

**ANDALAY
SOLAR PANELS**

**ATKINS ENGINEERS
228 ATLANTIC BLVD
KEY LARGO, FL 33037**

305-444-6260

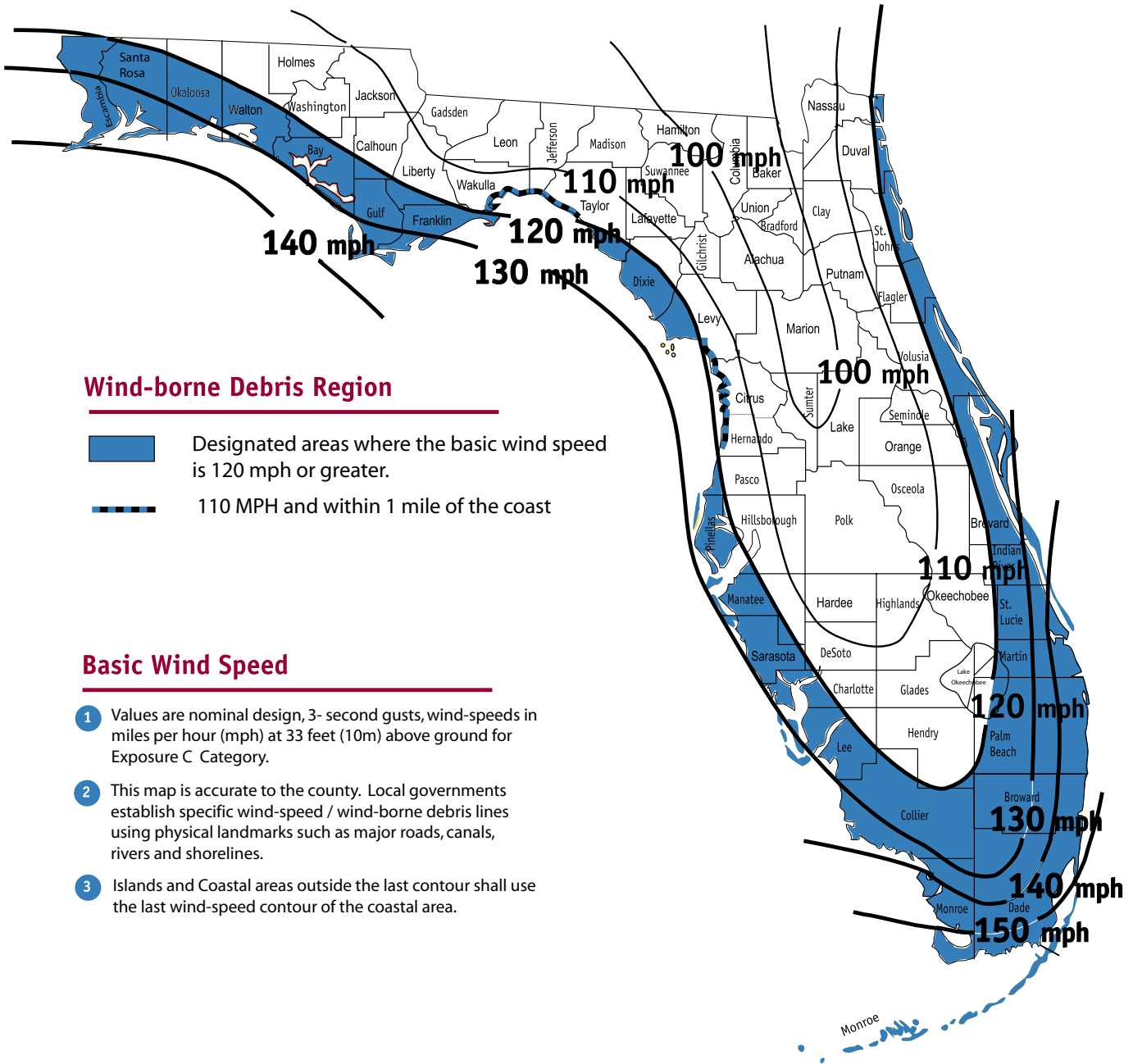
ANTONIO J RIVA P.E.

