



MIAMI-DADE COUNTY  
**PRODUCT CONTROL SECTION**  
 11805 SW 26 Street, Room 208  
 Miami, Florida 33175-2474  
 T (786) 315-2590 F (786) 315-2599  
[www.miamidade.gov/building](http://www.miamidade.gov/building)

**DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)  
 BOARD AND CODE ADMINISTRATION DIVISION  
 NOTICE OF ACCEPTANCE (NOA)**

**CGI Windows and Doors, Inc.**  
**3780 W 104<sup>th</sup> Street**  
**Hialeah, FL 33018**

**SCOPE:**

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER - Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein and has been designed to comply with the Florida Building Code, including the High Velocity Hurricane Zone.

**DESCRIPTION: Series Clipped, Extruded Aluminum Tube Mullion – L.M.I.**

**APPROVAL DOCUMENT:** Drawing No. TUBEMULL-CGI, titled “Aluminum Tube Mullions, Clipped (LM)”, sheets 1 through 23 of 23, dated 02/02/23, prepared by manufacturer, signed and sealed by Anthony Lynn Miller, P.E., bearing the Miami-Dade County Product Control Revision stamp with the Notice of Acceptance number and expiration date by the Miami-Dade County Product Control Section.

**MISSILE IMPACT RATING: Large and Small Missile Impact Resistant.**

**LABELING:** Each unit shall bear a permanent label with the manufacturer's name or logo, city, state, model/series, and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

**RENEWAL** of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

**TERMINATION** of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

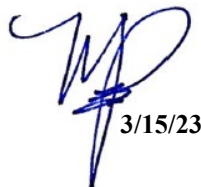
**ADVERTISEMENT:** The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

**INSPECTION:** A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA **revises and renews NOA No. 20-0610.10** and consists of this page 1 and evidence pages E-1, E-2, E-3 and E-4, as well as approval document mentioned above.

The submitted documentation was reviewed by **Manuel Perez, P.E.**



  
 3/15/23

**NOA No. 23-0221.03**  
**Expiration Date: March 28, 2028**  
**Approval Date: March 23, 2023**  
 Page 1

**CGI Windows and Doors, Inc.**

**NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED**

**1. EVIDENCE SUBMITTED UNDER PREVIOUS NOA's**

**A. DRAWINGS**


1. Manufacturer's die drawings and sections.  
*(Submitted under NOA No. 95-0929.39)*
2. Drawing No. MD-MULCLIP, titled "Clipped Mullion", sheets 1 through 7 of 7, dated 05/22/20, with revision A dated 05/22/20, prepared by manufacturer, signed and sealed by Anthony Lynn Miller, P.E.  
*(Submitted under NOA No.20-0610.10)*

**B. TESTS**

1. Test reports on: 1) Air Infiltration Test, per FBC, TAS 201-94  
2) Uniform Static Air Pressure Test, Loading per FBC, TAS 202-94  
3) Water Resistance Test, per FBC, TAS 202-94  
4) Small Missile Impact Test per FBC, TAS 201-94  
5) Large Missile Impact Test per FBC, TAS 201-94  
along with marked-up drawings and installation diagram of casement windows mullied using a 1"x 2"x 1/8" aluminum tube mullion, prepared by Hurricane Testing Lab, Inc., Test Report No. **HTL-0080-0105-08**, dated 03/26/08 for Specimens No. 1 and 2, signed and sealed by Vinu J. Abraham, P.E.  
*(Submitted under NOA No. 08-0331.07)*
2. Test reports on: 1) Large Missile Impact Test, Loading per SFBC, PA 201-94  
along with marked-up drawings and installation diagram of an aluminum fixed window, prepared by Hurricane Test Laboratory, Inc. Test Report No. **HTL-0080-0303-96**, dated 03/06/96, signed and sealed by Timothy S. Marshall, P.E.  
*(Submitted under NOA No. 95-0929.39)*
3. Test reports on: 1) Uniform Static Air Pressure Test, Loading per SFBC, PA 202-94  
along with marked-up drawings and installation diagram of fixed windows mullied using a 1"x 2"x 1/8" aluminum tube mullion, prepared by Hurricane Engineering & Testing, Inc., Test Report No. **HETI-96-525**, dated 02/12/96, signed and sealed by Hector M. Medina, P.E.  
*(Submitted under NOA No. 95-0929.39)*

**C. CALCULATIONS**

1. Anchor verification calculations and structural analysis, complying with **FBC 6<sup>th</sup> Edition (2017)** and **FBC 7<sup>th</sup> Edition (2020)** dated 06/05/20, prepared by manufacturer, signed and sealed by Anthony Lynn Miller, P.E.  
*(Submitted under NOA No. 20-0610.10)*
2. Glazing complies with **ASTM E1300-09**

  
Manuel Perez, P.E.  
Product Control Examiner  
NOA No. 23-0221.03

Expiration Date: March 28, 2028  
Approval Date: March 23, 2023

**CGI Windows and Doors, Inc.**

**NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED**

**1. EVIDENCE SUBMITTED UNDER PREVIOUS NOA's (CONTINUED)**

**D. QUALITY ASSURANCE**

1. Miami-Dade Department of Regulatory and Economic Resources (RER).

**E. MATERIAL CERTIFICATIONS**

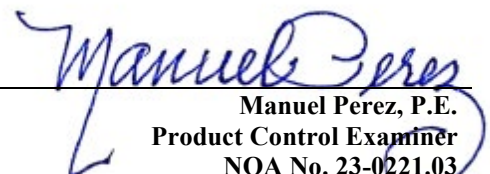
1. None.

**F. STATEMENTS**

1. Statement letter of conformance, complying with **FBC 6<sup>th</sup> Edition (2017)**, with **FBC 7<sup>th</sup> Edition (2020)** and of no financial interest, dated 05/22/20, signed and sealed by Anthony Lynn Miller, P.E.  
*(Submitted under NOA No. 20-0610.10)*
2. Statement letter of successor engineer per 61G15-27.001 Florida Administrative Code.  
*(Submitted under NOA No. 20-0610.10)*
3. Laboratory compliance letters for Test Report No. **HTL-0080-0105-08**, specimens **1** and **2**, issued by Hurricane Test Laboratory, Inc., dated 03/26/08, signed and sealed by Vinu J. Abraham, P.E.  
*(Submitted under NOA No. 08-0331.07)*
4. Laboratory compliance letters for Test Report No. **HTL-0080-0303-96**, issued by Hurricane Test Laboratory, Inc., dated 03/06/96, signed and sealed by Timothy S. Marshall, P.E.  
*(Submitted under NOA No. 95-0929.39)*
5. Laboratory compliance letters for Test Report No. **HETI-96-525**, issued by Hurricane Engineering & Testing, Inc., dated 02/12/96, signed and sealed by Hector M. Medina, P.E.  
*(Submitted under NOA No. 95-0929.39)*

**G. OTHERS**

1. Notice of Acceptance No. **18-0129.08**, issued to CGI Windows & Doors for their Series Clipped, Extruded Aluminum Tube Mullions – L.M.I., approved on 03/19/18 and expiring on 03/28/23.



