued in favour of technically responsive "most advantageous bid" evaluated as per details laid down at Annex-A after the approval of the competent authority.

1.5 NIPA Karachi may increase or decrease the ordered quantities under Public Procurement Rules, 2004.

1.6 NIPA Karachi has the right to ask for demonstration of the equipment/material quoted by the vendor.

2.0 TIME PERIOD

Requisite items are required to be delivered/installed within 25 days after issuance of Purchase Order.

3.0 EXTENSION OF DELIVERY/INSTALLATION PERIOD:

In special circumstances, request for extension of delivery period may be considered by the competent authority on the written request of the firm before the target date, which will be authorized to either accept or reject as per bid rejection clause 33(1), of PPRA, 2004 rules.

4.0 PENALTY OF DELAY / CANCELLATION:

4.1. The goods will be inspected by the NIPA Karachi through authorized committee/personnel and will be rejected if not found according to the given specifications as mentioned at Annex- A.

4.2. If the bidder fails / delays in performance of any of the obligations, under the contract / violates any of the provisions of the contract / commits breach of any of the terms and conditions of the contract the purchaser may, without prejudice to any other right of action / remedy it may have, deduct from the

contract price against undelivered portion, as liquidated damages, a sum of money @0.25% of the total contract price which is attributable to such part of the goods / the services / the works, in consequence of the failure/delay, be put to the intended use, for every day between the scheduled delivery date(s), with any extension of time thereof granted by the purchaser, and the actual delivery date(s). Provided that the amount so deducted shall not exceed, in the aggregate 10% of the Contract Price.

5.0 PAYMENT TO THE SUPPLIER

5.1. Payment will be made through treasury cheque to the bidder against invoice after 100% completion of delivery, installation and inspection by the authorized person/committee etc.

5.2. No payment will be made as advance.

5.3. Payment against partial delivery will not be made.

6.0 BID SECURITY

6.1. Bid security (Earnest money) @ 3% of estimated cost (i.e. the estimated of total quoted bid price) shall have to be attached along with (Financial Proposal) of the bidding document. It should be in the form of Pay Order / Bank Draft/CDR from a scheduled bank in favor of Director General, NIPA Karachi.

6.2. Bid security of unsuccessful bidders shall be returned on the finalization of the tender whereas the bid security of successful bidder shall be returned upon submission of Performance Guarantee.

6.3. The bid security shall be forfeited if

6.3.1. The offer is withdrawn, amended or revised after submission time.

6.3.2. The bidder fails to execute the contract strictly in accordance with terms and conditions of tender document

7.0 DEDUCTION OF TAXES

All the applicable taxes will be deducted while making payment as per Government Rules Instructions/ Notifications. Bidder will be responsible for the payment of duties, levies and clearance from customs authorities etc. Any exemption from any taxes are to be substantiated with applicable policy document/tax rules/SRO etc.

8.0 DISPUTE

Any dispute will be settled by following the procedure prescribed by PPRA, 2004 Rule 48.

9.0 ELIGIBILITY CRITERIA:

Category	Description	Document
Legal (Mandatory)	Valid Income Tax Registration (Status = Active with FBR)	Required
	Valid General Sales Tax Registration (Status = Active with FBR/SBR)	Required
	Valid Registration of Pakistan Engineering Council (PEC)	Required
	Active Certification with AEDB for Category ARE-V2 (Certification of Vendors/Installers/Service Providers for of On-Grid, Off-grid and hybrid Wind and Solar PV Installations up to 250 KW capacity under the recent List of Certified Companies under AEDB/PPIB Certification Regulation 2018)	Required
	Single Undertaking covering following aspects: i. Submission of undertaking that the firm is not blacklisted by any of Provincial or Federal Government Department anywhere in Pakistan. ii. In full compliance of the Execution Schedule and Delivery Period mentioned in tender document. a. Compliance to the technical specifications of "DESIGN, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF GRID TIED 150 KWP (BUILDING 1- CAR PARKING AREA) + 100 KWP (BUILDING 2- ROOF-TOP), SOLAR POWER SYSTEM AT NIPA KARACHI" (including all items) to be done mentioned vide Annex-A of this document. b. Product technical brochure(s) of specific make and model being offered with clear specifications must be enclosed with the bid (where applicable).	Required

Table 1: Eligibility Criteria (Checklist)

No.	Eligibility Criteria	Yes	No	Attach Evidence
1.	Active Certification with AEDB/PPIB for Category ARE-V2 (Certification of Vendors/Installers/Service Providers for of On-Grid, Off-grid and hybrid Wind and Solar PV Installations up to 250 KW capacity under the recent List of Certified Companies under AEDB/PPIB Certification Regulation 2018).			
2.	The bidder should have at least three years' experience in design/ manufacture/ supply/ Installation or commissioning on-grid solar solutions in Pakistan and must have required licenses by regulatory			

	authorities including AEDB and K Electric for the work			
3.	Details of turn-over (Including in terms of Rupees) of at least last three years that Average turn-over of at least last three years should not be less than Rs 15 Million per annum, as per online annual returns submitted to FBR.			
4.	List of Similar Projects completed with Documentary Proof. (Work Order and Completion Certificate)			
5.	Affidavit upon original stamp paper that the firm has never been black listed, not involved in any litigation with any government, Semi-Government & Autonomous Body.			
6.	Valid Registration of the firm with tax authorities FBR, GST and SRB with proof of company in active tax payer list. Professional Tax paid & copy of CNIC along-with company registration. Further eligibility is mentioned in the bidding documents.			
7.	Bid Security @ 3% of total Bid Price			

Note: Bidders must fill-up above mentioned checklist / table and attach copies of required documents with proper annex along with tender document.
Submission of all above documents is mandatory.

10.0TECHNICAL PROPOSAL EVALUATION & CRITERIA

A. Profile

- Company Profile showing Financial Strength and turn over for last 03 years
- No of years company is serving in the filed
- Locations / Address of Company Offices in all over Pakistan

B. Experience

- Documents / Certificates showing complete past Projects.
- Documents / Certificates of completion of similar nature of Projects from Clients

C. Technical Staff

- List of Technical / Engineering Staff, Supporting Staff etc.
- List of personnel / staff having specialization in relevant filed.

