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Job Title	Structure Design - Wind Load Definition and Wind Effe	Drg. Ref.		
Structure Design - Wind Load Definition and Wind Effects		Made by **XX**	Date **6/10/2025**	Chd.

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Wind Pressure in Direction X, Y

Regional (3s-Gust) Wind Speed, $V_{R,3s}$ and Regional Wind Pressure, p_R

*Note that **V_R (m/s)** defines the regional wind hazard level at the **design** level (DL), not code level (CL).*

Wind code of practice	IS875-3 India [2015] ▼
Wind code of practice for dyn. amp. and a-flow accn. r	AS1170.2 Australia [2021] ▼

Factor for WL in ULS load combos for superstructure ULS design, k_{ULS}	**1.50**
Factor for WL in SLS load combos for superstructure defl. design, k_{SLS}	**1.00**
Factor for WL in ULS load combos for foundation ULS design, f_{ULS}	**1.50**
Factor for WL in SLS load combos for foundation SLS design, f_{SLS}	**1.00**

Location: Mumbai, India [IS875-3-2015] ▼

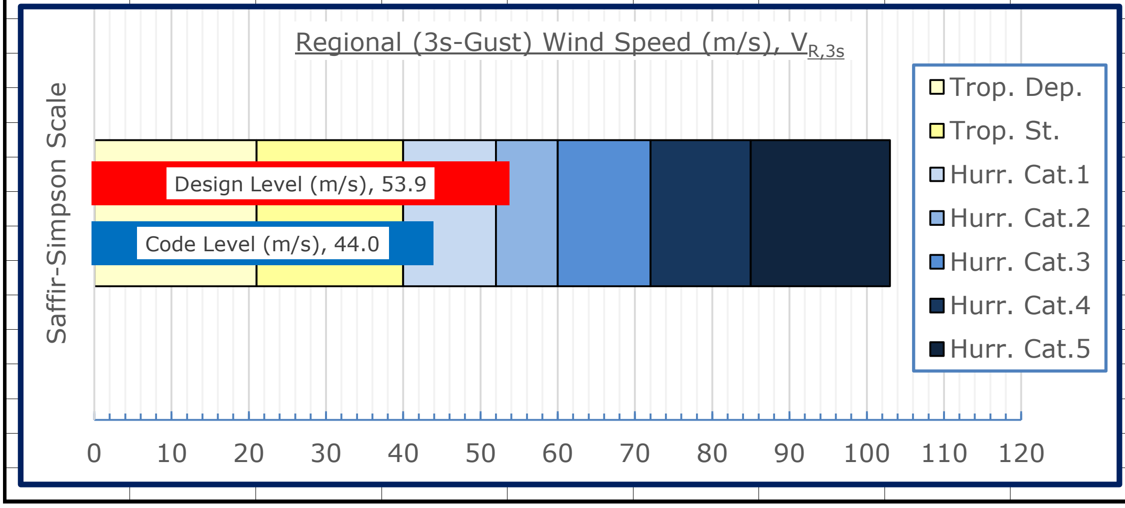
Importance factor, I **1.00**

Imp. class | Risk cat. | Occupancy cat. | Imp. level

Class I N=50y [Ordinary Buildings] [1.00] [T=285-1,000y] [cl.6.3.1, T.1 IS875-3:201 ▼

Ref. return period, T_R	***DL***	400	years
Regional (3s-gust) wind speed, $V_{R,3s}$	***DL***	**53.9**	m/s
Regional (1hr-mean) wind speed, $V_{R,hr}$		*N/A*	m/s
Regional (3s-gust) wind speed, $V_{R,3s}/[k_{ULS}^{0.5}]$	***CL***	**44.0**	m/s
Regional (1hr-mean) wind speed, $V_{R,hr}/[k_{ULS}^{0.5}]$		*N/A*	m/s
Regional wind pressure, $p_R=0.613V_{R,3s}^2$	***DL***	**1.78**	kPa
Regional wind pressure, $p_R/k_{ULS}=0.613.[V_{R,3s}/[k_{ULS}^{0.5}]]^2$	***CL***	**1.19**	kPa

Tropical Depression		Tropical Storm		Hurricane Cat. 1		Hurricane Cat. 2		Hurricane Cat. 3		Hurricane Cat. 4		Hurricane Cat. 5		Category	
0	21	21	40	40	52	52	60	60	72	72	85	85	103	m/s	$V_{R,3s}$
0	47	47	90	90	117	117	135	135	160	160	190	190	230	mph	$V_{R,3s}$
0	76	76	145	145	188	188	217	217	257	257	306	306	370	km/h	$V_{R,3s}$
0	0.27	0.27	0.99	0.99	1.68	1.68	2.23	2.23	3.14	3.14	4.42	4.42	6.48	kPa	P_R



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Site (3s-Gust) Wind Speed, $V_{site}(z)$ and Site Wind Pressure, $p_{site}(z)$

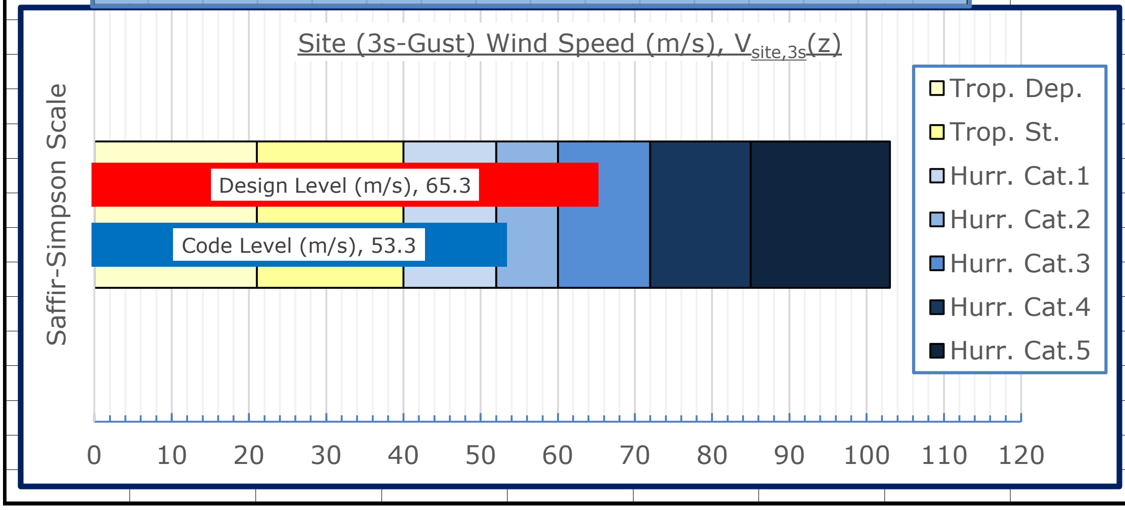
Note that ***$V_{site}(z)(m/s)$*** *defines the site wind hazard level at the* ***design*** *level (DL), not code level (CL).*

Site (3s-gust) wind speed at z, $V_{site,3s}(z)$	**DL**	**65.3**	m/s
Site (3s-gust) wind speed at z=h, $V_{site,3s}(z=h)$		**65.3**	m/s
Note $V_{site,3s}(z)=M_d.M_z(z).M_s.M_h.V_{R,3s}$			
Site (1hr-mean) wind speed at z, $V_{site,hr}(z)$	**DL**	**N/A**	m/s
Site (1hr-mean) wind speed at z=h, $V_{site,hr}(z=h)$		**N/A**	m/s
Note $V_{site,hr}(z)=M_d.M_z(z).M_s.M_h.V_{R,hr}$			
Site (3s-gust) wind speed at z, $V_{site,3s}(z)/[k_{ULS}^{0.5}]$	**CL**	**53.3**	m/s
Site (3s-gust) wind speed at z=h, $V_{site,3s}(z=h)/[k_{ULS}^{0.5}]$		**53.3**	m/s
Note $V_{site,3s}(z)/[k_{ULS}^{0.5}]=M_d.M_z(z).M_s.M_h.V_{R,3s}/[k_{ULS}^{0.5}]$			
Site (1hr-mean) wind speed at z, $V_{site,hr}(z)/[k_{ULS}^{0.5}]$	**CL**	**N/A**	m/s
Site (1hr-mean) wind speed at z=h, $V_{site,hr}(z=h)/[k_{ULS}^{0.5}]$		**N/A**	m/s
Note $V_{site,hr}(z)/[k_{ULS}^{0.5}]=M_d.M_z(z).M_s.M_h.V_{R,hr}/[k_{ULS}^{0.5}]$			

Directional multiplier, M_d		**0.95**	
Terrain | ground roughness | exposure multiplier at z, $M_z(z)$		**1.28**	**1.28**
Terrain category	Category 3 [Suburban Terrain] [cl.6.3.2.1]		
Shielding multiplier, M_s		**1.00**	
Hill shape | topographic | orography multiplier, M_h	1.00	**1.00**	

Site wind pressure at z, $p_{site}(z)=0.613V_{site,3s}(z)^2$	**DL**	**2.62**	kPa
Site wind pressure at z=h, $p_{site}(z=h)=0.613V_{site,3s}(z=h)^2$		**2.62**	kPa
Site wind pressure at z, $p_{site}(z)/k_{ULS}=0.613.[V_{site,3s}(z)/[k_{ULS}^{0.5}]]^2$	**CL**	**1.74**	kPa
Site wind pressure at z=h, $p_{site}(z=h)/k_{ULS}=0.613.[V_{site,3s}(z=h)/[k_U$		**1.74**	kPa

Tropical Depression		Tropical Storm		Hurricane Cat. 1		Hurricane Cat. 2		Hurricane Cat. 3		Hurricane Cat. 4		Hurricane Cat. 5		Category	
0	21	21	40	40	52	52	60	60	72	72	85	85	103	m/s	$V_{R,3s}$
0	47	47	90	90	117	117	135	135	160	160	190	190	230	mph	$V_{R,3s}$
0	76	76	145	145	188	188	217	217	257	257	306	306	370	km/h	$V_{R,3s}$
0	0.27	0.27	0.99	0.99	1.68	1.68	2.23	2.23	3.14	3.14	4.42	4.42	6.48	kPa	P_R



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Building Dimensions and Physical Properties

Average roof height of the structure above ground, h		228.0	m
Breadth of the structure on plan normal to wind stream, b		36.0	m
Depth of the structure on plan parallel to wind stream, d		60.0	m
Height on structure above local ground level, z		228.0	m
Overall building fundamental along-flow natural frequency, n_a		0.25	Hz
Damping ratio (as a fraction of critical) for ULS, ζ_{ULS}		0.030	
Overall building fundamental cross-flow natural frequency, n_c		0.20	Hz
Cross-flow fundamental mode shape power exponent, k		1.00	
Total DL and LL of building, ΣG and ΣQ	1400	200	MN
Floor area, A_F		1214	m^2
Total dynamic load of building, 1.00ΣG+0.30ΣQ		1460	MN
Average dynamic load per unit height, (1.00ΣG+0.30ΣQ)/h		**6,405**	kN/m
Average mass per unit height, m_0=(1.00ΣG+0.30ΣQ)/h		**652,896**	kg/m
Damping ratio (as a fraction of critical) for SLS, ζ_{SLS}		0.015	
Base wind bending moment, $\Sigma M_{SLS}=k_{SLS}.\Sigma[p_{des,ww}(z)/k_{ULS}-p_{des,lw}(z)/k_{ULS}].z.dA$		1899	MNm

Building Global Pressure or Cladding Local Pressure | Int. Pressure Consideration | Ref. Height

Building global pressure or cladding local pressure ?	Building Global Pressure ▼
Internal pressure consideration ?	Not Considered (0.0) ▼

Ref. height for dynamic pressure for leeward and side walls, z=z | z=h	z=z

CP3-V-2	Reference height, z=z | z=h	z=z	cl.5.5.2, cl.6 CP3-
BS6399-2	Reference height, z=z | z=h	z=z	cl.2.2.3.2 F.11,
EN1991-1-4	Reference height, z=z | z=h	z=h	cl.7.2.2, F.7.4
MS1553	Reference height, z=z | z=h	z=h	cl.5.4.1 MS1553-
ASCE7	Reference height, z=z | z=h	z=h	cl.27.3.1 ASCE7-
SNI1727	Reference height, z=z | z=h	z=h	cl.27.3.1 SNI1727-
NSCP	Reference height, z=z | z=h	z=h	cl.207B.4 NSCP-
AS1170.2	Reference height, z=z | z=h	z=h	cl.5.4.1 AS1170.2-
IS875-3	Reference height, z=z | z=h	z=z	cl.7.2 IS875-3-
HKWC	Reference height, z=z | z=h	z=z	cl.2.2.1, cl.3.2
< N/A >	N/A	N/A	N/A
< N/A >	N/A	N/A	N/A
< N/A >	N/A	N/A	N/A
< N/A >	N/A	N/A	N/A
< N/A >	N/A	N/A	N/A
< N/A >	N/A	N/A	N/A

Building Wind (Dynamic) Acceleration Response Criteria for Occupancy Comfort

Along-flow peak acceleration criteria, $\ddot{x}_{max,lim}$		**16.6**	mg	Melbourn
$\ddot{x}_{max,lim}=\sqrt{2ln(n_aT)}(0.68+(lnR)/5)e^{(-3.65-0.41lnn_a)}$, T=600s	Ret. prd, R	10.0	year(s)	
Cross-flow vortex shedding acceleration criteria, $\ddot{y}_{max,lim}$		**17.7**	mg	Melbourn
$\ddot{y}_{max,lim}=\sqrt{2ln(n_cT)}(0.68+(lnR)/5)e^{(-3.65-0.41lnn_c)}$, T=600s	Ret. prd, R	10.0	year(s)	

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Building Wind Pressure (Along-Flow), $p_{des}(z)$

*Note that building wind pressure (along-flow), $p_{des}(z)$ refers to the wind induced (static) along-flow drag and (dynamic) along-flow gust pressure definition at the **design** level (DL), not code level (CL).*

Building Wind Pressure (Building Net Stability), $p_{des,bldg}(z)$

Building, $p_{des,bldg}(z)=(C_{dyn}\|G).K_C.[C_{fig,ww}.p_{site}(z)-C_{fig,lw}.p_{site}(z=z\|h)]$	**DL**	**3.55**	kPa
Building, $p_{des,bldg}(z)/k_{ULS}=(C_{dyn}\|G).K_C.[C_{fig,ww}.p_{site}(z)-C_{fig,lw}.p_{site}(z=z$	**CL**	**2.37**	kPa

Note sign convention right positive;

Dynamic response factor | gust effect factor, C_{dyn} | G	**1.06**
Combination factor | correlation factor, K_C	**1.00**

Building Wind Pressure (Windward Wall | Leeward Wall | Side Wall | Upwind Roof | Downwind Ro

Building global pressure or cladding local pressure ?	Building Global Pressure
Internal pressure consideration ?	Not Considered (0.0)