**Manuel Perez, P.E.**  
**Product Control Examiner**  
**NOA No. 23-0221.03**  
**Expiration Date: March 28, 2028**  
**Approval Date: March 23, 2023**

**CGI Windows and Doors, Inc.**

**NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED**

**2. NEW EVIDENCE SUBMITTED**

**A. DRAWINGS**

1. Drawing No. TUBEMULL-CGI, titled "Aluminum Tube Mullions, Clipped (LM)", sheets 1 through 23 of 23, dated 02/02/23, prepared by manufacturer, signed and sealed by Anthony Lynn Miller, P.E.

**B. TESTS**

1. Test reports on: 1) Air Infiltration Test, per FBC, TAS 202-94  
2) Uniform Static Air Pressure Test, Loading per FBC, TAS 202-94  
3) Water Resistance Test, per FBC, TAS 202-94  
4) Large Missile Impact Test per FBC, TAS 201-94  
5) Cyclic Wind Pressure Loading per FBC, TAS 203-94  
6) Forced Entry Test, per FBC 2411.3.2.1, and TAS 202-94  
along with marked-up drawings and installation diagram of clipped aluminum mullions, prepared by Fenestration Testing Lab, Inc., Test Report No. **FTL-6443** (samples A-1 thru E-1), dated 02/28/11, and addendum letter dated 05/05/11, signed and sealed by Marlin D. Brinson, P.E.  
*(Submitted under NOA's No. 17-0630.11 and 20-0406.08)*
2. Test reports on: 1) Uniform Static Air Pressure Test, Loading per FBC, TAS 202-94  
2) Large Missile Impact Test per FBC, TAS 201-94  
3) Cyclic Wind Pressure Loading per FBC, TAS 203-94  
along with marked-up drawings and installation diagram of two series 1000 fixed windows mullied together, prepared by Fenestration Testing Laboratory, Inc. Test Report No. **FTL-18-8511**, dated 11/27/18, signed and sealed by Idalmis Ortega, P.E.  
*(Submitted under NOA's No. 15-0728.01 and 20-0826.03)*

**C. CALCULATIONS**

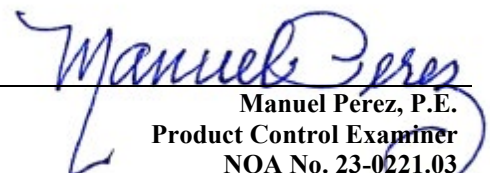
1. Mullion calculations, clip details, anchor verification calculations and structural analysis, adding additional mullions and clip options from NOA No. **20-0826.03**, also adding different clip styles from NOA's No. **20-0406.08** and No. **20-0610.10**, all complying with **FBC 7<sup>th</sup> Edition (2020)**, dated 02/15/23 by manufacturer, signed and sealed by Anthony Lynn Miller, P.E.

**D. QUALITY ASSURANCE**

1. Miami-Dade Department of Regulatory and Economic Resources (RER)

**E. MATERIAL CERTIFICATIONS**

1. None.

  
Manuel Perez, P.E.  
Product Control Examiner  
NOA No. 23-0221.03  
Expiration Date: March 28, 2028  
Approval Date: March 23, 2023

**CGI Windows and Doors, Inc.**

**NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED**

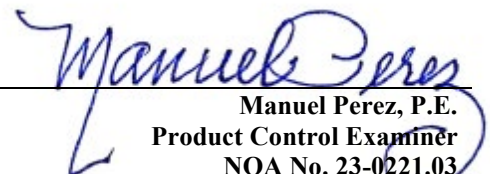
**2. NEW EVIDENCE SUBMITTED (CONTINUED)**

**F. STATEMENTS**

1. Statement letter of conformance, of complying with **FBC 7<sup>th</sup> Edition (2020)** dated 02/15/23, issued by manufacturer, signed and sealed by Anthony Lynn Miller, P.E.
2. Statement letter of no financial interest dated 02/15/23, issued by manufacturer, signed and sealed by Anthony Lynn Miller, P.E.
3. Private labeling agreement between WinDoor, Inc. and CGI Windows and Doors, Inc. document in conformance of RER guideline dated 02/15/23.

**G. OTHERS**

1. Notice of Acceptance No. **20-0610.10**, issued to CGI Windows and Doors, Inc. for their Series Clipped Mullion - L.M.I., approved on 09/24/20 and expiring on 03/28/23.



Manuel Perez, P.E.  
Product Control Examiner  
NOA No. 23-0221.03

Expiration Date: March 28, 2028  
Approval Date: March 23, 2023

**IMPACT-RESISTANT, CLIPPED, ALUMINUM TUBE MULLIONS**

1) MULLIONS AND CLIPS HAVE BEEN DESIGNED & TESTED TO COMPLY WITH THE REQUIREMENTS OF THE FLORIDA BUILDING CODE, AND ARE APPROVED FOR IMPACT AND NON-IMPACT APPLICATIONS IN THE HVHZ. MULLIONS ARE ONLY TO BE USED WITH THE MANUFACTURER'S FENESTRATION PRODUCTS.

2) INSTALLATION DETAILS SHOWN ARE FOR THE MULLION ONLY. ANCHORS SHOWN ARE IN ADDITION TO ANY ANCHORS REQUIRED FOR THE FENESTRATION PRODUCT INSTALLATION. TYPICAL APPLICATIONS ARE SHOWN. EACH SITUATION IS UNIQUE AND SHOULD BE EVALUATED BY AN EXPERIENCED INSTALLER FOR THE BEST INSTALLATION METHOD. OPTIONAL 1X OR 2X WOOD BUCKS IF USED, MUST BE ANCHORED PROPERLY TO TRANSFER LOADS AND ARE TO BE DESIGNED BY OTHERS.

