

**WOMEN'S POLYTECHNIC COLLEGE  
(PIPMATE - A GOVERNMENT OF PUDUCHERRY UNDERTAKING)  
LAWSPET, PUDUCHERRY – 605 008  
Phone No. 0413-2252833**

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**TENDER SCHEDULE–I: Supply of Equipment/ Machineries/ Laboratory Articles for Department of Architectural Assistantship of Women's Polytechnic College, Puducherry under Centrally Sponsored Scheme of MHRD - Up-gradation of Existing Polytechnics.**

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**TERMS AND CONDITIONS**

Bidders intending to offer rates for **Supply of Equipment/ Machineries/ Laboratory Articles** to Women's Polytechnic College, Puducherry should observe the Terms and Conditions given below:

1. Each Bidder must go through the Terms and Conditions containing the Description and Specification of the Equipment/ Machineries/ Laboratory Articles, carefully and understand them before submitting their tender on-line. No excuse that the Terms and Conditions have not been read or misunderstood will be entertained later.
2. The Bidders shall either be the Manufacturer or an Authorized dealer / Supplier of the quoted Equipment/ Machineries/ Laboratory Articles.
3. The Bidders shall submit their Tenders for the Equipment/ Machineries/ Laboratory Articles as per the specifications, supported with necessary Technical details and pamphlets/ catalogues. The Technical details and pamphlets/ catalogues of the Equipment/ Machineries/ Laboratory Articles quoted shall be submitted along with other documents required for Technical Bid.
4. The Bidders shall submit their Tender on-line before the last date for submission. Bidders are requested to stick to the date and time limit specified in the e-Tender notice. Tenders will be accepted only if they are submitted in the prescribed manner.
5. Each tender must be accompanied by an **Earnest Money Deposit (E.M.D.) of ₹17,350/-** (Rupees Seventeen thousand three hundred and fifty only) as mentioned in the e-tender notice. **The E.M.D. amount should be in the form of demand draft drawn on any of the nationalized banks, in favour of "The Principal, Women's Polytechnic College, Puducherry", payable at Puducherry. Bank guarantee or payment in any other form will not be accepted.**

6. The tenders submitted without the requisite E.M.D. amount will be summarily rejected and no request for exemption will be entertained except from the firms registered as Industrial Co-operative Society / Small Scale Industries with Government of Puducherry / N.S.I.C./ D.G.S. & D. as applicable. In such cases, a copy of the valid certificate for exemption of E.M.D. should be furnished along with the tender.
7. The E.M.D. amount will be returned to the unsuccessful bidders, but retained in the case of successful bidders and will be refunded only after execution of the supply order.
8. The bidder withdrawing the tender once submitted / not executing the supply order will lose the entire E.M.D. amount paid.
9. The rates should be quoted in whole Rupee and paisa only. The rates for each Equipment/ Machineries/ Laboratory Articles should be independent of other Equipment/ Machineries/ Laboratory Articles.
10. The rates quoted should be exclusive of all taxes, duties and all incidental charges such as loading, unloading, packing, forwarding, installation, insurance and stocking charges etc. The taxes applicable per unit may be entered in the appropriate columns of BoQ.
11. If artificially low rates are quoted in the tender, this institution will not consider any subsequent claim for compensation. The Bidders are advised to satisfy themselves that the rates quoted are only for the readily available Equipment/ Machineries/ Laboratory Articles, for which the tenders have been invited.
12. No representation for upward revision of rates will be allowed. Ex-Godown rates offered by the firm are not acceptable and such tenders will be summarily rejected. The rates quoted should be "FOR destination" basis, the destination being the Women's Polytechnic College, Puducherry.
13. The rates quoted should be in Indian currency only for the units specified against the Equipment/ Machineries/ Laboratory Articles and payment will be made in Indian currency only.
14. Government of India, DGS&D and Government of Puducherry rate contracts are to be compared with lowest price offered by the supplier through tender.
15. Installation and demonstration of Equipment/ Machineries/ Laboratory Articles should be done by the successful bidder at Institution premises at free of cost. Technical Reference and

User Manuals are to be supplied for the Equipment/ Machineries/ Laboratory Articles on free of cost.