Windward wall, $p_{des,ww}(z)=[C_{fig,ww}-C_{fig,int}].p_{site}(z)$	**DL**	**1.78**	kPa
Windward wall, $p_{des,ww}(z)/k_{ULS}=[C_{fig,ww}-C_{fig,int}].p_{site}(z)/k_{ULS}$	**CL**	**1.19**	kPa
Leeward wall, $p_{des,lw}(z)=[-C_{fig,lw}+C_{fig,int}).p_{site}(z=z\|h)$	**DL**	**1.57**	kPa
Leeward wall, $p_{des,lw}(z)/k_{ULS}=[-C_{fig,lw}+C_{fig,int}).p_{site}(z=z\|h)/k_{ULS}$	**CL**	**1.05**	kPa
Side wall, $p_{des,sw}(z)=[-C_{fig,sw}+C_{fig,int}).p_{site}(z=z\|h)$	**DL**	**1.67**	kPa
Side wall, $p_{des,sw}(z)/k_{ULS}=[-C_{fig,sw}+C_{fig,int}).p_{site}(z=z\|h)/k_{ULS}$	**CL**	**1.12**	kPa
Note sign convention right positive;			
Upwind roof, $p_{des,ur}(z=h)=[-C_{fig,ur}+C_{fig,int}).p_{site}(z=h)$	**DL**	**2.51**	kPa
Upwind roof, $p_{des,ur}(z=h)/k_{ULS}=[-C_{fig,ur}+C_{fig,int}).p_{site}(z=h)/k_{ULS}$	**CL**	**1.67**	kPa
Downwind roof, $p_{des,dr}(z=h)=[-C_{fig,dr}+C_{fig,int}).p_{site}(z=h)$	**DL**	**1.67**	kPa
Downwind roof, $p_{des,dr}(z=h)/k_{ULS}=[-C_{fig,dr}+C_{fig,int}).p_{site}(z=h)/k_{ULS}$	**CL**	**1.12**	kPa

Note sign convention upwards positive;

Aerodynamic shape factor (windward wall ext.), $C_{fig,ww}$	**0.68**
Aerodynamic shape factor (windward wall int.), $C_{fig,int}$	**0.00**
Aerodynamic shape factor (leeward wall ext.), $C_{fig,lw}$	**-0.60**
Aerodynamic shape factor (leeward wall int.), $C_{fig,int}$	**0.00**
Aerodynamic shape factor (side wall ext.), $C_{fig,sw}$	**-0.64**
Aerodynamic shape factor (side wall int.), $C_{fig,int}$	**0.00**
Aerodynamic shape factor (upwind roof ext.), $C_{fig,ur}$	**-0.96**
Aerodynamic shape factor (upwind roof int.), $C_{fig,int}$	**0.00**
Aerodynamic shape factor (downwind roof ext.), $C_{fig,dr}$	**-0.64**
Aerodynamic shape factor (downwind roof int.), $C_{fig,int}$	**0.00**

Note sign convention towards face positive;

Building Wind (Dynamic) Along-Flow and Cross-Flow Acceleration Response

Along-flow peak acceleration, $\ddot{x}_{max}$	**5.0**	mg	
Along-flow peak acceleration utilisation, $\ddot{x}_{max}/\ddot{x}_{max,lim}$	**30%**		**OK**
Cross-flow peak vortex shedding acceleration, $\ddot{y}_{max}$	**14.4**	mg	
Cross-flow peak vortex shedding acceleration utilisation, $\ddot{y}_{max}/\ddot{y}_{max,lim}$	**81%**		**OK**

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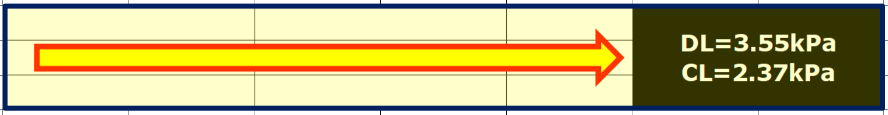
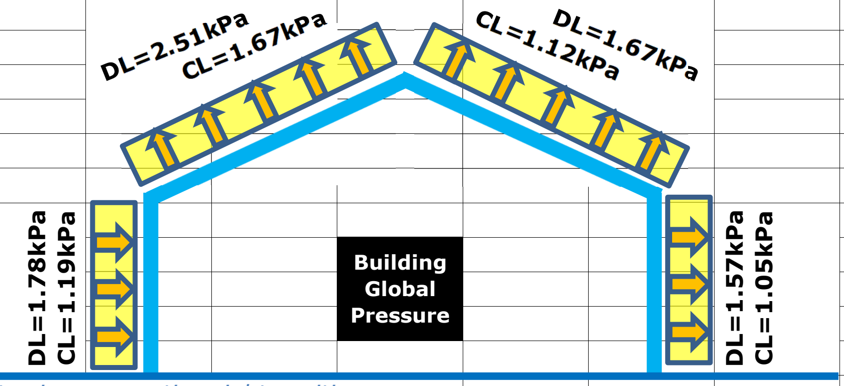
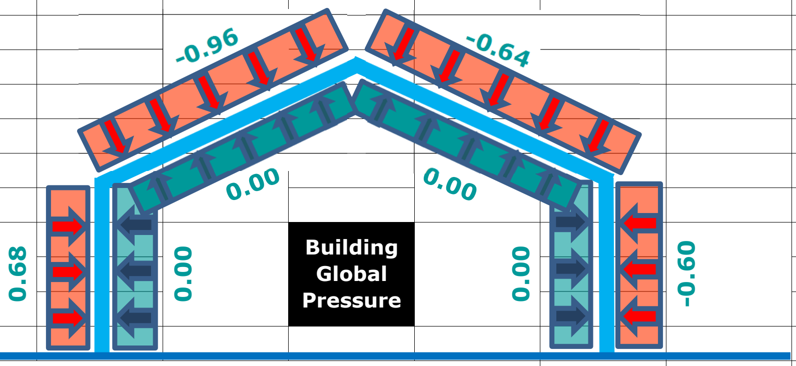


of), $p_{des,ww}(z)$ | $p_{des,lw}(z)$ | $p_{des,sw}(z)$ | $p_{des,ur}(z=h)$ | $p_{des,dr}(z=h)$



Note sign convention right positive;

Note sign convention upwards positive;



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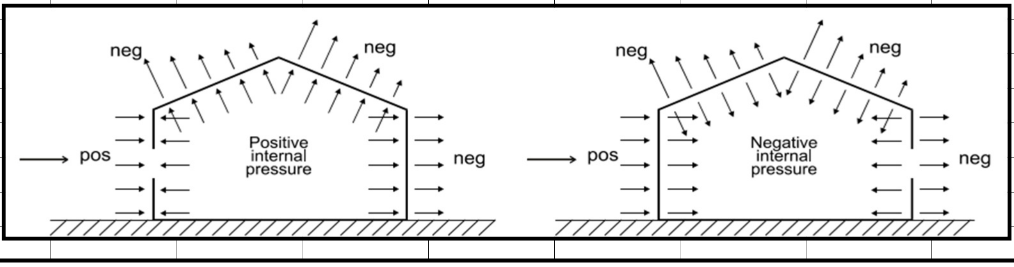

MAVERICK ENGINEERS Maverick United Consulting Engineers

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Structure Design - Wind Load Definition and Wind Effects

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Building Wind Pressure (Cross-Flow), $p_{des,cf}(z)$

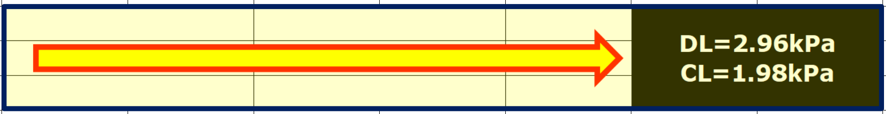
*Note that building wind pressure (cross-flow), **$p_{des,cf}(z)$** refers to the wind induced (static) cross-flow lift and (dynamic) cross-flow vortex shedding pressure definition at the **design** level (DL), not code level (CL).*

Building Wind Pressure (Building Net Stability), $p_{des,bldg,cf}(z)$

Building, $p_{des,bldg,cf}(z)=C_{fig,cf}.C_{dyn}.p_{site}(z=h)$	***DL***	**2.96**	kPa
Building, $p_{des,bldg,cf}(z)/k_{ULS}=C_{fig,cf}.C_{dyn}.p_{site}(z=h)/k_{ULS}$	***CL***	**1.98**	kPa

Note sign convention right positive;

Net aerodynamic shape x dyn. response factor, $C_{fig,cf}.C_{dyn}$ **1.13**



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Parameters for Site (3s-Gust) Wind Speed, $V_{site}(z)$

Directional Multiplier, M_d

Note the directional multiplier accounts for the randomness in the directionality of wind and recognizes the fact that the pressure coefficients are determined for specific wind directions. Winds do not always blow from the most critical direction for a given structure. The design wind speed is usually based on long-term statistical records, which assume the worst wind from any direction. For most structures, the probability that the maximum wind also comes from the most unfavorable direction (relative to the building geometry and load effect being considered) is less than 100%.

Directional multiplier, M_d **0.95**

$M_d = MAX\{S_4\} = 0.95$	0.95	T.26 CP3- V2-1972
$M_d = MAX\{S_d\} = 0.95$	0.95	T.3 BS6399-
$M_d = c_{dir} = 1.00$	1.00	Cl.4.2 EN1991-
$M_d = 1.00$	1.00	Cl.2.2 MS1553-
$M_d = \sqrt{K_d} = \sqrt{0.85} = 0.92$	0.92	T.26.6-1 ASCE7-
$M_d = \sqrt{K_d} = \sqrt{0.85} = 0.92$	0.92	T.26.6-1 SNI1727-
$M_d = \sqrt{K_d} = \sqrt{0.85} = 0.92$	0.92	T.207A.6- 1 NSCP-
$M_d = MAX\{M_d\} = 0.95$	0.95	T.3.2 AS1170.2-
$M_d = \sqrt{K_d} = \sqrt{0.90} = 0.95$	0.95	Cl.7.2.1 IS875-3-
$M_d = \sqrt{MAX\{S_\theta\}} = \sqrt{0.85} = 0.92$	0.92	T.A1-1 HKWC-
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Shielding Multiplier, M_s

Shielding multiplier, M_s **1.00**

Hill Shape | Topographic | Orography Multiplier, M_h

Hill shape | topographic | orography multiplier, M_h 1.00 **1.00**

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Terrain | Ground Roughness | Exposure Multiplier at z, $M_z(z)$

Terrain | ground roughness | exposure multiplier at z, $M_z(z)$		1.28	1.28
Terrain category	Category 3 [Suburban Terrain] [cl.6.3.2.1] ▼		

Grd. Rgh. 1	$M_z(z)=S_2(z)=0.1067ln(z)+0.6811 \geq 0.78$	1.26	1.26	CP3-V2-1
Grd. Rgh. 2	$M_z(z)=S_2(z)=0.1295ln(z)+0.5650 \geq 0.67$	1.27	1.27	CP3-V2-1
Grd. Rgh. 3	$M_z(z)=S_2(z)=0.1511ln(z)+0.4281 \geq 0.60$	1.25	1.25	CP3-V2-1
Grd. Rgh. 4	$M_z(z)=S_2(z)=0.1817ln(z)+0.2507 \geq 0.52$	1.24	1.24	CP3-V2-1
Cat. 1	$M_z(z)=S_b(z)/1.62=0.1299ln(z)+0.6947 \geq 0.78$	1.40	1.40	BS6399-2-1
Cat. 2	$M_z(z)=S_b(z)/1.62=0.1299ln(z)+0.6947 \geq 0.78$	1.40	1.40	BS6399-2-1
Cat. 3	$M_z(z)=S_b(z)/1.62=0.1591ln(z)+0.5889 \geq 0.66$	1.45	1.45	BS6399-2-1
Cat. 4	$M_z(z)=S_b(z)/1.62=0.1591ln(z)+0.5889 \geq 0.66$	1.45	1.45	BS6399-2-1
Cat. I	$1.0/(c_0(z).ln(z/z_{0,0.01}))]\}.c_r(z).c_0(z)/1.62,\ z_{min}=1m$	1.37	1.37	EN1991-1-4
Cat. II	$1.0/(c_0(z).ln(z/z_{0,0.05}))]\}.c_r(z).c_0(z)/1.62,\ z_{min}=2m$	1.34	1.34	EN1991-1-4
Cat. III	$[1.0/(c_0(z).ln(z/z_{0,0.3}))]\}.c_r(z).c_0(z)/1.62,\ z_{min}=5m$	1.26	1.26	EN1991-1-4
Cat. IV	$1.0/(c_0(z).ln(z/z_{0,1.0}))]\}.c_r(z).c_0(z)/1.62,\ z_{min}=10m$	1.19	1.19	EN1991-1-4
Cat. 1	$M_z(z)=0.0714ln(z)+0.9534 \geq 0.99$	1.34	1.34	MS1553-2
Cat. 2	$M_z(z)=0.0989ln(z)+0.7719 \geq 0.85$	1.31	1.31	MS1553-2
Cat. 3	$M_z(z)=0.1268ln(z)+0.5668 \geq 0.75$	1.26	1.26	MS1553-2
Cat. 4	$M_z(z)=0.1277ln(z)+0.4612 \geq 0.75$	1.15	1.15	MS1553-2
Exp. D	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/213.36)^{(2/11.5)} \geq \sqrt{1.03}$	1.43	1.43	T.26.11-1
Exp. C	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/274.32)^{(2/9.5)} \geq \sqrt{0.85}$	1.39	1.39	T.26.11-1
Exp. B	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/365.76)^{(2/7.0)} \geq \sqrt{0.57}$	1.33	1.33	T.26.11-1
Exp. B	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/365.76)^{(2/7.0)} \geq \sqrt{0.57}$	1.33	1.33	T.26.11-1
Exp. D	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/213.36)^{(2/11.5)} \geq \sqrt{1.03}$	1.43	1.43	26.9-1 SN
Exp. C	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/274.32)^{(2/9.5)} \geq \sqrt{0.85}$	1.39	1.39	26.9-1 SN
Exp. B	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/365.76)^{(2/7.0)} \geq \sqrt{0.57}$	1.33	1.33	26.9-1 SN
Exp. B	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/365.76)^{(2/7.0)} \geq \sqrt{0.57}$	1.33	1.33	26.9-1 SN
Exp. D	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/213.36)^{(2/11.5)} \geq \sqrt{1.03}$	1.43	1.43	T.207A.9-1
Exp. C	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/274.32)^{(2/9.5)} \geq \sqrt{0.85}$	1.39	1.39	T.207A.9-1
Exp. B	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/365.76)^{(2/7.0)} \geq \sqrt{0.57}$	1.33	1.33	T.207A.9-1
Exp. B	$M_z(z)=\sqrt{K_z}(z)=\sqrt{2.01}(z/365.76)^{(2/7.0)} \geq \sqrt{0.57}$	1.33	1.33	T.207A.9-1
Cat. 1	$M_z(z)=0.0999ln(z)+0.8484 \geq \sqrt{0.97}$	1.39	1.39	AS1170.2-
Cat. 2	$M_z(z)=0.099ln(z)+0.7815 \geq \sqrt{0.91}$	1.32	1.32	AS1170.2-
Cat. 3	$M_z(z)=0.1108ln(z)+0.6354 \geq \sqrt{0.83}$	1.24	1.24	AS1170.2-
Cat. 4	$M_z(z)=0.1039ln(z)+0.5272 \geq \sqrt{0.75}$	1.09	1.09	AS1170.2-

