

START WITH ASSESSMENT!

Measure and Mitigate Your Risks to a Lightning Strike.

The Lightning Protection Institute

Our lives are full of assessments and mitigating risks. A process that becomes almost habitual. From grabbing the umbrella for a rainy day to stocking up on supplies for a pending natural disaster. We assess and measure the potential risks “before” an event...to be prepared. This assessment enables us to protect ourselves from unwanted consequences.

There are over 31 million cloud to ground lightning strikes a year*. We know lightning is going to happen, so understanding how to mitigate those risks is essential to individuals and property owners. By understanding how to assess the risks of lightning, we can be prepared by taking the necessary steps to be protected.

Impact of Lightning:

Homes, Businesses, Critical Facilities

About 6000 times a minute, there is a lightning strike that contains an electrical discharge hotter than the sun. One lightning strike can cause immense damage that goes beyond fire. The damage to the electrical infrastructure and the electronics connected to that infrastructure can be destroyed - bringing communication, security and productivity to a halt.



| The impact of lightning on an apartment building |

If any of the following structures are hit by lightning, there are consequences beyond the repairs from a fire. When there are surges and/or damages to the electrical system, here are just a few consequences that impact time, money, and life.

Homes: Costly repairs and equipment replacement (TVs, washer/dryer, computers...)

Businesses: Emails and communication stopped, production downtime and loss of revenue

Critical Facilities: Inability to meet the emergencies of individuals or the community

And at the very worst - loss of life.

Lightning protection systems are scientifically proven to mitigate these risks. When properly installed, a lightning protection system makes a building resilient to the damage of lightning strike. These systems protect the structure, the electrical system, and the human life that are within the building.

LIGHTNING RISK ASSESSMENT

From homeowners to design/build experts, learning how to measure and mitigate the risks of lightning is vital to the prevention of lightning damage. For personal safety, assess the current and future weather conditions; if you see lightning, get indoors. For protecting homes, buildings, and structures, there are few ways to conduct an assessment to determine the risks of lightning. If the assessment determines that there are perceived risks of lightning, lightning protection systems can be installed to mitigate those risks.



Evaluate the building design and external surroundings.

What are the key factors in a risk assessment for lightning protection?

The NFPA 780 standard for lightning protection is one option that offers a simple and complex approach to assessments. At the advanced level, an assessment involves complex equations with several variables: (ie. $N_d = N_g \times A_e \times C_1 \times 10^{-6}$). At the very least, consider the key assessment factors within three general areas of a structure: external criteria, structure design & use, and internal activity.

External Criteria

Survey the immediate surroundings of that building & geographical location.

Surroundings

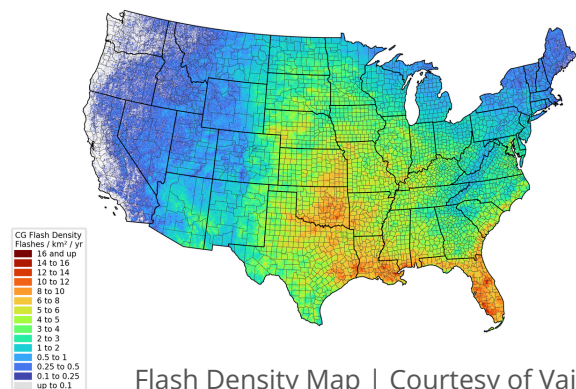
When you first walk up to a building or structure, scan the surroundings, and conduct a visual inspection. This involves identifying potential lightning strike paths, such as tall trees, antennas, or nearby structures. Evaluate the building's height and design. Now, assess how that structure compares to other buildings or objects near it.

- Is it the highest building?
- Is it situated on a hill or by itself?

If you are designing a new building, assess how that building will be incorporated into these surroundings to ensure proper consideration for making that building more sustainable to a lightning strike.

Geographic Location

What is the propensity for lightning strikes in that city, county, or state? Different regions have varying levels of lightning activity, and this information is crucial in determining the necessary level of protection. Lightning frequency data can be obtained from local weather services or scientific experts, such as Vaisala, who are collecting data on lightning activity.



Flash Density Map | Courtesy of Vaisala

Structure Design & Use

Evaluate the construction/building materials and use of that building/structure.

- What are the building materials: glass, wood, brick, etc.?
- Does the design impact the propensity for a lightning strike: Taller points or roof attachments?
- What is the use of that building:
Does it contain hazardous or flammable objects?
Does it store valuable and/or historical objects?
Does it perform critical services?

