www.rcenggstudios.com	**Wind Load Calculation for Piperacks**	Rev	
		Date	

Wind Data:

Basic Wind Speed (As per DBR)	Vb	=	50.00	m/s
Risk coefficient (for General Buildings as per DBR)	K1	=	1.00	
Terrain, height and structure size factor (from Table2 of IS:875 III, for Terrain category 2 & Class B)	K2	=	1.05	
Topography factor (As per DBR)	K3	=	1.00	
Importance Factor for cyclonic region	K4	=	1.15	
Design Wind Speed $Vz = V_b*k_1*k_2*k_3*k_4$		=	60.38	m/s
Design Wind Pressure $Pz = 0.6\ V_z^2$		=	2187.1	N/m^2
	Pz	**=**	**2.19**	**kN/m^2**
Wind directional factor, kd		=	1.00	
Combination factor, Kc		=	1.00	
For open framed structure kc = 1				
For closed framed structure kc = 0.9				
Area averaging Factor, Ka		=	0.80	
Pd = kd*ka*kc*Pz	**Pd**	**=**	**1.75**	

Load on open structure

Wind force on member, F=CfxAexPd

The value of force coefficients apply to a building or structure as a whole, and when multiplied by the effective frontal area A_e of the building or structure and by design wind pressure p_d, gives the total wind load on that particular building or structure.

$$F = C_f\ A_e\ p_d$$

where F is the force acting in a direction specified in the respective tables and C_f is the force coefficient for the building.

C_f - Net force coefficient **0.8** Table 24 IS875-part3

Level	Height above ground		Pd (kN/m²)	Cf * Pd (kN/m²)
Level-1	0.00 -	5.00	1.587	1.27
Level-2	5.00 -	10.00	1.587	1.27
Level-3	10.00 -	15.00	1.750	1.40

Transverse Wind Force due to Pipe:

Tributary Area: Ae = (D + W tan10) x Bent Spacing(m)

where, D is maximum pipe diameter at respective level & W is Width of Pipe Rack

z, (m)	Dia. of Pipe - D (m)	Usuable Width of PR,(m)	Length	Af, (m2)	F=CfxAexPd, (kN	Remarks
5.00	0.762	6.0	6.00	11.05	14.032	30" dia pipe
7.50	0.762	6.0	6.00	11.05	14.032	
12.50	0.762	6.0	6.00	11.05	15.473	

Transverse Wind Force due to Cable Tray:

Tributary Area: Ae = (D + W tan10) x Bent Spacing(m)

No. of Trays = 3 no's

z, (m)	cable tray height (m)	Usuable Width of PR,(m)	Length	Af, (m2)	F=CfxAexPd, (kN	Moment kNm (0.9m ht)
10.00	0.150	6.0	6.00	22.14	28.11	25.30