GUIDE TO THE FUNDAMENTALS OF LIGHTNING PROTECTION

WHAT IS LIGHTNING PROTECTION?

LIGHTNING PROTECTION IN SIMPLE TERMS IS A SAFEGUARD FOR BUILDINGS/ STRUCTURES AGAINST THE DEVASTATING EFFECTS OF A DIRECT OR INDIRECT LIGHTNING STRIKE

LIGHTNING PROTECTION IS A LIFE SAVING SERVICE

ISOLATED OR NON-ISOLATED LIGHTNING PROTECTION SYSTEMS

AN ISOLATED LIGHTNING PROTECTION SYSTEM SHOULD BE USED WHERE THE STRUCTURE IS CONSTRUCTED FROM COMBUSTABLE MATERIALS OR THERE IS RISK OF EXPLOSION SUCH AS FLOUR MILLS, BAKERYS, GAS PLANTS, AD PLANTS ETC.

NON-ISOLATED SYSTEMS SHOULD BE USED WHERE NO RISK OF EXPLOSION IS PRESENT

WHERE SHOULD LIGHTNING PROTECTION BE CONSIDERED?

- CHURCHES
- INDUSTRIAL UNITS
- CARE HOMES
- SCHOOLS
- AD PLANTS
- OFFICES
- HOSPITALS
- FIRE/ AMBULANCE STATIONS
- ENERGY CENTRES

LIST NOT EXHAUSTIVE…ANYWHERE WHERE THE FOLLOWING COMES INTO PLAY…

WHEN SHOULD LIGHTNING PROTECTION BE CONSIDERED?

LIGHTNING PROTECTION SHOULD BE CONSIDERED FOR ANY BUILDING OR STRUCTURE WHERE ANY OF THE FOLLOWING FOUR KEY POINTS ARE ANSWERED YES:

1. LOSS OF HUMAN LIFE

WHERE THERE IS A POSSIBILITY THAT THE RESULTS OF A DIRECT/ INDIRECT LIGHTNING STRIKE COULD CAUSE DEATH

2. LOSS OF SERVICE TO THE PUBLIC

WHERE THERE IS A POSSIBILITY THAT THE RESULTS OF A DIRECT/ INDIRECT LIGHTNING STRIKE COULD CAUSE A LOSS OF SERVICES THAT WOULD IMPACT THE PUBLIC IN A DETRIMENTAL WAY

3. LOSS OF CULTURAL HERITAGE

WHERE THERE IS A POSSIBILITY THAT THE RESULTS OF A DIRECT/ INDIRECT LIGHTNING STRIKE COULD CAUSE SEVERE, DEVASTATING, AND COSTLY DAMAGE TO OUR HERITAGE DAMAGING THE HISTORY AND LEGACY OF THE COUNTRY (GREAT BRITAIN)

4. LOSS OF ECONOMIC VALUE

WHERE THERE IS A POSSIBILITY THAT THE RESULTS OF A DIRECT/ INDIRECT LIGHTNING STRIKE COULD CAUSE A LOSS OF SERVICES CAUSING SERIOUS ECONOMIC VALUE TO THE BUSINESS AND WIDER SPREAD COMMUNITIES SUCH AS SUPPLIERS, WORKFORCE ETC. SUCH AS CAUSING A POWER OUTAGE/ FIRE WITHIN THE ELECTRICAL SYSTEMS OF THE BUILDINGS DAMAGING COMPUTERS, SOFTWARE, COMMUNICATIONS AND ASSETS WITHIN THE BUILDING ETC.

DEFINITIVE WORDING CAN BE FOUND WITHIN THE REGULATIONS BS EN 62305

STANDARDS TO BE CONSIDERED WHEN DEALING WITH LIGHTNING PROTECTION

BS EN 62305 EDITION 2

BS EN 62305 – 1 2011
BS EN 62305 – 2 2013
BS EN 62305 – 3 2011
BS EN 62305 – 4 2011
BSEN 62561 1-8 – MATERIAL STANDARD
BSEN 61643 1-1, 2-1 & 3-1 – LV SPD STANDARD
BS 7671 (18th EDITION) – WIRING REGULATIONS

DUTY OF CARE WHEN DECIDING ON LIGHTNING PROTECTION

STEP 1 - RISK ASSESSMENT!!!

