DIRECT STROKE LIGHTNING PROTECTION CALCULATION BY SHIELD WIRES

Calculations are based on Razevig method, as per Chapter 31 - Protection from Lightning Strokes, Book on "High Voltage Engineering".

1 Protective zone for shield wire

$b_x = 1.2\,h\,(1 - h_x / 0.8\,h)$ if $h_x < 2/3\,h$ (eqn. 31.9)

$b_x = 0.6\,h\,(1 - h_x / h)$ if $h_x > 2/3h$ (eqn. 31.8)

where,

h = Height of tower peak

h_x = Object Height for Protection

b_x = Zone of Side Stroke Protection for object height upto h_x

$h_o = h - (S / 4)$ (eqn. 31.10)

where,

S = Spacing between two shield wires

h_o = Oject Height protected within two Shield Wires

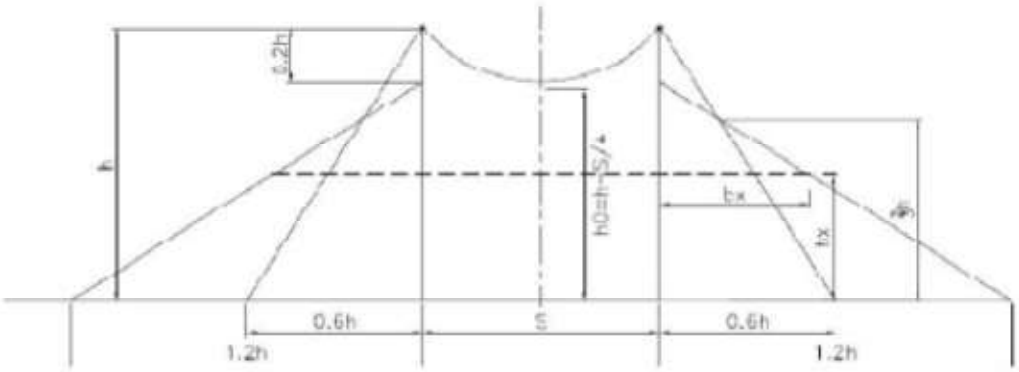

FIG : PROTECTION ZONE FOR PARALLEL SHIELD WIRE

2 Protection Zone Calculations

Sl.No.	Case Ref.	Shield Wire Stringing Height	Spacing between Shield Wire	Object Height for Protection	Protection Height achieved within Shield Wire	Whether Protection Achieved ?	Zone of Side stroke protection
		h	S	hx	ho	$h_o > h_x$	bx
1	Shield Wire within Switchyard	17.30	12.00	8.56	14.30	YES	7.92
2	Shield Wire within Switchyard	17.30	10.40	8.56	14.70	YES	7.92
3	Shield Wire within Switchyard	17.30	10.40	13.80	14.70	YES	2.10
4	Shield Wire within Switchyard	17.30	31.20	8.56	9.50	YES	7.92

Notes All figures are in meters

All heights are from ground level.