**Scope of work & Technical Specifications**

The scope of work includes Design, Supply, Installation, Testing & Commissioning of 18 KWp Solar Power Plant at Jeev Seva Samiti, Gandhidham.

**The General Scope of work includes:**

1. Designing of 18 KWp Solar Power Plant at Jeev Seva Samiti, Gandhidham along with the work of taking approvals from concern Government Departments and relevant Liaoning works.
2. The work also includes Supply, Installation, Testing & Commissioning of 18 KWp Solar Power Plant at Jeev Seva Samiti, Gandhidham after designing and approval of the same.
3. Arrange appropriate incentives or subsidies from the concern authorities as per the latest schemes for Sola Power Plant, if applicable.
4. **Technical Specification for Item No. 1.**

The complete designing of 18 KWp Solar Power Plant would be in the scope of the contractor and has to be finalized in consultation of the Engineer-In-Charge of Deendayal Port Authority and all the relevant documentation, drawing, Liaoning work and all the necessary approvals from various Government Departments, Co-ordination and Approval work shall be completely in the scope of the contractor.

The designing of the Solar Power Plant should that the minimum height of lower side of the inclined Solar Power Panel shall be 5 feet over the RCC Roof. The GI framing of the Solar Panel has to be done with GI pipes of minimum 2mm thickness and minimum 40mm X 60mm size and minimum 80 microns of galvanization with excellent workmanship of GI structure fabrication. The designing should also include appropriately selected Mono Perc solar panels, sizes and types of cabling, earthing, lightning arrestor, switchgears, AC Distribution box, DC Distribution box, Inverter(s) and other relevant accessories / devices / equipments. The design should also include base support civil work, if necessary and as directed by Engineer-In-Charge.

1. **Technical Specification for Item No. 2.**

This includes Supply, Installation, Testing & Commissioning of 18 KWp Solar Power Plant at Jeev Seva Samiti, Gandhidham. The complete work will include supply of items at Jeev Seva Samiti, Gandhidham and installation, testing & commissioning for successful operation of 18 KWp Solar Power Plant, along with Civil Work, if any, treating it as a comprehensive work including manpower & materials along with other liasoning work.

Jeev Seva Samiti, Gandhidham already has a PGVCL Electrical connection and the 18 KWp Solar Power Plant would be Grid Connected. Complete liasoning / coordination / approvals/ testing and Solar Power Plant related correspondence and/or approval related works with PGVCL / GETCO / Any other Government body/unit would be in the scope of the contractor.

Below are the basic details of some major items of the 18 KWp Solar Power Plant:

* **Solar Panels:**

Technology : MONO PERC

Each of Minimum : 18KWp

Quantity : As per design.

* **Inverter(s):**

Output : As Needed

* **Cables:**
* DC Cables shall be of minimum 4 sq.mm size or higher as per design
* AC Armoured Cables shall be of minimum 25 sq.mm or higher as per design
* **Earthing:**

3 Sets or more as per standard practice in Solar Power Plant Installation.

* **Lightning Arrester:**

As per standard practice in Solar Panel Installation.

* **Switchgears:**
* ACDB, DCDB, relevant accessories, MCBs, Surge Protection Devices, etc. as per standard practice in Solar Power Plant Installation.

The Solar Power Plant should have complete system warranty if minimum 7 Years and individual Sola Panel warranty of minimum 25 Years. The Contractor is bond to provide onsite maintenance support on call/need within 10 days of any complaint during warranty period.

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**Approved Make List for Electrical Items**