A RISK ASSESMENT IS THE FIRST STEP IN DETERMING IF LIGHTNING PROTECTION IS REQUIRED, IF YOU ARE UNSURE IF LIGHTNING PROTECTION IS NECESSARY, A RISK ASSESMENT WILL CALCULATE WHAT LEVEL OF PROTECTION IS REQUIRED TO TELL YOU IF IT IS REQUIRED OR NOT NECESSARY
INSURANCE COMPANIES, FIRE RISK ASSESSMENTS MAY ALSO DETERMINE A LIGHTNING PROTECTION REQUIREMENT

LEVELS OF LIGHTNING PROTECTION

THERE ARE FOUR LEVELS OF LIGHTNING PROTECTION, OFTEN PEOPLE WHO DO NOT KNOW MUCH ABOUT LIGHTNING PROTECTION WILL ASSUME THAT A LEVEL 4 LIGHTNING PROTECTION SYSTEM IS THE HIGHEST LEVEL OF PROTECTION, THIS IS NOT TRUE!! A LEVEL 1 LIGHTNING PROTECTION SYSTEM IS THE HIGHEST LEVEL OF PROTECTION

LEVEL IV
LEVEL III
LEVEL II
LEVEL I

LIGHTNING PROTECTION LEVEL TABLE FROM BS EN 62305

LIGHTNING PROTECTION LEVEL (LPL)	AIR TERMINATION NETWORK (GRID CONFIGURATION)	ROLLING SPHERE	DOWN CONDUCTOR (SPACINGS)
I	5X5M	20M	10M
II	10X10M	30M	10M
III	15X15M	45M	15M
IV	20X20M	60M	20M

WHY CHOOSE LIGHTNING PROTECTION UK

- ATLAS MEMBERS
- FAMILY BUSINESS
- HONEST PRICES
- PERSONAL TOUCH
- FULLY QUALIFIED DESIGN TEAM
- FULLY INSURED
- QUALITY SERVICE
- 30+ YEARS EXPERIENCE
- FULLY QUALIFIED INSTALLATION TEAM
- FIRST CLASS QUALITY SERVICES ASSURED
- PROFESSIONAL
- VAST KNOWLEDGE IN OUR SPECIALIST SERVICES

SERVICES WE PROVIDE AT LIGHTNING PROTECTION UK LIMITED

- LIGHTNING PROTECTION DESIGN
- TT EARTH INSTALLATIONS
- LIGHTNING PROTECTION RISK ASSESSMENT
- EDS SYSTEMS
- STATIC EARTHING
- CRANE EARTHING
- LIGHTNING PROTECTION INSTALLATION
- EVCP EARTH INSTALLATIONS
- SUBSTATION EARTHING NETWORKS
- FALL ARREST MAINTENANCE
- EXOTHERMIC WELDING
- TEMPORARY LIGHTNING PROTECTION SYSTEMS
- LIGHTNING PROTECTION TESTING/ MAINTENANCE SERVICES
- HVI ISOLATED SYSTEM INSTALLERS
- TRANSFORMER / GENERATOR/ FUEL TANKS EARTHING SYSTEMS
- MANSAFE INSPECTION
- SOIL RESISTIVITY TESTING
- STEP AND TOUCH POTENTIAL TESTING

NOTE: THE INFORMATION WITHIN THIS QUICK GUIDE TO LIGHTNING PROTECTION DOES NOT COVER THE WHOLE OF THE BRITISH STANDARD AND IS JUST A SIMPLE TERM GUIDE TO HELP YOU TO UNDERSTAND THE BASICS OF LIGHTNING PROTECTION IN THE OPINION OF LIGHTNING PROTECTION UK LIMITED

THE LATEST EDITION OF THE BRITISH STANDARD BS EN 62305 MAKES IT CLEAR THAT LIGHTNING PROTECTION DESIGN, INSTALLATION AND MAINTENANCE SHOULD BE CONDUCTED BY TRAINED, QUALIFIED AND EXPERT LIGHTNING PROTECTION DESIGNERS AND ENGINEERS

