Lumex

CALCULATION STANDARD

AS 1768:2021

LIGHTNING RISK ASSESSMENT REPORT

Abstract of risk assessment to identify and implement actions that lessen the impact of lightning, per AS 1768:2021.

Protection needed



Office block

CLIENT
Sample Engineering Ltd

PROJECT CODE
SAMPLE-001

ASSESSMENT ID
ASM-0001

REVISION
1

CREATED
14-Oct-2026

ASSESSOR
Sample Engineer

SITE
Sydney, New South Wales

STRUCTURE
20 × 20 × 40 m

Assessed under AS 1768:2021. Calculated by Sphera.

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SAMPLE

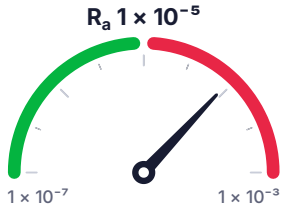
At a glance

Protection needed

R_1 exceeds the tolerable risk, so protection is needed.

AS 1768:2021 Table 2.1, Figure 2.1

Headline risk: loss of human life, R_1

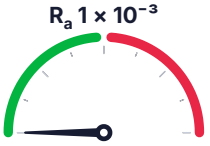


As assessed **9.1×10^{-5}**

About 9.1 times the tolerable risk R_1.

Tolerable risk $R_a = 1 \times 10^{-5}$ per year. AS 1768:2021 equation B.3.1(1), Table 2.1, Figure 2.1

Loss of service to the public, R_2 — Within



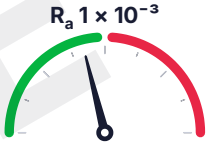
As assessed **0**

Loss of cultural heritage, R_3 — Within



As assessed **0**

Loss of economic value, R_4 — Within



As assessed **4.86×10^{-4}**

R_2 to R_4 each against its own tolerable risk. Each dial spans 100 times either side of its tolerable risk. A risk of 0 rests at the safe end. AS 1768:2021 Table 2.1

What drives R_1

- Risk of fire, explosion, mechanical or chemical damage from a strike to the structure
  A direct strike to the building can start a fire or an explosion. It can also cause mechanical or chemical damage.
  R_s 6.21×10^{-5}
- Risk of internal system failure from a strike near the structure
  A strike close by induces overvoltages in the wiring and equipment, which can make them fail.
  R_m 1.21×10^{-5}
- Risk of harm to people from a strike to the structure
  Touch and step voltages around the building
  R_h 8.29×10^{-6}

The three largest components of R_1, as assessed. R_w ties with R_h and is not shown. Bars in multiples of R_a. The dashed line marks R_a. AS 1768:2021 equation B.3.1(1)

Next steps

- Read the recommended protection. The least protection that brings every type of loss within its tolerable risk is set out in the recommended protection section. Fire protection is kept as entered.
- Check metal pipes such as gas and water on site: with a lightning protection system they need bonding where they come in. AS 1768:2021 3.6.2(c)
- Check the sign-off and the verification code before you share this report.

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

Executive summary

Headline risk, R_1, loss of human life

9.1×10^{-5} per year, against a tolerable risk of 1×10^{-5} per year.

Above the limit

AS 1768:2021 equation B.3.1(1), Table 2.1, Figure 2.1

R_1 exceeds the tolerable risk, so protection is needed.

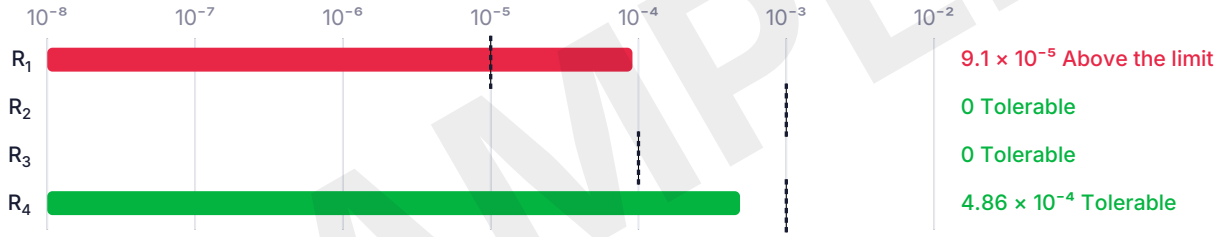
Protection needed

AS 1768:2021 Table 2.1, Figure 2.1

Risk	Type of loss	R	R_a	Outcome
R_1	Loss of human life	9.1×10^{-5}	1×10^{-5}	Above the limit
R_2	Loss of service to the public	0	1×10^{-3}	Tolerable
R_3	Loss of cultural heritage	0	1×10^{-4}	Tolerable
R_4	Loss of economic value	4.86×10^{-4}	1×10^{-3}	Tolerable

Risks and tolerable risks are per year. AS 1768:2021 equation B.3.1(1), Table 2.1

Risk by type of loss



The dashed line on each row marks that type of loss's own tolerable risk R_a.

R_1 to R_4 on a log scale, each against its own R_a. The outcome words are the verdict's own. AS 1768:2021 Table 2.1, Figure 2.1

SAMPLE

Structure

Answer	Value	Reference
Length L	20 m	AS 1768:2021 C.3.2.1
Width W	20 m	AS 1768:2021 C.3.2.1
Height H	40 m	AS 1768:2021 C.3.2.1
Susceptibility to fire, p_f	Low	AS 1768:2021 C.3.2.2
Susceptibility to sparking, p_s	Medium	AS 1768:2021 C.3.2.2
Internal wiring, p_i	Unscreened wiring	AS 1768:2021 C.3.2.2

Location

Answer	Value	Reference
Ground flash density N_g	3 flashes per square kilometre per year	AS 1768:2021 C.3.2.3
Environmental factor C_d	Isolated	AS 1768:2021 C.3.2.3
Service line density	Urban	AS 1768:2021 C.3.2.3

Service lines

Answer	Value	Reference
Power supply	Underground cable	AS 1768:2021 C.3.2.4.1
Power cable	Unscreened cable	AS 1768:2021 C.3.2.4.1 to C.3.2.4.3
Transformer at structure	Yes	AS 1768:2021 C.3.2.4.1