Table 2: Technical Evaluation

No.	Technical Categories	Units	Please Enter Response	Technical Score	Instructions
1.	Number of Solar System Installation and Commissioning Projects greater or equal to 150 KW since 1st June 2022 (in private / Government sector)	Number		25	Attach work order (with annexures marked and indicated)
2.	Cumulative Capacity of installed Solar Systems since 1st June 2022 (in private / Government sector)	Number		25	Attach work order (with annexures marked and indicated)
3.	Number of PEC registered engineers / technical Staff/ Site supervisor and their experience(s)	Number		10	Attach a summary with their details
4.	Number of technical trainings (related with solar system or their integration) received by the registered engineers/staff in last three years i.e. from 1st June 2022.	Number		10	Attach a summary with their details
5.	Number of projects with net metering involved since 1st June 2022 anywhere in Pakistan.	Number		20	Attach work order (with annexures marked and indicated)

6.	Financial Health (Revenue) in last three years.	PKR		10	Attach audited/signed statements for last 3 years
			Total Technical Score	**100**	**40% weightage in Grand Scores**

Note: Bidders must fill-up above mentioned checklist / table and attach copies of required documents with proper annex along with tender document.
Submission of all above documents is mandatory.

Note that in each technical category, the best response will get full score for that category, and the other responses will get proportional scores.

Technical evaluation criteria are as under:

a. The bids scoring less than 70% marks in the Technical Evaluation will be rejected and their financial bid envelope will be returned unopened.
b. Relative marking will be carried out for technical evaluation. Bidder 'X' submitting the higher evidence in each category will get full mark (in that particular category), and other bidders will get the relative mark accordingly (in that particular category).
c. The final score of technical bids will be added to the financial score and final award of contract decision will be based on total of technical score plus financial score.

11.0 FINANCIAL EVALUATION CRITERIA

11.1. The Financial Bids of the technically responsive bidders only will be opened online on EPADS (eprocure.gov.pk).

Table 3: Financial Data

No.	Financial Data	Units	Please enter Response	Financial Score	Instructions
1.	Bid Cost of the project.	PKR		80	
2.	LCOE, calculated for 25 years warranty period	PKR per kWh		20	
			Total Financial Score	100	**60% weightage in Grand Scores**

Note that in each financial category, the best response will get full score for that category, and the other responses will get proportional scores.

Note: Bidders must fill-up above mentioned checklist / table and attach copies of required documents with proper annex along with tender document.
Submission of all above documents is mandatory.

12.0 EVALUATION OF PROPOSAL AND SELECTION

12.1. Most advantageous bid in terms of "value for money" based on quality, timeliness, reliability, after sales service, up-grade ability, price, source, and after-sales the combination of whole-life cost shall be accepted.

12.2. Final assignment award will be on the basis of combined technical and financial score in the following manner:

Proposal	Weightage
Technical	40%
Financial	60%
Total	100%

Table 4: Grand Score

No.	Grand Score	Scores of 100	Weight	Weighted Score
1.	Technical Score		40%	
2.	Financial Score		60%	
			Grand Total Score	

13.0 BID / TENDER OPENING PROCEDURE:

As per Public Procurement Rules 2004, single stage two envelope bidding procedure shall be adopted online through EPADS (eprocure.gov.pk).

13.1 The bid shall comprise the financial proposal and the technical proposals separately.

13.2 The electronic bids, must be submitted by using EPADS on or before 02nd June 2025 at 11:00am. Electronic Bids will be opened on the same day at 11:30am.

13.3 Manual bids, shall not be accepted.

13.4 In case the last date of submission of bid coincide with any holiday or with unforeseen event, the last date for submission of the bids shall be the next working/normal day.

13.5 Initially, only "**TECHNICAL PROPOSAL**" shall be opened;

13.6 The technical proposal shall be evaluated in a manner prescribed in bidding documents. Proposal is liable to be rejected if it does not conform to the specified requirements / specifications. Any proposal (technical) having any reference to the price is also liable to be rejected.

13.7 During the technical evaluation no amendments in the technical proposal shall be permitted;

13.8 The **FINANCIAL PROPOSALS** of bids meeting the technical specifications shall be opened on EPADS on 03rd June.2025. However, NIPA Karachi

reserves the right to change the date of opening the financial bids if required. Any such change will be communicated to the bidders accordingly.

14.0 PERFORMANCE GUARANTEE

A provisional Offer Letter will be issued in favour of the successful bidder(s). Performance guarantee against **O&M period** of the item (Service, Parts & Labour) in the shape of bank guarantee from any scheduled bank or Pay Order equivalent to **5**% of the total purchase order(s) amount will have to be furnished within 7 days of receipt of Provisional Offer Letter along with acceptance of the offer. The bank guarantee will be furnished as per the format attached at Annex-C. Issuance of purchase order is subject to the submission of bank guarantee. In case the bank guarantee is not furnished within the stipulated time period the bid will be rejected and Provisional Offer Letter will be issued in favour of next in line bidder. Performance guarantee will be returned after successful completion of the warranty period.

Deputy Director (A&F)
National Institute of Public Administration,
Karachi.

SPECIFICATIONS AND DETAIL OF WORK

DESIGN, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF GRID TIED 150 KWP (BUILDING 1- CAR PARKING AREA) + 100 KWP (BUILDING 2- ROOF-TOP), SOLAR POWER SYSTEM AT NIPA KARACHI	
S. No.	**Scope of Work**
	a. This is required to install 250kW grid tied solar system with the provision of Net metering, smart energy meter, Weather Monitoring Station (WMS) showing solar irradiation sensor, ambient temperature sensor and wind speed monitor with necessary data logger and all necessary equipment protection. b. This is necessary that the successful bidder will provide the testing report of solar panels, covering STC test, Electroluminescence test, thermal imaging of the whole plant from the PV Testing lab (NED University) Karachi. All the cost of the testing will be borne by the successful bidder. c. M/s. NIPA reserve the rights to check the quality of solar panel at the site for verification of no major cracks on solar panel. d. Roof-top solar PV array shall be installed using fixed PV array support structure, the tilt angle will be based on the condition that there should be less shading and no-solar panel could be visible from the ground. The beauty of the building must be maintained. e. Earth pits are required at sufficient distance with earth resistance value equal to or below 1 ohm. f. For elevated solar structure, this is required to have two separate earth pits at two far ends, with earth resistance value equal to or below 1 ohm. Ensure each & every piece of the structure must be properly bonder and connected to the earth pit by means of branch main connection of earth continuity conductors. The two earth pits will also cover the solar panel structure earthing. g. For elevated structure, two earth pits are required for DC system + Elevated structure, one earth pit for AC system and one earth pit for the lighting arrestor. h. For roof-top system, one earth pit is required for DC system, one earth pit for AC system and one earth pit for the lighting arrestor. i. Ensure each & every piece of electrical equipment & apparatus shall be connected to the main earth bus by means of branch main connection of earth continuity conductors. j. Ensure all electrical equipment will be provided with an earth terminal at two ends, if one of the connection is broken there should be an alternative route. k. The inverter shall be installed in the control room as per site requirement. The necessary civil work including isolation of the room, paint, air-conditioning, ventilation is a part of this scope for the bidder. The DC and AC distribution boxes, DC and AC cabling, energy meters and data acquisition system shall be installed accordingly. l. Enough space in between the panel arrays and in between panel and wall should be left for moving and cleaning the solar panels.

