

## **CALCULATION OF LOADS FOR 220 KV D/C MONOPOLE OF TYPE "2P3(30 - 60deg)"**

### **INPUT DATA:**

1. Wind pressure on Conductors in Kg/Sq.m .	[ Pc ] =	106.5
2. Wind pressure on Ground wire in Kg/Sq.m	[ Pgw ] =	133
3. Wind pressure on Insulator Kg/Sq.m	[ Pi ] =	133.5
4. Wind span in mtrs for NC	[ WSNC ] =	150
5. Wind span in mtrs for BWC	[ WSBWC ] =	90
6. Weight Span in mtrs for NC (max).	[ W1 ] =	225
7. Weight Span in mtrs for NC (min).	[ W2 ] =	-225
8. Weight Span in mtrs for BWC (max).	[ W3 ] =	135
9. Weight Span in mtrs for BWC (min) .	[ W4 ] =	-135
10. Power Conductor Used.	<b><u>AAAC MOOSE</u></b>	
11. Diameter of Conductor in mtrs.	[ Dc ] =	0.03195
12. Weight of Conductor in Kg/m .	[ Wc ] =	1.666
13. Number of Conductor.	[ Nc ] =	1
14. Tension of Coductor at 32 deg.C & 30deg FW .	[ CT1 ] =	5213
15. Tension of Coductor at 32 deg.C & NW .	[ CT2 ] =	4074
16. Ground Wire Used.	<b><u>48F OPGW</u></b>	
17. Diameter of Ground Wire in mtrs.	[ Dgw ] =	0.0122
18. Weight of Ground wire in Kg/m.	[ Wgw ] =	0.451
19. Tension of Ground Wirer at 32 deg.C & 30 deg FW .	[ GT1 ] =	1263
20. Tension of Ground Wirer at 32 deg.C & NW .	[ GT2 ] =	456
21. No.of Insulator Strings.	[ NI ] =	2
22. Length of Insulator String in Mtrs.	[ LI ] =	3.35
22. Diameter of the Insulator in Mtrs.	[ DI ] =	0.255
23. Weight of Insulator String in Kg. (Max).	[ Wimax ] =	300
25. Weight of Insulator String in Kg. (Min).	[ Wimin ] =	150
26. Angle of Deviation in degrees.	[ THETA ] =	<b>30</b>
27. Angle of Deviation in Radians.	[ THETA ] =	0.523598783
28. Angle of Wind Direction (θ) in deg	[THEETA]=	<b>30</b>
29. Angle of Wind Direction (θ) in radians	[THEETA]=	0.523598783

## I. RELIABILITY REQUIREMENT

### A. TRANSEVERSE LOADS.

#### POWER CONDUCTOR

a) Wind on conductor $[P_c \cdot \sin^2 \Omega \cdot W_{SNC} \cdot DC] \cdot N_c$	=	476
b) Wind on Insulators $[P_i \cdot L_i \cdot D_i \cdot N_i \cdot 0.5] \cdot \cos(\theta)$	=	99
c) Due to Deviation $[2 \cdot CT_1 \cdot \sin(\theta/2)] \cdot N_c$	=	2698
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#### GROUND WIRE.

a) Wind on Ground wirer $[P_{gw} \cdot \sin^2 \Omega \cdot W_{SNC} \cdot D_{gw}]$	=	227
c) Due to Deviation $[2 \cdot GT_1 \cdot \sin(\theta/2)]$	=	654
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### B. LONGITUDINAL LOADS

a) CONDUCTOR	=	0
b) Wind on Insulators $[P_i \cdot L_i \cdot D_i \cdot N_i \cdot 0.5] \cdot \sin(\theta)$	=	57
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a) GROUND WIRE.	=	0
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### C. VERTICAL LOADS.

#### CONDUCTOR

		<b><u>Max.</u></b>	<b><u>Min.</u></b>
a) Weight of Conductor $[W_c \cdot W_1, W_c \cdot W_2] \cdot N_c$	=	375	-375
b) Weight of Inulator string $[W_{lmax}, W_{lmin}] \cdot N_i$	=	600	300
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		975	-75
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#### GROUND WIRE

a) Wght. of Ground Wire $[W_{gw} \cdot W_1, W_{gw} \cdot W_2]$	=	101	-101
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**LOADING TREES FOR 220kV D/C MONOPOLE OF TYPE "2P3(30° - 60°)"**

**(ANGLE OF DEVIATION: 30 Deg & WIND ANGLE: 30 Deg)**

**1 - RELIABILITY CONDITION**