16. The Equipment/ Machineries/ Laboratory Articles supplied shall be guaranteed for satisfactory working performance for a period of at least 12 months from the date of supply/ commissioning. Any defects noticed during this period shall be rectified at free of cost to the complete satisfaction of the Institution. If the damage is more and the Equipment/ Machineries/ Laboratory Articles is not functioning properly at the time of installation, then the entire Equipment/ Machineries/ Laboratory Articles must be replaced with a new one.
17. The requirements of Equipment/ Machineries/ Laboratory Articles found in this Tender Schedule are only approximate. The bidder should undertake to supply those requirements in excess or lesser to those specified in the schedule, as per the actual requirement of the Institution.
18. The order will be placed with the successful bidders for the supply of Equipment/ Machineries/ Laboratory Articles. The supply should be made at the supplier's own risk. In case of damages and breakages, if found in transit, the Equipment/ Machineries/ Laboratory Articles, thereof should be replaced.
19. Acceptance of the tender will rest with the Principal, Women's Polytechnic College, Puducherry, who does not bind herself to accept the lowest tender and reserves to herself the authority to reject any or all the tenders received without assigning any reasons. The Principal has the power to accept the Equipment/ Machineries/ Laboratory Articles of higher cost, if they are of reputed make and are as per the specifications. The decision of the Principal, Women's Polytechnic College, Puducherry in all matters relating to this Tender Schedule shall be final and conclusive. In case of any dispute, Puducherry shall be the place of jurisdiction.
20. The tender shall be submitted only if the bidder is agreeable to all the Terms and Conditions of this Tender Schedule, which includes the Description and Specifications of the Equipment/ Machineries/ Laboratory Articles mentioned therein. Irrespective of the Terms and Conditions that may have been specified by the bidder, only the Terms and Conditions specified in this Tender Document will be binding on the Bidder and the Tendering Authority.

21. The Technical Bid Cover is to be submitted to “The Principal, Women’s Polytechnic College, Puducherry”, with the following documents:

- a. Annexure-I, as per the format enclosed.
- b. **Demand drafts towards tender fee ₹525/-and E.M.D. amount of ₹17,350/- (Rupees Seventeen thousand three hundred and fifty only), drawn in favour of the Principal, Women’s Polytechnic College, Puducherry.**
- c. Declaration as given in the next para 22.
- d. Technical details of Equipment/ Machineries/ Laboratory Articles with Make and Model No., supported by pamphlets and catalogues etc.

**It is mandatory for the Bidder to upload the scanned copies of the above documents.**

22. The bidders shall furnish a declaration as given below in token of acceptance of all the Terms and Conditions of this tender. Otherwise, the tender will be rejected.

#### **DECLARATION**

***“I/We .....[Name of the firm / proprietor], the undersigned hereby solemnly declare that the Terms and Conditions of Tender Schedule-I: Supply of Equipment/ Machineries/ Laboratory Articles for Department of Architectural Assistantship of Women’s Polytechnic College, Puducherry, under Centrally Sponsored Scheme of MHRD - Up-gradation of Existing Polytechnics are accepted and that in the event of selection of my / our rates, the Equipment/ Machineries/ Laboratory Articles will be supplied within the stipulated period.”***

**SIGNATURE OF THE BIDDER  
(AUTHORIZED SIGNATORY)**

23. The Financial Bid shall contain the Tender offer form (BoQ). This bid shall contain only the price list. Any discrepancy in this regard will cause the rejection of the price list.

24. If the bidder is not willing to quote for any item, the appropriate columns shall be left blank. Financial Bid (Bill of quantities –BoQ) of the qualified bidders will be opened on the prescribed date. The qualified bidders in Technical bid will be informed through e-mail.

