

**CO-OPERATIVE ACADEMY OF PROFESSIONAL EDUCATION  
(CAPE)**

**1<sup>st</sup> floor Co-bank Towers, Vikas bhavan P.O., Trivandrum- 695 033**

**Ph- 0471-2316236, Fax- 0471-2310049**

**Providing Lightning Protection System at College of  
Engineering, Pathanapuram**

**Tender Documents**

## **Tender Notification**

Sealed Tenders are invited from reputed financially sound Class 'A'/'B' Electrical contractors having valid license for carrying out all HT voltage Installation work issued by the Kerala State Electrical Licensing Board for carrying out the electrical wiring work with approved materials conforming to BIS standards and other Statutory Rules and Regulations at **College of Engineering, Pathanapuram** as per the detailed specifications covered in the schedule attached herewith

Offers in sealed cover superscribing 'Tender for Providing Lightning Protection System at College of Engineering, Pathanapuram' shall be sent so as to reach the office of the undersigned on or before 13.00 Hrs on 27.06.2011

The offer should contain an Registration Fee of Rs.146/- and EMD of Rs.2,174/- by way of DD in favor of 'Director CAPE' drawn on SBT payable at Thiruvananthapuram

The tender shall be opened at 15 hours on 27.06.2011

Sd/-

The Director,  
CAPE, Co.Bank Tower,  
Vikas Bhavan P.O,  
Thiruvananthapuram.

## SPECIFICATIONS

**Specifications:** The installation shall be carried out as per relevant clauses in IS 2309-1989.

The principal components of the lightning protection system will be the following.

- 1) Air Terminations – Vertical & horizontal
- 2) Down Conductors
- 3) Joints & bonds.
- 4) Test link
- 5) Earth terminations
- 6) Earth Electrodes

Horizontal conductors shall be clamped along parapets, edges of flat roofs, ridges etc as required.

Down conductor should follow the most direct path between the air terminal conductor and the earth termination. Down conductors used, shall be arranged as evenly as practicable around the outside of the walls. Where Aluminium conductors are specified, it shall be supplied in factory rolled packs.

Scaffolding necessary for fixing the conductors shall be arranged by the Contractor at his expense. Minor civil works like cutting holes in shades, slabs etc will be the responsibility of the Contractor and no extras will be paid for this. Also no extras are payable by way of taxes and Govt. levies. Deductions as per Govt. rules shall be applicable on each running account bill.

Lightning protection should not spoil the architectural beauty and aesthetics of the building. The installation shall be mechanically strong to withstand the forces produced in the event of lightning and shall be of good quality and workmanship.

**Fixing of conductor:**-Horizontal and vertical runs should be fixed with Porcelain bus bar supports- (70x35x35mm size). Conductor clamps shall be screwed to the fixing surface at intervals of 100cm for horizontal runs at 50cm intervals for vertical runs, using steel pan-head screws of sufficient strength and size. Conductor should be placed over the Porcelain support, over which an Aluminium strip is to be fixed with stainless steel nut bolt (4-6mm dia.) and S.S plain washers are to be provided.. Where dissimilar metals meet, bimetal connectors as necessary shall be used and oxide inhibiting compound applied.

**Bonding:** - Any metal forming part of the structure or any building services having metallic parts which are in contact with the general mass of the earth shall be bonded to the lightning conductor system. Joining of strips shall be made with factory made rivets after cleaning the contact surfaces thoroughly.

**Test joints:** - Each down conductor should be provided with a test link at height 1.5 M above ground.

**Earth termination:** - Each down conductor shall be connected to separate Earth Electrodes.

**Testing:-** On completion of the installation, the resistance of each earth termination shall be measured and the continuity of all conductors and soundness of all bonds and joints shall be verified.

Readings shall be recorded in the proforma as given in Appendix F of IS 2309-1989.

**Resistance:-** Each station should have a resistance not exceeding 10 ohms x the number of earth electrodes provided.

The whole system shall have a combined resistance to earth not exceeding 10 ohms before making any bondings.

If the value is above 10 ohms, it has to be reduced by installing additional earth electrodes.

**Materials:-** For horizontal runs- 99% purity Aluminium tape 25 x 3 mm size is to be used.

Vertical down conductor up to the test joint - same conductor as the horizontal. Bonding Al. to Al. shall be by factory made Aluminium rivets.

Down conductor to earth electrode from the exit of test joint- shall be 32 x 6mm. hot dip galvanized Iron strip with smooth surface finish and it should be connected to earth pipe by G.I earth clamp & G.I nut bolt, plate & spring washers.

Vertical air termination for the main Building is to be fixed above the roof of the porch which is Pyramid shaped. If necessary the Contractor has to co-ordinate with the Building Contractor to get fixed a stainless steel or G.I pipe stump of sufficient strength for mounting the vertical Air termination at the extreme top of the pyramid roof. The stump should be vertically up-right. Water proofing as required shall also be provided.

### **Guarantee & Defect liability**

The work shall be guaranteed for a minimum period of 12 months (from the date of formal takeover), against faulty workmanship and defective materials. Any part if found defective during the guarantee period shall be replaced without any charge what so ever.

Other terms and conditions will be as per existing procedures in CAPE.

## Material Brands Approved

### a) Lightning Protection Materials & Accessories

1) Axis Electrical Components (I) P.Ltd

email: [marketing@axis-india.com](mailto:marketing@axis-india.com)

2) Super Impex – Mumbai

([www.superimpex.com](http://www.superimpex.com))

3) Steelite Engg. Ltd –Mumbai.

([www.steelitegroup.com](http://www.steelitegroup.com))

4) G.I pipe - Tata or Zemith

5) PVC Pipe – Hycount , Wellworth, Kelachandra, Star

6) PVC Wall plugs - Fischer

### **Reference numbers for materials**

Taper point Aerial Elevation rod- 1000mm

Axis ATP 1020 or equivalent from the other approved brands.

1300 mm Copper Aerial rod

Axis -CER 1320 or equivalent -do-

Multipoint top -do-

Axis CMP 20 or equivalent -do-

Air terminal Base

Aluminium - Axis AAT B 20 or equivalent -do-

Note : Material samples should be submitted to Consultants for approval before start using in the works.

# PRICE BID