## NOTICE INVITING BUDGETORY OFFERS

| | |
|---|---|
| Name of Work | **NAME OF WORK: "Dismantling, Shifting, Installation, Testing and Commissioning of 150Kw Rooftop solar plant at Port Hospital.**" |
| Date of submission of budgetary quotation | On or Before **12.12.2024.** |
| Address for communication: | Executive Engineer (E-HL),<br>Mechanical Engineering Department,<br>Mormugao Port Authority,<br>Electrical Section, 1st Floor,<br>"SAARASI" Admin. Building,<br>Headland sada<br>Vasco-de-Gama<br>Goa - 403804 |
| Contact Details | Phone : (0832) 2594241, 2594244<br>Email : xene.mgpt@gmail.com |
| Website | **www.mptgoa.gov.in** |

**EXECUTIVE ENGINEER (E-HL)**
**MORMUGAO PORT AUTHORITY**

**MORMUGAO PORT AUTHORITY**

**ENGINEERING MECHANICAL DEPARTMENT**

**Sub: Budgetary quotation for "Dismantling, Shifting, Installation, Testing and Commissioning of 150Kw Rooftop solar plant at Port Hospital."**

Mormugao Port Authority intends to carry out the work of “Dismantling, Shifting, Installation, Testing and Commissioning of 150Kw Rooftop solar plant at Port Hospital ".

As such, kindly furnish the budgetary quotation for the same (Scope of work enclosed as Schedule - 'A' and Price Schedule enclosed as Schedule - 'A1'.

The budgetary quotation should reach to this office on or before 12.12.2024.

Thanking you,

Yours sincerely,

**EXECUTIVE ENGINEER (E-HL)**

## SCHEDULE-A

## TECHNICAL SPECIFICATIONS

### 1.1 GENERAL

Mormugao Port Authority has installed a 150Kw Rooftop Solar power plant at Port Hospital. The plant has total 720 Modules mounted on Module Mounting Structure. There are 03 nos. inverters, 03 Nos DC DB's and 01 No. AC DB installed for this plant. Port now intends to shift the entire 150 Kw Solar plant on the ground and make it operational in the Port Hospital premises.

### 1.2 SCOPE OF WORK:

The Scope of Work broadly consists of:

a) Dismantling of existing 250wp solar panels and Shifting of Panels from terrace to ground.
b) Dismantling existing module mounting structure (MMS) except main column and shifting the same for reuse at new plot.
c) Preparation of earmarked area/ plot by removing shrubs/ bushes and other material for installation of MMs and panels. The plot should be properly levelled. The bidder shall aesthetically design the layout of the plant in the earmarked area so that all panels are accommodated.
d) Supply and Installation of C type Hot Dip Galvanized Steel Column (Main column) as per technical specifications.
e) Installation of balance MMS and installation of dismantled panels on the MMS.
f) Construction of Inverter Room of size 3mtrs X 3mtrs with Concrete slab and Masonry walls. Water proofing of the concrete slab shall be done. Providing necessary door with lockable latch, Aluminum sliding window, Electrical wiring etc complete. The external walls of inverter room shall be painted with 1 coat of primer, 1 coat of damp-proof paint and 2 coats of Apex exterior paint. Internal walls shall be painted with 1 coat of lambi/ putti, 1 coat of primer paint and 2 coats of internal paint. Inverter room shall be provided with following,
    a. Main Distribution board with MCB's of suitable rating.
    b. Main switch board.
    c. AC point witch metal clad box and MCB.
    d. 03 Nos 18/ 20W LED tube lights
    e. 01 No ceiling fan of sweep 1200mm.
    f. 03 Nos wall mounted fans of size 300 MM Sweep.
g) Disconnection and removing existing 3 inverters, DC DB's, AC DB's along with associated wiring/ cabling. Shifting, installation and connection of these items in the new inverter room.

h) Supply, laying and connection of 4 sq MM DC cables as per technical specifications. Joints in DC cabling are not permitted. All DC cabling is to be laid underground / on the wall through PVC pipes.

i) Supply, laying and termination of 4 core x 150sq.mm, 1.1KV, XLPE alluminium armoured cable by excavation of depth 1 meter. Also part of the cable length is required to be laid on wall by saddling.

