L. Roberto Lomas P.E.

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434-688-0609
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Manufacturer: Masonite
Report #: 514008
Date: 05/01/2017

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, 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:	0.0014
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:	-427.67	C:	-253.62	C:	-267.7	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**								

Solid members w/ & w/out gap:

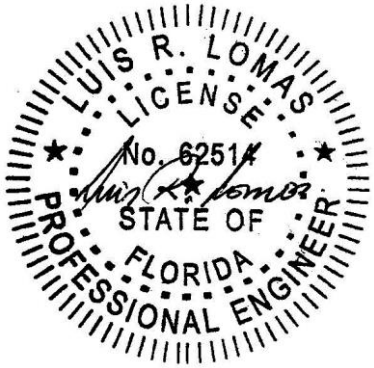
a. With threads present in shear plane

Fastener type:	**#10 wood screw**		(NDS 2012, 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:	Steel strap/clip		
Side member thickness:	t_s =	1.000 in		Main member thickness:	t_m =	0.048 in	
Side member dowel bearing strength:	F_{es} =	4,650 psi		Main member dowel bearing strength:	F_{em} =	61,850 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 =	11752 lbs/in	qs =	884 lbs/in	A:	0.0003	A:	0.00059	A:	0.00033	A:	0.0006
P =	13397 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:	-4038.9	C:	-3864.9	C:	-267.7	C:	-93.6
Z_m=	**5582 lbs**	**Z_s=**	**368 lbs**	P =	2287 lbs	Ms =	46.8 in-lbs	Mm =	46.8 in-lbs		
				K_D =	2.400	P =	2126 lbs	P =	420 lbs	P =	392 lbs
Min. Design value:	Z=	163 lbs		**Z=**	**953 lbs**	K_D =	2.400	K_D =	2.400	K_D =	2.400
Duration Factor:	C_D =	1.6				**Z=**	**886 lbs**	**Z=**	**175 lbs**	**Z=**	**163 lbs**
Allowable Design Value (ZC_D):		**Z'=**	**262 lbs/anchor**								

Fastener type:	**1/4" ITW Tapcon**		N.O.A. 16-1222.06		
Substrate:	Hollow block		Minimum embedment:		1.25 in
Edge distance:	4.00 in		Tabulated shear design value:	**Z =**	**202 lbs**
Edge distance:	2.00 in		Tabulated shear design value:	**Z =**	**161 lbs**
Actual edge distance:	2.50 in		Reduction factor:		0.85
Spacing:	4.00 in		Tabulated shear design value:	**Z =**	**202 lbs**
Spacing:	2.00 in		Tabulated shear design value:	**Z =**	**164 lbs**
Actual spacing:	3.00 in		Reduction factor:		0.91
Allowable Design Value (Zf_{AN}):	**Z''=**	**155 lbs/anchor**			
Minimum anchor capacity:		**155 lbs/anchor**			

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



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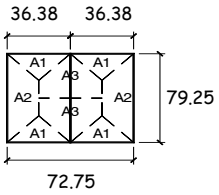
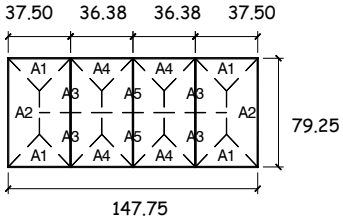
Anchor calculations, minimum required anchors



Design pressure: 60.0 psf

Zone	Area (ft^2)	Load (lbs)	Ind. (in)	Max. O.C. (in)	Anchor			Result
					Cap. (lbs)	Qty	Load (lbs)	
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

