Lumex

CALCULATION STANDARD

NFPA 780-2026

LIGHTNING RISK ASSESSMENT REPORT

Abstract of risk assessment to identify and implement actions that lessen the impact of lightning, per NFPA 780-2026.

Protection recommended



Office block

CLIENT
Sample Engineering Ltd

PROJECT CODE
SAMPLE-001

ASSESSMENT ID
ASM-0001

REVISION
1

CREATED
14-Oct-2026

ASSESSOR
Sample Engineer

SITE
Tampa, Florida

STRUCTURE
50 × 30 × 16 m

Assessed under NFPA 780-2026. Calculated by Sphera.

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SAMPLE

At a glance

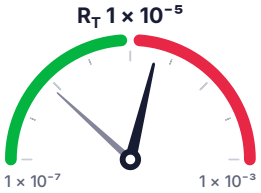
Protection recommended

Detailed assessment: R1 exceeds the tolerable risk.

NFPA 780-2026 L.6.5

Simplified risk assessment: N_D 1.4 × 10^{-1} per year against N_C 1.5 × 10^{-3} per year (L.5.2.1).

Loss of life or injury, R_1



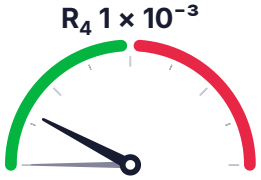
In place 2.01 × 10^{-5}

With the proposed protection 8.75 × 10^{-7}

About 2.01 times the tolerable risk R_1. With the proposed protection, within the tolerable risk R_1.

Tolerable risk R_T = 1 × 10^{-5} per year, NFPA 780-2026 Table L.6.2 and L.6.5. The dial spans 100 times either side of R_T.

Loss of economic value, R_4



In place 4.1 × 10^{-5}

With the proposed protection 6.16 × 10^{-6}

Within the tolerable risk R_4. With the proposed protection, within the tolerable risk R_4.

It is judged only against a tolerable value that the owner or the authority having jurisdiction selects (NFPA 780-2026 L.6.2).

R_4 is worked from the same loss values as R_1 (L.6.6.3), not from amounts of money.

What drives R_1

Risk of physical damage from a direct strike to an incoming service
A strike to an incoming service, such as a power or telephone line, can start a fire or damage the building.
R_V 1.66 × 10^{-5}

Risk of physical damage from a direct strike to the structure
A direct strike to the building starts a fire or damages it
R_B 3.49 × 10^{-6}

Injury to people, strike to a service
Touch voltage from a strike to an incoming service can injure people or animals.
R_U 6.63 × 10^{-8}

Largest first, of the components of R_1 with a value, protection in place. Bars in multiples of R_T. The dashed line marks R_T. NFPA 780-2026 Table L.6.6. R_A is left out, as the smallest.

Next steps

Read the proposed protection: Lumex found one set of measures that brings every type of loss judged within its tolerable risk (NFPA 780-2026 L.6.5). No measure in it can be dropped or weakened and still do so. — Protection Lumex recommends

Check the inputs the assessment was made from: the structure and its incoming services. — What was entered

Check the sign-off and the verification code before you share this report. — Legal Obligations

This is a calculated result, not a certification. A competent person, qualified where the structure is located, must review the inputs and this assessment before it is relied on or acted on.

SAMPLE

Office block

Verdict

Detailed assessment: R1 exceeds the tolerable risk.

Protection recommended

NFPA 780-2026 L.6.5

Risk	Type of loss	R	R_T	Outcome	Reference
R1	Loss of life or injury	2.01×10^{-5}	1×10^{-5}	Exceeds	NFPA 780-2026 L.6.2, L.6.5
R4	Loss of economic value	4.1×10^{-5}	1×10^{-3}	Within	NFPA 780-2026 L.6.2, L.6.5

R4 is worked from the same loss values as R1 (NFPA 780-2026 L.6.6.3), not from amounts of money. It is judged only against a tolerable value that the owner or the authority having jurisdiction selects (NFPA 780-2026 L.6.2).

Simplified risk assessment: N_D is 1.4×10^{-1} per year against N_C of 1.5×10^{-3} per year.

Protection recommended

NFPA 780-2026 L.5.2.1

The detailed assessment above decides the verdict. The simplified risk assessment is shown for reference.

SAMPLE

What was entered

The answers this assessment was computed from. Each choice is named as the engineer picked it, beside the NFPA 780-2026 table or clause it is read from.

The structure and its site

Symbol	Quantity	Value	Reference
A_D	How the collection area is found	The whole structure as a rectangle	NFPA 780-2026 L.4.1.1
L	Length	50 m	NFPA 780-2026 equation (L.4.1.1), L.6.6.1.2
W	Width	30 m	NFPA 780-2026 equation (L.4.1.1), L.6.6.1.2
H	Height	16 m	NFPA 780-2026 equation (L.4.1.1)
N_{SG}	Lightning ground strike-point density, per square kilometre per year	17	NFPA 780-2026 L.2.1
C_D	Location	Among structures no taller than it	NFPA 780-2026 Table L.4.2

The simplified risk assessment

Symbol	Quantity	Value	Reference
C2	Structure and roof materials	Nonmetallic structure, nonmetallic roof	NFPA 780-2026 Table L.5.1.2(a)
C3	Contents	Ordinary value, does not burn	NFPA 780-2026 Table L.5.1.2(b)
C4	Occupancy	Normally occupied	NFPA 780-2026 Table L.5.1.2(c)
C5	Consequence of a strike	Services need not keep running, no harm to the environment	NFPA 780-2026 Table L.5.1.2(d)
	One of the critical facilities listed	No	NFPA 780-2026 L.5.3.1, L.5.3.2
	Lightning strikes this area often	No	NFPA 780-2026 L.1.1
	A tall structure standing on its own	No	NFPA 780-2026 L.1.1

Protection in place

Symbol	Quantity	Value	Reference
P_A	Measures against injury at the structure	None	NFPA 780-2026 Table L.6.7.2
P_B	Protection against physical damage	No protection	NFPA 780-2026 Table L.6.7.3
P_C	Surge protection	No surge protection	NFPA 780-2026 Table L.6.7.4
P_C	A continuous metal or reinforced concrete frame	No	NFPA 780-2026 L.6.6.2.3, Table L.6.7.4
P_M	Coordinated surge protection at the equipment	No	NFPA 780-2026 L.6.6.2.4

Shielding and internal wiring

Symbol	Quantity	Value	Reference
K_{S1}	Shield at the structure's outer boundary	No shield	NFPA 780-2026 L.6.6.2.4
K_{S2}	Shields at internal boundaries	None	NFPA 780-2026 L.6.6.2.4
K_{S3}	Internal wiring	Unshielded, routed to avoid large loops	NFPA 780-2026 Table L.6.7.6

SAMPLE

Symbol	Quantity	Value	Reference
K_{S3}	Wiring in bonded continuous metal conduit	No	NFPA 780-2026 L.6.6.2.4
U_W	Lowest impulse withstand voltage of the equipment	2.5 kV, homes, offices, hotels and hospitals	NFPA 780-2026 equation (L.6.6.2.4c), Tables L.6.7.7, L.6.7.8

Losses

Symbol	Quantity	Value	Reference
L_T	Where people are	People inside the building	NFPA 780-2026 Table L.6.7.9
r_t	Floor or ground surface	Soil or concrete	NFPA 780-2026 Table L.6.7.10
r_p	Fire provisions	Manual extinguishers or alarms, hydrants, fireproof compartments or protected escapes	NFPA 780-2026 Table L.6.7.11
r_f	Risk of fire	Low fire risk	NFPA 780-2026 Table L.6.7.12
h_Z	Special hazard	No special hazard	NFPA 780-2026 Table L.6.7.13
L_F, L_O	Type of structure	Industrial, commercial or school	NFPA 780-2026 Table L.6.7.9
	A risk of explosion	No	NFPA 780-2026 L.6.5, Tables L.6.7.9, L.6.7.11, L.6.7.12
	Internal systems whose failure endangers life	No	NFPA 780-2026 L.6.5
	Animals might be injured	No	NFPA 780-2026 L.6.5