3) THE TYPE AND NUMBER OF ANCHORS IS CRITICAL TO THE STRUCTURAL PERFORMANCE OF THE MULLED UNITS. MULLIONS HAVE BEEN TESTED AS "FREE-FLOATING" AND DO NOT NEED TO BE DIRECTLY ATTACHED TO THE MULLION CLIPS, BUT SHALL NOT HAVE A GAP OF MORE THAN 1/4" FROM THE CLIP, SEE FIG. 1, SHEET 4.

4) THE ANCHORAGE METHODS SHOWN HAVE BEEN DESIGNED TO RESIST THE WINDLOADS CORRESPONDING TO THE REQUIRED DESIGN PRESSURE. MULLIONS ARE CALCULATED TO DEFLECT NO MORE THAN L/180. THE 1/3 STRESS INCREASE WAS NOT USED IN THIS ANCHOR EVALUATION. THE 1.6 LOAD DURATION FACTOR WAS USED FOR THE EVALUATION OF WOOD SCREWS.

5) PROPER SEALING OF ENTIRE ASSEMBLY IS THE RESPONSIBILITY OF OTHERS AND IS BEYOND THE SCOPE OF THESE INSTRUCTIONS.

6) USE THE COMBINED WIDTH OR HEIGHT OF ONLY TWO ADJACENT FENESTRATION PRODUCTS TO DETERMINE PRESSURES AND ANCHORAGE FOR THE COMMON MULLION. FOR MULTIPLE UNITS, CONSIDER ONLY TWO ADJACENT UNITS AT A TIME WHEN USING THE DESIGN PRESSURE AND ANCHORAGE TABLES. THE LOWEST DESIGN PRESSURE OF MULTIPLE MULLIONS OR FENESTRATION PRODUCTS SHALL APPLY.

7) ANCHOR EMBEDMENT TO BASE MATERIAL SHALL BE BEYOND WALL DRESSING OR STUCCO. WOOD BUCKS BY OTHERS, MUST BE ANCHORED PROPERLY TO TRANSFER LOADS TO THE STRUCTURE. ANCHORS SHALL BE COATED OR CORROSION RESISTANT AS APPROPRIATE FOR SUBSTRATE MATERIAL. DISSIMILAR MATERIALS SHALL BE PROTECTED AS REQUIRED TO PREVENT REACTIONS.

8) REFERENCE: DEWALT ULTRACON+, DEWALT/ELCO AGGRE-GATOR & CRETEFLEX NOA'S.

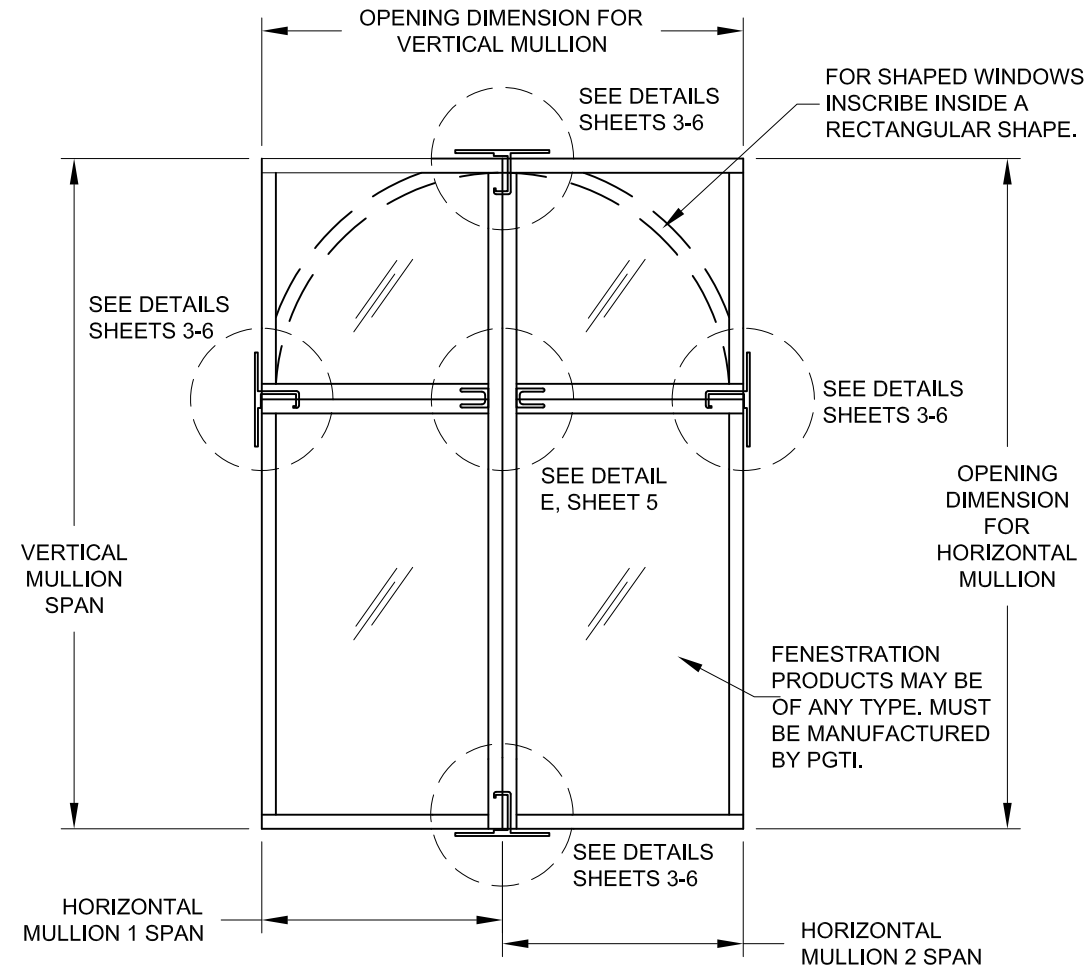
9) QUANTITY OF UNITS WITHIN A MULTIPLE MULLED ASSEMBLY IS UNLIMITED PROVIDED THAT THE SPAN AND OPENING WIDTH/HEIGHT OF EACH INDIVIDUAL MULLION COMPLIES WITH THE REQUIREMENTS OF THIS APPROVAL.

