

# **Association of State Road Transport Undertakings**



**SUPPLY, INSTALLATION,  
TESTING AND COMMISSIONING OF  
10KWP GRID CONNECTED  
SOLAR PHOTOVOLTAIC POWER PLANT**

**AT**

**ASRTU Bhawan,  
Plot No.4-A, PSP Block, Pocket- 14, Sector-8, Dwarka, New Delhi – 110077**

# **Design, Supply, Installation, Testing and Commissioning of 10KW Ground Model Solar Photo Voltaic Power Plant aggregated capacity with Five Years of Comprehensive Maintenance Contract**

## **1. INTRODUCTION**

**Association of State Road Transport Undertakings (ASRTU)** represents 62 Public Sector Bus Transport Organizations (STUs) in India for their common aims & objectives related to public bus transport system. Its member STUs own nearly 1.5 lakh buses and purchase spares worth about Rs.2500 crores a year. ASRTU also invites National Competitive Bids and concludes Rate Contracts (RCs) for automobile spares and accessories in common use with all the STUs. **ASRTU's policy is to encourage quality and competition, hence inviting tenders from OE suppliers exclusively.**

**ASRTU** at present has an average power demand of around 80-90 kW and peak demand of 100 kW and imports grid power from DISCOM at 11 kV substation.

**ASRTU** plans to generate solar power by installing a 10 kWp capacity Ground Model Solar PV power plant.

### **AIM OF THE DOCUMENT**

The purpose of this document is to propose a Solar Grid Connected Power Plant System of 10kWp capacity. The document is aimed giving details of Design, Engineering, Manufacture, Installation, Testing and Commissioning of 10kWp System.

### **SYSTEM DESCRIPTION**

The Solar Array comprises of Solar Modules that generate DC electricity in proportion to the amount of sunlight available, generating the most power on a clear day when the sun is at a normal angle to the Solar Array. The DC power produced from Solar Array is fed in to an ACDB through a Solar PCU (Inverter + Charge controller) for distribution. This energy will be utilized to operate the AC applicable loads. The Solar Array is anchored to the ground using structures and equipment supplied by INSTALLER. The grid connects system runs in parallel to the grid rather than separate to it, supplements the electric energy generated from solar during sunny days thus saves the conventional energy. The Solar Array comprises of Solar Modules interconnected electrically in series and parallel. These Solar Modules are fastened to a support structure, which is fixed on to the Roof / Ground with Concrete foundations.

The Solar Module's electrical output cables are fixed at site for a sealed, electrical connection between the modules.

## **2. INTENT OF SPECIFICATION**

Intent of the specification is to describe the requirement of ASRTU for procurement and installation of equipments, civil works and other auxiliary and support facilities and to provide techno-commercial inputs to bidders to enable them to prepare and submit their best offer to meet this requirement. The specification intends to cover the design, engineering, manufacture, supply, transportation, un-loading, storage, in-plant transportation to site from stores, erection, testing & commissioning and performance guarantee and enabling work as encountered during execution of work

Relevant details necessary for preparation and submission of best offers are included in the subsequent sections of this Technical Specifications. However the bidders are free to suggest any superior technology/ practices where ever required, with full details, as an alternative

The specification shall be read in totality and the bid shall be prepared accordingly. The bidders shall consider and include in their offer any equipment/ system / service not specifically mentioned in this specification but essential for the completeness of the project in all respects as envisaged by ASRTU.

### 3. SCOPE OF WORKS AND SERVICES

Scope of Supply & Work includes Design, Engineering, Manufacture, Procurement & Supply of equipment and materials; testing at manufacturers works, inspection, packing and forwarding, unloading at site, associated civil works, services, permits, installation and incidentals, erection, testing and commissioning of 10KWp Grid tied Solar PV Power Plant with associated equipments and materials on turnkey basis in ASRTU, New Delhi. The equipment and materials for 10KWp Grid tied Solar PV Power Plant with associated system shall include but not be limited to the Design, Supply, Erection, and Testing & Commissioning of the following equipments and sub-systems:

- Solar PV modules including mounting frames, Mounting structures, foundation bolts and nuts for holding structures and module inter connection, Array Junction boxes / String combiner Box with surge protection and monitoring system.
- Power Control Unit including MPPT and synchronizing facility at 415V,50Hz
- AC Distribution Board
- Auxiliary AC & DC power system for control and protection system for the total plant complex including Battery and Battery charger.
- Plant Monitoring Desk
- Monitoring system for all electrical parameters of the solar PV plant
- Solar Observatory/Weather Monitoring system to check Solar Irradiation, Wind Speed & Ambient Temperature
- Protection and Metering system for the complete installation including Meters, Relays and other associated devices
- Earthing and Lightning Protection system for the complete installation
- AC/DC Power and Control Cables and accessories
- Communication system with existing plant installations and control rooms
- Nomenclature, Danger Plates, Name Plate, Instructions etc.
- Civil works including, foundations, electrical control building, Boundary/fencing & gate, roads and drains etc. Dewatering system for the entire power plant.
- There should be provision for the project to be extended to 20KW in future.

#### **Scope of the successful bidder shall also include:**

- Site Survey, Measurement of solar insolation and other relevant parameters required for design of the system etc.
- Complete Design, engineering, preparation and submission of drawings Equipment and material specification preparation.
- Procurement and expediting of all supplies and Delivery of equipment and material to job site.
- Pre-commissioning & Commissioning of all supplied Equipments and Test running of Grid Connect Solar Power Plant.
- Any other items not specifically mentioned in the specification but which are required for erection, testing and commissioning and satisfactory operation of the solar power plant are deemed to be included in the scope of the specification unless specifically excluded on turnkey basis.
- Provision of Safety items like hand gloves, shock treatment charts, rubber mats, danger/caution boards.
- Supply of all commissioning spares and Supply of special tools and tackles
- Project management including project administration, project coordination, scheduling, progress reporting to employer.
- Adhering to safety practices during erection, commissioning and subsequent operation and maintenance of the system including fire prevention.
- There should be provision to extend the project up to 20 KW in future.

## 4. SYSTEM PHILOSOPHY AND DESIGN CONSIDERATIONS

### System Philosophy

- The solar power generation system of 10KW is required to generate a min of 15,000 kWh of solar energy in the first year of operation, subject to power outage pattern, site and weather conditions. The bidder shall design the major components and sub-systems accordingly.
- The power generation guarantee has to be done by applying liberal de-rating factors for the array and recognizing the efficiency parameters of PCUs, transformers, etc. The output at Inverter (s) will be considered for verification of power generation.
- The bidder shall study the site condition, estimate/measure solar radiation etc. and shall design as well as size the power plant to achieve the specified annual energy generation in the first year and subsequent years as specified under NMGG clause. He shall use adequate capacity of SPV module, PCUs, Junction boxes etc to ensure generation of power accordingly. Number and rating of solar panels shall be designed accordingly
- **The bidder should visit the site to assess the suitability and sufficiency of the space available for the project.**
- Number of solar photovoltaic panels shall be decided based on the system rating. The panels shall be connected in arrays and strings. As per design of bidder the SPV array/ string may consist of number of SPV modules that directly produces DC electricity power on receipt of solar irradiation. This DC power shall be converted to AC power by requisite designed capacity of inverters.
- The bidder shall design the solar power system in such a way that System controller/MPPT of Inverters have ability to harvest the maximum possible Solar power generation to be exported to the Grid
- The Bidder has to choose solar generation technology using Mono/Poly-Crystalline Silicon Solar Modules manufactured in India of reputed make.

## 5. SYSTEM CONFIGURATIONS

### **PV MODULES**

- SPV Poly-crystalline modules (**Manufactured in India**) to be supplied should have minimum declared output of 240Wp or more. Number of modules to be supplied shall be worked out accordingly. The power tolerance of each module shall be  $\pm 5\%$ . **Supply of 10 kWp Multi Crystalline PV Solar modules, modules complies IEC 61215 Wp, 60 cells**  
**Dimension : 1680mm x 1000mm x 50mm (approximately)**  
**Module weight: 23 kgs approximate  $\pm 1\%$  allowance is allowed.**  
**Solar Photovoltaic module efficiency greater than 15% (to be certified by third party)**
- Module shall have a conversion efficiency of greater than 15 % at Standard test conditions (STC).
- Cells used in offered module should of reputed make. Photo conversion efficiency of SPV Cell should be greater than 17% at STC.
- No. of cells per module shall be 60.