Types of loss and their tolerable risks

Symbol	Quantity	Value	Reference
R1	Loss of life or injury	Assessed. R_T: the Table L.6.2 default	NFPA 780-2026 L.6.5, Table L.6.2
R2	Loss of service	Not assessed	NFPA 780-2026 L.6.5, Table L.6.2
R3	Loss of historical significance	Not assessed	NFPA 780-2026 L.6.5, Table L.6.2
R4	Loss of economic value	Assessed. R_T: set by the owner	NFPA 780-2026 L.6.5, L.6.2

Incoming service: Power

Symbol	Quantity	Value	Reference
	Type of service	Power	NFPA 780-2026 Table L.6.7.8
L_L	Length	Not known, so 1 km is assumed	NFPA 780-2026 L.6.6.1.3
C_E	Environment the service runs through	Suburban residential	NFPA 780-2026 Table L.6.7.1
C_T	A transformer between the service and the structure	No	NFPA 780-2026 L.6.6.1.3
N_L	Run underground beneath a ground mesh	No	NFPA 780-2026 L.6.6.1.3
P_U	Shield of the service	Unshielded, or its shield not bonded where the equipment is bonded, U_W 2.5 kV	NFPA 780-2026 Table L.6.7.7
P_A	Measures against injury at this service	None	NFPA 780-2026 L.6.6.2.5, Table L.6.7.2

SAMPLE

Symbol	Quantity	Value	Reference
N_{DJ}	Structure at the far end	Not given	NFPA 780-2026 L.6.6.1.4

Incoming service: Telephone

Symbol	Quantity	Value	Reference
	Type of service	Telecommunication	NFPA 780-2026 Table L.6.7.8
L_L	Length	Not known, so 1 km is assumed	NFPA 780-2026 L.6.6.1.3
C_E	Environment the service runs through	Suburban residential	NFPA 780-2026 Table L.6.7.1
C_T	A transformer between the service and the structure	No	NFPA 780-2026 L.6.6.1.3
N_L	Run underground beneath a ground mesh	No	NFPA 780-2026 L.6.6.1.3
P_U	Shield of the service	Shield bonded with the equipment, 5 to 20 Ω/km, U_W 2.5 kV	NFPA 780-2026 Table L.6.7.7
P_A	Measures against injury at this service	None	NFPA 780-2026 L.6.6.2.5, Table L.6.7.2
N_{DJ}	Structure at the far end	Not given	NFPA 780-2026 L.6.6.1.4

SAMPLE

Simplified risk assessment

Symbol	Quantity	Value	Reference
N_{SG}	Lightning ground strike-point density (km²/ year)	17	NFPA 780-2026 L.2.1
C_D	Location factor	0.5	NFPA 780-2026 Table L.4.2
A_D	Equivalent collection area	16,418.2 m²	NFPA 780-2026 L.4.1
N_D	Strikes to the structure per year	1.4×10^{-1}	NFPA 780-2026 equation (L.3)
C2	Construction coefficient	1	NFPA 780-2026 Table L.5.1.2(a)
C3	Contents coefficient	1	NFPA 780-2026 Table L.5.1.2(b)
C4	Occupancy coefficient	1	NFPA 780-2026 Table L.5.1.2(c)
C5	Consequence coefficient	1	NFPA 780-2026 Table L.5.1.2(d)
C	Product of C2, C3, C4 and C5	1	NFPA 780-2026 L.5.1.1
N_C	Tolerable lightning frequency	1.5×10^{-3}	NFPA 780-2026 equation (L.5.1.1)

SAMPLE

Detailed assessment

Strikes to and near the structure

Symbol	Quantity	Value	Reference
A_M	Area within 350 m of the structure	442,345.1 m²	NFPA 780-2026 L.6.6.1.2
N_M	Annual threat of occurrence from strikes near the structure	3.62	NFPA 780-2026 equation (L.6.6.1.2)

Risk components

Symbol	Quantity	Value	Reference
R_A	Injury to people, strike to the structure	1.4×10^{-8}	NFPA 780-2026 Table L.6.6
R_B	Risk of physical damage from a direct strike to the structure	3.49×10^{-6}	NFPA 780-2026 Table L.6.6
R_C	Internal system failure, strike to the structure	1.4×10^{-7}	NFPA 780-2026 Table L.6.6
R_M	Internal system failure, strike near the structure	3.26×10^{-6}	NFPA 780-2026 Table L.6.6
R_U	Injury to people, strike to a service	6.63×10^{-8}	NFPA 780-2026 Table L.6.6
R_V	Risk of physical damage from a direct strike to an incoming service	1.66×10^{-5}	NFPA 780-2026 Table L.6.6
R_W	Internal system failure, strike to a service	6.63×10^{-7}	NFPA 780-2026 Table L.6.6
R_Z	Internal system failure, strike near a service	1.68×10^{-5}	NFPA 780-2026 Table L.6.6

Risk components on a log scale



The components of NFPA 780-2026 Table L.6.6, largest first, then each type of loss with its R_T of NFPA 780-2026 Table L.6.2 marked by a dashed line. The outcome words are the verdict's own (NFPA 780-2026 L.6.5).

SAMPLE

Incoming services

Each service is assessed on its own. The last row of each table gives the NFPA 780-2026 clause, equation or table for its column.

Service	L_L (m)	C_E	C_T	N_L	N_{DJ}	N_I	P_U	P_V	P_W	P_Z
Power	1000	0.5	1	3.4×10^{-1}	0	3.4×10^{1}	1	1	1	0.3
Telephone	1000	0.5	1	3.4×10^{-1}	0	3.4×10^{1}	0.95	0.95	0.95	0.2
Reference	L.6.6.1.3	Table L.6.7.1	L.6.6.1.3	eq. (L.6.6.1.3)	L.6.6.1.4	eq. (L.6.6.1.5)	L.6.6.2.5	L.6.6.2.6	L.6.6.2.7	L.6.6.2.8

Service	R_U	R_V	R_W	R_Z
Power	3.4×10^{-8}	8.5×10^{-6}	3.4×10^{-7}	1.01×10^{-5}
Telephone	3.23×10^{-8}	8.08×10^{-6}	3.23×10^{-7}	6.73×10^{-6}
Reference	Table L.6.6	Table L.6.6	Table L.6.6	Table L.6.6

Probabilities and shielding factors

Symbol	Quantity	Value	Reference
P_A	Injury from a strike to the structure	1	NFPA 780-2026 Table L.6.7.2
P_B	Physical damage from a strike to the structure	1	NFPA 780-2026 Table L.6.7.3
P_C	Internal system failure from a strike to the structure, as applied	1	NFPA 780-2026 L.6.6.2.3, Table L.6.7.4
K_{S1}	Shielding at the structure's outer boundary	1	NFPA 780-2026 L.6.6.2.4
K_{S2}	Shielding at internal boundaries	1	NFPA 780-2026 L.6.6.2.4
K_{S3}	Internal wiring	0.2	NFPA 780-2026 L.6.6.2.4, Table L.6.7.6
K_{S4}	Equipment withstand voltage	0.6	NFPA 780-2026 equation (L.6.6.2.4c)
K_S	Combined shielding factor	0.12	NFPA 780-2026 equation (L.6.6.2.4a)
P_M	Internal system failure from a strike near the structure, as applied	0.9	NFPA 780-2026 L.6.6.2.4, Table L.6.7.5

Loss factors

Symbol	Quantity	Value	Reference
L_T	Mean value of loss of life	1×10^{-5}	NFPA 780-2026 Table L.6.7.9
r_t	Reduction for the floor or ground surface	0.01	NFPA 780-2026 Table L.6.7.10
r_p	Reduction factor for provisions that reduce fire consequences	0.5	NFPA 780-2026 Table L.6.7.11
r_f	Reduction for the risk of fire	0.001	NFPA 780-2026 Table L.6.7.12
h_Z	Factor for the hazard kinds in the structure	1	NFPA 780-2026 Table L.6.7.13
L_F	Typical mean loss from physical damage	0.05	NFPA 780-2026 Table L.6.7.9
$L_A = L_U$	Injury to people	1×10^{-7}	NFPA 780-2026 equation (L.6.6.3.1)
$L_B = L_V$	Physical damage	2.5×10^{-5}	NFPA 780-2026 equations (L.6.6.3.2a), (L.6.6.3.2b)
$L_C = L_M = L_W = L_Z = L_O$	Internal system failure	1×10^{-6}	NFPA 780-2026 equation (L.6.6.3.3), Table L.6.7.9

SAMPLE

Protection Lumex proposes

This section is a Lumex proposal. It is not a step of NFPA 780-2026, which asks only whether each type of loss is within its tolerable risk and leaves the choice of protection to the engineer (NFPA 780-2026 L.1, L.6.5).