10) SUBSTRATES: CONCRETE SHALL CONFORM TO ACI 301 SPECIFICATIONS. HOLLOW AND GROUT-FILLED CONCRETE BLOCK UNIT (CMU) SHALL CONFORM TO ASTM C-90. WOOD SHALL BE SOUTHERN YELLOW PINE WITH AN SG OF 0.55. ALUMINUM SHALL BE 6063-T5 AND BE A MINIMUM OF .125" THICK. STEEL STUDS TO BE A MINIMUM GRADE 33 AND 0.045" THICK (18 GAUGE). STRUCTURAL STEEL TO BE AT LEAST .125" THICK AND A36. ALL ANCHORS INTO METAL SHALL EXTEND AT LEAST 3 SCREW THREADS BEYOND THE MATERIAL. #12 & #14 ANCHORS INTO WOOD MAY BE STEEL, 18-8 S.S. OR 410 S.S.

**CODES / STANDARDS USED:**

- 2020 FLORIDA BUILDING CODE (FBC), 7TH EDITION
- ANSI/AF&PA NDS-2018 FOR WOOD CONSTRUCTION
- ALUMINUM DESIGN MANUAL, ADM-2015
- AISI S100-16
- AISC 360-16

**FIGURE 1: MULTIPLE MULLIONS**



**DESIGN PRESSURE RATING**

SEE TABLES 1A - 14A

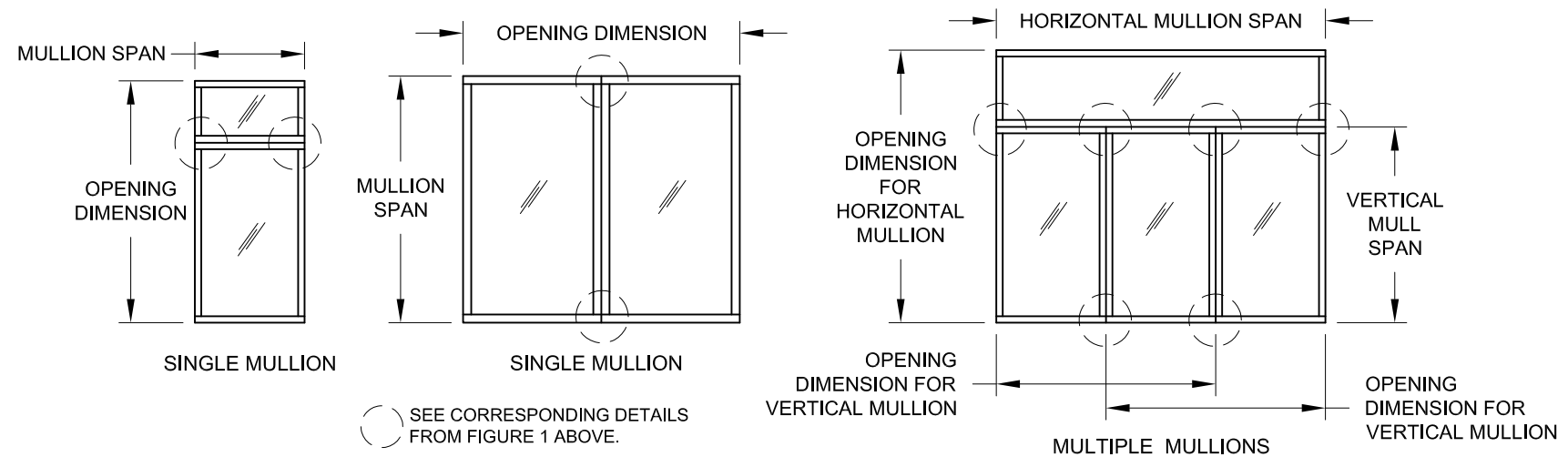
**IMPACT RATING**

RATED FOR LARGE & SMALL MISSILE IMPACT RESISTANCE

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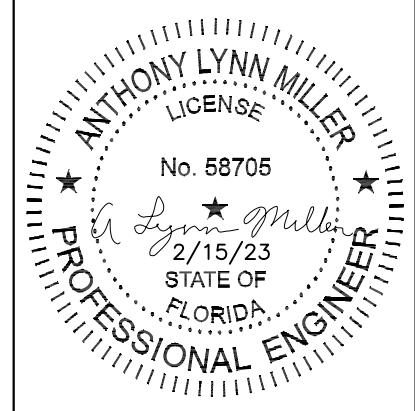
**FIGURE 2: ADDITIONAL EXAMPLES OF MULLION CONFIGURATIONS:**



**PRODUCT REVISED**  
as complying with the Florida Building Code  
**NOA-No. 23-0221.03**  
Expiration Date: **03/28/2028**  
By: *Manuel Perez*  
Miami-Dade Product Control

Revision:

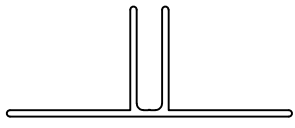
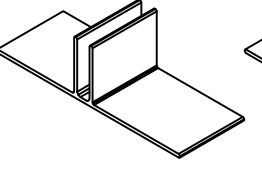
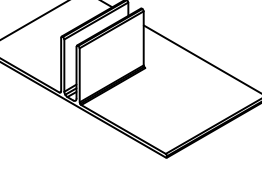
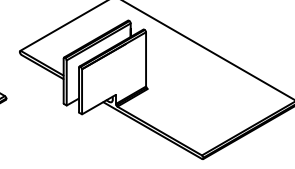
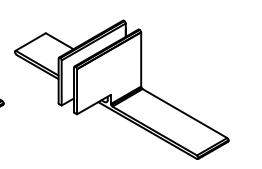