Internal Activity

Identify people and activity on the inside of the structure.

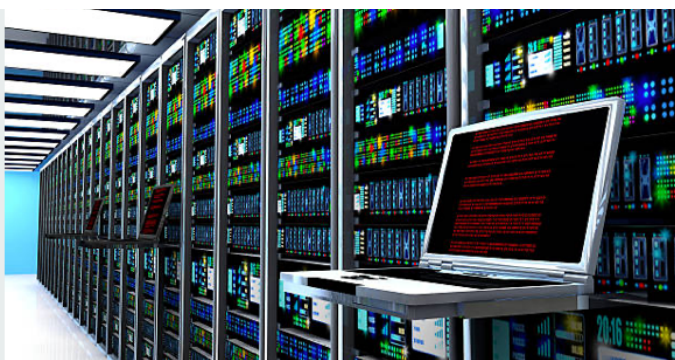
People

- Are there many people inside this structure?
- What's the panic level if a building evacuation is necessary?
- Can the people in these buildings move quickly?

For instance: In a nursing home or hospital, all occupants can not quickly exit a building that was hit by lightning. In a large high-rise (office building - hotel) with large groups of people, a speedy exit may not be possible.

Activity

What is the functionality of that building?



Data centers contain valuable information that enable us to perform daily tasks and maintain historical records.

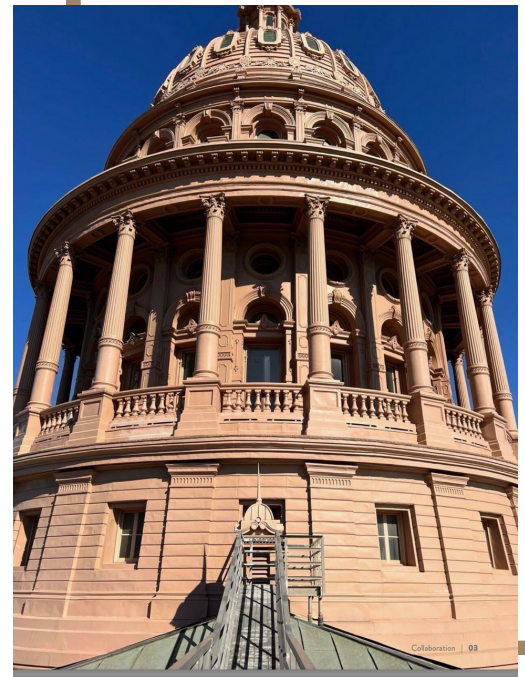


Photo Credit: Austin, TX Capitol

Identify the services that are being conducted in that building. If lightning hits the structure you are assessing, what happens to the people and services within that structure?

The physical and electrical destruction of lightning can impact the services for an individual, business, or community. Here are some key structures to protect in high-risk areas:

- Data Centers
- Distribution Centers
- Schools and Churches
- Public Works Facilities
- Critical facilities:
Fire, Police, Hospitals, Emergency Operation Centers



We rely on critical facilities daily. Communities can not afford to have these facilities struck by lightning.

Lightning is happening 100 times every second.

Incorporate the assessment of lightning into our daily lives to mitigate risks. .

Assessment leads to mitigating risks and protecting ourselves against unwanted consequences. Having a general understanding of a lightning risk assessment enables all of us to make better choices. Individuals and homeowners can protect themselves and their homes. Design/build experts and facility managers can make choices to ensure their buildings are more resilient, sustainable, and safer with lightning protection systems.



Photo Credit: Bonded Lightning Protection, TX
22 One 22 Building in Nashville, TN

Proper steps for a formal ASSESSMENT and INSTALLATION

If your general assessment leads you to question the structure's vulnerability, the NFPA 780 specifies that the formal assessment process should be carried out by qualified professionals who are knowledgeable about lightning protection systems. These professionals may include lightning protection system designers, engineers, or certified installers who have undergone specific training and have a comprehensive understanding of the NFPA 780 guidelines.

By following the lightning assessment process outlined by NFPA 780, property owners can ensure that their lightning protection systems are properly designed, installed, and maintained. Proper installation protects structures from the devastating effects of lightning strikes and promotes the safety of individuals within those structures.

Preparation and Protection Starts with Assessment!

This article was originally written for the Insurance Information Institute.
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