j) Supply and installation of Lightning Arrestor to cover the entire area of the relocated solar plant.

k) Supply, installation testing, connection of 5 nos. Earthing as per technical specifications provided below for body/structure earthing and for Lightning Arrestor.

l) Supply, installation, connection and testing of 250A, 4Pole MCCB along with enclosure in the main panel room. The AC cable coming from Inverter room is to be connected to this MCCB.

m) Providing chain link fencing along the periphery of the solar plant and one entrance gate for the solar plant.

n) Testing and commissioning of the shifted 150KW plant.

o) The existing water pipe line along with the tank, water pump used for cleaning of modules from hospital roof is to be dismantled, shifted and installed at the new location. Water tank shall be placed on the inverter room. Any additional items such as pipes, joints etc necessary for complete installation of cleaning system is in the scope of the bidder. Bidder will have to make arrangements to tap the water supply from the nearest tapping point provided by the Port.

p) The balance material removed from the 150Kw plant is to be shifted to MPA scrap yard at Baina.

q) During dismantling and shifting if any of the items indicated below are damaged, then the bidder shall supply and install the same. The items so supplied shall have equivalent or shall have higher/ better specifications than the existing ones. The bidder shall quote the rates towards the supply of these items separately in the PART B of the BOQ. The rate from BOQ will be used to make payment to the bidder on the actual supplied quantities during execution of the work.

| **Sr. no.** | **Description** | Specifications of Existing item |
|---|---|---|
| 1 | Module | Wattage: 250Wp, Cells: 60Nos, Poly Crystalline. Make: Premier Solar Systems Pvt Ltd. Model No: PSS250. |

| | | |
|---|---|---|
| 2 | Inverter | 50KVA, 62.5KWp, Make Delta, Model RPI-M50A. |
| 3 | Rafter/ Purlin | 80CSx50 x 20x3.15 MM. Hot dip Galvanized with 120 Microns thickness. |
| 4 | Connection cleat | 70x70x100x3MM. Hot dip Galvanized with 120 Microns thickness. |
| 5 | ACDB | 180 KWp, Surge Arrestor: 01 No, 3 input, 1 output, 250A 4pole MCCB, MFM: 01 No, RYB indicators LED. |
| 6 | DCDB | 60KWp, 10 input, 10 output, MOV's: 30nos, Fuses: 10 nos, |
| 7 | Water tank | Capacity: 1000 liters, Three layer insulated polyethylene water storage tanks made from high quality material, durable polyethylene. |
| 8 | Water Pump | 0.5 Hp, Single phase. |

The details of the items given above are indicative. The bidder can visit the site to check the specifications/ details before quoting.

**Note:** The bidder shall carry out the above complete work as per IER and other relevant standards. The scope of work is not restricted, if any additional material/ accessories, works are felt necessary, for completion of the work, the contractor shall execute the same as per IER and relevant standard on the offered rate.

In case any extra miscellaneous materials / accessories like nuts, bolts, lugs, connectors etc. are required for completion of the work, the same has to be supplied and installed by the bidder at his own cost and Port will not be responsible for any payment against these items.

**1.3 TECHNICAL SPECIFICATIONS:**

**i) L.T. 4 Core, 150 Sq MM Aluminium Armoured Cable.**

**a) Supply of L.T. 4 core, 150 sq mm Aluminium Armoured cable.**

Supply and laying 1 run of L.T. 4 core, 150 sq mm Aluminium XLPE cable of 1.1KV grade, extruded PVC inner sheathed, single layer of galvanized steel wire / strip armoured, over all PVC sheathed conforming to IS 7098 Part I 1985 with latest amendments with ISI mark. The cable quantity shown in BOQ is tentative. The cable measurements are tentative and may vary as per site condition. The Contractor shall measure the actual quantity as per the site requirement and confirm the same from E.I.C before taking for procurement action.

Note: i) Test certificates from the manufacturers for the cable shall be submitted along with the supply of cable.