- The module frame shall be made of anodized aluminium or corrosion resistant material, which shall be electrically compatible with the structural material used for mounting the modules.
- Solar modules offered shall be certified as per IEC 61215 and qualify IEC 61730 and IEC61701 amended up to date or equivalent Standard
- SPV module shall contain mono/poly-crystalline high power silicon solar cells. The solar cell shall have surface anti-reflective coating to help to absorb more light in all weather conditions.
- Solar PV module array shall consist of high efficiency Solar Modules utilizing mono/Poly Crystalline Silicon Solar PV cells. Individual Solar Module rating shall not be less than 240Wp at Standard test conditions. Bigger watt size Solar PV module will be preferred (more than 240Wp).
- Solar module shall be laminated using lamination technology using established polymer (EVA).
- The solar modules shall have suitable encapsulation and sealing arrangements to protect the silicon cells from the environment. The arrangement and the material of encapsulation shall be compatible with the thermal expansion properties of the Silicon cells and the module framing arrangement/material. The encapsulation arrangement shall ensure complete moisture proofing during life of the solar modules.
- The Module shall be made of high transmittance glass front surface giving high encapsulation gain
- Module rating is considered under standard test conditions, however Solar Modules shall be designed to operate and perform under site condition including high temperature & dust (sometimes)
- All materials used shall be having a proven history of reliable, light weight and stable operation in external outdoor applications and shall have service life of 25 years.
- Solar PV Module design shall conform to following requirement :
  - Weather proof DC rated MC connector and a lead cable coming out as a part of the module, making connections easier and secure, not allowing for any loose connections.
  - Resistant of water, abrasion, hail impact, humidity & other environment factor for the worst situation at site.
  - The PV junction box shall be IP65 and shall have sufficient bypass diodes to avoid shadowing effects.
- The offered Solar module should give 90% output of rated capacity for first 10 years, 80% output of rated capacity for 25 years.
- The fill factor of module shall not be less than 0.70 (typical).
- The I-V curve of each PV module with Sl. Nos. should be submitted along with Modules meeting the required specifications.
- Identification and Traceability: Each PV module used in any solar power project must use a RF identification tag. The following information must be mentioned in the RFID used on each module. This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.
  - Name of the manufacturer of PV module
  - Name of the manufacturer of Solar cells
  - Month and year of the manufacturer (Separately for Solar cell and module)
  - Country of origin (Separately for Solar cell and module)
  - I-V curve for the module

- Wattage,  $I_m$ ,  $V_m$  and FF for the module
- Unique Serial No and Model No of the module
- Date and year of obtaining IEC PV module qualification certificate
- Name of the test lab issuing IEC certificate
- Other relevant information on traceability of Solar cell and module as per ISO 9001 series

Bidder shall provide data sheet for Solar PV Module (Under Standard Testing Condition) along with their offer.

## 6. MODULE MOUNTING STRUCTURE

The module mounting structure is designed for holding suitable number of modules in series/parallel. The frames and leg assemblies of the array structures shall be made of MS hot dip galvanized of suitable sections of Angle, Channel, Tubes or any other sections conforming to IS:2062 for steel structure to meet the design criteria. All nuts & bolts considered for fastening modules with this structure shall be of very good quality of Stainless Steel. The array structure shall be designed in such a way that it will occupy minimum space without sacrificing the output from SPV panels at the same time it shall withstand severe wind speed up to maximum 100Kmph.

- The Module structure design shall be appropriate and innovative. The bidder may choose to offer module mounting structure as per their design/ economics.
- The module alignment and tilt angle shall be calculated to provide the maximum annual energy output. This shall be decided based on the location of array installation.
- The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement.
- The structures shall be fixed to the foundation in such a manner that, in future if required they can be easily relocated to a different foundation.
- The mounting structure shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the base properly.
- The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.
- Nut & bolts, supporting structures including Module Mounting Structures shall have to be adequately protected from atmosphere and weather prevailing in the area.
- All fasteners shall be of stainless steel of grade SS 304/404 or superior.
- The Mounting structure shall be grounded properly using GI strips and maintenance free earthing kit.
- The support structure & foundation shall be so designed to withstand speed for wind zone of the location as given in relevant Indian wind load codes/ standards.
- SPV module mounting structure shall be fixed type with provision of manual correction in tilt angle which shall be made after every 3 months to get maximum output.
- Hot dipped Galvanized Steel Structural with minimum 70 microns of galvanization must be considered for all type of structural steel proposed for the power plant
- Design drawings with material selected shall be submitted for prior approval of the employer.
- The bidder/manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings.