Protection

Answer	Value	Reference
Protection level LPL I to IV	No protection	AS 1768:2021 B.4.2 (E); Table 3.1, C.3.4.2(b)
Fire protection, k_f	No fire protection	AS 1768:2021 C.3.4.2(a)
Surge protection at point of entry	No	Not printed in AS 1768:2021
Surge protection to all equipment (secondary protection)	No	Not printed in AS 1768:2021

Losses

Answer	Value	Reference
Evacuation difficulties, k_{h1}	Average level of panic	AS 1768:2021 C.3.2.5.1
Loss of life, location type for fire, O_{f1}	Medium occupancy	AS 1768:2021 C.3.2.5.1
Loss of life, location type for overvoltages, O_{o1}	Medium occupancy	AS 1768:2021 C.3.2.5.1
Service to the public, fire, O_{f2}	No essential service	AS 1768:2021 C.3.2.5.2
Service to the public, overvoltages, O_{o2}	Not relevant to structure	AS 1768:2021 C.3.2.5.2
Cultural heritage, fire, O_{f3}	Not relevant to structure	AS 1768:2021 C.3.2.5.3
Economic loss, fire, O_{f4}	Offices, schools, universities	AS 1768:2021 C.3.2.5.4
Economic loss, overvoltages, O_{o4}	Offices, schools, property for public use	AS 1768:2021 C.3.2.5.4

SAMPLE

Answer	Value	Reference
Tolerable risk of economic loss, R_{a4}	Loss is 1 in 1 000 years	AS 1768:2021 C.3.2.5.4, Table 2.1 NOTE
Animals, step and touch voltage, O_{h4}	Not applicable	AS 1768:2021 C.3.2.5.4

SAMPLE

Collection areas and dangerous events

The areas are in square kilometres and the events are per year. Each figure is the one the calculation trace resolved.

The structure

Symbol	Quantity	Value	Reference
A_d	Collection area for strikes to the structure	0.05524 km²	AS 1768:2021 B.2.3.1
N_d	Strikes to the structure per year	1.66×10^{-1}	AS 1768:2021 B.2.3.1
A_m	Area where a nearby strike can induce overvoltages in the structure	0.1615 km²	AS 1768:2021 B.2.3.1
N_m	Strikes near the structure per year	4.85×10^{-1}	AS 1768:2021 B.2.3.1

Underground service lines

Symbol	Quantity	Value	Reference
A_{c2}	Collection area for strikes to an underground line	0 km²	AS 1768:2021 B.2.3.1
N_{c2p}	Strikes to the underground power line per year	0	AS 1768:2021 B.2.3.1
A_{i2}	Area where a strike near an underground line induces overvoltages	0.05 km²	AS 1768:2021 B.2.3.1
N_{i2p}	Strikes near the underground power line per year	3.75×10^{-3}	AS 1768:2021 B.2.3.1

Only the service lines this site has are listed. The calculation trace keeps the figures for every kind of line, and only the lines entered add to the risk, through their cable factors. AS 1768:2021 C.3.2.4

SAMPLE

Risk by type of loss

R_1 exceeds the tolerable risk, so protection is needed.

Protection needed

AS 1768:2021 Table 2.1, Figure 2.1

Risk	Type of loss	R	R_a	Outcome
R_1	Loss of human life	9.1×10^{-5}	1×10^{-5}	Above the limit
R_2	Loss of service to the public	0	1×10^{-3}	Tolerable
R_3	Loss of cultural heritage	0	1×10^{-4}	Tolerable
R_4	Loss of economic value	4.86×10^{-4}	1×10^{-3}	Tolerable

Risks and tolerable risks are per year. AS 1768:2021 equation B.3.1(1), Table 2.1

Risk components

Risk	R_h	R_s	R_w	R_g	R_c	R_m	R_e	R_l	R_d	R_i
R_1	8.29×10^{-6}	6.21×10^{-5}	8.29×10^{-6}	0	0	1.21×10^{-5}	0	1.88×10^{-7}	7.87×10^{-5}	1.23×10^{-5}
R_2	-	0	0	-	0	0	0	0	0	0
R_3	-	0	-	-	0	-	-	-	0	0
R_4	0	7.46×10^{-5}	1.66×10^{-4}	0	0	2.42×10^{-4}	0	3.75×10^{-6}	2.4×10^{-4}	2.46×10^{-4}

R_d sums the components from flashes to the structure, R_i the rest. AS 1768:2021 equation B.3.1(1)

A hyphen means the tool does not compute that component for this type of loss.

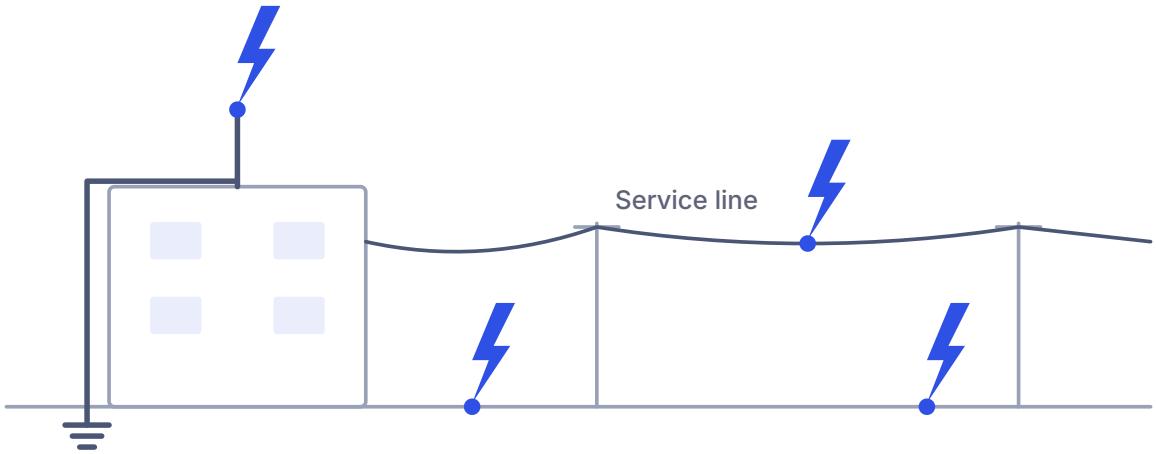
Tolerable risk for loss of cultural heritage

This assessment applies 10^{-4} per year, the tolerable risk Table 2.1 lists for loss of cultural heritage. The standard's own tool applies 10^{-3} per year, and the worked example in Figure C.2 prints the same. Table 2.1 is part of the standard itself, while Figure C.2 sits in an informative appendix, and the lower value is the safer of the two, so this assessment takes Table 2.1. Its verdict for loss of cultural heritage can therefore differ from the tool's.

