



## OMEGA RED GROUP LTD

Form FOR-034

### QUESTIONNAIRE TO ENABLE RISK ASSESSMENT TO BS EN 62305 PROTECTION AGAINST LIGHTNING, Part 2-Risk Assessment.

<p>Client Name:</p> <p>Company:</p> <p>Telephone No:</p> <p>Clients Reference:</p> <p>Omega Reference:</p>	<p>Address/Location of Structure to be protected:</p>
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**GUIDANCE NOTES;**

BS EN 62305 requires the calculation of a risk assessment, the result of which determines if protection is required and if so, the level (I to IV) of lightning protection to be fitted.

BS EN 62305 considers four separate risks and the starting point is for the client to determine which of these risks are to be considered. **Loss of Human life** is obviously the most important consideration and unless overriding reasons prevail will be considered in almost all cases. **Loss of Service to the Public** will be considered where this would have a detrimental effect upon customers or where unacceptable economic loss may result due to the loss of service. **Loss of Cultural Heritage** will usually be considered where culturally important losses, structures or contents for example, may be an unacceptable loss. **Loss of Economic Value** can also be calculated but this has no tolerable level, the data produced is merely used to calculate a theoretical saving as a result of having a LPS fitted. To calculate this, detailed financial information is required, see section 9.0. Unless asked otherwise, please only tick or insert information in one option for each question.

	Issue	X	Options	Guidance notes
1.0	Risk to be considered		<input type="checkbox"/> Loss of Human Life <input type="checkbox"/> Unacceptable loss of services to the public <input type="checkbox"/> Loss of Irreplaceable Cultural Heritage <input type="checkbox"/> Loss of economic value	Tick the box to the left of the individual losses to identify which loss/es you wish to be considered, more than one loss can be calculated for a structure and it is quite usual for both loss of human life and services to the public to be considered.
2.0	<b>Characteristics of the structure to be protected</b>			
2.1	Dimensions in metres		Length	For more than one structure, complete a separate schedule with dimensions and confirm that all the other characteristics are the same.
			Width	
			Height	
2.2	Soil resistivity $\rho$		$\Omega m$	Insert value of soil resistivity if known. If not known, the standard defaults to 500.
2.3	Location relative to surroundings $C_{d/b}$		<input type="radio"/> Object surrounded by higher objects or trees <input type="radio"/> Object surrounded by objects or trees of the same height or smaller <input type="radio"/> Isolated object no other object in the vicinity <input type="radio"/> Isolated object on a hilltop or a knoll	Tick the appropriate button to the left of the description.



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2.4	Location of incoming services relative to surroundings $C_e$	Urban with buildings over 20m	Select from the drop-down box the appropriate location						
2.5	Shield at structure boundary $K_{S1}$	<input type="radio"/> Non conducting - e.g. timber/masonry and non conducting cladding <input type="radio"/> Conductive frame with non conducting cladding <input type="radio"/> Conductive frame and cladding - typical door/window openings <input type="radio"/> Conductive frame and cladding - 100mm maximum openings <input type="radio"/> Conductive frame and cladding - 10mm maximum openings <input type="radio"/> Structure fully clad with metal - no openings	Tick to the left of the description, the button that most appropriately describes the building facade.						
3.0	Characteristics of the structures at the other end of the services connected to the structure to be protected.								
3.1	Sub-Station dimensions in metres	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20%;"></td><td>Length</td></tr> <tr><td></td><td>Width</td></tr> <tr><td></td><td>Height</td></tr> </table>		Length		Width		Height	If these dimensions are not known then default values of 5 x 5 x 5m will be used.
	Length								
	Width								
	Height								
3.1.1	Location of sub station relative to surroundings $C_{d/a}$	<input type="radio"/> Object surrounded by higher objects or trees <input type="radio"/> Object surrounded by objects or trees of the same height or smaller <input type="radio"/> Isolated object no other object in the vicinity <input type="radio"/> Isolated object on a hilltop or a knoll	Tick the appropriate button to the left of the description. If not known, write that in this box.						
3.2	Telephone Exchange dimensions in metres	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20%;"></td><td>Length</td></tr> <tr><td></td><td>Width</td></tr> <tr><td></td><td>Height</td></tr> </table>		Length		Width		Height	If these dimensions are not known then default values of 20 x 20 x 8m will be used.
	Length								
	Width								
	Height								
3.2.1	Location of telephone exchange relative to surroundings $C_{d/a}$	<input type="radio"/> Object surrounded by higher objects or trees <input type="radio"/> Object surrounded by objects or trees of the same height or smaller <input type="radio"/> Isolated object no other object in the vicinity <input type="radio"/> Isolated object on a hilltop or a knoll	Tick the appropriate button to the left of the description. If not known, write that in this box.						
3.3	Other, e.g. from an adjacent structure, dimensions in metres	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20%;"></td><td>Length</td></tr> <tr><td></td><td>Width</td></tr> <tr><td></td><td>Height</td></tr> </table>		Length		Width		Height	Dimensions of any structure feeding the structure to be protected by a metal service line.
	Length								
	Width								
	Height								



