

Construction of 220KV DC line on DC towers from existing 220kV Indi sub-station to proposed 220kV Chadchan (Devaranimbaragi) sub-station for a distance of 29.628Kms using AAAC Moose ACSR conductor in Indi Taluk Vijayapur District.

DESIGN OF 220KV D/C MONOPOLE WITH AAAC MOOSR CONDUCTOR & 150M SPAN LENGTH.

WIND PRESSURE CALCULATION ON CONDUCTOR, GROUND WIRE & INSULATOR STRING FOR 220KV DC NARROW BASE TOWERS AS PER IS: 802 (Part-1/Sec-1) : 2015

Wind Zone considered for Design (Vb)	=	2	39	M/Sec
Design Wind speed (Vr)	=	39/1.375		
	=	28.4		M/sec
Basic Span	=	150		M
Reliability Level	=	1		
Terrain Category	=	2		
Factor K1	=	1		
Factor K2	=	1		
Design wind Speed (Vd)	=	Vr x K1 x K2		
	=	28.4 x 1 x 1		
	=	28.4		
Design wind pressure (Pd = 0.6 x Vd x Vd)	=	(0.6 x 28.4 x 28.4)		
	=	482.7		N/Sq.M
	=	49.2		Kg/Sq.M

1.0 Wind Pressure on Power Conductor (Pc):

Maximum Height of the Power conductor	=	25.525	M
Sag at Minimum Temp & Nil Wind	=	2.62	M
Mean Height of the Power conductor (h)	=	23.78	M
Design Wind Pressure (Pd)	=	49.2	Kg/Sq.M
Drag Co-Efficient (Cd)	=	1	
Gust Response Factor (Gc)	=	2.1616	(Table-7 (IS 802-2015))

$$\text{Wind Pressure on Conductor (Pc)} = \text{Pd} \times \text{Cd} \times \text{Gc}$$

$$= 49.21 \times 1 \times 2.16156$$

Pc	=	106.36	Kg/Sq.M
SAY		106.50	Kg/Sq.M

2.0 Wind Pressure on Ground Wire:

Maximum Height of the Ground Wire/OPGW	=	33.525	M
Sag at Minimum Temp. & Nil Wind	=	2.358	M
Mean Height of the Ground Wire	=	31.95	M
Design Wind Pressure (Pd)	=	49.2	Kg/Sq.M
Drag Co-Efficient (Cd)	=	1.2	
Gust Repsonce Factor (Gc)	=	2.251	

$$\text{Wind Pressure on Ground Wire (Pe)} = \text{Pd} \times \text{Gc} \times \text{Cd}$$

$$= 49.21 \times 1.2 \times 2.2515$$

Pe	=	132.94	Kg/Sq.M
SAY		133.00	Kg/Sq.M

Construction of 220KV DC line on DC towers from existing 220kv Indi sub-station to proposed 220kv Chadchan (Devaranimbaragi) sub-station for a distance of 29.628Kms using AAAC Moose ACSR conductor in Indi Taluk Vijayapur District.

DESIGN OF 220KV D/C MONOPOLE WITH AAAC MOOSR CONDUCTOR & 150M SPAN LENGTH.

WIND PRESSURE CALCULATION ON CONDUCTOR, GROUND WIRE & INSULATOR STRING FOR 220KV DC NARROW BASE TOWERS AS PER IS: 802 (Part-1/Sec-1) : 2015

3.0 Wind Pressure on Insulator String (Pi):

Maximum Height of the Insulator string	=	25.52 M
Mean Height of the Insulator string	=	25.52 M
Design Wind Pressure (Pd)	=	49.2 Kg/Sq.M
Drag Co-Efficient (Cd)	=	1.2
Gust Repsonce Factor (Gc)	=	2.255248

$$\begin{aligned}\text{Wind Pressure on Ground Wire (Pe)} &= Pd \times Gc \times Cd \\ &= 49.21 \times 1.2 \times 2.25525\end{aligned}$$

$$\begin{aligned}\underline{\text{Pi}} &= \underline{133.16} \quad \underline{\text{Kg/Sq.M}} \\ \underline{\text{SAY}} & \quad \underline{133.50} \quad \underline{\text{Kg/Sq.M}}\end{aligned}$$