25. The rates quoted should be only as per the unit printed in the schedule and should be valid for a period of one year from the date of opening of the tender.
26. The bid validity period is 180 days and the successful bidder must supply the materials within a period of 30 days from the date of the supply order.
27. In case any Equipment/ Machineries/ Laboratory Articles present in the list are found to be covered under DGS&D rate contract or in the quoting of the Government of India/ Government of India undertaking firms, such Equipment/ Machineries/ Laboratory Articles will not be considered through this tender.
28. Copies of any document submitted along with tender including Xerox copies, should be clear and legible. If the required certificates are in a language other than English, attested copy of English version should be furnished for verification and record.
29. Entry to participate in the Tender Opening Committee Meeting is restricted only to bonafide bidders or one of their Authorized Representatives. The bidders or their Authorized Representative who are present shall produce the authorization letter and sign in the Attendance register evidencing their presence during the opening of the tenders.
30. The bidder or their Authorized Representative who are present shall not bring mobile phones to the venue of tender opening.
31. In the event of tender opening date, being declared as a holiday for the office of the tendering authority, the due date for submission of tender and opening of tender will be the next working day at the same time.
32. The bidder shall bear all costs associated with the preparation and submission of tender and this institution will in no case be responsible or liable for these costs, regardless of the outcome of the tendering process.
33. Specification and requirements of Equipment/ Machineries/ Laboratory Articles is available in **Annexure-II**. The quantity of stores (Equipment/ Machineries/ Laboratory Articles) indicated in the schedule is only tentative and approximate. This institution has the right to increase or decrease the quantity required of any Equipment/ Machineries/ Laboratory Articles.

34. The Principal, Women's Polytechnic College, Puducherry is vested with powers to cancel or revoke the Supply order without assigning any reason therefor, if the Supplier fails to effect the supply in conformity with the terms and conditions mentioned in this tender schedule and supply order.
35. The Equipment/ Machineries/ Laboratory Articles should be delivered to Women's Polytechnic College, Puducherry on receipt of supply order or as per the delivery schedule in the supply order. The Bidder/ Supplier shall take back rejected Equipment/ Machineries/ Laboratory Articles within 7 days from the date of communication. If the Bidder/ Supplier fail to remove the rejected stores within the specified period, the same will be disposed off by the Principal, Women's Polytechnic College, Puducherry.
36. The bidder shall submit the bill of cost in triplicate along with an advanced stamped receipt immediately after execution of the supply order for arranging payment. The payment will be made on receipt of said Equipment/ Machineries/ Laboratory Articles at site, in good condition subject to fulfillment of all other terms and conditions.
37. Payment shall be made only after executing the supply order to the entire satisfaction of the Institution. No advance payment will be made under any circumstances.
38. The Bidder shall mention the Address for Communication with Landline/ Mobile Phone number and E-mail I.D. for informing the status of Technical bid.

**G. RANI  
PRINCIPAL**

**ANNEXURE-I  
TECHNICAL BID**

From

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.....,  
.....,  
.....  
Phone No.:.....  
Mobile Phone No.:.....  
E-mail I.D.:.....

To

The Principal,  
Women's Polytechnic College,  
Lawspet, Puducherry – 605 008.

Sir,

Sub: Technical Bid for the "**Tender Schedule-I: Supply of Equipment/ Machineries/ Laboratory Articles for Department of Architectural Assistantship of Women's Polytechnic College, Puducherry, under Centrally Sponsored Scheme of MHRD - Up-gradation of Existing Polytechnics**" – Submitted – Reg.

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I/ We submit herewith the Technical Bid through on-line for the "**Tender Schedule-I: Supply of Equipment/ Machineries/ Laboratory Articles for Department of Architectural Assistantship of Women's Polytechnic College, Puducherry, under Centrally Sponsored Scheme of MHRD - Up-gradation of Existing Polytechnics**" with the following documents for consideration.

1. Scanned Copy of D.D. towards tender fee for ₹525/-.
2. Scanned Copy of D.D. towards E.M.D. amount of ₹17,350/-.
3. Declaration of the Bidder.
4. Scanned copies of Catalogues/ Technical pamphlets of items to be supplied with make and model details.

Yours faithfully,

(AUTHORIZED SIGNATORY)

Encl. as above.

*[N.B. The Bidder should submit the copy of the Technical Bid as per Annexure-I and copies of proof for payment of tender fee and E.M.D. amount etc. to the Principal, Women's Polytechnic College, Puducherry before 26-4-2017@12.00 noon]*



## ANNEXURE-II

### Tender Schedule-I: Supply of Equipment/ Machineries/ Laboratory Articles for Department of Architectural Assistantship of Women's Polytechnic College, Puducherry, under Centrally Sponsored Scheme of MHRD - Up-gradation of Existing Polytechnics

