L. Roberto Lomas P.E.

1432 Woodford Rd.
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Manufacturer: Masonite
Report #: 514008A
Date: 10/10/2017

Test Report: N/A

Product: Double Door with and without sidelites 12'x6'8" (wood 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.

Anchor capacity in shear condition:

Solid members w/ & w/out gap:

a. With threads present in shear plane

Fastener type:	**#10 wood screw**		(NDS 2012, NDS 2015, TR12)				
Nominal diameter:	D:	0.190	in	Gap:	g:	0.0000	in
Root diameter:	Dr:	0.152	in	Moment arm:		0.0000	in
Minimum required penetration:	p:	1.140	in	Screw bending yield strength:	F_{yb} =	80,000	psi
Side member:	Douglas Fir-Larch (G=0.50)			Main member:	Spruce-Pine-Fir (G=0.42)		
Side member thickness:	t_s =	1.000	in	Main member thickness:	t_m =	1.500	in
Side member dowel bearing strength:	F_{es} =	4,650	psi	Main member dowel bearing strength:	F_{em} =	3,350	psi
Side member dowel bearing length:	l_s =	1.000	in	Main member dowel bearing length:	l_m =	1.140	in

Mode I_m		Mode I_s		Mode II		Mode III_m		Mode III_s		Mode IV	
qm =	636.5 lbs/in	qs =	884 lbs/in	A:	0.0007	A:	0.00096	A:	0.00107	A:	0.00135
P =	725.61 lbs	P =	884 lbs	B:	1.07	B:	0.57	B:	0.5	B:	0.000
K_D =	2.400	K_D =	2.400	C:	-427.674	C:	-253.623	C:	-267.699	C:	-93.6
Z_m=	**302 lbs**	**Z_s=**	**368 lbs**	P =	331 lbs	Ms =	46.8 in-lbs	Mm =	46.8 in-lbs		
				K_D =	2.400	P =	297 lbs	P =	319 lbs	P =	263 lbs
Min. Design value:	Z=	110 lbs		**Z=**	**138 lbs**	K_D =	2.400	K_D =	2.400	K_D =	2.400
Duration Factor:	C_D =	1.6				**Z=**	**124 lbs**	**Z=**	**133 lbs**	**Z=**	**110 lbs**

Allowable Design Value (ZC_D): Z'= 175 lbs/anchor

Fastener type: **1/4 ITW Tapcon**
N.O.A. 16-1222.06
Substrate: Hollow block
Minimum embedment: 1.25 in
Actual edge distance: 2.50 in
Actual C To C spacing: 3.00 in
Allowable Design Value: Z''= 155 lbs/anchor (per interpolation when needed)

Tabulated values

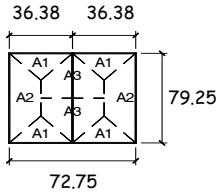
edge distance	*spacing (in)*	
	2.00	*4.00*
2.00	130	161
4.00	163	202

Fastener type: **#10 Tek screw**
Substrate: 18 GA, Steel
Tabulated design value: **Z= 1266 lbs**
Safety factor: F_S= 4
Allowable Design Value (ZF_S): Z'= 316 lbs/anchor

Minimum anchor capacity: 155 lbs/anchor

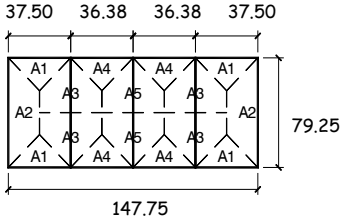
Note: Anchors with the least capacity is used for calculations to qualify anchors with higher capacity.

