				47.3 ft²	60.1 ft²
-	-	-	-	Flush (Letters)	Flush (Box)
				Busy Bee	Busy Bee Logo

SIGN INSTALLER INSTRUCTIONS

1. Verify (ft²) (flush, raceway, or pin) (solid area or letters)
2. Select fastener for wall structure.
3. Evenly space fasteners over whole sign area.

USE MORE FASTENERS IF THE SIGN NEEDS IT! ONLY ATTACH TO STRUCTURAL WALL MATERIAL (UNO). Shape and strength of sign may require more fasteners. Example: "I" may need 2 fasteners, "J" - 3, "H" - 4, "W" - 5; and 1/8" thick plastic may need more fasteners to avoid bending. Follow sign manufacturer's instructions and code requirements for placement of fasteners. At least put one in each corner top and bottom. Follow fastener manufacturer's instructions and code requirements for installation.

CALCULATION: Minimum Number of Fasteners Evenly Spaced Over Whole Sign

(Fasteners = Wind Force on Whole Sign Area / Fastener Allowable Tension)

Minimum Fasteners for Whole Sign

(Use More if Sign Needs It)

Busy Bee	Busy Bee Logo	Fastener	Wall Structure	Pull	Fastener Installation
4	7	3/8" or 1/2" ThruBolt	Structural Wall	200	3/8" or 1/2" bolt, nut, washer thru wall; CMU, brick, concrete, 2x4 or unistrut backer
8	13	3/8" or 1/2" ThruBolt	Wood Sheathing	100	3/8" or 1/2" bolt, nut, and washer thru 1/2" OSB or plywood sheathing
4	7	3/8" Lag Shield	Concrete	200	3/8" - 16 screw in hole, tap anchor flush.
15	25	3/8" Lag Shield	Grout Filled CMU	50	3/8" - 16 screw in hole, tap anchor flush.
5	8	1/4" Tapcon	Concrete	171	1/4" Tapcon, min 1.5" embedment, protect from moisture.
36	60	1/4" Tapcon	Grout Filled CMU	21	1/4" Tapcon, min 1.25" embedment, protect from moisture.
10	16	#12 Metal Screw	20ga CFS Frame	83	#12-14 Self-drilling screws 3 threads thru 20ga steel frame.
19	32	#12 Wood Screw	5/8" Plywood	40	#12-14 wood screw or SMS into 5/8" OSB or plywood.
5	8	Timber Screw	Wood Framing	170	FastenMaster TimberLOK, 1/4" thread wood screw 1.25" in wood
10	17	3/8" Toggle Bolt	Hollow CMU	75	3/8" Toggler - Snaptoggle BC, toggle anchor - into hollow CMU
15	25	3/8" Toggle Bolt	5/8" plywood	50	3/8" Toggler - Snaptoggle BC, toggle anchor - into 5/8" plywood
4	7	1/2"Sleeve Anchor	Concrete	190	1/2" HILTI HLC-H or HLC-HX304SS3/8 Sleeve Anchor, 1.5" embed
4	7	1/2"Sleeve Anchor	Grout Filled CMU	190	1/2" HILTI HLC-H or HLC-HX304SS3/8 Sleeve Anchor, 1.5" embed
15	25	3/8" Stud Epoxy	Hollow CMU	50	3/8" thd rod stud in HIT-SC 16x50 screen tube, in Hollow CMU, Hilti epoxy HIT-HY-270, or equal.
15	25	3/8" Stud Epoxy	Concrete	50	3/8" thd rod stud in Concrete, Hilti epoxy HIT-HY-270, or equal. 2" embed.
		Stud Thru	1/2" Plywood Sheathing	60	3/16"pin-stud, nut, and washer thru 1/2" plywood sheathing or 20ga. metal building
		Stud Glued	Wall (test)	25	3/16"pin-stud glued in wall, LIQUID NAILS FUZE-IT, LN-2000

IMPORTANT - Adhesives and toggles are strong but none have code approval for structural applications. Sign installer must test these connection strengths. Pull on fastener 2.5 * Allowable Tension. Use tripod, game scale, and hooks.

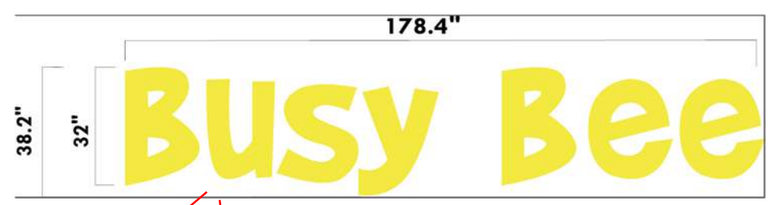
signengineering@gmail.com

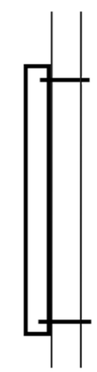
Florida, FBC 7th Ed (2020), Sect 1609 wind		ref ASCE 7-16
II	Risk Category	I, Low; II, Normal hazard to human life; III, Substantial hazard to human life; IV, Essential, emergency, critical
120	Wind Speed	Basic Wind Speed, Ultimate, mph, from ASCE 7-16, Fig 26.5-1A, Risk II; or Fig.26.5-1B, Risk III & IV
C	Exposure	Wind Exposure; C, House size obstructions for > 600 ft; D, no obstructions > 5000'
30	Sign Height	Sign Height Above Ground, ft, H; Sign cannot be higher than top of wall or 60'. For multiple signs use worst case.
See Table	Sign Area	Gross Sign Area, ft², means the overall area surrounding and including all sign letters and logos.