The detailed assessment is run again with the protection below in place of the protection recorded. Every other answer stays the same, and every figure follows the same NFPA 780-2026 clauses and tables.

The verdict of this report is taken from the protection in place. The proposal does not change it.

Protection proposed

Symbol	Quantity	Value	Reference
P_B	Protection against physical damage	LPS designed on a 45 m (150 ft) striking distance	NFPA 780-2026 Table L.6.7.3
P_C	Surge protection	Surge protection to NFPA 780 Section 4.19	NFPA 780-2026 Table L.6.7.4
P_M	Coordinated surge protection at the equipment	No	NFPA 780-2026 L.6.6.2.4
P_A	Measures against injury at the structure	None	NFPA 780-2026 Table L.6.7.2
P_A	Power: measures against injury	None	NFPA 780-2026 L.6.6.2.5 with Table L.6.7.2
P_A	Telephone: measures against injury	None	NFPA 780-2026 L.6.6.2.5 with Table L.6.7.2

Risks in place and with the proposed protection

Risk	Type of loss	R in place	R proposed	R_T	Proposed outcome	Reference
R1	Loss of life or injury	2.01×10^{-5}	8.75×10^{-7}	1×10^{-5}	Within	NFPA 780-2026 L.6.2, L.6.5
R4	Loss of economic value	4.1×10^{-5}	6.16×10^{-6}	1×10^{-3}	Within	NFPA 780-2026 L.6.2, L.6.5

Probabilities with the proposed protection

Symbol	Quantity	Value	Reference
P_A	Injury from a strike to the structure	1	NFPA 780-2026 Table L.6.7.2
P_B	Physical damage from a strike to the structure	0.1	NFPA 780-2026 Table L.6.7.3
P_C	Internal system failure from a strike to the structure, as applied	0.03	NFPA 780-2026 L.6.6.2.3, Table L.6.7.4
P_M	Internal system failure from a strike near the structure, as applied	0.9	NFPA 780-2026 L.6.6.2.4, Table L.6.7.5

Risk components with the proposed protection

Symbol	Quantity	Value	Reference
R_A	Injury to people, strike to the structure	1.4×10^{-8}	NFPA 780-2026 Table L.6.6
R_B	Risk of physical damage from a direct strike to the structure	3.49×10^{-7}	NFPA 780-2026 Table L.6.6
R_C	Internal system failure, strike to the structure	4.19×10^{-9}	NFPA 780-2026 Table L.6.6
R_M	Internal system failure, strike near the structure	3.26×10^{-6}	NFPA 780-2026 Table L.6.6

SAMPLE

Symbol	Quantity	Value	Reference
R_U	Injury to people, strike to a service	2.04×10^{-9}	NFPA 780-2026 Table L.6.6
R_V	Risk of physical damage from a direct strike to an incoming service	5.1×10^{-7}	NFPA 780-2026 Table L.6.6
R_W	Internal system failure, strike to a service	2.04×10^{-8}	NFPA 780-2026 Table L.6.6
R_Z	Internal system failure, strike near a service	2.02×10^{-6}	NFPA 780-2026 Table L.6.6

Incoming services with the proposed protection

Service	P_U	P_V	P_W	P_Z
Power	0.03	0.03	0.03	0.03
Telephone	0.03	0.03	0.03	0.03
Reference	L.6.6.2.5	L.6.6.2.6	L.6.6.2.7	L.6.6.2.8

Service	R_U	R_V	R_W	R_Z
Power	1.02×10^{-9}	2.55×10^{-7}	1.02×10^{-8}	1.01×10^{-6}
Telephone	1.02×10^{-9}	2.55×10^{-7}	1.02×10^{-8}	1.01×10^{-6}
Reference	Table L.6.6	Table L.6.6	Table L.6.6	Table L.6.6

SAMPLE

Protection Lumex recommends

This section is a Lumex recommendation. It is not a step of NFPA 780-2026, which asks only whether each type of loss is within its tolerable risk and leaves the choice of protection to the engineer (NFPA 780-2026 L.1, L.6.5).

Lumex starts from the protection in place, never from a proposal, and searches protection against physical damage, surge protection, coordinated surge protection at the equipment, and measures against injury at the structure and at each service. It recalculates the detailed assessment for each set it tries, with the same NFPA 780-2026 clauses and tables.

The verdict of this report is taken from the protection in place. The recommendation does not change it.

Lumex found one set of measures that brings every type of loss judged within its tolerable risk (NFPA 780-2026 L.6.5). No measure in it can be dropped or weakened and still do so.

Set 1

Symbol	Measure	Recommended	Reference
P_B	Protection against physical damage	LPS designed on a 45 m (150 ft) striking distance	NFPA 780-2026 Table L.6.7.3
P_C	Surge protection	Surge protection to NFPA 780 Section 4.19	NFPA 780-2026 Table L.6.7.4

Risk	Type of loss	R in place	R with this set	R_T	Outcome with this set	Reference
R1	Loss of life or injury	2.01×10^{-5}	8.75×10^{-7}	1×10^{-5}	Within	NFPA 780-2026 L.6.2, L.6.5
R4	Loss of economic value	4.1×10^{-5}	6.16×10^{-6}	1×10^{-3}	Within	NFPA 780-2026 L.6.2, L.6.5

SAMPLE

How this assessment was made

All clause, equation and table references in this report cite NFPA 780-2026.

Every figure in this report was calculated by Sphera, the calculation engine, from the equations and tables of Annex L.

Annex L is informative. It guides the decision to protect and is not a requirement of the standard. Its tolerable risk values are defaults. The owner, someone acting for the owner, or the authority having jurisdiction may set others (L.6.2).

The annex offers two methods. The simplified risk assessment compares N_D with N_C (L.5.2.1). The detailed assessment compares each relevant type of loss with its own R_T (L.6.5). When both ran, the detailed assessment decides the verdict and the simplified risk assessment is shown for reference.

Where the Figure L.6.8 worksheet disagrees with the clauses, the clauses decide. N_L and N_I use C_E from Table L.6.7.1, N_L uses A_L from L.6.6.1.3, and every strike density is N_{SG}.

The annex gives no equation for N_{DJ}. This assessment takes it from A_{DJ}, the adjacent structure's own C_{DJ} from Table L.4.2, and C_T, in the form the worksheet shows.

Table L.6.2 sets no tolerable value for R4. This assessment computes R4 and judges it only against a value the owner enters.

Each incoming service is assessed on its own, and R_U, R_V, R_W and R_Z are summed over all services.

P_P is defined in L.6.6.3, but no loss equation uses it, so this assessment does not apply it.

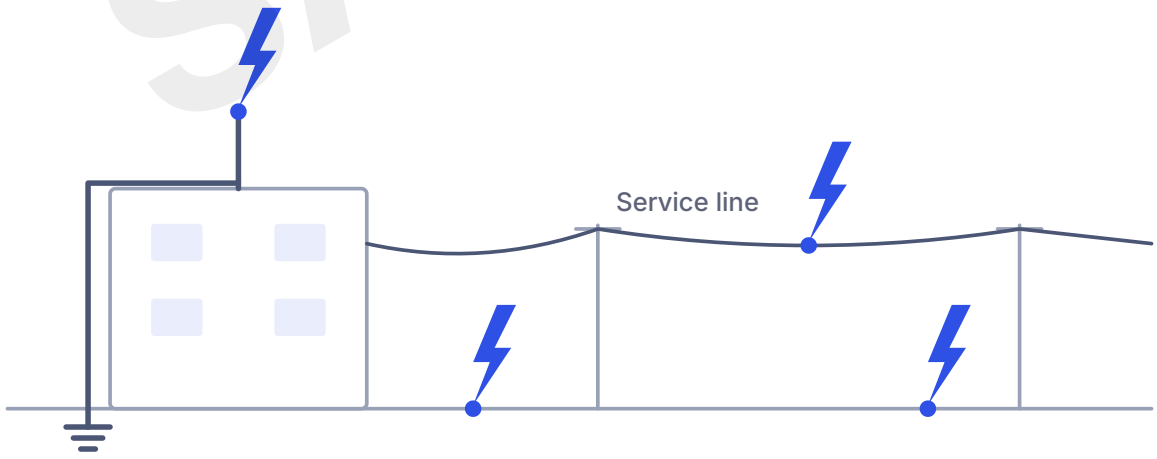
Table L.6.7.5 prints P_M at nine values of K_S. A K_S that falls between two of them takes the next printed value above it, which gives the higher P_M, so the shielding credit never exceeds the table's.