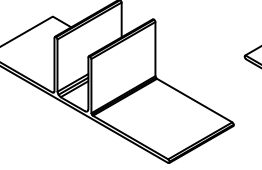
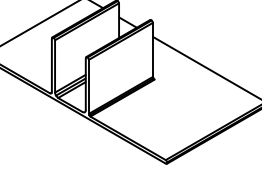
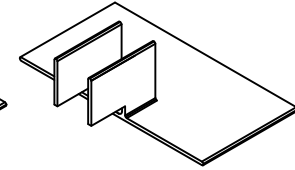
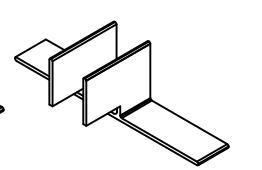
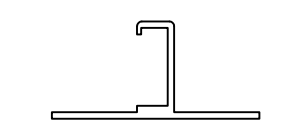
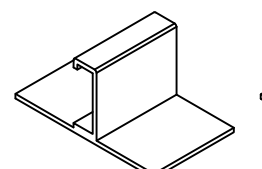
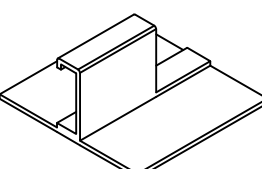
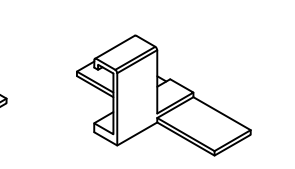
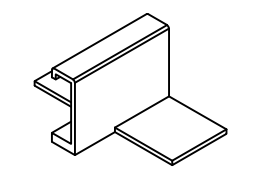
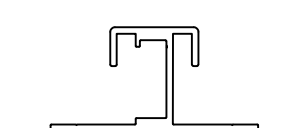
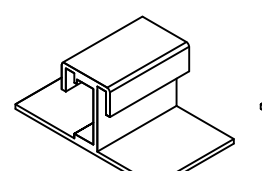
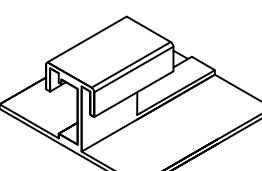
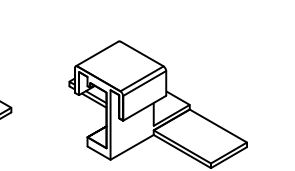
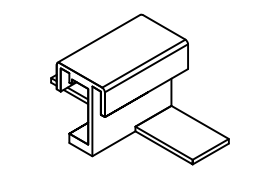
PREPARED BY A. LYNN MILLER 1070 TECHNOLOGY DRIVE N. VENICE, FL 34275 (941) 480-1600	REGISTRATION #29296	DATE 02/02/23	REV.
	ALUMINUM TUBE MULLIONS, CLIPPED (LM)	DRAWN BY JENS ROSOWSKI	TUBEMULL-1
IMPACT RESISTANT Windows & Doors WE'RE STRONGER™ 3780 W 104TH STREET HIALEAH, FL 33018 (305) 593-6590	GENERAL NOTES & ELEVATIONS	DWG No. 1 OF 23	SHEET NTS
MULLS	SCALE	TITLE	SERIES



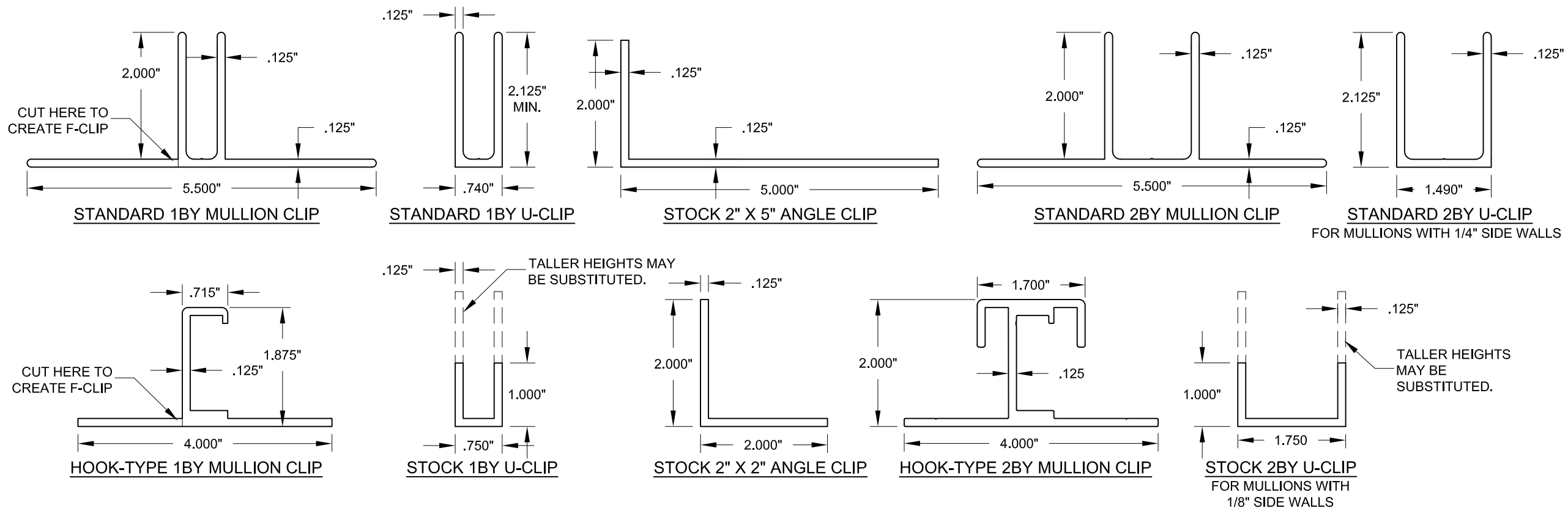
A. LYNN MILLER, P.E., P.E.# 58705

**INSTRUCTIONS:**

- 1) DETERMINE THE ALLOWABLE STRESS DESIGN PRESSURE REQUIREMENT (LBS/FT<sup>2</sup>) FOR THE OPENING USING THE **ASCE-7 STANDARD**.
- 2) TO FIND THE DESIGN PRESSURE OF THE MULLION, USE TABLES 1A THROUGH 14A. THE MULLION DESIGN PRESSURE OBTAINED SHALL MEET OR EXCEED THE DESIGN PRESSURE REQUIREMENT FOR THE OPENING OBTAINED IN STEP 1. NOTE THAT YOU MUST FIRST DETERMINE WHETHER YOU HAVE A SINGLE MULLION OR CROSSING MULLIONS.
- 3) AFTER OBTAINING THE MULLION'S DESIGN PRESSURE, FIND THE VALUE IN THE COLUMN TITLED "ANCHOR CAPACITY REQUIRED (LBS)". THIS VALUE REPRESENTS THE CLIP/ANCHOR CAPACITY THAT MUST BE MET TO ATTAIN THE MULLION DESIGN PRESSURE.
- 4) FROM THE ANCHOR/CLIP CAPACITY TABLE ON THE SAME SHEET, CHOOSE AN ANCHOR/CLIP/SUBSTRATE CONDITION THAT MEETS OR EXCEEDS THE VALUE OBTAINED FROM STEP 3.
- 5) VERIFY THE DESIGN PRESSURE OF THE FENESTRATION PRODUCT TO BE USED AND COMPARE WITH THE FINAL DESIGN PRESSURE FOR THIS MULLION SYSTEM. THE LOWER OF THE TWO SHALL APPLY FOR THE ENTIRE MULLED ASSEMBLY.
- 6) HIGHLIGHT OPTION USED AND TABLE VALUES USED IN A SPECIFIC APPLICATION WHEN USING THIS APPROVAL TO APPLY FOR A PERMIT.
- 7) OPTIONALLY, IF THE MULLION DESIGN PRESSURE OBTAINED IN THE TABLE IS MUCH HIGHER THAN THE DESIGN PRESSURE REQUIREMENT FOR THE OPENING, YOU MAY USE THE "ANCHOR CAPACITY ADJUSTMENT FORMULA" ON SHEET 1 TO OBTAIN A LOWER ANCHOR/CLIP CAPACITY.