Anchor calculations, minimum required anchors



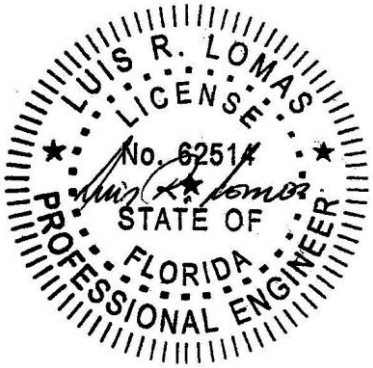
Design pressure: 60.0 psf

Zone	Area (ft^2)	Load (lbs)	Ind. (in)	Max. O.C. (in)	Anchor Cap. (lbs)	Anchor Qty	Anchor Load (lbs)	Result
A_1	2.3	138	N/A	N/A	155	1	138	OK
A_2	7.7	463	6.00	21.00	155	5	93	OK
A_3	7.7	463	N/A	N/A	155	3	154	OK



Design pressure: 60.0 psf

Zone	Area (ft^2)	Load (lbs)	Ind. (in)	Max. O.C. (in)	Anchor Cap. (lbs)	Anchor Qty	Anchor Load (lbs)	Result
A_1	2.4	146	N/A	N/A	155	1	146	OK
A_2	7.9	473	6.00	21.00	155	5	95	OK
A_3	7.8	468	N/A	N/A	155	4	117	OK
A_4	2.3	138	N/A	N/A	155	1	138	OK
A_5	7.7	463	N/A	N/A	155	3	154	OK



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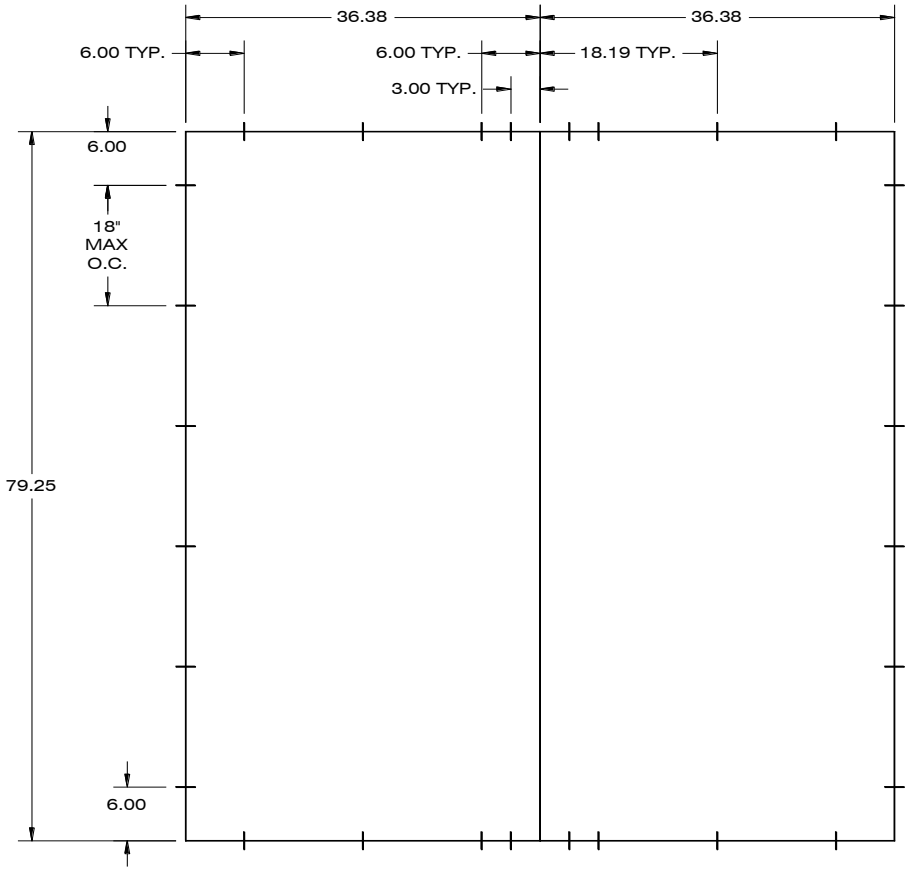
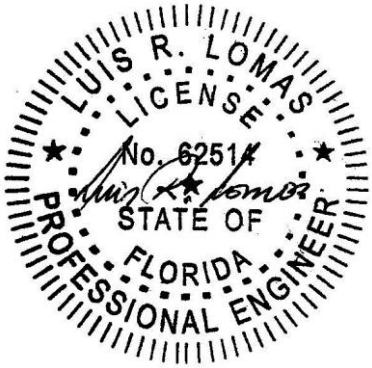
Anchor Locations:

Double door





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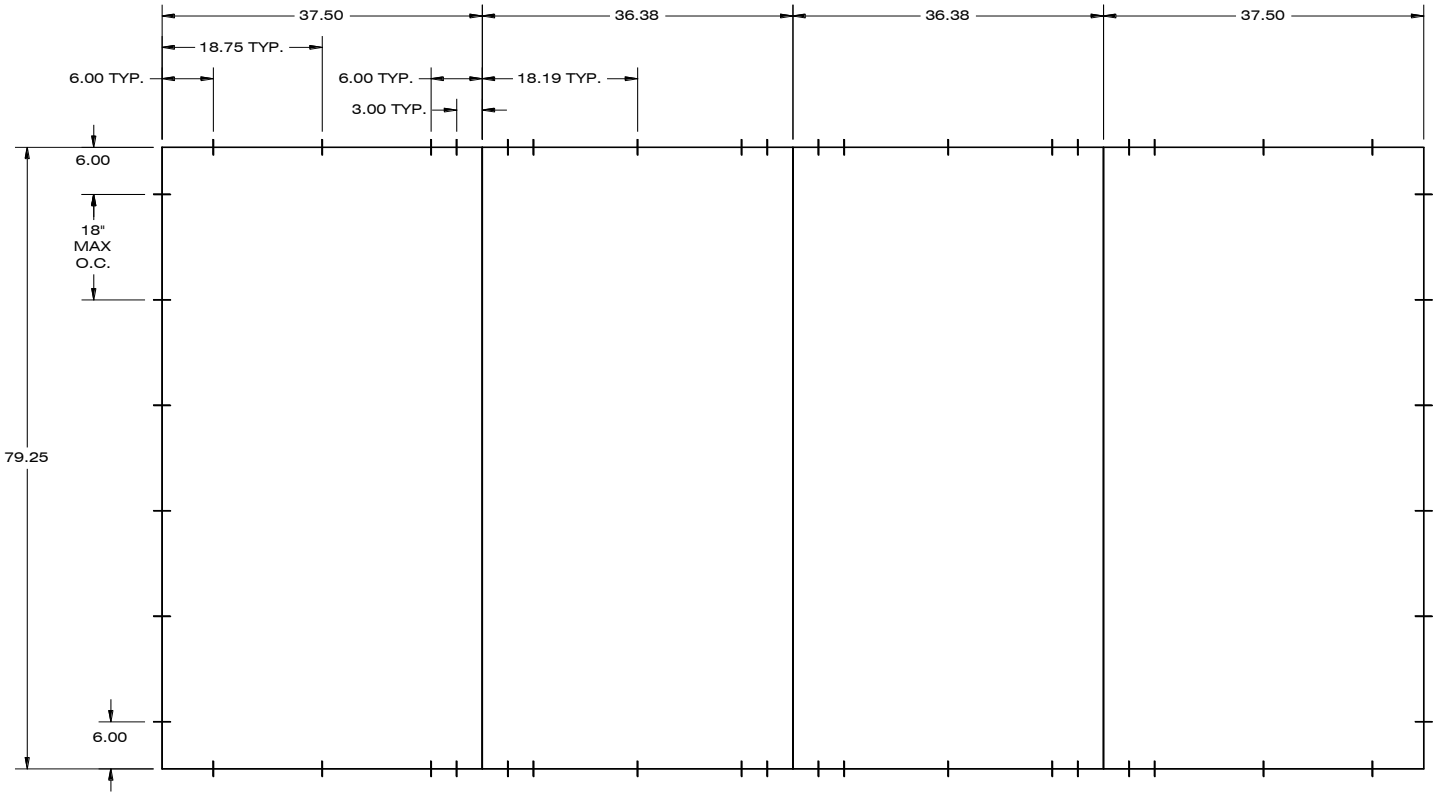
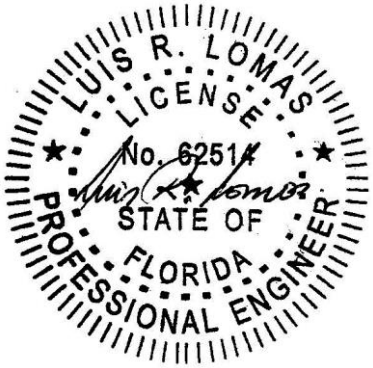
Double door with sidelites





