MWFRS Wind Load Calculations

ASCE 7-10 Chapter 28 Wind Loads on Buildings; Envelope Procedure
Simple Diaphragm

Project: First Baptist Church 4141 PONTCHARTRAIN DR, SLIDELL LA

Table 28.5-1 Enclosed Simple Diaphragm Low-Rise Buildings

1. Risk Category Table 1.5-1 — Cat I
2. Basic Wind Speed, by wesite at council.org — 142 mph
3. Wind load parameters
   - a. Surface Roughness, Section 26.7.2: — Roughness C
   - b. Exposure Category, Section 26.7.3: — Exposure C
   - c. Topographic Factor, Section 26.8.2: — K_{zt} = 1
4. Wind Pressures Fig 28.6-1 — Load Case 1 for roof slope 25º

Interpolating Wind Speeds												
Basic Wind Speed	Roof Angle	Load Case	Horizontal Pressures, P_{s30} (psf)				Vertical Pressures, P_{s30} (psf)				Overhangs	
			A	B	C	D	E	F	G	H	Eoh	Goh
142 mph	25º	1	33.6	5.4	24.3	5.5	-14.9	-20.4	-10.8	-16.4	-27.8	-23.7
142 mph	25º	1	39.0	6.3	28.2	6.4	-17.3	-23.6	-12.5	-19.0	-32.3	-27.5
142 mph	25º	1	34.7	5.6	25.1	5.7	-15.4	-21.0	-11.1	-16.9	-28.7	-24.5

5. Building mean height (h) = <15 ft — λ for Exposure B = 1.21
6. Adjusted wind pressure P_s = Equation 28.6-1 — $P_s = \lambda K_{zt} P_{s30} = 1.21 * 1 * P_{s30}$

Adjusted Wind Pressure Ps												
Basic Wind Speed	Roof Angle	Load Case	Horizontal Pressures, Ps (psf)				Vertical Pressures, Ps (psf)				Overhangs	
			A	B	C	D	E	F	G	H	Eoh	Goh
142 mph	25º	1	42.0	6.8	30.3	6.9	-18.6	-25.5	-13.5	-20.5	-34.7	-29.6

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