## 7. INVERTERS / POWER CONDITIONING UNIT (PCU)

The PCU shall consist of in-built charge controller and bi-directional inverter to supply continuous power to the dedicated load with support to the load coming either from the solar array, battery bank, Grid Power in order of preference. The sine wave inverter shall generate a sinusoidal AC voltage with an exceptionally precise voltage and stabilized frequency. The inverter shall be protected against overload and short circuit.

- Inverter/PCU shall be centralized grid tied in nature, shall consist of MPPT controller, inverter shall be decided based on array design/suitable rating in case of string design, associated control and protection devices etc all integrated into PCU. It shall provide necessary protections for Grid Synchronization. The Inverters should convert DC power produced by SPV modules into AC power and must synchronize automatically its AC output to the exact AC Voltage and frequency of Grid.
  - The DC energy produced has to be utilized to maximum and supplied to the bus for inverting to AC voltage to extract maximum energy from solar array and provides 3-ph, 400V AC/ (+10% to – 10%), 50-60 Hz with total harmonic voltage distortion less than 2% to synchronize with local grid .
  - The Inverters shall be of very high quality having efficiency not less than 97% and shall be capable of running in integrated mode.
  - The Inverters should be designed to be completely compatible with the SPV array voltage and Grid supply voltage.
  - The dimension, weight, foundation details etc. of the PCU shall be clearly indicated in the detailed technical specification.
  - The PCU shall be capable of complete automatic operation, including wake-up, synchronization & shut down independently & automatically.
  - Both AC & DC lines shall have suitable fuses & surge arrestors and contactors to allow safe start up and shut down of the system. Fuses used in the DC circuit should be DC rated.
  - Inverters/PCU shall operate in sleeping mode when there will be no power connected.
  - Protections :
    - Over voltage both at input & output
    - Over current both at input & output
    - Over/under grid frequency
    - Heat sink over temperature
    - Short circuit
    - Protection against lightening
    - Surge arrestors to protect against Surge voltage induced at output due to external source
    - Anti- Islanding Protection
    - And other required protections
- It should have user friendly LED/LCD or touch display for programming and view on line parameters such as:
- Inverter per phase Voltage, current, kW, kVA and frequency,
  - Grid Voltage and frequency,
  - Inverter (Grid) on Line status,
  - PV panel voltage,
  - Solar charge current
  - Individual power stage heat sink and cabinet temperature,
  - Inverter Import export kWh summation
  - Solar kWh summation
  - Inverter on
  - Grid on
  - Inverter under voltage/over voltage

- Inverter over load
- Inverter over temperature
- PCU shall be capable to synchronize independently & automatically with grid power line frequency to attain synchronization and export power generated by solar plant to grid.
- The PCU shall be capable of operating in parallel with the grid utility service and shall be capable of interrupting line fault currents and line to ground fault currents.
- The PCU shall be able to withstand an unbalanced load conforming to IEC standard (+/-5% voltage) and relevant Indian electricity condition. The PCU shall include appropriate self-protective and self-diagnostic features to protect itself and the PV array from damage in the event of PCU component failure or from parameters – beyond the PCU's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the PCU, including commutation feature, shall be cleared by the PCU protective devices and not by the existing site utility grid service circuit breaker.
- The Inverter shall go to shutdown/standby mode, with its contacts open, under the following conditions before attempting an automatic restart after an appropriate time delay.
  - When the power available from the PV array is insufficient to supply the losses of the PCU, the PCU shall go to standby/shutdown mode.
  - The PCU control shall prevent excessive cycling of shut down during insufficient solar radiance.
- Operation outside the limits of power quality as described in the technical data sheet should cause the power conditioner to disconnect the grid. Additional parameters requiring automatic disconnection are
  - Over current
  - Earth fault
  - And reverse power
  - In each of the above cases, tripping time should be very less.
- Detailed technical description of the complete unit of offered Inverter should be furnished with bid document Following Technical documents of Inverter shall be supplied for approval after placement of order
  - Detailed technical description of the complete unit
  - Instructions for installation and operation
  - Electrical diagrams of all internal cabling necessary for installation, maintenance and fault finding.
  - Description of electrical and mechanical characteristics of units
  - Maintenance and fault finding procedures.
  - Safety precautions
  - Software for data monitoring with detailed description.
  - Details of data acquisition
  - Factory test reports in details on various parameters.
  - Trouble shooting procedures
  - All maintenance requirements and their schedules, including detailed instructions on how to perform each task.
  - Detailed schematics of all power instrumentation and control equipment and subsystems along with their interconnection diagrams. Schematics shall indicate wiring diagrams, their numbers and quantities, type and ratings of alt components and subsystems.
  - A detailed bill of materials which shall list components model numbers, quantities and manufacturer of each supplied item.
  - All documents and write ups shall be in English. They shall be clean and legible, and must be checked, signed, approved and dated by a competent representative of the



contractor.