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72	Cat. 1	$M_z(z)=k_2(z)=0.0804\ln(z)+0.8789\geq1.05$	1.32	1.32	IS875-3-2
72	Cat. 2	$M_z(z)=k_2(z)=0.0927\ln(z)+0.8002\geq1.00$	1.30	1.30	IS875-3-2
72	Cat. 3	$M_z(z)=k_2(z)=0.1116\ln(z)+0.6726\geq0.91$	1.28	1.28	IS875-3-2
72	Cat. 4	$M_z(z)=k_2(z)=0.1521\ln(z)+0.4343\geq0.80$	1.26	1.26	IS875-3-2
997	Cat. 1	$M_z(z)=0.0898\ln(z)+0.7961\geq0.90$	1.28	1.28	2 HKWC-2
997	Cat. 2	$M_z(z)=0.0898\ln(z)+0.7961\geq0.90$	1.28	1.28	2 HKWC-2
997	Cat. 3	$M_z(z)=0.0898\ln(z)+0.7961\geq0.90$	1.28	1.28	2 HKWC-2
997	Cat. 4	$M_z(z)=0.0898\ln(z)+0.7961\geq0.90$	1.28	1.28	2 HKWC-2
-2005		N/A	N/A	N/A	N/A
-2005		N/A	N/A	N/A	N/A
-2005		N/A	N/A	N/A	N/A
-2005		N/A	N/A	N/A	N/A
002		N/A	N/A	N/A	N/A
002		N/A	N/A	N/A	N/A
002		N/A	N/A	N/A	N/A
002		N/A	N/A	N/A	N/A
ASCE7-16		N/A	N/A	N/A	N/A
ASCE7-16		N/A	N/A	N/A	N/A
ASCE7-16		N/A	N/A	N/A	N/A
ASCE7-16		N/A	N/A	N/A	N/A
1727-2020		N/A	N/A	N/A	N/A
1727-2020		N/A	N/A	N/A	N/A
1727-2020		N/A	N/A	N/A	N/A
1727-2020		N/A	N/A	N/A	N/A
NSCP-2015		N/A	N/A	N/A	N/A
NSCP-2015		N/A	N/A	N/A	N/A
NSCP-2015		N/A	N/A	N/A	N/A
NSCP-2015		N/A	N/A	N/A	N/A
2021		N/A	N/A	N/A	N/A
2021		N/A	N/A	N/A	N/A
2021		N/A	N/A	N/A	N/A
2021		N/A	N/A	N/A	N/A

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Terrain | Ground Roughness | Exposure Multiplier at z, $M_z(z)$

z [m]	CP3-V-2	BS6399-2	EN1991-1-4	MS1553	ASCE7	SNI1727	NSCP	AS1170.2
5.0	0.67	0.84	0.70	0.77	0.77	0.77	0.77	0.91
10.0	0.78	0.96	0.81	0.86	0.85	0.85	0.85	0.91
20.0	0.88	1.07	0.91	0.95	0.94	0.94	0.94	0.97
30.0	0.94	1.13	0.97	1.00	0.99	0.99	0.99	1.01
40.0	0.99	1.18	1.01	1.03	1.03	1.03	1.03	1.04
50.0	1.02	1.21	1.05	1.06	1.07	1.07	1.07	1.07
60.0	1.05	1.24	1.07	1.09	1.10	1.10	1.10	1.09
70.0	1.07	1.26	1.10	1.11	1.12	1.12	1.12	1.11
80.0	1.09	1.29	1.11	1.12	1.14	1.14	1.14	1.12
90.0	1.11	1.30	1.13	1.14	1.16	1.16	1.16	1.13
100.0	1.12	1.32	1.15	1.15	1.18	1.18	1.18	1.15
125.0	1.16	1.36	1.18	1.18	1.22	1.22	1.22	1.17
150.0	1.19	1.39	1.20	1.20	1.25	1.25	1.25	1.19
175.0	1.21	1.41	1.23	1.22	1.28	1.28	1.28	1.21
200.0	1.23	1.43	1.25	1.24	1.30	1.30	1.30	1.22
225.0	1.25	1.45	1.26	1.25	1.32	1.32	1.32	1.24
250.0	1.26	1.47	1.28	1.27	1.34	1.34	1.34	1.25
275.0	1.28	1.48	1.29	1.28	1.36	1.36	1.36	1.26
300.0	1.29	1.50	1.30	1.29	1.38	1.38	1.38	1.27
325.0	1.30	1.51	1.31	1.30	1.39	1.39	1.39	1.28
350.0	1.31	1.52	1.32	1.31	1.41	1.41	1.41	1.28
375.0	1.32	1.53	1.33	1.32	1.42	1.42	1.42	1.29
400.0	1.33	1.54	1.34	1.33	1.44	1.44	1.44	1.30
425.0	1.34	1.55	1.35	1.33	1.45	1.45	1.45	1.31
450.0	1.35	1.56	1.36	1.34	1.46	1.46	1.46	1.31
475.0	1.36	1.57	1.37	1.35	1.47	1.47	1.47	1.32
500.0	1.37	1.58	1.38	1.35	1.48	1.48	1.48	1.32

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Terrain | Ground Roughness | Exposure Multiplier at z, $M_z(z)$

z [m]	IS875-3	HKWC	< N/A >	< N/A >	< N/A >	< N/A >	< N/A >	< N/A >
5.0	0.91	0.94						
10.0	0.93	1.00						
20.0	1.01	1.07						
30.0	1.05	1.10						
40.0	1.08	1.13						
50.0	1.11	1.15						
60.0	1.13	1.16						
70.0	1.15	1.18						
80.0	1.16	1.19						
90.0	1.17	1.20						
100.0	1.19	1.21						
125.0	1.21	1.23						
150.0	1.23	1.25						
175.0	1.25	1.26						
200.0	1.26	1.27						
225.0	1.28	1.28						
250.0	1.29	1.29						
275.0	1.30	1.30						
300.0	1.31	1.31						
325.0	1.32	1.32						
350.0	1.33	1.32						
375.0	1.33	1.33						
400.0	1.34	1.33						
425.0	1.35	1.34						
450.0	1.35	1.34						
475.0	1.36	1.35						
500.0	1.37	1.35						

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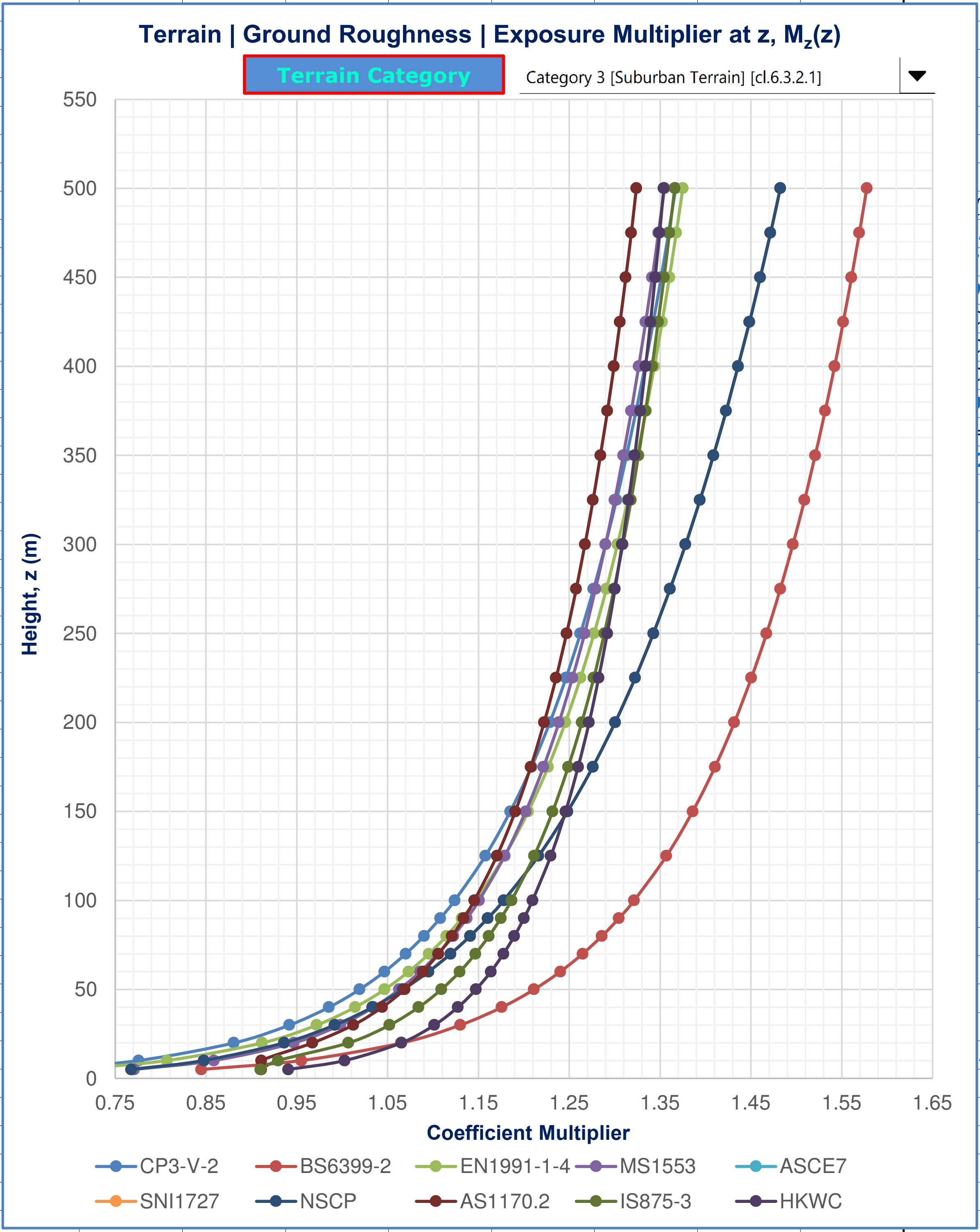

Category 3 [Suburban Terrain] [cl.6.3.2.1]

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Parameters for Building Wind Pressure (Along-Flow), $p_{des}(z)$

Aerodynamic Shape Factor (Windward Wall), $C_{fig,ww}$

Aerodynamic shape factor (windward wall ext.), $C_{fig,ww}=C_{p,e}.K_l$	**0.68**
Aerodynamic shape factor (windward wall int.), $C_{fig,int}=C_{p,i}.K_l$	**0.00**
Internal pressure consideration ?	Not Considered (0.0)

Note sign convention towards face positive;

External pressure coefficient, $C_{p,e}$	**0.68**
Internal pressure coefficient, $C_{p,i}$	**0.00**

Internal		*External*		
$.3 , +0.2 , 0.75 (C_{pe} = -0.80)\}$	0.00	$C_{p,e} = MAX\{C_{pe,A}\}= 0.70$	0.70	cl.4.3,
$+0.2 , 0.75\text{-}0.9 (C_{pe} = -0.80)\}$	0.00	$.MAX\{C_{pe}\}=0.80.(0.85)=0.68$	0.68	cl.2.1.3.3
$0.35 , 0.75\text{-}0.9 (C_{pe} = -0.80)\}$	0.00	$C_{p,e} = MAX\{C_{pe,10,D}\}= 0.80$	0.80	cl.5.3,
$+0.6 , 0.7\text{-}1.0 (C_{p,e} = -0.65)\}$	0.00	$C_{p,e} =MAX\{C_{p,e,h>25m}\}= 0.80$	0.80	cl.5.2,
$=C_{pi} =\{ -0.18 , +0.18 , -0.55 \}$	0.00	$_a .MAX\{C_p\}=0.80.(0.80)=0.64$	0.64	cl.27.3.1,
$=C_{pi} =\{ -0.18 , +0.18 , -0.55 \}$	0.00	$_a .MAX\{C_p\}=0.80.(0.80)=0.64$	0.64	cl.27.3.1,
$=C_{pi} =\{ -0.18 , +0.18 , -0.55 \}$	0.00	$_a .MAX\{C_p\}=0.80.(0.80)=0.64$	0.64	cl.20/B.4
$+0.8 , 1.0 .K_a .(C_{p,e} = -0.65)\}$	0.00	$C_{p,e} =MAX\{C_{p,e,h>25m}\}= 0.80$	0.80	cl.5.2,
$.\{ -0.2 , +0.2 , -0.50 , -0.70 \}$	0.00	$_{A,h/w>6,l/w=2}\}=0.80.(0.85)=0.68$	0.68	cl.7.2,
$, +0.2 , 0.8\text{-}1.0 (C_{pe} = -0.80)\}$	0.00	$MAX\{C_{pe}\}=0.925.(0.80)=0.74$	0.74	cl.2.3,
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Note area reduction factor K_a is built into these $C_{p,e}$ | $C_{p,i}$ coefficients, where relevant;

Building global pressure or cladding local pr	Building Global Pressure
External cladding local pressure factor, K_l	**1.00**
Internal cladding local pressure factor, K_l	**1.00**

Internal		*External*		
$K_l = 1.00$	1.00	$K_l =MAX\{C_{p,local}/C_{pe,A}\}= 1.00$	1.00	cl.4.3 |
$K_l =1/C_{a,B,a=70m} =1/ 0.80 =1.25$	1.25	$K_l =1/C_{a,B,a=70m} =1/ 0.80 =1.25$	1.25	cl.2.1.3.3
$K_l = 1.00$	1.00	$_{e,1,D}/C_{pe,10,D}\}= 1.00 /0.80=1.25$	1.25	cl.5.3,
$K_l = 1.00$	1.00	$K_l =MAX\{K_l\}= 1.25$	1.25	cl.5.2 |
$K_l = 1.00$	1.00	$\{C_{p,local}/C_p\}= 0.90 /0.60 = 1.50$	1.50	cl.27.3.1
$K_l = 1.00$	1.00	$\{C_{p,local}/C_p\}= 0.90 /0.60 = 1.50$	1.50	cl.27.3.1
$K_l = 1.00$	1.00	$\{C_{p,local}/C_p\}= 0.90 /0.60 = 1.50$	1.50	cl.20/B.4
$K_l = 1.00\text{-}1.50$	1.00	$K_l =MAX\{K_l\}= 1.50$	1.50	cl.5.2,
$K_l = 1.00$	1.00	$K_l =MAX\{C_{p,local}/C_{pe,A}\}= 1.00$	1.00	cl.7.2,
$/S_{s,L0.5p=50m} = 1.10 /0.925=1.19$	1.19	$/S_{s,L0.5p=50m} = 1.50 /0.925=1.62$	1.62	cl.2.3,
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

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Aerodynamic Shape Factor (Leeward Wall), $C_{fig,lw}$

Aerodynamic shape factor (leeward wall ext.), $C_{fig,lw}=C_{p,e}.K_l$ **-0.60**

Aerodynamic shape factor (leeward wall int.), $C_{fig,int}=C_{p,i}.K_l$ **0.00**

Internal pressure consideration ? Not Considered (0.0)

Note sign convention towards face positive;