IF USING THIS TYPE OF CLIP.....	.....THESE CLIP STYLE OPTIONS MAY BE USED INTERCHANGEABLY PROVIDED THAT THE SAME ANCHOR HOLE QUANTITY AND HOLE SPACING IS MAINTAINED.				
 STANDARD 1BY CLIP					
 STANDARD 2BY CLIP					
 HOOK-TYPE 1BY CLIP					
 HOOK-TYPE 2BY CLIP					

\* THE CLEARANCE OR OFFSET CLIPS ARE RECOMMENDED FOR FIN-FRAMED WINDOWS, BUT MAY ALSO BE USED FOR OTHER FRAME TYPES.



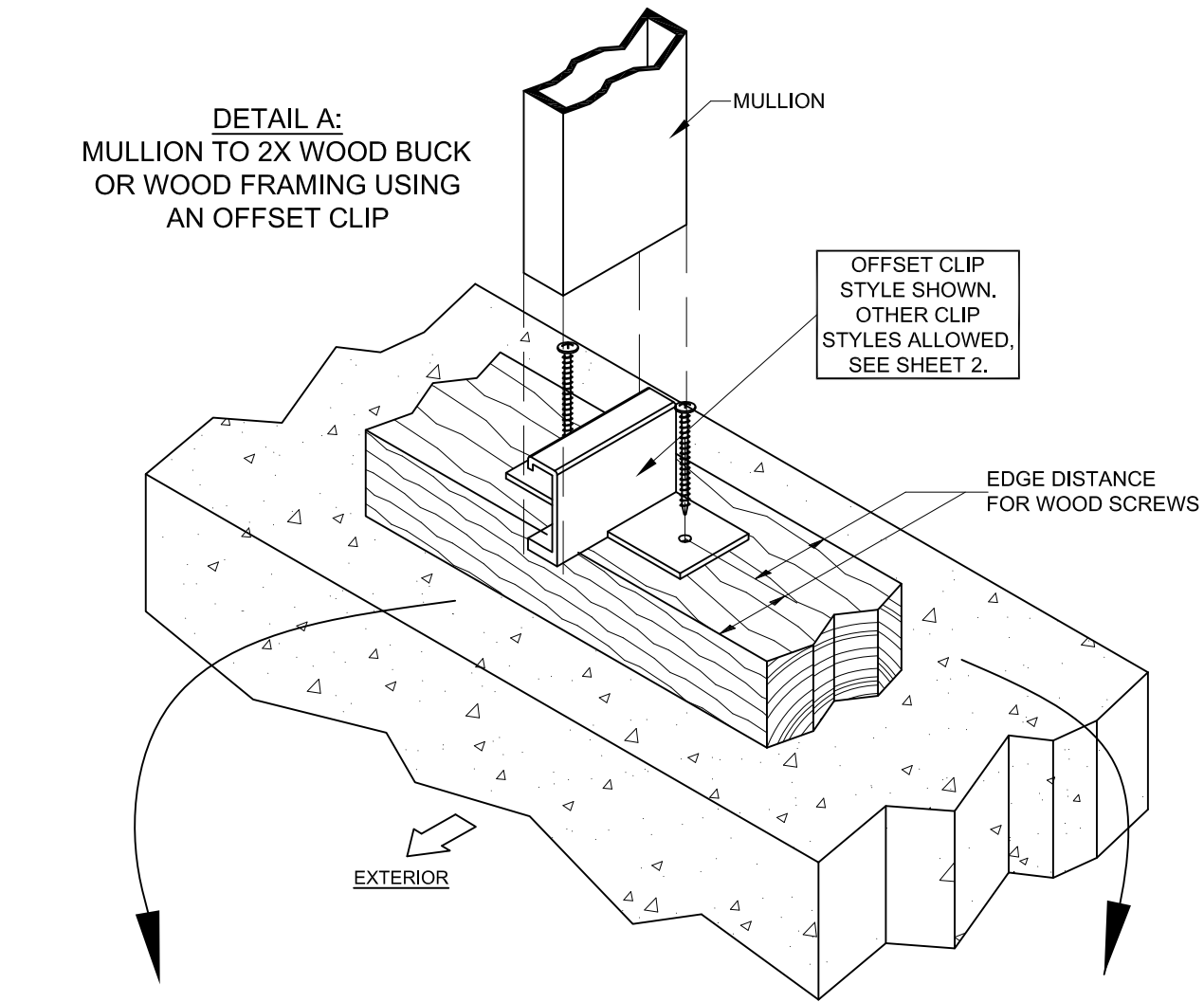
**PRODUCT REVISED**  
as complying with the Florida Building Code  
**NOA-No. 23-0221.03**  
Expiration Date: **03/28/2028**  
By: *Manuel Perez*  
Miami-Dade Product Control

Revision:

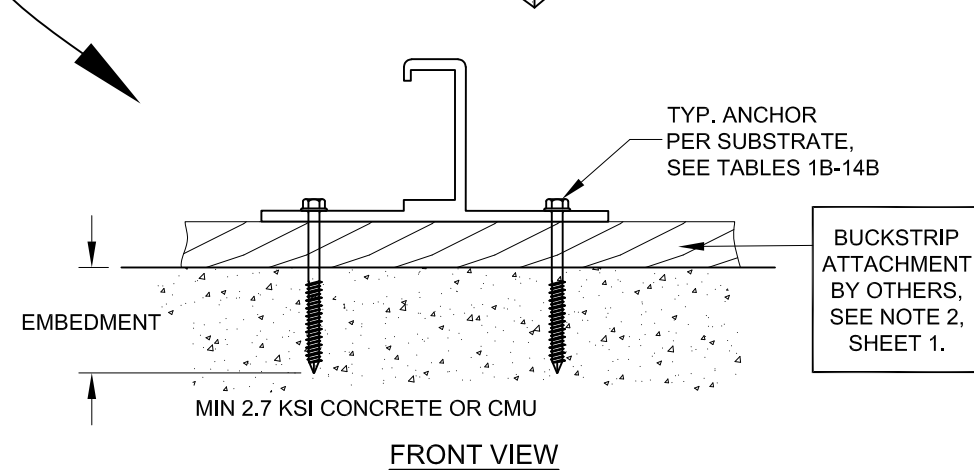
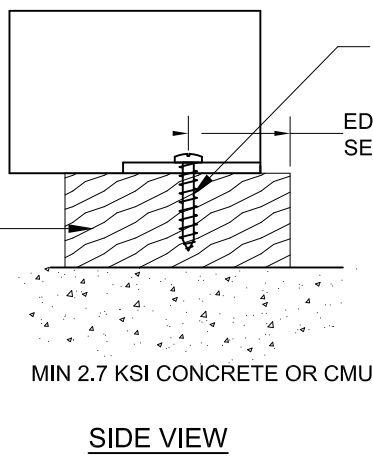
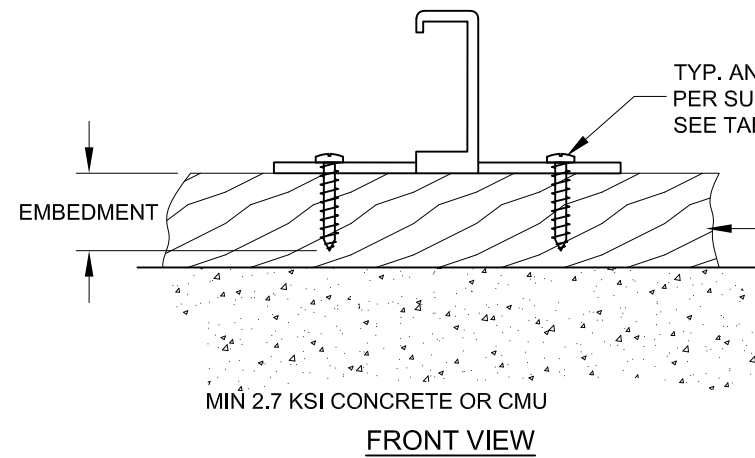
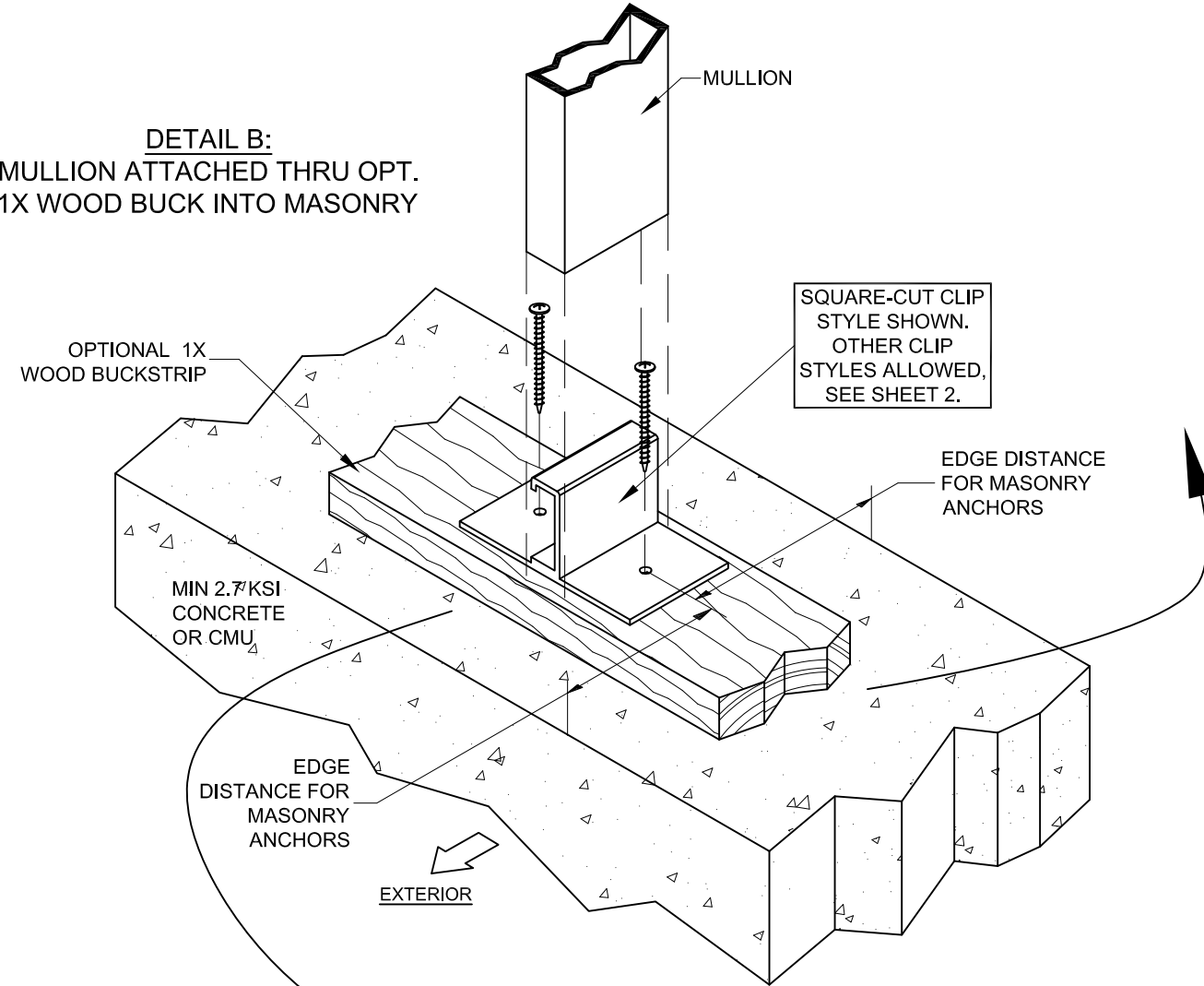
PREPARED BY A. LYNN MILLER 1070 TECHNOLOGY DRIVE N. VENICE, FL 34275 (941) 480-1600	REGISTRATION #29296	Date	02/02/23
	ALUMINUM TUBE MULLIONS, CLIPPED (LM)	By	JENS ROSOWSKI
<b>Impact Resistant Windows &amp; Doors</b> WE'RE STRONGER™ 3780 W 104TH STREET HIALEAH, FL 33018 (305) 593-6590	DWG No.	2 OF 23	TUBEMULL-1
	INSTRUCTIONS & CLIP INFO	Sheet	NTS
MULLS	Scale		