L.6.6.2.4 gives K_{S1} and K_{S2} only for a grid or a continuous metal shield. A boundary with neither takes 1, so it earns no reduction.

L.6.6.1.2 says only that A_M reaches 350 m beyond the perimeter. This assessment takes the area within 350 m of the footprint to find N_M.

SAMPLE

Sources of damage



The four sources of damage, by where the flash lands (NFPA 780-2026 L.1.3.1).

Calculation trace

Every quantity in the order the calculation worked it out, with the expression, the values put into it, the result and the NFPA 780-2026 clause, equation or table it comes from. The trace is worked again from the answers above each time the report is drawn, so it explains exactly the figures printed.

NFPA 780-2026 L.5

Scope	Symbol	Expression	Values	Result	Origin	Reference
Structure	**L**	structure length, m	-	50	Entered	NFPA 780-2026 L.4.1.1
Structure	**W**	structure width, m	-	30	Entered	NFPA 780-2026 L.4.1.1
Structure	**H**	structure height, m	-	16	Entered	NFPA 780-2026 L.4.1.1
Location	**N_{SG}**	lightning ground strike-point density, per km² per year	-	17	Entered	NFPA 780-2026 L.2.1
Structure	**A_D**	$LW + 6H(L + W) + 9 \times \pi \times H^2$	$50 \times 30 + 6 \times 16 \times (50 + 30) + 9 \times \pi \times 16^2$	16,418.2	Calculated	NFPA 780-2026 equation (L.4.1.1)
Structure	**C_D**	selected option	Among structures no taller than it	5×10^{-1}	Standard table	NFPA 780-2026 Table L.4.2
Structure	**N_D**	$N_{SG} \times A_D \times C_D \times 10^{-6}$	$17 \times 16{,}418.2 \times 5 \times 10^{-1} \times 10^{-6}$	1.4×10^{-1}	Calculated	NFPA 780-2026 equation (L.3)
Structure	**C2**	selected option	Nonmetallic structure, nonmetallic roof	1	Standard table	NFPA 780-2026 Table L.5.1.2(a)
Structure	**C3**	selected option	Ordinary value, does not burn	1	Standard table	NFPA 780-2026 Table L.5.1.2(b)
Structure	**C4**	selected option	Normally occupied	1	Standard table	NFPA 780-2026 Table L.5.1.2(c)
Structure	**C5**	selected option	Services need not keep running, no harm to the environment	1	Standard table	NFPA 780-2026 Table L.5.1.2(d)
Structure	**C**	$C2 \times C3 \times C4 \times C5$	$1 \times 1 \times 1 \times 1$	1	Calculated	NFPA 780-2026 L.5.1.1, L.5.1.2
Structure	**N_C**	$1.5 \times 10^{-3} / C$	$1.5 \times 10^{-3} / 1$	1.5×10^{-3}	Calculated	NFPA 780-2026 equation (L.5.1.1)
Structure	**N_D vs N_C**	$N_D \le N_C$	$1.4 \times 10^{-1} > 1.5 \times 10^{-3}$	1.4×10^{-1}	Calculated	NFPA 780-2026 L.5.2.1

NFPA 780-2026 L.6

Scope	Symbol	Expression	Values	Result	Origin	Reference
Structure	**A_M**	$LW + 2 \times 350 \times (L + W) + \pi \times 350^2$	$50 \times 30 + 2 \times 350 \times (50 + 30) + \pi \times 350^2$	442,345.1	Calculated	NFPA 780-2026 L.6.6.1.2
Structure	**N_M**	$\max(0, N_{SG} \times (A_M - A_D) \times C_D \times 10^{-6})$	$\max(0, 17 \times (442{,}345.1 - 16{,}418.2) \times 5 \times 10^{-1} \times 10^{-6})$	3.62	Calculated	NFPA 780-2026 equation (L.6.6.1.2)
Probabilities	**P_A**	product of the measures taken	-	1	Rule of the standard	NFPA 780-2026 Table L.6.7.2 note
Probabilities	**P_B**	selected option	No protection	1	Standard table	NFPA 780-2026 Table L.6.7.3
Probabilities	**P_C**	selected option	No surge protection	1	Rule of the standard	NFPA 780-2026 Table L.6.7.4; NFPA 780-2026 L.6.6.2.3, no LPS and no continuous frame
Probabilities	**K_{S1}**	1, no shield at this boundary	-	1	Lumex default	Product decision: L.6.6.2.4 gives no value for an unshielded boundary
Probabilities	**K_{S2}**	product of the internal boundaries, 1 with none	-	1	Rule of the standard	NFPA 780-2026 L.6.6.2.4
Probabilities	**K_{S3}**	selected option	Unshielded, routed to avoid large loops	2×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.6

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Scope	Symbol	Expression	Values	Result	Origin	Reference
Probabilities	U_W	selected option	2.5 kV, homes, offices, hotels and hospitals	2.5	Standard table	NFPA 780-2026 Tables L.6.7.7, L.6.7.8
Probabilities	K_{S4}	$1.5 / U_W$	1.5 / 2.5	6×10^{-1}	Calculated	NFPA 780-2026 equation (L.6.6.2.4c)
Probabilities	K_S	$K_{S1} \times K_{S2} \times K_{S3} \times K_{S4}$	$1 \times 1 \times 2 \times 10^{-1} \times 6 \times 10^{-1}$	1.2×10^{-1}	Calculated	NFPA 780-2026 equation (L.6.6.2.4a)
Probabilities	P_M	table row at K_S	Shielding factor 1.5×10^{-1}	9×10^{-1}	Calculated	NFPA 780-2026 Table L.6.7.5
Losses	L_T	selected option	People inside the building	1×10^{-5}	Standard table	NFPA 780-2026 Table L.6.7.9
Losses	r_t	selected option	Soil or concrete	1×10^{-2}	Standard table	NFPA 780-2026 Table L.6.7.10
Losses	$L_A = L_U$	$r_t \times L_T$	$1 \times 10^{-2} \times 1 \times 10^{-5}$	1×10^{-7}	Calculated	NFPA 780-2026 equation (L.6.6.3.1)
Losses	r_p	selected option	Manual extinguishers or alarms, hydrants, fireproof compartments or protected escapes	5×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.11 note
Losses	r_f	selected option	Low fire risk	1×10^{-3}	Standard table	NFPA 780-2026 Table L.6.7.12
Losses	h_Z	selected option	No special hazard	1	Standard table	NFPA 780-2026 Table L.6.7.13
Losses	L_F	selected option	Industrial, commercial or school	5×10^{-2}	Standard table	NFPA 780-2026 Table L.6.7.9
Losses	$L_B = L_V$	$r_p \times r_f \times h_Z \times L_F$	$5 \times 10^{-1} \times 1 \times 10^{-3} \times 1 \times 5 \times 10^{-2}$	2.5×10^{-5}	Calculated	NFPA 780-2026 equations (L.6.6.3.2a), (L.6.6.3.2b)
Losses	L_O	selected option	Industrial, commercial or school	1×10^{-6}	Standard table	NFPA 780-2026 Table L.6.7.9
Losses	$L_C = L_M = L_W = L_Z$	L_O	1×10^{-6}	1×10^{-6}	Calculated	NFPA 780-2026 equation (L.6.6.3.3)
Structure	R_A	$N_D \times P_A \times L_A$	$1.4 \times 10^{-1} \times 1 \times 1 \times 10^{-7}$	1.4×10^{-8}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_B	$N_D \times P_B \times L_B$	$1.4 \times 10^{-1} \times 1 \times 2.5 \times 10^{-5}$	3.49×10^{-6}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_C	$N_D \times P_C \times L_C$	$1.4 \times 10^{-1} \times 1 \times 1 \times 10^{-6}$	1.4×10^{-7}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_M	$N_M \times P_M \times L_M$	$3.62 \times 9 \times 10^{-1} \times 1 \times 10^{-6}$	3.26×10^{-6}	Calculated	NFPA 780-2026 Table L.6.6
Service Power	L_L	selected option	not known	1,000	Rule of the standard	NFPA 780-2026 L.6.6.1.3
Service Power	C_E	selected option	Suburban residential	5×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.1
Service Power	C_T	1, no transformer	-	1	Rule of the standard	NFPA 780-2026 L.6.6.1.3, no transformer
Service Power	A_L	$40 \times L_L$	$40 \times 1{,}000$	40,000	Calculated	NFPA 780-2026 L.6.6.1.3
Service Power	N_L	$N_{SG} \times A_L \times C_E \times C_T \times 10^{-6}$	$17 \times 40{,}000 \times 5 \times 10^{-1} \times 1 \times 10^{-6}$	3.4×10^{-1}	Calculated	NFPA 780-2026 equation (L.6.6.1.3)
Service Power	A_I	$4000 \times L_L$	$4{,}000 \times 1{,}000$	4,000,000	Calculated	NFPA 780-2026 L.6.6.1.5
Service Power	N_I	$N_{SG} \times A_I \times C_E \times C_T \times 10^{-6}$	$17 \times 4{,}000{,}000 \times 5 \times 10^{-1} \times 1 \times 10^{-6}$	34	Calculated	NFPA 780-2026 equation (L.6.6.1.5)
Service Power	N_{DJ}	0, no structure within 3H	-	0	Rule of the standard	NFPA 780-2026 Table L.6.6 note
Service Power	P_U	selected option	Unshielded, or its shield not bonded where the equipment is bonded, U_W 2.5 kV	1	Standard table	NFPA 780-2026 Table L.6.7.7