SL. No.	ITEM WITH SPECIFICATION	QUANTITY
1	<b><u>DRAFTING TABLE WITH CHAIR:</u></b> Cam design drawing stand with angle and height adjustment for A1 SIZE made from ms tubular section of size 20mmX20mm as frame and legs of size 35mm x 20 mm and internal thickness of 18 gauge and finished with powder coating of desired colour, 30"x42" laminated drawing board along with a T Scale 42" with marking and a Set of set square of size 10" x 12" with revolving chair as instructed.	46 Nos.
2	<b><u>PLUMBING SERVICES MODEL: European Water Closet:</u></b> Supplying and installation of European Water Closet (EWC) over a platform of size 3'x4.5' and raised by 6" made out of marine plywood of 20 mm thickness connected with 4" diameter PVC pipe line of 0.6m length with a "T" Joint with flushing tank, abultion tap (brass) with 3/4" PVC pipe connection with all specials in the space provided and as directed. The platform area shall be fixed with ceramic tile over the plywood with glue and the wall area shall be gladed with marine plywood and finished with glazed tile dadoeing to a height of 3'. The plywood shall be treated with an anti-termite coating.	1 No.
3	<b><u>PLUMBING SERVICES MODEL: Indian Water Closet:</u></b> Supplying and installation of Indian Water Closet (IWC-Orissa pan) with a "P" trap over a platform of size 3'X4.5' and raised by 6" made out of marine plywood of 20 mm thickness connected with 4" diameter PVC pipe line of 0.6m length with a " T" Joint with 1/2" flushing valve, fausset with 3/4" PVC pipe connection with all specials in the space provided and as directed. The platform area shall be fixed with ceramic tile over the plywood with glue and the wall area shall be gladed with marine plywood and finished with glazed tile dadoeing to a height of 3'. The plywood shall be treated with anti-termite coating.	1 No.
4	<b><u>PLUMBING SERVICES MODEL: Bath Room arrangement:</u></b> Wall Mounted Mixer Tap, Shower, floor trap arrangement on one corner of the plywood platform of size 3'x3' raised by 6" made out of marine plywood of thickness 20mm and treated with a anti-termite coating. A plywood box of 12"x12"x12" as prototype model of Geyser are connected with 3/4" UPVC pipe line Gully trap model in waterproof plywood of 1" thickness of size 9"x9"x12".	1 No.
5	<b><u>PLUMBING SERVICES MODEL: Kitchen Arrangement:</u></b> Modular Kitchen arrangement in a space of 3mX3m with "L" type arrangement with the following technical specifications and as directed and all products to be ISI certified. <b>Work top:</b> To be finished to a height of 75cm with granite of 18mm thick. Cabinet below the work top are to be covered with panel doors and drawers. The cabinets and drawers are to be made of 18mm thick water proof plywood and finished with laminates. <b>Sink:</b> Single bowl stainless steel sink of 18 gauge. Plumbing accessories provided below the sink are to be covered with panel door. <b>Chimney:</b> Electrical chimney with all necessary accessories. <b>Drawers:</b> 60cm wide 25cm height with rails arranged in two compartments Wall cabinet: Kitchen wall cabinet of size 120cm wide 75cm height and 40cm depth are	1 No.