External pressure coefficient, $C_{p,e}$ **-0.60**

Internal pressure coefficient, $C_{p,i}$ **0.00**

Internal		External		
$-0.3, +0.2, 0.75 (C_{pe} = 0.70)\}$	0.00	$C_{p,e} = MAX\{C_{pe,B}\} = -0.40$	-0.40	cl.4.3,
$, +0.2, 0.75\text{-}0.9 (C_{pe} = 0.85)\}$	0.00	$X\{C_{pe}\}=0.80.(-0.50) = -0.40$	-0.40	cl.2.1.3.3
$+0.35, 0.75\text{-}0.9 (C_{pe} = 0.80)\}$	0.00	$C_{p,e} = MAX\{C_{pe,10,E}\} = -0.70$	-0.70	cl.5.3,
$, +0.6, 0.7\text{-}1.0 (C_{p,e} = 0.80)\}$	0.00	$C_{p,e} = MAX\{C_{p,e,d/b \le 1}\} = -0.50$	-0.50	cl.5.2,
$=C_{pi} = \{-0.18, +0.18, +0.55\}$	0.00	$MAX\{C_p\}=0.80.(-0.50)=0.40$	-0.40	cl.27.3.1,
$=C_{pi} = \{-0.18, +0.18, +0.55\}$	0.00	$MAX\{C_p\}=0.80.(-0.50)=0.40$	-0.40	cl.27.3.1,
$=C_{pi} = \{-0.18, +0.18, +0.55\}$	0.00	$MAX\{C_p\}=0.80.(-0.50)=0.40$	-0.40	cl.20/B.4
$, +0.8, 0.7\text{-}1.0 (C_{p,e} = 0.80)\}$	0.00	$C_{p,e} = MAX\{C_{p,e,d/b \le 1}\} = -0.50$	-0.50	cl.5.2,
$\{-0.2, +0.2, +0.50, +0.70\}$	0.00	$_{>6,l/w=2}\}=0.80.(-0.75) = -0.60$	-0.60	cl.7.2,
$3, +0.2, 0.8\text{-}1.0 (C_{pe} = 0.80)\}$	0.00	$\{C_{pe}\}=0.925.(-0.30) = -0.28$	-0.28	cl.2.3,
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Note area reduction factor K_a is built into these $C_{p,e}$ | $C_{p,i}$ coefficients, where relevant,

Building global pressure or cladding local pr Building Global Pressure

External cladding local pressure factor, K_l **1.00**

Internal cladding local pressure factor, K_l **1.00**

Internal		External		
$K_l = 1.00$	1.00	$_{cal}/C_{pe,B}\} = -1.20/-0.40=3.00$	3.00	cl.4.3 |
$K_l = 1/C_{a,B,a=70m} = 1/0.80 = 1.25$	1.25	$K_l = 1/C_{a,B,a=70m} = 1/0.80 = 1.25$	1.25	cl.2.1.3.3
$K_l = 1.00$	1.00	$/C_{pe,10,E}\} = -0.70/-0.70=1.00$	1.00	cl.5.3,
$K_l = 1.00$	1.00	$K_l = MAX\{K_l\} = 1.00$	1.00	cl.5.2 |
$K_l = 1.00$	1.00	$_{p,local}/C_p\} = -1.80/-1.00=1.80$	1.80	cl.27.3.1
$K_l = 1.00$	1.00	$_{p,local}/C_p\} = -1.80/-1.00=1.80$	1.80	cl.27.3.1
$K_l = 1.00$	1.00	$_{p,local}/C_p\} = -1.80/-1.00=1.80$	1.80	cl.20/B.4
$K_l = 1.00\text{-}1.00$	1.00	$K_l = MAX\{K_l\} = 1.00$	1.00	cl.5.2,
$K_l = 1.00$	1.00	$_{cal}/C_{pe,B}\} = -1.20/-0.75=1.60$	1.60	cl.7.2,
$/S_{s,L0.5p=50m} = 1.10/0.925=1.19$	1.19	$/S_{s,L0.5p=50m} = 1.50/0.925=1.62$	1.62	cl.2.3,
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

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Aerodynamic Shape Factor (Side Wall), $C_{fig,sw}$

Aerodynamic shape factor (side wall ext.), $C_{fig,sw}=C_{p,e}.K_l$	**-0.64**
Aerodynamic shape factor (side wall int.), $C_{fig,int}=C_{p,i}.K_l$	**0.00**
Internal pressure consideration ?	Not Considered (0.0)

Note sign convention towards face positive;

External pressure coefficient, $C_{p,e}$	**-0.64**
Internal pressure coefficient, $C_{p,i}$	**0.00**

Internal		External		
$-0.3, +0.2, 0.75 (C_{pe} = 0.70)\}$	0.00	$C_{p,e} = MAX\{C_{pe,CD}\} = -0.80$	-0.80	cl.4.3, App.F |
$, +0.2, 0.75\text{-}0.9 (C_{pe} = 0.85)\}$	0.00	$\{C_{pe,B}\}=0.80.(-0.80) = -0.64$	-0.64	cl.2.1.3.3 F.4,
$+0.35, 0.75\text{-}0.9 (C_{pe} = 0.80)\}$	0.00	$C_{p,e} = MAX\{C_{pe,10,B}\} = -0.80$	-0.80	cl.5.3, cl.7.2.9 |
$3, +0.6, 0.7\text{-}1.0 (C_{p,e} = 0.80)\}$	0.00	$X\{C_{p,e}\}=0.80.(-0.65) = -0.52$	-0.52	cl.5.2, T.5.1(a)
$=C_{pi} = \{-0.18, +0.18, +0.55\}$	0.00	$MAX\{C_p\}=0.80.(-0.70)=0.56$	-0.56	cl.27.3.1, T.26.13-
$=C_{pi} = \{-0.18, +0.18, +0.55\}$	0.00	$MAX\{C_p\}=0.80.(-0.70)=0.56$	-0.56	cl.27.3.1, T.26.13-
$=C_{pi} = \{-0.18, +0.18, +0.55\}$	0.00	$MAX\{C_p\}=0.80.(-0.70)=0.56$	-0.56	cl.20/B.4
$3, +0.8, 0.7\text{-}1.0 (C_{p,e} = 0.80)\}$	0.00	$X\{C_{p,e}\}=0.80.(-0.65) = -0.52$	-0.52	cl.5.2, T.5.1(a)
$.\{-0.2, +0.2, +0.50, +0.70\}$	0.00	$\{C_{pe,CD}\}=0.80.(-0.80) = -0.64$	-0.64	cl.7.2, cl.7.3.1
$3, +0.2, 0.8\text{-}1.0 (C_{pe} = 0.80)\}$	0.00	$\{C_{pe}\}=0.925.(-0.80) = -0.74$	-0.74	cl.2.3, F.5-2
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Note area reduction factor K_a is built into these $C_{p,e}$ | $C_{p,i}$ coefficients, where relevant,

Building global pressure or cladding local pr	Building Global Pressure
External cladding local pressure factor, K_l	**1.00**
Internal cladding local pressure factor, K_l	**1.00**

Internal		External		
$K_l = 1.00$	1.00	$_{al}/C_{pe,CD}\} = -1.20 / -0.80=1.50$	1.50	cl.4.3 | cl.4.3
$K_l = 1/C_{a,B,a=70m} = 1/0.80 = 1.25$	1.25	$K_l = 1/C_{a,B,a=70m} = 1/0.80 = 1.25$	1.25	cl.2.1.3.3 F.4 |
$K_l = 1.00$	1.00	$C_{pe,10,B}\} = -1.10 / -0.80=1.375$	1.375	cl.5.3, cl.7.2.9 |
$K_l = 1.00$	1.00	$K_l = MAX\{K_l\} = K_{l,SA4} = 2.00$	2.00	cl.5.2 | cl.5.3
$K_l = 1.00$	1.00	$_{p,local}/C_p\} = -1.80 / -1.00=1.80$	1.80	cl.27.3.1 |
$K_l = 1.00$	1.00	$_{p,local}/C_p\} = -1.80 / -1.00=1.80$	1.80	cl.27.3.1 |
$K_l = 1.00$	1.00	$_{p,local}/C_p\} = -1.80 / -1.00=1.80$	1.80	cl.20/B.4 |
$K_l = 1.00\text{-}2.00$	1.00	$K_l = MAX\{K_l\} = K_{l,SA4} = 2.00$	2.00	cl.5.2, T.5.1(a)
$K_l = 1.00$	1.00	$_{al}/C_{pe,CD}\} = -1.20 / -0.80=1.50$	1.50	cl.7.2, cl.7.3.1 |
$/S_{s,L0.5p=50m} = 1.10/0.925=1.19$	1.19	$/S_{s,L0.5p=50m} = 1.50/0.925=1.62$	1.62	cl.2.3, F.5-2
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

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Aerodynamic Shape Factor (Upwind Roof), $C_{fig,ur}$

Aerodynamic shape factor (upwind roof ext.), $C_{fig,ur}=C_{p,e}.K_l$	**-0.96**
Aerodynamic shape factor (upwind roof int.), $C_{fig,int}=C_{p,i}.K_l$	**0.00**
Internal pressure consideration ?	Not Considered (0.0)

Note sign convention towards face positive;

External pressure coefficient, $C_{p,e}$	**-0.96**
Internal pressure coefficient, $C_{p,i}$	**0.00**

Internal		*External*		
$-0.3 , +0.2 , 0.75 (C_{pe} = 0.70)\}$	0.00	$= MAX\{C_{pe,h/w \le 0.5,\ \alpha \le 25°}\}= -1.20$	-1.20	cl.4.3, App E |
$, +0.2 , 0.75\text{-}0.9 (C_{pe} = 0.85)\}$	0.00	$_{pe,\ \alpha \le 25°}\}=0.80.(-0.70)= -0.56$	-0.56	cl.2.1.3.3 E.4
$+0.35 , 0.75\text{-}0.9 (C_{pe} = 0.80)\}$	0.00	$_{p,e} = MAX\{C_{pe,10,H,\ \theta \le 25°}\}= -0.90$	-0.90	cl.5.3, cl.7.2.9 |
$3 , +0.6 , 0.7\text{-}1.0 (C_{p,e} = 0.80)\}$	0.00	$_{.5,\ \alpha \le 25°}\}=0.80.(-0.90)= -0.72$	-0.72	cl.5.2, T.5.1(a)
$=C_{pi} =\{ -0.18 , +0.18 , +0.55 \}$	0.00	$_{.5,\ \theta \le 25°}\}=0.80.(-0.90)= -0.72$	-0.72	cl.27.3.1, T.26.13-
$=C_{pi} =\{ -0.18 , +0.18 , +0.55 \}$	0.00	$_{.5,\ \theta \le 25°}\}=0.80.(-0.90)= -0.72$	-0.72	cl.27.3.1, T.26.13-
$=C_{pi} =\{ -0.18 , +0.18 , +0.55 \}$	0.00	$_{.5,\ \theta \le 25°}\}=0.80.(-0.90)= -0.72$	-0.72	cl.20/B.4
$3 , +0.8 , 0.7\text{-}1.0 (C_{p,e} = 0.80)\}$	0.00	$_{.5,\ \alpha \le 25°}\}=0.80.(-0.90)= -0.72$	-0.72	cl.5.2, T.5.1(a)
$.\{ -0.2 , +0.2 , +0.50 , +0.70 \}$	0.00	$_{.5,\ \alpha \le 25°}\}=0.80.(-1.20)= -0.96$	-0.96	cl.7.2, cl.7.3.1
$3 , +0.2 , 0.8\text{-}1.0 (C_{pe} = 0.80)\}$	0.00	$_{e,a \le 25°}\}=0.925.(-0.80)= -0.74$	-0.74	cl.2.3, F.5-2
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Note area reduction factor K_a is built into these $C_{p,e}$ | $C_{p,i}$ coefficients, where relevant;

Building global pressure or cladding local pr	Building Global Pressure
External cladding local pressure factor, K_l	**1.00**
Internal cladding local pressure factor, K_l	**1.00**

Internal		*External*		
$K_l = 1.00$	1.00	$_{\le 0.5,\ \alpha \le 25°}\}= -2.00 / -1.20=1.67$	1.67	cl.4.3 | cl.4.3
$K_l =1/C_{a,B,a=70m} =1/ 0.80 =1.25$	1.25	$K_l =1/C_{a,B,a=70m} =1/ 0.80 =1.25$	1.25	cl.2.1.3.3 E.4 |
$K_l = 1.00$	1.00	$/C_{pe,10,F}\}= -2.00 / -0.90=2.22$	2.22	cl.5.3, cl.7.2.9 |
$K_l = 1.00$	1.00	$K_l =MAX\{K_l\}=K_{l,RA2} = 2.00$	2.00	cl.5.2 | cl.5.3
$K_l = 1.00$	1.00	$_{p,local}/C_p\}= -3.20 / -0.90=3.56$	3.56	cl.27.3.1 |
$K_l = 1.00$	1.00	$_{p,local}/C_p\}= -3.20 / -0.90=3.56$	3.56	cl.27.3.1 |
$K_l = 1.00$	1.00	$_{p,local}/C_p\}= -3.20 / -0.90=3.56$	3.56	cl.20/B.4 |
$K_l = 1.00\text{-}2.00$	1.00	$K_l =MAX\{K_l\}=K_{l,RA2} = 2.00$	2.00	cl.5.2, T.5.1(a)
$K_l = 1.00$	1.00	$_{\le 0.5,\ \alpha \le 25°}\}= -2.00 / -1.20=1.67$	1.67	cl.7.2, cl.7.3.1 |
$/S_{s,L0.5p=50m} = 1.10 /0.925=1.19$	1.19	$/S_{s,L0.5p=50m} = 1.50 /0.925=1.62$	1.62	cl.2.3, F.5-2
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

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Aerodynamic Shape Factor (Downwind Roof), $C_{fig,dr}$

Aerodynamic shape factor (downwind roof ext.), $C_{fig,dr}=C_{p,e}.K_l$	**-0.64**
Aerodynamic shape factor (downwind roof int.), $C_{fig,int}=C_{p,i}.K_l$	**0.00**
Internal pressure consideration ?	Not Considered (0.0)

Note sign convention towards face positive;

External pressure coefficient, $C_{p,e}$	**-0.64**
Internal pressure coefficient, $C_{p,i}$	**0.00**

Internal		External		
$-0.3, +0.2, 0.75\,(C_{pe}=0.70)\}$	0.00	$MAX\{C_{pe,h/w\leq0.5,\ \alpha\leq25°}\}=-0.80$	-0.80	cl.4.3,
$, +0.2, 0.75\text{-}0.9\,(C_{pe}=0.85)\}$	0.00	$_{pe,\ \alpha\leq25°}\}=0.80.(-0.60)=-0.48$	-0.48	cl.2.1.3.3
$+0.35, 0.75\text{-}0.9\,(C_{pe}=0.80)\}$	0.00	$_{p,e}=MAX\{C_{pe,10,H,\ \theta\leq25°}\}=-0.90$	-0.90	cl.5.3,
$3, +0.6, 0.7\text{-}1.0\,(C_{p,e}=0.80)\}$	0.00	$_{.5,\ \alpha\leq25°}\}=0.80.(-0.60)=-0.48$	-0.48	cl.5.2,
$=C_{pi}=\{-0.18, +0.18, +0.55\}$	0.00	$_{.5,\ \theta\leq25°}\}=0.80.(-0.90)=-0.72$	-0.72	cl.27.3.1,
$=C_{pi}=\{-0.18, +0.18, +0.55\}$	0.00	$_{.5,\ \theta\leq25°}\}=0.80.(-0.90)=-0.72$	-0.72	cl.27.3.1,
$=C_{pi}=\{-0.18, +0.18, +0.55\}$	0.00	$_{.5,\ \theta\leq25°}\}=0.80.(-0.90)=-0.72$	-0.72	cl.20/B.4
$3, +0.8, 0.7\text{-}1.0\,(C_{p,e}=0.80)\}$	0.00	$_{.5,\ \alpha\leq25°}\}=0.80.(-0.60)=-0.48$	-0.48	cl.5.2,
$.\{-0.2, +0.2, +0.50, +0.70\}$	0.00	$_{.5,\ \alpha\leq25°}\}=0.80.(-0.80)=-0.64$	-0.64	cl.7.2,
$3, +0.2, 0.8\text{-}1.0\,(C_{pe}=0.80)\}$	0.00	$_{e,a\leq25°}\}=0.925.(-0.80)=-0.74$	-0.74	cl.2.3,
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Note area reduction factor K_a is built into these $C_{p,e}$ | $C_{p,i}$ coefficients, where relevant;

