

SHUTTERS / IMPACT PROTECTION

DEFINITION:

Impact protection systems; such as panel shutters, rolling shutters, grid panels, etc. are designed to meet the wind loads and impact resistant standards as specified in Chapter 16, Florida Building Code. Their purpose is to protect wall openings from high winds and windborne debris.

Please submit/upload plans in PDF format

Please indicate items submitted with a checkmark (√)

Create online as **Residential Shutter** **(1 or 2 family dwelling or townhouse)**
 Commercial Shutter **(Multi-Family dwelling or Commercial Building)**

Please upload [this Checklist and any Required Forms](#) in **.pdf format** to the appropriate category [<BuildingPlans>](#) [<SupportingDocs>](#) [<NOA>](#) [<Survey>](#) following the TOJ Naming Convention found in Help Documents.

1. **Plans** [<BuildingPlans>](#)

- a. Provide plan/layout identifying shutter locations, sizes and emergency egress _____
- b. Identify details of support structure construction at window and door openings _____

2. **Supporting Documents** [<SupportingDocs>](#)

- a. Wind load information:
 - Required design pressures _____
 - Mean roof height _____
 - Wind exposure category and zones (appropriately mark tables included) _____
- ~~b. Copy of completed contract signed by both parties _____~~
- c. Owner/Builder Affidavit, if applicable _____

3. **Product Approval** [<NOA>](#)

- a. Provide Product Approvals (one of the following)
 - State of Florida Product Approval with installation instructions engineered plans _____
 - Miami-Dade Notice of Acceptance (NOA) with installation instructions engineered plans. Be sure to mark the **exact** product number _____
 - Engineer signed/sealed plans and calculations for custom design _____
- b. Information required from product approval:
 - ALL project specific details shall be Identified/Marked/Circled on product Approval Installation Instructions
 - Engineered plans shall include actual design pressures, anchor details, building height span fastener type, support structure construction, types/thickness of glazing _____

NOTE:

- **Indicate Design Pressures from the Product Approval vs the Required Design Pressures (this may be accomplished in a schedule)**
- **Residential/Commercial buildings under construction do not require separate permits for impact protections systems. Submit as a revision to the building permit.**
- **An Electrical permit will be required for motor driven shutters**

**TABLE R301.2(2)
COMPONENT AND CLADDING LOADS FOR A BUILDING WITH A MEAN
ROOF HEIGHT OF 30 FEET LOCATED IN EXPOSURE B (ASD) (psf)^{a, b, c, d, e, f}**