P.E. #01565

11/21/09

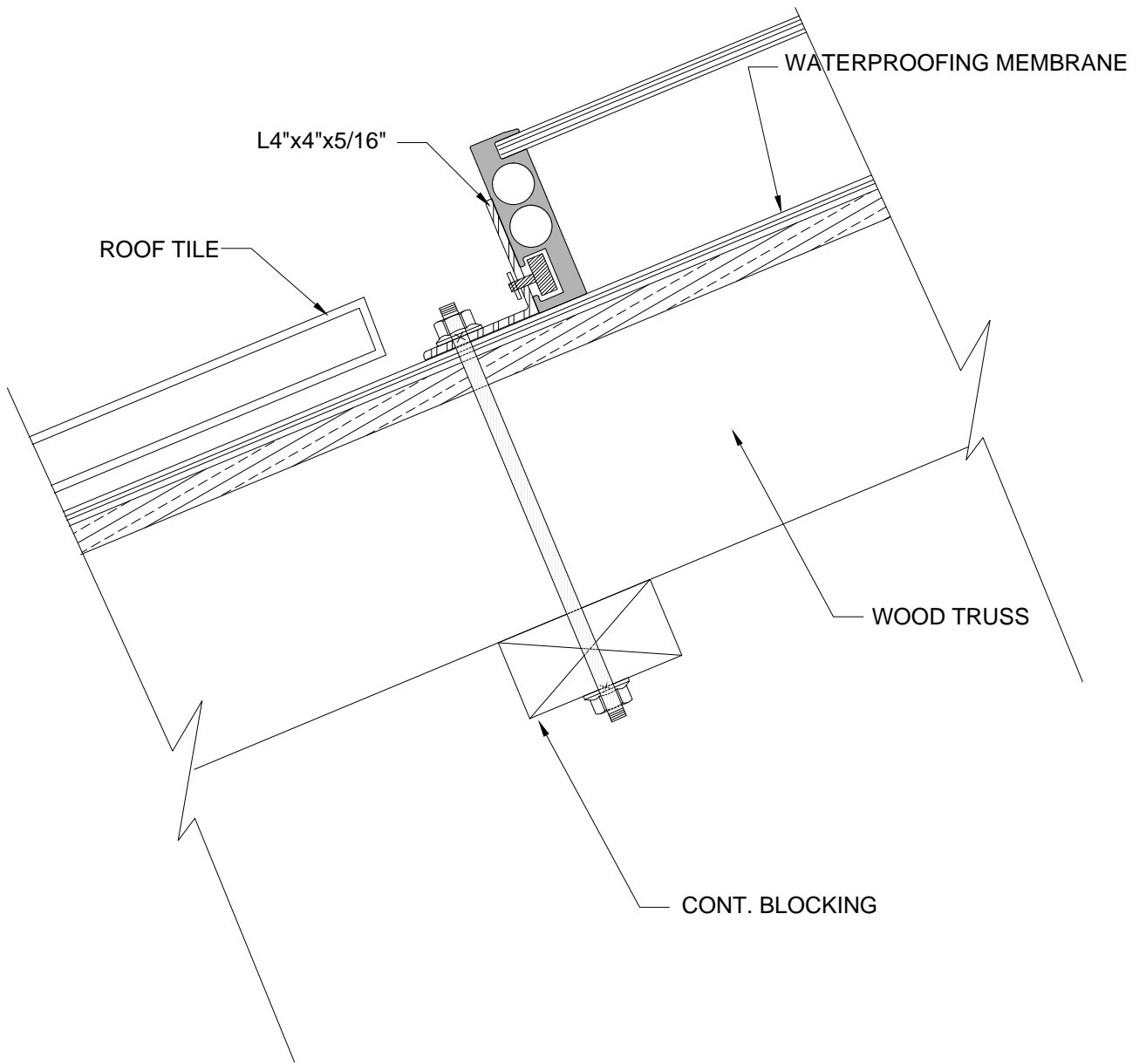
State of Florida

Wind-Borne Debris Region



Uplift Pressures - FLORIDA

Model	Wind Speed mph	Field - No internal pressure PSF	Field - w/ internal pressure PSF	Edge - No internal pressure PSF	Edge - w/ internal pressure PSF
2 Story	130	-33.4	-40.1	-63.1	-69.7
2 Story	146	-42.1	-50.5	-79.6	-88.0



