

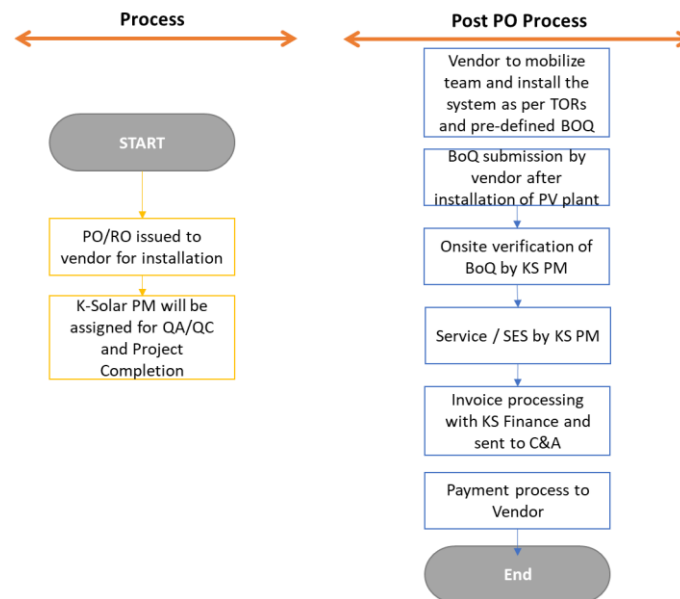
INSTALLATION SERVICES – RESIDENTIAL

10KW TO 30KW

RESPONSIBLE FOR DESIGN, INSTALLATION AND COMMISSIONING OF PROJECT AND PROVIDING AFTERSALES SUPPORT FOR ANY PROJECT

1 MODE OF OPERATION:

PROCESS OVERVIEW



2 ELIGIBLY TERMS FOR SOLAR INSTALLATION VENDOR:

- List of experienced teams with Strong technical experience and capability
- Detailed List of Quality plan for execution of project to be submitted for review
- Detailed List of PV installation Checklist for commissioning of project to be submitted for review
- For residential systems, installation of system will not take more than 10 days and one dedicated vehicle equipped with all the related tools and materials should be mobilized for standard mounting system with team for relevant staff
- Provide evidence of neat and clean installations for residential system. Must be eligible to install the system in arrangement highlighted in reference images: *Appendix - A*
 - List of related/similar project execution to be shared:
 - Detailed list of projects to be submitted/one drive link can be provided in case of soft copy for evaluation
- All the projects, PV checklist and quality plan will be scored based on TORS shared below
- List of different instruments for 3D images and modeling

- Drone imagery

Proposal to be submitted with 3D images – reference images: *Appendix - B*

- Strong understanding of EPC and O&M contracts
- Understanding on accurate bill of material and costing and how to avoid cost over runs and competitive price to make winning cases.
- All design software licenses to be available in house
- Strong understanding of technical standards

2.1 LICENSE REQUIREMENTS

- Must have valid PEC license
- Must have valid AEDB license
- Valid Helioscope/Aurora design software

2.2 HSEQ REQUIREMENTS

- Must have relevant HSEQ company wide policies, SOPs and checklist
- To be submitted with proposal

3 CONTRACT WITH SERVICE PROVIDER

3.1 CONTRACT PERIOD TIME

- One Year from the date of contract signing

3.2 PROJECT COMPLETION TIME

The project installation time after issuance of PO shall be followed as per project size as given below:

Project size	Project completion time after po issuance
10 kW	5 days
11-15 kW	7 days
16-20 kW	10 days
21-30 kW and above	12 days

3.3 PAYMENT MODE

- Fixed Per watt Basis for installation for all capacity of projects
- Cost of BOQs should be reviewed thoroughly and quoted accordingly as invoicing will be done based on the signed BOQ

3.4 PAYMENT TERMS

- 50% Project Completion
- 50% after 30days

3.5 INSURANCE GURANTEE/PERFORMANCE BOND - TERMS AND CONDITIONS

Insurance guarantee or performance bond: 10% of Project Cost to be Retained for 6 Months against the following terms and conditions:

- Quality Standards enforcement on products and installation

- Quality Assurance of equipment & installation
- After Sales support through one window
- Provide product warranties contracts that cover all liabilities for their installation

4 TORS FOR: SOLAR INSTALLATION – RESIDENTIAL:

4.1 SCOPE OF WORK:

When the project is awarded, following detailed design & engineering, procurement, project management and testing & commissioning services shall be provided:

SYSTEM CAPACITY	SCOPE OF WORK	UNIT	QTY
SYSTEM SIZE 10KW TO 30KW	Installation and commissioning of complete system: <ul style="list-style-type: none"> • Supply of balance of system as mentioned in TORs • Marking/layout on the roof for concrete pads/kerbstones. • Mounting solar PV panel, inverters, and Structure. • Electrical wiring and cabling. • Integrating the system into Main Electrical DB. • Testing and commissioning of the system. • Internet Connection • Compliance of Net metering and licensing requirements of K-Electric, AEDB and NEPRA. 	Per watt	2MW

4.2 PROJECT MANAGEMENT QUALITY PLAN REQUIREMENT:

ACTION TITLE	ACTIVITIES
PROJECT MANAGEMENT PLAN	<ul style="list-style-type: none"> • Information about the PMQP document: <ul style="list-style-type: none"> - Purpose of PMQP is to outline individual project QA, process, roles, problem and change management etc. - Scope of the Project as specified in the Contract Agreement.
OVERVIEW OF THE PROJECT	<ul style="list-style-type: none"> • Information is needed about the Project: - Civil Works <ul style="list-style-type: none"> - Marking of Civil Pedestals size - Looking and clearing for any obstructions at site from layout - Casting of pedestals at water level derived from roof levels - Chiseling of 6-8 mm of the marked area - Insert Steel nails of 2-3 Inches connected with steel wire. - Placement of frame around the marked area. - Pouring of concrete mix of ratio 1:3:3 or 1:2:4 - Allow dry time of at least 15-30 mins as per the weather conditions - Curing for at least three days at premises. - Anchoring of 13mm die drill bit and insert 10mmx75mm anchor bolts to fasten the solar panel mounting on top of pedestals.

	<ul style="list-style-type: none"> - Mounting of Solar Mountings and Solar Panels - Erection of mountings with alignment and tightness at anchor bolts. - Placement of Solar panels at erected mountings at right angle and alignment. - Electrical Wiring Works: - - String wiring of the Solar Panels through MC4 Connectors as per NEC Standards. - Interconnection of Solar Panels - Panel to Panel Earth Loops - Earthing of Structure and Loop to main earth busbar - Conduit UPVC for electrical wiring to Main DB and Inverter - Channel Duct at walls for wiring route. - Installation of DC and AC Breaker Box. - Wiring from DC Fuse to Inverter - Wiring from Inverter to AC Mains - Termination at Solar and - AC Mains End - Earth Pit making with copper rod / plate as applicable for less than 5 Ohm resistance.
COMPLIANCE OF STANDARDS	<ul style="list-style-type: none"> • AEDB and NEPRA net metering compliance to be strictly followed with all the checklist to be verified at project closure • HESQ compliance to be followed throughout the project
PROJECT ORGANIZATION AND RESPONSIBILITIES	<ul style="list-style-type: none"> • Project Engineer reporting structure, supervisor reporting and outsourcing controls • Mandatory sections for IDA Project Progress Report Document Control, Signoff and Change Record

5 BOQS FOR: SOLAR INSTALLATION – RESIDENTIAL:

The list of BOQs to be quoted as per market price and will be duly verified. The invoices will be made based on these BOQ at the completion of each project:

SOLAR PV SYSTEM INSTALLATION CHECKLIST (BOQS)			
ITEM	MATERIAL DESCRIPTION	UNIT	QTY
DC Cable 4 mm ²	4 mm ² DC Copper Cable; Single core 1000Vdc double insulated XLPE, uPVC Pipe, Lugs, Shrouds*	m	
DC Cable 6 mm ²	6 mm ² DC Copper Cable; Single core 1000Vdc double insulated XLPE, uPVC Pipe, Lugs, Shrouds*	m	
DC Cable 10 mm ²	10 mm ² DC Copper Cable; Single core 1000Vdc double insulated XLPE, uPVC Pipe, Lugs, Shrouds*	M	
DC Cable 25 mm ²	25 mm ² DC Copper Cable; Single core 1000Vdc double insulated XLPE, uPVC Pipe, Lugs, Shrouds*	M	