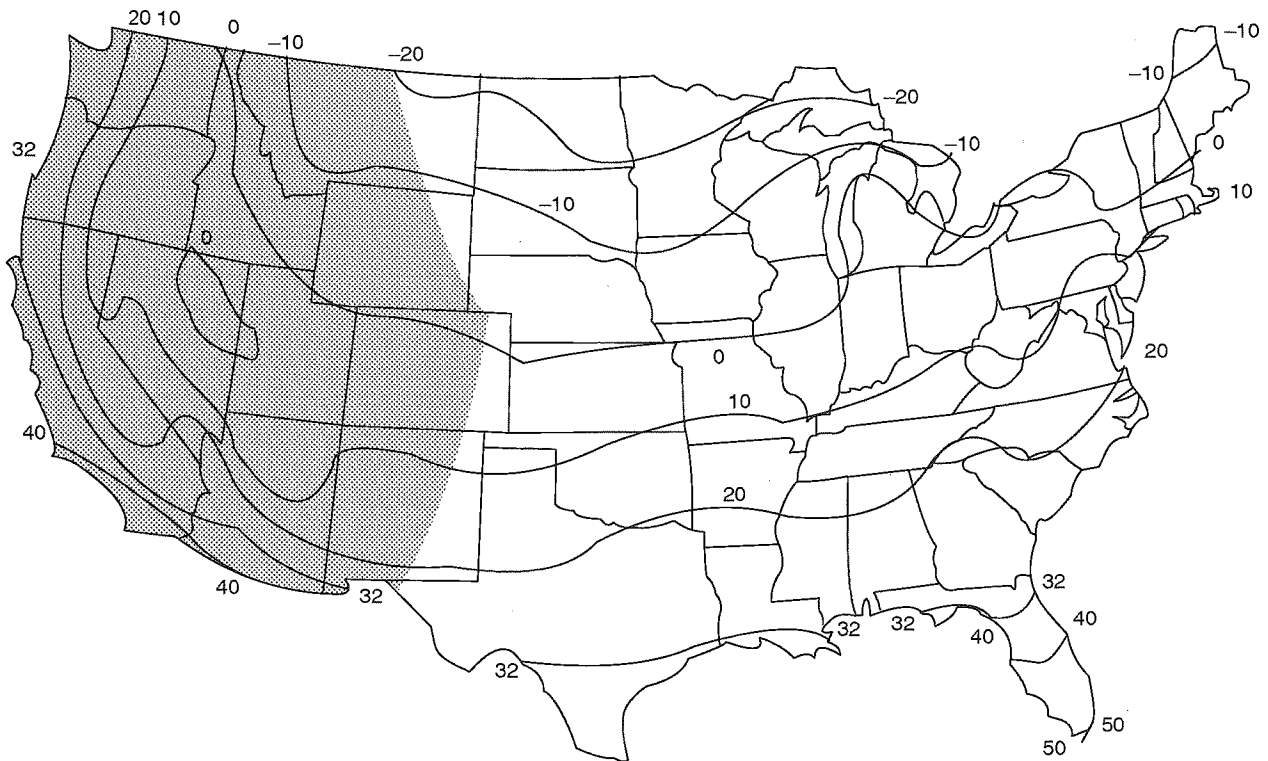
ZONE	EFFECTIVE WIND AREA (feet ²)	ULTIMATE DESIGN WIND SPEED, V _{ULT} (mph)																		
		110		115		120		130		140		150		160		170		180		
Roof 0 to 7 degrees	1	10	10.0	-13.0	10.0	-14.0	10.0	-15.0	10.0	-18.0	10.0	-21.0	9.9	-24.0	11.2	-27.0	12.6	-31.0	14.2	-35.0
	1	20	10.0	-12.0	10.0	-13.0	10.0	-15.0	10.0	-17.0	10.0	-20.0	9.2	-23.0	10.6	-26.0	11.9	-30.0	13.3	-34.1
	1	50	10.0	-12.0	10.0	-13.0	10.0	-14.0	10.0	-17.0	10.0	-19.0	8.5	-22.0	10.0	-26.0	10.8	-29.0	12.2	-32.9
	1	100	10.0	-11.0	10.0	-13.0	10.0	-14.0	10.0	-16.0	10.0	-19.0	7.8	-22.0	10.0	-25.0	10.0	-28.0	11.3	-32.0
	2	10	10.0	-21.0	10.0	-23.0	10.0	-26.0	10.0	-30.0	10.0	-35.0	9.9	-40.0	11.2	-46.0	12.6	-52.0	14.2	-58.7
	2	20	10.0	-19.0	10.0	-21.0	10.0	-23.0	10.0	-27.0	10.0	-31.0	9.2	-36.0	10.6	-41.0	11.9	-46.0	13.3	-52.4
	2	50	10.0	-16.0	10.0	-18.0	10.0	-19.0	10.0	-23.0	10.0	-26.0	8.5	-30.0	10.0	-34.0	10.8	-39.0	12.2	-44.1
	2	100	10.0	-14.0	10.0	-15.0	10.0	-16.0	10.0	-19.0	10.0	-22.0	7.8	-26.0	10.0	-30.0	10.0	-33.0	11.3	-37.9
	3	10	10.0	-33.0	10.0	-36.0	10.0	-39.0	10.0	-46.0	10.0	-53.0	9.9	-61.0	11.2	-69.0	12.6	-78.0	14.2	-88.3
	3	20	10.0	-27.0	10.0	-29.0	10.0	-32.0	10.0	-38.0	10.0	-44.0	9.2	-50.0	10.6	-57.0	11.9	-65.0	13.3	-73.1
	3	50	10.0	-19.0	10.0	-21.0	10.0	-23.0	10.0	-27.0	10.0	-32.0	8.5	-36.0	10.0	-41.0	10.8	-47.0	12.2	-53.1
	3	100	10.0	-14.0	10.0	-15.0	10.0	-16.0	10.0	-19.0	10.0	-22.0	7.8	-26.0	10.0	-30.0	10.0	-33.0	11.3	-37.9
Roof > 7 to 27 degrees	1	10	10.0	-11.0	10.0	-13.0	10.0	-14.0	10.5	-16.0	12.2	-19.0	14.0	-22.0	15.9	-25.0	17.9	-28.0	20.2	-32.0
	1	20	10.0	-11.0	10.0	-12.0	10.0	-13.0	10.0	-16.0	11.1	-18.0	12.8	-21.0	14.5	-24.0	16.4	-27.0	18.4	-31.1
	1	50	10.0	-11.0	10.0	-12.0	10.0	-13.0	10.0	-15.0	10.0	-18.0	11.1	-20.0	12.7	-23.0	14.3	-26.0	16.0	-29.9
	1	100	10.0	-10.0	10.0	-11.0	10.0	-12.0	10.0	-15.0	10.0	-17.0	9.9	-20.0	11.2	-22.0	12.6	-25.0	14.2	-29.0
	2	10	10.0	-20.0	10.0	-22.0	10.0	-24.0	10.5	-29.0	12.2	-33.0	14.0	-38.0	15.9	-44.0	17.9	-49.0	20.2	-55.8
	2	20	10.0	-19.0	10.0	-20.0	10.0	-22.0	10.0	-26.0	11.1	-31.0	12.8	-35.0	14.5	-40.0	16.4	-45.0	18.4	-51.2
	2	50	10.0	-16.0	10.0	-18.0	10.0	-20.0	10.0	-23.0	10.0	-27.0	11.1	-31.0	12.7	-35.0	14.3	-40.0	16.0	-45.4
	2	100	10.0	-15.0	10.0	-16.0	10.0	-18.0	10.0	-21.0	10.0	-24.0	9.9	-28.0	11.2	-32.0	12.6	-36.0	14.2	-40.9
	3	10	10.0	-30.0	10.0	-33.0	10.0	-36.0	10.5	-43.0	12.2	-49.0	14.0	-57.0	15.9	-65.0	17.9	-73.0	20.2	-82.4
	3	20	10.0	-28.0	10.0	-31.0	10.0	-34.0	10.0	-40.0	11.1	-46.0	12.8	-53.0	14.5	-60.0	16.4	-68.0	18.4	-77.0
