Wind Load Report - New Garage

1. Site & Building Data

Roof Type:	Gable
Wind Speed (ult):	110 mph
Exposure Category:	C
Enclosure Class:	Enclosed
Building Width (W):	18 ft.
Building Length (L):	50 ft.
Eave Height (h_e):	14 ft.
Foundation Height (h_f):	0 ft.
Roof Pitch:	4 /12
Eave Overhang (OH_e):	2 ft.
Gable Overhang (OH_g):	2 ft.

2. Parameters & Coefficients

Topographic Factor (K_{zt}):	1.0
Directionality Factor (K_d):	.85
Roof Angle (θ):	18.43 deg.
Mean Roof Height (h):	15.50 ft.
Ridge Height (h_r):	17.00 ft.
Pos. Internal Pressure (+GCpi):	+0.18
Neg. Internal Pressure (-GCpi):	-0.18
Velocity Pressure Exp. Coeff. (K_h):	0.85 @ z=h
Velocity Pressure (q_h):	22.51 psf
End Zone Width (a):	3.00 ft.
Zone 2/2E Dist.:	9.00 ft.

3. Design Assumptions and Notes

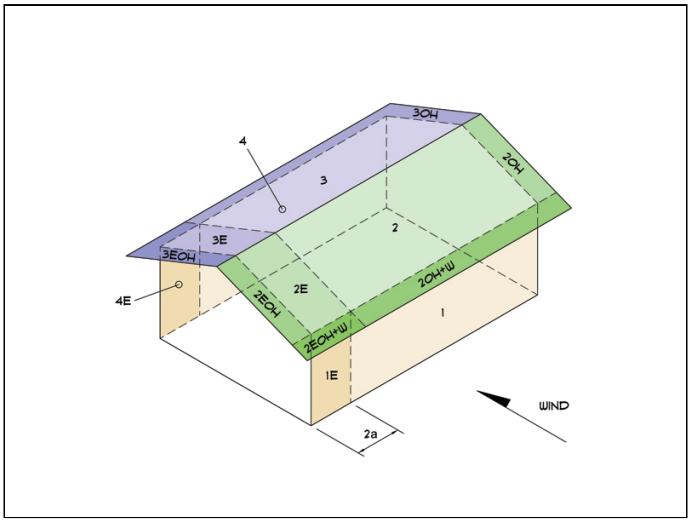
Code Standard:	ASCE 7-10
Geometry:	Regular-Shaped Bldg.
Height Class:	Low-Rise Building
Notes:	

4. Design Loads

Top Chord Dead Load:	7 psf
Bottom Chord Dead Load:	10 psf
Truss/Rafter Spacing:	24 in. o/c

4. Design Wind Pressures: MWFRS Envelope Procedure

Load Case A: Transverse Direction			
Surface	GCpf	Design Pressure (psf)	
		(w/ +GCpi)	(w/ -GCpi)
1	0.52	7.57	15.67
2	-0.69	-19.58	-11.48
3	-0.47	-14.60	-6.49
4	-0.42	-13.40	-5.30
1E	0.78	13.51	21.61
2E	-1.07	-28.13	-20.03
3E	-0.67	-19.20	-11.10
4E	-0.62	-17.96	-9.86
2OH	-0.69	-15.53	
2EOH	-1.07	-24.08	
3OH	-0.47	-10.54	
3EOH	-0.67	-15.15	
2OH+W	-0.69/-0.7	-31.17	
2EOH+W	-1.07/-0.7	-39.73	



a) (+) and (-) signs signify wind pressures acting toward & away from surfaces.
b) External Pressure Coefficients linearly interpolated from Fig. 28.4-1 ASCE 7-10.
c) Design building for all wind directions, 4 load patterns per load case.
d) Total horizontal shear shall not be less than that by neglecting roof wind forces.
e) Min. wind load for enclosed or partially enclosed bldg.: 16 psf wall, 8 psf roof.
f) Design pressures are for strength design, multiply by 0.6 for ASD.

