

CALCULATION OF LOADS FOR 220 KV D/C MONOPOLE OF TYPE - 2P3

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.	<u>AAAC MOOSE</u>	
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 & 45deg FW .	[CT1] =	5104
15. Tension of Coductor at 32 deg.C & NW .	[CT2] =	4074
16. Ground Wire Used.	<u>48F OPGW</u>	
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 & 45 deg FW .	[GT1] =	1205
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] =	30
27. Angle of Deviation in Radians.	[THETA] =	0.523598783
28. Angle of Wind Direction (θ) in deg	[THEETA]=	45
29. Angle of Wind Direction (θ) in radians	[THEETA]=	0.785398175

I. RELIABILITY REQUIREMENT

A. TRANSEVERSE LOADS.

POWER CONDUCTOR

a) Wind on conductor $[P_c \cdot \sin^2 \Omega \cdot W_{SNC} \cdot DC] \cdot N_c$	=	383
b) Wind on Insulators $[P_i \cdot L_i \cdot D_i \cdot N_i \cdot 0.5] \cdot \cos(\theta)$	=	81
c) Due to Deviation $[2 \cdot CT_1 \cdot \sin(\theta/2)] \cdot N_c$	=	2642
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GROUND WIRE.

a) Wind on Ground wire $[P_{gw} \cdot \sin^2 \Omega \cdot W_{SNC} \cdot D_{gw}]$	=	183
c) Due to Deviation $[2 \cdot GT_1 \cdot \sin(\theta/2)]$	=	624
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B. LONGITUDINAL LOADS

a) CONDUCTOR	=	0
b) Wind on Insulators $[P_i \cdot L_i \cdot D_i \cdot N_i \cdot 0.5] \cdot \sin(\theta)$	=	81
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		81
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a) GROUND WIRE.	=	0
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C. VERTICAL LOADS.

CONDUCTOR

		<u>Max.</u>	<u>Min.</u>
a) Weight of Conductor $[W_c \cdot W_1, W_c \cdot W_2] \cdot N_c$	=	375	-375
b) Weight of Insulator 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: 45 Deg)

1 - RELIABILITY CONDITION