	<p>to be provided.</p> <p><b>Hardware:</b> Handles, hinges and all other hardware required are to be made of stainless steel.</p> <p><b>Trolleys and Trays:</b> Two numbers of trolleys and two number of trays are to be accommodated in the cabinets to keep the utensils.</p>	
6	<p><b><u>PLUMBING SERVICES MODEL:</u></b> Septic Tank Arrangement in Miniature size: 1m length x 0.5m width x 0.6m depth with a base and cover slab in water proof plywood of 1" thickness, "T" Joints-2 nos. for inlet and outlet, waffle slab made out of plywood of 0.5m length x 0.2 m width, soak pit 0.6m diameter plastic drum or bucket. All the accessories are to be connected with 1" PVC pipe lines.</p> <p><b>Septic tank Model:</b> Septic tank model made of water proof plywood and dimensions for a size of 2.5mx1.5mx2m (scaled down to half full size).</p>	1 No.
7	<p><b><u>ELECTRICAL ACCESSORIES MODEL</u></b></p> <p>Electrical Services layout Model: Supplying and installation of the following-Main Board Cabinet of 2'0"x1'6" in Metal Box, Three Phase Energy meter 10-20 amps, Porcelain Fuse of 32 amps-3 nos., Fuse Carrier Box, Phase changer of 20 amps-3 nos., Main switch-1 no., Phase indicator -3 nos., Miniature Circuit Breaker (MCB)- 15 nos., Distribution Board in Metal box like cabinet, Main MCB switch- 4 Pole, single phase MCB switch 20 amps- two pole, Service Electrical wires in Aluminum -5 sq.mm -one coil, Service Electrical wire in Aluminum - 7.5 sq.mm of 5m, Earthing wire in Copper 7.5 sq.mm of 5m, Copper plate 60cmx60cm of 0.3cm thickness connected with ½" dia. copper tube, 1.5 sq.mm electrical wire of 4 coils in three different colours like red, yellow, blue and black, 2.5 sq.mm electrical wire of 4 coils in three different colours like red, yellow, blue and black, 4 sq.mm electrical wire of 20mts. (2 x 10mts.) in two different colours, Inverter, Tubular Battery of 165 AMPH, Junction Box in PVC- 5 nos., PVC tube of ¾" of 10 length, Elbow and Bend of ¾" - each 10 nos., Ceiling Rose in PVC- 5 nos., Ceiling fan Clamp in Metal - 2 nos. and Ceiling Clamp in PVC - 2 nos., Ceiling plate in PVC- 3 nos., Button Holder- 2 nos., Angle Holder – 2 nos., Fluorescent lamp 1.2m length holder (Luminaire), Metal Switch boxes with cover plate one in each 8 model, 6 model, 3 model &amp; 1 model, 5 amps Switches- 20 nos., Two way switches 5 amps - 5 nos., 5 amps socket- 3 nos., 5 amps two pins 1 no. , 5 amps three pins- 1 no., 5 amps electronic model fan regulator, Calling Bell along with switch- 1 no., LED lamp (Skirting)-- 3 model, LED lamp (Ceiling mounted) - 1 no., 15 amps switches- 3 nos., 15 amps Socket- 3 nos., False ceiling twin tube light holder along with lamp 40 watts, False ceiling CFL 40 watts lamp fittings, Multi meter, Volt meter, Ammeter, Tester- 2 nos., Hand glove- 3 sets, AC plug- 2 nos., stabilizer, GI "u" clamp ¾" - 25 nos., cutting player, Wire sleever, Screw Driver set- Box Type.</p>	1 set
8	<p><b><u>MODEL OF AUTOMATIC OVERHEAD WATER TANK CONTROLLING SYSTEM:</u></b></p> <p>Supply and installation of Automatic Overhead tank controller system: Automatic overhead tank controller system, PVC water tank of 500 litres - 1 no. (as Sump), triple layered cpvc water tank of 500 litres - 1 no. (as overhead tank), Electric motor 0.5 HP- 1 no., Foot valve, Bip cock- 2 nos., Brass half-turn Valves of ¾" - 2 nos., with all necessary electrical connections.</p>	1 No.