NOT TO SCALE

ANDALAY

SOLAR PANEL

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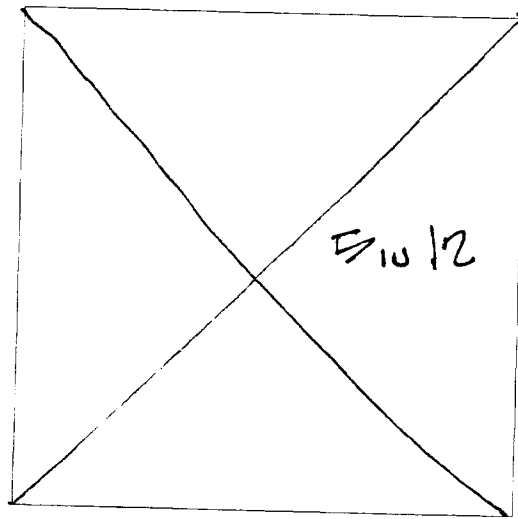
228 Atlantic Blvd. Key Largo, Fl. 33037
 Key Largo (305) 451-4556
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WWW.AE-FL.COM

Date:
 11/11/09

sk-1
 1 OF 1

Project Name: - Solar Panel



2 story
146 MPH.

Location: Miami Florida

By: AJR

Start Date: 9/30/2009

Comments:

Local Information

ASCE7-05

Wind Dir.	Exposure
1	C
2	C
3	C
4	C

Basic Wind Speed: 146 mph

Topography: None

Optional Factors

This project uses load combinations
from ASCE 7.