AS 1768:2021 Table 2.1, Figure C.2

SAMPLE

Sources of damage



S1 On the structure — R_h R_s R_w

S2 Near it — R_m

S3 On the line — R_g R_c R_e

S4 Near the line — R_l

Counts in the risks R_1 to R_4

The four sources of damage, by where the flash lands. AS 1768:2021 2.5.1

SAMPLE

Recommended protection

The least protection that brings every type of loss within its tolerable risk is shown below. Fire protection is kept as entered.

Answer	Value	Reference
Protection level LPL I to IV	LPL IV	AS 1768:2021 B.4.2 (E); Table 3.1, C.3.4.2(b)
Surge protection at point of entry	Yes	Not printed in AS 1768:2021
Surge protection to all equipment (secondary protection)	No	Not printed in AS 1768:2021
Fire protection, k_f, as entered	No fire protection	AS 1768:2021 C.3.4.2(a)

Risk with the recommended protection

Risk	Type of loss	R	R_a	Outcome
R_1	Loss of human life	9.54×10^{-6}	1×10^{-5}	Tolerable
R_2	Loss of service to the public	0	1×10^{-3}	Tolerable
R_3	Loss of cultural heritage	0	1×10^{-4}	Tolerable
R_4	Loss of economic value	7.2×10^{-5}	1×10^{-3}	Tolerable

Risks and tolerable risks are per year. AS 1768:2021 equation B.3.1(1), Table 2.1

AS 1768:2021 C.3.4.2, B.4.2, B.4.3

With a lightning protection system, the risk uses the LPS efficiency E that B.4.2 gives, 98, 95, 90 and 80 per cent for LPL I to IV. Table 3.1 prints the interception efficiency, 99, 97, 91 and 84 per cent, a different quantity used to design the system. The standard's own tool applies the Table 3.1 figures in the risk, so a protected structure's figures here can differ from the tool's. AS 1768:2021 B.4.2, Table 3.1

Where a lightning protection system is fitted, metal pipes such as gas and water also need bonding to its earthing where they come into the building. This assessment does not record those pipes, so check them on site. AS 1768:2021 3.6.2(c)

SAMPLE

Protection Lumex proposes

This section is a Lumex proposal. AS 1768:2021 does not ask for one: it judges the protection as declared against the tolerable risks (AS 1768:2021 Table 2.1, Figure 2.1).

The calculation is run again with the protection below in place of the protection declared. Every other answer stays the same, and every figure follows the same AS 1768:2021 clauses and tool cells.

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

Protection as assessed and as proposed

Measure	As assessed	Proposed	Reference
Protection level LPL I to IV	No protection	LPL IV	AS 1768:2021 B.4.2 (E); Table 3.1, C.3.4.2(b)
Fire protection, k_f	No fire protection	Automated fire protection	AS 1768:2021 C.3.4.2(a)
Surge protection at point of entry	No	Yes	Not printed in AS 1768:2021
Surge protection to all equipment (secondary protection)	No	No	Not printed in AS 1768:2021

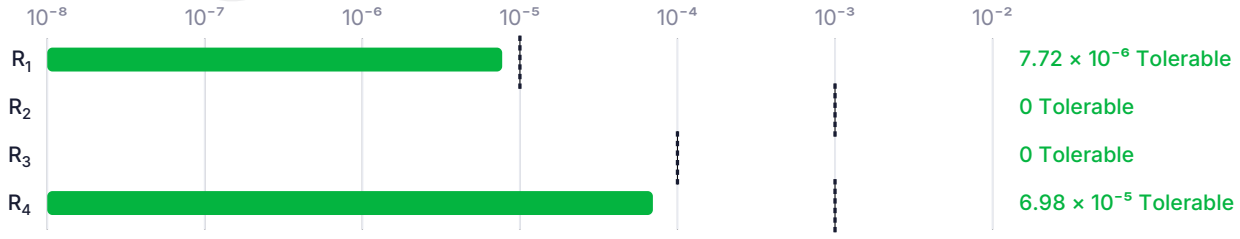
Risk as assessed and with the proposed protection

Risk	Type of loss	R as assessed	R proposed	R_a	Proposed outcome
R_1	Loss of human life	9.1×10^{-5}	7.72×10^{-6}	1×10^{-5}	Tolerable
R_2	Loss of service to the public	0	0	1×10^{-3}	Tolerable
R_3	Loss of cultural heritage	0	0	1×10^{-4}	Tolerable
R_4	Loss of economic value	4.86×10^{-4}	6.98×10^{-5}	1×10^{-3}	Tolerable

Risks and tolerable risks are per year. AS 1768:2021 equation B.3.1(1), Table 2.1, Figure 2.1

With the proposed protection, every type of loss would be within its tolerable risk.

Risk with the proposed protection



The dashed line on each row marks that type of loss's own tolerable risk R_a.

R_1 to R_4 on a log scale, each against its own R_a. The outcome words are the verdict's own. AS 1768:2021 Table 2.1, Figure 2.1

SAMPLE

Conclusion

Assessed against AS 1768:2021 with the protection as declared, R_1 exceeds its tolerable risk. The structure needs further protection.

Protection needed

AS 1768:2021 Table 2.1, Figure 2.1

The least protection the method finds that brings every type of loss within its tolerable risk is LPL IV with surge protection at point of entry, keeping the fire protection as entered.

AS 1768:2021 C.3.4.2, B.4.2, B.4.3

With a lightning protection system, the risk uses the LPS efficiency E that B.4.2 gives, 98, 95, 90 and 80 per cent for LPL I to IV. Table 3.1 prints the interception efficiency, 99, 97, 91 and 84 per cent, a different quantity used to design the system. The standard's own tool applies the Table 3.1 figures in the risk, so a protected structure's figures here can differ from the tool's. AS 1768:2021 B.4.2, Table 3.1

With the protection Lumex proposes, every type of loss would be within its tolerable risk. The proposal is a Lumex feature and does not change the verdict above.