WIND LOAD CALC: ASCE 7-16, Section 29.4.2, Solid Attached Signs

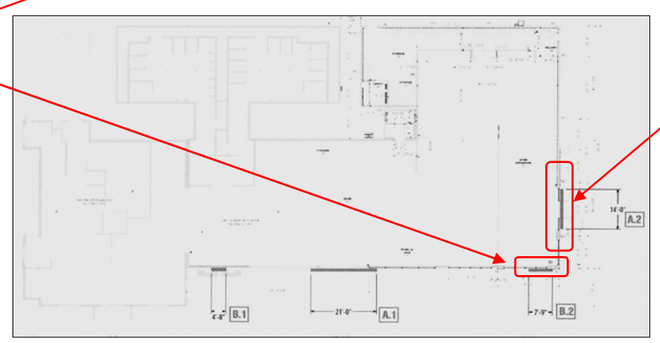
Components & Cladding wind pressure on solid sign attached flat against wall or parallel to wall, < 3' from surface and > 3' from edge, equals wall wind pressure from ASCE 7-16, Section 30.4.

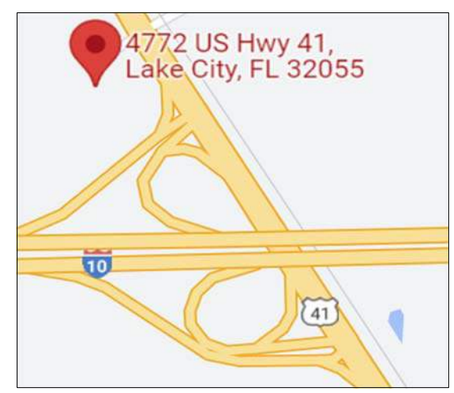
See Table		Wind Force on Sign; $F = P_{ASD}$ * Net Sign Area
-26	psf	Wind Pressure; P_{ASD} = Pult * 0.6 per ASCE 7-16 section 2.4.1
-44	psf	Wind Pressure; $P_{ult} = q_{h,ult}*GC_p$; C&C, ASCE 7-16, Eq 30.3-1
31	psf	Velocity Pressure; $q_{h,ult} = 0.00256*K_z*K_{zt}*K_d*V^2_{ult}$; ASCE 7-16, Eq 26.10-1
0.98		Veloc Pres Expos Coeff; K_z=2.01*(H/900)^(2/9.5)ExpC, (700&11.5)ExpD; ASCE 7-16, Table 26.10-1
-1.4		Ext. Pressure Coeff; GC_p=-1.4(<60ft) -1.8(>60ft) Zone 5, 1 ft² area, ASCE 7-16, Figure 30.3-1, 30.5-1
0.85		Wind Direction Factor; K_d = .85 for attached signs, ASCE 7-16, Table 26.6-1
0		Int. Pressure Coeff; GC_{pi} = 0, sign flat against wall, ASCE 7-16, Sec 29.3.2
1.0		Topographic Factor; Kzt = 1 for flat ground, no hill, ridge, or escarpment >15'; = 2 for corners or edges
5	psf	Sign Weight; must be less than 5 pounds per sq.ft. net area.





93"





4	4	4	4	4	6	Min Fasteners
				750	1245	Wind Force
				28	47	Net Area sqft
100	100	100	100	60	79	% Net Area
0	0	0	0	47	60	AREA SQ FT

Mark Disosway, Professional Engineer, Florida License 53915

This item has been digitally signed and sealed by Mark Disosway, PE, on the digital signature date. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies. UNO valid for one sign each type at this location.

MARK D DISOSWAY III LICENSE No 53915 DIGITAL SIGNATURE CLICK HERE TO VERIFY STATE OF FLORIDA PROFESSIONAL ENGINEER

2023.01.04 15:33:14 -05'00'

This seal for structural engineering per Scope of Work (Fasteners only)

SCOPE OF WORK

ENGINEERING: Calculation of minimum fasteners, ONLY. (See equation).
This seal IS NOT: architecture, electric, or structure of sign and wall.
By using this engineering sign installer, manufacturer, and owner agree to:
1. Select fastener from table based on wall structure. 2. Install fasteners per fastener manufacturer instructions in locations required by sign manufacturer; this may mean more fasteners are required than shown in table. 3. Make sure sign and wall meets building code, sign code, and UL. Verify stated wind (speed, risk, exp, topo), sign (size, area, location on wall, max weight), wall (materials and construction).

PASTED IMAGES, DETAILS, DRAWINGS, AND NOTES ON THIS SHEET ARE NOT ENGINEERED OR REVIEWED. They were pasted in at customer's request to help relate fastener engineering to the job.

signengineering@gmail.com
Mark Disosway, PE, 163 SW Midtown Place, Ste 103, Lake City, Florida 32025 386-754-5419

Job # 221503

WALL SIGN: Flat on wall max 12" thick.

Signcraft & More, Inc.

Busy Bee #7
4772 NW Hwy 41
Lake City, FL 32055

Job221503,Sign1,Sht1of1,Rev0,Day230104