Section - Main Section

Enclosure Classification: Enclosed

Building Category: II

Wall	Length(ft)	Overhang(ft)
1	40.0	0.0
2	40.0	0.0
3	40.0	0.0
4	40.0	0.0

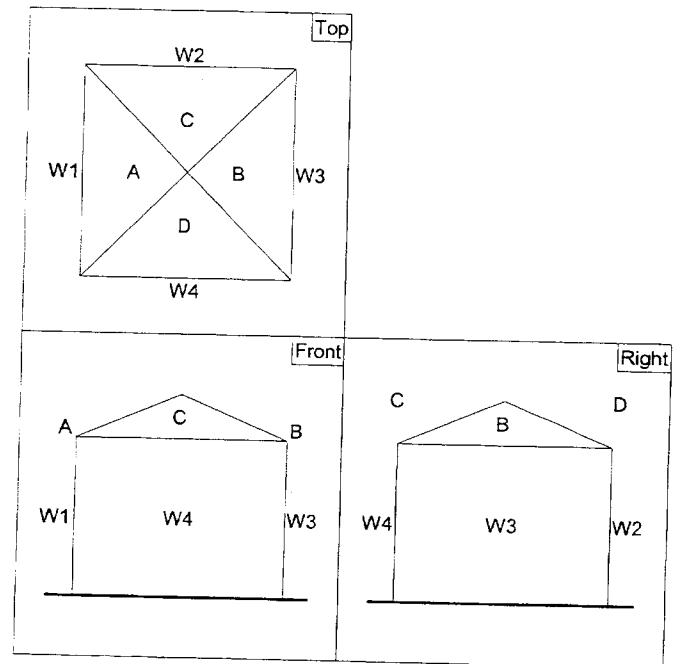
Eave Height: 30 ft

Parapet Height: 0 ft

Parapet Enclosure: Solid

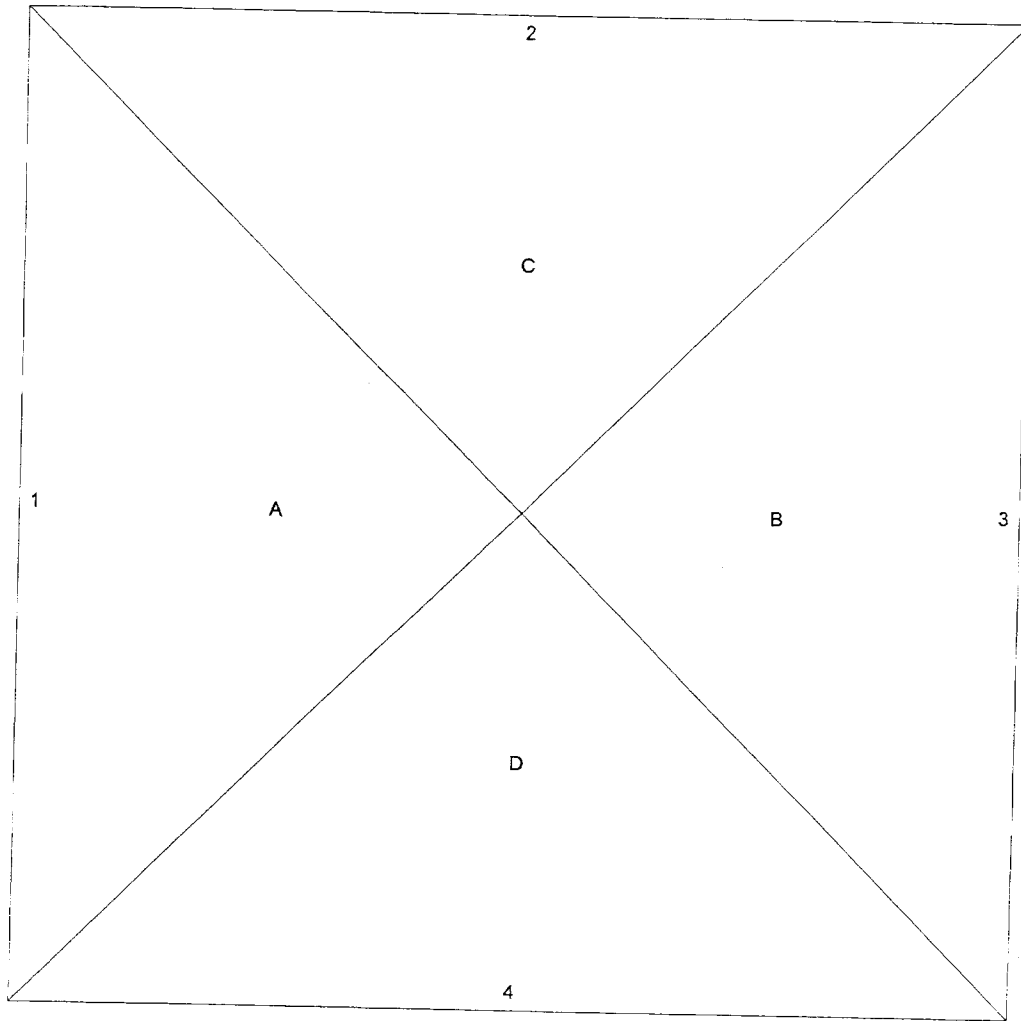
Roof Shape: Hipped

Roof	Slope(:12)
A&B	5.0
C&D	5.0



Composite Drawing

ASCE7-05



Components and Cladding Input

Component Description	Wall/Roof	Surface Label	Zone	Span(ft)	Width(ft)	Area(sqft)
Solar Panel	Roof	A	(All)			10.00

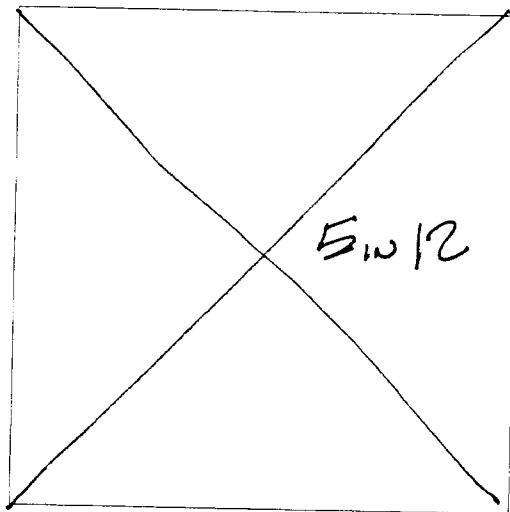
Components and Cladding Output

Component Description	Surface	Zone	z(ft)	q(psf)	GCp	GCpi	ExtPres(psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
Solar Panel	A	1	34.2	46.8	0.50	0.18	23.4	15.0	31.8
			34.2	46.8	-0.90		-42.1	-50.5	-33.7
		2	34.2	46.8	0.50		23.4	15.0	31.8
			34.2	46.8	-1.70		-79.6	-88.0	-71.1
		3	34.2	46.8	0.50		23.4	15.0	31.8
			34.2	46.8	-1.70		-79.6	-88.0	-71.1

No internal pressure

w/ Int. pressure

Project Name: - Solar Panel



2 story
130 mph

Location: Miami Florida

By: AJR

Start Date: 9/30/2009

Comments:

Local Information

Wind Dir.	Exposure
1	C
2	C
3	C
4	C

Basic Wind Speed: 130 mph

Topography: None

Optional Factors

This project uses load combinations
from ASCE 7.