Conditions and scope

The figures assume a metal or reinforced concrete structure is electrically continuous, well earthed and has adequate air terminations. Whatever the result, make continuity and earthing meet Sections 3 and 5, and confirm the air terminations are in place. AS 1768:2021 2.5.3

Protection can be justified whatever the risk result. Deciding to fit it is the engineer's judgement. AS 1768:2021 2.2

The method is for standalone structures. It does not cover people outdoors, structures whose owner has already decided on protection, or small shelters, shade structures and rotundas. AS 1768:2021 2.1

Distributed and open-air sites, such as treatment plants, mine sites, ground-mounted solar arrays, golf courses and school grounds, need another approach. Multiply the site area by N_g for the site as a whole, then assess each structure on its own. AS 1768:2021 2.5.4

Part of a building can be assessed alone only if the rest of the building has no explosion risk, fire barriers of at least 120 minutes enclose the part, and every service entering it has surge protection. AS 1768:2021 B.4.1(a)

Surge protection advice

Consider surge protection even when the risks pass, where surge damage could harm people, disrupt a public utility or cost more than the owner can accept. AS 1768:2021 4.2.1(ii) to (iv)

Consider a lightning protection system whatever the risk result, where a direct strike could harm people, disrupt a public utility or cause an unacceptable economic loss. AS 1768:2021 3.1

When the result calls only for surge protection at point of entry, consider surge protection on sensitive equipment as well. AS 1768:2021 4.1, C.3.4.3

SAMPLE

Calculation trace

Every quantity in the order the calculation resolved it, with the expression, the values put into it and where it comes from. The calculation reproduces AS 1768:2021 tool v5.0 cell by cell.

Scope	Symbol	Expression	Values	Result	Origin	Reference
Structure	**L**	length of the structure	20	20	Entered	AS 1768:2021 C.3.2.1
Structure	**W**	width of the structure	20	20	Entered	AS 1768:2021 C.3.2.1
Structure	**H**	height of the structure	40	40	Entered	AS 1768:2021 C.3.2.1
Structure	**N_g**	ground flash density entered for the site	3	3	Entered	AS 1768:2021 C.3.2.3
Structure	**C_d**	selected option	Isolated	1	Standard table	AS 1768:2021 C.3.2.3; tool v5.0 Data Sheet!D12
Service lines	**C_s**	selected option	Urban	0.1	Standard table	AS 1768:2021 C.3.2.3; tool v5.0 Data Sheet!D14 (Cs), D37, D48 (L1, L2, not printed in the standard)
Service lines	**L1, L2**	selected option	Urban	100	Standard table	AS 1768:2021 C.3.2.3; tool v5.0 Data Sheet!D14 (Cs), D37, D48 (L1, L2, not printed in the standard)
Service lines	**C_{t0}**	selected option	There is a transformer at the structure	0.25	Standard table	AS 1768:2021 C.3.2.4.1; tool v5.0 Data Sheet!D29
Structure	**p_f**	selected option	Low	0.001	Standard table	AS 1768:2021 C.3.2.2; tool v5.0 Data Sheet!D18
Structure	**p_s**	selected option	Medium	0.5	Standard table	AS 1768:2021 C.3.2.2; tool v5.0 Data Sheet!D15
Structure	**p_i**	selected option	Unscreened wiring	1	Standard table	AS 1768:2021 C.3.2.2; tool v5.0 Data Sheet!D19
Protection	**E**	selected option	No protection	0	Standard table	AS 1768:2021 B.4.2 (E); Table 3.1, C.3.4.2(b)
Protection	**k_f**	selected option	No fire protection	1	Standard table	AS 1768:2021 C.3.4.2(a); tool v5.0 Data Sheet!I39
Protection	**k_3**	selected option	No surge protection to all equipment (secondary protection)	1	Rule of the standard	AS 1768:2021 tool v5.0 Data Sheet!I38 (k3), I41 (k5); not printed in the standard
Protection	**k_5**	selected option	No surge protection at point of entry	1	Rule of the standard	AS 1768:2021 tool v5.0 Data Sheet!I38 (k3), I41 (k5); not printed in the standard
Service lines	**n_{ohp}**	1 when the power service is overhead	0	0	Entered	AS 1768:2021 tool v5.0 Risk - Category 1!M15
Service lines	**n_{ugp}**	1 when the power service is underground	1	1	Entered	AS 1768:2021 tool v5.0 Risk - Category 1!M16
Service lines	**p_{e0}**	selected option	Unscreened cable	1	Standard table	AS 1768:2021 C.3.2.4.1 to C.3.2.4.3; tool v5.0 Data Sheet!D28, D34, D46, Risk - Category 1!F26
Service lines	**n_{oh}**	number of other overhead conductive services	0	0	Entered	AS 1768:2021 C.3.2.4.2
Service lines	**n_{ug}**	number of underground conductive services	0	0	Entered	AS 1768:2021 C.3.2.4.3
Service lines	**p_{e1}**	no other overhead service	-	0	Rule of the standard	AS 1768:2021 tool v5.0 Risk - Category 1!F21, F23, F56
Service lines	**p_{e2}**	no other underground service	-	0	Rule of the standard	AS 1768:2021 tool v5.0 Risk - Category 1!F24, F25, F56

