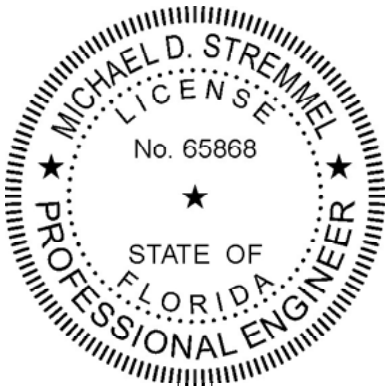
PRODUCT APPROVAL SUPPORTING CALCULATIONS

Series 1606 Premium Coastal Outswing Doors (Impact)

REPORT TO:

WEATHER SHIELD WINDOWS & DOORS
ONE WEATHER SHIELD PLAZA
MEDFORD, WISCONSIN 54451

REPORT NUMBER: 27845.03-107-16-R0
REPORT DATE: 12/22/2023



This item has been digitally signed and sealed by Michael D. Stremmel, PE on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on electronic copies.

2023.12.22 08:59:29 -05'00'

Michael D. Stremmel, PE
FL PE 65868
FL REG 37122

Scope

Molimo, LLC was contracted by Weather Shield Windows & Doors to evaluate installation methods for their Series 1606 Premium Coastal Outswing Doors (Impact). The evaluation is based on physical testing and product certifications. Reference standards utilized in this project include:

Florida Building Code, Building, 8th Edition (2023). International Code Council, 2023.

ANSI/AWC NDS-2018 *National Design Specification (NDS) for Wood Construction*. American Wood Council, 2018.

AISI S100-16 *North American Specification for the Design of Cold-Formed Steel Structural Members, 2016*. American Iron and Steel Institute, 2016.

ADM1-2020 *2020 Aluminum Design Manual*. The Aluminum Association, Inc., 2020

ICC-ES Report ESR-1976 *ITW Buildex TEKS Self-Drilling Fasteners*. ICC Evaluation Service. 07/2020.

NOA 16-1222.06 *Tapcon with Advanced Threadform Technology Concrete and Masonry Anchors*. Miami-Dade County Product Control Section, December 13, 2016.

The anchorage analyses presented herein do not address the water resistance, water penetration or air infiltration performance of the installation method or the installed product. In addition, the analyses rely on the assumption that the building substrate is capable of withstanding incurred loads.

Certification of Independence

In accordance with Rule 61G20-3 Florida Administrative Code, Molimo, LLC hereby certifies the following:

- Molimo, LLC does not have, nor does it intend to acquire or will it acquire, a financial interest in any company manufacturing or distributing products tested or labeled by the agency.

- Molimo, LLC is not owned, operated or controlled by any company manufacturing or distributing products it tests or labels.

- Michael D. Stremmel, P.E. does not have nor will acquire, a financial interest in any company manufacturing or distributing products for which the reports are being issued.

- Michael D. Stremmel, P.E does not have, nor will acquire, a financial interest in any other entity involved in the approval process of the product.

Analyses

Window Anchorage

The as-tested and as-tested with alternate substrate anchorage methods are evaluated on page 26 to page 39 and summarized in Table 1, Table 2 (page 4) and Table 3 (page 5). The as-tested capacities will be used to justify anchorage to alternate substrates having equal or higher anchorage capacities.

Table 1 Anchorage Capacities for Fin Installation

Substrate	Anchor	Capacity	Comments
Wood SYP 2x	#6 x 1-5/8" Screw	204 lb	1. As-tested installation. 2. Limited by pull-over at fin. 3. 1/4" maximum shim space between frame and substrate.
16 Gauge Steel Stud	#10-16 TEKS Screw	209 lb	1. 50 ksi yield strength stud. 2. Full penetration +3 threads. 3. Limited by pull-out at substrate. 4. 1/4" maximum shim space between frame and substrate.
1/8" thick Aluminum Tube Mullion	#10-16 TEKS Screw	235 lb	1. 6063-T6 aluminum tube mullion. 2. Full penetration +3 threads. 3. Limited by pull-out at substrate. 4. 1/4" maximum shim space between frame and substrate. 5. 1/8" thick mullion qualifies 1/4" thick mullion

In all cases the alternate substrate capacities for the fin installation connections are equal to or greater than the as-tested value. Thus, the connection to the alternate substrate with the proposed anchor placed at the as-tested spacing is acceptable.

Table 2 Anchorage Capacities for Through-Frame Installation

Substrate	Anchor	Capacity	Comments
Wood SYP 2x	#10 x 2-1/2" Screw	112 lb	1. As-tested installation. 2. 1-1/4" minimum penetration. 3. Limited by shear capacity. 4. 1/4" maximum shim space between frame and substrate.
16 Gauge Steel Stud	#10-16 TEKS Screw	359 lb	1. 50 ksi yield strength stud. 2. Full penetration +3 threads. 3. Limited by bearing capacity. 4. 1/4" maximum shim space between frame and substrate.
1/8" thick Aluminum Tube Mullion	#10-16 TEKS Screw	359 lb	1. 6063-T6 aluminum tube mullion. 2. Full penetration +3 threads. 3. Limited by bearing capacity. 4. 1/4" maximum shim space between frame and substrate. 5. 1/8" thick mullion qualifies 1/4" thick mullion.
Concrete	3/16" Tapcon	186 lb	1. Minimum f'_c = 3,000 psi. 2. 1-1/2" minimum embedment. 3. 2" minimum edge distance. 4. Limited by shear capacity. 5. 1/4" maximum shim space between frame and substrate.
CMU	3/16" Tapcon	135 lb	1. Minimum ASTM C90 CMU. 2. 1" minimum embedment. 3. 2" minimum edge distance. 4. Limited by shear capacity. 5. 1/4" maximum shim space between frame and substrate.

In all cases the alternate substrate capacities for the through-frame installation connections are equal to or greater than the as-tested value. Thus, the connection to the alternate substrate with the proposed anchor placed at the as-tested spacing is acceptable.

Table 3 Anchorage Capacities for Anchor Clip Installation

Substrate	Anchor	Capacity	Comments
Wood SYP 2x	#6 x 1-5/8" Screw (Four Screws)	24 lb	1. As-tested installation. 2. 1-1/4" minimum penetration 3. Limited by bending of anchor clip. 4. 1/4" maximum shim space between frame and substrate.
16 Gauge Steel Stud	#10-16 TEKS Screw (Four Screws)	24 lb	1. 50 ksi yield strength stud. 2. Full penetration +3 threads. 3. Limited by bending of anchor clip. 4. 1/4" maximum shim space between frame and substrate.
1/8" thick Aluminum Tube Mullion	#10-16 TEKS Screw (Four Screws)	24 lb	1. 6063-T6 aluminum tube mullion. 2. Full penetration +3 threads. 3. Limited by bearing capacity. 4. 1/4" maximum shim space between frame and substrate. 5. 1/8" thick mullion qualifies 1/4" thick mullion
Concrete	3/16" Tapcon (One Anchor)	24 lb	1. Minimum f'_c = 3,000 psi 2. 1-1/2" minimum embedment. 3. 1" Minimum edge distance. 4. Limited by bending of anchor clip. 5. 1/4" maximum shim space between frame and substrate.
CMU	3/16" Tapcon (One Anchor)	24 lb	1. Minimum ASTM C90 CMU 2. 1" minimum embedment 3. 2" Minimum edge distance. 4. Limited by bending of anchor clip. 5. 1/4" maximum shim space between frame and substrate.

Note: For all substrates, the clip shall be secured to the window frame with four (4) #8 x 3/4" screws.

In all cases the alternate substrate capacities for the anchor clip installation connections are equal to or greater than the as-tested value. Thus, the connection to the alternate substrate with the proposed anchor(s) placed at the as-tested spacing is acceptable.

