# Wind Loading-5/16in Petrarch

The most common causes of any panel system failure are inadequate fastening and insufficient studs leading to excessive deflection or stress in the panel. This Data Sheet provides a simple step-by-step method of checking the panel's structural integrity.

**1.** Determine the maximum wind pressure (or suction) to be imposed on the panels.
**2.** Determine the ideal or desired panel layout, i.e. width and height required to suit the project.
**3.** From Graph 1 read off the vertical scale the appropriate wind pressure and determine the maximum allowable unsupported panel span limit. Check that this is in excess of proposed stud centers.
(e.g. 40-lbs/sq. ft. (pressure or suction) wind loading — maximum allowed panel span (stud centers) is 24ins.
**4.** From Diagram 2 for single span and Diagram 3 for double or triple span panels, calculate the maximum load to be carried by the fasteners.

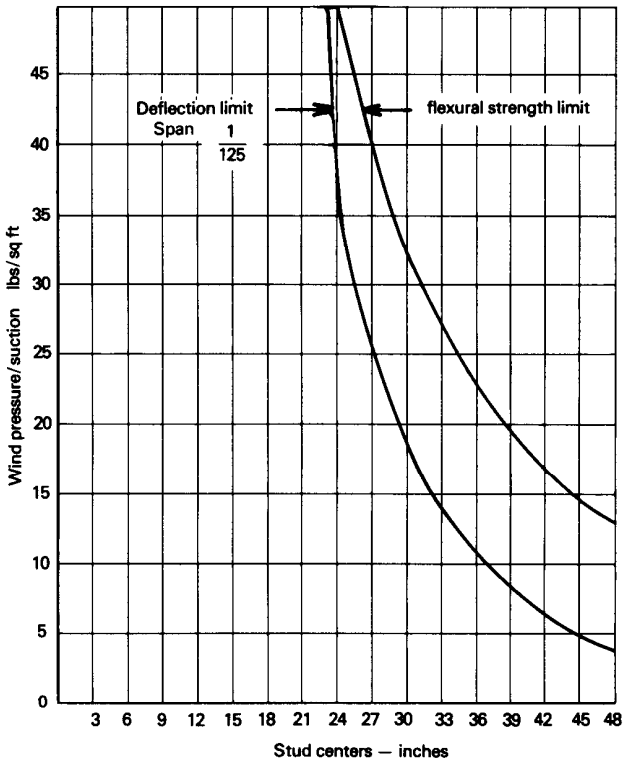
### Single span panels (diagram 2)

In this case, one of the edge screws can easily be identified as carrying the maximum load.
The load on the screw can be determined from —
Load on screw = A x B x Wind load (suction)/sq. ft.
where — A = ½ panel width
B = c/c x 1.25

### Double or triple span panels (diagram 3)

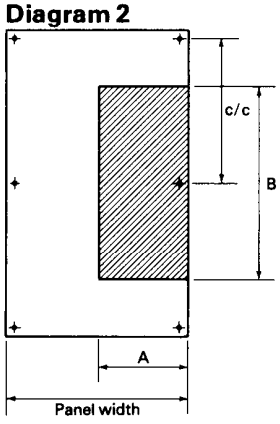
In all such cases it will be found that one of the central screws will carry the most load and can be determined from —
Load on screw = A x B x Wind load (suction)/sq. ft.
where — A = $c/c^1$ x 1.25
B = $c/c^2$ x 1.25

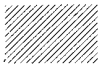
### Deflection/flexural strength




**Graph 1**

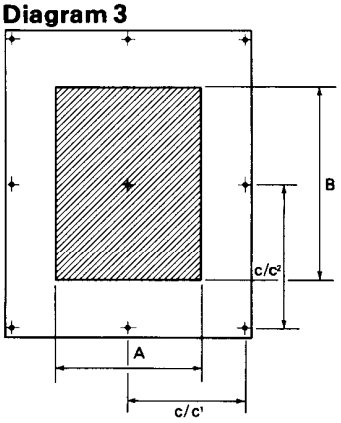
**Diagram 2**



Indicates area of wind loading imposed on fastener.

**Diagram 3**




CEP PANELS, INC. | Quality Exterior Architectural Wall Panels
22 East Chicago Avenue | Suite 210 | Naperville, Illinois 60540
(800) 450-6099 | (630) 355-4040 | Fax: (630) 355-4995
www.cep-panels.com | info@cep-panels.com

**5.** From table below, check that the safe working load of the fastener selected exceeds the maximum load calculated from (4) overleaf. If the actual load is greater than the safe working load, reduce the centers (usually the vertical center) of the fasteners and re-check as in (4) above.

**Recommended maximum load per screw**

| | | |
|---|---|---|
| No. 10 x 1½ in. screw into wood | — | 142 lbs. |
| Buildex S12 Buglehead x 1¼ in. screw into steel | — | 151 lbs. |
| Buildex S12 Trimhead x 1⅝ in. screw into wood | — | 84 lbs. |
| Buildex Trimhead 'S' screw into steel | — | 57 lbs. |
| Buildex Std No. 10 self-tap screw into steel | — | 138 lbs. |
| Buildex Tapcon No. 2 self-tap screw into steel | — | 180 lbs. |

**General guidance notes**

1. The vertical c/c of fasteners should not normally exceed 24 in. when using the gasket joint sealing system, and 30 in. when the joints are to be caulked.