9	<p><b><u>SOLAR PANEL MODELS:</u></b></p> <p><b>Solar panel</b>-Maximum power voltage: 4.0V Maximum power current: 100.0mA Dimension: 70*65*3.2mm.</p> <p><b>Mechanical Characteristics</b> – 1. Mono-crystalline Silicon solar cells, 2. Encapsulated: PC film lamination.</p> <p><b>Technical characteristics</b>-(STC Standard Testing Condition: 1000W/M2 AM1.5, 25°C.)</p> <p><b>Description of Goods Technical Spec:</b>Open Circuit Voltage(<math>V_{oc}</math>) -4.6V<math>\pm</math>8%, Short Circuit Current (<math>I_{sc}</math>) -105mA<math>\pm</math>8%,Maximum Power Voltage(<math>V_{mp}</math>)-4.0V<math>\pm</math>8%, Maximum Power Current(<math>I_{mp}</math>) - 00.0mA<math>\pm</math>8% Maximum Power(<math>P_{pm}</math>) - 0.4W<math>\pm</math>8%</p>	1 No.
10	<p><b><u>SOLAR WATER HEATER (ETC):Solar Evacuated tubes collector specifications (ETC collectors as approved from MNRE):</u></b></p> <p><b><u>A. INNER TANK MATERIAL:</u></b>a) Stainless Steel SS 316 &amp; b) SS304-2B (22SWG), <b><u>B. HOT WATER TANK INSULATION DENSITY:</u></b>a) High Density injected PUF insulation: 50mm &amp; b) High des PUF (poly urethane foam) Installation of 50mm thickness between inner outer tank ensures maximum heat retention ever season (maximum up to 72 hours), <b><u>C. TANK STAND AND SUPPORTS:</u></b>Mild Steel with suitable anti corrosive coating, <b><u>D. WORKING PRESSURE OF THE SYSTEM:</u></b>Normal, Gravity Feed, Less than 1 Kg/cm<sup>2</sup>&amp; Recommended Operating Pressure:10 Bars, <b><u>E. TANK TEST PRESSURE:</u></b>Factory Pressure Tested for 2 Kgs/Cm<sup>2</sup>.<b><u>F. SOLAR EVACUATED TUBE DIMENSION:</u></b>a) Double walled glass Outer Tube Dia. 47+0.7mm, tube length-1500+5mm. &amp; Inner Diameter: 33.4mm &amp; b) Thickness of tube at least 1.60 mm., <b><u>G. TUBE ASSEMBLING FRAME:</u></b>Mild steel section with PP coating, <b><u>H. TUBE ASSEMBLING FRAME SIZE:</u></b>Length-2.10mts. Width-3.20mts, Height-1.50mts.<b><u>I.Cold water tank:</u></b> 2.4mts. From the terrace level. <b><u>J.BACK UP PROVIDE:</u></b> a. Electrical heaters: 1.5kW thermostat <b><u>K.TUBE COATING:</u></b> Copper coated tubes with selective absorptive coating Graded Al-N <b><u>L.GASKET FOR FLANGES:</u></b>3 mm thick gasket of Neoprene/synthetic rubber gasket shall be used for sealing the joints between flanges <b><u>M.COLLECTOR SUPPORT FRAME:</u></b>The structure should be in a position of withstand a wind velocity of 100kms./hr. shall be made with angle iron of 35mmx35mmx4mm; will have vertical support at top and bottom edge of the inclined plane of the collector at a distance of 1.5M or less. The vertical support shall be firmly grouted with the roof. <b><u>N.PAINTING OF STANDS:</u></b> Proper cleaning and degreasing of the surface should be done with the help of three in one Solution before painting. Two coats of zinc chromate red oxide primer shall be applied followed by two coats of enamel paint of suitable Colour as per NIT. <b><u>O.STORAGE TANK (HOT WATER):</u></b>a) Material --Stainless Steel (SS 316/ IS 1730 grade), <b><u>P. THICKNESS:</u></b>Minimum thickness Tank capacity --- 20 gauge (0.91mm)for 100 lpd, 20 gauge (0.91mm)for 200 lpd, 20 gauge (0.91mm)for 500 lpd, 18 gauge (1.2mm) for 1000 lpd, 18 gauge (1.2mm) for 1500 lpd, 18 gauge (1.6mm) for 2000 lpd, 16 gauge (1.6mm) for 3000 lpd, 16 gauge (2.0mm) for 4000 lpd, 16 gauge (2.0mm) for 5000 lpd, <b><u>Q. INSULATION AND INSTALLATION:</u></b>All sockets and internal fittings of the tanks should be of stainless steel.100 mm thick insulation of 48 kg/cu.m. Density having approx. k value_0.03 W/mk and R value 3.34 sq.m. deg.C/W to withstand a temp. of 250deg.c.Thin polythene sheet shall be used as covering between the glass wool and the cladding sheet besides the retaining material such as chicken mesh etc. Aluminum sheet of thickness 24 SWG shall be used for cladding the tank insulation. The storage tank shall be properly installed at site using enameled coated appropriate size angle iron stands, girder, cement concrete pedestals of 1:2:3 ratio or any other specific provision suitable to site.To ensure the stability against heavy storm etc. but not less than 1'x1'x6" dimensions. External of the tank should be</p>	1 No.

