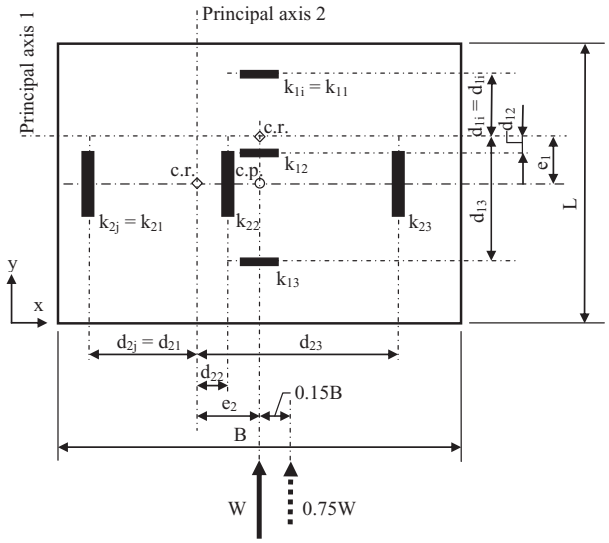
Exemption from Torsional Load Cases

Figure CD-1



B = horizontal plan dimension of the building normal to the wind
L = horizontal plan dimension of the building parallel to the wind
c.r. = center of rigidity, c.p. = center of wind pressure
k_{1i} = stiffness of frame I parallel to major axis 1
k_{2j} = stiffness of frame J parallel to major axis 2
d_{1i} = distance of frame I to c.r. perpendicular to major axis 1
d_{2j} = distance of frame J to c.r. perpendicular to major axis 2
e_1 = distance from c.p. to c.r. perpendicular to major axis 1
e_2 = distance from c.p. to c.r. perpendicular to major axis 2
J = polar moment of inertial of all MWFRS wind frames in the building
W = wind load as required by standard
V_{1i} = wind force in frame i parallel to major axis 1
V_2j = wind force in frame j parallel to major axis 2
x_0, y_0 = coordinates for center of rigidity from the origin of any convenient x, y axes

$$x_0 = \frac{\sum_{i=1}^{n} x_{1i} k_{1i}}{\sum_{i=1}^{n} k_{1i}} \qquad y_0 = \frac{\sum_{i=1}^{n} y_{1i} k_{1i}}{\sum_{i=1}^{n} k_{1i}} \qquad J = \sum_{i=1}^{n} k_{1i} d_{1i}^{\,2} + \sum_{j=1}^{m} k_{2j} d_{2j}^{\,2}$$

$$V_{1i} = \frac{(0.75W)\,k_{1i}}{\sum_{i=1}^{n} k_{1i}} + \frac{(0.75W)(e_1 + 0.15B)\,k_{1i}\,d_{1i}}{J}$$

$$V_{2j} = \frac{(0.75W)\,k_{2j}}{\sum_{j=1}^{m} k_{2j}} + \frac{(0.75W)(e_2 + 0.15B)\,k_{2j}\,d_{2j}}{J}$$