	m. Desktop and/or mobile app monitoring system showing inverter and WMS parameter needs to be provided. Overall application must be capable of calculating daily, monthly and yearly yield. n. Inverters will be installed at LT control room and the net metering will be done at the substation. o. For solar panels and inverter, contractor must provide flash test report, CoC and PSI report with stamp from the importer and the contractor. Along with all shipping documents and flash test report, this is required that the serial number of panels could be verified from online database of the parent company. p. For solar panels and inverter, the contractor must supply warranty from the importer on their letter head. If the product is local (e.g. inverter), the contractor must supply warranty from the local supplier on their letter head. **q.** The bidder has to provide the details of any additional works (not covered above), but NECESSARY for the functioning of the system. The additional cost will be provided. However, the works of minor nature, which are not mentioned, shall be incorporated by the bidder.
S. No.	**Photovoltaic Solar System**
	The system is designed to cover the Essential loads in NIPA Karachi. a. The system will be grid interactive connected which will allow many power sources options. The system will import from the grid when loads are being more than the generated from PV and supply surplus electricity to the grid when PV generates more than the loads. b. Contractor shall submit shop drawings for all civil, electrical and a complete photovoltaic solar system works, including a single line diagram showing all the components of the PV system, DC & AC distribution boards, PV Arrays layout, connections and cables, wire cross section for all the system to be approved by the Engineer before executing the work. c. The contractor shall submit the catalogues of each component showing the requested specifications stated at the bill of quantity. d. The contractor shall submit the Manufacture testing certificate, country of origin, certified characteristics, test performance curves, as recommended by manufacturer, maintenance manuals and manufacturer's warranty for each component of the system. e. The contractor shall submit the testing documents of circuit breakers, AC Cable, DC Cable. f. As-built drawings shall be submitted after handing over the work. g. All DBs will be lockable type. h. Upon completion of the installation, the contractor shall organize an onsite training program involving nominated employer's staff. Such a program should be carried out during the commissioning phase. The cost of the training should be deemed to have been included in the tendered rates. i. The price includes all builder's work, making good and reinstatement including necessary materials and workmanship as

	well as removal of unwanted materials to dump sites approved by the engineer to complete the job successfully. j. All the following items include Supply, Installation, Testing, Commissioning and Operate of the complete PV Solar System. k. All materials that are not naturally corrosion-resistant shall be treated or finished to protect surface and functional integrity under the ambient conditions prevailing at the site. l. To protect metallic accessories from corrosion two anti-corrosive coats of paint will be made of material.
3.	**Design of Elevated Structure**
	The elevated structure for the solar PV system shall be designed to ensure mechanical stability, long-term durability, and safe accessibility for operation and maintenance. The structure is composed of 114mm diameter, 12-gauge round steel poles anchored on civil concrete blocks measuring 18″x18″x30″. These poles support a framework of 3x6 inch main girders (3mm thick, ~1.75 kg/ft) and 5x2.5 inch purlin girders (2.5mm thick, ~1.45 kg/ft), connected with L-angle cross supports for added rigidity. Structural connections shall use stainless steel bolts with aluminum clamps, and all metal surfaces shall be treated with epoxy primer followed by epoxy black paint to ensure corrosion resistance. Walkways made of 16-gauge chequered sheet with L-angle reinforcement shall be integrated into the design, providing clear, safe access for inspection and maintenance. The top and base plates—6"x6" (5mm) and 10"x10" (8mm) respectively—shall distribute structural loads evenly. The design must be validated against applicable wind loads, seismic activity, and environmental factors, with all components properly grounded to ensure electrical safety. **Earthing of Elevated Steel Structure** To ensure electrical safety and compliance with relevant standards, the elevated steel structure must be properly earthed. Each steel pole shall be connected to a dedicated copper-bonded earth rod of minimum 16mm diameter and 3 meters length, driven into the ground adjacent to the structure. A bare copper conductor of at least 25mm² shall be used to bond the structure to the earth rods, using either exothermic welding or corrosion-resistant mechanical clamps. All structural elements, including poles, main girders, purlins, walkways, and ladders, must be interconnected using equipotential bonding conductors to eliminate potential differences during fault or lightning events. In case the structure exceeds 3 meters in height or is located in open terrain, an additional lightning protection system comprising air termination rods and down conductors shall be installed and connected to a separate or combined earth grid. The total earth resistance of the system should not exceed 1 ohms, and testing shall be conducted to confirm compliance. All connections must be accessible via inspection chambers to facilitate periodic maintenance and testing.
4.	**Design of the Single Pole Parking Shed** The Single Pole Parking Shed is designed as a space-efficient, elevated steel framework suitable for hosting solar PV modules or providing shaded vehicle