Anchorage Requirements

Anchorage requirements for the various approved Series 1606 Premium Coastal Outswing Doors (Impact) are presented in Table 5 (page 7) to Table 22 (page 24). Table 4 presents the glazing codes used in the tables.

Table 4 Glazing Constructions

Glazing Code	Glazing Construction
GL1	1" Insulating Glass 3/16" Tempered (Exterior) 5/32" Annealed / 0.090" PVB / 5/32" Annealed (Interior)
GL2	1" Insulating Glass 5/32" Tempered (Exterior) 5/32" Annealed / 0.090" PVB / 5/32" Annealed (Interior)
GL3	7/16" Monolithic Laminated Glass 5/32" Annealed / 0.090" PVB / 5/32" Annealed
GL4	17/32" Monolithic Laminated Glass 7/32" Annealed / 0.090" PVB / 7/32" Annealed

Table 5 Series 1606 XX Outswing (Impact) (6-2 x 8-2) – Insulating Glass

Door: Series 1606 XX Outswing (6-2 x 8-2) **Test Report**: ESP028942P-2342 Rev. B
Overall Size: 74" wide by 98" tall **Product Approval**: FL21999
Panel Size: 36" x 95" **High Velocity Hurricane Zone**: Yes
Glazing: 1" Insulating Glass (GL2)
Maximum DLO: 26-5/32" x 83-3/16" **Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-75 psf
Missile Impact: Missile D, Wind Zone 4

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 6 Series 1606 XX Outswing (Impact) (6-2 x 8-2) – Monolithic Glass

Door: Series 1606 XX Outswing (6-2 x 8-2) **Test Report**: ESP028942P-2342 Rev. B
Overall Size: 74" wide by 98" tall **Product Approval**: FL21999
Panel Size: 36" x 95" **High Velocity Hurricane Zone**: Yes
Glazing: 7/16" Monolithic (GL3)
Maximum DLO: 26-5/32" x 83-1/16" **Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-75 psf
Missile Impact: Missile D, Wind Zone 4

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 7 Series 1606 XX Outswing (Impact) (7-0 x 10-0) – Insulating Glass

Door: Series 1606 XX Outswing (7-0x10-0) **Test Report**: ESP025891P-2188 Rev. D
Overall Size: 84" wide by 120" tall QCT16-4149.01-R1
Panel Size: 41" x 117" **Product Approval**: FL21999
Glazing: 1" Insulating Glass (GL1) **High Velocity Hurricane Zone**: Yes
Maximum DLO: 30-15/16" x 105-3/16" **Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-60 psf
Missile Impact: Missile D, Wind Zone 4

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 8 Series 1606 XX Outswing (Impact) (7-0 x 10-0) – Monolithic Glass

Door: Series 1606 XX Outswing (7-0x10-0) **Test Report**: ESP028942P-2342 Rev. B
Overall Size: 84" wide by 120" tall **Product Approval**: FL21999
Panel Size: 41" x 117" **High Velocity Hurricane Zone**: Yes
Glazing: 17/32" Monolithic (GL4)
Maximum DLO: 30-15/16" x 105-3/16" **Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-60 psf
Missile Impact: Missile D, Wind Zone 4

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 9 Series 1606 XX Outswing (Impact) (6-2 x 8-2) – Insulating Glass; ADA Sill

Door: Series 1606 XX Outswing (6-2 x 8-2)	**Test Report**: ESP028942P-2342 Rev. B ESP025891P-2188 Rev. D
Overall Size: 74" wide by 98" tall	
Panel Size: 36" x 95"	**Product Approval**: FL21999
Glazing: 1" Insulating Glass (GL2)	**High Velocity Hurricane Zone**: Yes
Maximum DLO: 26-5/32" x 83-3/16"	**Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-75 psf	
Missile Impact: Missile D, Wind Zone 4	Requires overhang per FBC 1709.5.1

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 10 Series 1606 XX Outswing (Impact) (6-2 x 8-2) – Monolithic Glass; ADA Sill

Door: Series 1606 XX Outswing (6-2 x 8-2)	**Test Report**: ESP028942P-2342 Rev. B ESP025891P-2188 Rev. D
Overall Size: 74" wide by 98" tall	
Panel Size: 36" x 95"	**Product Approval**: FL21999
Glazing: 7/16" Monolithic (GL3)	**High Velocity Hurricane Zone**: Yes
Maximum DLO: 26-5/32" x 83-1/16"	**Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-75 psf	
Missile Impact: Missile D, Wind Zone 4	Requires overhang per FBC 1709.5.1

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 11 Series 1606 XX Outswing (Impact) (7-0 x 10-0) – Insulating Glass; ADA Sill

Door: Series 1606 XX Outswing (7-0x10-0)	**Test Report**: ESP025891P-2188 Rev. D QCT16-4149.01-R1
Overall Size: 84" wide by 120" tall	**Product Approval**: FL21999
Panel Size: 41" x 117"	**High Velocity Hurricane Zone**: Yes
Glazing: 1" Insulating Glass (GL1)	**Maximum Raised Panel Height**: 29-21/32"
Maximum DLO: 30-15/16" x 105-3/16"	
Design Pressure: +60/-60 psf	
Missile Impact: Missile D, Wind Zone 4	Requires overhang per FBC 1709.5.1

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 12 Series 1606 XX Outswing (Impact) (7-0 x 10-0) – Monolithic Glass; ADA Sill

Door: Series 1606 XX Outswing (7-0x10-0)	**Test Report**: ESP028942P-2342 Rev. B ESP025891P-2188 Rev. D
Overall Size: 84" wide by 120" tall	
Panel Size: 41" x 117"	**Product Approval**: FL21999
Glazing: 17/32" Monolithic (GL4)	**High Velocity Hurricane Zone**: Yes
Maximum DLO: 30-15/16" x 105-3/16"	**Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-60 psf	
Missile Impact: Missile D, Wind Zone 4	Requires overhang per FBC 1709.5.1

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 13 Series 1606 O Sidelite (Impact) (3-6 x 10-0) – Insulating Glass

Door: Series 1606 O Sidelite (3-6 x 10-0) **Test Report**: ESP024263P-2078 Rev. D
Overall Size: 42" wide by 120" tall **Product Approval**: FL21999
Panel Size: 41" x 118" **High Velocity Hurricane Zone**: Yes
Glazing: 1" Insulting Glass (GL1)
Maximum DLO: 35-3/4" x 102-11/16" **Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-60 psf
Missile Impact: Missile D, Wind Zone 4

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 14 Series 1606 O Sidelite (Impact) (3-6 x 10-0) – Monolithic Glass

Door: Series 1606 O Sidelite (3-6 x 10-0) **Test Report**: ESP024263P-2078 Rev. D
Overall Size: 42" wide by 120" tall **Product Approval**: FL21999
Panel Size: 41" x 118" **High Velocity Hurricane Zone**: Yes
Glazing: 17/32" Monolithic (GL4)
Maximum DLO: 35-3/4" x 102-11/16" **Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-60 psf
Missile Impact: Missile D, Wind Zone 4

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	4. Southern Yellow Pine substrate. 5. 1-1/2" penetration to substrate. 6. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	4. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 5. Full penetration + 3 threads. 6. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	4. Southern Yellow Pine substrate. 5. 1-1/4" penetration to substrate. 6. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	4. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 5. Full penetration + 3 threads. 6. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	4. f'_c = 3,000 psi concrete. 5. 1-1/2" embedment to substrate. 6. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	4. ASTM C90 medium weight block. 5. 1" penetration to substrate. 6. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	4. Southern Yellow Pine substrate. 5. 1-1/2" penetration to substrate. 6. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	4. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 5. Full penetration + 3 threads. 6. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	4. f'_c = 3,000 psi concrete. 5. 1-1/2" embedment to substrate. 6. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	4. ASTM C90 medium weight block. 5. 1" penetration to substrate. 6. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 15 Series 1606 X Outswing (Impact) (3-2 x 8-2) – Insulating Glass