	3	50	10.0	-26.0	10.0	-28.0	10.0	-31.0	10.0	-36.0	10.0	-42.0	11.1	-48.0	12.7	-55.0	14.3	-62.0	16.0	-69.9
	3	100	10.0	-24.0	10.0	-26.0	10.0	-28.0	10.0	-33.0	10.0	-39.0	9.9	-44.0	11.2	-51.0	12.6	-57.0	14.2	-64.6
Roof > 27 to 45 degrees	1	10	11.9	-13.0	13.1	-14.0	14.2	-15.0	16.7	-18.0	19.4	-21.0	22.2	-24.0	25.3	-27.0	28.5	-31.0	32.0	-35.0
	1	20	11.6	-12.0	12.7	-13.0	13.8	-14.0	16.2	-17.0	18.8	-20.0	21.6	-23.0	24.6	-26.0	27.7	-29.0	31.1	-33.2
	1	50	11.2	-11.0	12.2	-12.0	13.3	-13.0	15.6	-16.0	18.1	-18.0	20.8	-21.0	23.6	-24.0	26.7	-27.0	29.9	-30.8
	1	100	10.9	-10.0	11.9	-11.0	12.9	-12.0	15.1	-15.0	17.6	-17.0	20.2	-20.0	22.9	-22.0	25.9	-25.0	29.0	-29.0
	2	10	11.9	-15.0	13.1	-16.0	14.2	-18.0	16.7	-21.0	19.4	-24.0	22.2	-28.0	25.3	-32.0	28.5	-36.0	32.0	-40.9
	2	20	11.6	-14.0	12.7	-16.0	13.8	-17.0	16.2	-20.0	18.8	-23.0	21.6	-27.0	24.6	-30.0	27.7	-34.0	31.1	-39.1
	2	50	11.2	-13.0	12.2	-15.0	13.3	-16.0	15.6	-19.0	18.1	-22.0	20.8	-25.0	23.6	-29.0	26.7	-32.0	29.9	-36.8
	2	100	10.9	-13.0	11.9	-14.0	12.9	-15.0	15.1	-18.0	17.6	-21.0	20.2	-24.0	22.9	-27.0	25.9	-31.0	29.0	-35.0
	3	10	11.9	-15.0	13.1	-16.0	14.2	-18.0	16.7	-21.0	19.4	-24.0	22.2	-28.0	25.3	-32.0	28.5	-36.0	32.0	-40.9
	3	20	11.6	-14.0	12.7	-16.0	13.8	-17.0	16.2	-20.0	18.8	-23.0	21.6	-27.0	24.6	-30.0	27.7	-34.0	31.1	-39.1
	3	50	11.2	-13.0	12.2	-15.0	13.3	-16.0	15.6	-19.0	18.1	-22.0	20.8	-25.0	23.6	-29.0	26.7	-32.0	29.9	-36.8
	3	100	10.9	-13.0	11.9	-14.0	12.9	-15.0	15.1	-18.0	17.6	-21.0	20.2	-24.0	22.9	-27.0	25.9	-31.0	29.0	-35.0
Wall	4	10	13.1	-14.0	14.3	-15.0	15.5	-16.0	18.2	-19.0	21.2	-22.0	24.3	-26.0	27.7	-30.0	31.2	-33.0	35.0	-37.9
	4	20	12.5	-13.0	13.6	-14.0	14.8	-16.0	17.4	-19.0	20.2	-22.0	23.2	-25.0	26.4	-28.0	29.7	-32.0	33.4	-36.4
	4	50	11.7	-12.0	12.8	-14.0	13.9	-15.0	16.3	-17.0	19.0	-20.0	21.7	-23.0	24.7	-27.0	27.9	-30.0	31.3	-34.3
	4	100	11.1	-12.0	12.1	-13.0	13.2	-14.0	15.5	-17.0	18.0	-19.0	20.6	-22.0	23.5	-25.0	26.5	-29.0	29.8	-32.7
	4	500	10.0	-10.0	10.6	-11.0	11.6	-12.0	13.6	-15.0	15.8	-17.0	18.1	-20.0	20.6	-22.0	23.2	-25.0	26.1	-29.0
	5	10	13.1	-17.0	14.3	-19.0	15.5	-20.0	18.2	-24.0	21.2	-28.0	24.3	-32.0	27.7	-37.0	31.2	-41.0	35.0	-46.8
	5	20	12.5	-16.0	13.6	-17.0	14.8	-19.0	17.4	-22.0	20.2	-26.0	23.2	-30.0	26.4	-34.0	29.7	-39.0	33.4	-43.7
	5	50	11.7	-14.0	12.8	-16.0	13.9	-17.0	16.3	-20.0	19.0	-23.0	21.7	-27.0	24.7	-31.0	27.9	-35.0	31.3	-39.5
	5	100	11.1	-13.0	12.1	-14.0	13.2	-16.0	15.5	-19.0	18.0	-22.0	20.6	-25.0	23.5	-28.0	26.5	-32.0	29.8	-36.4
	5	500	10.0	-10.0	10.6	-11.0	11.6	-12.0	13.6	-15.0	15.8	-17.0	18.1	-20.0	20.6	-22.0	23.2	-25.0	26.1	-29.0