Building global pressure or cladding local pr	Building Global Pressure
External cladding local pressure factor, K_l	**1.00**
Internal cladding local pressure factor, K_l	**1.00**

Internal		External		
$K_l=1.00$	1.00	$_{\leq0.5,\ \alpha\leq25°}\}=-1.20/-0.80=1.50$	1.50	cl.4.3 |
$K_l=1/C_{a,B,a=70m}=1/0.80=1.25$	1.25	$K_l=1/C_{a,B,a=70m}=1/0.80=1.25$	1.25	cl.2.1.3.3
$K_l=1.00$	1.00	$/C_{pe,10,F}\}=-2.00/-1.30=1.54$	1.54	cl.5.3,
$K_l=1.00$	1.00	$K_l=MAX\{K_l\}=K_{l,RA4}=2.00$	2.00	cl.5.2 |
$K_l=1.00$	1.00	$_{p,local}/C_p\}=-3.20/-0.90=3.56$	3.56	cl.27.3.1
$K_l=1.00$	1.00	$_{p,local}/C_p\}=-3.20/-0.90=3.56$	3.56	cl.27.3.1
$K_l=1.00$	1.00	$_{p,local}/C_p\}=-3.20/-0.90=3.56$	3.56	cl.20/B.4
$K_l=1.00\text{-}2.00$	1.00	$K_l=MAX\{K_l\}=K_{l,RA4}=2.00$	2.00	cl.5.2,
$K_l=1.00$	1.00	$_{\leq0.5,\ \alpha\leq25°}\}=-1.20/-0.80=1.50$	1.50	cl.7.2,
$/S_{s,L0.5p=50m}=1.10/0.925=1.19$	1.19	$/S_{s,L0.5p=50m}=1.50/0.925=1.62$	1.62	cl.2.3,
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

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Combination | Correlation Factor, K_C

Note the combination or correlation factor accounts for the fact that peak wind loads are not perfectly correlated across multiple surfaces, in particular the windward and leeward faces.

Combination | correlation factor, K_C **1.00**

K_C=1.00	1.00	cl.4.3 CP3-V2-
K_C=0.85	0.85	cl.2.1.3.3
K_C=1.00	1.00	cl.5.3, cl.7.2.2
K_C=1.00	1.00	cl.5.2, T.5.5
K_C=1.00	1.00	cl.27.3.1 ASCE7-
K_C=1.00	1.00	cl.27.3.1 SNI1727-
K_C=1.00	1.00	cl.207B.4 NSCP-
K_C=0.90	0.90	cl.5.2, T.5.5
K_C=1.00	1.00	cl.7.2, cl.7.3.1
K_C=1.00	1.00	cl.2.3 HKWC-
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

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Dynamic Response Factor | Gust Effect Factor, C_{dyn} | G

Note the dynamic response or gust response factor scales up wind loads to account for the influence of turbulence, resonance, and flexibility of the structure.

Dynamic response factor, C_{dyn}		**1.06**	Cl.6.4.1 AS1170.2

$$C_{\mathrm{dyn}} = \frac{\cancel{1} + 2I_{\mathrm{h}}\sqrt{g_{\cancel{v}}{}^{2}\cancel{B}_{\mathrm{S}} + \frac{\cancel{H}_{\mathrm{s}}g_{\mathrm{R}}{}^{2}SE_{\mathrm{t}}}{\zeta}}}{(1+2g_{\mathrm{v}}I_{\mathrm{h}})}$$

Note $C_{dyn} \geq 1.00$

Note ζ_{ULS} for static force

Note ζ_{SLS} for dynamic acceleration

Turbulence intensity at z=h, $I_h(z=h)$		**0.135**	Cl.6.4.1 AS1170.2
Cat. 1	*$I_h(z=h)=-0.011ln(z=h)+0.1423 \leq 0.128$*	*0.083*	T.6.1 AS1170.2
Cat. 2	*$I_h(z=h)=-0.024ln(z=h)+0.2401 \leq 0.196$*	*0.110*	T.6.1 AS1170.2
Cat. 3	*$I_h(z=h)=-0.034ln(z=h)+0.3199 \leq 0.271$*	*0.135*	T.6.1 AS1170.2
Cat. 4	*$I_h(z=h)=-0.061ln(z=h)+0.5157 \leq 0.342$*	*0.185*	T.6.1 AS1170.2
Peak factor for upwind vel. fluctuations, g_v=3.4		**3.4**	Cl.6.4.1 AS1170.2
Integral turbulence length scale, $L_h=85(h/10)^{0.25}$		**185.7** m	Cl.6.4.1 AS1170.2
Background factor, B_s		**0.884**	Cl.6.4.1 AS1170.2

$$B_s = \left[1 + \frac{\left[0.26(h-s)^2 + 0.46b_{sh}^2\right]^{0.5}}{L_h}\right]^{-1}$$

Note s=z

Note b_{sh} =b

Height factor reso. resp., $H_s=1+((s=z)/h)^2$		**2.0**		Cl.6.4.1 AS1170.2
Peak factor reso. resp., $g_R=\sqrt{[1.2+2.ln(600n_a)]}$		**3.3**		Cl.6.4.1 AS1170.2
Size reduction factor, S	**0.078**	**0.078**		Cl.6.4.1 AS1170.2

$$S = \frac{1}{\left[1+\frac{3.5n_ah(1+g_vI_h)}{V_{des}}\right]\left[1+\frac{4n_ab_{0h}(1+g_vI_h)}{V_{des}}\right]}$$

$V_{des}=V_{site,3s}(z=h)$
$/[k_{ULS}{}^{0.5}]$
b_{0h} =b

Spectrum turbulence, $E_t=\pi N/[1+70.8N^2]^{5/6}$	**0.076**	**0.076**		Cl.6.4.1 AS1170.2
Reduced freq., $N=n_a.L_h.(1+g_vI_h)$	**1.27**	**1.27**		Cl.6.4.1 AS1170.2
Note $V_{des}=V_{site,3s}(z=h)/[k_{ULS}{}^{0.5}$	53.3	53.3	m/s	Cl.6.4.1 AS1170.2
Along-flow peak acceleration, $\ddot{x}_{max}$		**0.050**	m/s^2	Cl.E.2 AS1170.2
		5.0	mg	Cl.E.2 AS1170.2
		0.50	%g	Cl.E.2 AS1170.2

$$\ddot{x}_{max} = \frac{3}{m_0h^2}\ x\ \frac{2I_h\sqrt{\frac{g_R^2SE_t}{\zeta_{SLS}}}}{(1+2g_vI_h)}\ x\ \Sigma M_{SLS}$$

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Gust effect factor, G		**0.87**		cl.26.11. 5 ASCE7-

$$G_f = 0.925\left(\frac{\cancel{1} + 1.7I_{\bar{z}}\sqrt{\cancel{g_Q^2Q^2} + g_R^2R^2}}{1 + 1.7g_vI_{\bar{z}}}\right)$$

Note G≥0.85

Note ζ_{ULS} (in R) for static force

Note ζ_{SLS} (in R) for dynamic acceleration

Intensity of turbulence, $I_z(z_{0.6h})=c.(10/z_{0.6h})^{1/6}$		**0.194**		cl.26.11. 4 ASCE7-
Exp. D *$_z(z_{0.6h})=c.(10/z_{0.6h})^{1/6}=0.15.(10/0.6h)^{1/6}$*		*0.097*		1.26.11- 1 ASCE7-
Exp. C *$_z(z_{0.6h})=c.(10/z_{0.6h})^{1/6}=0.20.(10/0.6h)^{1/6}$*		*0.129*		1.26.11- 1 ASCE7-
Exp. B *$_z(z_{0.6h})=c.(10/z_{0.6h})^{1/6}=0.30.(10/0.6h)^{1/6}$*		*0.194*		1.26.11- 1 ASCE7-
Exp. B *$_z(z_{0.6h})=c.(10/z_{0.6h})^{1/6}=0.30.(10/0.6h)^{1/6}$*		*0.194*		1.26.11- 1 ASCE7-
Peak factor for wind resp., g_v=3.4		**3.4**		cl.26.11. 5 ASCE7-
Integral length scale of turbulence, $L_z=\ell(z_{0.6h}/10)^{\varepsilon}$		**233.3**	m	cl.26.11. 4
Background resp. factor, Q		**0.771**		cl.26.11. 5 ASCE7-

$$Q = \left[\frac{1}{1 + 0.63\left(\frac{B+h}{L_z}\right)^{0.63}}\right]^{0.5}$$

Note $z_{0.6h}$ =0.6h

Note B=b

Peak factor for background resp., g_Q=3.4		**3.4**		cl.26.11. 5 ASCE7-
Peak factor reso. resp., $g_R=\sqrt{[2.\ln(3600n_a)]}+0.577/\sqrt{[2}$		**3.8**		cl.26.11. 5 ASCE7-
Reso. resp. factor, R	**0.553**	**0.391**		cl.26.11. 5 ASCE7-

$$R = \sqrt{\frac{1}{\beta}R_nR_hR_B(0.53 + 0.47R_L)}$$

$R_h=1/\eta-1$	*0.135*	0.135		cl.26.11. 5 ASCE7-
$R_B=1/\eta-1$	*0.545*	0.545		cl.26.11. 5 ASCE7-
$R_L=1/\eta-1$	*0.151*	0.151		cl.26.11. 5 ASCE7-
Reso. resp. factor, $R_n=7.47N_1/(1+10.3N_1)^{5/}$	**0.104**	**0.104**		cl.26.11. 5 ASCE7-
Reduced freq., $N_1=n_a.L_z/V_z$	**1.53**	**1.53**		cl.26.11. 5 ASCE7-
Note $V_z=b.(z/10)^{\alpha}.V_{R,3s}$, z=0.6	*38.1*	*38.1*	*m/s*	cl.26.11. 5 ASCE7-
Along-flow peak acceleration, $\ddot{x}_{max}$		**0.051**	m/s^2	CTBUH | cl C26.11
		5.1	mg	CTBUH | cl C26.11
		0.51	%g	CTBUH | cl C26.11

$$\ddot{x}_{max} = G_{hr}\frac{M_{hr}}{M_1}(2\pi n_a)^2 = G\frac{M_{3s}}{M_1}(2\pi n_a)^2 = \frac{3}{m_0h^2}\ x\ \mathrm{G}\ x\ \Sigma M_{SLS}$$

Note G_{hr} acts on $V_{site,hr}$ if M_{hr} based on $V_{site,hr}$, or $G=G_{hr}/(1+1.7g_vI_{\bar{z}})$ acts on $V_{site,3s}$ if M_{3s} based on $V_{site,3s}$. Also R=func.(ζ_{SLS}).

$M_{3s}= 0.6.(1/2).\rho.V_{site,3s}(z=h)^2.bh^2=0.6.(0.613V_{site,3s}(z=h)^2).bh^2$

$M_1 = (1/3).\rho_s.bd.h^2.(2\pi n_a)^2 = (1/3).(m_0/bd).bd.h^2.(2\pi n_a)^2$

$= (1/3).m_0.h^2.(2\pi n_a)^2$

Peak base overturning moment, ΣM_{SLS} (for ref.)		**1957**	MNm	*CTBUH*

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Parameters for Building Wind Pressure (Cross-Flow), $p_{des}(z)$

Net Aerodynamic Shape x Dynamic Response Factor, $C_{fig,cf}.C_{dyn}$

Net aerodynamic shape x dyn. response factor, $C_{fig,cf}.C_{dyn}$		**1.13**		Cl.6.5.2.1 AS1170.2

$$(C_{fig}C_{dyn})=1.5g_R\left(\frac{b}{d}\right)\frac{K_m}{(1+g_vI_h)^2}\left(\frac{z}{h}\right)^k\sqrt{\frac{\pi C_{fs}}{\zeta}}$$

Note ζ_{ULS} for static force

Peak factor c-flow resp., g_R=√[1.2+2.ln(600n_c)]		**3.3**		Cl.6.5.2.1 AS1170.2
Mode shape corr. for c-flow accn., K_m=0.76+0.24k		**1.00**		Cl.6.5.2.1 AS1170.2
Turbulence intensity at z=h, I_h(z=h)		**0.135**	**0.149**	Cl.6.4.1 AS1170.2
Cat. 1 $I_z(z=h)$=-0.011ln(z=h)+0.1423≤0.128		*0.083*	*0.087*	T.6.1 AS1170.2
Cat. 2 $I_z(z=h)$=-0.024ln(z=h)+0.2401≤0.196		*0.110*	*0.120*	T.6.1 AS1170.2
Cat. 3 $I_z(z=h)$=-0.034ln(z=h)+0.3199≤0.271		*0.135*	*0.149*	T.6.1 AS1170.2
Cat. 4 $I_z(z=h)$=-0.061ln(z=h)+0.5157≤0.342		*0.185*	*0.209*	T.6.1 AS1170.2
Peak factor for upwind vel. fluctuations, g_v=3.4		**3.4**		Cl.6.4.1 AS1170.2
Reduced velocity, $V_n=V_{des}/[n_c.b.(1+g_vI_h)]$	**5.07**	**5.07**	m/s	Cl.6.5.2.3 AS1170.2
Note $V_{des}=V_{site,3s}(z=h)/[k_{ULS}^{0.5}$	*53.3*	*53.3*	*m/s*	Cl.6.5.2.3 AS1170.2

Actual building ratio (h:b:d)	**3.0**	**0.5**	**0.8**
Actual building ratio (h:b:d)	**6.0**	**0.9**	**1.6**