**b) Laying of LT, 4 core, 150 sq mm Aluminium Armoured cable**

Laying underground 1 run of L.T. 4 core, 150 sq mm Aluminium Armoured cable from Inverter room to the panel room by excavating trench of depth 100 cms, including supply and laying of Bricks. After laying, the cable trench should be back filled with soil and route markers to be provided after every 10metres. Cable is also to be laid underground after road cutting. For crossing the road, cable has to be laid through class B GI pipe at depth of 100cmc and then the road has to be made good.

**c) Laying the cable on wall by saddling**.

Laying the LT 4 C x150 sq mm armoured cable on wall by saddling. The saddles should be made from GI strip of thickness 3 MM. The saddles should be provided at the distance of 1 Mtr each. Cable should be laid properly and neatly on the wall.

**d)** The end termination for 1100V grade cables shall be of crimping type lugs and shall be supplied by the contractor. The crimping type lugs shall be installed by highly skilled personnel with all accessories and other material confirming to relevant IS specification. The additional length of cable shall be provided for loop of sufficient length for future requirement before commencing end termination work. The work includes all labour and material as directed by E.I.C.

**ii) DC cable**

i. Solar DC cables shall be 4 sq mm, single core, tinned copper, Flame Retardant Low smoke (FRLS). DC cable with positive polarity shall have marking of red line on black outer sheath and the negative polarity cable shall be with black colour PVC outer sheath conforming to EN 50618. In addition to manufacturer's identification on cables as per relevant standard, following marking shall also be provided over outer sheath.
   a) Cable size and voltage grade
   b) Word 'FRNC/ FRLS' (as applicable) at every metre
   c) Sequential marking of length of the cable in metres at every metre.

ii) DC cables wherever required shall be laid underground through PVC pipes after excavation of minimum 200 MM depth. DC cables in the inverter room shall be laid through PVC pipes on wall. The pipes shall be neatly fixed on wall with the help of saddles.

iii) The DC cables shall be connected using proper connectors/ lugs as necessary.

**iii) MCCB**

a. MCCB shall be rated for 250A with 4 pole with suitable extension of terminal to terminate 150sq. mm cable.
b. The MCCBs shall be designed in accordance with the IEC Publications 60947.1 and 60947.2.
c. The MCCB shall be manually operated and shunt trip type.
d. MCCB shall have current limiting feature. The MCCB contacts shall be of the self-cleaning type, made from an approved arc resisting material. All contacts shall be self-aligning, and shall be readily replaceable.
e. Suitable enclosure shall be provided to house the MCCB. The enclosure shall be double door type made of Mild Steel of thickness not less than 1.6 mm. and shall be

properly pretreated and stove enameled/Powder Coated.

**iv) Module Mounting structure (MMS)**

a) The main column or leg of the Module Mounting Structures (MMS) shall be MS Hot Dip galvanized C channel of size 80CSx 50x20x3.15 mm as per IS 2062 (grade E350 or higher) and IS 4759:1996. The length of the column shall be 1.6 mtrs. Minimum thickness of galvanization shall be at least 120 microns. Carrying out excavation/ boring of size not less than 0.6 meter × 0.2meter and Casting of foundation for the main column with M30 concrete. Muffing of height 150 MM above ground level shall be provided for the column of MMS. Minimum clearance between finished ground level and lowest edge of module shall be 450 mm.

b) Balance MMS which is removed and shifted from the existing plant is to be installed on the columns after completion of curing period of the concrete.

c) The panels removed from the existing rooftop plant are to be shifted and installed on the erected MMS.

d) All fasteners, Nut & bolts used shall be of Stainless steel - SS 304 or higher grade.

**v) Lightning Arrestor**

a) Lightning Protection System (LPS) for entire plant against direct and indirect lighting strokes shall be provided as per IS/IEC 62305:2010.
b) Protection level for the entire plant shall be Level-III.
c) Air terminals, down conductors and earth termination system shall be designed as per relevant parts of IS/IEC 62305:2010.
d) Necessary foundation/anchoring for holding the air terminal in position to be made after giving due consideration to shadow on PV array, maximum wind speed and maintenance requirement at site in future.
e) Lightning arresters shall be equipped with lightning counters.
f) The lightning conductor shall be earthed through flats and connected to the earth mats as per applicable Indian Standards with earth pits. Minimum two earth pits shall be provided for each lightening arrestor. Each lightning conductor shall be fitted with individual earth pit as per required Standards.