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m², 1 mile per hour = 0.447 m/s, 1 pound per square foot = 0.0479 kPa.

- a. The effective wind area shall be equal to the span length multiplied by an effective width. This width shall be permitted to be not less than one-third the span length. For cladding fasteners, the effective wind area shall not be greater than the area that is tributary to an individual fastener.
- b. For effective areas between those given, the load shall be interpolated or the load associated with the lower effective area shall be used.
- c. Table values shall be adjusted for height and exposure by multiplying by the adjustment coefficient in Table R301.2(3).
- d. See Figure R301.2(7) for location of zones.
- e. Plus and minus signs signify pressures acting toward and away from the building surfaces.
- f. Table values have been multiplied by 0.6 to convert component and cladding pressures to ASD.

TABLE R301.2(3)
HEIGHT AND EXPOSURE ADJUSTMENT COEFFICIENTS FOR TABLE R301.2(2)

MEAN ROOF HEIGHT	EXPOSURE		
	B	C	D
15	1.00	1.21	1.47
20	1.00	1.29	1.55
25	1.00	1.35	1.61
30	1.00	1.40	1.66
35	1.05	1.45	1.70
40	1.09	1.49	1.74
45	1.12	1.53	1.78
50	1.16	1.56	1.81
55	1.19	1.59	1.84
60	1.22	1.62	1.87



 DESIGN TEMPERATURES IN THIS AREA MUST BE BASED ON ANALYSIS OF LOCAL CLIMATE AND TOPOGRAPHY

For SI: °C = [(°F)-32]/1.8.