DC Cable 70 mm²	70 mm ² DC Copper Cable; Single core 1000Vdc double insulated XLPE, uPVC Pipe, Lugs, Shrouds*	m	
AC Cable 4 mm²	4 mm ² AC Copper Cable; Single core 600 Vac cuPVC/PVC insulated, uPVC Pipe, Lugs, Shrouds* or Equivalent	m	
AC Cable 6 mm²	6 mm ² AC Copper Cable; Single core 600 Vac cuPVC/PVC insulated, uPVC Pipe, Lugs, Shrouds*	m	
AC Cable 10 mm²	10 mm ² AC Copper Cable; Single core 600 Vac cuPVC/PVC insulated, uPVC Pipe, Lugs, Shrouds*	m	
AC Cable 25 mm²	25 mm ² AC Copper Cable; 4 core 600 Vac cuPVC/PVC insulated, uPVC Pipe, Lugs, Shrouds*	m	
AC Cable 35 mm²	35 mm ² AC Copper Cable; 4 core 600 Vac cuPVC/PVC insulated, uPVC Pipe, Lugs, Shrouds*	m	
AC Cable 70 mm²	70 mm ² AC Copper Cable; 4 core 600 Vac cuPVC/PVC insulated, Armored (if applicable) uPVC Pipe, Lugs, Shrouds*	m	
AC Cable 95 mm²	95 mm ² AC Copper Cable; 4 core 600 Vac cuPVC/PVC insulated, Armored (if applicable) uPVC Pipe, Lugs, Shrouds*	m	
AC Cable 120 mm²	120 mm ² AC Copper Cable; 4 core 600 Vac cuPVC/PVC insulated, Armored (if applicable) uPVC Pipe, Lugs, Shrouds*	m	
AC Cable 150 mm²	150 mm ² AC Copper Cable; 4 core 600 Vac cuPVC/PVC insulated, Armored (if applicable) uPVC Pipe, Lugs, Shrouds*	m	
AC Cable 185 mm²	185 mm ² AC Copper Cable; 4 core 600 Vac cuPVC/PVC insulated, Armored (if applicable) uPVC Pipe, Lugs, Shrouds*	m	
AC Cable 240 mm²	240 mm ² AC Copper Cable; 4 core 600 Vac cuPVC/PVC insulated, Armored (if applicable), uPVC Pipe, Lugs, Shrouds*	m	
Earthing Cable 10 mm²	10mm ² Copper Cable for Earthing and lightning arrester; Single core 1000Vdc cu PVC/PVC insulated, uPVC Pipe, Lugs, Shrouds*	m	
Lightning Arrester	19 mm ² Rod Copper Clad 1 Meter / 2 Meter	EA	
Earthing Package	Earthing Plate: 1.5 Inch; Separate AC & DC grounding pits of 60 ft depth / Earthing Rod 25mm with clamps	EA	
Earth Wire	Y/G 4 mm ² Earth wire with Lugs shrouds SS 6mm Nut Bolts with Plain and Star Washers	m	
Communication Cable	Shielded communication cable STP CAT-6	m	

