

MWFRS Wind Load Calculations

ASCE 7-10 Chapter 28

Volunteer Fire Department Building located at E Sixth St, Gramercy, LA 70052, USA

Tbl 28.5-1 Enclosed Simple Diaphragm Low-Rise Buildings

1. Risk Category Tbl 1.5-1 Cat IV Essential Facility
2. Basic Wind Speed, by website at council.org 143mph
3. Wind load parameters:
 - a. Surface Roughness, Sec 26.7.2: Roughness C
 - b. Exposure Cat, Sec 26.7.3: Exposure C
 - c. Topographic Factor, Sec 26.8.2: $K_{zt} = 1$
4. Wind Pressures Fig 28.6-1 Load Case 1 for roof slope $0^\circ - 5^\circ$

Interpolating Wind Speeds											
Basic Wind Speed	Roof Angle	Horizontal Pressures, P_{s30} (psf)				Vertical Pressures, P_{s30} (psf)				Overhangs	
		A	B	C	D	E	F	G	H	Eoh	Goh
140 mph	5°	31.1	-16.1	20.6	-9.6	-37.3	-21.2	-26.0	-16.4	-52.3	-40.9
150 mph	5°	35.7	-18.5	23.7	-11.0	-42.9	-24.4	-29.8	-18.9	-60.0	-47.0
143 mph	5°	32.5	-16.8	21.5	-10.0	-39.0	-22.2	-27.1	-17.2	-54.6	-42.7

5. Building mean height (h) = 25ft λ for Exposure C – 1.35
6. Adjusted wind pressure P_s Equation 28.6-1 $P_s = \lambda K_{zt} P_{s30}$

Adjusted Wind Pressure P_s											
Basic Wind Speed	Roof Angle	Horizontal Pressures, P_s (psf)				Vertical Pressures, P_s (psf)				Overhangs	
		A	B	C	D	E	F	G	H	Eoh	Goh
143 mph	5°	43.8	-22.7	29.1	-13.5	-52.6	-29.9	-36.6	-23.2	-73.7	-57.7

7. D1.1 One and Two Story Building with $h \leq 30$ ft are exempt from torsional load cases.