Cross-flow force spectrum coefficient, C_{fs}		**0.0064**	**0.0064**	Cl.6.5.2.3 AS1170.2
	Interpolated (for b and d, weighted) $\log_{10}C_f$	**-2.195**	**-2.195**	
	Interpolated (for b) $\log_{10}C_{fs}$	**-2.239**	**-2.239**	
	Interpolated (for d) $\log_{10}C_{fs}$	**-2.191**	**-2.191**	
	Interpolated (for $I_{h,2h/3}$) $\log_{10}C_{fs}$	**-2.373**	**-2.373**	Cl.6.5.2.3 AS1170.2
(h:b:d) = (3:1:1) *$I_{h,z=2h/3}$ = 0.12*	$\mathrm{Log}_{10}C_{fs}$	-2.514	-2.514	Cl.6.5.2.3 AS1170.2
	$\mathrm{Log}_{10}\,C_{fs} = 0.000353V_n^4 - 0.0134V_n^3 + 0.15V_n^2 - 0.345V_n - 3.109$			
(h:b:d) = (3:1:1) *$I_{h,2h/3}$ = 0.20*	$\mathrm{Log}_{10}C_{fs}$	-2.126	-2.126	Cl.6.5.2.3 AS1170.2
	$\mathrm{Log}_{10}\,C_{fs} = 0.00008V_n^4 - 0.0028\,V_n^3 + 0.0199V_n^2 + 0.13V_n - 2.985$			
(h:b:d) = (6:1:1)	$\mathrm{Log}_{10}C_{fs}$	**-2.258**	**-2.258**	Cl.6.5.2.3 AS1170.2
	$\log_{10}C_{fs} = 0.00037V_n^4 - 0.0145V_n^3 + 0.17V_n^2 - 0.49V_n - 2.5$			
(h:b:d) = (6:2:1)	$\mathrm{Log}_{10}C_{fs}$	**-2.633**	**-2.633**	Cl.6.5.2.3 AS1170.2
	$\log_{10}C_{fs} = \dfrac{-0.00045V_n^4 + 0.065V_n^2 - 3.05}{0.00015V_n^4 - 0.018V_n^2 + 1}$			
(h:b:d) = (6:1:2)	$\mathrm{Log}_{10}C_{fs}$	**-2.142**	**-2.142**	Cl.6.5.2.3 AS1170.2
	$\log_{10}\,C_{fs} = -0.0087.V_n^2 + 0.2419V_n - 3.1458$			

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Susceptibility to vortex shedding, $V_{site,10m}(z=h) \geq v_{crit,i}/1.25$		***Not Susceptible***	
Site (1hr-mean) wind speed at z=h, $V_{site,hr}$(	***DL***	44.7 m/s	
Note $V_{site,hr}(z=h)=V_{site,3s}(z=h)/[1+g_v.I_h(z=h)]$			
Site (10m-mean) wind speed at z=h, $V_{site,10}$	***DL***	47.0 m/s	*Annex B.2 ISO*
Note $V_{site,10m}(z=h)=1.05V_{site,hr}(z=h)$			*Annex B.2 ISO*
Critical wind speed, $v_{crit,i}=b.n_c/S_t$		90.0 m/s	
Strouhal number, St		0.08	

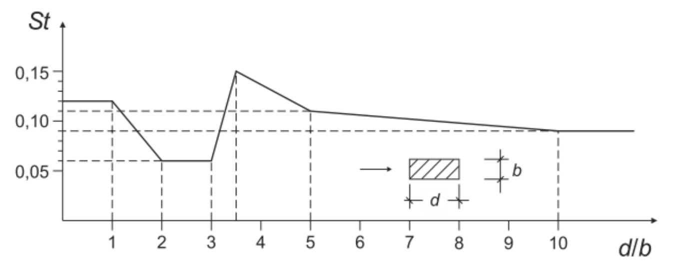

Figure E.1 — Strouhal number (*St*) for rectangular cross-sections with sharp corners

Cross-flow peak vortex shedding acceleration, $\ddot{y}_{max}$	**0.144** m/s^2	*Cl.E.3.2 AS1170.2*
	14.4 mg	*Cl.E.3.2 AS1170.2*
Note ζ_{SLS} for dynami	**1.44** %g	*Cl.E.3.2 AS1170.2*
Note (b/m_0) replaced by $A_F/(m_0.d)$		*CTBUH*

$$\ddot{y}_{max} = \frac{1.5bg_R}{m_0}\left[\frac{0.5\rho_{air}\left[V_{des,\theta}\right]^2}{\left(1+g_v I_h\right)^2}\right] K_m \sqrt{\frac{\pi C_{fs}}{\zeta}}$$

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Wind Load in Direction X

Note combo boxes and their cori Mumbai, India [IS875-3-2015] ▼ *d to the SD - Wind Pressure {1D} sheet;*

Regional (3s-gust) wind speed, $V_{R,3s}$ | $V_{R,3s}/[k_{ULS}^{0.5}]$	53.9	44.0	m/s
Importanc Class I N=50y [Ordinary Buildings] [1.00] [T=285-1,000y] [cl.6.3.1, T.1 IS875-3:2015 ▼		1.00	
Terrain category Category 3 [Suburban Terrain] [cl.6.3.2.1] ▼			
Average roof height of the structure above ground, h		228.0	m
Breadth of the structure on plan normal to wind stream, b		36.0	m
Depth of the structure on plan parallel to wind stream, d		60.0	m
Height on structure above local ground level, z		228.0	m
Site (3s-gust) wind speed at z, $V_{site,3s}(z)/[k_{ULS}^{0.5}]$		53.3	m/s
Site (3s-gust) wind speed at z=h, $V_{site,3s}(z=h)/[k_{ULS}^{0.5}]$		53.3	m/s
Overall building fundamental along-flow natural frequency, n_a		0.25	Hz
Damping ratio (as a fraction of critical) for ULS, ζ_{ULS}		0.030	
Overall building fundamental cross-flow natural frequency, n_c		0.20	Hz
Cross-flow fundamental mode shape power exponent, k		1.00	

Wind Pressure Analysis in X @ z=z

2.37 kPa 1.98 kPa

Storey	Storey Height h_s m	Height Tributary m	Breadth Tributary m	Along-Fl. Pressure in X kPa	Along-Fl. Force in X kN	Along-Fl. PΔ Force in X kN	Cross-Fl. Pressure in Y kPa	Cross-Fl. Force in Y kN	Cross-Fl. PΔ Force in Y kN
						23550			20265
70	228.0					15700			13510
St01		1.500	36.0	1.13	61	61	0.01	1	1
St02	3.000	3.750	36.0	1.13	153	153	0.03	8	8
St03	4.500	3.750	36.0	1.13	153	153	0.07	17	17
St04	3.000	3.000	36.0	1.22	132	132	0.10	18	18
St05	3.000	3.000	36.0	1.29	139	139	0.13	23	23
St06	3.000	3.000	36.0	1.34	145	145	0.15	27	27
St07	3.000	3.000	36.0	1.39	150	150	0.18	32	32
St08	3.000	3.825	36.0	1.43	198	198	0.20	47	47
St09	4.650	4.425	36.0	1.49	238	238	0.24	65	65
St10	4.200	3.000	36.0	1.54	166	166	0.28	50	50
St11	1.800	2.550	36.0	1.55	143	143	0.30	45	45
St12	3.300	3.300	36.0	1.58	188	188	0.32	64	64
St13	3.300	3.300	36.0	1.61	191	191	0.35	70	70
St14	3.300	3.300	36.0	1.64	195	195	0.38	76	76
St15	3.300	3.300	36.0	1.66	197	197	0.41	81	81
St16	3.300	3.300	36.0	1.68	200	200	0.44	87	87
St17	3.300	3.300	36.0	1.71	203	203	0.47	93	93
St18	3.300	3.300	36.0	1.73	205	205	0.50	98	98
St19	3.300	3.300	36.0	1.75	207	207	0.52	104	104
St20	3.300	3.300	36.0	1.76	210	210	0.55	110	110
St21	3.300	3.300	36.0	1.78	212	212	0.58	115	115
St22	3.300	3.300	36.0	1.80	214	214	0.61	121	121
St23	3.300	3.300	36.0	1.81	216	216	0.64	127	127
St24	3.300	3.300	36.0	1.83	217	217	0.67	132	132
St25	3.300	3.300	36.0	1.84	219	219	0.70	138	138
St26	3.300	3.300	36.0	1.86	221	221	0.72	144	144
St27	3.300	3.300	36.0	1.87	222	222	0.75	149	149
St28	3.300	3.300	36.0	1.89	224	224	0.78	155	155
St29	3.300	3.300	36.0	1.90	226	226	0.81	161	161
St30	3.300	3.300	36.0	1.91	227	227	0.84	166	166
St31	3.300	3.300	36.0	1.92	228	228	0.87	172	172
St32	3.300	3.300	36.0	1.94	230	230	0.90	178	178
St33	3.300	3.300	36.0	1.95	231	231	0.93	183	183
St34	3.300	3.300	36.0	1.96	233	233	0.95	189	189
St35	3.300	3.300	36.0	1.97	234	234	0.98	195	195
St36	3.300	3.300	36.0	1.98	235	235	1.01	200	200
St37	3.300	3.300	36.0	1.99	236	236	1.04	206	206
St38	3.300	3.300	36.0	2.00	238	238	1.07	212	212
St39	3.300	3.300	36.0	2.02	240	240	1.10	217	217
St40	3.300	2.850	36.0	2.03	208	208	1.13	192	192
St41	2.400	2.850	36.0	2.04	209	209	1.15	196	196
St42	3.300	3.300	36.0	2.05	244	244	1.17	233	233
St43	3.300	3.300	36.0	2.07	245	245	1.20	238	238
St44	3.300	3.300	36.0	2.08	247	247	1.23	244	244
St45	3.300	3.300	36.0	2.09	248	248	1.26	250	250
St46	3.300	3.300	36.0	2.10	250	250	1.29	255	255

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P-Δ factor in direction X		1.00		
Factor for WL in ULS load combos for superstructure ULS design, k_{ULS}		1.50		
Factor for WL in SLS load combos for superstructure defl. design, k_{SLS}		1.00		
Factored (design level) P-Δ wind shear in X as a % of total DL, ΣG		1.7%		
Total DL and LL of building, ΣG and ΣQ	1400	200	MN	
Building / floor area, A_B / A_F	85000	1214	m^2	*18.8*
Damping ratio (as a fraction of critical) for SLS, ζ_{SLS}		0.015		*kPa*
Base wind bending moment, $\Sigma M_{SLS}=k_{SLS}.\Sigma[p_{des,ww}(z)/k_{ULS}-p_{des,lw}(z)/k_{ULS}].z.dA$		1899	MNm	
Along-flow peak acceleration		5.0	mg	
Along-flow peak acceleration utilisation		30%		OK
Cross-flow peak vortex shedding acceleration		14.4	mg	
Cross-flow peak vortex shedding acceleration utilisation		81%		OK

1.19 1.05 kPa

Automated Calculations

Storey Tabulation in X and Y

Wind Load X @ z={0-h} and Wind Acceleration in X

Transfer Level

Storey St01 ▼

Note that a transfer level is akin to a 100% effective outrigger for base moment resolution; For no transfer level insert St01;

	ΣBuilding Height Σh_s m	Along-Fl. Windward Pressure in X kPa	Along-Fl. Leeward Pressure in X kPa	Along-Fl. ΣMoment in X MNm	Along-Fl. PΔ Base Shear X kN	Along-Fl. PΔ Base Moment X MNm
				2848	23550	2924
Σ				1898	15700	1950
Stump	1.000	0.60	0.53	1898	15700	1950
	4.000	0.60	0.53	1852	15639	1903
	8.500	0.60	0.53	1784	15486	1833
	11.500	0.65	0.57	1739	15333	1787
	14.500	0.68	0.60	1694	15201	1741
	17.500	0.71	0.63	1649	15062	1696
	20.500	0.74	0.65	1605	14917	1651
	23.500	0.76	0.67	1562	14767	1607
	28.150	0.79	0.70	1495	14569	1539
	32.350	0.82	0.72	1436	14332	1479
	34.150	0.83	0.73	1411	14166	1454
	37.450	0.84	0.74	1366	14023	1407
	40.750	0.86	0.76	1321	13835	1362
	44.050	0.87	0.77	1277	13643	1317
	47.350	0.88	0.78	1234	13449	1272
	50.650	0.89	0.79	1191	13251	1229
	53.950	0.91	0.80	1149	13051	1186
	57.250	0.92	0.81	1107	12849	1143
	60.550	0.93	0.82	1066	12644	1101
	63.850	0.94	0.83	1026	12436	1060
	67.150	0.95	0.84	987	12227	1020
	70.450	0.96	0.84	948	12015	980
	73.750	0.96	0.85	910	11801	941
	77.050	0.97	0.86	872	11586	903
	80.350	0.98	0.86	836	11368	866
	83.650	0.99	0.87	800	11149	829
	86.950	0.99	0.88	765	10928	793
	90.250	1.00	0.88	730	10706	758
	93.550	1.01	0.89	697	10482	723
	96.850	1.02	0.90	664	10256	689
	100.150	1.02	0.90	631	10029	656
	103.450	1.03	0.91	600	9801	624
	106.750	1.03	0.91	569	9571	592
	110.050	1.04	0.92	539	9340	561
	113.350	1.05	0.92	510	9107	531
	116.650	1.05	0.93	482	8873	502
	119.950	1.06	0.93	454	8638	473
	123.250	1.06	0.94	427	8402	446
	126.550	1.07	0.94	401	8164	419
	129.850	1.07	0.95	376	7924	393
	132.250	1.08	0.95	358	7716	374
	135.550	1.08	0.95	334	7507	349
	138.850	1.09	0.96	311	7263	325
	142.150	1.09	0.96	289	7017	302
	145.450	1.09	0.97	267	6770	280
	148.750	1.10	0.97	246	6522	258

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Wind Load in Direction Y

Note combo boxes and their cori Mumbai, India [IS875-3-2015] ▼ *d to the SD - Wind Pre*

Regional (3s-gust) wind speed, $V_{R,3s}$ | $V_{R,3s}/[k_{ULS}^{0.5}]$	53.9	44.0	m/s
Importanc Class I N=50y [Ordinary Buildings] [1.00] [T=285-1,000y] [cl.6.3.1, T.1 IS875-3:2015 ▼		1.00	
Terrain category Category 3 [Suburban Terrain] [cl.6.3.2.1] ▼			
Average roof height of the structure above ground, h		228.0	m
Breadth of the structure on plan normal to wind stream, b		60.0	m
Depth of the structure on plan parallel to wind stream, d		36.0	m
Height on structure above local ground level, z		228.0	m
Site (3s-gust) wind speed at z, $V_{site,3s}(z)/[k_{ULS}^{0.5}]$		53.3	m/s
Site (3s-gust) wind speed at z=h, $V_{site,3s}(z=h)/[k_{ULS}^{0.5}]$		53.3	m/s
Overall building fundamental along-flow natural frequency, n_a		0.20	Hz
Damping ratio (as a fraction of critical) for ULS, ζ_{ULS}		0.030	
Overall building fundamental cross-flow natural frequency, n_c		0.25	Hz
Cross-flow fundamental mode shape power exponent, k		1.00	