Section - Main Section

Enclosure Classification: Enclosed

Building Category: II

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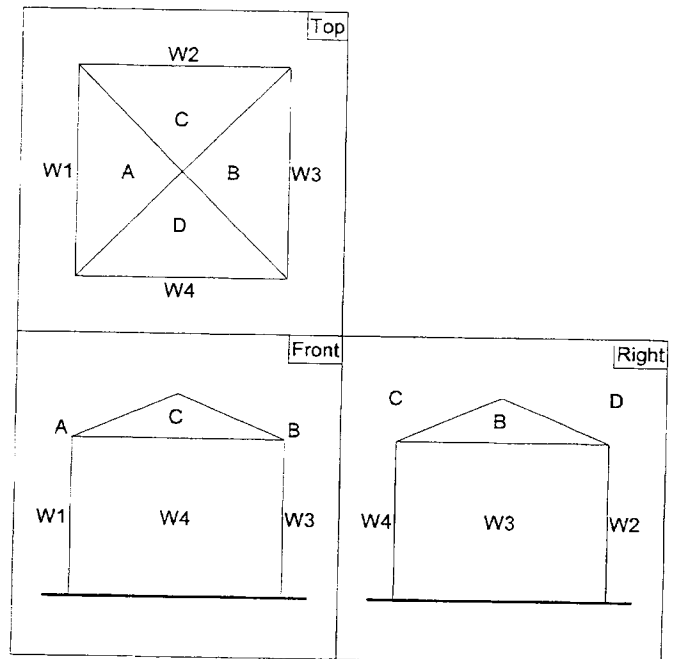
Eave Height: 30 ft ✓