Subject: Wind Loads	Customer:	Location: APN 104-163-10	Job No.: 40629
Engr.: Engineer Name	ENGINEERING COMPANY INC. Street Address City, CA 99999 ph. (800) 000-0000 www.website.com		Rev.: -
Date: 6/29/2024			Page: 1

Load Case B: Longitudinal Direction			
Surface	GCpf	Design Pressure (psf)	
		(w/ +GCpi)	(w/ -GCpi)
1	-0.45	-14.18	-6.08
2	-0.69	-19.58	-11.48
3	-0.37	-12.38	-4.28
4	-0.45	-14.18	-6.08
5	0.40	4.95	13.05
6	-0.29	-10.58	-2.48
1E	-0.48	-14.85	-6.75
2E	-1.07	-28.13	-20.03
3E	-0.53	-15.98	-7.88
4E	-0.48	-14.85	-6.75
5E	0.61	9.68	17.78
6E	-0.43	-13.73	-5.63
2OH	-0.69	-15.53	
2EOH	-1.07	-24.08	
3OH	-0.37	-8.33	
3EOH	-0.53	-11.93	
2EOH+W	-1.07/-0.7	-39.83	
3EOH+W	-0.53/-0.7	-27.68	

a) (+) and (-) signs signify wind pressures acting toward & away from surfaces.
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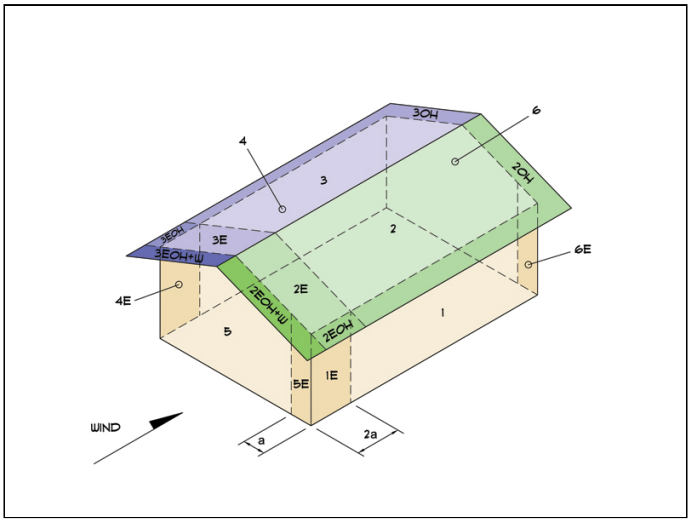
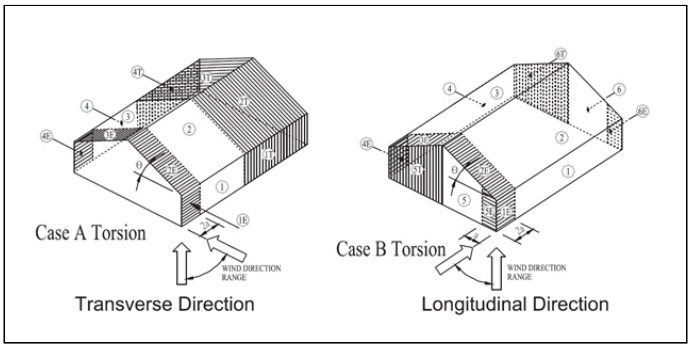


Torsional Load Cases				
Surface	Load Case	GCpf	Design Pressure (psf)	
			(w/ +GCpi)	(w/ -GCpi)
1T	A	-	1.89	3.92
2T	A	-	-4.89	-2.87
3T	A	-	-3.65	-1.62
4T	A	-	-3.35	-1.32
5T	B	-	1.24	3.26
6T	B	-	-2.64	-0.62

a) (+) and (-) signs signify wind pressures acting toward & away from surfaces.
b) Pressures designated with a "T" are 25% of full design wind pressures.
c) Torsional loading shall apply to all 8 load patterns using the figures shown.
d) Design pressures are for strength design, multiply by 0.6 for ASD.
e) Torsional Design Exceptions: One story bldg. with h ≤ 30 ft,
Two stories or less framed with light frame construction,
Two stories or less with flexible diaphragms.