**vi) Earthing**

a) The Earthing shall be carried out by using 40 mm dia. 3 mm thick, 3 meter long GI pipe with GI funnel, mesh and suitable size reducer fixed on the top of the earth electrode. The funnel should be enclosed in a CC chamber of size 400 x 400 x 400 mm above the ground, with Kadappa stone cover.
b) The electrode shall have staggered holes of 12-mm dia. and the electrode should be covered 150 mm around with alternate layers of salt and charcoal from the bottom of the pipe to the bottom of the CC chamber.
c) The earthing connection from the electrode is to be carried out using single core, tinned copper wire of size 10 Sq MM. The earthing cables wherever required shall be laid underground through PVC pipes after excavation of minimum 200 MM depth.
d) Module Mounting Structures (MMS), String Combiner Box (SCB) structures in the PV array field and structures of equipment's in the inverter room shall be grounded properly as per IS:3043-1987.

e) All the nut bolts, washers used for connection of earthing system shall be stainless steel (SS)
f) Each earth pit resistance shall be less than 2 Ohms. Earth Resistance should be tested in presence of the representative of MPA by calibrated earth tester. Proper marking is to be provided on each earth pit.

**vii) Chain link fencing**

a) The plant shall be protected by providing chain link along the periphery. The minimum height of the fencing shall be 2.0 m from the ground level. The chain link of 50mm x 50mm diamond mesh of PVC coated 10 gauge galvanized steel wire with 12 gauge barbed wires at top (3numbers) is to be provided. Main vertical post for the fencing shall be ISA 75mm x75mm x 6mm and shall be provided with cross bracing on both side of ISA 45mm x 45mm x 5mm. Also, line wire at top, middle and bottom of chain link mesh of 8 gauges is to be provided. Chain link fencing shall be fixed in ground by sufficient concrete foundation up to depth of 200mm.
b) All-weather main gate of at least 3 meters width has to be provided at the entrance of the plant.

1.4 OTHER TERMS AND CONDITIONS:

a) The Bidders are advised to visit the site and get acquainted regarding the nature of the work involved at site conditions before quoting the rates.
b) Any other work/ item necessary for the shifting and commissioning of 150KW solar plant has to be taken care of by the bidder without any additional cost, although it is not mentioned in the BoQ/ scope of work
c) All the tools/ tackles, logistics for to & fro transportation of equipment's, necessary material required for execution of the work has to be arranged by contractor at his own cost.
d) Power supply shall be provided to contractor free of cost from the nearest available point for execution of the work however the supply cable has to be arranged by the contractor.
e) After completion of the subject work, the contractor shall clear the area of any unwanted scrap while handing over.
f) Work shall be carried out following all environmental norms, all safety regulations as per relevant and prevailing standards.
g) The contractor shall adhere to all electrical/electronic regulations, safety regulations & all other statutory regulations as applicable.
h) Bidder shall take necessary care to consider all the items/ activities necessary for shifting, installation and commissioning of 150Kw rooftop plant.