	parking with integrated solar infrastructure. The core support is a 6″x6″ square steel pipe, fabricated from 10-gauge steel, installed vertically over reinforced RCC civil blocks measuring 18″x18″x30″. This central vertical pole supports a cantilevered structure on either side, creating a symmetrical or mono-slope shed design. The horizontal arms (cantilevered beams) extending from the pole are set to 16 feet in length on each side, creating a total span of 32 feet, accommodating two vehicle bays or multiple solar module rows. The main girder—running perpendicular to the pole and forming the structural spine of the canopy—is made from 4″x8″ steel box section with 4mm wall thickness, weighing approximately 5–7 kg/ft. The purlin girders, spaced at appropriate intervals across the length of the canopy, are constructed from 5″x2.5″ steel tubes, 2.5mm thick (1.45 kg/ft). These purlins are connected to the main girder to support solar PV modules or metal roofing sheets. To ensure lateral stability and resistance against sway due to wind loads or dynamic forces, 3″x6″ steel cross-support girders are installed diagonally between the main girder and the pole, forming triangular bracing geometry. These act as moment-resisting elements to prevent torsional deflection. Additional L-angle or tubular cross bracing, with gusset plates welded or bolted at joint intersections, may be added at each end of the structure for enhanced wind resistance. The base of the pole is welded to a 12″x12″, 10mm thick steel base plate, securely anchored with foundation bolts into the concrete block. At the top, an 8″x8″, 8mm thick steel top plate connects the main girder to the pole, ensuring a uniform distribution of load and a robust connection. Stainless steel bolts and aluminum clamps are used for all mechanical fixings to ensure long-term resistance to corrosion. The entire steel frame is coated with epoxy primer and high-grade epoxy paint, typically black, to withstand harsh weather and extend the system's service life. This structural configuration is designed with considerations for wind loads, snow/rain drainage, thermal expansion, and electrical grounding, making it suitable for both solar applications and modern institutional/industrial parking requirements. **Earthing of Single Pole Parking Shed Structure** To ensure safety and compliance with electrical standards, the single pole parking shed structure shall be properly earthed. A **copper-bonded earth rod** (minimum 16mm diameter, 3 meters length) shall be installed adjacent to the base of each pole. A **bare copper conductor (minimum 25mm²)** shall be used to connect the metallic structure to the earth rod using corrosion-resistant clamps or exothermic welding. All metal components, including the pole, main girder, and purlins, shall be **equipotentially bonded** to eliminate voltage differentials during fault conditions. Where required, a **lightning protection rod** may be mounted at the highest point of the shed and bonded to the same earthing

	system. The complete earthing setup must achieve an earth resistance of **≤1 ohms**, verified through standard earth resistance testing methods.

Specification of Equipment:

PV Module:

Parameters	**Minimum Specifications required**
Module Make	Tier 1, Jinko, Longi, JA, AEG, Canadian Along with all shipping documents and flash test report. This is required that the serial number of panels could be verified from online database of the parent company or the contractor must supply warranty from the importer on their letter head.
PV Module Type	Mono-crystalline
Cell quality	A grade
Module efficiency	>21% (higher efficiency panels will be preferable)
Power tolerance	Must be +3 or more
Operating temperature	-40℃~+85℃
Temperature coefficient of Pmax	-0.35%/℃ or less
Bypass diode	As per design
Certification	IEC61215(2016), IEC61730(2016) ISO9001:2015: Quality Management System ISO14001:2015: Environment Management System ISO45001:2018: Occupational health and safety management systems
Frame	Anodized Aluminium Alloy
Junction Box	IP 68 rated
Cable	4mm2 (IEC), 1000mm
Connectors	MC4 or comparable, weatherproof.
Front glass	3.2mm, anti-reflection coating, high transmission, tempered glass
Protection	Anti- PID resistant (if PID effect was found in the panel, whole lot will be rejected, even within the 10 years product warranty).
Performance warranty	10 ~ 12 years product replacement warranty, if the major component malfunction including glass breakage and diode malfunctioning 10 ~ 12 years product performance warranty (90% rated power at the end of 10 years at STC). 25 years product warranty
Note that: M/s. NIPA reserves the right for random panel testing for STC (performance analysis during the guaranteed period) and EL (cracks analysis at the time of testing and commissioning).	

Cabling:

1. All exposed wiring (with the possible exception of the module interconnects) must be covered in conduits/ ducts. Wiring through roofing, walls and other structures must be protected through the use of bushings.
2. Direct drilling/use of rawal bolt/screw at the roof is strictly prohibited.
3. Wiring shall be colour coded as per IEC standards and labelled at the start and termination point.
4. All wiring must be enclosed in earthed cable tray/ conduit particularly main DC cable run from solar array up to the inverter location in a substation.
5. Especially avoid installing the conduit direct over the roof; there must be distance not less than 2 inches between the roof surface and conduit/duct.
6. Wires (in case of trenching) should be buried under 2 feet and should be covered with conduit of suitable strength.
7. All wires must be terminated with proper end sleeves and wire thimbles with different colors for positive and negative polarity, as well as RYB-N.
8. Calculations must support following (or equal) BS 7671, IEE wiring regulations 17th Edition, IEC 60364:2001, IEC 61214 ed 1, sec 8.3 standards.
9. Cable voltage drop specifications are as follows:
    a. PV to Junction box and Junction box to inverter should not be more than 1.5% each.
10. All panel-panel connection with MC4 connector must be individually tied with each module's frame using cable tie in order to avoid contact with the ground.
11. Cables must be joined by the use of junction boxes, screw connectors and block connectors, MC4 or equalling connectors must be used for PV joints.
12. Brand should be Pakistan cables or Fast cables.

PV Mounting Structure (roof-top):

Structure material	Aluminum
Wind loading	Mounting system should be able to allow air circulations for cooling in high temperature and with stand wind speed of 150km/ hour at 3 sec gust.
Angle adjustment mounting structure	Angle 10-24 degree.
Material surface protection	Mounting structure should be corrosion free including nuts and bolts.
Civil work	Structure foundation will be prepared using kerbs block. Number of foundations will depend upon the sites.

Grid Tied Inverter

Inverter Make	Brand should be verifiable (EU tier 1 only)
Inverter type	On grid with pure sine wave.
Maximum Efficiency	98% or above
Output voltage range	3/N/PE, 220/380V, 230/400V
Rated AC Frequency	50Hz
Nominal AC active power	136,000W, 50,000W
Maximum input voltage	1500 V
Maximum input current (per MPPT)	25-30A
Minimum operating voltage/startup voltage	500-550V

Operating voltage range	500–1500 V
Rated input voltage	900V
Operating temperature	-30℃ ~ + 70℃ (+/-10 ℃ is acceptable)
Humidity	0 ~ 95% RH
Maximum THD	= or <3%
Performance warranty	5 years replacement warranty, + 5 years warranty of the inverter, if the inverter mal-function or shows poor performance during the 10 years life time.
Adjustable Power factor range	0.8 lagging – 0.8 leading
IP rating	IP 65 or IP 66 (preferable)
Topology	Transformer less
Protections	Input-side Disconnection Device Anti-islanding Protection AC Overcurrent Protection DC Reverse-polarity Protection PV-array String Fault Monitoring Surge protection DC Surge Arrester Type II AC Surge Arrester Type II DC Insulation Resistance Detection Residual Current Monitoring Unit
Applicable standards	
Safety	EN 62109-1/-2, IEC 62109-1/-2, IEC 62116
Grid Connection Standards	EN 50530, IEC 61727, IEC 60068, IEC 61683