FIGURE R301.2(1)
ISOLINES OF THE 97¹/₂-PERCENT WINTER (DECEMBER, JANUARY AND FEBRUARY) DESIGN TEMPERATURES (°F)

BCAB Fenestration Voluntary Wind Load Chart For PBC*

Per ASCE 7-10 Method 1, Part 1 and FBC (2017) for Retrofitting in Accordance with Formal Interpretation #5
 For Detached One-and Two family dwellings and Multiple Single-Family Dwellings (Townhouses) with Mean Roof Height ≤ 30 feet

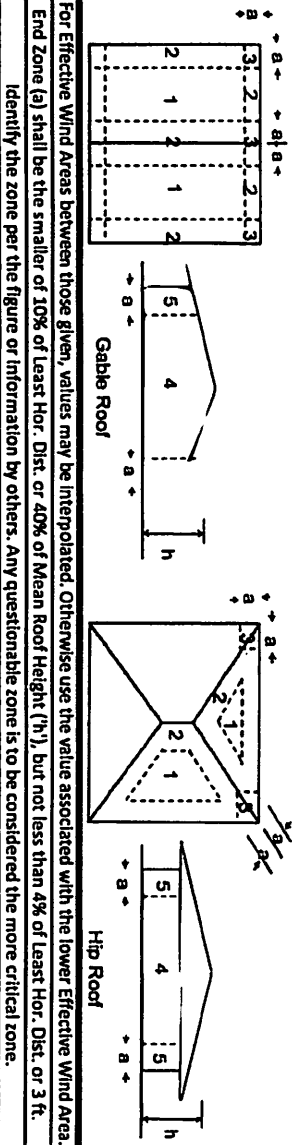
* Using Allowable Stress Design methodology (P = 0.8W) / ** Exposure shall be determined according to ASCE 7-10 Section 26.7.3 (Exposure Categories)
 Wind 170 mph (3-second gust) / Exposure C** / Kd = 0.85 / Kzt = 1.0 / Pressures are in PSF / Not for use in Coastal (Exposure 'D' areas)

Effective Wind Area (ft²)	Location: Gable or Hip Roof	Mean Roof Height of 15 feet			Mean Roof Height of 20 feet			Mean Roof Height of 25 feet			Mean Roof Height of 30 feet														
		Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3												
10	Gable/Hip Roof	+16.0	-37.8	16.0	-63.4	16.0	+95.4	16.3	-40.2	16.3	-67.4	16.3	+101.4	17.1	-42.1	17.1	-70.6	17.1	+106.3	17.8	-43.7	17.8	-73.4	17.8	+110.4
20	Roof	+16.0	-36.8	16.0	-56.7	16.0	+79.1	16.0	-39.1	16.0	-60.2	16.0	+84.0	16.0	-41.0	16.0	-53.2	16.0	+88.0	16.7	-42.6	16.7	-55.2	16.7	+91.5
50	0 ≤ γ ≤ 7°	+16.0	-35.6	16.0	-47.7	16.0	+57.4	16.0	-37.8	16.0	-50.7	16.0	+61.0	16.0	-39.6	16.0	-45.7	16.0	+57.4	16.0	-40.0	16.0	-47.4	16.0	+52.2
100	0 to 1.5:12]	+16.0	-34.6	16.0	-41.0	16.0	+41.0	16.0	-36.8	16.0	-43.6	16.0	+36.5	16.0	-38.5	16.0	-45.7	16.0	+45.7	16.0	-40.0	16.0	-47.4	16.0	+47.4
30	Gable/Hip Roof	+21.8	-34.6	21.8	-60.2	21.8	+89.0	23.1	-36.8	23.1	-64.0	23.1	+94.6	24.3	-38.5	24.3	-67.1	24.3	+99.2	25.2	-40.0	25.2	-69.7	25.2	+103.0
20	Roof	+19.9	-33.6	19.9	-55.4	19.9	+83.3	21.1	-35.7	21.1	-58.9	21.1	+88.5	22.1	-37.4	22.1	-61.7	22.1	+92.7	23.0	-38.9	23.0	-64.1	23.0	+96.3
50	7° < θ ≤ 27°	+17.3	-32.4	17.3	-49.0	17.3	+75.6	18.4	-34.4	18.4	-52.1	18.4	+60.3	19.3	-36.0	19.3	-54.6	19.3	+64.2	20.0	-37.4	20.0	-56.7	20.0	+67.5
100	1.5 to 6:12]	+16.0	-31.4	16.0	-44.2	16.0	+69.8	16.3	-33.3	16.3	-47.0	16.3	+54.2	17.1	-35.0	17.1	-49.2	17.1	+57.8	17.8	-36.3	17.8	-51.1	17.8	+60.8
30	Gable Roof	+34.6	-37.8	34.6	-44.2	34.6	+68.8	36.8	-40.2	36.8	-47.0	36.8	+68.8	38.5	-42.1	38.5	-49.2	38.5	+69.2	40.0	-43.7	40.0	-51.1	40.0	+71.8
20	Roof	+33.6	-35.9	33.6	-42.3	33.6	+65.7	35.7	-38.1	35.7	-44.9	35.7	+65.7	37.4	-39.9	37.4	-47.1	37.4	+65.7	38.9	-41.5	38.9	-48.9	38.9	+68.9
50	27° < θ ≤ 45°	+32.4	-33.3	32.4	-39.7	32.4	+59.7	34.4	-35.4	34.4	-42.2	34.4	+54.2	36.0	-37.1	36.0	-44.2	36.0	+54.2	37.4	-38.6	37.4	-46.0	37.4	+60.8
100	45 to 12:12]	+31.4	-31.4	31.4	-37.8	31.4	+53.3	33.3	-33.3	33.3	-40.2	33.3	+50.0	35.0	-35.0	35.0	-42.1	35.0	+50.0	36.3	-36.3	36.3	-43.7	36.3	+53.7