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Scope	Symbol	Expression	Values	Result	Origin	Reference
Service Power	P_V	P_U	1	1	Calculated	NFPA 780-2026 L.6.6.2.6
Service Power	P_W	P_U	1	1	Calculated	NFPA 780-2026 L.6.6.2.7
Service Power	P_Z	selected option	Power line, U_W 2.5 kV	3×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.8
Service Power	R_U	$(N_L + N_{DJ}) \times P_U \times L_U$	$3.4 \times 10^{-1} \times 1 \times 1 \times 10^{-7}$	3.4×10^{-8}	Calculated	NFPA 780-2026 Table L.6.6
Service Power	R_V	$(N_L + N_{DJ}) \times P_V \times L_V$	$3.4 \times 10^{-1} \times 1 \times 2.5 \times 10^{-5}$	8.5×10^{-6}	Calculated	NFPA 780-2026 Table L.6.6
Service Power	R_W	$(N_L + N_{DJ}) \times P_W \times L_W$	$3.4 \times 10^{-1} \times 1 \times 1 \times 10^{-6}$	3.4×10^{-7}	Calculated	NFPA 780-2026 Table L.6.6
Service Power	R_Z	$(N_I - N_L) \times P_Z \times L_Z$	$(34 - 3.4 \times 10^{-1}) \times 3 \times 10^{-1} \times 1 \times 10^{-6}$	1.01×10^{-5}	Calculated	NFPA 780-2026 Table L.6.6
Service Telephone	L_L	selected option	not known	1,000	Rule of the standard	NFPA 780-2026 L.6.6.1.3
Service Telephone	C_E	selected option	Suburban residential	5×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.1
Service Telephone	C_T	1, no transformer	-	1	Rule of the standard	NFPA 780-2026 L.6.6.1.3, no transformer
Service Telephone	A_L	$40 \times L_L$	$40 \times 1{,}000$	40,000	Calculated	NFPA 780-2026 L.6.6.1.3
Service Telephone	N_L	$N_{SG} \times A_L \times C_E \times C_T \times 10^{-6}$	$17 \times 40{,}000 \times 5 \times 10^{-1} \times 1 \times 10^{-6}$	3.4×10^{-1}	Calculated	NFPA 780-2026 equation (L.6.6.1.3)
Service Telephone	A_I	$4000 \times L_L$	$4{,}000 \times 1{,}000$	4,000,000	Calculated	NFPA 780-2026 L.6.6.1.5
Service Telephone	N_I	$N_{SG} \times A_I \times C_E \times C_T \times 10^{-6}$	$17 \times 4{,}000{,}000 \times 5 \times 10^{-1} \times 1 \times 10^{-6}$	34	Calculated	NFPA 780-2026 equation (L.6.6.1.5)
Service Telephone	N_{DJ}	0, no structure within 3H	-	0	Rule of the standard	NFPA 780-2026 Table L.6.6 note
Service Telephone	P_U	selected option	Shield bonded with the equipment, 5 to 20 Ω/km, U_W 2.5 kV	9.5×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.7
Service Telephone	P_V	P_U	9.5×10^{-1}	9.5×10^{-1}	Calculated	NFPA 780-2026 L.6.6.2.6
Service Telephone	P_W	P_U	9.5×10^{-1}	9.5×10^{-1}	Calculated	NFPA 780-2026 L.6.6.2.7
Service Telephone	P_Z	selected option	Telecom line, U_W 2.5 kV	2×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.8
Service Telephone	R_U	$(N_L + N_{DJ}) \times P_U \times L_U$	$3.4 \times 10^{-1} \times 9.5 \times 10^{-1} \times 1 \times 10^{-7}$	3.23×10^{-8}	Calculated	NFPA 780-2026 Table L.6.6
Service Telephone	R_V	$(N_L + N_{DJ}) \times P_V \times L_V$	$3.4 \times 10^{-1} \times 9.5 \times 10^{-1} \times 2.5 \times 10^{-5}$	8.08×10^{-6}	Calculated	NFPA 780-2026 Table L.6.6
Service Telephone	R_W	$(N_L + N_{DJ}) \times P_W \times L_W$	$3.4 \times 10^{-1} \times 9.5 \times 10^{-1} \times 1 \times 10^{-6}$	3.23×10^{-7}	Calculated	NFPA 780-2026 Table L.6.6
Service Telephone	R_Z	$(N_I - N_L) \times P_Z \times L_Z$	$(34 - 3.4 \times 10^{-1}) \times 2 \times 10^{-1} \times 1 \times 10^{-6}$	6.73×10^{-6}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_U	sum over services	$3.4 \times 10^{-8} + 3.23 \times 10^{-8}$	6.63×10^{-8}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_V	sum over services	$8.5 \times 10^{-6} + 8.08 \times 10^{-6}$	1.66×10^{-5}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_W	sum over services	$3.4 \times 10^{-7} + 3.23 \times 10^{-7}$	6.63×10^{-7}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_Z	sum over services	$1.01 \times 10^{-5} + 6.73 \times 10^{-6}$	1.68×10^{-5}	Calculated	NFPA 780-2026 Table L.6.6
Risks	R1	$R_A + R_B + R_U + R_V$	$1.4 \times 10^{-8} + 3.49 \times 10^{-6} + 6.63 \times 10^{-8} + 1.66 \times 10^{-5}$	2.01×10^{-5}	Calculated	NFPA 780-2026 L.6.5
Risks	R_T	tolerable risk, R1	-	1×10^{-5}	Standard table	NFPA 780-2026 Table L.6.2

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Scope	Symbol	Expression	Values	Result	Origin	Reference
Risks	**R1 vs R_T**	$R1 < R_T$	$2.01 \times 10^{-5} \geq 1 \times 10^{-5}$	2.01×10^{-5}	Calculated	NFPA 780-2026 L.6.5
Risks	**R4**	$R_B + R_C + R_M + R_V + R_W + R_Z$	$3.49 \times 10^{-6} + 1.4 \times 10^{-7} + 3.26 \times 10^{-6} + 1.66 \times 10^{-5} + 6.63 \times 10^{-7} + 1.68 \times 10^{-5}$	4.1×10^{-5}	Calculated	NFPA 780-2026 L.6.5
Risks	**R_T**	tolerable risk, R4	-	1×10^{-3}	Entered	Owner's value, NFPA 780-2026 L.6.2
Risks	**R4 vs R_T**	$R4 < R_T$	$4.1 \times 10^{-5} < 1 \times 10^{-3}$	4.1×10^{-5}	Calculated	NFPA 780-2026 L.6.5
Risks	**R**	R1 + R2 + R3 + R4, reported only	$2.01 \times 10^{-5} + 4.1 \times 10^{-5}$	6.11×10^{-5}	Calculated	NFPA 780-2026 L.6.5