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3.3.1	Location of other structure relative to surroundings $C_{d/a}$	<input type="radio"/> Object surrounded by higher objects or trees <input type="radio"/> Object surrounded by objects or trees of the same height or smaller <input type="radio"/> Isolated object no other object in the vicinity <input type="radio"/> Isolated object on a hilltop or a knoll				Tick the appropriate button to the left of the description. If not known, write that in this box.
<b>4.0</b>	<b>Characteristics of Service Lines Entering the Structure to be Protected</b>					
4.1	Type of Service	P	T	O	P = Power Service/Line T = Telecommunications Service/Line O = Other Service/Line	Complete the "P" column by selecting the characteristics of the service, Choose "P" for Power Line, "T" for Telephone Line & "O" for Other Line for question 4.2 through 4.9.
4.2	Incoming service characteristic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Unshielded cable	Tick the appropriate button to the left of the description. Rs = Resistance. For other, please define specific characteristics here:
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Shielded cable with no bonding	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Shielded and bonded cable $5 < R_s \leq 20$ Ohms/km	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Shielded and bonded cable $1 < R_s \leq 5$ Ohms/km	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Shielded and bonded cable $R_s \leq 1$ Ohm/km	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Other	
4.3	Service wiring type internal to the structure $K_{s3}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Unshielded cable - no routing precautions in order to avoid loops	Tick the appropriate button to the left of the description. If unknown, use the top selection.
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Unshielded cable - with routing precautions in order to avoid large loops	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Unshielded cable - with routing precautions in order to avoid small loops	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Shielded cable $5 < R_s \leq 20$ Ohms/km	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Shielded cable $1 < R_s \leq 5$ Ohms/km	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Shielded cable $R_s \leq 1$ Ohms/km	
4.4	Transformer factor $G_t$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No transformer on site, service only.	Tick the appropriate button to the left of the description.
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Service with two winding transformer.	
4.5	Impulse withstand voltage of internal system to be protected $U_w$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1.5 kV - socket outlets feeding electronic equipment, or telecoms equipment.	Tick the appropriate button to the left of the description. Generally, where you have internal systems feeding socket outlets or telecommunications equipment
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2.5 kV - sub distribution boards	



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		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4.0 kV - Main distribution board	then 1.5kV is appropriate. Where looking to protect to the main or sub board positions only then 2.5 or 4.0kV may be appropriate.
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6.0 kV electricity meter	
4.6	Service line routeing	Overhead	Overhead	Overhead	Overhead or Buried	Tick the appropriate button to the left of the description.
4.7	Height of line $H_c$				Height above floor level for overhead line.	Height in metres. For buried cables, insert N/A.
4.8	Length of line $L_c$				Length of line.	Length of line in metres to sub-station, telephone exchange or other line source structure if known.
4.9	Location of the line relative to surroundings $C_{d/c}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Line surrounded by higher objects or trees.	Tick the appropriate button to the left of the description. For buried services, the "Line surrounded by higher objects or trees" should be used.
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Line surrounded by objects or trees of the same height or smaller.	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Isolated line, no other objects in the vicinity.	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Isolated line on a hilltop or knoll.	
5.0	Characteristics of the structure to be protected					
5.1	Type of floor covering inside $r_u$	Agricultural, concrete.				Select from the drop down box the most appropriate flooring medium inside the structure.
5.2	Type of floor covering outside $r_a$	Agricultural, concrete.				Select from the drop down box the most appropriate flooring medium outside the structure.
5.2	Risk of fire of structure $r_f$	None				Select from the drop down box the most appropriate risk of fire to the structure. Where specific detail not known or is not available, select Ordinary.
5.3	Provisions taken to reduce consequences of fire $r_p$	<input type="radio"/> No provisions <input type="radio"/> Manual fire extinguishers or systems, manual alarm, hydrants or protected escape routes. <input type="radio"/> Automatic fire extinguishers or automatic alarm installations				If the automatic system is not fitted with protection against over-voltages then tick the Manual choice.