Door: Series 1606 X Outswing (3-2 x 8-2) **Test Report**: ESP028942P-2342 Rev. B
Overall Size: 38" wide by 98" tall **Product Approval**: FL21999
Panel Size: 36" x 95" **High Velocity Hurricane Zone**: Yes
Glazing: 1" Insulating Glass (GL2)
Maximum DLO: 26-5/32" x 83-3/16" **Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-75 psf
Missile Impact: Missile D, Wind Zone 4

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 16 Series 1606 X Outswing (Impact) (3-2 x 8-2) – Monolithic Glass

Door: Series 1606 X Outswing (3-2 x 8-2) **Test Report**: ESP028942P-2342 Rev. B
Overall Size: 38" wide by 98" tall **Product Approval**: FL21999
Panel Size: 36" x 95" **High Velocity Hurricane Zone**: Yes
Glazing: 7/16" Monolithic (GL3)
Maximum DLO: 26-5/32" x 83-1/16" **Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-75 psf
Missile Impact: Missile D, Wind Zone 4

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 17 Series 1606 X Outswing (Impact) (3-8 x 10-0) – Insulating Glass

Door: Series 1606 X Outswing (3-8x10-0)
Overall Size: 34" wide by 120" tall
Panel Size: 41" x 117"
Glazing: 1" Insulating Glass (GL1)
Maximum DLO: 30-15/16" x 105-3/16"
Design Pressure: +60/-60 psf
Missile Impact: Missile D, Wind Zone 4

Test Report: ESP025891P-2188 Rev. D
QCT16-4149.01-R1
Product Approval: FL21999
High Velocity Hurricane Zone: Yes
Maximum Raised Panel Height: 29-21/32"

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 18 Series 1606 X Outswing (Impact) (3-8 x 10-0) – Monolithic Glass

Door: Series 1606 X Outswing (3-8x10-0) **Test Report**: ESP028942P-2342 Rev. B
Overall Size: 44" wide by 120" tall **Product Approval**: FL21999
Panel Size: 41" x 117" **High Velocity Hurricane Zone**: Yes
Glazing: 17/32" Monolithic (GL4)
Maximum DLO: 30-15/16" x 105-3/16" **Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-60 psf
Missile Impact: Missile D, Wind Zone 4

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 19 Series 1606 X Outswing (Impact) (3-2 x 8-2) – Insulating Glass; ADA Sill

Door: Series 1606 X Outswing (3-2 x 8-2)	**Test Report**: ESP028942P-2342 Rev. B
Overall Size: 38" wide by 98" tall	ESP025891P-2188 Rev. D
Panel Size: 36" x 95"	**Product Approval**: FL21999
Glazing: 1" Insulating Glass (GL2)	**High Velocity Hurricane Zone**: Yes
Maximum DLO: 26-5/32" x 83-3/16"	**Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-75 psf	
Missile Impact: Missile D, Wind Zone 4	Requires overhang per FBC 1709.5.1

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 20 Series 1606 X Outswing (Impact) (3-2 x 8-2) – Monolithic Glass; ADA Sill

Door: Series 1606 X Outswing (3-2 x 8-2)	**Test Report**: ESP028942P-2342 Rev. B
Overall Size: 38" wide by 98" tall	ESP025891P-2188 Rev. D
Panel Size: 36" x 95"	**Product Approval**: FL21999
Glazing: 7/16" Monolithic (GL3)	**High Velocity Hurricane Zone**: Yes
Maximum DLO: 26-5/32" x 83-1/16"	**Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-75 psf	
Missile Impact: Missile D, Wind Zone 4	Requires overhang per FBC 1709.5.1

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 21 Series 1606 X Outswing (Impact) (3-8 x 10-0) – Insulating Glass; ADA Sill

Door: Series 1606 X Outswing (3-8x10-0)	**Test Report**: ESP025891P-2188 Rev. D QCT16-4149.01-R1
Overall Size: 44" wide by 120" tall	
Panel Size: 41" x 117"	**Product Approval**: FL21999
Glazing: 1" Insulating Glass (GL1)	**High Velocity Hurricane Zone**: Yes
Maximum DLO: 30-15/16" x 105-3/16"	**Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-60 psf	
Missile Impact: Missile D, Wind Zone 4	Requires overhang per FBC 1709.5.1

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Table 22 Series 1606 X Outswing (Impact) (3-8 x 10-0) – Monolithic Glass; ADA Sill

Door: Series 1606 X Outswing (3-8x10-0)	**Test Report**: ESP028942P-2342 Rev. B
Overall Size: 44" wide by 120" tall	ESP025891P-2188 Rev. D
Panel Size: 41" x 117"	**Product Approval**: FL21999
Glazing: 17/32" Monolithic (GL4)	**High Velocity Hurricane Zone**: Yes
Maximum DLO: 30-15/16" x 105-3/16"	**Maximum Raised Panel Height**: 29-21/32"
Design Pressure: +60/-60 psf	
Missile Impact: Missile D, Wind Zone 4	Requires overhang per FBC 1709.5.1

Installation Method	Substrate	Anchor	Comments
Fin (see Note 1)	Wood	#6 x 1-5/8" Screw	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 5/8" minimum edge distance.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
Through-Frame (see Note 1)	Wood	#10 x 2-1/2" Screw	1. Southern Yellow Pine substrate. 2. 1-1/4" penetration to substrate. 3. 1-1/8" min. edge distance at sill; 2-1/8" min. at head and jambs.
	Steel Stud or Alum. Mull.	#10-16 TEKS Screw	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 2" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.
Anchor Clip (see Note 1, 2)	Wood	(4) #6 x 1-5/8" Screws	1. Southern Yellow Pine substrate. 2. 1-1/2" penetration to substrate. 3. 1/2" minimum edge distance.
	Steel Stud or Alum. Mull.	(4) #10-16 TEKS Screws	1. 16 gauge, 50 ksi steel stud or 1/8" min. thick 6063-T6 mullion. 2. Full penetration + 3 threads. 3. 1/2" minimum edge distance.
	Concrete	3/16" Tapcon Anchor (NOA 16-1222.06)	1. f'_c = 3,000 psi concrete. 2. 1-1/2" embedment to substrate. 3. 1" minimum edge distance.
	CMU	3/16" Tapcon Anchor (NOA 16-1222.06)	1. ASTM C90 medium weight block. 2. 1" penetration to substrate. 3. 2" minimum edge distance.

Notes: 1. Anchor placement per Drawing 45-17203 (attached)
2. Anchor clip shall be secured to window frame with four (4) #8 x 3/4" screws.

Attachments

Appendix A – Revision Log (1 page)

Appendix B – Installation Drawings (4 pages)

As-Tested – PVC Nail Fin to Wood

#6 x 1-5/8" Wood Screw

PVC Nailing Fin

Southern Yellow Pine Wood Substrate Minimum (G=0.55)

Allowable Tension of #6 x 1-5/8" Wood Screw

W = 1.6(1.500")(119 lb/in) (NDS, Table 12.2B)
W = 286 lb

Pull-Over of #6 x 1-5/8" Wood Screw

Validated by Testing

Report: ESP017571P-1606
Size: 72" wide by 84" tall
Pressure: 70 psf
As-tested spacing: 8"-10" on center

Load to Anchor: p = (70 psf/144)(84"/2)(10") = 204 lb

Pull-over governs

Must maintain anchor spacing and anchor head size

As-tested spacing: 8"-10" on center
As-tested anchor head size: 0.279"

Capacity of Connection is 204 lb

Alternate Substrate – PVC Nail Fin to Steel Stud

#10-16 TEKS Screw

PVC Nailing Fin

Minimum 16 gauge 50 KSI Steel Stud

Allowable Tension of #10-16 TEKS Screw

P_{ss}/Ω = (145 lb)(1.44) = 209 lb (ESR-1976, Table 2)

Pull-Over of #10-16 TEKS Screw

Anchor head size: 0.365" > 0.279" Maintain as-tested spacing.