Lumex proposal: NFPA 780-2026 L.6 with the proposed protection

Scope	Symbol	Expression	Values	Result	Origin	Reference
Structure	**A_M**	$LW + 2 \times 350 \times (L + W) + \pi \times 350^2$	$50 \times 30 + 2 \times 350 \times (50 + 30) + \pi \times 350^2$	442,345.1	Calculated	NFPA 780-2026 L.6.6.1.2
Structure	**N_M**	$\max(0, N_{SG} \times (A_M - A_D) \times C_D \times 10^{-6})$	$\max(0, 17 \times (442{,}345.1 - 16{,}418.2) \times 5 \times 10^{-1} \times 10^{-6})$	3.62	Calculated	NFPA 780-2026 equation (L.6.6.1.2)
Probabilities	**P_A**	product of the measures taken	-	1	Rule of the standard	NFPA 780-2026 Table L.6.7.2 note
Probabilities	**P_B**	selected option	LPS designed on a 45 m (150 ft) striking distance	1×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.3
Probabilities	**P_C**	selected option	Surge protection to NFPA 780 Section 4.19	3×10^{-2}	Standard table	NFPA 780-2026 Table L.6.7.4
Probabilities	**K_{S1}**	1, no shield at this boundary	-	1	Lumex default	Product decision: L.6.6.2.4 gives no value for an unshielded boundary
Probabilities	**K_{S2}**	product of the internal boundaries, 1 with none	-	1	Rule of the standard	NFPA 780-2026 L.6.6.2.4
Probabilities	**K_{S3}**	selected option	Unshielded, routed to avoid large loops	2×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.6
Probabilities	**U_W**	selected option	2.5 kV, homes, offices, hotels and hospitals	2.5	Standard table	NFPA 780-2026 Tables L.6.7.7, L.6.7.8
Probabilities	**K_{S4}**	$1.5 / U_W$	1.5 / 2.5	6×10^{-1}	Calculated	NFPA 780-2026 equation (L.6.6.2.4c)
Probabilities	**K_S**	$K_{S1} \times K_{S2} \times K_{S3} \times K_{S4}$	$1 \times 1 \times 2 \times 10^{-1} \times 6 \times 10^{-1}$	1.2×10^{-1}	Calculated	NFPA 780-2026 equation (L.6.6.2.4a)
Probabilities	**P_M**	table row at K_S	Shielding factor 1.5×10^{-1}	9×10^{-1}	Calculated	NFPA 780-2026 Table L.6.7.5
Losses	**L_T**	selected option	People inside the building	1×10^{-5}	Standard table	NFPA 780-2026 Table L.6.7.9
Losses	**r_t**	selected option	Soil or concrete	1×10^{-2}	Standard table	NFPA 780-2026 Table L.6.7.10
Losses	**$L_A = L_U$**	$r_t \times L_T$	$1 \times 10^{-2} \times 1 \times 10^{-5}$	1×10^{-7}	Calculated	NFPA 780-2026 equation (L.6.6.3.1)
Losses	**r_p**	selected option	Manual extinguishers or alarms, hydrants, fireproof compartments or protected escapes	5×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.11 note
Losses	**r_f**	selected option	Low fire risk	1×10^{-3}	Standard table	NFPA 780-2026 Table L.6.7.12
Losses	**h_Z**	selected option	No special hazard	1	Standard table	NFPA 780-2026 Table L.6.7.13
Losses	**L_F**	selected option	Industrial, commercial or school	5×10^{-2}	Standard table	NFPA 780-2026 Table L.6.7.9
Losses	**$L_B = L_V$**	$r_p \times r_f \times h_Z \times L_F$	$5 \times 10^{-1} \times 1 \times 10^{-3} \times 1 \times 5 \times 10^{-2}$	2.5×10^{-5}	Calculated	NFPA 780-2026 equations (L.6.6.3.2a), (L.6.6.3.2b)

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Scope	Symbol	Expression	Values	Result	Origin	Reference
Losses	L_O	selected option	Industrial, commercial or school	1×10^{-6}	Standard table	NFPA 780-2026 Table L.6.7.9
Losses	$L_C = L_M = L_W = L_Z$	L_O	1×10^{-6}	1×10^{-6}	Calculated	NFPA 780-2026 equation (L.6.6.3.3)
Structure	R_A	$N_D \times P_A \times L_A$	$1.4 \times 10^{-1} \times 1 \times 1 \times 10^{-7}$	1.4×10^{-8}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_B	$N_D \times P_B \times L_B$	$1.4 \times 10^{-1} \times 1 \times 10^{-1} \times 2.5 \times 10^{-5}$	3.49×10^{-7}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_C	$N_D \times P_C \times L_C$	$1.4 \times 10^{-1} \times 3 \times 10^{-2} \times 1 \times 10^{-6}$	4.19×10^{-9}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_M	$N_M \times P_M \times L_M$	$3.62 \times 9 \times 10^{-1} \times 1 \times 10^{-6}$	3.26×10^{-6}	Calculated	NFPA 780-2026 Table L.6.6
Service Power	L_L	selected option	not known	1,000	Rule of the standard	NFPA 780-2026 L.6.6.1.3
Service Power	C_E	selected option	Suburban residential	5×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.1
Service Power	C_T	1, no transformer	-	1	Rule of the standard	NFPA 780-2026 L.6.6.1.3, no transformer
Service Power	A_L	$40 \times L_L$	$40 \times 1{,}000$	40,000	Calculated	NFPA 780-2026 L.6.6.1.3
Service Power	N_L	$N_{SG} \times A_L \times C_E \times C_T \times 10^{-6}$	$17 \times 40{,}000 \times 5 \times 10^{-1} \times 1 \times 10^{-6}$	3.4×10^{-1}	Calculated	NFPA 780-2026 equation (L.6.6.1.3)
Service Power	A_I	$4000 \times L_L$	$4{,}000 \times 1{,}000$	4,000,000	Calculated	NFPA 780-2026 L.6.6.1.5
Service Power	N_I	$N_{SG} \times A_I \times C_E \times C_T \times 10^{-6}$	$17 \times 4{,}000{,}000 \times 5 \times 10^{-1} \times 1 \times 10^{-6}$	34	Calculated	NFPA 780-2026 equation (L.6.6.1.5)
Service Power	N_{DJ}	0, no structure within 3H	-	0	Rule of the standard	NFPA 780-2026 Table L.6.6 note
Service Power	P_U	selected option	Unshielded, or its shield not bonded where the equipment is bonded, U_W 2.5 kV	1	Standard table	NFPA 780-2026 Table L.6.7.7
Service Power	P_U	$\min(P_C, P_U)$, surge protection	$\min(3 \times 10^{-2}, 1)$	3×10^{-2}	Calculated	NFPA 780-2026 L.6.6.2.5
Service Power	P_V	$\min(P_C, P_U)$	$\min(3 \times 10^{-2}, 1)$	3×10^{-2}	Calculated	NFPA 780-2026 L.6.6.2.6
Service Power	P_W	$\min(P_C, P_U)$	$\min(3 \times 10^{-2}, 1)$	3×10^{-2}	Calculated	NFPA 780-2026 L.6.6.2.7
Service Power	P_Z	selected option	Power line, U_W 2.5 kV	3×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.8
Service Power	P_Z	$\min(P_C, P_Z)$, surge protection	$\min(3 \times 10^{-2}, 3 \times 10^{-1})$	3×10^{-2}	Calculated	NFPA 780-2026 L.6.6.2.8
Service Power	R_U	$(N_L + N_{DJ}) \times P_U \times L_U$	$3.4 \times 10^{-1} \times 3 \times 10^{-2} \times 1 \times 10^{-7}$	1.02×10^{-9}	Calculated	NFPA 780-2026 Table L.6.6
Service Power	R_V	$(N_L + N_{DJ}) \times P_V \times L_V$	$3.4 \times 10^{-1} \times 3 \times 10^{-2} \times 2.5 \times 10^{-5}$	2.55×10^{-7}	Calculated	NFPA 780-2026 Table L.6.6
Service Power	R_W	$(N_L + N_{DJ}) \times P_W \times L_W$	$3.4 \times 10^{-1} \times 3 \times 10^{-2} \times 1 \times 10^{-6}$	1.02×10^{-8}	Calculated	NFPA 780-2026 Table L.6.6
Service Power	R_Z	$(N_I - N_L) \times P_Z \times L_Z$	$(34 - 3.4 \times 10^{-1}) \times 3 \times 10^{-2} \times 1 \times 10^{-6}$	1.01×10^{-6}	Calculated	NFPA 780-2026 Table L.6.6
Service Telephone	L_L	selected option	not known	1,000	Rule of the standard	NFPA 780-2026 L.6.6.1.3
Service Telephone	C_E	selected option	Suburban residential	5×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.1
Service Telephone	C_T	1, no transformer	-	1	Rule of the standard	NFPA 780-2026 L.6.6.1.3, no transformer
Service Telephone	A_L	$40 \times L_L$	$40 \times 1{,}000$	40,000	Calculated	NFPA 780-2026 L.6.6.1.3