LIGHTNING PROTECTION UK LIMITED CONTACT DETAILS

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FARADAY CHAPMAN LIGHTNING PROTECTION CONSULTANTS ARE A PART OF THE LIGHTNING PROTECTION UK GROUP

LPUK LIGHTNING PROTECTION UK LTD

THE 5 ELEMENTS THAT MAKE A LIGHTNING PROTECTION SYSTEM

AIR TERMINATION NETWORK

AN AIR TERMINATION IS A COLLECTIVE NETWORK OF CONDUCTIVE MATERIALS…
THE COVERING OF THE ROOF FORMING A FARADAY CAGE PROTECTIVE COVER

- METALLIC ROOFS FUNCTION AS A FARADAY CAGE
- 25X3 PVC TAPE (COPPER OR ALUMINIUM) INSTALLED IN A GRID CONFIGURATION CREATES A FARADAY CAGE PROTECTIVE COVER
- A SERIES OF AIR RODS OR MASTS

DOWNCONDUCTORS

DOWN CONDUCTORS FORM THE SAFE PATH TO EARTH FROM ROOF TO GROUND LEVEL USING THE MOST DIRECT ROUTE FROM THE AIR TERMINATION NETWORK TO GROUND LEVEL

- STEEL FRAMES AND STEEL REINFORCING CAN BE USED AS THE CONDUCTIVE DISCHARGE PATH TO EARTH…HIGH LEVEL BONDS CONNECTING METALLIC ROOF AND STEEL FRAME FORM A SUITABLE AND SAFE DISCHARGE PATH TO EARTH
- 25X3 PVC TAPE (COPPER OR ALUMINIUM) CONNECTED AT ROOF AND GROUND LEVEL FORM A SUITABLE AND SAFE DISCHARGE PATH TO EARTH

THE LIGHTNING CURRENT IS SHARED BETWEEN THE DOWN CONDUCTORS – THE MORE DOWN CONDUCTORS INSTALLED THE BETTER PATH TO EARTH MAKING THE SYSTEM MORE EFFECTIVE

EARTH TERMINATION NETWORK

EARTH TERMINATIONS ARE THE VITAL IN THE DISSIPATION OF THE LIGHTNING CURRENT IN THE EVENT OF A DIRECT LIGHTNING STRIKE

TYPE A ARRANGEMENT:

EARTH RODS/ EARTH MATS / EARTH PLATES

TYPE B ARRANGEMENT:

A BURIED RING CONDUCTOR IN THE GROUND AROUND THE PERIMETER OF THE STRUCTURE

FOUNDATION EARTH ELECTRODES:

UTILISATION OF THE PILE CAP REINFORCMENTS THAT FORM THE STRUCTURE OF THE BUILDING

EQUIPOTENTIAL BOND

JUST LIKE WATER AND GAS LIGHTNING PROTECTION IS A SERVICE AND MUST BE BONDED BACK TO THE MAIN EARTHING TERMINAL OF THE BUILDING

FOR SELECTING CABLE SIZE REFER TO BS EN 62305

SURGE PROTECTION DEVICES (SPDs)

A SURGE PROTECTION DEVICE MUST BE INSTALLED ALONGSIDE ANY LIGHTNING PROTECTION SYSTEM AS DESCRIBED IN BS 7671 – 18TH EDITION. A SURGE PROTECTION DEVICE WILL PROVIDE ADDITIONAL PROTECTION AGAINST DIRECT/ INDIRECT DAMAGE TO THE ELECTRICAL DEVICES AND WIRING SYSTEMS WITHIN A BUILDING SUCH AS TELEPHONE LINES, LIGHTNING, CAR PARKING LIGHTING, SATELLITE, AHU, CCTV, EV CHARGING POINTS ETC

DEPENDING ON THE LIGHTNING PROTECTION ZONE AND THE LIGHTNING PROTECTION LEVEL TYPE 1, TYPE 2 OR TYPE 3 MAY BE REQUIRED

LIGHTNING PROTECTION UK LIMITED AND
FARADAY CHAPMAN LIGHTNING PROTECTION CONSULTANTS LIMITED
ARE A PART OF THE LPUK GROUP

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