Capacity of Connection is 209 lb

Alternate Substrate – PVC Nail Fin to Aluminum Tube Mullion

#10-16 TEKS Screw

PVC Nailing Fin

1/8" thick 6063-T6 aluminum tube mullion (qualifies 1/4" thick mullion)

Tensile Capacity of #10-16 TEKS Screw

P_{ts}/Ω = 885 lb (ESR-1976)

Pull-Out of #10-16 TEKS Screw at Tube Mullion

$P_{not} = K_s D L_e F_{ty2}/3.0$
P_{not} = 1.2 (0.190")(0.125")(25,000 psi)/3.0
P_{not} = 238 lb

Pull-Over of #10-16 TEKS Screw

Anchor head size: 0.365" > 0.279" Maintain as-tested spacing.

Capacity of Connection is 235 lb

As-Tested – Through Frame to Wood

#10 x 2-1/2" Wood Screw

1-3/16" thick Window Frame (Ponderosa Pine/Douglas Fir, G_{min} = 0.43)

1/4" Maximum Shim Space

Southern Yellow Pine 2x Wood Substrate (G=0.55)

Allowable Shear of #10 x 1-1/2" Wood Screw

Z' = 117 lb (Limited by Mode IV, see next two pages)

Capacity of Connection is 112 lb

As-Tested – Through Frame to Wood (Continued)

Lateral Design Strength of Wood Connections

Data

Fastener

Fastener	=	#10 Wood Screw	
Shank Dia	=	0.190	in.
Root Dia.	=	0.152	in.
F_{yb}	=	80,000	psi
Fastener length	=	2.500	in.

Main Member

Material	=	SYP	
G	=	0.55	
θ	=	90	<= (Angle of load to grain $0^o \leq \theta \leq 90^o$)
F_e	=	5,550	psi
Thickness	=	1.500	in.

Side Member

Material	=	Ponderosa Pine	
G	=	0.43	
θ	=	90	<= (Angle of load to grain $0^o \leq \theta \leq 90^o$)
F_{es}	=	3,500	psi
Thickness	=	1.180	in.

Calculations

Lateral Bearing Factors

D	=	0.152	in.
ℓ_m	=	0.940	in.
K_θ	=	1.25	
K_D	=	2.20	
R_e	=	1.586	
R_t	=	0.80	
k_1	=	0.4616	
k_2	=	1.4939	
k_3	=	0.96	

Yield Mode	R_d
I_m, I_s	2.20
II	2.20
III_m, III_s, IV	2.20

As-Tested – Through Frame to Wood (Continued)

Lateral Design Values, Z				
Mode I_m	=	360	lbf	
Mode I_s	=	285	lbf	
Mode II	=	132	lbf	
Mode III_m	=	129	lbf	
Mode III_s	=	121	lbf	
Mode IV	=	112	lbf	<====== Minimum Value
C_D	=	1		
Wet Service Factor				
Fabrication/In-Service		Dry/Dry		
C_M	=	1.0		
In service temperature		T≤100˚F		
C_t	=	1.0		
C_g	=	1.0		
C_Δ	=	1.0		
Is fastener installed in end grain?		No		
C_{eg}	=	1.00		
Is fastener part of a diaphragm?		No		
C_{di}	=	1.0		
Is fastener toe-nailed?		No		
C_{tn}	=	1.00		
Z'	**=**	**112**	**lbf**	

Alternate Substrate – Through Frame to Steel Stud

#10-16 TEKS Screw

1-3/16" thick Window Frame (Ponderosa Pine/Douglas Fir, G = 0.43)

1/4" Maximum Shim Space

Minimum 16 gauge 50 KSI Steel Stud

Allowable Shear of #10-16 TEKS Screw

P_{ss}/Ω = 573 lb (ESR-1976)

Bearing of #10-16 TEKS Screw on Wood Frame

F_e = 3,500 psi
D = 0.190"
$V_a = (F_e)(D)(L)/R_d$ = (3,500 psi)(0.190")(1.188")/2.2 = 359 lb

Bearing of #10-16 TEKS Screw on Steel Stud

$V_a = 2.7DtF_{tu}/3.0$
V_a = 2.7(0.190")(0.054")(65,000 psi)/3.0
V_a = 600 lb.

Tilting of #10-16 TEKS Screw in Steel Stud

$V_a = 4.2(t_2^3D)^{1/2}F_{tu2}/n_s$
$V_a = 4.2(0.054"^3 \times 0.190")^{1/2}$(65,000 psi)/3.0
V_a = 497 lb.

Capacity of Connection is 359 lb.

Alternate Substrate – Through Frame to Aluminum Tube Mullion

#10-16 TEKS Screw

1-3/16" thick Window Frame (Ponderosa Pine/Douglas Fir, G = 0.43)

1/4" Maximum Shim Space

1/8" thick 6063-T6 aluminum tube mullion (qualifies 1/4" thick mullion)

Allowable Shear of #10-16 TEKS Screw

P_{ss}/Ω = 573 lb (ESR-1976)

Bearing of #10-16 TEKS Screw on Wood Frame

F_e = 3,500 psi
D = 0.190"
$V_a = (F_e)(D)(L)/R_d$ = (3,500 psi)(0.190")(1.188")/2.2 = 359 lb

Bearing of #10-16 TEKS Screw on Aluminum Tube Mullion

$V_a = 2DtF_u/n_u$
V_a = 2(0.190")(0.125")(30,000 psi)/3.0
V_a = 475 lb.

Tilting of #10-16 TEKS Screw in Aluminum Tube Mullion

$V_a = 4.2(t_2^3D)^{1/2}F_{tu2}/n_s$
$V_a = 4.2(0.125"^3 \times 0.190")^{1/2}(30{,}000 \text{ psi})/3.0$
V_a = 809 lb.

Capacity of Connection is 359 lb.

Alternate Substrate – Through Frame to Concrete

3/16" Tapcon Anchor

2" Minimum Edge Distance, 1-1/2" Minimum Embedment, 2" Minimum Spacing

1-3/16" thick Window Frame (Ponderosa Pine/Douglas Fir, G = 0.43)

1/4" Maximum Shim Space

Minimum f'_c = 3,000 psi Concrete

Allowable Shear of 3/16" Tapcon Anchor

P_{ss}/Ω = 186 lb (NOA No. 16-1222.06)

Bearing of 3/16" Tapcon Anchor on Wood Frame

F_e = 3,500 psi
D = 0.188"
$V_a = (F_e)(D)(L)/R_d$ = (3,500 psi)(0.188")(1.188")/2.2 = 355 lb

Capacity of Connection is 186 lb

Alternate Substrate – Through Frame to CMU

3/16" Tapcon Anchor

2" Minimum Edge Distance, 1" Minimum Embedment, 3" Minimum Spacing

1-3/16" thick Window Frame (Ponderosa Pine/Douglas Fir, G = 0.43)

1/4" Maximum Shim Space

Minimum ASTM C90 Medium-Weight Concrete Masonry Unit

Allowable Shear of 3/16" Tapcon Anchor

P_{ss}/Ω = 135 lb (NOA No. 16-1222.06)

Bearing of 3/16" Tapcon Anchor on Wood Frame

F_e = 3,500 psi
D = 0.188"
$V_a = (F_e)(D)(L)/R_d$ = (3,500 psi)(0.188")(1.188")/2.2 = 355 lb

Capacity of Connection is 135 lb

As-Tested – Installation Clip to Wood

(4) #6 x 1-5/8" Wood Screws

0.040" thick steel anchor clip (F_y = 33,000 psi, F_u = 45,000 psi)

Southern Yellow Pine Wood Substrate Minimum (G=0.55)