Wind Pressure Analysis in Y @ z=z

2.36 kPa 2.39 kPa

Storey	Storey Height h_s m	Height Tributary m	Breadth Tributary m	Along-Fl. Pressure in Y kPa	Along-Fl. Force in Y kN	Along-Fl. PΔ Force in Y kN	Cross-Fl. Pressure in X kPa	Cross-Fl. Force in X kN	Cross-Fl. PΔ Force in X kN
						39255			14679
70	228.0					26170			9786
St01		1.500	60.0	1.13	102	102	0.01	1	1
St02	3.000	3.750	60.0	1.13	254	254	0.04	6	6
St03	4.500	3.750	60.0	1.13	255	255	0.09	12	12
St04	3.000	3.000	60.0	1.22	220	220	0.12	13	13
St05	3.000	3.000	60.0	1.29	232	232	0.15	16	16
St06	3.000	3.000	60.0	1.34	242	242	0.18	20	20
St07	3.000	3.000	60.0	1.39	251	251	0.21	23	23
St08	3.000	3.825	60.0	1.43	329	329	0.25	34	34
St09	4.650	4.425	60.0	1.49	396	396	0.29	47	47
St10	4.200	3.000	60.0	1.54	277	277	0.34	37	37
St11	1.800	2.550	60.0	1.55	238	238	0.36	33	33
St12	3.300	3.300	60.0	1.58	314	314	0.39	47	47
St13	3.300	3.300	60.0	1.61	319	319	0.43	51	51
St14	3.300	3.300	60.0	1.64	324	324	0.46	55	55
St15	3.300	3.300	60.0	1.66	329	329	0.50	59	59
St16	3.300	3.300	60.0	1.68	334	334	0.53	63	63
St17	3.300	3.300	60.0	1.71	338	338	0.56	67	67
St18	3.300	3.300	60.0	1.73	342	342	0.60	71	71
St19	3.300	3.300	60.0	1.75	346	346	0.63	75	75
St20	3.300	3.300	60.0	1.76	349	349	0.67	79	79
St21	3.300	3.300	60.0	1.78	353	353	0.70	83	83
St22	3.300	3.300	60.0	1.80	356	356	0.74	88	88
St23	3.300	3.300	60.0	1.81	359	359	0.77	92	92
St24	3.300	3.300	60.0	1.83	362	362	0.81	96	96
St25	3.300	3.300	60.0	1.84	365	365	0.84	100	100
St26	3.300	3.300	60.0	1.86	368	368	0.88	104	104
St27	3.300	3.300	60.0	1.87	371	371	0.91	108	108
St28	3.300	3.300	60.0	1.89	373	373	0.94	112	112
St29	3.300	3.300	60.0	1.90	376	376	0.98	116	116
St30	3.300	3.300	60.0	1.91	378	378	1.01	120	120
St31	3.300	3.300	60.0	1.92	381	381	1.05	124	124
St32	3.300	3.300	60.0	1.94	383	383	1.08	129	129
St33	3.300	3.300	60.0	1.95	385	385	1.12	133	133
St34	3.300	3.300	60.0	1.96	388	388	1.15	137	137
St35	3.300	3.300	60.0	1.97	390	390	1.19	141	141
St36	3.300	3.300	60.0	1.98	392	392	1.22	145	145
St37	3.300	3.300	60.0	2.00	395	395	1.26	149	149
St38	3.300	3.300	60.0	2.01	398	398	1.29	153	153
St39	3.300	3.300	60.0	2.02	400	400	1.32	157	157
St40	3.300	2.850	60.0	2.04	348	348	1.36	139	139
St41	2.400	2.850	60.0	2.04	350	350	1.38	142	142
St42	3.300	3.300	60.0	2.06	407	407	1.42	168	168
St43	3.300	3.300	60.0	2.07	410	410	1.45	173	173
St44	3.300	3.300	60.0	2.08	412	412	1.49	177	177
St45	3.300	3.300	60.0	2.10	415	415	1.52	181	181
St46	3.300	3.300	60.0	2.11	417	417	1.56	185	185

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Wind Load in Direction X

Note combo boxes and their cor Mumbai, India [IS875-3-2015] ▼ *d to the SD - Wind Pressure {1D} sheet;*

Regional (3s-gust) wind speed, $V_{R,3s}$ | $V_{R,3s}/[k_{ULS}{}^{0.5}]$	53.9	44.0	m/s
Importanc Class I N=50y [Ordinary Buildings] [1.00] [T=285-1,000y] [cl.6.3.1, T.1 IS875-3:2015 ▼		1.00	
Terrain category Category 3 [Suburban Terrain] [cl.6.3.2.1] ▼			
Average roof height of the structure above ground, h		228.0	m
Breadth of the structure on plan normal to wind stream, b		36.0	m
Depth of the structure on plan parallel to wind stream, d		60.0	m
Height on structure above local ground level, z		228.0	m
Site (3s-gust) wind speed at z, $V_{site,3s}(z)/[k_{ULS}{}^{0.5}]$		53.3	m/s
Site (3s-gust) wind speed at z=h, $V_{site,3s}(z=h)/[k_{ULS}{}^{0.5}]$		53.3	m/s
Overall building fundamental along-flow natural frequency, n_a		0.25	Hz
Damping ratio (as a fraction of critical) for ULS, ζ_{ULS}		0.030	
Overall building fundamental cross-flow natural frequency, n_c		0.20	Hz
Cross-flow fundamental mode shape power exponent, k		1.00	

Wind Pressure Analysis in X @ z=z 2.37 kPa 1.98 kPa

Storey	Storey Height h_s m	Height Tributary m	Breadth Tributary m	Along-Fl. Pressure in X kPa	Along-Fl. Force in X kN	Along-Fl. PΔ Force in X kN	Cross-Fl. Pressure in Y kPa	Cross-Fl. Force in Y kN	Cross-Fl. PΔ Force in Y kN
						23550			20265
70	228.0					15700			13510
St47	3.300	3.300	36.0	2.12	251	251	1.32	261	261
St48	3.300	3.300	36.0	2.13	253	253	1.35	267	267
St49	3.300	3.300	36.0	2.14	254	254	1.38	272	272
St50	3.300	3.300	36.0	2.15	256	256	1.40	278	278
St51	3.300	3.300	36.0	2.17	257	257	1.43	284	284
St52	3.300	3.300	36.0	2.18	259	259	1.46	289	289
St53	3.300	3.300	36.0	2.19	260	260	1.49	295	295
St54	3.300	3.300	36.0	2.20	262	262	1.52	301	301
St55	3.300	3.300	36.0	2.21	263	263	1.55	306	306
St56	3.300	3.300	36.0	2.22	264	264	1.58	312	312
St57	3.300	3.300	36.0	2.24	266	266	1.60	318	318
St58	3.300	3.300	36.0	2.25	267	267	1.63	323	323
St59	3.300	3.300	36.0	2.26	268	268	1.66	329	329
St60	3.300	3.300	36.0	2.27	270	270	1.69	335	335
St61	3.300	3.300	36.0	2.28	271	271	1.72	340	340
St62	3.300	3.300	36.0	2.29	272	272	1.75	346	346
St63	3.300	3.300	36.0	2.30	273	273	1.78	352	352
St64	3.300	3.300	36.0	2.31	275	275	1.80	357	357
St65	3.300	3.300	36.0	2.32	276	276	1.83	363	363
St66	3.300	3.300	36.0	2.33	277	277	1.86	369	369
St67	3.300	3.300	36.0	2.34	278	278	1.89	374	374
St68	3.300	3.300	36.0	2.35	279	279	1.92	380	380
St69	3.300	3.300	36.0	2.36	280	280	1.95	386	386
St70	3.300	1.650	36.0	2.37	141	141	1.98	196	196

Note when expanding or contracting table, refresh equations within columns with summation, Σ as they are dependent upon other rows;

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P-Δ factor in direction X		1.00		
Factor for WL in ULS load combos for superstructure ULS design, k_{ULS}		1.50		
Factor for WL in SLS load combos for superstructure defl. design, k_{SLS}		1.00		
Factored (design level) P-Δ wind shear in X as a % of total DL, ΣG		1.7%		
Total DL and LL of building, ΣG and ΣQ	1400	200	MN	
Building / floor area, A_B / A_F	85000	1214	m²	18.8
Damping ratio (as a fraction of critical) for SLS, ζ_{SLS}		0.015		kPa
Base wind bending moment, $\Sigma M_{SLS}=k_{SLS}.\Sigma[p_{des,ww}(z)/k_{ULS}-p_{des,lw}(z)/k_{ULS}].z.dA$		1899	MNm	
Along-flow peak acceleration		5.0	mg	
Along-flow peak acceleration utilisation		30%		OK
Cross-flow peak vortex shedding acceleration		14.4	mg	
Cross-flow peak vortex shedding acceleration utilisation		81%		OK

1.19 1.05 kPa

Automated Calculations

Storey Tabulation in X and Y

Wind Load X @ z={0-h} and Wind

	ΣBuilding Height Σh_s m	Along-Fl. Windward Pressure in X kPa	Along-Fl. Leeward Pressure in X kPa	Along-Fl. ΣMoment in X MNm	Along-Fl. PΔ Base Shear X kN	Along-Fl. PΔ Base Moment X MNm
				2848	23550	2924
Σ				1898	15700	1950
	152.050	1.10	0.97	227	6272	238
	155.350	1.11	0.98	208	6020	218
	158.650	1.11	0.98	189	5767	199
	161.950	1.12	0.98	172	5513	181
	165.250	1.12	0.99	155	5257	163
	168.550	1.12	0.99	139	5000	147
	171.850	1.13	1.00	125	4741	131
	175.150	1.13	1.00	110	4481	116
	178.450	1.14	1.00	97	4219	102
	181.750	1.14	1.01	85	3957	89
	185.050	1.14	1.01	73	3692	77
	188.350	1.15	1.01	62	3427	66
	191.650	1.15	1.01	52	3160	55
	194.950	1.15	1.02	43	2891	46
	198.250	1.16	1.02	35	2622	37
	201.550	1.16	1.02	28	2351	29
	204.850	1.16	1.03	21	2079	23
	208.150	1.17	1.03	16	1805	17
	211.450	1.17	1.03	11	1531	12
	214.750	1.17	1.04	7	1255	7
	218.050	1.18	1.04	4	978	4
	221.350	1.18	1.04	2	700	2
	224.650	1.18	1.04	0	421	0
	227.950	1.19	1.05	0	141	0

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Wind Load in Direction Y

Note combo boxes and their cor Mumbai, India [IS875-3-2015] ▼ *d to the SD - Wind Pre*

Regional (3s-gust) wind speed, $V_{R,3s}$ | $V_{R,3s}/[k_{ULS}{}^{0.5}]$	53.9	44.0	m/s
Importanc Class I N=50y [Ordinary Buildings] [1.00] [T=285-1,000y] [cl.6.3.1, T.1 IS875-3:2015 ▼		1.00	
Terrain category Category 3 [Suburban Terrain] [cl.6.3.2.1] ▼			
Average roof height of the structure above ground, h		228.0	m
Breadth of the structure on plan normal to wind stream, b		60.0	m
Depth of the structure on plan parallel to wind stream, d		36.0	m
Height on structure above local ground level, z		228.0	m
Site (3s-gust) wind speed at z, $V_{site,3s}(z)/[k_{ULS}{}^{0.5}]$		53.3	m/s
Site (3s-gust) wind speed at z=h, $V_{site,3s}(z=h)/[k_{ULS}{}^{0.5}]$		53.3	m/s
Overall building fundamental along-flow natural frequency, n_a		0.20	Hz
Damping ratio (as a fraction of critical) for ULS, ζ_{ULS}		0.030	
Overall building fundamental cross-flow natural frequency, n_c		0.25	Hz
Cross-flow fundamental mode shape power exponent, k		1.00	

Wind Pressure Analysis in Y @ z=z 2.36 kPa 2.39 kPa

Storey	Storey Height h_s m	Height Tributary m	Breadth Tributary m	Along-Fl. Pressure in Y kPa	Along-Fl. Force in Y kN	Along-Fl. PΔ Force in Y kN	Cross-Fl. Pressure in X kPa	Cross-Fl. Force in X kN	Cross-Fl. PΔ Force in X kN
						39255			14679
70	228.0					26170			9786
St47	3.300	3.300	60.0	2.12	420	420	1.59	189	189
St48	3.300	3.300	60.0	2.13	422	422	1.63	193	193
St49	3.300	3.300	60.0	2.14	424	424	1.66	197	197
St50	3.300	3.300	60.0	2.16	427	427	1.69	201	201
St51	3.300	3.300	60.0	2.17	429	429	1.73	205	205
St52	3.300	3.300	60.0	2.18	431	431	1.76	210	210
St53	3.300	3.300	60.0	2.19	434	434	1.80	214	214
St54	3.300	3.300	60.0	2.20	436	436	1.83	218	218
St55	3.300	3.300	60.0	2.21	438	438	1.87	222	222
St56	3.300	3.300	60.0	2.22	440	440	1.90	226	226
St57	3.300	3.300	60.0	2.23	442	442	1.94	230	230
St58	3.300	3.300	60.0	2.25	445	445	1.97	234	234
St59	3.300	3.300	60.0	2.26	447	447	2.01	238	238
St60	3.300	3.300	60.0	2.27	449	449	2.04	242	242
St61	3.300	3.300	60.0	2.28	451	451	2.07	246	246
St62	3.300	3.300	60.0	2.29	453	453	2.11	251	251
St63	3.300	3.300	60.0	2.30	455	455	2.14	255	255
St64	3.300	3.300	60.0	2.31	457	457	2.18	259	259
St65	3.300	3.300	60.0	2.32	459	459	2.21	263	263
St66	3.300	3.300	60.0	2.33	461	461	2.25	267	267
St67	3.300	3.300	60.0	2.34	463	463	2.28	271	271
St68	3.300	3.300	60.0	2.35	465	465	2.32	275	275
St69	3.300	3.300	60.0	2.36	466	466	2.35	279	279
St70	3.300	1.650	60.0	2.36	234	234	2.39	142	142

Note when expanding or contracting table, refresh equations within columns with summation, Σ as they are c

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ssure {1D} sheet;				
P-Δ factor in direction Y		1.00		
Factor for WL in ULS load combos for superstructure ULS design, k_{ULS}		**1.50**		
Factor for WL in SLS load combos for superstructure defl. design, k_{SLS}		**1.00**		
Factored (design level) P-Δ wind shear in Y as a % of total DL, ΣG		**2.8%**		
Total DL and LL of building, ΣG and ΣQ	1400	200	MN	
Building / floor area, A_B / A_F	85000	**1214**	m^2	***18.8***
Damping ratio (as a fraction of critical) for SLS, ζ_{SLS}		0.015		*kPa*
Base wind bending moment, $\Sigma M_{SLS}=k_{SLS}.\Sigma[p_{des,ww}(z)/k_{ULS}-p_{des,lw}(z)/k_{ULS}].z.dA$		**3164**	MNm	
Along-flow peak acceleration		**8.9**	mg	
Along-flow peak acceleration utilisation		**50%**		**OK**
Cross-flow peak vortex shedding acceleration		**10.5**	mg	
Cross-flow peak vortex shedding acceleration utilisation		**63%**		**OK**