BIDDER INFORMATION	
Name of Firm/Company	
Complete Postal Address	
Phone	
Contact Person / Designation	
Cell Number	
E-Mail	
Fax Number	
National Tax Number	
GST Number	

NATIONAL INSTITUTE OF PUBLIC ADMINISTRATION KARACHI

BID DOCUMENT

DESIGN, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF GRID TIED 150 KWP (BUILDING 1- CAR PARKING AREA) + 100 KWP (BUILDING 2- ROOF-TOP), SOLAR POWER SYSTEM AT NIPA KARACHI

FINANCIAL PROPOSAL

Tender # **Works/Solar/2025/I**

SUMMARY OF BID PRICES

Item 1	DESIGN, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF GRID TIED 150 KWP (BUILDING 1- CAR PARKING AREA) + 100 KWP (BUILDING 2- ROOF-TOP), SOLAR POWER SYSTEM AT NIPA KARACHI			
Part	**DESCRIPTION**	**TOTAL INSTALLED CAPACITY kWp**	**AMOUNT (PKR)**	**TOTAL UNIT GENERATION YEARLY(Minimum) KWh**
a.	**Building 1**	150kW		
b.	**Building 2**	100kW		
	Total	250kW		
1	TOTAL COST OF THE PROJECT WITH OUT TAX	PKR		
2	TOTAL COST OF THE PROJECT WITH TAX	PKR		
3	TOTAL COST OF THE PROJECT PER WATT WITH TAX	PKR		

ANNEX-B

PRICE SCHEDULE/ FINANCIAL COST SHEET/ QUOTATION (FOR EACH ITEM SEPARATELY)

Part A- BOQ OF DESIGN, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF GRID TIED 150 KWP (BUILDING 1- CAR PARKING AREA), SOLAR POWER SYSTEM AT NIPA KARACHI

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
a.	**PV MODULES - 150.0 KWp:** Supply of N-Type or any latest tech. Bifacial Photovoltaic Solar Modules **(Grade-A,Tier 1)** Type anti- reflective high transparency low iron tempered glass, with earthing provision. The modules STC parameters must be as under (a) Min Power Pmax 540Wp or above, but below 620 Wp rated power (b) Junction Box Protection Degree, IP 68 (c) Connection box, 4.0mm2 conductor cross section, (d) Cable with, MC4 male and female connectors, (e) Anodized Aluminium Frame and Support Bars The Contractor shall provide manufacturer warranty for solar panel for a period not less than 25 years. The contractor must submit all the required certificates for each PV solar panel from manufacturer as per specification. All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.	Panel	278 - 242		
b.	**GRID-TIED INVERTER:** Three phase, 136kW or above, Grid Tie Inverter, three phase (400V), as per specification with 5 years standard warranty. . **Note:** Monitoring Device with Remote App (Mobile / Web) based Shall be part of contractor.	No.	1		

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	Make: Huwaei, Inverex, Sungrow or equivalent				
c	**Elevated Structure-Parking Lot** Supply of PV Mounting structure in MS Iron. The mounting structures must be designed structurally to be suitable to withstand all static loads (weight of modules, wind loads etc) minimum wind speed 35m/s with 3sec of gust pressure in harsh environment. The design submission must be as per ASTM-A36, ASTM-123 and ASCE 7-10. The mounting structure components are bonded together to guarantee potential equalization. The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed. The PV array structure design shall be appropriate with a factor of safety of minimum 1.5. The work is to be carried out strictly as per approved structure drawings, design and specification and the rate quoted is inclusive of the following:	Job	01		
	Column/Pole Size: Minimum 15', 114mm, circular shape, in 12 Gauge.				
	Main Girder: Length=100' Weight around 1.7kg o Size around 6x3inch o 2.8mm thickness				
	Base plate: 8mm & 10inch square				
	Top Plate: 5mm & 6inch Square				
	Walkway: Chequered sheet width 18" with L-angle support				
	Ladder: 1x3inch 16gauge pipe				
	Nut Bolt: SS bolt with Aluminium Clamp				
	Paint: Epoxy paint Black colour & Epoxy Primer as per ASTM 123.				
	All the Structure material should be minimum 12 Gauge.				
	Civil Blocks 18"x18"x30"				
	Civil Pads: RCC concrete pads, pads sizes shall be as per structural requirement along with bituman coating				
	Fasteners: All Allen bolts, Spring Washer, Nuts, Washer & Plate Washer must be SS304.				

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	Walkway of Structure should have proper cleaning platform minimum width of 2.0' with support. Paint: Before applying two coats of epoxy paint in smoke Gray colour, the contractor must first apply two coats of red oxide coating. Coating thickness measurement need to be provided. Mounting Accessories: Includes brackets, Solid Midclamps & End clamps should be of high grade Aluminum. Layout at Site approved by NIPA Site Team Civil work as per drawing and specification approved by NIPA Site Team. Placing of SS Rawal Bolts, Nuts bolts as per design & length & Details approved by NIPA Site Team The Contractor shall remove all the debris and clear the site before & after the completion of work as per NIPA direction The Contractor shall submit the detail technical shop drawing before execution of work. After completion of the work the contractor shall submit the as built drawing. All Allen bolts, nuts, bolts, washers, spring washers and screws for PV Panel mounting should be Stainless steel (SS 304).				
d.	**Single pole parking shed:** 1) Pole 6"x6" 10 gauge 2) main Girder 4x8inch 5-7kg/ft 4mm 3) crosses 3x6inch girder 2.8kg/ft 3mm 4) purlin girder 1.45kg/ft 2.5mm Walkways not included in single poles shed, the other properties and material detail will be same as 'c'.	Job	01		
d.	**DC Combiner Boxes** Supply of DC box/Array Junction Box 14gauge wall mounted with all accessories for outdoor usage, proper cable glands as per cable size, slotted cable ducts should be installed for internal DC cabling. DC Combiner Box shall be provided DC Fuses 25-30 A, 1000VDC, 2 fuses per string. DC Fuse Make: Himel/Chint/Equivalent DC SPD 40kA -or above DC SPD Make: Himel/Chint/Equivalent	EACH	1		
e.	**AC Combiner Boxes-LV Panel**	EACH	1		

