

# L. Roberto Lomas P.E.

208 7th Avenue  
Indialantic, 32903  
434-688-0609 (phone fax)  
rlomas@lrlomaspe.com

Client: Masonite  
Report: 513901-1D  
Date: 9/28/2023

## Test Report:

Product: Doors with transom anchoring

## 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 shear condition:

Solid members w/ & w/out gap:

### a. With threads present in shear plane

|                                     |                             |                                     |                              |
|-------------------------------------|-----------------------------|-------------------------------------|------------------------------|
| Fastener type: #10 wood screw       |                             | (NDS 2018, 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 <sub>yb</sub> = 80,000 psi |
| Side member:                        | Spruce-Pine-Fir (G=0.42)    | Main member:                        | Spruce-Pine-Fir (G=0.42)     |
| Side member thickness:              | t <sub>s</sub> = 0.750 in   | Main member thickness:              | t <sub>m</sub> = 1.500 in    |
| Side member dowel bearing strength: | F <sub>ds</sub> = 3,350 psi | Main member dowel bearing strength: | F <sub>dm</sub> = 3,350 psi  |
| Side member dowel bearing length:   | l <sub>s</sub> = 0.750 in   | Main member dowel bearing length:   | l <sub>m</sub> = 1.140 in    |

| Mode I <sub>m</sub>                        | Mode I <sub>s</sub>         | Mode II                | Mode III <sub>m</sub>  | Mode III <sub>s</sub>  | Mode IV                |
|--------------------------------------------|-----------------------------|------------------------|------------------------|------------------------|------------------------|
| q <sub>m</sub> = 636.5 lbs/in              | q <sub>s</sub> = 637 lbs/in | A: 0.0008              | A: 0.00118             | A: 0.00118             | A: 0.00157             |
| P = 725.61 lbs                             | P = 477 lbs                 | B: 0.945               | B: 0.57                | B: 0.375               | B: 0.000               |
| K <sub>D</sub> = 2.400                     | K <sub>D</sub> = 2.400      | C: -296.307            | C: -253.623            | C: -136.332            | C: -93.6               |
| Z <sub>m</sub> = 302 lbs                   | Z <sub>s</sub> = 199 lbs    | P = 258 lbs            | Ms = 46.8 in-lbs       | Mm = 46.8 in-lbs       | P = 244 lbs            |
|                                            |                             | K <sub>D</sub> = 2.400 | P = 281 lbs            | P = 216 lbs            | K <sub>D</sub> = 2.400 |
| Min. Design value:                         | Z = 90 lbs                  | Z = 108 lbs            | K <sub>D</sub> = 2.400 | K <sub>D</sub> = 2.400 | Z = 102 lbs            |
| Duration Factor:                           | C <sub>D</sub> = 1.6        |                        | Z = 117 lbs            | Z = 90 lbs             |                        |
| Allowable Design Value (ZC <sub>D</sub> ): | Z' = 144 lbs/anchor         |                        |                        |                        |                        |

Fastener type: 3/16 ITW Tapcon

N.O.A. 21-0201.06

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' = 141 lbs/anchor (per interpolation when needed)

Tabulated values

| edge<br>distance | spacing (in) |      |
|------------------|--------------|------|
|                  | 1.50         | 3.00 |
| 2.00             | 135          | 135  |
| 3.00             | 147          | 147  |

Fastener type: #10 Tek screw

Substrate: 18 GA Steel

Tabulated design value: Z = 1266 lbs

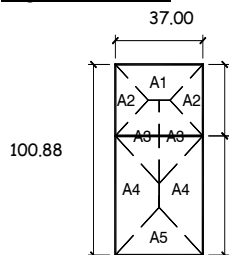
Safety factor: F<sub>s</sub> = 4

Allowable Design Value (ZF<sub>s</sub>): Z' = 316 lbs/anchor

Minimum anchor capacity: 141 lbs/anchor

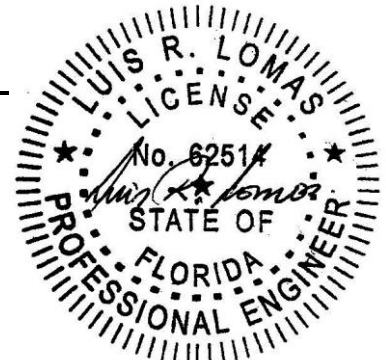
## Anchor calculations, minimum required anchors

### Single with transom:



Design pressure: 55.0 psf

| Zone           | Area (ft²) | Load (lbs) | Ind. (in) | Max. O.C. (in) | Anchor     |     |            | Result |
|----------------|------------|------------|-----------|----------------|------------|-----|------------|--------|
|                |            |            |           |                | Cap. (lbs) | Qty | Load (lbs) |        |
| A <sub>1</sub> | 1.83       | 101        | 6.00      | 14.00          | 141        | 3   | 34         | OK     |
| A <sub>2</sub> | 0.64       | 35         | 6.00      | N/A            | 141        | 1   | 35         | OK     |
| A <sub>3</sub> | 2.10       | 116        | N/A       | N/A            | 141        | 1   | 116        | OK     |
| A <sub>4</sub> | 8.11       | 446        | 6.00      | 18.00          | 141        | 5   | 89         | OK     |
| A <sub>5</sub> | 2.38       | 131        | 6.00      | 15.00          | 141        | 3   | 44         | OK     |