SAMPLE

Scope	Symbol	Expression	Values	Result	Origin	Reference
Structure	A_d	$(L \times W + 6 \times H \times (L+W) + 9 \times \pi \times H^2) / 10^6$	$(20 \times 20 + 6 \times 40 \times (20+20) + 9 \times \pi \times 40^2) / 10^6$	0.05524	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA7
Structure	N_d	$N_g \times A_d \times C_d$	3 × 0.05524 × 1	0.1657	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA8
Structure	D_m	fixed by the tool	250	250	Standard table	AS 1768:2021 tool v5.0 Data Sheet!D13
Structure	A_m	$\max(0, (L \times W + 2 \times D_m \times (L+W) + \pi \times D_m^2) / 10^6 - A_d)$	$\max(0, (20 \times 20 + 2 \times 250 \times (20+20) + \pi \times 250^2) / 10^6 - 0.05524)$	0.1615	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA12, D13
Structure	N_m	$N_g \times A_m$	3 × 0.1615	0.4845	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA13
Service lines	H_{c1}	fixed by the tool	7	7	Standard table	AS 1768:2021 tool v5.0 Data Sheet!D35
Service lines	D_{c1}	$3 \times H_{c1}$	3 × 7	21	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA22, D35
Service lines	L_{c1}	max(0, L1 - 3×H)	max(0, 100 - 3×40)	0	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA23, AA24
Service lines	A_{c1}	$2 \times D_{c1} \times L_{c1} / 10^6$	$2 \times 21 \times 0 / 10^6$	0	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA25
Service lines	N_{c1p}	$N_g \times A_{c1} \times C_{t0} \times C_s$	3 × 0 × 0.25 × 0.1	0	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA27
Service lines	N_{c1}	$N_g \times A_{c1} \times C_s$	3 × 0 × 0.1	0	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA28
Service lines	D_{i1}	fixed by the tool	1000	1000	Standard table	AS 1768:2021 tool v5.0 Data Sheet!AA32, simplified from ITU-T K.47
Service lines	A_{i1}	$2 \times D_{i1} \times L1 / 10^6$	$2 \times 1000 \times 100 / 10^6$	0.2	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA32, AA33
Service lines	N_{i1p}	$N_g \times A_{i1} \times C_{t0} \times C_s$	3 × 0.2 × 0.25 × 0.1	0.015	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA34
Service lines	N_{i1}	$N_g \times A_{i1} \times C_s$	3 × 0.2 × 0.1	0.06	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA35
Service lines	ρ	fixed by the tool	100	100	Standard table	AS 1768:2021 tool v5.0 Data Sheet!D47
Service lines	D_{c2}	$0.2 \times \sqrt{\rho}$	$0.2 \times \sqrt{100}$	2	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA43, D47
Service lines	L_{c2}	max(0, L2 - 3×H)	max(0, 100 - 3×40)	0	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA44, AA45
Service lines	A_{c2}	$2 \times D_{c2} \times L_{c2} / 10^6$	$2 \times 2 \times 0 / 10^6$	0	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA46
Service lines	N_{c2p}	$N_g \times A_{c2} \times C_{t0} \times C_s$	3 × 0 × 0.25 × 0.1	0	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA48
Service lines	N_{c2}	$N_g \times A_{c2} \times C_s$	3 × 0 × 0.1	0	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA49
Service lines	D_{i2}	$25 \times \sqrt{\rho}$	$25 \times \sqrt{100}$	250	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA53
Service lines	A_{i2}	$2 \times D_{i2} \times L2 / 10^6$	$2 \times 250 \times 100 / 10^6$	0.05	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA54
Service lines	N_{i2p}	$N_g \times A_{i2} \times C_{t0} \times C_s$	3 × 0.05 × 0.25 × 0.1	0.00375	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA55
Service lines	N_{i2}	$N_g \times A_{i2} \times C_s$	3 × 0.05 × 0.1	0.015	Calculated	AS 1768:2021 tool v5.0 Data Sheet!AA56
Probabilities	k_1	1 - E	1 - 0	1	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F45
Probabilities	p_h	fixed by the tool	0.01	0.01	Standard table	AS 1768:2021 tool v5.0 Data Sheet!D16
Probabilities	P_h	$k_1 \times p_h \times p_s$	1 × 0.01 × 0.5	0.005	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F47, Data Sheet!D16

SAMPLE

Scope	Symbol	Expression	Values	Result	Origin	Reference
Probabilities	p_{et}	$p_{e0} + n_{oh} \times p_{e1} + n_{ug} \times p_{e2}$	1 + 0×0 + 0×0	1	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F56
Probabilities	p_{etc}	$\min(1, p_{et})$	min(1, 1)	1	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F58
Probabilities	P_{ewd}	$k_5 \times p_{etc}$	1 × 1	1	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F60
Probabilities	P_s	$k_f \times p_f \times (k_1 \times p_s + P_{ewd})$	1 × 0.001 × (1×0.5 + 1)	0.0015	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F63
Probabilities	P_{ewdo}	$k_3 \times k_5 \times p_{etc}$	1 × 1 × 1	1	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F71
Probabilities	P_w	$1 - (1 - k_1 \times p_s \times p_i \times k_3) \times (1 - P_{ewdo})$	1 - (1 - 1×0.5×1×1) × (1 - 1)	1	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F74
Probabilities	P_m	$k_1 \times k_3 \times p_s \times p_i$	1 × 1 × 0.5 × 1	0.5	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F83
Probabilities	P_{c1p}	$n_{ohp} \times k_5 \times p_{e0}$	0 × 1 × 1	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M45
Probabilities	P_{c1}	$n_{oh} \times k_5 \times p_{e1}$	0 × 1 × 0	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M47
Probabilities	P_{c2p}	$n_{ugp} \times k_5 \times p_{e0}$	1 × 1 × 1	1	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M49
Probabilities	P_{c2}	$n_{ug} \times k_5 \times p_{e2}$	0 × 1 × 0	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M51
Probabilities	P_{i1p}	$n_{ohp} \times k_3 \times k_5 \times p_{e0}$	0 × 1 × 1 × 1	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M69
Probabilities	P_{i1}	$n_{oh} \times k_3 \times k_5 \times p_{e1}$	0 × 1 × 1 × 0	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M71
Probabilities	P_{i2p}	$n_{ugp} \times k_3 \times k_5 \times p_{e0}$	1 × 1 × 1 × 1	1	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M73
Probabilities	P_{i2}	$n_{ug} \times k_3 \times k_5 \times p_{e2}$	0 × 1 × 1 × 0	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M75
Probabilities	sum $N_c \times P_c$	$N_{c1} \times P_{c1} + N_{c2} \times P_{c2} + N_{c1p} \times P_{c1p} + N_{c2p} \times P_{c2p}$	0×0 + 0×0 + 0×0 + 0×1	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M53, M58, M63
Probabilities	sum $N_i \times P_i$	$N_{i1} \times P_{i1} + N_{i2} \times P_{i2} + N_{i1p} \times P_{i1p} + N_{i2p} \times P_{i2p}$	0.06×0 + 0.015×0 + 0.015×0 + 0.00375×1	0.00375	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M77
Category 1	k_{h1}	selected option	Average level of panic	5	Standard table	AS 1768:2021 C.3.2.5.1; tool v5.0 Cover Sheet!AW22:AW27
Category 1	O_{f1}	selected option	Medium occupancy	0.05	Standard table	AS 1768:2021 C.3.2.5.1; tool v5.0 Cover Sheet!AW33:AW36
Category 1	O_{o1}	selected option	Medium occupancy	1×10^{-5}	Standard table	AS 1768:2021 C.3.2.5.1; tool v5.0 Cover Sheet!AW38:AW41
Category 1	O_{h1}	fixed by the tool	0.01	0.01	Standard table	AS 1768:2021 tool v5.0 Data Sheet!I8
Category 1	p_g	fixed by the tool	1×10^{-5}	1×10^{-5}	Standard table	AS 1768:2021 tool v5.0 Risk - Category 1!M21, Risk - Category 4!F20
Category 1	O_{g1}	fixed by the tool	0.0001	1×10^{-4}	Standard table	AS 1768:2021 tool v5.0 Risk - Category 1!M22
Category 1	R_h	$N_d \times P_h \times O_{h1}$	0.1657 × 0.005 × 0.01	8.29×10^{-6}	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F50, Data Sheet!I8
Category 1	R_s	$N_d \times P_s \times O_{f1} \times k_{h1}$	0.1657 × 0.0015 × 0.05 × 5	6.21×10^{-5}	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F66
Category 1	R_w	$N_d \times P_w \times O_{o1} \times k_{h1}$	$0.1657 \times 1 \times 1 \times 10^{-5} \times 5$	8.29×10^{-6}	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F77
Category 1	R_g	$p_g \times \text{sum}(N_c \times P_c) \times O_{g1}$	$1 \times 10^{-5} \times 0 \times 0.0001$	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M53, M21, M22