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5.4	Shields internal to the structure $K_{S2}$	<input type="radio"/> Non conducting - timber/masonry and cladding <input type="radio"/> Conductive frame with non conducting cladding <input type="radio"/> Conductive frame and cladding - typical door/window openings <input type="radio"/> Conductive frame and cladding - 100mm maximum openings <input type="radio"/> Conductive frame and cladding - 10mm maximum openings <input type="radio"/> Zone fully clad with metal - no openings			Tick the appropriate button to the left of the description to indicate the type of walling inside the structure.																																																								
5.5	Special hazards $h_z$	<input type="radio"/> No special hazard <input type="radio"/> Low level of panic, structure limited to two floors and <100 <input type="radio"/> Average level of panic, occupants >100 but <1000 <input type="radio"/> Difficulty in evacuation, immobilised persons, hospitals etc. <input type="radio"/> High level of panic, occupants >1000 <input type="radio"/> Hazard for surroundings or environment <input type="radio"/> Contamination of surroundings or environment			Indicate appropriate hazard situation																																																								
5.6	Loss due to injury by touch and step voltages $L_t$	H	P	State the number of hours (H) per day that the structure will be inhabited and if known, the number of people (P) in it.																																																									
5.7	Loss due to physical damage $L_f$	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%; text-align: center;"><input type="checkbox"/></td><td>Hospital</td><td style="width: 5%; text-align: center;"><input type="checkbox"/></td><td>Hotel</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Large House</td><td style="text-align: center;"><input type="checkbox"/></td><td>Block of Flats</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Oil Refinery</td><td style="text-align: center;"><input type="checkbox"/></td><td>Halls</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Prison</td><td style="text-align: center;"><input type="checkbox"/></td><td>Police Station</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Farm Building</td><td style="text-align: center;"><input type="checkbox"/></td><td>Nursing Home</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Children's Home</td><td style="text-align: center;"><input type="checkbox"/></td><td>Factory</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Railway Station</td><td style="text-align: center;"><input type="checkbox"/></td><td>Airport</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Fuel Station</td><td style="text-align: center;"><input type="checkbox"/></td><td>Leisure</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Shopping Centre</td><td style="text-align: center;"><input type="checkbox"/></td><td>Cathedral</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>University</td><td style="text-align: center;"><input type="checkbox"/></td><td>Museum</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Commercial/Office Block</td><td style="text-align: center;"><input type="checkbox"/></td><td>Department Store</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Indt'l Warehouse</td><td style="text-align: center;"><input type="checkbox"/></td><td>Civil Building</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Community Centre</td><td style="text-align: center;"><input type="checkbox"/></td><td>Medical Centre</td></tr> <tr><td style="text-align: center;"><input type="checkbox"/></td><td>Telephone X</td><td style="text-align: center;"><input type="checkbox"/></td><td>Water Works</td></tr> </table>		<input type="checkbox"/>	Hospital	<input type="checkbox"/>	Hotel	<input type="checkbox"/>	Large House	<input type="checkbox"/>	Block of Flats	<input type="checkbox"/>	Oil Refinery	<input type="checkbox"/>	Halls	<input type="checkbox"/>	Prison	<input type="checkbox"/>	Police Station	<input type="checkbox"/>	Farm Building	<input type="checkbox"/>	Nursing Home	<input type="checkbox"/>	Children's Home	<input type="checkbox"/>	Factory	<input type="checkbox"/>	Railway Station	<input type="checkbox"/>	Airport	<input type="checkbox"/>	Fuel Station	<input type="checkbox"/>	Leisure	<input type="checkbox"/>	Shopping Centre	<input type="checkbox"/>	Cathedral	<input type="checkbox"/>	University	<input type="checkbox"/>	Museum	<input type="checkbox"/>	Commercial/Office Block	<input type="checkbox"/>	Department Store	<input type="checkbox"/>	Indt'l Warehouse	<input type="checkbox"/>	Civil Building	<input type="checkbox"/>	Community Centre	<input type="checkbox"/>	Medical Centre	<input type="checkbox"/>	Telephone X	<input type="checkbox"/>	Water Works	Indicate the use of the structure. Select more than one if the structure has more than one use.	
<input type="checkbox"/>	Hospital	<input type="checkbox"/>	Hotel																																																										
<input type="checkbox"/>	Large House	<input type="checkbox"/>	Block of Flats																																																										
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		<input type="checkbox"/> Power Station <input type="checkbox"/> School <input type="checkbox"/> Theatre <input type="checkbox"/> Sports Stadium <input type="checkbox"/> Wind Farm <input type="checkbox"/> Other	<input type="checkbox"/> Sub-Station <input type="checkbox"/> Gas C'pound <input type="checkbox"/> Church <input type="checkbox"/> Base Station <input type="checkbox"/> Ruins					
5.8	Loss due to over-voltages $L_o$	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">H</td> <td style="width: 50%;">P</td> </tr> <tr> <td style="height: 20px;"></td> <td style="height: 20px;"></td> </tr> </table> <input type="checkbox"/> <input type="checkbox"/>	H	P			State the number of hours (H) per day that the structure will be inhabited and if known, the number of people (P) in it.  Risk of explosion  Hospital or other structure where loss of a service would immediately endanger life.	This section 4.8 only needs to be completed for structures with risk of explosion or Hospital or other structure where loss of a service would immediately endanger life.
H	P							
<b>6.0 Unacceptable Loss of Service to the Public</b>								
6.1	Service lost to the Public		State the number of persons/users not able to be served by the facility due to a loss.  State the total number of persons/users served by the facility.	This information is only required if the Loss of Service to the Public is to be considered. If the information is unknown, state that to the left of the description and a default value set within the standard will be applied to the risk assessment.				
<b>7.0 Loss of Irreplaceable Cultural Heritage</b>								
7.1	Loss of Cultural Heritage		State the insurable value of goods likely to be lost.  State the total insured value of all insured goods present in the facility.	This information is only required if the Loss of Cultural Heritage is to be considered. If the information is unknown, state that to the left of the description and a default value set within the standard will be applied to the risk assessment.				
<b>8.0 Economic Loss Due To;</b>								
8.1	Special Hazard $h_{z4}$	<input type="radio"/> No special hazard <input type="radio"/> Hazard for surroundings <input type="radio"/> Contamination for surroundings or environment		Tick the appropriate indicating hazards that would be created in the event of a strike.				
8.2	Step and touch voltage $L_{t4}$	No		Will the structure have animals located inside or outside? Indicate Yes or No the appropriate				
8.3	Fire or physical damage $L_{f4}$	<input type="radio"/> Hospital, Hotel, Industrial, Museum or Agricultural <input type="radio"/> Schools, Office/Commercial/Economic, Church, Public Entertainment <input type="radio"/> Others		Tick the appropriate button to the left of the description to define the use for the structure Hospitals, Industrial or Commercial complexes, Offices, Hotels Museums, Agricultural, Schools, Churches, Public buildings. Others				