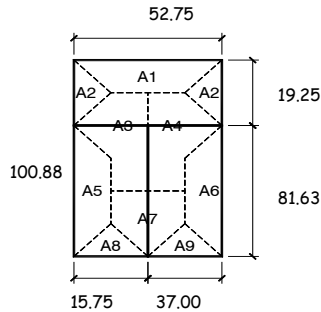
Luis R. Lomas P.E.  
FL No.: 62514  
9/28/2023

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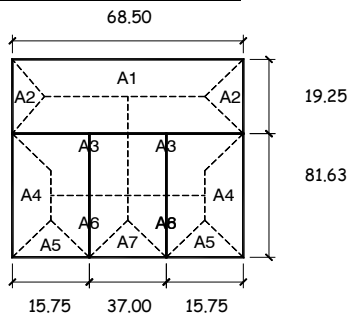
## Single with sidelite and transom:



Design pressure: 55.0 psf

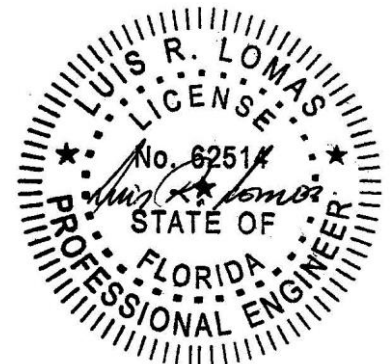
| Zone           | Area (ft <sup>2</sup> ) | Load (lbs) | Ind. (in) | Max. O.C. (in) | Anchor     |     |            | Result |
|----------------|-------------------------|------------|-----------|----------------|------------|-----|------------|--------|
|                |                         |            |           |                | Cap. (lbs) | Qty | Load (lbs) |        |
| A <sub>1</sub> | 2.88                    | 159        | 6.00      | 14.00          | 141        | 4   | 40         | OK     |
| A <sub>2</sub> | 0.64                    | 35         | N/A       | N/A            | 141        | 1   | 35         | OK     |
| A <sub>3</sub> | 3.89                    | 214        | N/A       | N/A            | 141        | 2   | 107        | OK     |
| A <sub>4</sub> | 7.87                    | 433        | N/A       | N/A            | 141        | 4   | 108        | OK     |
| A <sub>5</sub> | 4.03                    | 222        | 6.00      | 18.00          | 141        | 5   | 44         | OK     |
| A <sub>6</sub> | 8.11                    | 446        | 6.00      | 18.00          | 141        | 5   | 89         | OK     |
| A <sub>7</sub> | 6.07                    | 334        | N/A       | N/A            | 141        | 3   | 111        | OK     |
| A <sub>8</sub> | 0.43                    | 24         | N/A       | N/A            | 141        | 1   | 24         | OK     |
| A <sub>9</sub> | 2.38                    | 131        | N/A       | N/A            | 141        | 1   | 131        | OK     |

## Single with sidelites and transom:



Design pressure: 55.0 psf

| Zone           | Area (ft <sup>2</sup> ) | Load (lbs) | Ind. (in) | Max. O.C. (in) | Anchor     |     |            | Result |
|----------------|-------------------------|------------|-----------|----------------|------------|-----|------------|--------|
|                |                         |            |           |                | Cap. (lbs) | Qty | Load (lbs) |        |
| A <sub>1</sub> | 3.94                    | 216        | 6.0       | 15.00          | 141        | 5   | 43         | OK     |
| A <sub>2</sub> | 0.64                    | 35         | N/A       | N/A            | 141        | 1   | 35         | OK     |
| A <sub>3</sub> | 9.66                    | 531        | 4.0       | 16.00          | 141        | 4   | 133        | OK     |
| A <sub>4</sub> | 4.03                    | 222        | 6.0       | 18.00          | 141        | 5   | 44         | OK     |
| A <sub>5</sub> | 0.43                    | 24         | N/A       | N/A            | 141        | 1   | 24         | OK     |
| A <sub>6</sub> | 6.07                    | 334        | N/A       | N/A            | 141        | 3   | 111        | OK     |
| A <sub>7</sub> | 2.38                    | 131        | N/A       | N/A            | 141        | 1   | 131        | OK     |