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Engr.	ENGINEERING COMPANY INC.		Rev.
Engineer Name	Street Address City, CA 99999		-
Date	ph. (800) 000-0000 www.website.com		Page
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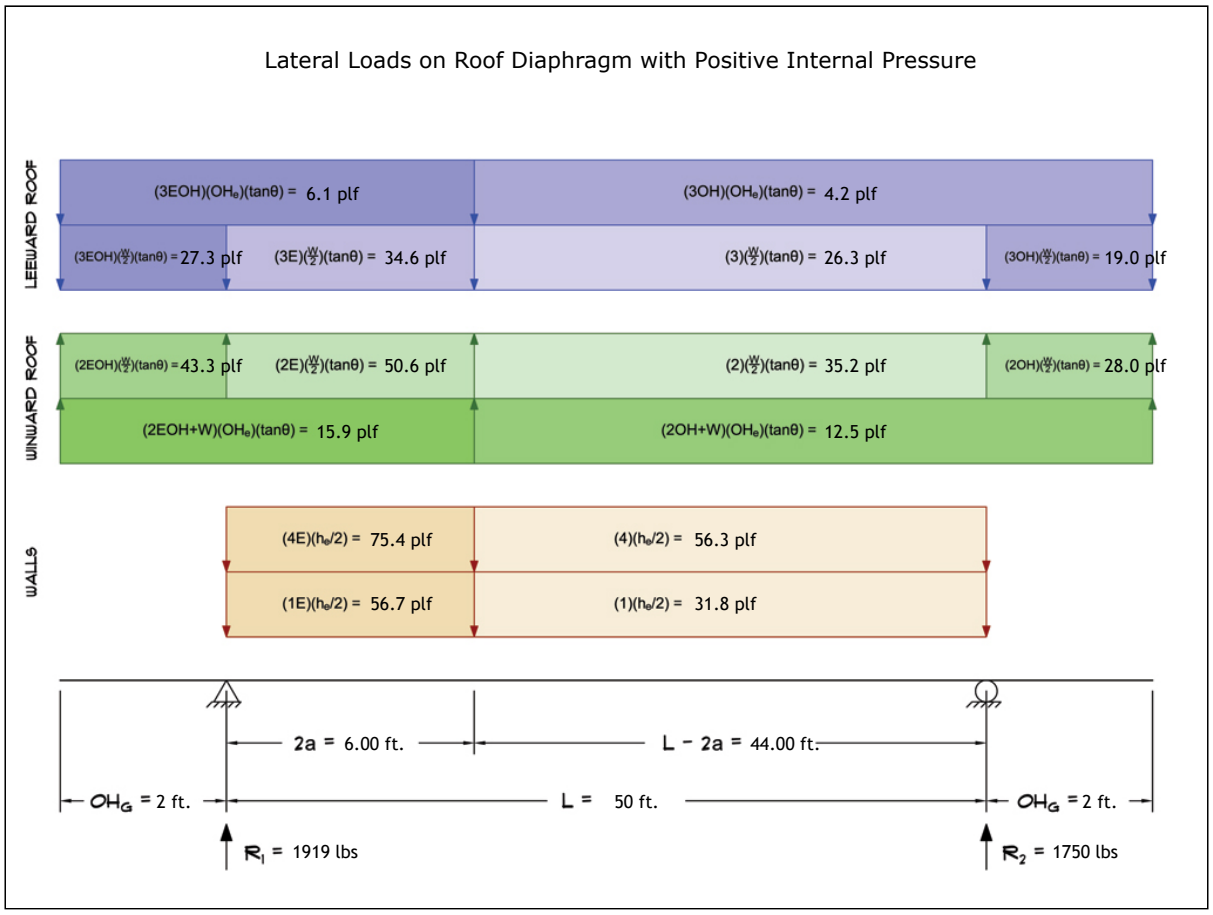
STRUCTURAL ENGINEERS COMPANY LOGO

5. Wind Load Calculations

1.) Lateral Loads - Transverse Direction:

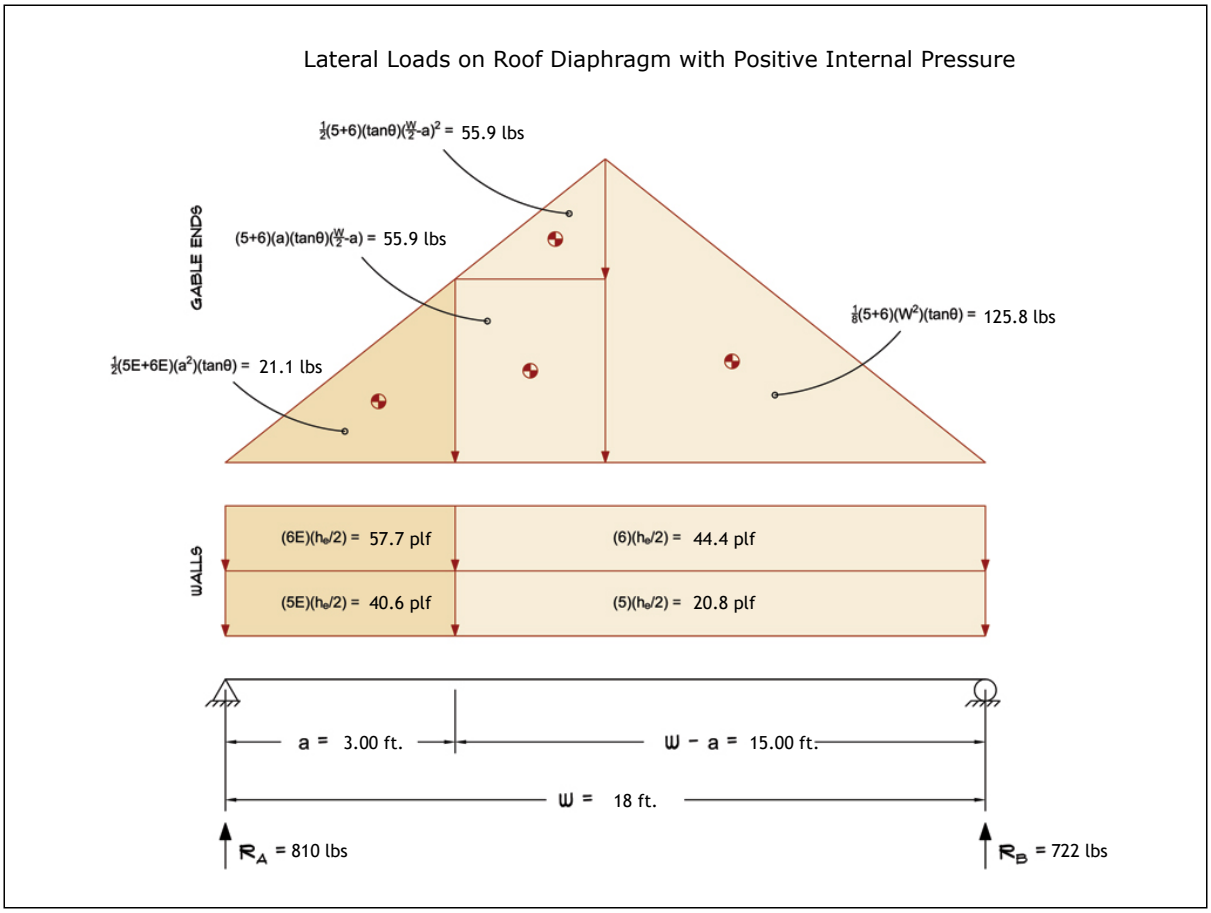


a) (-) signs signify wind lateral forces acting opposite to the direction of the arrows shown.
b) Strength design values multiplied by 0.6 to obtain ASD values.

Wind Base Shear (ASD)						
Load Case A: Transverse Direction						
Load Case	Walls (lbs)	Roof (lbs)	Roof Overhangs (lbs)	Total Lateral Load (lbs)	R_1 (lbs)	R_2 (lbs)
Positive Internal Pressure	4669	-491	-508	3669	1919	1750
Negative Internal Pressure	4669	-491	-508	3669	1919	1750
Roof Pressure = 0	4669	0	0	4669	2451	2218
Min. Pressures (8 psf, 16 psf)	3360	720	230	4310	2155	2155

a) Bottom half of wall neglected in tributary area calculations.
b) Strength design values multiplied by 0.6 to obtain ASD values.