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8.4	Over Voltages L <sub>o4</sub>	<input type="radio"/> Risk of Explosion <input type="radio"/> Hospitals, Industrial or Commercial complexes, Offices, Hotels. <input type="radio"/> Museums, Agricultural, Schools, Churches, Public Buildings. <input type="radio"/> Others	Tick the appropriate button to the left of the description. Where "Others" is the choice, please state type of structure here;														
<b>9.0 Information Required to Calculate Costs/Savings derived From Fitting Lightning Protection</b>																	
9.1	Costs of;	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%;">Any animals in the structure.</td> </tr> <tr> <td></td> <td>Any systems in the structure.</td> </tr> <tr> <td></td> <td>Cost of the Structure. .</td> </tr> <tr> <td></td> <td>Cost of the contents of the structure.</td> </tr> <tr> <td></td> <td>Interest rate paid on the financing for the structure and systems.</td> </tr> <tr> <td></td> <td>Amortization rate as a percentage write down per year.</td> </tr> <tr> <td></td> <td>Maintenance rate per year as a percentage of original cost.</td> </tr> </table>		Any animals in the structure.		Any systems in the structure.		Cost of the Structure. .		Cost of the contents of the structure.		Interest rate paid on the financing for the structure and systems.		Amortization rate as a percentage write down per year.		Maintenance rate per year as a percentage of original cost.	Insert values in £M or %age to suit the various cost headings. This information will then be used in conjunction with the risk components identified for economic loss in order to produce a value of saving/cost per year as a result of fitting a lightning protection system in accordance with the risk assessment.
	Any animals in the structure.																
	Any systems in the structure.																
	Cost of the Structure. .																
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