1/4" Maximum Shim Space

Allowable Tension of #6 x 1-5/8" Wood Screw

W = 1.6(1.500")(119 lb/in) (NDS, Table 12.2B)
W = 286 lb

Pull-Over of #6 x 1-5/8" Wood Screw

$P_{nov} = 1.5t_1d_wF_u/\Omega$
P_{nov} = 1.5(0.040")(0.279")(45,000 psi)/3.0
P_{nov} = 251 lb

Tension in Clip

A_{net} = (1.500" – (2)(0.180"))(0.040") = 0.0456 in^2
$P_n = F_uA_{net}$ = (45,000 psi)(0.0456 in^2) = 2,052 lb
$P_a = P_n/\Omega$ = 2,052 lb/2.0 = 1,026 lb

Bending of Clip

L = (1/4" shim + 1/2" edge distance)/2 = 0.375"; guided cantilever at bend in clip
S = (1.500")(0.040")^2/6 = 0.0004 in^3
$F_b = 0.67F_y$ = (0.67)(33,000 psi) = 22,110 psi
$M_a = P_a(L) = F_bS$; $P_a = F_bS/L$ = (22,110 psi)(0.0004 in^3)/0.375" = 24 lb

Capacity of Connection is 24 lb

Alternate Substrate – Installation Clip to Steel Stud

#10-16 TEKS Screw

0.040" thick steel anchor clip (F_y = 33,000 psi, F_u = 45,000 psi)

Minimum 16 gauge 50 KSI Steel Stud

1/4" Maximum Shim Space

Pull-Out of #10-16 TEKS Screw

$P_{not} = 0.85t_c d F_{u2}/3.0$
$P_{not} = 0.85(0.054")(0.190")(65{,}000 \text{ psi})/3.0$
$P_{not} = 189$ lb

Pull-Over of #10-16 TEKS Screw

$P_{nov} = 1.5t_1 d_w F_u/\Omega$
$P_{nov} = 1.5(0.040")(0.365")(45{,}000 \text{ psi})/3.0$
$P_{nov} = 329$ lb

Tension in Clip

$A_{net} = (1.500" - (2)(0.180"))(0.040") = 0.0456 \text{ in}^2$
$P_n = F_u A_{net} = (45{,}000 \text{ psi})(0.0456 \text{ in}^2) = 2{,}052$ lb
$P_a = P_n/\Omega = 2{,}052 \text{ lb}/2.0 = 1{,}026$ lb

Bending of Clip

L = (1/4" shim + 1/2" edge distance)/2 = 0.375"; guided cantilever at bend in clip
$S = (1.500")(0.040")^2/6 = 0.0004 \text{ in}^3$
$F_b = 0.67F_y = (0.67)(33{,}000 \text{ psi}) = 22{,}110$ psi
$M_a = P_a(L) = F_b S$; $P_a = F_b S/L = (22{,}110 \text{ psi})(0.0004 \text{ in}^3)/0.375" = 24$ lb

Capacity of Connection is 24 lb

Alternate Substrate – Installation Clip to Aluminum Tube Mullion

#10-16 TEKS Screw

0.040" thick steel anchor clip (F_y = 33,000 psi, F_u = 45,000 psi)

1/8" thick 6063-T6 aluminum tube mullion (qualifies 1/4" thick tube mullion)

1/4" Maximum Shim Space

Pull-Out of #10-16 TEKS Screw at Tube Mullion

$P_{not} = K_s D L_e F_{ty2}/3.0$
P_{not} = 1.2 (0.190")(0.125")(25,000 psi)/3.0
P_{not} = 238 lb

Pull-Over of #10-16 TEKS Screw

$P_{nov} = 1.5 t_1 d_w F_u/\Omega$
P_{nov} = 1.5(0.040")(0.365")(45,000 psi)/3.0
P_{nov} = 329 lb

Tension in Clip

A_{net} = (1.500" – (2)(0.180"))(0.040") = 0.0456 in^2
$P_n = F_u A_{net}$ = (45,000 psi)(0.0456 in^2) = 2,052 lb
$P_a = P_n/\Omega$ = 2,052 lb/2.0 = 1,026 lb

Bending of Clip

L = (1/4" shim + 1/2" edge distance)/2 = 0.375"; guided cantilever at bend in clip
S = (1.500")(0.040")^2/6 = 0.0004 in^3
$F_b = 0.67 F_y$ = (0.67)(33,000 psi) = 22,110 psi
$M_a = P_a(L) = F_b S$; $P_a = F_b S/L$ = (22,110 psi)(0.0004 in^3)/0.375" = 24 lb

Capacity of Connection is 24 lb

Alternate Substrate – Installation Clip to Concrete

3/16" Tapcon Anchor

1" Minimum Edge Distance, 1-1/2" Minimum Embedment

Minimum f'_c = 3,000 psi Concrete

0.040" thick steel anchor clip (F_y = 33,000 psi, F_u = 45,000 psi)

1/4" Maximum Shim Space

Tension Capacity of 3/16" Tapcon Anchor

P_a = 261 lb (NOA No. 16-1222.06)

Pull-Over of 3/16" Tapcon Anchor

$P_{nov} = 1.5t_1d_wF_u/\Omega$
P_{nov} = 1.5(0.040")(0.357")(45,000 psi)/3.0
P_{nov} = 321 lb

Tension in Clip

A_{net} = (1.500" – (2)(0.180"))(0.040") = 0.0456 in^2
$P_n = F_uA_{net}$ = (45,000 psi)(0.0456 in^2) = 2,052 lb
$P_a = P_n/\Omega$ = 2,052 lb/2.0 = 1,026 lb

Bending of Clip

L = (1/4" shim + 1/2" edge distance)/2 = 0.375"; guided cantilever at bend in clip
S = (1.500")(0.040")^2/6 = 0.0004 in^3
$F_b = 0.67F_y$ = (0.67)(33,000 psi) = 22,110 psi
$M_a = P_a(L) = F_bS$; $P_a = F_bS/L$ = (22,110 psi)(0.0004 in^3)/0.375" = 24 lb

Capacity of Connection is 24 lb

Alternate Substrate – Installation Clip to CMU

3/16" Tapcon Anchor

2" Minimum Edge Distance, 1" Minimum Embedment

Minimum ASTM C90 Medium-Weight Concrete Masonry Unit

0.040" thick steel anchor clip (F_y = 33,000 psi, F_u = 45,000 psi)

1/4" Maximum Shim Space

Tension Capacity of 3/16" Tapcon Anchor

P_a = 68 lb (NOA No. 16-1222.06)

Pull-Over of 3/16" Tapcon Anchor

$P_{nov} = 1.5t_1d_wF_u/\Omega$
P_{nov} = 1.5(0.040")(0.357")(45,000 psi)/3.0
P_{nov} = 321 lb

Tension in Clip

A_{net} = (1.500" – (2)(0.180"))(0.040") = 0.0456 in^2
$P_n = F_uA_{net}$ = (45,000 psi)(0.0456 in^2) = 2,052 lb
$P_a = P_n/\Omega$ = 2,052 lb/2.0 = 1,026 lb

Bending of Clip

L = (1/4" shim + 1/2" edge distance)/2 = 0.375"; guided cantilever at bend in clip
S = (1.500")(0.040")^2/6 = 0.0004 in^3
$F_b = 0.67F_y$ = (0.67)(33,000 psi) = 22,110 psi
$M_a = P_a(L) = F_bS$; $P_a = F_bS/L$ = (22,110 psi)(0.0004 in^3)/0.375" = 24 lb