Effective Wind Area (ft²)	Location	Mean Roof Height of 15 feet			Mean Roof Height of 20 feet			Mean Roof Height of 25 feet			Mean Roof Height of 30 feet														
		Zone 4	Zone 5	Zone 6	Zone 4	Zone 5	Zone 6	Zone 4	Zone 5	Zone 6	Zone 4	Zone 5	Zone 6												
10	Wall	+37.8	-41.0	37.8	-50.6	40.2	-43.6	40.2	-43.6	40.2	-53.8	42.1	-45.7	42.1	-43.8	40.2	-52.6	41.8	-45.5	41.8	-49.4	39.2	-42.9	39.2	-49.4
20		+36.1	-39.3	36.1	-47.2	38.3	-41.7	38.3	-41.7	38.3	-50.1	36.0	-41.3	37.7	-41.3	37.7	-47.5	35.8	-39.4	35.8	-40.9	37.2	-45.5	32.6	-36.3
50		+33.8	-37.0	33.8	-42.7	36.0	-39.4	36.0	-39.4	36.0	-45.4	34.1	-37.5	34.1	-37.5	34.1	-43.8	31.4	-35.0	31.4	-35.0	31.4	-43.8	31.4	-35.0
100		+32.1	-35.3	32.1	-39.3	34.1	-37.5	34.1	-37.5	34.1	-41.7	31.4	-35.0	31.4	-35.0	31.4	-41.7	31.4	-35.0	31.4	-35.0	31.4	-41.7	31.4	-35.0
500		+28.2	-31.4	28.2	-31.4	29.9	-33.3	29.9	-33.3	29.9	-33.3	31.4	-35.0	31.4	-35.0	31.4	-35.0	31.4	-35.0	31.4	-35.0	31.4	-35.0	31.4	-35.0

*** For Hip Roofs with angle > 7 degrees (1.5:12) and ≤ 25 degrees (5:5.12), Zone 3 shall be treated as Zone 2 [Figure 30.4.2B, Note 7, p. 337]

Garage Door Wind Loads
 for a Building with 30-foot Mean Roof Height
 Exposure C
 Tables 1609.7(1) & (2), and Section 1609.3.1



For Effective Wind Areas between those given, values may be interpolated. Otherwise use the value associated with the lower Effective Wind Area.
 End Zone (a) shall be the smaller of 10% of Least Hor. Dist. or 40% of Mean Roof Height (h_r), but not less than 4% of Least Hor. Dist. or 3 ft.
 Identify the zone per the figure or information by others. Any questionable zone is to be considered the more critical zone.
 Design is based on the 3-second gust (wind velocity) for Risk Category II (general residential & commercial construction) per FBC 1620.2. Brownard. These tables not for use with essential facilities or assembly occupancies.