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Scope	Symbol	Expression	Values	Result	Origin	Reference
Category 1	R_c	$k_f \times p_f \times \text{sum}(N_c \times P_c) \times O_{f1} \times k_{h1}$	$1 \times 0.001 \times 0 \times 0.05 \times 5$	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M58
Category 1	R_m	$N_m \times P_m \times O_{o1} \times k_{h1}$	$0.4845 \times 0.5 \times 1 \times 10^{-5} \times 5$	1.21×10^{-5}	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!F85
Category 1	R_e	$k_3 \times \text{sum}(N_c \times P_c) \times O_{o1} \times k_{h1}$	$1 \times 0 \times 1 \times 10^{-5} \times 5$	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M63
Category 1	R_l	$\text{sum}(N_i \times P_i) \times O_{o1} \times k_{h1}$	$0.00375 \times 1 \times 10^{-5} \times 5$	1.88×10^{-7}	Calculated	AS 1768:2021 tool v5.0 Risk - Category 1!M77
Category 1	R_d	$R_h + R_s + R_w$	$8.29 \times 10^{-6} + 6.21 \times 10^{-5} + 8.29 \times 10^{-6}$	7.87×10^{-5}	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 1!M81, M83, M85, M87
Category 1	R_i	$R_g + R_c + R_m + R_e + R_l$	$0 + 0 + 1.21 \times 10^{-5} + 0 + 1.88 \times 10^{-7}$	1.23×10^{-5}	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 1!M81, M83, M85, M87
Category 1	R	$R_d + R_i$	$7.87 \times 10^{-5} + 1.23 \times 10^{-5}$	9.1×10^{-5}	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 1!M81, M83, M85, M87
Category 1	R_a	tolerable risk	-	1×10^{-5}	Standard table	AS 1768:2021 Table 2.1; tool v5.0 Risk - Category 1!M36
Category 1	R vs R_a	$R \le R_a$	$9.1 \times 10^{-5} > 1 \times 10^{-5}$	9.1×10^{-5}	Calculated	AS 1768:2021 Table 2.1, Figure 2.1
Category 2	O_{f2}	selected option	No essential service	0	Standard table	AS 1768:2021 C.3.2.5.2; tool v5.0 Cover Sheet! AZ33:AZ36
Category 2	O_{o2}	selected option	Not relevant to structure	0	Standard table	AS 1768:2021 C.3.2.5.2; tool v5.0 Cover Sheet! AZ40:AZ45
Category 2	R_s	$N_d \times P_s \times O_{f2}$	$0.1657 \times 0.0015 \times 0$	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 2!E41
Category 2	R_w	$N_d \times P_w \times O_{o2}$	$0.1657 \times 1 \times 0$	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 2!E45
Category 2	R_c	$k_f \times p_f \times \text{sum}(N_c \times P_c) \times O_{f2}$	$1 \times 0.001 \times 0 \times 0$	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 2!E43
Category 2	R_m	$N_m \times P_m \times O_{o2}$	$0.4845 \times 0.5 \times 0$	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 2!E47
Category 2	R_e	$k_3 \times \text{sum}(N_c \times P_c) \times O_{o2}$	$1 \times 0 \times 0$	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 2!E49
Category 2	R_l	$\text{sum}(N_i \times P_i) \times O_{o2}$	0.00375×0	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 2!E51
Category 2	R_d	$R_s + R_w$	$0 + 0$	0	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 2!M41, M43, M45, M47
Category 2	R_i	$R_c + R_m + R_e + R_l$	$0 + 0 + 0 + 0$	0	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 2!M41, M43, M45, M47
Category 2	R	$R_d + R_i$	$0 + 0$	0	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 2!M41, M43, M45, M47
Category 2	R_a	tolerable risk	-	1×10^{-3}	Standard table	AS 1768:2021 Table 2.1; tool v5.0 Risk - Category 2!M36
Category 2	R vs R_a	$R \le R_a$	$0 \le 1 \times 10^{-3}$	0	Calculated	AS 1768:2021 Table 2.1, Figure 2.1
Category 3	O_{f3}	selected option	Not relevant to structure	0	Standard table	AS 1768:2021 C.3.2.5.3; tool v5.0 Cover Sheet! BD33:BD34