Capacity of Connection is 24 lb

Appendix A

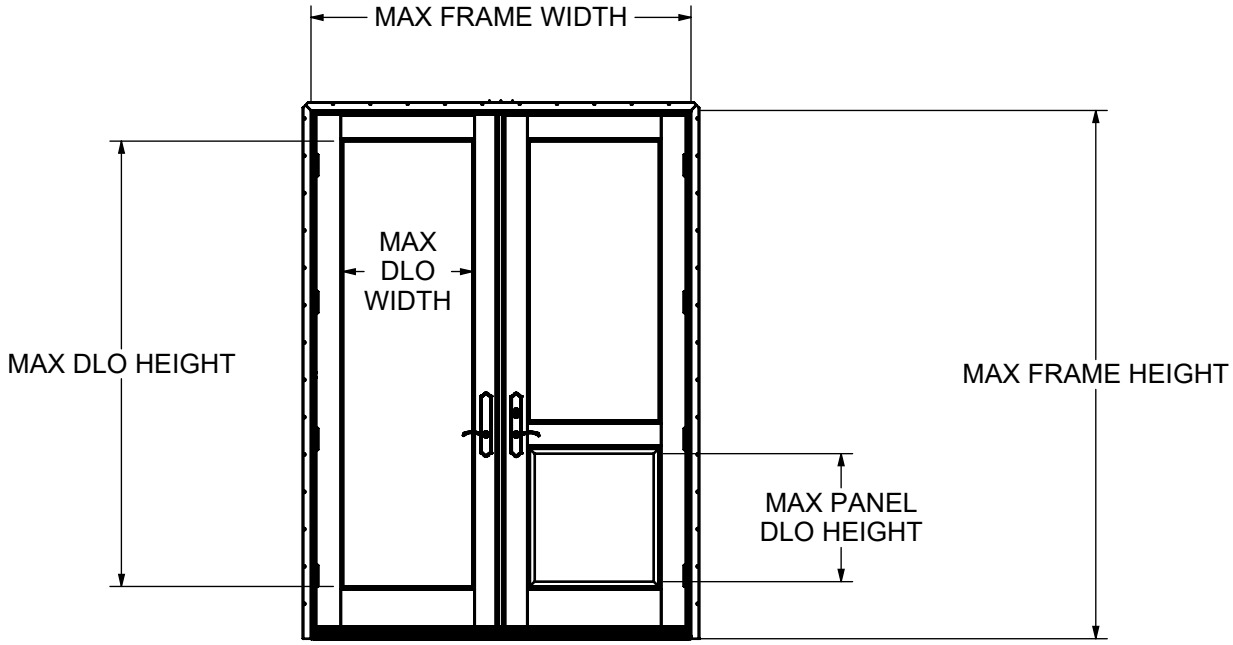
Revision Log

Identification	Date	Page & Revision
Original Issue	12/22/23	Not Applicable

Molimo™
Architectural Product Testing

Appendix B

Installation Drawings

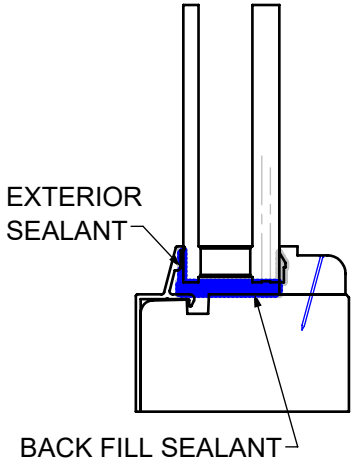


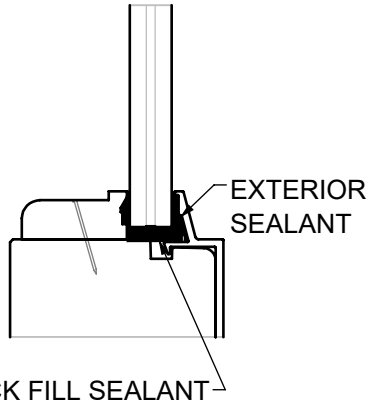
1606 OUTSWING FRENCH DOOR PREMIUM COSTAL QUALIFIES RECTANGLE AND ARCH TOP DOORS

GLAZING TABLE	
EXTERIOR SEALANT	BACK FILL SEALANT
GE RAPID STRENGTH 7700 (2 PART)	GE SCS 2000

QUALIFIES RECTANGLE / EYEBROW UNITS IN A 1 OR 2 PANEL CONFIGURATION

DESCRIPTION	FRAME SIZE		DAY LIGHT OPENING		DESIGN PRESSURE (psf)	FRAME MATERIAL
	WIDTH (IN.)	HEIGHT (IN.)	WIDTH (IN.)	HEIGHT (IN.)		
FRENCH DOOR (IMPACT)	73.69	98.03	25.50	82.44	+60 / -75	WOOD, ALUMINUM
FRENCH DOOR (IMPACT)	83.25	120.03	30.281	104.438	+60 / -60	WOOD, ALUMINUM
FRENCH DOOR (IMPACT)	43.38	120.03	30.281	104.438	+60 / -60	WOOD, ALUMINUM





GENERAL NOTE(S):
1. THESE UNITS HAVE BEEN TESTED, ANALYZED, HALLMARK CERTIFIED AND FBC APPROVED.
2. GLASS MEETS THE REQUIREMENTS OF ASTM E1300.
3. SETTING BLOCK SHOULD BE 70-90 DUROMETER AS PER 2411.3.3.1 OF THE CURRENT FBC.
4. GLASS LITES THAT EXCEED 36" IN WIDTH SHALL USE SETTING BLOCKS AT ¼ SPAN FROM CORNERS AS PER 2411.3.3.1 OF THE CURRENT FBC.
5. LARGE AND SMALL MISSILE IMPACT RESISTANT. WINDOW AND DOOR UNITS REQUIRED TO MEET SMALL MISSILE IMPACT WIND-BORNE DEBRIS PROTECTION REQUIRE THE EXTERIOR LITE OF AN INSULATED UNIT TO BE TEMPERED PER FBC, SECTION 2411.3.3.7.

TOLERANCES UNLESS SPECIFIED:	
INCHES	ANGLE
.x ± .1"	xx ± 1°
.xx ± .03"	xx.x ± .5° (1/2°)
.xxx ± .015"	xx.xx ± .25° (1/4°)

WEATHER SHIELD. WINDOWS & DOORS

PRODUCTS: 1606

REV	DATE	DESCRIPTION	PCR NO.	ENG

TYP. WALL THICKNESS:
WT/FT: AREA:
MAT: FINISH:
PDR #: 15855 PROFILE #:

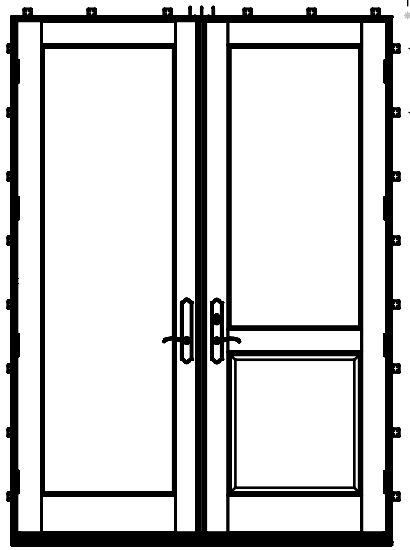
DRAWN BY: MDS | DATE: 12/20/2023 | TITLE: INSTALLATION INSTRUCTION

PROPERTY OF WEATHER SHIELD MFG., INC.
DRAWING IS NOT TO BE REPRINTED OR SUBMITTED FOR USE OUTSIDE OF WEATHER SHIELD MFG., INC.
ALL RIGHTS RESERVED.

