Advanced Lightning Rod

General

1.1 The lightning protection system shall be of the enhanced type which is designed to attract lightning to a preferred point and safely convey the lightning energy to ground with minimal risk of side flashing via a pre-determined route.

1.2 The complete lightning protection system will comprise the following key components.

(a) Advanced lightning rod
(b) Mounting support
(c) High voltage shielded cable
(d) Lightning Strike Recorder
(e) Dedicated earthing system

The Lightning Rod

2.1 The advanced lightning rod shall be of a “Controlled Advanced Triggering” type and will respond dynamically upon leader activity in the near area.

2.2 The advanced lightning rod shall be configured as a spheroid which is comprised of separate electrically isolated panels surrounding an earthed central finial.

2.3 The insulation material used to electrically isolate the panels shall be comprised of a base polymer which provides high ozone and UV resistance with a dielectric strength of 24 – 38 kV/mm.

2.4 The external shape of the advanced lightning rod shall be such that it will limit the development of sharp point corona discharge under static thunderstorm conditions.

2.5 The upper section of the central finial shall be rounded to provide a blunt surface.

2.6 The upper section of the central finial shall be rated to withstand 200kA.

2.7 An air gap shall be provided between the individual electrically isolated panels (4 panels) and the blunt configured tip of the central rod. Dome shapes and pointed central rods will not be acceptable.

2.8 Arcing shall occur between the panel sections of the spheroid and the blunt configured finial tip only upon the progression of a lightning leader.

2.9 The advanced lightning rod shall have no moving parts and will have no dependence on external power supply or batteries. There should be no high impedance static drain unit between the central rod and the panels.

2.10 Under a normal atmosphere all components of the advanced lightning terminal shall be non-corroding.

2.11 The advanced lightning rod shall be installed at a minimum of 10 metres above the ground.

2.12 The advanced lightning rod shall be insulated from all surrounding points and features of the structure being protected.

2.13 The advanced lightning rod shall not be installed in a corrosive environment unless the manufacturer's written approval has first been granted.

2.14 The advanced lightning rod shall be installed as per the manufacturer's instructions.

2.15 The advanced lightning rod shall not be of the ESE type and all lightning terminals claiming compliance to NF C17-102 shall not be considered suitable.

2.16 The advanced lightning rod shall have been tested to the following standard IEC 60-1:1989.

2.17 The lightning rod shall be shown to have withstood a minimum current impulse of a 180kA 8/20 µs waveform as per the test standard IEC 60-1: 1989.

Mounting Support of Lightning Rod

3.1 The mounting pole used to support the lightning rod shall be a circular insulating fibreglass tube at a minimum height of 2 metres. The pole will have an outside diameter of 68 mm.

3.2 The mounting pole and supports shall be securely fixed with brackets and guy wires where required.

3.3 The downconductor shall pass through the centre of the insulating pole for the entire length of the pole.

High Voltage Shielded Cable - (HVSC Plus)

4.1 The high voltage shielded cable shall consist of a central filler, concentric aluminium conductor, binder tape, conductor screen insulation, insulation, insulation screen, copper tape screen and external outer sheath.

4.2 The main aluminum conductor within the high voltage shielded cable shall have a minimum cross sectional area of 50 mm².

4.3 The outer diameter of the high voltage shielded cable shall be 36 mm.

4.4 The high voltage shielded cable shall have an inductance of 93 nH/m.

4.5 The main aluminum conductor shall allow for direct connection to the lightning rod through the use of a compression lug.

4.6 The high voltage shielded cable shall be fixed to the structure through the use of suitable saddles every two metres for the length of the cable route.

4.7 The high voltage shielded cable shall be installed as per manufacturer's instructions and shall have a minimum bending radius of 430 mm.

4.8 The high voltage shielded cable will have a withstand voltage (1.2/50 µs impulse) of ≥ 500 kV

4.9 The high voltage shielded cable shall have been tested in accordance with standard AS1931, Part 1 (2).

Event Recording Device

5.1 All systems shall be installed complete with the lightning strike recorder.

5.2 The lightning strike recorder shall contain a mechanical 6 digit display which will register all lightning discharges with a sensitivity of 1500 A 8/20 µs peak current impulse.

5.3 The lightning strike recorder shall be housed in an IP 67 rated enclosure and will operate without reliance on batteries or an external power source.

5.4 The lightning strike recorder shall be installed as per the manufacturer's instructions

5.5 It shall be shown that the event recording device has been successfully tested under test standard IEC 60-1:1989

Earthing

6.1 The earthing system shall incorporate the following individual components or a combination of the following – 25 x 3mm flat copper tape buried to a depth of not more than 800 mm or by deep driven copper bonded steel core earth rods. All components of the earthing system shall be electrically connected to the central injection rod which is securely connected to the lower end of the high voltage shielded cable.

6.2 The earthing system shall be installed so that the final impedance reading does not exceed 10 Ohms unless otherwise stipulated by the lightning protection manufacturer or consulting engineer.

6.3 It is recommended that the earthing system is bonded to all structural reinforcing steel of the building, along with all connecting services.

6.4 The use of ground resistance improvement material shall be applied in order to reduce the resistivity levels of the earthing system.

Head Office 49 Patriarch Drive, Huntingfield Tasmania, Australia 7055
Postal PO Box 379 Kingston, Tasmania, Australia 7051
Web www.lpi.com.au
Phone + 61 3 6281 2475
Facsimile + 61 3 6229 1900
Email info@lpi.com.au