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Scope	Symbol	Expression	Values	Result	Origin	Reference
Category 3	R_s	$N_d \times P_s \times O_{f3}$	0.1657 × 0.0015 × 0	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 3!J26
Category 3	R_c	$k_f \times p_f \times \text{sum}(N_c \times P_c) \times O_{f3}$	1 × 0.001 × 0 × 0	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 3!J28
Category 3	R_d	R_s	0	0	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 3!J30, J32, J34, J36
Category 3	R_i	R_c	0	0	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 3!J30, J32, J34, J36
Category 3	R	$R_d + R_i$	0 + 0	0	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 3!J30, J32, J34, J36
Category 3	R_a	tolerable risk	-	1×10^{-4}	Standard table	AS 1768:2021 Table 2.1
Category 3	R vs R_a	$R \leq R_a$	$0 \leq 1 \times 10^{-4}$	0	Calculated	AS 1768:2021 Table 2.1, Figure 2.1
Category 4	O_{h4}	selected option	Not applicable	0	Standard table	AS 1768:2021 C.3.2.5.4; tool v5.0 Cover Sheet!BH9:BH10
Category 4	O_{f4}	selected option	Offices, schools, universities	0.3	Standard table	AS 1768:2021 C.3.2.5.4; tool v5.0 Cover Sheet!BH32:BH37
Category 4	O_{o4}	selected option	Offices, schools, property for public use	0.001	Standard table	AS 1768:2021 C.3.2.5.4; tool v5.0 Cover Sheet!BH40:BH44
Category 4	R_{a4}	selected option	Loss is 1 in 1 000 years	1×10^{-3}	Standard table	AS 1768:2021 C.3.2.5.4, Table 2.1 NOTE; tool v5.0 Cover Sheet!AW45:AW47
Category 4	p_g	fixed by the tool	1×10^{-5}	1×10^{-5}	Standard table	AS 1768:2021 tool v5.0 Risk - Category 1!M21, Risk - Category 4!F20
Category 4	O_{g4}	not applied when O_{h4} is 0	0	0	Rule of the standard	AS 1768:2021 tool v5.0 Risk - Category 4!F22
Category 4	R_h	$N_d \times P_h \times O_{h4}$	0.1657 × 0.005 × 0	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 4!F45
Category 4	R_s	$N_d \times P_s \times O_{f4}$	0.1657 × 0.0015 × 0.3	7.46×10^{-5}	Calculated	AS 1768:2021 tool v5.0 Risk - Category 4!F47
Category 4	R_w	$N_d \times P_w \times O_{o4}$	0.1657 × 1 × 0.001	1.66×10^{-4}	Calculated	AS 1768:2021 tool v5.0 Risk - Category 4!F49
Category 4	R_g	$p_g \times \text{sum}(N_c \times P_c) \times O_{g4}$	$1 \times 10^{-5} \times 0 \times 0$	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 4!F53, F20, F22
Category 4	R_m	$N_m \times P_m \times O_{o4}$	0.4845 × 0.5 × 0.001	2.42×10^{-4}	Calculated	AS 1768:2021 tool v5.0 Risk - Category 4!F51
Category 4	R_c	$k_f \times p_f \times \text{sum}(N_c \times P_c) \times O_{f4}$	1 × 0.001 × 0 × 0.3	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 4!F55
Category 4	R_e	$k_3 \times \text{sum}(N_c \times P_c) \times O_{o4}$	1 × 0 × 0.001	0	Calculated	AS 1768:2021 tool v5.0 Risk - Category 4!M45
Category 4	R_l	$\text{sum}(N_l \times P_l) \times O_{o4}$	0.00375 × 0.001	3.75×10^{-6}	Calculated	AS 1768:2021 tool v5.0 Risk - Category 4!M47
Category 4	R_d	$R_h + R_s + R_w$	$0 + 7.46 \times 10^{-5} + 1.66 \times 10^{-4}$	2.4×10^{-4}	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 4!M49, M51, M53, M55
Category 4	R_i	$R_g + R_m + R_c + R_e + R_l$	$0 + 2.42 \times 10^{-4} + 0 + 0 + 3.75 \times 10^{-6}$	2.46×10^{-4}	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 4!M49, M51, M53, M55

SAMPLE

Scope	Symbol	Expression	Values	Result	Origin	Reference
Category 4	**R**	$R_d + R_i$	$2.4 \times 10^{-4} + 2.46 \times 10^{-4}$	4.86×10^{-4}	Calculated	AS 1768:2021 equation B.3.1(1); tool v5.0 Risk - Category 4!M49, M51, M53, M55
Category 4	**R_a**	tolerable risk	-	1×10^{-3}	Calculated	AS 1768:2021 C.3.2.5.4, Table 2.1 NOTE; tool v5.0 Cover Sheet!AW45:AW47
Category 4	**R vs R_a**	$R \le R_a$	$4.86 \times 10^{-4} \le 1 \times 10^{-3}$	4.86×10^{-4}	Calculated	AS 1768:2021 Table 2.1, Figure 2.1

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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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Date: _____ Signature: _____

Place: _____ Stamp: _____

Protection proposals

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 in place of the protection declared. The chosen proposal is the one the section on the protection Lumex proposes describes. A proposal never changes the verdict of this report. AS 1768:2021 Table 2.1, Figure 2.1



Bars in multiples of the tolerable risk, on a log scale. The dashed line marks the tolerable risk. AS 1768:2021 Table 2.1, Figure 2.1

Proposal	Protection	R_1	Outcome
Proposal A Chosen for this report	Lightning protection level: LPL IV Fire protection, k_f: Automated fire protection Surge protection: surge protection at point of entry	7.72×10^{-6}	Every type of loss within its tolerable risk

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Table of abbreviations

Each symbol this report prints, what it stands for, and where AS 1768:2021 defines it. The calculation trace gives where each figure is computed. The standard prints only some of these symbols. Each of the others is the calculation tool's, and its entry says so.

Symbol	Meaning	Reference
A_{c1}, A_{c2}	Collection area for strikes to an overhead or an underground line. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
A_d	Collection area for strikes to the structure, in square kilometres. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
A_{i1}, A_{i2}	Area where a strike near an overhead or an underground line induces overvoltages. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
A_m	Area where a nearby strike can induce overvoltages in the structure. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
C_d	Environmental factor, how exposed the surroundings leave the structure. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.3
C_s	Factor for the density of service lines around the site. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.3
C_{t0}	Correction for a transformer at structure. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.4.1
D_{c1}, L_{c1}	Width either side and effective length of an overhead line's collection strip. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
D_{c2}, L_{c2}	Width either side and effective length of an underground line's collection strip. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
D_{i1}	Width either side of an overhead line within which a strike induces overvoltages. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021; simplified from ITU-T K.47
D_{i2}	Width either side of an underground line within which a strike induces overvoltages. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
D_m	Distance from the structure within which a flash to ground can induce overvoltages in it. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
E	Efficiency of the lightning protection system the risk uses for its protection level, not the interception efficiency of Table 3.1	AS 1768:2021 B.4.2
H	Height of the equivalent rectangular structure	AS 1768:2021 C.3.2.1
H_{c1}	Height taken for an overhead service line. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
k_1	Share of strikes to the structure the LPS does not protect against, 1 - E. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
k_3	Reduction for surge protection to all equipment (secondary protection). This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
k_5	Reduction for surge protection at point of entry. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
k_f	Reduction for the fire protection measures in place. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.4.2(a)
k_{h1}	Factor for how hard the structure is to evacuate. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.5.1
L	Length of the equivalent rectangular structure	AS 1768:2021 C.3.2.1
L1, L2	Length of an overhead or an underground service line, set by the service line density. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
LPL	Protection level LPL I to IV	AS 1768:2021 Table 3.1
N_{c1}, N_{c2}	Strikes to each other overhead or underground line per year. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021