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	Supply AC Combiner Box (LV Panel) with pad floor standing/Wall Mounted Locally fabricated in 14-gauge, Colour Code: RAL7035, MS Powder Coated, Copper Glands, Lugs, Phase indication lights, Tin Coated Copper Busbar for 3 Phases with colour coded heat shrinkable sleeves, Neutral & Earth with Polycarbonate cover sheet. Brass glands at bottom In & Out, CT's, Energy meter with all related accessories for outdoor usage dust proof enclosure. AC Breaker 1 x 350A, 35kA 4P, MCCB, 400V/415V, AC SPD 4Pole, 65kA with HRC Fuses Energy Meter: Invertor's OEM CT's: Ficco|Saci or Equivalent MCCB Make: ABB / Terasaki / Schineider or Equivalent SPD Make: ABB / Terasaki / Schineider or Equivalent HRC Fuses Make: ABB / Terasaki / Schineider or Equivalent				
f.	**DC Cable** Supply of 1 Core 4mm2 Cu/XLPO/XLPO cable complete in all respect with accessories to connect the PV solar cells together and to the inverter directly to have a complete operational circuit, clamps, trays and cable end terminations which shall be DC plug and socket connectors. The allowable voltage drop for DC cables between PV Arrays and inverter should be less than 2%. Minimum voltage capacity 1500VDC, Highest permissible voltage conductor/conductor should be 1.5kV DC, Standard Double insulated: Cross link polyolefin, Tinned copper conductor: Cable should be Certified from TUV Approved. Standard:EN50618 Make: Pakistan Cable, Fast Cable, or equivalent as Engineer Approved.	Length (m)	~1500m		

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
g.	**AC Cables** Supply of the power cables with all required works in different sizes of ducts/pipes, Cable lugs, Clamps and all needed fittings to connect cables terminals from source to destination with LV termination kit (Raychm). According to drawings, specifications, instructions, and demand of the supervising engineer as follow: 1x 120mm2, 4C, Cu/PVC/PVC STD Pure Copper – From Inverter to LT Panel Brand: Pakistan Cable | Fast Cable or Equivalent as NIPA Site Team Approved.	Length	~25m		
h.	**EARTHING SYSTEM** Supply of Earth Electrodes (Rod Type) for Earthing System with 25mm Dia 3 meters (10feet) long driven Pure copper Solid rod, complete with clamps lugs, washer/bolts, connected with 1x70mmsq bare copper 50mm dia G.I pipe/UPVC pipe class 'D/E' up to Earth chamber, job includes cad-welding of copper conductor to earth electrode rod at one end and provision/fixing of cable lugs at other end, including all accessories and RCC inspection chamber, heavy duty G.I. Cover having earth symbol, etc as per the specifications and Drawings and to the entire satisfaction and approval of the Engineer. This is required to provide Specifications & Drawings. Bidder will make sure that earth resistance should be less than 1 ohm of each earth pit. Minimum depth of the earth pit should be 40ft, earthing result should be less than 1 Ohm for AC/DC/LA. If required, additional earth pit can also be made. Site assessment can be carried out to determine the no. of parallel earth pits required.	JOB	4		
i.	**Earthing Cables** Supply of Earthing Cable, Including uPVC Pipe with related accessories. **Ground cables 4 & 16, 50 sq. mm.** 4sqmm for panel to grounding. 16sqmm for La and panels to earth pit.	Length (m)	As per Site		

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	25sqmm for AC Brand : Pakistan Cable | Fast Cable or Equivalent				
j.	**Cable tray** Galvanized Cable tray is required to run from solar arrays-structure up to the substation/ control room, enclosing all DC cables. GI flexible can be used in indoor use only. Cable tray route must be mentioned in drawings Cable Tray 150mm x 100mm or as per site with 16 SWG HDGI. Complete with all installation material such as angle iron support of size, MS round bar, elbows, Tee, Nuts, Bolts, Washer, Hilti drop-in anchour, etc. Complete in all respect, as per the site requirement.	Length (m)	As per Site		
k.	**Miscellaneous Items**				
	Supply of 3-inch UPVC conduit sockets, Bends, Elbows, T-Joints, G.I Clamps, complete in all respects for all string cables.	Length (m)	As per Site		
l.	**Excavation and backfilling** Excavation and backfilling for Mechanical protection of DC cable run from one Building 1 to the control room substation. All cables must be armored against the mechanical damage.	JOB	1		
m.	**Net-metering Application:** Contractor shall also apply for the net-metering and complete the process of documentation. M/s. NIPA will provide the necessary documentation required for application process. All the cost of application and documentation must be included in the total cost.	JOB	1		
n.	**OPERATION & MAINTENANCE:** Two years of operations and maintenance is an integral activity of this EPC project, which will determine the success of this project. It is to be noted that 2 years O&M will be initiated after project closet.	JOB	1		

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	Industry best practices to be used to operate and maintain the solar PV Project. All necessary preventive and corrective actions to be shared and implemented before the start of the O&M contract. Cleaning rate should be atleast 1 time after 15 days. Painting of structure after 6-months. The following key performance metrics to be monitored and reported which are as follows: •Inspection of cables, connectors, junction boxes, and grounding systems. •Tightening of bolts, screws, and clamps in mounting structures. •Identifying and resolving faults in modules, inverters, or other components. •Rapid response to critical failures to minimize downtime. •Tracking key performance indicators (KPIs) such as energy output, PR(performance ratio), and system availability. •Implementing software updates for inverters and monitoring systems. •Managing claims for defective components under warranty. •Implementing and maintaining safety measures for O&M personnel. Note: Contractor should submit the 150 kWp Performance commitment table, mentioning monthly yield. However, if O& M is not complied properly, security deposit will be deducted and the company will give the O&M to other company.				
o.	**Renovation of Inverter Room** This room already exists near the parking area where the solar panels are to be installed. This room will be utilized to safely and securely accommodate solar inverter for the proper functioning of the solar power system. Key features include:	JOB	1		

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	• Room Size: dimensions – **24 ft x 21 ft** • Structure Type: Additional brick/block masonry walls if required. • Ventilation: Adequate natural and/or mechanical ventilation • Doors & Windows: Standard metal door and louvered window for airflow • Electricals: Conduit piping and basic electrical provision for lighting and maintenance • Finishing: Plastering, painting, and weather protection as required. Note: All civil works will be executed in compliance with local building codes and site conditions. Final layout and design will be subject to client approval.				