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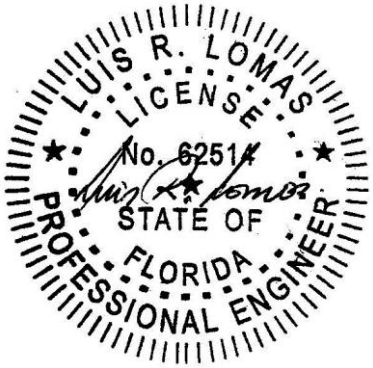
Installation instructions:

1. FOR ANCHORING THROUGH FRAME INTO WOOD FRAMING OR 2X BUCK USE #10 WOOD SCREWS WITH SUFFICIENT LENGTH TO ACHIEVE A 1 1/4" MINIMUM EMBEDMENT INTO SUBSTRATE WITH 1/2" MINIMUM EDGE DISTANCE. LOCATE ANCHORS AS SHOWN BELOW.
2. FOR ANCHORING THROUGH FRAME 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 BELOW.
3. FOR ANCHORING THROUGH FRAME INTO METAL STRUCTURE USE #10 SMS OR SELF DRILLING SCREWS WITH SUFFICIENT LENGTH TO ACHIEVE 3 THREADS MINIMUM BEYOND STRUCTURE INTERIOR WALL WITH 1/2" MINIMUM EDGE DISTANCE. LOCATE ANCHORS AS SHOWN BELOW.
4. ALL FASTENERS TO BE CORROSION RESISTANT.
5. INSTALLATION ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH ANCHOR MANUFACTURER'S INSTALLATION INSTRUCTIONS AND ANCHORS SHALL NOT BE USED IN SUBSTRATES WITH STRENGTHS LESS THAN THE MINIMUM STRENGTH SPECIFIED BELOW:
   A. WOOD: MINIMUM SPECIFIC GRAVITY OF G=0.42
   B. CONCRETE: MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI.
   C. MASONRY: HOLLOW/FILLED BLOCK PER ASTM C90 WITH Fm=2,000PSI MINIMUM.
   D. METAL STRUCTURE: STEEL 18GA (.048") FY=33KSI/FU=52KSI OR ALUMINUM 6063-T5 FU=30KSI .052" THICK MINIMUM
6. ANCHOR LOCATIONS SHOWN IN THIS DOCUMENT ARE THE MINIMUM REQUIRED FOR THE DESCRIBED PRODUCT EXPOSED AT THE DESIGN PRESSURE INDICATED HEREIN.
7. WOOD FRAMING AND MASONRY OPENING TO BE DESIGNED AND ANCHORED TO PROPERLY TRANSFER ALL LOADS TO STRUCTURE. FRAMING AND MASONRY OPENING IS THE RESPONSIBILITY OF THE ARCHITECT OR ENGINEER OF RECORD.
8. 1X BUCK OVER MASONRY/CONCRETE IS OPTIONAL.
9. WHERE SHIM OR BUCK THICKNESS IS LESS THAN 1-1/2" UNITS MUST BE ANCHORED THROUGH FRAME IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS. ANCHORS SHALL BE SECURELY FASTENED DIRECTLY INTO MASONRY, CONCRETE OR OTHER STRUCTURAL SUBSTRATE MATERIAL.
10. WHERE WOOD BUCK THICKNESS IS 1-1/2" OR GREATER, BUCK SHALL BE SECURELY FASTENED TO MASONRY, CONCRETE OR OTHER STRUCTURAL SUBSTRATE. UNITS MAY BE ANCHORED THROUGH FRAME TO SECURED WOOD BUCK IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS.
11. WHERE 1X BUCK IS NOT USED DISSIMILAR MATERIALS MUST BE SEPARATED WITH APPROVED COATING OR MEMBRANE. SELECTION OF COATING OR MEMBRANE IS THE RESPONSIBILITY OF THE ARCHITECT OR ENGINEER OF RECORD.
12. BUCKS SHALL EXTEND BEYOND WINDOW INTERIOR FACE SO THAT FULL FRAME SUPPORT IS PROVIDED.



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