DWG NO.: 45-17203 | REV B

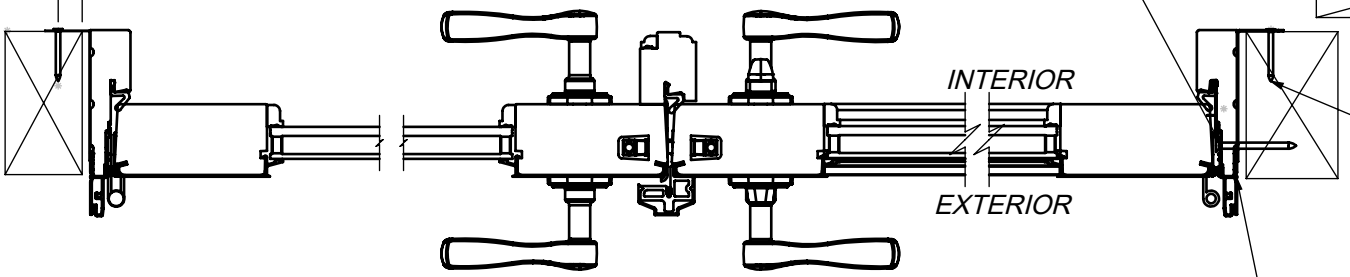
SCALE: 1:36 | SHEET NAME: Sheet1 | SHEET 1 OF 4

DO NOT SCALE DRAWING

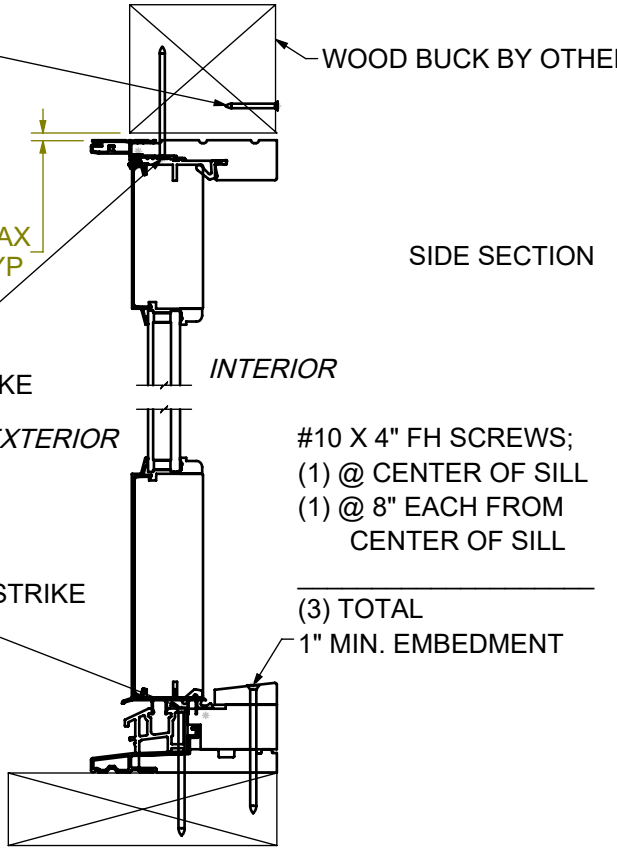


INSTALLATION CLIP METHOD

QUALIFIES RECTANGLE / EYEBROW UNITS IN A 1 OR 2 PANEL CONFIGURATION



TOP VIEW



SIDE SECTION

THIS SCHEDULE ADDRESSES ONLY THE FASTENERS REQUIRED TO ANCHOR THE DOOR TO ARCHIVE THE RATED DESIGN PRESSURE. THOROUGHLY READ AND FOLLOW THE MANUFACTURES INSTALLATION INSTRUCTIONS RECEIVED WITH THE UNIT. THIS GUIDE DOES NOT ADDRESS THE SEALING CONSIDERATIONS THAT MAY ARISE IN DIFFERENT WALL CONDITIONS.

REV	DATE	DESCRIPTION	PCR NO.	ENG

TYP. WALL THICKNESS:	
WT/FT:	AREA:
MAT:	FINISH:
PDR #: 15855	PROFILE #:

TOLERANCES UNLESS SPECIFIED:	
INCHES	ANGLE
.x ± .1"	xx ± 1°
.xx ± .03"	xx.x ± .5° (1/2°)
.xxx ± .015"	xx.xx ± .25° (1/4°)

WEATHER SHIELD
WINDOWS & DOORS

PRODUCTS: 1606

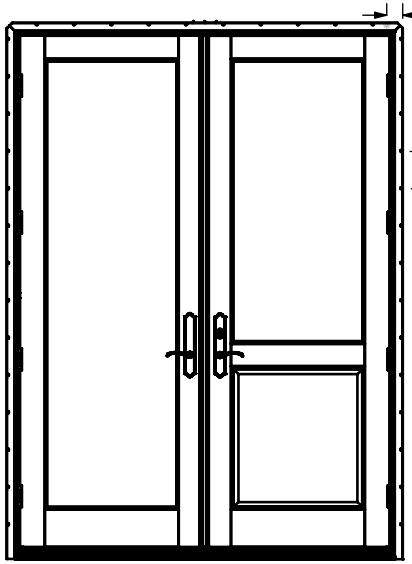
DRAWN BY: MDS | DATE: 12/20/2023 | TITLE: INSTALLATION INSTRUCTION

PROPERTY OF WEATHER SHIELD MFG., INC.
DRAWING IS NOT TO BE REPRINTED OR SUBMITTED FOR USE OUTSIDE OF WEATHER SHIELD MFG., INC.
ALL RIGHTS RESERVED.

DWG NO.: 45-17203 | REV: B

SCALE: 1:36 | SHEET NAME: Sheet2 | SHEET 2 OF 4

DO NOT SCALE DRAWING



#6 X 1-5/8" FH SCREWS;
3" FROM EACH CORNER
AND 8-10" ON CENTER

1" MIN. EMBEDMENT

WOOD BUCK BY OTHERS

.250 (6.35MM) MAX
SHIM SPACE TYP

SIDE SECTION

#10 X 3-1/2" FH SCREWS;
(3) THROUGH THE HEAD STRIKE
2" MIN. EMBEDMENT

EXTERIOR *INTERIOR*

#10 X 4" FH SCREWS;
(1) @ CENTER OF SILL
(1) @ 8" EACH FROM
CENTER OF SILL

(3) TOTAL
1" MIN. EMBEDMENT

#10 X 4" FH SCREWS;
(3) THROUGH THE SILL STRIKE
2" MIN. EMBEDMENT

NAILING FIN METHOD

QUALIFIES RECTANGLE / EYEBROW UNITS IN A 1 OR 2 PANEL CONFIGURATION

(2) #10 X 2-1/2" FH SCREW PER HINGE
MINIMUM 1-1/2" EMBEDMENT

INTERIOR

EXTERIOR

.750 MIN. EDGE DISTANCE

TOP VIEW

#6 X 1-5/8" FH SCREWS;
3" FROM EACH CORNER
AND 8-10" ON CENTER
BOTH SIDES

1" MIN. EMBEDMENT

PERIMETER SEALING
BY OTHERS

THIS SCHEDULE ADDRESSES ONLY THE FASTENERS REQUIRED TO ANCHOR THE DOOR TO ARCHIVE THE RATED DESIGN PRESSURE. THOROUGHLY READ AND FOLLOW THE MANUFACTURES INSTALLATION INSTRUCTIONS RECEIVED WITH THE UNIT. THIS GUIDE DOES NOT ADDRESS THE SEALING CONSIDERATIONS THAT MAY ARISE IN DIFFERENT WALL CONDITIONS.