		1.19	**1.05**	kPa	**Automated Calculations**		
	ΣBuilding Height Σh_s m	**Along-Fl. Windward Pressure in Y kPa**	**Along-Fl. Leeward Pressure in Y kPa**	**Along-Fl. ΣMoment in Y MNm**	**Storey Tabulation in X and Y**	**Along-Fl. PΔ Base Shear Y kN**	**Along-Fl. PΔ Base Moment Y MNm**
				4746	**Wind Load Y @ z={0-h} and Wind Acceleration in Y**	**39255**	**4874**
Σ				**3164**		**26170**	**3249**
Stump	1.000	0.60	0.53	3164		**26170**	**3249**
	4.000	0.60	0.53	3087		**26068**	**3171**
	8.500	0.60	0.53	2973		**25813**	**3055**
	11.500	0.65	0.57	2898	**Transfer Level**	**25558**	**2978**
	14.500	0.68	0.60	2823		**25339**	**2902**
	17.500	0.71	0.63	2749		**25107**	**2827**
	20.500	0.74	0.65	2676	Storey St01 ▼	**24865**	**2752**
	23.500	0.76	0.67	2603		**24614**	**2678**
	28.150	0.79	0.70	2492	*Note that a transfer*	**24285**	**2565**
	32.350	0.82	0.72	2394	*level is akin to a*	**23889**	**2465**
	34.150	0.83	0.73	2352	*100% effective*	**23612**	**2423**
	37.450	0.84	0.74	2277	*outrigger for base*	**23375**	**2345**
	40.750	0.86	0.76	2202	*moment resolution;*	**23061**	**2269**
	44.050	0.87	0.77	2128	*For no transfer level*	**22742**	**2194**
	47.350	0.88	0.78	2056	*insert St01;*	**22418**	**2120**
	50.650	0.89	0.79	1985		**22089**	**2047**
	53.950	0.91	0.80	1914		**21755**	**1976**
	57.250	0.92	0.81	1845		**21417**	**1905**
	60.550	0.93	0.82	1777		**21075**	**1835**
	63.850	0.94	0.83	1710		**20730**	**1767**
	67.150	0.95	0.84	1644		**20380**	**1700**
	70.450	0.96	0.84	1580		**20028**	**1634**
	73.750	0.96	0.85	1516		**19672**	**1569**
	77.050	0.97	0.86	1454		**19312**	**1505**
	80.350	0.98	0.86	1393		**18950**	**1442**
	83.650	0.99	0.87	1333		**18585**	**1381**
	86.950	0.99	0.88	1274		**18217**	**1321**
	90.250	1.00	0.88	1217		**17846**	**1262**
	93.550	1.01	0.89	1161		**17473**	**1204**
	96.850	1.02	0.90	1106		**17097**	**1148**
	100.150	1.02	0.90	1052		**16718**	**1093**
	103.450	1.03	0.91	1000		**16338**	**1039**
	106.750	1.03	0.91	949		**15954**	**986**
	110.050	1.04	0.92	899		**15569**	**935**
	113.350	1.05	0.92	850		**15181**	**885**
	116.650	1.05	0.93	803		**14792**	**836**
	119.950	1.06	0.93	757		**14399**	**788**
	123.250	1.06	0.94	712		**14004**	**742**
	126.550	1.07	0.94	669		**13607**	**697**
	129.850	1.07	0.95	626		**13206**	**654**
	132.250	1.08	0.95	597		**12858**	**623**
	135.550	1.08	0.95	557		**12509**	**582**
	138.850	1.09	0.96	518		**12101**	**542**
	142.150	1.09	0.96	481		**11691**	**503**
	145.450	1.09	0.97	445		**11279**	**466**
	148.750	1.10	0.97	411		**10864**	**430**

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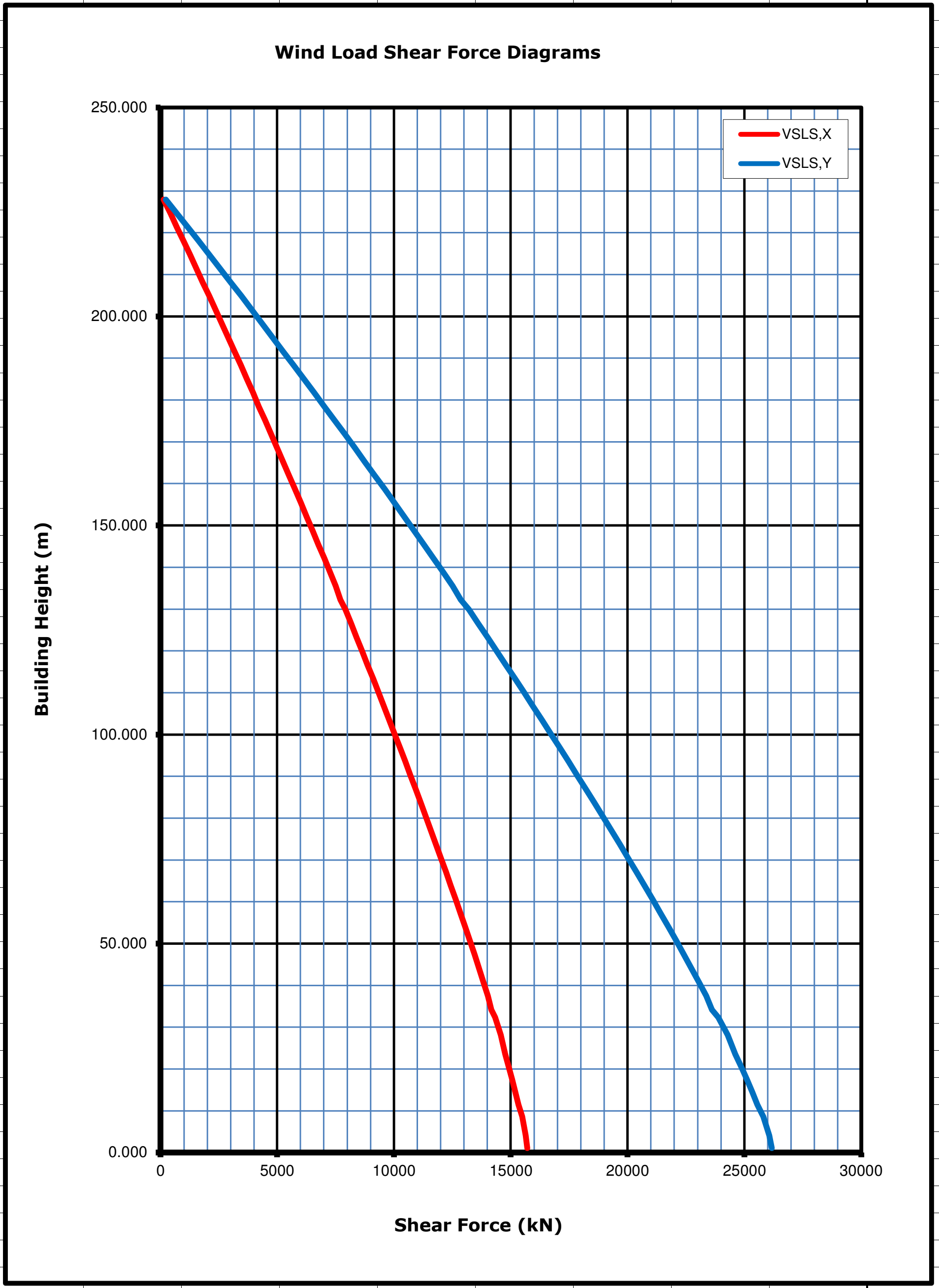
Wind Load Shear Force Diagrams in Direction X and Y



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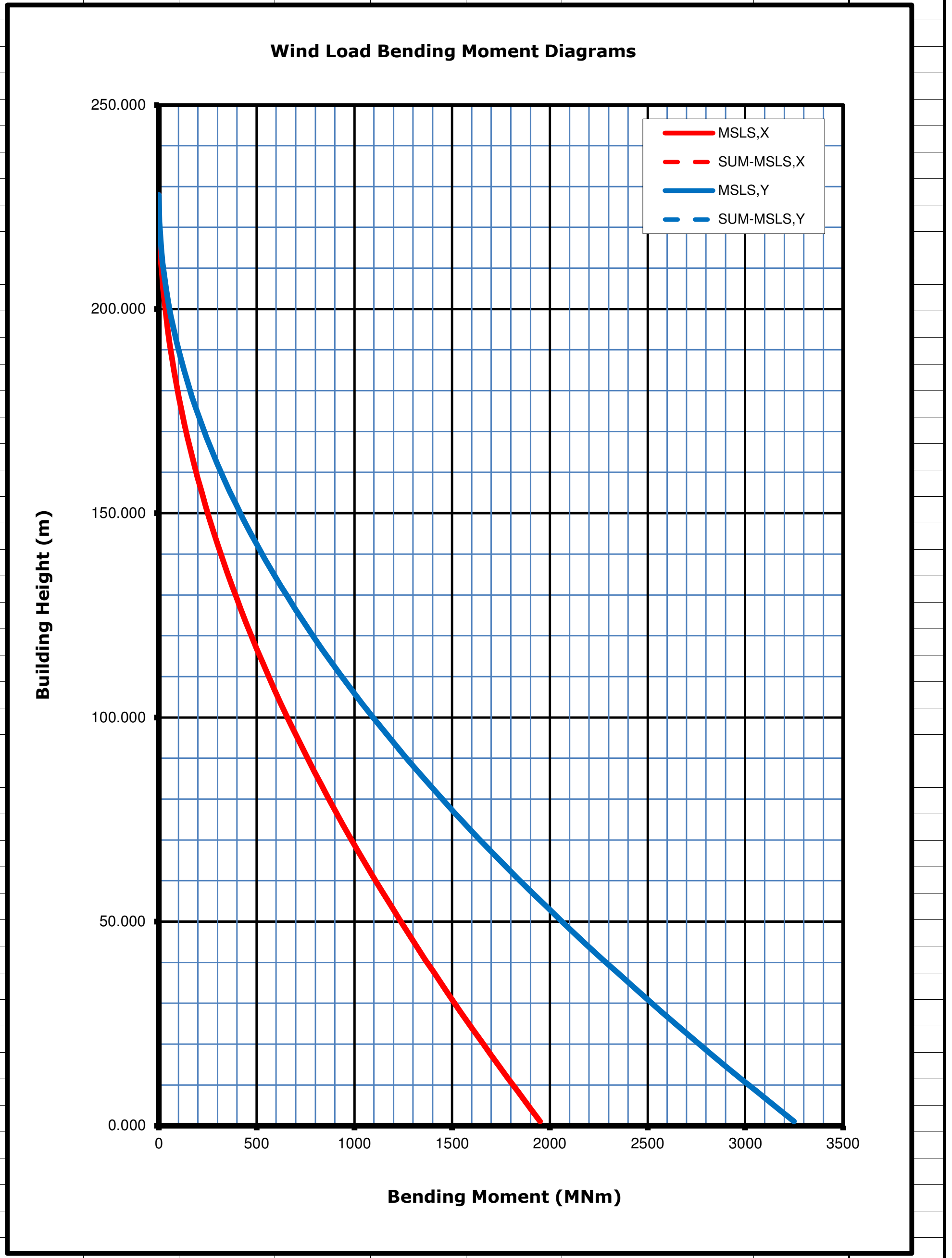
Wind Load Bending Moment Diagrams in Direction X and Y



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ssure {1D} sheet;

P-Δ factor in direction Y	1.00	
Factor for WL in ULS load combos for superstructure ULS design, k_{ULS}	**1.50**	
Factor for WL in SLS load combos for superstructure defl. design, k_{SLS}	**1.00**	
Factored (design level) P-Δ wind shear in Y as a % of total DL, ΣG	**2.8%**	
Total DL and LL of building, ΣG and ΣQ	1400	200 MN
Building / floor area, A_B / A_F	85000	**1214** m^2	***18.8***
Damping ratio (as a fraction of critical) for SLS, ζ_{SLS}	0.015	*kPa*
Base wind bending moment, $\Sigma M_{SLS}=k_{SLS}.\Sigma[p_{des,ww}(z)/k_{ULS}-p_{des,lw}(z)/k_{ULS}].z.dA$	**3164** MNm	
Along-flow peak acceleration	**8.9** mg	
Along-flow peak acceleration utilisation	**50%**	**OK**
Cross-flow peak vortex shedding acceleration	**10.5** mg	
Cross-flow peak vortex shedding acceleration utilisation	**63%**	**OK**

Automated Calculations

Storey Tabulation in X and Y

Wind Load Y @ z={0-h} and Wind

	ΣBuilding Height Σh_s m	**Along-Fl. Windward Pressure in Y kPa**	**Along-Fl. Leeward Pressure in Y kPa**	**Along-Fl. ΣMoment in Y MNm**	**Along-Fl. PΔ Base Shear Y kN**	**Along-Fl. PΔ Base Moment Y MNm**
		1.19	**1.05**	kPa		
				4746	**39255**	**4874**
Σ				**3164**	**26170**	**3249**
	152.050	1.10	0.97	378	**10447**	**396**
	155.350	1.11	0.98	346	**10027**	**362**
	158.650	1.11	0.98	316	**9605**	**331**
	161.950	1.12	0.98	286	**9181**	**300**
	165.250	1.12	0.99	259	**8754**	**272**
	168.550	1.12	0.99	232	**8325**	**244**
	171.850	1.13	1.00	208	**7893**	**218**
	175.150	1.13	1.00	184	**7460**	**193**
	178.450	1.14	1.00	162	**7024**	**170**
	181.750	1.14	1.01	141	**6586**	**149**
	185.050	1.14	1.01	122	**6145**	**128**
	188.350	1.15	1.01	104	**5703**	**109**
	191.650	1.15	1.01	87	**5258**	**92**
	194.950	1.15	1.02	72	**4812**	**76**
	198.250	1.16	1.02	59	**4363**	**62**
	201.550	1.16	1.02	46	**3912**	**49**
	204.850	1.16	1.03	36	**3459**	**38**
	208.150	1.17	1.03	26	**3004**	**28**
	211.450	1.17	1.03	18	**2547**	**19**
	214.750	1.17	1.04	12	**2088**	**12**
	218.050	1.18	1.04	7	**1628**	**7**
	221.350	1.18	1.04	3	**1165**	**3**
	224.650	1.18	1.04	1	**700**	**1**
	227.950	1.19	1.05	0	**234**	**0**

dependent upon other rows;

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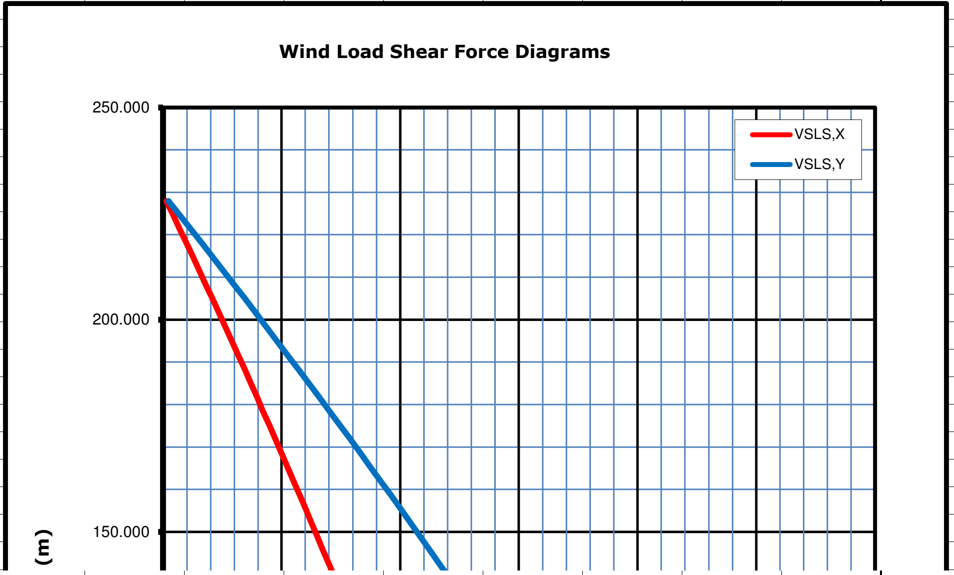
Wind Load Shear Force Diagrams in Direction X and Y



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Wind Load Bending Moment Diagrams in Direction X and Y