2" Cable Tray	2" Cable Trays; Aluminum/GI Over and Under roof Trays*	m	
4" Cable Tray	4" Cable Trays; Aluminium/GI Over and Under roof Trays*	m	
6" Cable Tray	6" Cable Trays; Aluminium Over and Under roof Trays*	m	
8" Cable Tray	8" Cable Trays; Aluminium Over and Under roof Trays*	m	
AC/DC PANEL; SOLAR AC/DC 10KW	AC & DC SPDs, IP 65 AC breaker box with fuses / DC Isolators, Rotary type Changeover, Distribution box with AC breakers. Auto phase reversal protection with Energy Analyzer Schneider and all the allied accessories	EA	
AC/DC PANEL; SOLAR AC/DC 15KW		EA	
AC/DC PANEL; SOLAR AC/DC 20KW		EA	
AC/DC PANEL; SOLAR AC/DC 25KW		EA	
AC/DC PANEL; SOLAR AC/DC 33KW, COMM		EA	
AC/DC PANEL; SOLAR AC/DC 50KW, COMM		EA	
AC/DC PANEL; SOLAR AC/DC 100KW, COMM		EA	
AC/DC PANEL; SOLAR AC/DC 110KW, COMM		EA	
AC/DC PANEL; SOLAR AC/DC 250KW, COMM		EA	
Display Devices (Tablet)	Separate tablet/display device (16/21+ inch) with wall mount display at building entrance; installation and connectivity of inverter application	EA	
Display Devices (LCD)	Separate tablet/display device (16/21+ inch) with wall mount display at building entrance; installation and connectivity of inverter application	EA	
Cleaning Equipment	High Pressure Washer/Karcher pump 1600W (Toshiba/Hyundai/Daewoo), Bladed wiper/dry mop (8' Bladed Wiper and Mop)	EA	
Solar Structure GI Non Elevated**	STRUCTURE; SOLAR, GI, STANDARD, NON-ELEVATED	WATT	
Solar Structure Al Non Elevated**	STRUCTURE; SOLAR, AL, STANDARD, NON-ELEVATED	WATT	
Solar Structure GI Elevated**	STRUCTURE; SOLAR, GI, ELEVATED	WATT	
Solar Structure Al Elevated**	STRUCTURE; SOLAR, AL, ELEVATED	WATT	
Miscellaneous Item:	* PVC Socket, Bend, T, Elbow, Saddles, Tapes, Breaker End Stopper, Screws and Rawals, nuts & bolts, washers, Glands, Silicon Tubes, Epoxy Grouting, Extension Foots, and all other allied accessories		

****All structure should come in with pre-casted pressurized concrete ballast/civil pads based on our site requirements; Anchor bolts Stainless steel grade A4 of Grade 304L for structure installation**

DESCRIPTION	UNIT	QTY
STRUCTURE; SOLAR, GI, STANDARD, NON-ELEVATED	WATT	1,000,000
STRUCTURE; SOLAR, AL, STANDARD, NON-ELEVATED	WATT	4,500,000
STRUCTURE; SOLAR, GI, ELEVATED	WATT	2,000,000
STRUCTURE; SOLAR, AL, ELEVATED	WATT	2,000,000
STRUCTURE; SOLAR, GI/MS, CAR PARKING	WATT	500,000

6 TEAM AND WORK STRUCTURE REQUIRED

6.1 SUPPLY CHAIN MANAGEMENT TEAM:

- a. Maintaining and managing required inventory: Cables and other miscellaneous items
- b. Transportation of inventory from warehouse to site
- c. Weekly/Monthly report on inventory update to K-Solar team

6.2 EXECUTION TEAM WITH END-TO-END SOLUTION PROVIDER:

- d. Site preparation: installation team including:
 - i. Civil and Mechanical team for construction or amendment of any civil work required and installation of structure (including poles where required)
 - ii. Electrical team for installation of inverter and associated DBs, connection of panels, complete end to end wiring with earthing and interconnection of system
- e. Commissioning of system in presence of K-Solar team engineers and submission of completion report to KE solar team
- f. For residential systems, installation of system will not take more than 05 days and one dedicated vehicle equipped with all tools and materials should be mobilized for standard mounting system

6.3 AFTER SALES AND SUPPORT TEAMS:

- g. Immediate (12 hrs) attend of complaints if any error or malfunctioning appears
- h. Identification of fault cause and submission of report to K-Solar engineer
- i. Immediate resolution of complaint including replacement of any equipment required

6.4 HR TEAM

For fulfilling the requirement of all kind of resources on immediate basis. HR will ensure that all execution and onsite team will wear K-Solar uniform

7 APPENDIX – A

INSTALLATION IMAGES REQUIRED FOR K-SOLAR RESIDENTIAL PROJECTS



Installation of Residential PV System – Turnkey V2.0 | March 2021

8 APPENDIX – B

3D IMAGES REQUIRED FOR K-SOLAR RESIDENTIAL PROPOSALS

