WIND LOADING ANALYSIS - Main Wind-Force Resisting System

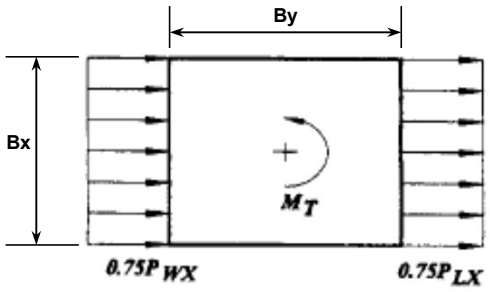
Per ASCE 7-05 Code Method 2 for Enclosed or Partially Enclosed Buildings

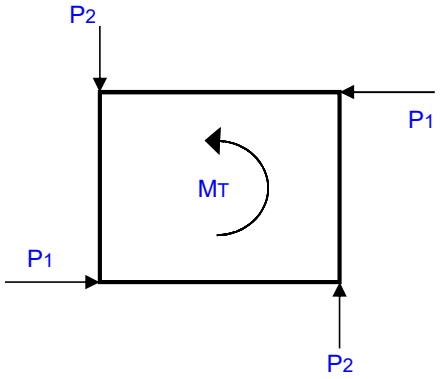
Design Wind Load Case 2 from Figure 6-9

Job Name:		Subject:			
Job Number:		Originator:		Checker:	

ASCE 7-05 Figure 6-9 - Design Wind Load Case 2

For Case 2 (x-direction wind)





Application of Additional Torsional Moment

$$M_T = 0.75\,(P_{WX}+P_{LX})B_X e_X$$
$$e_X = \pm\, 0.15\,B_X$$

Input Data:

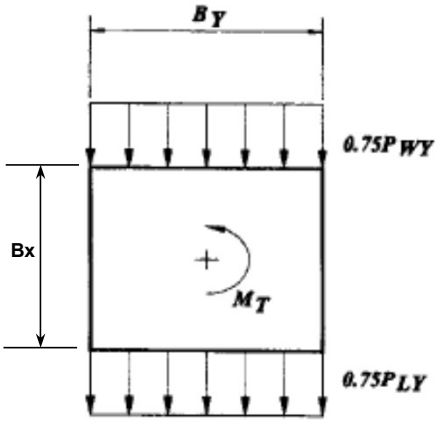
Bldg. Dimension (x-dir.) =	100.00	ft.
Bldg. Dimension (y-dir.) =	200.00	ft.
Windward, Pwx =	0.0290	ksf
Leeward, PLx =	0.0080	ksf

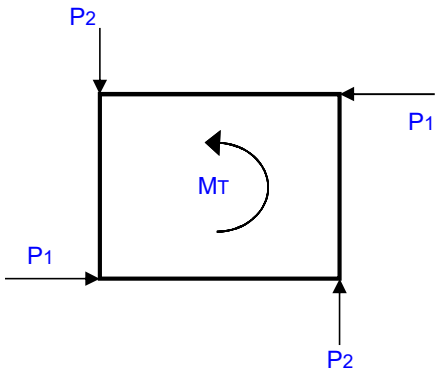
Results:

Length, Bx =	200.00	ft.
Length, By =	100.00	ft.
Eccentricity, ex =	30.00	ft., ex = 0.15*Bx
Tors. Moment, MT =	166.5	ft-k, MT=0.75*(Pwx+PLx)*Bx*ex
Perimeter Force, qw =	0.004163	kips/ft./ft. Ht., qw = MT/(2*Bx*By)
Applied Load, P1 =	0.416	kips/ft. Ht., P1 = qw*By
Applied Load, P2 =	0.833	kips/ft. Ht., P2 = qw*Bx

Note: Loadings P1 and P2 are to be applied per ft. of building height.

For Case 2 (y-direction wind)





Application of Additional Torsional Moment

$$M_T = 0.75\,(P_{WY}+P_{LY})B_Y e_Y$$
$$e_Y = \pm\, 0.15\,B_Y$$

Input Data:

Bldg. Dimension (x-dir.) =	100.00	ft.
Bldg. Dimension (y-dir.) =	200.00	ft.
Windward, Pwy =	0.0298	ksf
Leeward, PLy =	0.0025	ksf

Results:

Length, Bx =	200.00	ft.
Length, By =	100.00	ft.
Eccentricity, ey =	15.00	ft., ey = 0.15*By
Tors. Moment, MT =	36.3	ft-k, MT=0.75*(Pwy+PLy)*By*ey
Perimeter Force, qw =	0.000908	kips/ft./ft. Ht., qw = MT/(2*Bx*By)
Applied Load, P1 =	0.091	kips/ft. Ht., P1 = qw*By

Applied Load, P_2 = 0.182 kips/ft. Ht., $P_2 = q_w * B_x$

Note: Loadings P1 and P2 are to be applied per ft. of building height.

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