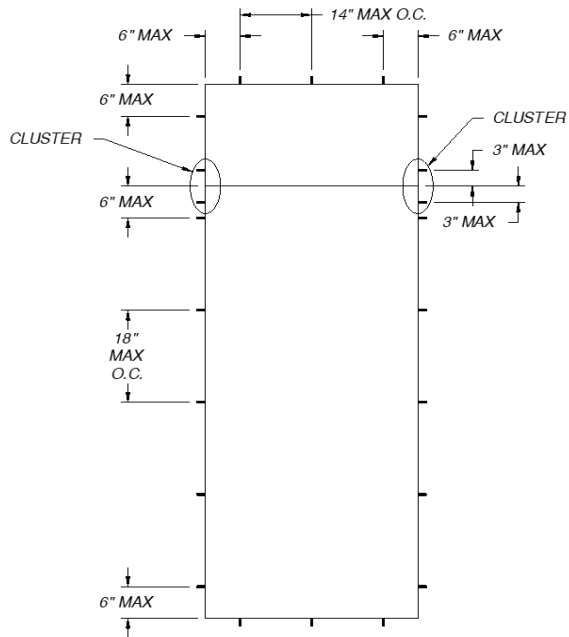


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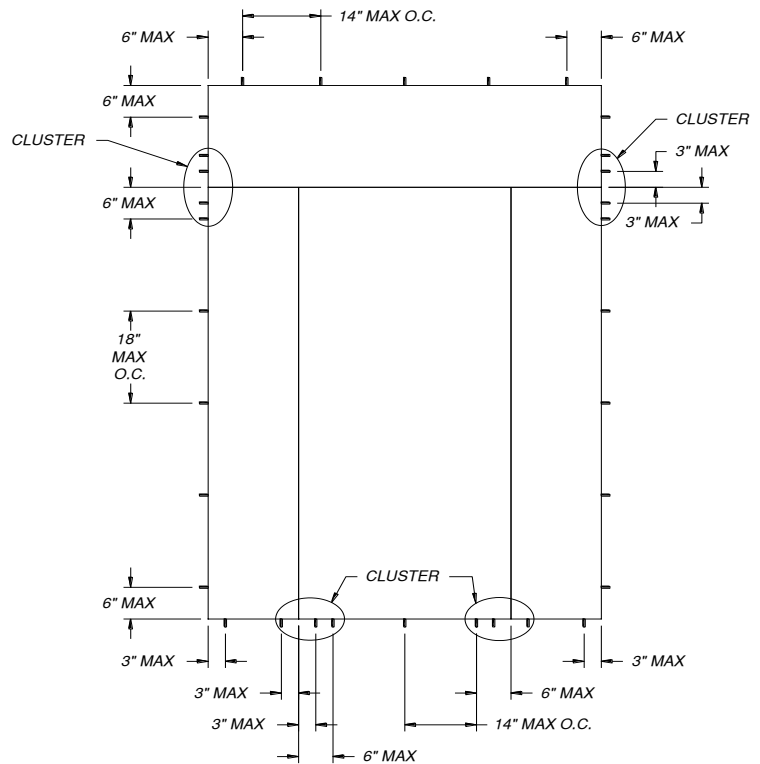
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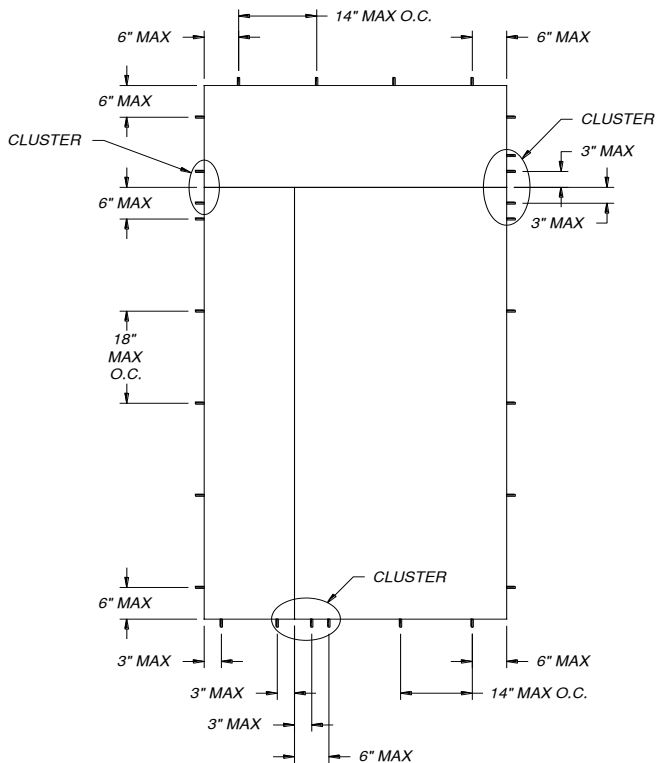
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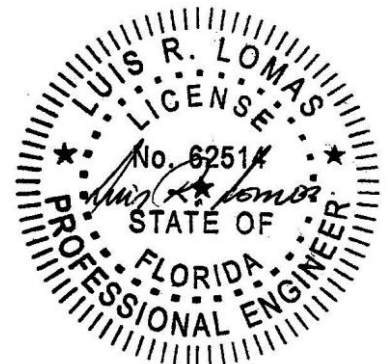
Single w/transom anchor layout



Single w/sidelites and transom anchor layout



Single w/sidelite and transom anchor layout



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