REV	DATE	DESCRIPTION	PCR NO.	ENG

TYP. WALL THICKNESS:
WT/FT: AREA:
MAT: FINISH:
PDR #: 15855 PROFILE #:

TOLERANCES UNLESS SPECIFIED:	
INCHES	ANGLE
.x ± .1"	xx ± 1°
.xx ± .03"	xx.x ± .5° (1/2°)
.xxx ± .015"	xx.xx ± .25° (1/4°)

WEATHER SHIELD.
WINDOWS & DOORS

PRODUCTS: 1606

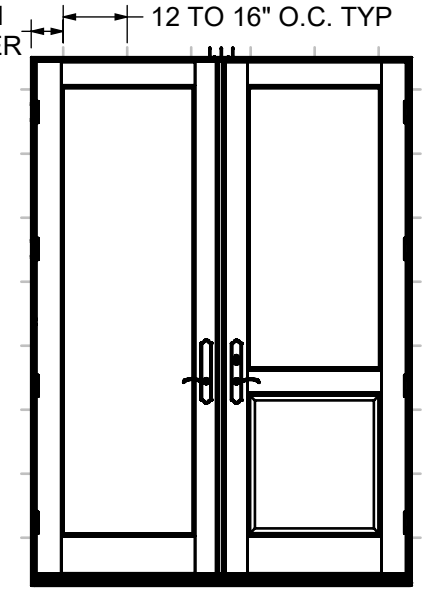
DRAWN BY: MDS
DATE: 12/20/2023
TITLE: INSTALLATION INSTRUCTION

PROPERTY OF WEATHER SHIELD MFG., INC.
DRAWING IS NOT TO BE REPRINTED OR
SUBMITTED FOR USE OUTSIDE OF
WEATHER SHIELD MFG., INC.
ALL RIGHTS RESERVED.

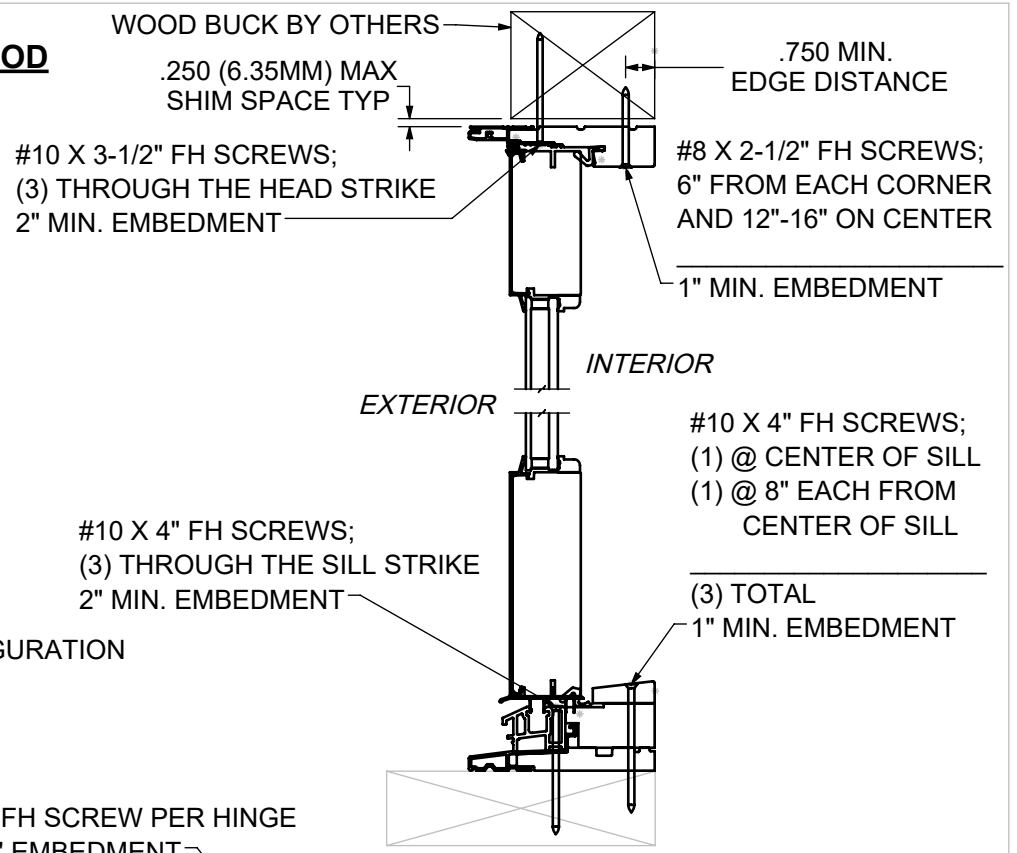
DWG NO.: 45-17203
REV B
SCALE: 1:36 SHEET NAME: Sheet3 SHEET 3 OF 4

DO NOT SCALE DRAWING

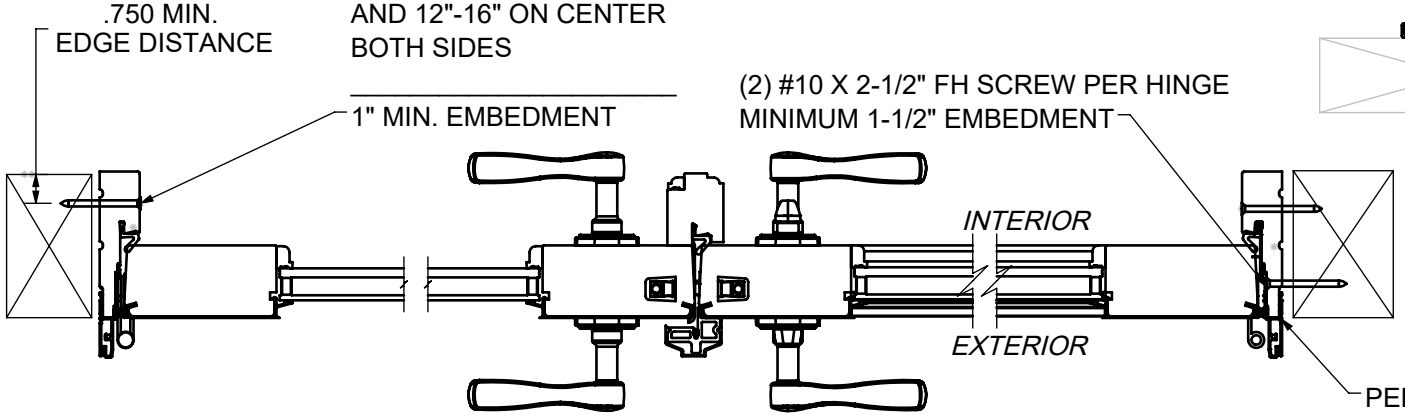
THROUGH JAMB METHOD



QUALIFIES RECTANGLE / EYEBROW UNITS IN A 1 OR 2 PANEL CONFIGURATION



SIDE SECTION



TOP VIEW

THIS SCHEDULE ADDRESSES ONLY THE FASTENERS REQUIRED TO ANCHOR THE DOOR TO ARCHIVE THE RATED DESIGN PRESSURE. THOROUGHLY READ AND FOLLOW THE MANUFACTURES INSTALLATION INSTRUCTIONS RECEIVED WITH THE UNIT. THIS GUIDE DOES NOT ADDRESS THE SEALING CONSIDERATIONS THAT MAY ARISE IN DIFFERENT WALL CONDITIONS.

REV	DATE	DESCRIPTION	PCR NO.	ENG

TYP. WALL THICKNESS:	
WT/FT:	AREA:
MAT:	FINISH:
PDR #: 15855	PROFILE #:

TOLERANCES UNLESS SPECIFIED:	
INCHES	ANGLE
.x ± .1"	xx ± 1°
.xx ± .03"	xx.x ± .5° (1/2°)
.xxx ± .015"	xx.xx ± .25° (1/4°)

WEATHER SHIELD.
WINDOWS & DOORS

PRODUCTS: 1606

DRAWN BY:	DATE:	TITLE:
MDS	12/20/2023	INSTALLATION INSTRUCTION

PROPERTY OF WEATHER SHIELD MFG., INC.
DRAWING IS NOT TO BE REPRINTED OR SUBMITTED FOR USE OUTSIDE OF WEATHER SHIELD MFG., INC.
ALL RIGHTS RESERVED.

DWG NO.: 45-17203 REV B

SCALE: 1:36 SHEET NAME: Sheet4 SHEET 4 OF 4

DO NOT SCALE DRAWING