|  |  |  |
| --- | --- | --- |
| **Sr. No.** | **Description** | **Recommended Makes** |
| 1 | HT VCB | SIEMENS / CROMPTON GREAVES/ABB/Schneider |
| 1(a) | HV Gas Insulated Breakers | SIEMENS /Schneider/ABB |
| 2 | POWER TRANSFORMERS | VOLTAMP/CROMPTON GREAVES /BHARAT BIJLEE/ BHEL/ SIEMENS/ ABB/ Schneider/T&R |
| 3 | DISTRIBUTION TRANSFORMERS | EMCO/KIRLOSKAR/PATSON/VOLTAMP/ ABB / Schneider / T&R |
| 4 | RESIN CAST TRANSFORMERS |  |
| A)    RESIN CAST IMPREGNATED | VOLTAMP / KIRLOSKAR / EMCO |
| B)    DRY CAST | VOLTAMP/KIRLOSKAR/EMCO |
| 5 | HT XLPE CABLES | POLYCAB/TORRENT/RPG ASIAN/ /GLOSTER/ UNISTAR/ UNISTAR/KEI/FINOLEX/HAVELS |
| 6 | LT XLPE CABLES | POLYCAB/TORRENT/RPG ASIAN/ / RALLISON/PRIMECAB/ HAVELLS/ UNISTAR/AVOCAB / ADCAB |
| 7 | LT ACB | SIEMENS/L&T/SCHNEIDER/C&S |
| 8 | PROTECTION RELAYS | AREVA/L&T/SIEMENS/ABB/C&S |
| 9 | LT PANEL | CPRI APPROVED |
| 10 | CHANGE OVER SWITCH | SIEMENS/L&T/ABB/C&S/SCHNIDER/ LEGRAND / INDOASIAN |
| 11 | SFU FOR MAIN LT DISTRIBUTION PANELS | SIEMENS/L&T/ABB/C&S |
| 12 | SFU FOR DISTRIBUTION PANELS & FEEDER PILLERS | SIEMENS/L&T/ABB/C&S/ SCHNEIDER/ LEGRAND/ INDOASIAN/HAVELLS |
| 13 | MCCB FOR MAIN LT DISTRIBUTION PANELS | SIEMENS/L&T/ABB |
| 14 | MCCB FOR DISTRIBUTION PANELS AND FEEDER PILLERS | SIEMENS/L&T/ABB/C&S/ SCHNIDER/ LEGRAND/ INDOASIAN/HAVELLS |
| 15 | MCB/ELCB/RCCB/ RCCBO FOR MAIN LT DISTRIBUTION PANELS | SIEMENS/HAGER L&T/ABB |
| 16 | MCB FOR DISTRIBUTION PANELS AND FEEDER PILLERS | SIEMENS/L&T/ABB/C&S/ SCHNEIDER/ LEGRAND/ INDOASIAN/ HAVELLS/ STANDARD |
| 17 | MCB DISTRIBUTION BOARD | STANDARD / HENSEL/LEGRAND / INDOASIAN / HAVELLS |
| 18 | MULTI FUNCTION DIGITAL METER FOR MAIN LT DISTRIBUTION PANELS/DIGITAL KWH METERS | L&T/ENERCON/SECURE/L&G/ RISHABH |
| 19 | ANALOG VOLT/AMPARE METER FOR DISTRIBUTION PANELS AND FEEDER PILLERS | RISHABH/AE/ENERCON/L&T |
| 20 | SLECTOR SWITCH FOR VOLTMETER/AMPARE METER | L&T/SIEMENS/C&S |
| 21 | POWER CONTACTOR & OVER LOAD RELAYS | L&T/SIEMENS/ABB |
| 22 | QUARTZ TIME CLOCK SWITCH | L&T/INDOASIAN/SIEMENS |
| 23 | PVC WIRE WITH COPPER CONDUCTOR | RR KABEL / KEI / POLYCAB/MILEX/GUJCAB/ STANDARD / FINOLEX / ANCHOR |
| 24 | FLUSH TYPE SWITCHES, SOCKETS, HOLDERS AND CEILING ROSES & ELECTRONIC REGULATORS | ANCHOR/MK/NORTHWEST/VINAY /PANAMA / HAVELLS |
| 25 | DOOR BELLS/CALL BELLS | ANCHOR/LEGEND/MK/NORTHWEST |
| 26 | MODULAR SWITCHES, SOCKETS, PLATES & BOXES | ANCHOR / MK / NORTHWEST / LEGRAND /HAVELLs / INDOASIAN / SIMENS. |
| 27 | PVC CONDUIT/OVAL CONDUIT & CASSING CAPPING AND ACCESSORIES | PRECISION/VULCAN/FINOLEX/ GARWARE/ RESTOPLAST/ SWASTIK / BPI |
| 28 | GLS LAMPS & FLUORESCENT LAMPS | PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI / GE |
| 29 | HPSV, HPMV & METAL HELIDE LAMPS | PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI / GE |
| 30 | IGNITORS FOR HPSV, METAL HELIDE LAMPS | PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI / GE |
| 31 | LUMINARIES | PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI / GE/C&S |
| 31a | LED LUMINARIES | Philips/Bajaj/Wipro/CG/Surya/Pyrotech/Syska/Nessa/C&S  having surge Protection ≥10KV for fittings & internal Surge  Protection for Driver of≥4KV, LED Chip only  OSRAM/CREE/Philips Lumileds/Citizen/ with LM-79,80  CERTIFICATION |
| 32 | CEILING FANS | BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC |
| 33 | WALL MOUNTING FANS | BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC |
| 34 | EXHUAST FANS | BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC |
| 35 | HEAVY DUTY INDUSTRIAL WALL MOUNTING FANS | BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC or its equivalent |
| 36 | WATER COOLER | VOLTAS/SHRIRAM USHA/BLUE STAR |
| 37 | AIR CONDITIONERS | VOLTAS/CARRIER/BLUESTAR/USHA/ HITACHI/LG/ SAMSUNG/ONIDA |
| 38 | REFRIGERATORS | VOLTAS / CARRIER / BLUESTAR / USHA / HITACHI / LG / SAMSUNG / WHIRLPOOL |
| 39 | VOLTAGE STABILIZER | VEELINE / CAPRI |
| 40 | INVERTERS | SUKAM / MICROTEK /EVVO |
| 41 | D.G. SETS |  |
| A)    ENGINE | CUMMINS/GREAVES/KIRLOSKAR/ CATERPILLAR /ASHOK LEYLAND /VOLVO |
| B)    ALTERNATOR | STAMFORD/CROMPTON GREAVES /JYOTI/ KIRLOSKAR ELECTRIC |
| 42 | ELECTRIC MOTOR | ALSTOM/CROMPTON GREAVES /SIEMENS/ KIRLOSKAR/ABB |
| 43 | WATER PUMPS | SWASTIK / KSB |
| 44 | WATER GEYSER | BAJAJ/USHA / CROMPTON GREAVES / SPHEREHOT / RACOLD |
| 45 | LUGS & CABLE GLANDS | DOWELLS / JAINSON / BRACO |
| 46 | Solar Panels | LONGI / TRINA / GOLDI / VIKRAM / REWNYSIS / RAYZON / WAAREE or equivalent subject to submission of relevant documents of successful operation in various Government Organisations. |
| Note:  In case of supply of Make of material which is not in the DPA approved Make list, the said material should be supplied as per the latest GETCO approved Make list.  In case of supply of Make of material which is neither available in the DPA approved Make list not in the latest GETCO approved Make list, the said material should be supplied as per the Make decided by EIC for which written intimation will be given to the contractor.  Before procurement of material, the Make of the material should be approved by EIC in writing. | | |

**Executive Engineer (Electrical)**

**Deendayal Port Authority**