



Table I-2(a)
Index "A" - Type of Structure

Structure	Index Value
Single family residence under 5,000 square feet.	1
Single family residence over 5,000 square feet.	2
Residential, office, or factory building less than 50 feet in height covering less than 25,000 square feet of ground area.	3
Residential, office, or factory building less than 50 feet in height covering over 25,000 square feet of ground area.	5
Residential, office, or factory building from 75 to 150 feet in height	4
Residential, office, or factory building over 150 feet in height	5
Municipal services buildings, fire, police, water, sewer, etc.	8
Hangars	7
Power generation stations, central telephone exchanges.	7
Water towers and cooling towers	8
Libraries, museums, and historical structures	8
Farm Buildings	8
Golf shelters and other recreational shelters	9
Places of public assembly such as schools, churches, theaters, & stadiums	9
Slender structures such as smokestacks, church steeples, spires, control towers, lighthouses, etc.	10
Hospitals, nursing homes, housing for the elderly and handicapped	10
Buildings for manufacturing, storage, and handling hazardous materials	10

I-1 General

I-1.1 This lightning risk assessment guide is prepared to assist in the analysis of various criteria to determine the risk of loss due to lightning. As a guide, it is not possible to cover each special design element that may render a structure more or less susceptible to lightning damage. In special cases personal and economic factors may be very important and should be considered in addition to the assessment obtained by use of this guide.

I-1.2 If the structure is in a high risk situation, a risk index (R) should be computed for a wide range of structures in the environment concerned. The structure's index is then compared to the index of these other structures so that a judgment of local risk weighing can be made.

I-2 Determining the Risk. The assessment of risk index (R) is given in Table I-2. The risk index (R) is obtained by dividing the sum of the values given in Tables I-2(a) through I-2(e) by the lightning frequency index value obtained from Table I-2(f).

The risk index (R) is:

$$R = \frac{A + B + C + D + E}{F}$$

Table I-2
Assessment of Risk, R

R Value	Risk Value
0-2	Light
2-3	Light to Moderate
3-4	Moderate
4-7	Moderate to Severe
Over 7	Severe

Table I-2(b)
Index "B" - Type of Construction

Structural Framework	Roof Type	Index Value
Non Metallic (other than wood)	Wood	5
	Composition	3
	Metal - not continuous	4
	Metal - electrically continuous	1
Wood	Wood	5
	Composition	3
	Metal - not continuous	4
	Metal - electrically continuous	2
Reinforced Concrete	Wood	5
	Composition	3
	Metal - not continuous	4
	Metal - electrically continuous	1
Structural Steel	Wood	4
	Composition	3
	Metal - not continuous	3
	Metal - electrically continuous	1

Table I-2(c)
Index "C" - Relative Location

Location	Index Value
Structures less than 10,000 square feet surrounded by other structures	1
Structures over 10,000 square feet surrounded by higher structures	2
Structures less than 10,000 square feet surrounded by lower structures	4
Structures over 10,000 square feet surrounded by lower structures	5
Structures extending up to 50 feet above adjacent structures or terrain	7
Structures extending more than 50 feet above adjacent structures or terrain	10

Table I-2(d)
Index "D" - Topography

Topography	Index Value
On flat land	1
On hillside	2
On hill top	4
On mountain top	5

Table I-2(e)
Index "E" Occupancy and Contents

Occupancy and Contents	Index Value
Noncombustible materials - unoccupied	1
Residential furnishings	2
Ordinary furnishings or equipment	2
Cattle and livestock	3
Small public assembly - less than 50 people	4
Combustible materials	5
Large public assembly - 50 people or more	6
High value equipment and materials	7
Essential services - police, fire, etc.	8
Immobile or bedfast persons	8
Flammable liquids and gasses	8
Critical operating equipment	9
Historic Contents	10
Explosives and explosive ingredients	10

Table I-2(f)
Index "F" - Lightning Frequency
Isoceraunic level (see isoceraunic map)

Lightning Frequency	Index Value
0-5	9
6-10	8
11-20	7
21-30	6
31-40	5
41-50	4
51-60	3
61-70	2
over 70	1

The computed "R" values for the eastern United States should be multiplied by a factor varying from 1.5 in the northeast to 0.5 in the southeast. This factor is due to the differences in storm characteristics in these regions.



Chimney damaged by lightning



Figure I-20(f)(a) Statistics for continental United States showing mean annual number of days with thunderstorms.