	<p>properly insulated so that hot watertemperature does not decrease by more than 5 deg.C in about 16 hrs. Times. <b><u>R.PIPING:</u></b>a) Material Medium class (B class) GI as per IS 1239 shall be used for piping. b) Insulation---25mm thick insulation of 48kg/cu.m. density and K value+0.03 W/MK R value+1.67 sq.m. C/W to withstand and temp. of 250 deg. C be used. Thin plastic sheet shall be used as covering between glass wool and aluminum cladding besides other retaining material like chicken mesh etc.26 SWG thick aluminium sheet shall be used for cladding the insulated pipe. The pipe line should be properly supported and fixed with clamp with the help of suitable size stand/civil structure (cement concrete ratio 1:1.5:3) ISI mark strainer of standard make should be fitted in the main cold water supply line before the system.<b><u>S. VALVES/NIPPLE/TESS/BEND</u></b> -Gun metal valve ISI marked shall be used. Nipple/tees and bends of ISI marked of medium class GI (B class) shall be used. Air vents in each row are to be provided. <b><u>T. INSTRUMENTATION</u></b>-Temperature gauge: 1 No. (for Hot Water Storage Tank/Outlet), Gun metal strainer: 1 No. (at Cold Water inlet) Water meter -1 at the inlet of cold water tank. Maximum 2 nos. Of chrome plated brass taps for systems up to 200 LPD thereafter 1 tap per 200 LPD superior qualities for distribution line. <b><u>U. SYSTEM LAYOUT &amp; DESIGN</u></b>-Maximum number of collectors in series should not be more than ten. Maximum number of collectors in parallel in one rowwithout the use of any piping connections should not be more than six. Air venting at appropriate places without hindrance of a spring leaded valve to prevent air locking in the system should be provided. For this purpose, the system shall have, at a suitable point, atmospheric pressure conditions preferably in the high temperature zone. System shall have a suitable expansion/make up tank at a high point in the system to ensure that collectors run full all the times. Capacity of this expansion/make up tank should be 1.5% of the system capacity for all systems &amp; <b><u>V. ELECTRICAL BACK UP</u></b> (only upto 1000 lpd) -- For 100 lpd - 2 KW – Rate shall be quoted for 100lpd.</p>	
11	<p><b><u>SOLAR COOKER:</u></b></p> <p>A. <b><u>Solar parabolic dish cooker – 1 No.:</u></b> Dish solar cooker should have an aperture diameter of 1.4 meter and focal length 0.28 meter. The reflecting material used for fabrication of this cooker shall be of anodized aluminum sheet which has a reflectivity of over 80%. The tracking of the cooker shall be manual and should have the provisions to be adjusted in 15 to 20 minutes during cooking time. It should have a delivering power of about 0.6 KW which can boil 2 to 3 liters of water in half an hour. The temperature achieved at the bottom of the vessel could be around 350 to 400 deg C which is sufficient for roasting, frying and boiling.</p> <p>B. <b><u>Solar box type cooker – 1 No.:</u></b>Size of the cooker UV resistant molded fiberglass body 540x 540 x 200 mm. Cooking Capacity 2 Kg. or 6-8 Kg per day, Total weight Approx. Ten Kg including cooking pots. Tray Material &amp; coating Aluminum sheet, black painted of high absorption and low emission. Cooking pots -- Aluminum, hard black coated cooking pots with lid. Thermal performance F1 &gt;= 0.12, F2 &gt; 0.4 [GRADE 'A' as per Indian Standard specifications].</p>	1 set

12	<b>GPS</b> hand held with GIS software for adding maps and surveying facilities Accuracy < 2 meters on screen mapping should be possible and screen should perform under different light conditions With Barometric altimeter, Batteries: Duration 24 hr Waterproof and durable. Dedicated GPS units should cope with rain. Touch screen type, included electronic compass Should have external memory card facility, USB Interface.	1 No.
13	<b>THEODOLITE:</b> <b>Standard Vernier Theodolite</b> with erect image, optical plummet alongwith Aluminium stand and with the following specifications in wooden box: - Accuracy 20 seconds, length - 178mm, Effective Aperture - 38mm, Magnification 30X, Short focus - 1.5m, stadia ratio 1:100, additive constant - 0, resolving power 4", circle diameter -113 mm, graduation - 10', vernier reading - 20", plate level sensitivity -45'/2mm, vertical circle level - 1'/2mm with tripod stand and other accessories. - Erect Image using prisms. - Optical plummet system embedded in circle. - Dark blue coated lenses. - Steel axis with ball bearings. - Circles made from pure silver. - Carrying case.	1 No.