- The Bidder should note that Inverters/PCU is going to be installed in an area which is prone to hot air of 48 to 55 degree centigrade. Thus the room shelter, air blower/ fan (auto operated as per requirement) if required, for Inverter will be in scope of supply. Integrated solutions into prefabricated buildings or in standard metallic container may be accepted. The Bidder shall provide data sheet for Inverter/ Power Conditioning Unit along with their offer.

## 8. STRING COMBINER BOX OR ARRAY JUNCTION BOXES

The junction boxes shall be dustproof, vermin, and waterproof and made of Thermo Plastic. The terminals shall be connected to copper bus-bar arrangement of proper sizes. The junction boxes shall have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables.

- The junction Boxes shall have suitable arrangement for the followings (typical):-
  - Combine groups of modules into independent charging sub-arrays that will be wired into the controller.
  - Provide arrangement for disconnection for each of the groups.
  - Provide a test point for each sub-group for quick fault location
  - To provide group array isolation
- The string combiner box/ junction box shall be dust, vermin, and waterproof and made of Polycarbonate Plastic
- The terminal will be connected to copper bus-bar arrangement of proper size to be provided. The junction boxes shall have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables
- Suitable markings shall be provided on the bus-bars for easy identification and cable ferrules will be fitted at the cable termination points for identification.
- The string combiner box/ junction box shall be with protection class IP 65 for mounting outside in Open weather condition.
- The string combiner box/ Array junction Box will also have suitable surge protection device.
- The current carrying ratings of the string combiner box/ junction box shall be suitable with adequate safety factor, to inter connect the Solar PV system corresponding to the project capacity, as designed by the contractor
- Necessary sensors and transducers shall be provided in the string combiner boxes to facilitate monitoring of all string parameters in the data acquisition system.
- String level remote monitoring facility shall be incorporated to monitor generation and faults at string level.

## 9. DISTRIBUTION BOARD & LT PANEL

DC Distribution panel should be provided to receive the DC output from the array field with analog measurement panel for voltage, current from different MJBs so as to check any failure in the array field. It shall have MCB/MCCBs of suitable rating for connection and disconnection of array sections. DCDB shall have CRCA/FRP/ABS. Plastic enclosure of dust & vermin proof.

AC Distribution Panel Board (DPB) shall control the AC power from inverter to three different feeders through switches; there shall also be the provision for Manual switching so that the delivered power can be controlled from centralized Push Button (PB) station which is called Plant Control Unit.

Common AC DPB shall have the arrangement for measuring all electrical quantities such as Voltage, Current, Frequency, of different feeder line & energy supplied to the different feeder. DPB shall have the provision of visual indication of existence of power input & output

through circuit diagram. Common AC DPB shall have sheet iron enclosure of dust & vermin proof & shall have adequate cooling arrangement. The bus-bars are to be made of copper of desired size.

## 10. POWER & CONTROL CABLES

The size of the cables between array interconnections, array to junction boxes, junction boxes to Charge controller etc are to be selected to keep the voltage drop and losses to the minimum.

- Power Cables of adequate rating and specification shall be supplied and installed for interconnection of :
  - Modules/panels within array
  - Array & Power Control Unit
  - Power Control Unit and the battery
  - Power control Unit to AC distribution board
  - AC distribution board PCU
  - Evacuation and transmission if required
- The power & control cables shall be 1.1/11 kv grade, heavy duty, stranded copper / Aluminum conductor, PVC insulated, galvanized steel wire/strip armored, flame retardant low smoke (FRLS) extruded PVC type ST-1 outer sheathed. The cables shall, in general conform to IS-1554 Part-I & other relevant standards.
- In addition suitable specification instrumentation and communication cables shall be supplied and installed as per design requirement.
- The permissible voltage drop at AC cables shall not be more than 2 % of peak PCU O/P voltage
- Relevant codes and operating standards shall be followed for selection and installation of all cables.
- Cables shall be laid on air or underground as per the site condition and requirement with proper installation procedures.