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Symbol	Meaning	Reference
N_{c1p}, N_{c2p}	Strikes to the power line per year, overhead or underground. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
N_d	Strikes to the structure per year. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
N_g	Ground flashes per square kilometre per year at the site	AS 1768:2021 1.3.25, C.3.2.3
N_{i1}, N_{i2}	Strikes near each other overhead or underground line per year. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
N_{i1p}, N_{i2p}	Strikes near the power line per year, overhead or underground. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
N_m	Strikes near the structure per year. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
n_{oh}	Number of other overhead service lines. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.4.2
n_{ohp}	1 when the power service comes in overhead, otherwise 0. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
n_{ug}	Number of other underground service lines. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.4.3
n_{ugp}	1 when the power service comes in underground, otherwise 0. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
O_{f1}, O_{o1}	Share of life lost to fire and to overvoltages, by type of location. These symbols are the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.5.1
O_{f2}, O_{o2}	Share of the public service lost to fire and to overvoltages. These symbols are the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.5.2
O_{f3}	Share of cultural heritage lost to fire. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.5.3
O_{f4}, O_{o4}	Share of economic value lost to fire and to overvoltages. These symbols are the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.5.4
O_{g1}	Share of life lost when people inside the structure meet dangerous step and touch voltages. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
O_{g4}	Share of economic value lost when dangerous step and touch voltages occur inside the structure. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
O_{h1}	Share of life lost when people outside the structure meet dangerous step and touch voltages. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
O_{h4}	Share of economic value lost through animals harmed by step and touch voltages. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.5.4
P_{c1p}, P_{c1}, P_{c2p}, P_{c2}	Chance a strike to a service line causes damage, for the power line and the other lines, overhead then underground. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
p_{e0}	Chance of a dangerous discharge along the power line, set by its cable type. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.4.1 to C.3.2.4.3
p_{e1}	The same chance for each other overhead service line. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.4.1 to C.3.2.4.3
p_{e2}	The same chance for each other underground service line. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.4.1 to C.3.2.4.3
p_{et}, p_{etc}	Sum of the cable factors over every service line, and that sum capped at 1. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
P_{ewd}	Chance a service line brings a damaging surge in, after surge protection at point of entry. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021

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Symbol	Meaning	Reference
P_{ewdo}	The same chance with surge protection to all equipment (secondary protection) as well. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
p_f	How readily the structure catches fire or is damaged by it. This symbol is the calculation tool's; the standard's B.1(c) writes this classification p_s.	AS 1768:2021 C.3.2.2, B.1(c)
p_g	Chance of dangerous step and touch voltages inside the structure. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
P_h	Chance a strike to the structure harms people through step and touch voltages. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
p_h	Chance of dangerous step and touch voltages outside the structure. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
p_i	Factor for the type of internal wiring. This symbol is the calculation tool's, not the standard's.	AS 1768:2021 C.3.2.2
P_{i1p}, P_{i1}, P_{i2p}, P_{i2}	Chance a strike near a service line causes damage, in the same order. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
P_m	Chance a strike near the structure makes internal systems fail. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
p_s	How likely a flash is to cause a dangerous spark, set by how the structure is built and earthed. This symbol is the calculation tool's; the standard's B.1(c) uses p_s for the fire classification instead.	AS 1768:2021 C.3.2.2, B.1(c)
P_s	Chance a strike to the structure causes fire or physical damage. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
P_w	Chance a strike to the structure makes internal systems fail. This symbol is the calculation tool's, not the standard's.	Not printed in AS 1768:2021
R	Risk for one type of loss, R_d plus R_i	AS 1768:2021 equation B.3.1(1)
R_1	Risk of loss of human life	AS 1768:2021 B.2.2
R_2	Risk of losing service to the public	AS 1768:2021 B.2.2
R_3	Risk of loss of cultural heritage	AS 1768:2021 B.2.2
R_4	Risk of loss of economic value	AS 1768:2021 B.2.2
R_a, R_{a1} to R_{a4}	Highest risk treated as tolerable for a type of loss. R_a is the standard's symbol; R_{a1} to R_{a4} are the calculation tool's labels for the four types of loss.	AS 1768:2021 1.3.55, Table 2.1, C.3.2.5.4
R_c	Risk of fire, explosion, mechanical or chemical damage from a strike to a service line	AS 1768:2021 equation B.3.1(1)
R_d	Sum of the components from strikes to the structure	AS 1768:2021 equation B.3.1(1)
R_e	Risk of internal system failure from a strike to a service line	AS 1768:2021 equation B.3.1(1)
R_g	Risk of harm to people from a strike to a service line	AS 1768:2021 equation B.3.1(1)
R_h	Risk of harm to people from a strike to the structure	AS 1768:2021 equation B.3.1(1)
R_i	Sum of the components from strikes near the structure and to or near the service lines	AS 1768:2021 equation B.3.1(1)
R_l	Risk of internal system failure from a strike near a service line	AS 1768:2021 equation B.3.1(1)
R_m	Risk of internal system failure from a strike near the structure	AS 1768:2021 equation B.3.1(1)
R_s	Risk of fire, explosion, mechanical or chemical damage from a strike to the structure	AS 1768:2021 equation B.3.1(1)
R_w	Risk of internal system failure from a strike to the structure	AS 1768:2021 equation B.3.1(1)
sum $N_c \times P_c$	Damaging events per year from strikes to the service lines. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021
sum $N_i \times P_i$	Damaging events per year from strikes near the service lines. These symbols are the calculation tool's, not the standard's.	Not printed in AS 1768:2021

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Symbol	Meaning	Reference
W	Width of the equivalent rectangular structure	AS 1768:2021 C.3.2.1
ρ	Soil resistivity taken for underground service lines, in Ω·m	Not printed in AS 1768:2021

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