2. To ensure that the safe working loads of screws are obtained, holes should be drilled strictly in accordance with our recommendations (see Data Sheet 78/D1).

3. In each case the safe work load of the screws listed are based on the failure mode being the screwhead pulling through the sheet. It is therefore important to check with the screw manufacturer the relevant pull-out value exceeds the values shown (this is dependent on thickness of stud and, in the case of wood studs, the length of screw).

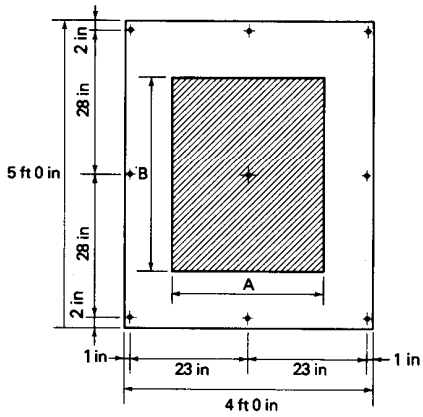
4. Edge distances from centre of hole to edge of panel should not normally be less than 1 in. and at a corner should be a minimum of 2 in. from one edge and 1 in. from the other.

**Example**

*Step 1*

Fascia Panels.
Wind pressure/suction — 30 lbs/sq. ft.
Joints to be caulked

*Step 2*




*Step 3*

Check stud supports.
30 lbs. pressure vertical scale graph 1 horizontal scale max. span 26 in. therefore OK.

*Step 4*

Load on screw $A = \frac{23'' \times 1.25}{12} = 2.40$ ft.

$B = \frac{28'' \times 1.25}{12} = 2.92$ ft.

Wind load = 2.4 x 2.92 x 30-lbs/sq. ft. = 210-lbs. load on screw

*Step 5*

Check screws against recommended maximum load per screw.
No screws will take this load.
Re-check with 3 extra screws to reduce c/c² from 28 in. to 18½ in. —

$B = \frac{18.5 \times 1.25}{12} = 1.93$ ft.

Wind load = 1.93 x 2.4 x 30-lbs/sq. ft. = 139-lbs.
OK to use No. 10 screws into wood or steel or Buildex S12 bugle head into steel.

Petrarch®

**CEP PANELS, INC.**
22 East Chicago Av. Suite 210
Naperville, IL 60540
(800) 450-6099 | (630) 355-4040 | Fax: (630) 355-4995

# WIND VELOCITY TO STATIC PRESSURE CONVERSION TABLE

| Wind Velocity (MPH) | Static Pressure (Inches of Water) | Reading On Water Manometer | Static Pressure (lbs. per sq. ft.) |
|---|---|---|---|
| 5 | .01 | .005 | .062 |
| 10 | .04 | .020 | .249 |
| 15 | .10 | .050 | .561 |
| 20 | .19 | .095 | .998 |
| 25 | .30 | .150 | 1.560 |
| 30 | .43 | .215 | 2.246 |
| 35 | .58 | .290 | 3.057 |
| 40 | .76 | .380 | 3.993 |
| 45 | .97 | .485 | 5.054 |
| 50 | 1.20 | .600 | 6.240 |
| 55 | 1.45 | .725 | 7.550 |
| 60 | 1.72 | .860 | 8.985 |
| 65 | 2.02 | 1.010 | 10.545 |
| 70 | 2.35 | 1.175 | 12.230 |
| 75 | 2.70 | 1.350 | 14.040 |
| 80 | 3.07 | 1.535 | 15.974 |
| 85 | 3.46 | 1.730 | 18.033 |
| 90 | 3.88 | 1.940 | 20.217 |
| 95 | 4.33 | 2.165 | 22.526 |
| 100 | 4.80 | 2.400 | 24.960 |
| 105 | 5.29 | 2.645 | 27.510 |
| 110 | 5.80 | 2.900 | 30.201 |
| 115 | 6.34 | 3.170 | 33.009 |
| 120 | 6.91 | 3.455 | 35.942 |
| 125 | 7.50 | 3.750 | 39.000 |
| 130 | 8.11 | 4.055 | 42.182 |
| 135 | 8.74 | 4.370 | 45.489 |
| 140 | 9.40 | 4.700 | 48.921 |
| 145 | 10.09 | 5.045 | 52.478 |
| 150 | 10.80 | 5.400 | 56.160 |
| 155 | 11.53 | 5.765 | 59.960 |
| 160 | 12.28 | 6.140 | 63.897 |
| 165 | 13.06 | 6.530 | 67.953 |
| 170 | 13.87 | 6.935 | 72.134 |
| 175 | 14.70 | 7.350 | 76.440 |
| 180 | 15.55 | 7.775 | 80.870 |
| 185 | 16.42 | 8.210 | 85.425 |
| 190 | 17.32 | 8.660 | 90.105 |
| 195 | 18.25 | 9.125 | 94.910 |
| 200 | 19.20 | 9.600 | 99.840 |

FORMULAS:
$P\text{-}0.000+8\ V^2$

LBS/SQ. FT. - $.00048\ V^2 \times 5.202$ (or)
LBS/SQ. FT. - $.0024PG\ V^2$ as used above

P - Pressure in inches of water
V - Wind velocity (mph)

$$V = \sqrt{\frac{P}{0.00048}}$$