

				47.3 ft²	60.1 ft²	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.		signengineering@gmail.com				
				Flush (Letters)	Flush (Box)								
				Busy Bee	Busy Bee Logo				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.	Florida, FBC 7th Ed (2020), Sect 1609		ref ASCE 7-16	
						CALCULATION: Minimum Number of Fasteners Evenly Spaced Over Whole Sign (Fasteners = Wind Force on Whole Sign Area / Fastener Allowable Tension)		wind					
Minimum Fasteners for Whole Sign (Use More if Sign Needs It)						Fastener	Wall Structure	Pull	Fastener Installation		II	Risk Category	I, Low; II, Normal hazard to human life; III, Substantial hazard to human life; IV, Essential, emergency, critical
				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	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	
				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	C	Exposure	Wind Exposure; C, House size obstructions for > 600 ft; D, no obstructions > 5000'	
				4	7	3/8" Lag Shield	Concrete	200	3/8" - 16 screw in hole, tap anchor flush.	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.	
				15	25	3/8" Lag Shield	Grout Filled CMU	50	3/8" - 16 screw in hole, tap anchor flush.	See Table	Sign Area	Gross Sign Area, ft², means the overall area surrounding and including all sign letters and logos.	
				5	8	1/4" Tapcon	Concrete	171	1/4" Tapcon, min 1.5" embedment, protect from moisture.	WIND LOAD CALC: ASCE 7-16, Section 29.4.2, Solid Attached Signs			
				36	60	1/4" Tapcon	Grout Filled CMU	21	1/4" Tapcon, min 1.25" embedment, protect from moisture.	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.			
				10	16	#12 Metal Screw	20ga CFS Frame	83	#12-14 Self-drilling screws 3 threads thru 20ga steel frame.	See Table	Wind Force on Sign; F = P _{ASD} * Net Sign Area		
				19	32	#12 Wood Screw	5/8" Plywood	40	#12-14 wood screw or SMS into 5/8" OSB or plywood.	-26	psf	Wind Pressure; P _{ASD} = P _{ult} * 0.6 per ASCE 7-16 section 2.4.1	
				5	8	Timber Screw	Wood Framing	170	FastenMaster TimberLOK, 1/4" thread wood screw 1.25" in wood	-44	psf	Wind Pressure; P _{ult} = q _{h,ult} * GC _p ; C&C, ASCE 7-16, Eq 30.3-1	
				10	17	3/8" Toggle Bolt	Hollow CMU	75	3/8" Toggler - Snaptoggle BC, toggle anchor - into hollow CMU	31	psf	Velocity Pressure; q _{h,ult} = 0.00256 * K _e * K _{zt} * K _d * V _{ult} ²; ASCE 7-16, Eq 26.10-1	
				15	25	3/8" Toggle Bolt	5/8" plywood	50	3/8" Toggler - Snaptoggle BC, toggle anchor - into 5/8" plywood	0.98		Veloc Pres Expos Coeff; K _e = 2.01 * (H/900)^(2/9.5) Exp C, (700&11.5) Exp D; ASCE 7-16, Table 26.10-1	
				4	7	1/2" Sleeve Anchor	Concrete	190	1/2" HILTI HLC-H or HLC-HX304SS3/8 Sleeve Anchor, 1.5" embed	-1.4		Ext. Pressure Coeff; GC _e = -1.4 (<60ft) -1.8 (>60ft) Zone 5, 1 ft² area, ASCE 7-16, Figure 30.3-1, 30.5-1	
				4	7	1/2" Sleeve Anchor	Grout Filled CMU	190	1/2" HILTI HLC-H or HLC-HX304SS3/8 Sleeve Anchor, 1.5" embed	0.85		Wind Direction Factor; K _d = .85 for attached signs, ASCE 7-16, Table 26.6-1	
				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.	0		Int. Pressure Coeff; GC _{pi} = 0, sign flat against wall, ASCE 7-16, Sec 29.3.2	
				15	25	3/8" Stud Epoxy	Concrete	50	3/8" thd rod stud in Concrete, Hilti epoxy HIT-HY-270, or equal. 2" embed.	1.0		Topographic Factor; K _{zt} = 1 for flat ground, no hill, ridge, or escarpment >15'; = 2 for corners or edges	
						Stud Thru	1/2" Plywood Sheathing	60	3/16" pin-stud, nut, and washer thru 1/2" plywood sheathing or 20ga. metal building	5	psf	Sign Weight; must be less than 5 pounds per sq.ft. net area.	
						Stud Glued	Wall (test)	25	3/16" pin-stud glued in wall, LIQUID NAILS FUZE-IT, LN-2000	FLUSH MOUNT			
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.													



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.

2023.01.04
15:33:14
-05'00'

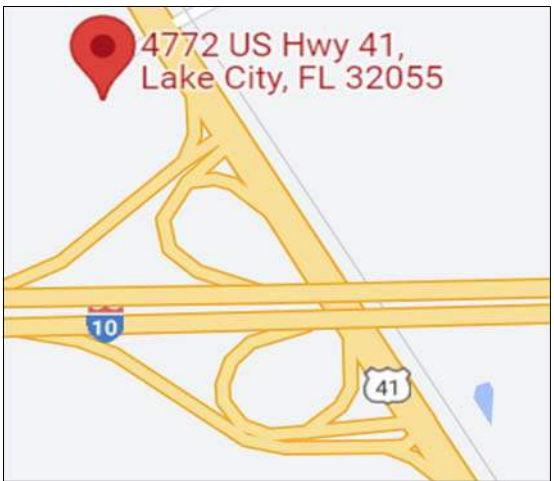
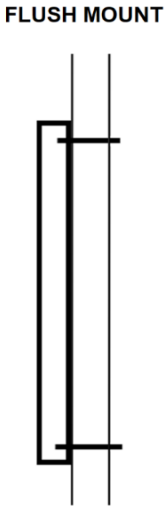
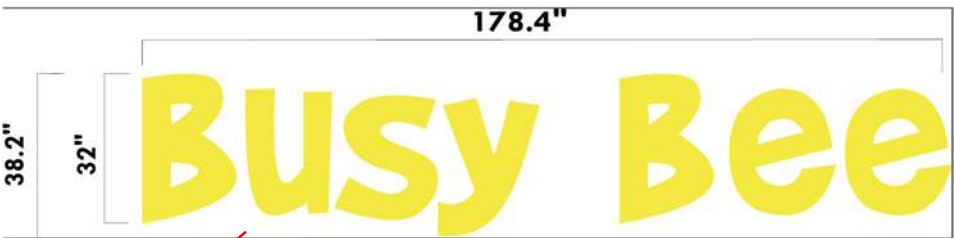
This seal for structural engineering per Scope of Work (Fasteners only)
SCOPE OF WORK
ENGINEERING: Calculation of minimum fasteners, ONLY. (See equation).
This seal IS NOT: architecture, electric, or structure of sign and wall.
By using this engineering sign installer, manufacturer, and owner agree to:
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



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