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Client: Masonite
Report: 512746D
Date: 10/4/2023

Test Report:

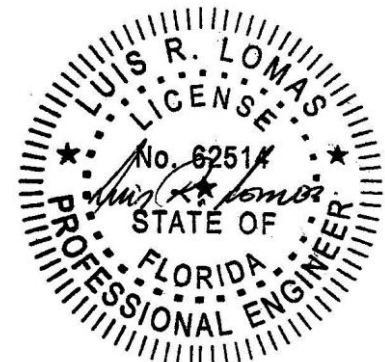
Product: 6'8" and 8'0" opaque door two-piece steel frame

Scope:

This analysis provides calculations, quantities, and spacing requirements for installing product to substrate, and it applies only to the product described herein. These calculations comply with requirements of the Florida Building Code 8th edition (2023).

Anchor capacity in withdrawal or pullout condition:

Fastener type:	#8	Wood screw	(NDS 2018)		
Wood screw length:	1.50	in		Screw diameter:	D= 0.164 in
Thread length:	1.000	in		Embedment:	1.50 in
Main member type:	Spruce-Pine-Fir			Effective embedment:	p _m = 1.000 in
Tabulated withdrawal design value:	W =	82 lbs/in		Duration Factor:	C _D = 1.60
Allowable Design Value (W _p C _D):	W' =	131 lbs/anchor			
Fastener type:	#10 Tek screw				
Substrate:	18 GA, Steel				
Tabulated design value:	W =	499 lbs			
Safety factor:	F _s =	4			
Allowable Design Value (W _{F_s}):	W' =	124 lbs/anchor			
Fastener type:	#10		(Calculations per 2017 Aluminum Design Manual)		
Nominal screw diameter:	D	0.190 in		Nominal hole diameter:	D _h 0.142 in
Root diameter:	D _r	0.138 in		Thread stripping area:	A _{sn} 0.401 in ²
Nominal screw head diameter:	D _{ws}	0.359 in		Root area:	A _r 0.0149 in ²
Screw nominal tensile strength (.75F _u):	F _{nt}	90 ksi		Full thread engagement:	L _e 0.060 in
Screw location coefficient:	C	1.0		Safety factor:	Ω 3
Side member material:	Metal framing			Main member material:	Metal framing
Thickness:	t ₁	0.036 in		Thickness:	t ₂ 0.060 in
Ultimate tensile strength:	F _{tu2}	70.00 ksi		Yield strength:	F _{ty2} 50.00 ksi
Thickness coefficient:	K _s	1.01		Ultimate tensile strength:	F _{tu2} 70.00 ksi
Screw tension calculations:					
Mode 1 (pull out):	If $0.06 \leq L_e \leq 1.25$ then $R_n = K_s D L_e F_{ty2}$		If $0.125 < L_e < .25$ then $R_n = (1.2 D F_{ty2} (0.25 - t_2) + 1.16 A_{sn} F_{tu2} (L_e - 0.125))$		
	If $0.25 \leq L_e \leq 0.375$ then $R_n = 0.58 A_{sn} t_2 F_{tu2}$		Mode 1:	R _n =	575 lbs
Mode 2 (pull over):	$R_n = C t_1 F_{tu1} (D_{ws} - D_h)$		Mode 2:	R _n =	546 lbs
Mode 3 (ultimate tensile capacity):	$R_n = F_{tu} A_r / 1.25$		Mode 3:	R _n =	1075 lbs
Allowable withdrawal capacity:	W:	182 lbs/anchor			
Minimum anchor capacity:	124 lbs/anchor for head and jambs anchoring				



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Anchor capacity in shear condition:

Fastener type: 1/4 ITW Tapcon

N.O.A. 21-0201.06

Substrate: Concrete

Minimum embedment: 1.75 in

Actual edge distance: 2.50 in

Actual C To C spacing: 6.00 in

Allowable Design Value: $Z' = 382$ lbs/anchor (per interpolation when needed)

Tabulated values

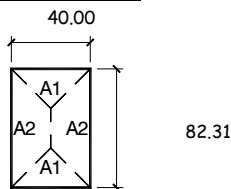
edge distance	spacing (in)	
	2.00	4.00
1.50	248	303
3.00	345	421

Minimum anchor capacity: 382 lbs/anchor

Note: Anchors with the least capacity is used for calculations to qualify anchors with higher capacity.