PART -B: BOQ OF DESIGN, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF GRID TIED 100 KWP (BUILDING 2- ROOF-TOP), SOLAR POWER SYSTEM AT NIPA KARACHI

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
a.	**PV MODULES - 100.0 KWp:** Supply of N-Type or any latest tech. Bifacial Photovoltaic Solar Modules **(Grade-A,Tier 1)** Type anti- reflective high transparency low iron tempered glass, with earthing provision. The modules STC parameters must be as under (a) Min Power Pmax 540Wp or above, but below 620 Wp rated power (b) Junction Box Protection Degree, IP 68 (c) Connection box, 4.0mm2 conductor cross section, (d) Cable with, MC4 male and female connectors, (e) Anodized Aluminium Frame and Support Bars The Contractor shall provide manufacturer warranty for solar panel for a period not less than 25 years. The contractor must submit all the required certificates for each PV solar panel from manufacturer as per specification. All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.	No.	186-162		
b.	**GRID-TIED INVERTER:** Three phase, 50kW or above, Grid Tie Inverter, three phase(400V), as per specification with 5 years standard warranty. .**Note:** Monitoring Device with Remote App (Mobile / Web) based Shall be part of contractor. Make: Huwaei, Inverex, Sungrow or equivalent	No.	2		
c.	**MOUNTING STRUCTURE** Aluminum L2 structure with 12-14 gauge, mounting on Kurbs block with SS rawal bolt.	No.	93-81		
	The kerb blocks proposed for use in the solar project shall be **precast concrete units** with dimensions of **12 inches x 12 inches x 6 inches** (L x H x W). Each block shall have a minimum **compressive strength of 3000-3,500 PSI**, suitable for medium-duty boundary and				

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	support applications. The estimated **weight of each block is approximately 45 kilograms**, ensuring adequate mass for stability and resistance to displacement.				
	Layout at Site approved by NIPA Site Team				
	Civil work as per drawing and specification approved by NIPA Site Team.				
	Placing of SS Rawal Bolts, Nuts bolts as per design & length & Details approved by NIPA Site Team				
	The Contractor shall remove all the debris and clear the site before & after the completion of work as per NIPA direction				
	The Contractor shall submit the detail technical shop drawing before execution of work.				
	After completion of the work the contractor shall submit the as built drawing.				
	All Allen bolts, nuts, bolts, washers, spring washers and screws for PV Panel mounting should be Stainless steel (SS 304).				
d.	**DC Combiner Boxes** Supply of DC box/Array Junction Box 14gauge wall mounted with all accessories for outdoor usage, proper cable glands as per cable size, slotted cable ducts should be installed for internal DC cabling. DC Combiner Box shall be provided DC Fuses 25-30 A, 1000VDC, 2 fuses per string DC Fuse Make: Himel/Chint/Equivalent DC SPD 40k DC SPD Make: Himel/Chint/Equivalent	No.	1		
e.	**AC Combiner Boxes-LV Panel** Supply AC Combiner Box (LV Panel) with pad floor standing/Wall Mounted Locally fabricated in 14-gauge, Colour Code: RAL7035, MS Powder Coated, Copper Glands, Lugs, Phase indication lights, Tin Coated Copper Busbar for 3 Phases with colour coded heat shrinkable sleeves, Neutral & Earth with Polycarbonate cover sheet. Brass glands at bottom In & Out, CT's, Energy meter with all related accessories for outdoor usage dust proof enclosure. Circuit Breakers: • **2 x 150A 35KA 4pole, MCCB, 400V/415V for each inverter** • **1 x 250A 35KA 4pole Main CB for both inverter** • **1 x 630A 50KA 4pole from Main Substation to LT room CB, MCCB, 400V/415V.**	No.	1		

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	AC SPD 4Pole, 65kA with HRC Fuses Energy Meter: Invertor's OEM CT's: Ficco|Saci or Equivalent MCCB Make: Chint/ ABB / Terasaki / Schineider or Equivalent SPD Make: Chint/ ABB / Terasaki / Schineider or Equivalent HRC Fuses Make: Chint/ ABB / Terasaki / Schineider or Equivalent				
f.	**DC Cable** Supply of 1 Core 4mm2 Cu/XLPO/XLPO cable complete in all respect with accessories to connect the PV solar cells together and to the inverter directly to have a complete operational circuit, clamps, trays and cable end terminations which shall be DC plug and socket connectors. The allowable voltage drop for DC cables between PV Arrays and inverter should be less than 2%. Minimum voltage capacity 1500VDC, Highest permissible voltage conductor/conductor should be 1.5kV DC, Standard Double insulated: Cross link polyolefin, Tinned copper conductor: Cable should be Certified from TUV Approved. Standard: EN50618 Make: Pakistan Cable|Fast Cable|or equivalent as Engineer Approved.	Meter	15		
g.	**AC Cables** Supply of the power cables with all required works in different sizes of ducts/pipes, Cable lugs, Clamps and all needed fittings to connect cables terminals from source to destination with LV termination kit (Raychm). According to drawings, specifications, instructions, and demand of the supervising engineer as follow: 4C x 95mm2, Cu/PVC/PVC STD Pure Copper – From DB to LT Panel 4C x 35mm2, Cu/PVC/PVC STD Pure Copper – From Inverter to DB Brand: Pakistan Cable|Fast Cable or Equivalent as NIPA Site Team Approved.	 Length Length	 15m 10m		
h.	**Power Cable from Main substation to LV Control room (Building 2 termination)**	Length (m)	~102m		

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	This is required to run a 120mm2 power cable from main substation to the LT room. The length is approx. 102m. The current cable is insufficient to carry solar power. 120mm2 cables must be armored against the mechanical damage. Brand: Pakistan Cable | Fast Cable or Equivalent as NIPA Site Team Approved.				
i.	**Additional Circuit Breaker at Main Substation:** For 120mm2 cable from Main substation to LT room, we need to install 1 x 630A 50KA 4pole at Main Substation, MCCB, 400V/415V at suitable location of substation. MCCB Make: Chint/ ABB / Terasaki / Schineider or Equivalent	No.	1		
j.	**EARTHING SYSTEM** Supply of Earth Electrodes (Rod Type) for Earthing System with 25mm Dia 3 meters (10feet) long driven Pure copper Solid rod, complete with clamps lugs, washer/bolts, connected with 1x70mmsq bare copper 50mm dia G.I pipe/UPVC pipe class 'D/E' up to Earth chamber, job includes cad-welding of copper conductor to earth electrode rod at one end and provision/fixing of cable lugs at other end, including all accessories and RCC inspection chamber, heavy duty G.I. Cover having earth symbol, etc as per the specifications and Drawings and to the entire satisfaction and approval of the Engineer. This is required to provide Specifications & Drawings. Bidder will make sure that earth resistance should be less than 1 ohm of each earth pit. Minimum depth of the earth pit should be 40ft, earthing result should be less than 1 Ohm for AC/DC/LA. If required, additional earth pit can also be made. Site assessment can be carried out to determine the no. of parallel earth pits required.	JOB	3		
k.	**Earthing Cables** Supply of Earthing Cable, Including uPVC Pipe with related accessories.	Length (m)	As per Site		