Parapet Height: 0 ft

Parapet Enclosure: Solid

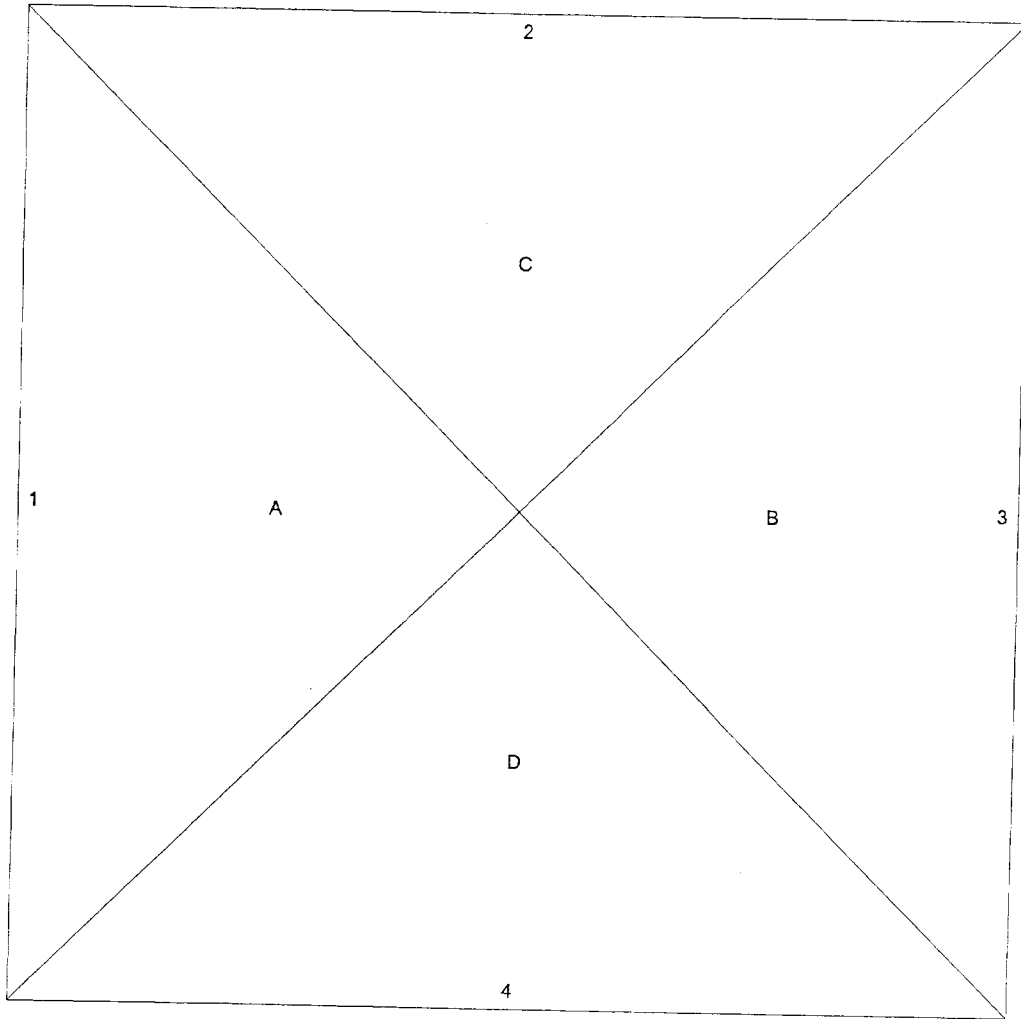
Roof Shape: Hipped

Roof	Slope(:12)
A&B	5.0
C&D	5.0



Composite Drawing

ASCE7-05



Components and Cladding Input

Component Description	Wall/Roof	Surface Label	Zone	Span(ft)	Width(ft)	Area(sqft)
Solar Panel	Roof	A	(All)			10.00

Components and Cladding Output

Component Description	Surface	Zone	z(ft)	q(psf)	GCp	GCpi	ExtPres(psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
Solar Panel	A	1	34.2	37.1	0.50	0.18	18.6	11.9	25.2
			34.2	37.1	-0.90		-33.4	-40.1	-26.7
		2	34.2	37.1	0.50		18.6	11.9	25.2
			34.2	37.1	-1.70		-63.1	-69.7	-56.4
		3	34.2	37.1	0.50		18.6	11.9	25.2
			34.2	37.1	-1.70		-63.1	-69.7	-56.4

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- SOLAR PANEL

Anadalay Solar Panel

Typical roof suction pressure:

Miami

2 story

146 mph

exp C

Spacing at 24" on center

Uplift Pressure

wu := 88

Stresses at Top of Section:

Reaction

$$R := wu \cdot \frac{24}{2 \cdot 12} \quad \text{LBS}$$

$$Mc := R \cdot 0.30$$

$$Mc = 26 \quad \text{Lb in}$$

Section Modulus

$$b := 12$$

$$d := 0.07$$

$$S_{xx} := b \cdot \frac{d^2}{6} \quad \text{In}^3$$

$$f := \frac{Mc}{S_{xx}}$$

$$f = 2694 \quad \text{psi} \quad \text{OK}$$

Allowable tension in bending = 9,000 psi

Top Section (0.07 inches thick) receiving panel is capable of resisting 88 psf of wind suction

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Check : St Proto frame long 10035 R16

$$S_x := 0.296$$

Max Support distance = 24 inches

$$w_r := w_u \cdot \frac{32}{12} \cdot 0.50$$

$$w_r = 117$$

Moment

$$M_u := \frac{1}{8} \cdot w_r \cdot \left(\frac{24}{12} \right)^2$$

$$M_u = 59$$

Stresses

$$f_r := \frac{M_u}{S_x}$$

$$f_r = 198$$

OK

Check Angle Bracket spaced at 24" max

$$R_r := w_r \cdot \frac{24}{12} \quad \text{lbs}$$

$$R_r = 235$$

$$S_b := 1.75 \cdot \frac{25^2}{6}$$

$$S_b = 0.02$$

$$M_b := R_r \cdot 2$$

$$M_b = 469$$

$$f_b := \frac{M_b}{S_b}$$

$$f_b = 25746$$

NG

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Check Angle Bracket spaced at 24" max
Increase angle width to 4.0" wide

$$Rr := wr \cdot \frac{24}{12} \quad \text{lbs}$$

$$Sb := 4.0 \cdot \frac{\left(\frac{5}{16}\right)^2}{6}$$

$$Sb = 0.07$$

$$Mb := Rr \cdot 2$$

$$Mb = 469$$

$$fb := \frac{Mb}{Sb}$$

$$fb = 7209$$

L shape angle : 4" wide x 5/16" thick