Anchor calculations, minimum required anchors

Single door 40x82 5/16

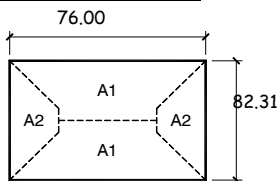


Design pressure: 66.0 psf

Zone	Area (ft ²)	Load (lbs)	Ind. (in)	Max. O.C. (in)	Anchor			Result
					Cap. (lbs)	Qty	Load (lbs)	
A ₁	2.8	183	N/A	N/A	124	2	92	OK
					382	2	92	OK
A ₂	8.7	571	6.00	10.13	124	8	71	OK

head
sill
jamb

Double door 76x82 5/16"



Design pressure: 66.0 psf

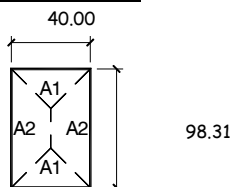
Number of panels: 2

Panel width: 38.0 in

Zone	Area (ft ²)	Load (lbs)	Ind. (in)	Max. O.C. (in)	Anchor			Result
					Cap. (lbs)	Qty	Load (lbs)	
A ₁	13.4	882	N/A	N/A	124	8	110	OK
					382	4	221	OK
A ₂	8.4	552	6.0	10.13	124	8	69	OK

head
sill
jamb

Single door 40x98 5/16



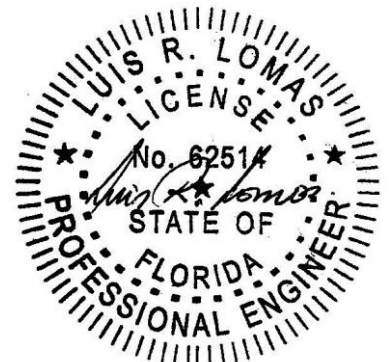
Design pressure: 55.0 psf

Zone	Area (ft ²)	Load (lbs)	Ind. (in)	Max. O.C. (in)	Anchor			Result
					Cap. (lbs)	Qty	Load (lbs)	
A ₁	2.8	153	N/A	N/A	124	2	76	OK
					382	2	76	OK
A ₂	10.9	598	6.00	10.13	124	10	60	OK

head
sill
jamb

ANCHOR UNITS AS FOLLOWS:

1. FOR ANCHORING HEAD AND JAMBS INTO WOOD FRAMING OR 2X BUCK USE #8 WOOD SCREWS WITH SUFFICIENT LENGTH TO ACHIEVE A 1 1/4" MINIMUM EMBEDMENT INTO SUBSTRATE. LOCATE ANCHORS AS SHOWN IN INSTALLATION DRAWING DWG-MA-FL0178-11 AND DWG-MA-FL0179-11
2. FOR ANCHORING HEAD AND JAMBS INTO METAL FRAMING USE #10 SELF DRILLING SCREWS WITH SUFFICIENT LENGTH TO ACHIEVE 3 THREADS MINIMUM BEYOND STRUCTURE INTERIOR WALL. LOCATE ANCHORS AS SHOWN IN INSTALLATION DRAWING DWG-MA-FL0178-11 AND DWG-MA-FL0179-11
3. FOR ANCHORING SILL INTO MASONRY/CONCRETE USE 1/4" TAPCONS WITH SUFFICIENT LENGTH TO ACHIEVE A 1 1/4" MINIMUM EMBEDMENT INTO SUBSTRATE WITH 2 1/2" MINIMUM EDGE DISTANCE. LOCATE ANCHORS AS SHOWN IN INSTALLATION DRAWING DWG-MA-FL0178-11 AND DWG-MA-FL0179-11



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