**SCHEDULE A1**

**PRICE SCHEDULE (BILL OF QUANTITIES – BOQ)**

**PART A: for Dismantling, Shifting, Installation and commission of 150KW Plant**

| Sr. no. | Particular | Unit | Quantity | HSN/ SAC code | Rate (Rs) | Amount (RS) | GST % |
|---|---|---|---|---|---|---|---|
| 1 | Dismantling of existing 250wp solar panels and Shifting of Panels from terrace to ground as per scope of work and Technical specifications. | No | 720 | | | | |
| 2 | Dismantling of existing module mounting structure (except Main column) and shifting to ground as per scope of work and Technical specifications. | set | 144 | | | | |
| 3 | Disconnecting of existing 50KW inverter alongwith ACDB, DCDB, DC AND AC Cables as per scope of work and Technical specifications. | set | 3 | | | | |
| 4 | Clearing of plot area for panel installation as per scope of work and Technical specifications. | LS | LS | | | | |
| 5 | a) Supply of C type Hot Dip Galvanized Steel Column as per scope of work and Technical specifications. | No | 432 | | | | |
| | b) Installtion of C type Hot Dip Galvanized Steel Column as per scope of work and Technical specifications. | No | 432 | | | | |
| 6 | Installation of balance module mounting structure, mounting of Solar panels,DC cabling, mounting of Inverters, DCDB's, ACDB's etc. complete as per scope of work and Technical specifications. | KW | 150 | | | | |
| 7 | a) Supply of DC cables as per scope of work and Technical specifications. | Mtr | 5000 | | | | |
| | b) Laying and termination of DC cables as per scope of work and Technical specifications. | Mtr | 5000 | | | | |
| 8 | a) Supply of 250A 4 Pole MCCB as per scope of work and Technical specifications. | No | 1 | | | | |
| | b) Installation of 250A 4 Pole MCCB as per scope of work and Technical specifications. | No | 1 | | | | |
| 9 | Construction of room for Inverters, Electrical panels etc as per scope of work and Technical specifications. | set | 1 | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10 | a) Supply of 4 corex150sq.mm, 1.1KV, XLPE alluminium armoured cable a s per scope of work. | Mtr | 200 | | | | |
| | b) Laying, of 4 corex150sq.mm, 1.1KV, XLPE alluminium armoured cable as per scope of work and Technical specifications. | Mtr | 70 | | | | |
| | c) Laying 4C x 150 sq MM Aluminium cable on wall as per scope of work and technical specifications | Mtr | 120 | | | | |
| 11 | a) Supply of lightning arrestor as per technical specifications. | No | 2 | | | | |
| | b) Installation of Lightning Arrestor as per scope of work and Technical specifications. | No | 2 | | | | |
| 12 | a) Supply of Earthing as per the technical specifications. | No | 7 | | | | |
| | b) Installation testing, connection of pipe Earthing as per scope of work and Technical specifications. | No | 7 | | | | |
| 13 | a) Supply of copper cable for earthing as per the technical specifications. | Mtr | 1500 | | | | |
| | b) ) Laying and termination of copper cable for earthing as per scope of work and Technical specifications. | Mtr | 1500 | | | | |
| 14 | a) Supply of Chain link fencing as per the technical specifications. | Mtr | 300 | | | | |
| | b) Installation of chain link fencing as per scope of work and Technical specifications. | Mtr | 300 | | | | |
| 15 | Dismantling, Shifting, installation and commissioning of water tank with pump and pipe line as per scope and technical specifications | LS | 1 | | | | |
| 16 | Testing and commissioning of system as per scope of work and Technical specifications. | LS | 1 | | | | |
| | | | | PART A TOTAL Rs. | | | |

Total (In Words)
Rupees_____only
exclusive of GST.

**PART B: Rates for supply of items against the items damaged during process of dismantling and shifting**

| Sr. no. | Particular | Unit | Qty | HSN/ SAC code | Rate (Rs) | Amount (RS) | GST % |
|---|---|---|---|---|---|---|---|
| 1 | Supply of Module as per scope of work and Technical Specifications | No | 1 | | | | |
| 2 | Supply of Inverter as per scope of work and Technical Specifications | No | 1 | | | | |
| 3 | Supply of Rafter/ Purlin as per scope of work and Technical Specifications | Kg | 1 | | | | |
| 4 | Supply of Connection cleat as per scope of work and Technical Specifications | Kg | 1 | | | | |
| 5 | Supply of ACDB as per scope of work and Technical Specifications | No. | 1 | | | | |
| 6 | Supply of DCDB as per scope of work and Technical Specifications | No. | 1 | | | | |
| 7 | Supply of water tank as per scope of work and Technical Specifications | No. | 1 | | | | |
| 8 | Supply of water pump as per scope of work and Technical Specifications | No. | 1 | | | | |
| PART B TOTAL Rs. | | | | | | | |

Total (In Words)
Rupees_____only
exclusive of GST.