SAMPLE

Scope	Symbol	Expression	Values	Result	Origin	Reference
Service Telephone	N_L	$N_{SG} \times A_L \times C_E \times C_T \times 10^{-6}$	$17 \times 40{,}000 \times 5 \times 10^{-1} \times 1 \times 10^{-6}$	3.4×10^{-1}	Calculated	NFPA 780-2026 equation (L.6.6.1.3)
Service Telephone	A_I	$4000 \times L_L$	4,000 × 1,000	4,000,000	Calculated	NFPA 780-2026 L.6.6.1.5
Service Telephone	N_I	$N_{SG} \times A_I \times C_E \times C_T \times 10^{-6}$	$17 \times 4{,}000{,}000 \times 5 \times 10^{-1} \times 1 \times 10^{-6}$	34	Calculated	NFPA 780-2026 equation (L.6.6.1.5)
Service Telephone	N_{DJ}	0, no structure within 3H	-	0	Rule of the standard	NFPA 780-2026 Table L.6.6 note
Service Telephone	P_U	selected option	Shield bonded with the equipment, 5 to 20 Ω/km, U_W 2.5 kV	9.5×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.7
Service Telephone	P_U	$\min(P_C, P_U)$, surge protection	$\min(3 \times 10^{-2}, 9.5 \times 10^{-1})$	3×10^{-2}	Calculated	NFPA 780-2026 L.6.6.2.5
Service Telephone	P_V	$\min(P_C, P_U)$	$\min(3 \times 10^{-2}, 9.5 \times 10^{-1})$	3×10^{-2}	Calculated	NFPA 780-2026 L.6.6.2.6
Service Telephone	P_W	$\min(P_C, P_U)$	$\min(3 \times 10^{-2}, 9.5 \times 10^{-1})$	3×10^{-2}	Calculated	NFPA 780-2026 L.6.6.2.7
Service Telephone	P_Z	selected option	Telecom line, U_W 2.5 kV	2×10^{-1}	Standard table	NFPA 780-2026 Table L.6.7.8
Service Telephone	P_Z	$\min(P_C, P_Z)$, surge protection	$\min(3 \times 10^{-2}, 2 \times 10^{-1})$	3×10^{-2}	Calculated	NFPA 780-2026 L.6.6.2.8
Service Telephone	R_U	$(N_L + N_{DJ}) \times P_U \times L_U$	$3.4 \times 10^{-1} \times 3 \times 10^{-2} \times 1 \times 10^{-7}$	1.02×10^{-9}	Calculated	NFPA 780-2026 Table L.6.6
Service Telephone	R_V	$(N_L + N_{DJ}) \times P_V \times L_V$	$3.4 \times 10^{-1} \times 3 \times 10^{-2} \times 2.5 \times 10^{-5}$	2.55×10^{-7}	Calculated	NFPA 780-2026 Table L.6.6
Service Telephone	R_W	$(N_L + N_{DJ}) \times P_W \times L_W$	$3.4 \times 10^{-1} \times 3 \times 10^{-2} \times 1 \times 10^{-6}$	1.02×10^{-8}	Calculated	NFPA 780-2026 Table L.6.6
Service Telephone	R_Z	$(N_I - N_L) \times P_Z \times L_Z$	$(34 - 3.4 \times 10^{-1}) \times 3 \times 10^{-2} \times 1 \times 10^{-6}$	1.01×10^{-6}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_U	sum over services	$1.02 \times 10^{-9} + 1.02 \times 10^{-9}$	2.04×10^{-9}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_V	sum over services	$2.55 \times 10^{-7} + 2.55 \times 10^{-7}$	5.1×10^{-7}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_W	sum over services	$1.02 \times 10^{-8} + 1.02 \times 10^{-8}$	2.04×10^{-8}	Calculated	NFPA 780-2026 Table L.6.6
Structure	R_Z	sum over services	$1.01 \times 10^{-6} + 1.01 \times 10^{-6}$	2.02×10^{-6}	Calculated	NFPA 780-2026 Table L.6.6
Risks	**R1**	$R_A + R_B + R_U + R_V$	$1.4 \times 10^{-8} + 3.49 \times 10^{-7} + 2.04 \times 10^{-9} + 5.1 \times 10^{-7}$	8.75×10^{-7}	Calculated	NFPA 780-2026 L.6.5
Risks	R_T	tolerable risk, R1	-	1×10^{-5}	Standard table	NFPA 780-2026 Table L.6.2
Risks	**R1 vs R_T**	$R1 < R_T$	$8.75 \times 10^{-7} < 1 \times 10^{-5}$	8.75×10^{-7}	Calculated	NFPA 780-2026 L.6.5
Risks	**R4**	$R_B + R_C + R_M + R_V + R_W + R_Z$	$3.49 \times 10^{-7} + 4.19 \times 10^{-9} + 3.26 \times 10^{-6} + 5.1 \times 10^{-7} + 2.04 \times 10^{-8} + 2.02 \times 10^{-6}$	6.16×10^{-6}	Calculated	NFPA 780-2026 L.6.5
Risks	R_T	tolerable risk, R4	-	1×10^{-3}	Entered	Owner's value, NFPA 780-2026 L.6.2
Risks	**R4 vs R_T**	$R4 < R_T$	$6.16 \times 10^{-6} < 1 \times 10^{-3}$	6.16×10^{-6}	Calculated	NFPA 780-2026 L.6.5
Risks	**R**	R1 + R2 + R3 + R4, reported only	$8.75 \times 10^{-7} + 6.16 \times 10^{-6}$	7.04×10^{-6}	Calculated	NFPA 780-2026 L.6.5

A hyphen means nothing was recorded, or the quantity does not apply here.

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Legal obligations

The Lumex lightning risk assessment platform calculates risk by the method of a published lightning protection standard. The standard and edition applied to this assessment are stated on the cover.

This assessment covers the risk to the building from lightning strikes and their effects. It uses inputs from the building's owner or operator, or from an expert, and takes those inputs as accurate.

This risk assessment no longer applies if anything changes at the site that would change the inputs it was based on.

This assessment is computed from the inputs recorded in it. It does not certify the structure, and it does not replace the judgement of the competent person who signs it.

This report is a computer-generated risk assessment produced by applying the method of the standard named on the cover to data supplied by the user. It is a decision-support aid, not a certified engineering design, a professional opinion, or a statement of code compliance, and its results depend entirely on the accuracy and completeness of the inputs provided. This report must be reviewed, validated, and approved by a competent lightning-protection professional before it is relied upon or acted upon. To the maximum extent permitted by law, Webority Technologies Private Limited (the platform operator) accepts no liability for any loss, damage, injury, or cost arising from the use of, or reliance on, this report or its calculations, which are governed by the platform's Terms & Conditions.

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Office block

Date: _____ Signature: _____

Place: _____ Stamp: _____

Protection proposals

Loss of life or injury, R1, with each proposal

Protection	0.01× 0.1× 1× 10× 100× 1000×	R1 and outcome
In place Protection as recorded on the assessment		2.01×10^{-5} Exceeds
Proposal A Chosen for this report LPS designed on a 45 m (150 ft) striking distance Surge protection to NFPA 780 Section 4.19		8.75×10^{-7} Within
Protection Lumex recommends LPS designed on a 45 m (150 ft) striking distance Surge protection to NFPA 780 Section 4.19		8.75×10^{-7} Within

Bars in multiples of the tolerable risk R_T of 1×10^{-5} per year, on a log scale. The dashed line marks R_T. The outcome words are the verdict's own (NFPA 780-2026 L.6.2, L.6.5).