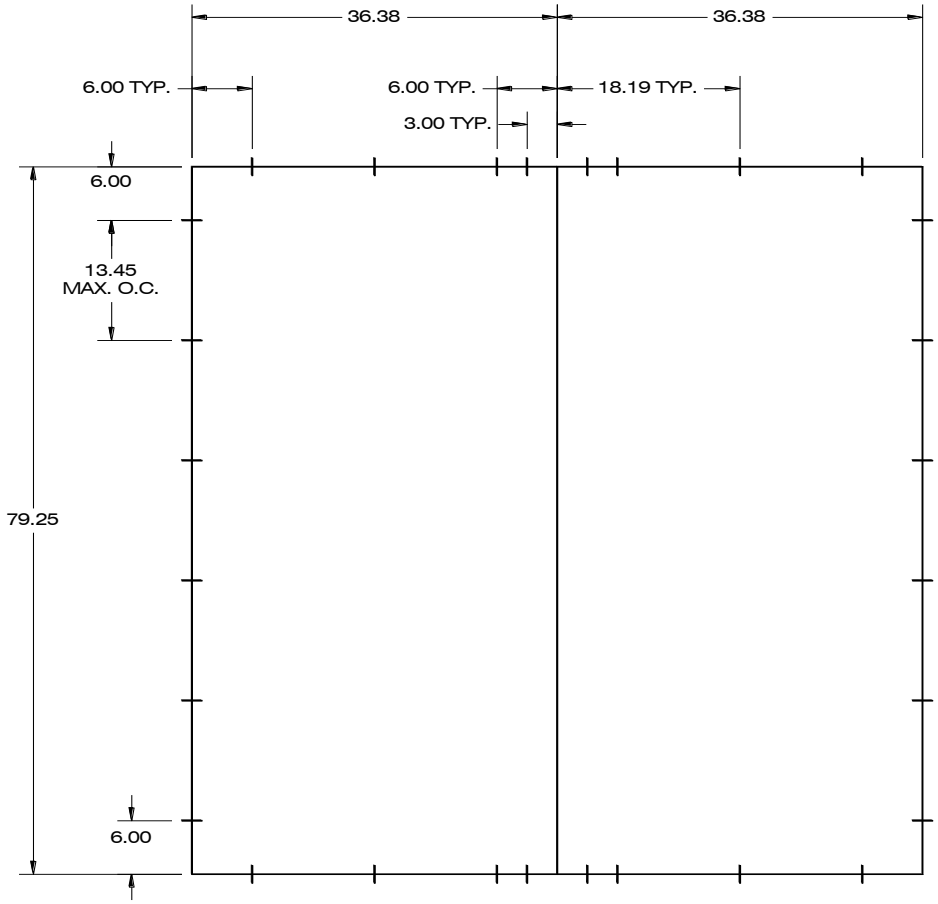


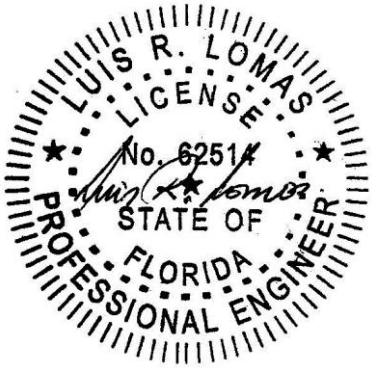
Design pressure: 60.0 psf

Zone	Area (ft^2)	Load (lbs)	Ind. (in)	Max. O.C. (in)	Anchor			Result
					Cap. (lbs)	Qty	Load (lbs)	
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

Anchor Locations:

Double door





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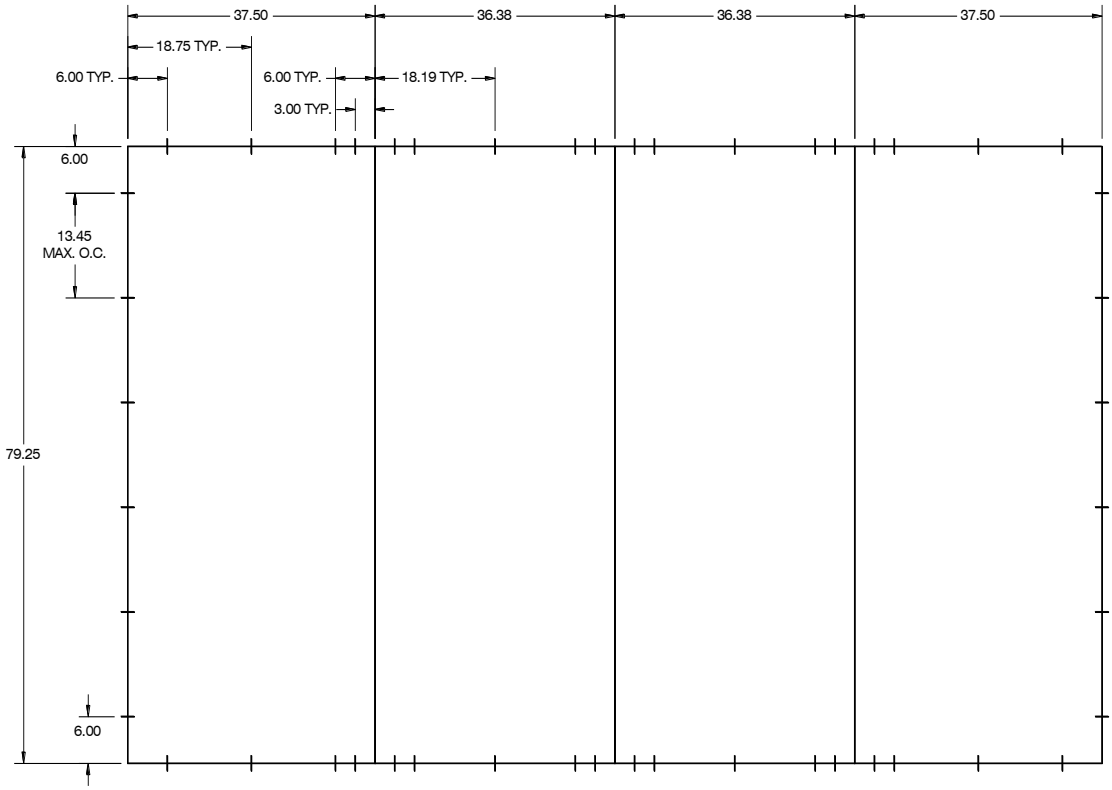
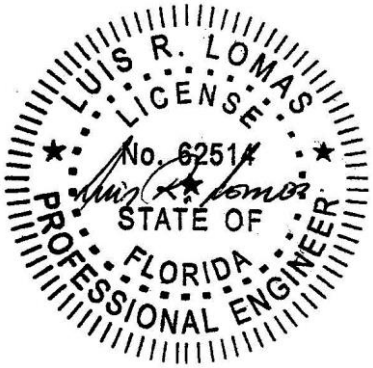
Double door with sidelites



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 3/16" 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.



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