**Date:** **Signature:**

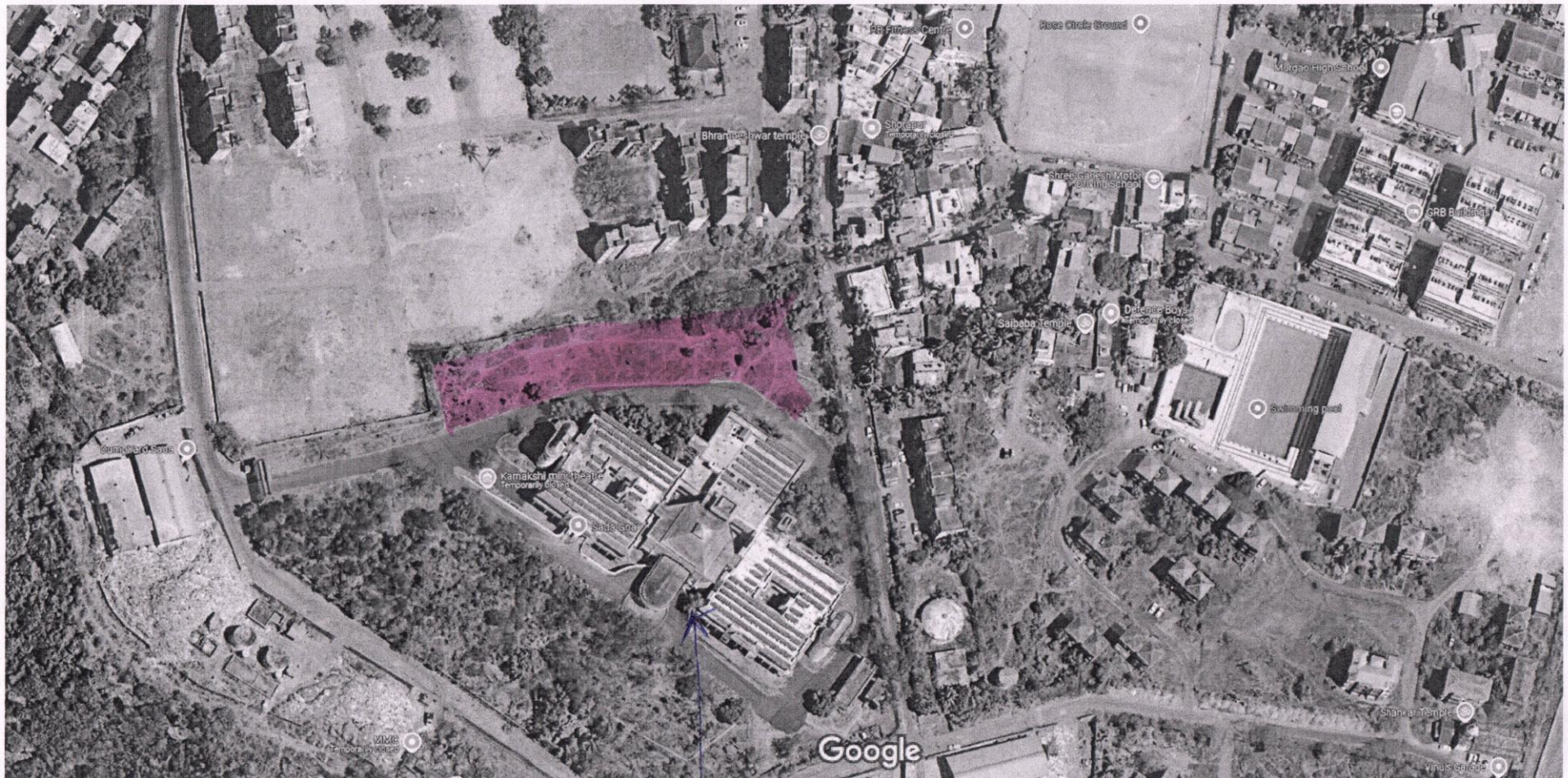
**Place:** **Name:**

**Address:**

**Office Seal of firm:**

**Note:** The offered rates shall be exclusive of GST.

Google Maps

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Existing 150kw Roof top Plant

– Proposed Plot for shifting Solar roof top Plant (150kw)