Risks with each proposal

Risk	Type of loss	In place	Proposal A (chosen)	Recommended	R_T	Reference
R1	Loss of life or injury	2.01×10^{-5}	8.75×10^{-7}	8.75×10^{-7}	1×10^{-5}	NFPA 780-2026 L.6.2, L.6.5
R4	Loss of economic value	4.1×10^{-5}	6.16×10^{-6}	6.16×10^{-6}	1×10^{-3}	NFPA 780-2026 L.6.2, L.6.5

These are all the protection proposals saved on this assessment. Each one was worked out with the same calculation as the rest of this report, with its protection added to the protection in place. The chosen proposal is the one the section on the protection Lumex proposes describes. A proposal never changes the verdict of this report (NFPA 780-2026 L.6.5).

Proposal	Protection proposed	Risks with it	Outcome
Proposal A Chosen for this report	Protection against physical damage: LPS designed on a 45 m (150 ft) striking distance Surge protection: Surge protection to NFPA 780 Section 4.19 Coordinated surge protection at the equipment: No Measures against injury at the structure: None Power: measures against injury: None Telephone: measures against injury: None	**R1** 8.75×10^{-7} **R4** 6.16×10^{-6}	Every type of loss judged is within its tolerable risk

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Table of Abbreviations

Each symbol this report prints, what it stands for, and where NFPA 780-2026 defines or uses it.

Symbol	Meaning	Reference
A_D	Collection area of the structure: the ground area where a strike counts as a strike to it	NFPA 780-2026 L.4.1
A_{DJ}	Collection area of the structure at the far end of a service	NFPA 780-2026 equation (L.6.6.1.4)
A_L	Collection area of a service, 40 times its length	NFPA 780-2026 L.6.6.1.3
A_M	Area within 350 m of the structure, where a strike counts as near it	NFPA 780-2026 L.6.6.1.2
C	The four coefficients C2 to C5 of the simplified risk assessment, multiplied together	NFPA 780-2026 L.5.1.1
C2	Construction coefficient, set by the structure and roof materials	NFPA 780-2026 Table L.5.1.2(a)
C3	Contents coefficient, set by the value and combustibility of the contents	NFPA 780-2026 Table L.5.1.2(b)
C4	Occupancy coefficient, set by who is inside and how easily they leave	NFPA 780-2026 Table L.5.1.2(c)
C5	Consequence coefficient, set by what a strike would stop or harm	NFPA 780-2026 Table L.5.1.2(d)
C_D	Location factor: how exposed the surroundings leave the structure	NFPA 780-2026 Table L.4.2
C_{DJ}	Location factor	NFPA 780-2026 Table L.4.2
C_E	Service environmental coefficient	NFPA 780-2026 Table L.6.7.1
C_T	Correction for a transformer between a service and the structure	NFPA 780-2026 L.6.6.1.3
H	Height of the structure, or of its prominent part	NFPA 780-2026 L.4.1.1
h_Z	Factor that raises the physical damage loss for a special hazard	NFPA 780-2026 Table L.6.7.13
K_S	Combined shielding factor, K_{S1} to K_{S4} multiplied together	NFPA 780-2026 equation (L.6.6.2.4a)
K_{S1}	Shielding of the structure's outer boundary	NFPA 780-2026 L.6.6.2.4
K_{S2}	Shielding of the boundaries inside the structure	NFPA 780-2026 L.6.6.2.4
K_{S3}	Factor for how the internal wiring is run	NFPA 780-2026 Table L.6.7.6
K_{S4}	Factor for the equipment's impulse withstand voltage	NFPA 780-2026 equation (L.6.6.2.4c)
L	Length	NFPA 780-2026 L.4.1.1
$L_A = L_U$	L_A: loss value for human life; L_U: loss value for living beings	NFPA 780-2026 equation (L.6.6.3.1)
$L_B = L_V$	Value of loss from a direct strike to the structure (L_B); value of loss from a strike to an incoming service (L_V)	NFPA 780-2026 equations (L.6.6.3.2a), (L.6.6.3.2b)
$L_C = L_M = L_W = L_Z = L_O$	Value of loss from failure of internal systems, by where the strike lands	NFPA 780-2026 equation (L.6.6.3.3)
L_F	Typical share lost to physical damage, by type of structure	NFPA 780-2026 Table L.6.7.9
L_L	Length of a service	NFPA 780-2026 L.6.6.1.3
L_T	Mean value of loss of life	NFPA 780-2026 Table L.6.7.9
N_C	Tolerable lightning frequency	NFPA 780-2026 equation (L.5.1.1)
N_D	Strikes to the structure expected per year	NFPA 780-2026 equation (L.3)
N_{DJ}	Strikes per year to the structure at the far end of a service	NFPA 780-2026 L.6.6.1.4
N_I	Strikes per year near a service	NFPA 780-2026 equation (L.6.6.1.5)

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Symbol	Meaning	Reference
N_L	Strikes per year to a service	NFPA 780-2026 equation (L.6.6.1.3)
N_M	Strikes per year near the structure	NFPA 780-2026 equation (L.6.6.1.2)
N_{SG}	Lightning ground strike-point density (km²/year)	NFPA 780-2026 L.2.1
P_A	Chance a strike to the structure injures someone	NFPA 780-2026 Table L.6.7.2
P_B	Chance a strike to the structure causes physical damage	NFPA 780-2026 Table L.6.7.3
P_C	Chance a strike to the structure makes internal systems fail	NFPA 780-2026 L.6.6.2.3, Table L.6.7.4
P_M	Chance a strike near the structure makes internal systems fail	NFPA 780-2026 L.6.6.2.4, Table L.6.7.5
P_P	Share of people in a dangerous place, defined by the annex and not applied here	NFPA 780-2026 L.6.6.3
P_U	Chance a strike to a service injures someone	NFPA 780-2026 L.6.6.2.5, Table L.6.7.7
P_V	Chance a strike to a service entering the structure causes physical damage	NFPA 780-2026 L.6.6.2.6
P_W	Chance a strike to a service makes internal systems fail	NFPA 780-2026 L.6.6.2.7
P_Z	Chance a strike near a service makes internal systems fail	NFPA 780-2026 L.6.6.2.8, Table L.6.7.8
R1	Risk from loss of life or injury	NFPA 780-2026 L.6.3, L.6.5
R2	Risk associated with loss of service	NFPA 780-2026 L.6.3, L.6.5
R3	Risk associated with loss of historical significance	NFPA 780-2026 L.6.3, L.6.5
R4	Risk associated with loss of economic value	NFPA 780-2026 L.6.3, L.6.5
R_A	Risk of injury from a strike to the structure	NFPA 780-2026 Table L.6.6
R_B	Risk of physical damage from a strike to the structure	NFPA 780-2026 Table L.6.6
R_C	Risk of internal system failure from a strike to the structure	NFPA 780-2026 Table L.6.6
r_f	Reduction for how readily the structure burns	NFPA 780-2026 Table L.6.7.12
R_M	Risk of internal system failure from a strike near the structure	NFPA 780-2026 Table L.6.6
r_p	Reduction for the fire provisions taken	NFPA 780-2026 Table L.6.7.11
R_T	Highest risk treated as tolerable for a type of loss	NFPA 780-2026 Table L.6.2
r_t	Reduction for the floor or ground surface	NFPA 780-2026 Table L.6.7.10
R_U	Risk of injury from a strike to a service	NFPA 780-2026 Table L.6.6
R_V	Risk of physical damage from a strike to a service	NFPA 780-2026 Table L.6.6
R_W	Risk of internal system failure from a strike to a service	NFPA 780-2026 Table L.6.6
R_Z	Risk of internal system failure from a strike near a service	NFPA 780-2026 Table L.6.6
U_W	Lowest impulse voltage the equipment withstands	NFPA 780-2026 equation (L.6.6.2.4c)
W	Width	NFPA 780-2026 L.4.1.1
W_M	Spacing of a grid shield	NFPA 780-2026 equation (L.6.6.2.4b)

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