## SYSTEM PERFORMANCE

The system once installed at site would provide reliable, uninterrupted power supply to the AC Applicable Loads.

## TERMS & CONDITIONS :

- The final rates quoted should be after deducting all subsidies to be given by Govt., of India.
- ASRTU will not provide any assistance in providing subsidies. It is the complete responsibility of the bidder to get the subsidy.
- Regarding subsidies etc., the changes as applicable from time to time as per the G.Os issued from time to time shall apply.
- Supplier should be both Manufacturer and Implementer – **proof to be submitted.**
- Inverter efficiency should be > 97% (**certificate given by third party is to be enclosed**)
- There should be provision to extend the project to 20kWp in future.
- Panel efficiency should be > 15% (**certificate given by third party is to be enclosed**)

**Taxes** : As Applicable

**Payment:** 50% advance and balance 50% after supply , installation & commissioning.

**Transportation:** Inclusive

**Guarantee** : For SPV Modules 90% peak power generation warranty for 10 years 80% peak power generation for further 15 years period. One year for system warranty.

**AMC** : After one year of warranty period will be charged extra (quote the AMC charges for 5 years).

**Service** : Prompt after Sale Service is solicited.

**Jurisdiction** : Subject to Delhi Jurisdiction only.

**Installation &** : Inclusive

**Commissioning**

## FINANCIAL CRITERIA

- 1) The Annual turnover of the Bidder should be not less than Rs. 2 Cr for any one of the past 3 yrs starting from the Financial year 2013-14 - **proof to be submitted.**
- 2) **The EMD is Rs.20,000/- (Rupees Twenty Thousand only) should be paid at the time of Tender document submission in the form of Demand Draft drawn in favor of the” Executive Director, ASRTU, New Delhi”**
- 3) **EMD Rs.20,000/- will be released after satisfactory performance of 5 years from the date of installation.**
- 4) **In any matter the decision of ASRTU is final and binding.**
- 5) **ASRTU reserves the right to cancel the tender at any time without assigning any reasons.**

## TECHNICAL CRITERIA

- 1) Bidder should be Original Manufacturer of PV Modules with IEC 61215, 61730 & 61701 certifications in India. Consortium is not applicable. – proof to be submitted
- 2) Solar PV Module efficiency has to be greater than 15% @ STC. – proof to be submitted. A Certificate to this effect issued by third party has to be submitted.
- 3) The Company Should be an ISO 9001 -2008 & 14001 2004 Certified – proof to be submitted. (desirable)
- 4) Bidder should have successfully commissioned at least one net metering project with not less than 20kwp Grid tied solar power plant – proof to be submitted.
- 5) The firm, who has set up at least one solar power plant of minimum 20 kWp or above capacity in the premises of reputed organizations – proof to be submitted.
- 6) Successful Bidder should establish authorized service station in New Delhi. Accordingly under taking is to be given.
- 7) Certificate to the effect that the Solar Pv Modules supplied are indigenously manufactured [India] and not imported. – Proof to be submitted.
- 8) Bidders whose Certification/Registration with Govt. of India – MNRE should be valid while tendering and for atleast upto the completion of the present work.
- 9) All components should have MNRE – certification.
- 10) For Civil works, all the materials satisfying the relevant requirements as per relevant codes are to be used. For RCC works minimum M25 concrete and Fe 500 steel are to be used. Only designed concrete mixes are to be used.

## General Information :

- a) The tender conditions and formats of different forms can be seen in the ASRTU web site [www.asrtu.org](http://www.asrtu.org)
- b) Tender initiation date is on **20.05.2016**. Last date for submission of tender documents is on **10.06.2016 @ 04.00 p.m.**
- c) Both the Technical bid and financial bids along with original Demand Drafts of bid processing fee, EMD etc., are to be kept in separate envelopes and are to be sealed. Every cover should bear the tenderers complete address, along with the title of the project .
- d) The Technical bid opening date : **13.06.2016 @ 11.00 a.m. onwards**
- e) Price bid opening date : **22.06.2016 @ 11.00 a.m. onwards**
- f) All the tenderers should submit both the bids i.e., technical and price bid in separate covers. Otherwise tender will not be considered.
- g) ASRTU reserves the right to cancel the tender at anytime without assigning any reasons.
- h) Wherever efficiencies are specified certificates given by authorized third party are to be enclosed to that effect.
- i) **Any correspondence should be made in the name of the Executive Director, ASRTU, New Delhi.**