How to apply structural lightning protection

Conductors

The first choice faced by the designer of a structural lightning protection system is the type of conductor system to be used.

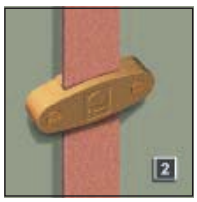
Choose the material required, i.e. copper or aluminium.

Choose the type of conductor required, i.e. tape, solid circular or stranded.

Conductor network

The conductor network is the means of intercepting/carrying the current of a lightning strike safely to the earth termination network. Use the guidelines of BS EN 62305-1 & 3 for the correct placement of conductors.

Fixings



Select the correct system of fixings for each part of the conductor system. Fixings are available for a wide range of modern construction materials, e.g. brick, stone, plastic and metal.

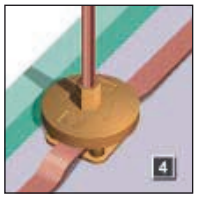
Air termination network

The air termination network is the point of connection for a lightning strike. It typically consists of a meshed conductor arrangement covering the roof of the structure. The mesh size is now determined by the chosen LPL.

Air terminals

Use air terminals in the form of vertical air rods for the protection of prominent roof top features or equipment. Use strike pads to connect and thus expose concealed conductors.

Air rod bases



Choose the correct air rod base. This will ensure that the vertical air rods are both solidly fixed to the fabric of the structure and have a low resistance connection to the conductor network.

Interconnection components

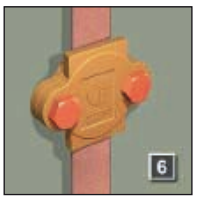
NEW Crossover clamp specially designed for use where conductors cross as part of a roof network.

Down conductor network

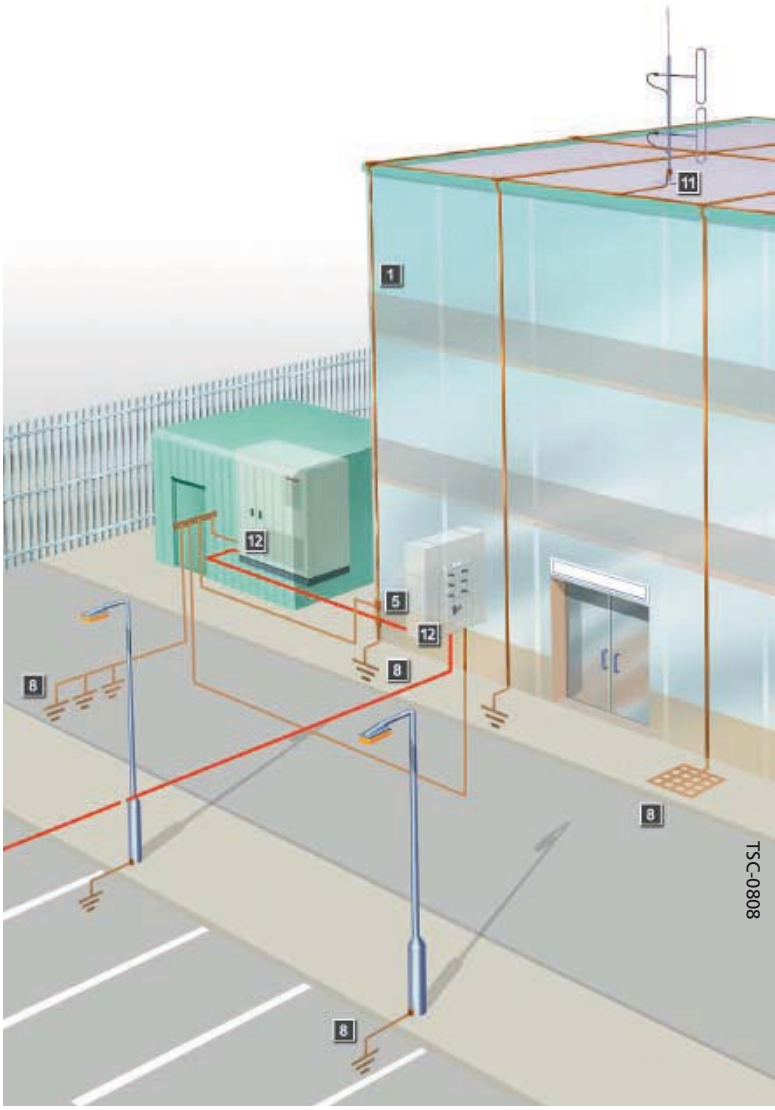
Conductor jointing clamps

Select a component for the interconnection of multiple conductors or for changes of direction. Jointing clamps will ensure a low resistance, corrosion resistant connection between air termination and down conductors.

Test clamps



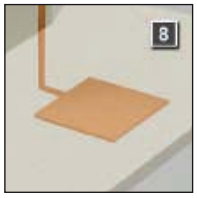
In order to allow periodic disconnection and testing of the earth termination network, select a test clamp to be placed within the run of each down conductor.



Earth termination network

The means of dissipating the current to the general mass of earth.

Earth electrodes



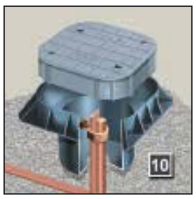
Choose an earth electrode to suit the system design i.e. Type A, Type B or foundation electrode. Electrodes can be constructed individually from earth rods, earth plates, flat tape, stranded cable or any combination of these.

Earth rod clamps

Select a high copper content alloy earth rod clamp for the connection of the earthing conductor to the earth rod. In this below ground application, the clamp must ensure a good electrical contact and resist corrosion throughout the lifetime of the installation.

This illustration is designed to demonstrate the main aspects and individual components of a structural lightning protection system. It is not intended to represent an actual scheme conforming to a particular code of practice. The drawing is not to scale.

Earth inspection pits



Select an earth inspection pit to protect the earth electrode connections. High strength pits are available in plastic and concrete.

Equipotential bonding

Bonding is the most commonly employed method of avoiding the damaging effects of side flashing. All continuous metalwork should be considered for bonding. All metallic services, e.g. cable armouring, gas, water or steam piping, entering the building should also be bonded as directly as possible to the earth termination network.

Bonds to metalwork

Select the correct type of metalwork bond for the application, i.e. a flat column face, a circular rainwater pipe or a ribbed reinforcing bar.

Lightning current or Equipotential bonding SPDs

Designed to prevent dangerous sparking caused by flashover, lightning current or equipotential bonding SPDs *must* be fitted to all lines entering or leaving the structure.

Product selector

(1) Conductors
(2) Conductor fixings

(3) Air terminals
(4) Air rod bases
(5) Conductor jointing clamps

(6) Test clamps
(7) Crossover conductor clamp
(8) Earth electrodes
(9) Earth rod clamps
(10) Earth inspection pits
(11) Bonds
(12) Lightning current or Equipotential bonding SPDs