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	Ground cables 4 &16, 25 sq. mm. • 4sqmm for panel to grounding. • 16sqmm for La and panels to earth pit. • 25sqmm for AC Brand: Pakistan Cable, Fast Cable or Equivalent				
l.	**Cable tray** Galvanized Cable tray is required to run from solar arrays-structure up to the substation/ control room, enclosing all DC cables. GI flexible can be used in indoor use only. Cable tray route must be mentioned in drawings. Cable Tray 150mm x 100mm or as per site with 16 SWG HDGI. Complete with all installation material such as angle iron support of size, MS round bar, elbows, Tee, Nuts, Bolts, Washer, Hilti drop-in anchour, etc. Complete in all respect, as per the site requirement.	Length (m)	As per Site		
m.	**MISCELLANEOUS ITEMS**				
	Supply of 3-inch UPVC conduit sockets, Bends, Elbows, T-Joints, G.I Clamps, complete in all respects for all string cables.	Length (m)	As per Site		
n.	**Excavation and backfilling** Excavation and backfilling for Mechanical protection of DC and AC cable run from roof-top to inverter room and main substation to LV room respectively. All cables must be armored against the mechanical damage.	JOB	1		
o.	**Net-metering Application:** Contractor shall also apply for the net-metering and complete the process of documentation. M/s. NIPA will provide the necessary documentation required for application process. All the cost of application and documentation must be included in the total cost.	JOB	1		
p.	**OPERATION & MAINTENANCE:** Two years of operations and maintenance is an integral activity of this EPC project, which will determine the success of this project. It is to be noted that 2 years O&M will be initiated after project closet.	JOB	1		

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	Industry best practices to be used to operate and maintain the solar PV Project. All necessary preventive and corrective actions to be shared and implemented before the start of the O&M contract. Cleaning rate should be atleast 1 time after 15 days. Painting of structure after 6-months. The following key performance metrics to be monitored and reported which are as follows: •Inspection of cables, connectors, junction boxes, and grounding systems. •Tightening of bolts, screws, and clamps in mounting structures. •Identifying and resolving faults in modules, inverters, or other components. •Rapid response to critical failures to minimize downtime. •Tracking key performance indicators (KPIs) such as energy output, PR(performance ratio), and system availability. •Implementing software updates for inverters and monitoring systems. •Managing claims for defective components under warranty. •Implementing and maintaining safety measures for O&M personnel. Note: Contractor should submit the 100 kWp Performance commitment table, mentioning monthly yield. However, if O& M is not complied properly, security deposit will be deducted and the company will give the O&M to other company.				
q.	**INVERTER ROOM** This place already exists, however necessary partition can be made with proper air-conditioning and ventilation system can be made. Key features include: • Ventilation: Adequate natural and/or mechanical ventilation • Doors & Windows: Standard metal door and louvered window for airflow • Electricals: Conduit piping and basic electrical provision for lighting and maintenance • Finishing: Plastering, painting, and weather protection as required. Note: All civil works will be executed in compliance with local building codes and site	JOB	1		

S. No	Item A Details	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)
	conditions. Final layout and design will be subject to client approval.				
r.	**Weather monitoring station (WMS)** Supply & installation of WMS capable of monitor, recording, with desktop or mobile app having solar irradiation sensor, ambient temperature sensor, relative humidity, UV index and wind speed monitor. The overall system will help in calculation of PR of the system.				
s.	**Cleaning of solar panel:** **a. Pressure Washer 135 Bar** Power 1600W Max Pressure 135 bar Max Flow Rate 5.5 L/min Pressure Rate 90 Bar ±10% Weight 8 Kg **b. Pressure Washer 105 Bar** Power 1400W Max Pressure 105 bar Max Flow Rate 5.5 L/min Pressure Rate 70 Bar ±10% Weight 7 Kg **Make: Hyndai/ Kharcher/ equivalent**	No. No.	01 01		

Total Cost (in numbers) PKR (without taxes) _____

Total Cost (in words) PKR (without taxes) _____

Total Cost (in numbers) PKR (with taxes)_____

Total Cost (in words) PKR (with taxes)_____

Date _____

Signature of authorized person
Name:
(Company Seal)

Note: No cutting or overwriting is allowed. Any cutting or overwriting will lead to rejection of the financial proposal.

BIDDER INFORMATION	
Name of Firm/Company	
Complete Postal Address	
Phone	
Contact Person / Designation	
Cell Number	
E-Mail	
Fax Number	
National Tax Number	
GST Number	

ANNEX-C

Performance Security (or Guarantee)

(BANK **GUARAN**TEE)

[The Procuring Agency, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated]

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: *Director General, National Institute of Public Administration, Karachi*

Date: *[Insert date of issue]*

Performance Guarantee No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

Framework Agreement No.: *[insert Procuring Agency's reference for the Framework Agreement]*

Call-off Contract No.: *[insert Procuring Agency's reference for the specific Call-off Contract]*

We have been informed that _ *[insert name of Supplier, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into a Call-0ff Contract No. *[insert reference number of the contract]* dated *[insert date]* with the Beneficiary, for the supply of _ *[insert name of contract and brief description of Goods and Related Services]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Call-off Contract, a performance guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]*
(_____) *[insert amount in words]*, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the …. Day of ……, 2…, and any demand for payment under it must be received by us at this office indicated above on or before that date.

_____

[signature(s)]

ANNEX-D

Experience of Similar Supply and Installation

S. No.	Assignment Description	Name /Contact Details of Client	Cost	Start Date	End Date	Remarks

Registered Engineer and Staff Details

S. No	Name with designation	Highest qualification	PEC No.	Experience	CV and other documents Attached (Yes/ No)
1.					

Trainings of Registered Engineer and Staff for capacity building

S. No	Name with designation	Training title	Duration	Venue	Trainer Name	Proof Attached (Yes/ No)
1.						