2.) Lateral Loads - Longitudinal Direction:

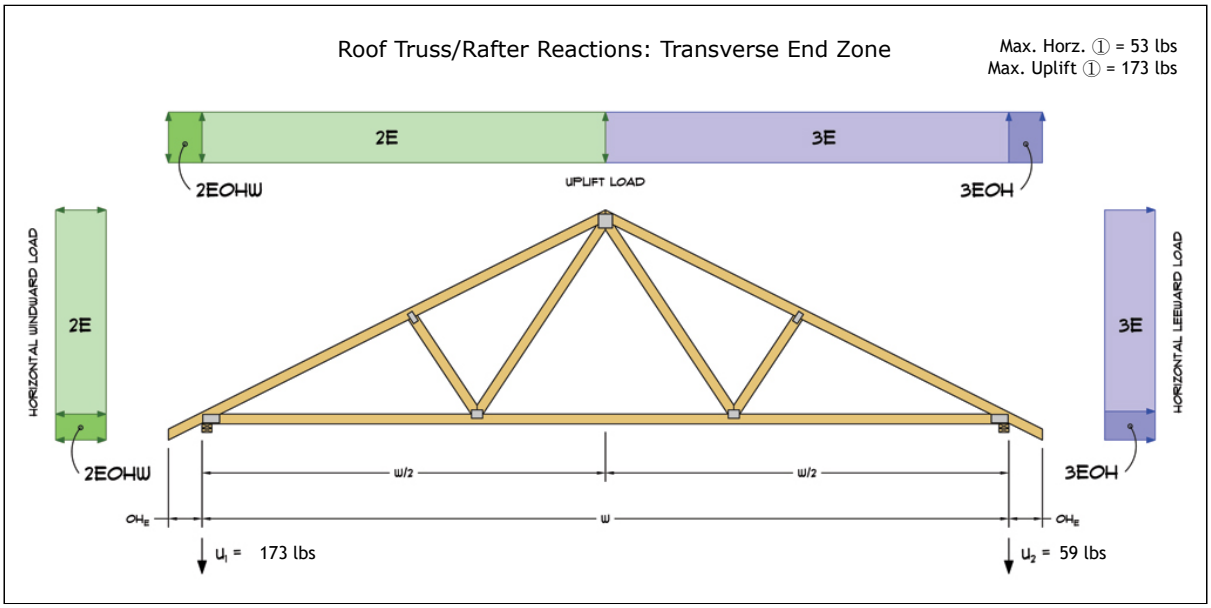


a) (-) signs signify wind lateral forces acting opposite to the direction of the arrows shown.
b) Strength design values multiplied by 0.6 to obtain ASD values.
c) Where the length of building (L) exceeds 4X the mean roof height (h), wind drag forces should additionally be considered.

Wind Base Shear (ASD)						
Load Case B: Longitudinal Direction						
Load Case	Walls (lbs)	Gable Ends (lbs)	Roof (lbs)	Total Lateral Load (lbs)	R_A (lbs)	R_B (lbs)
Positive Internal Pressure	1273	259	0	1532	810	722
Negative Internal Pressure	1273	259	0	1532	810	722
Roof Pressure = 0	1273	259	0	1532	810	722
Min. Pressures (8 psf, 16 psf)	1210	259	0	1469	734	734

a) Bottom half of wall neglected in tributary area calculations.
b) Strength design values multiplied by 0.6 to obtain ASD values.

3.) Roof Truss Reactions:



a) Strength design values multiplied by 0.6 to obtain ASD values.
b) Windward loads may be positive or negative depending on pitch of roof.

Roof Truss/Rafter Reactions (ASD)					
w/ Positive Internal Pressure					
Load Case	Horizontal Load (lbs)	Gross Uplift (lbs)	Net Uplift (lbs)	U_1 (lbs)	U_2 (lbs)
Transverse Int. Zone	34	469	58	70	-12
Transverse End Zone	52	643	232	173	59
Longitudinal Int. Zone	32	402	-8	25	-33
Longitudinal End Zone	53	563	152	125	27

a) Gross Uplift calculations do not include any counteracting roof dead loads.
b) Net Uplift calculations include counteracting roof dead loads multiplied by 0.6 per load case (7) ASCE 7-10.
c) Strength design values multiplied by 0.6 to obtain ASD values for wind loads.
d) Loads based on truss spacing calculated at 24" o/c.
e) Negative values for horizontal load indicate load acting in windward direction (tranverse load cases).
f) Negative values for uplift indicate net downward force (zero uplift).