ANTHONY LYNN MILLER  
 LICENSE  
 No. 58705  
 2/15/23  
 STATE OF FLORIDA  
 PROFESSIONAL ENGINEER  
 A. LYNN MILLER, P.E., P.E.# 58705

**DETAIL A:**  
MULLION TO 2X WOOD BUCK  
OR WOOD FRAMING USING  
AN OFFSET CLIP



**DETAIL B:**  
MULLION ATTACHED THRU OPT.  
1X WOOD BUCK INTO MASONRY



**INSTALLATION NOTES:**

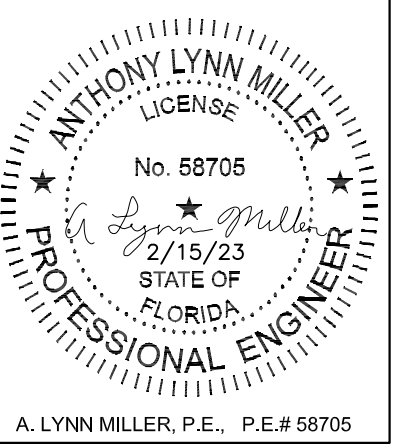
- 1) ANCHOR EMBEDMENT TO SUBSTRATE SHALL BE BEYOND WALL DRESSING OR STUCCO. SUBSTRATE MAY VARY FROM DETAILS, SEE TABLES 1B-14B FOR SUBSTRATE PROPERTIES. ANCHOR HEAD TYPE MAY BE PANHEAD, HEXHEAD OR FLATHEAD.
- 2) QUANTITY OF ANCHORS, MULLION TYPES AND MULLION CLIP TYPES AND STYLES SHOWN ABOVE ARE FOR PICTORIAL REPRESENTATION ONLY. BECAUSE THE ANCHOR CAPACITY IS BASED PARTLY ON THE ANCHOR TO ANCHOR DISTANCE, THE CORRECT QUANTITY AND LOCATION OF ANCHORS MUST BE FOLLOWED, REFER TO THE TABLES ON THE FOLLOWING SHEETS.

- 3) MULLIONS MAY BE INSTALLED HORIZONTALLY OR VERTICALLY. 2X2 OR 2X5 ANGLE CLIPS, IF USED, MUST BE INSTALLED IN PAIRS AND PULLED AGAINST THE MULLION'S INSIDE WALL FOR A SECURE FIT.
- 4) FOR MASONRY APPLICATIONS IN MIAMI-DADE COUNTY, USE ONLY MIAMI-DADE COUNTY APPROVED DEWALT ULTRAACON, DEWALT ULTRAACON+, ELCO 1/4" AGGREGATOR OR ELCO CRETEFLEX MASONRY ANCHORS AS LISTED IN TABLES 1B-14B.

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Miami-Dade Product Control

Revision:

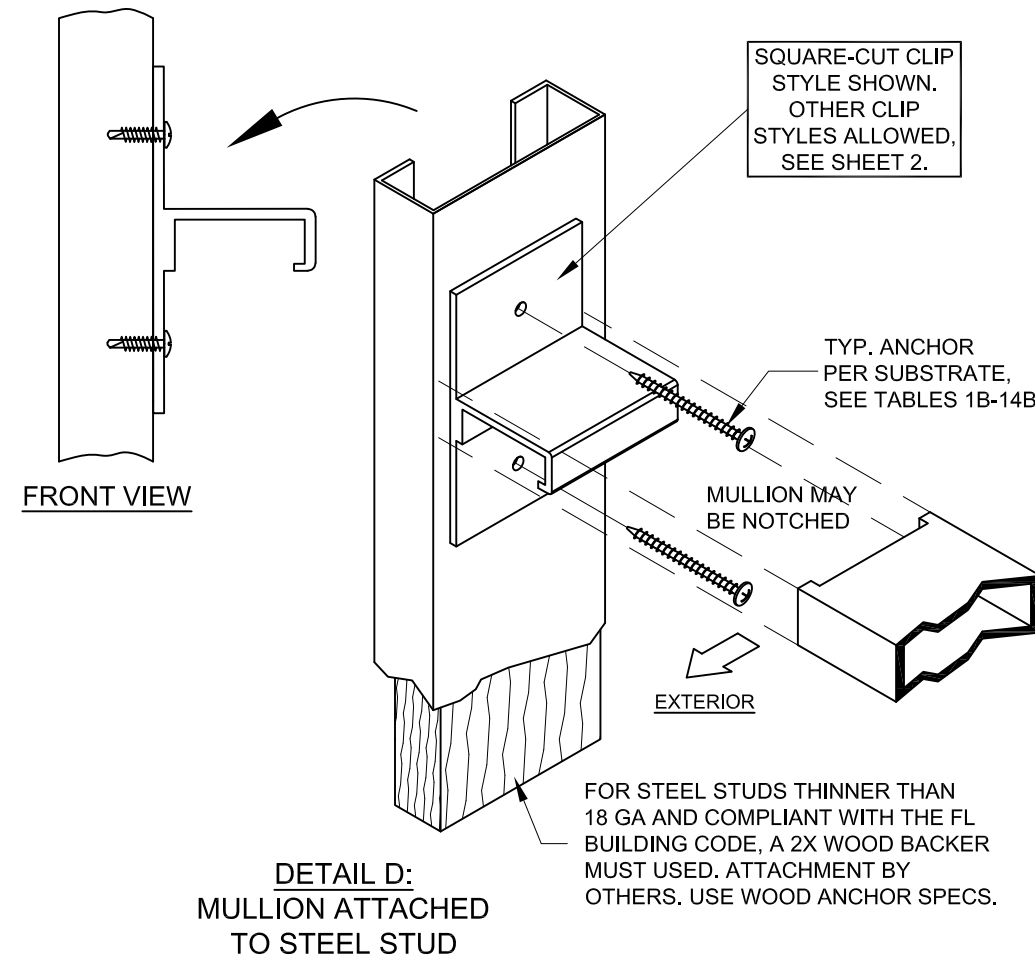
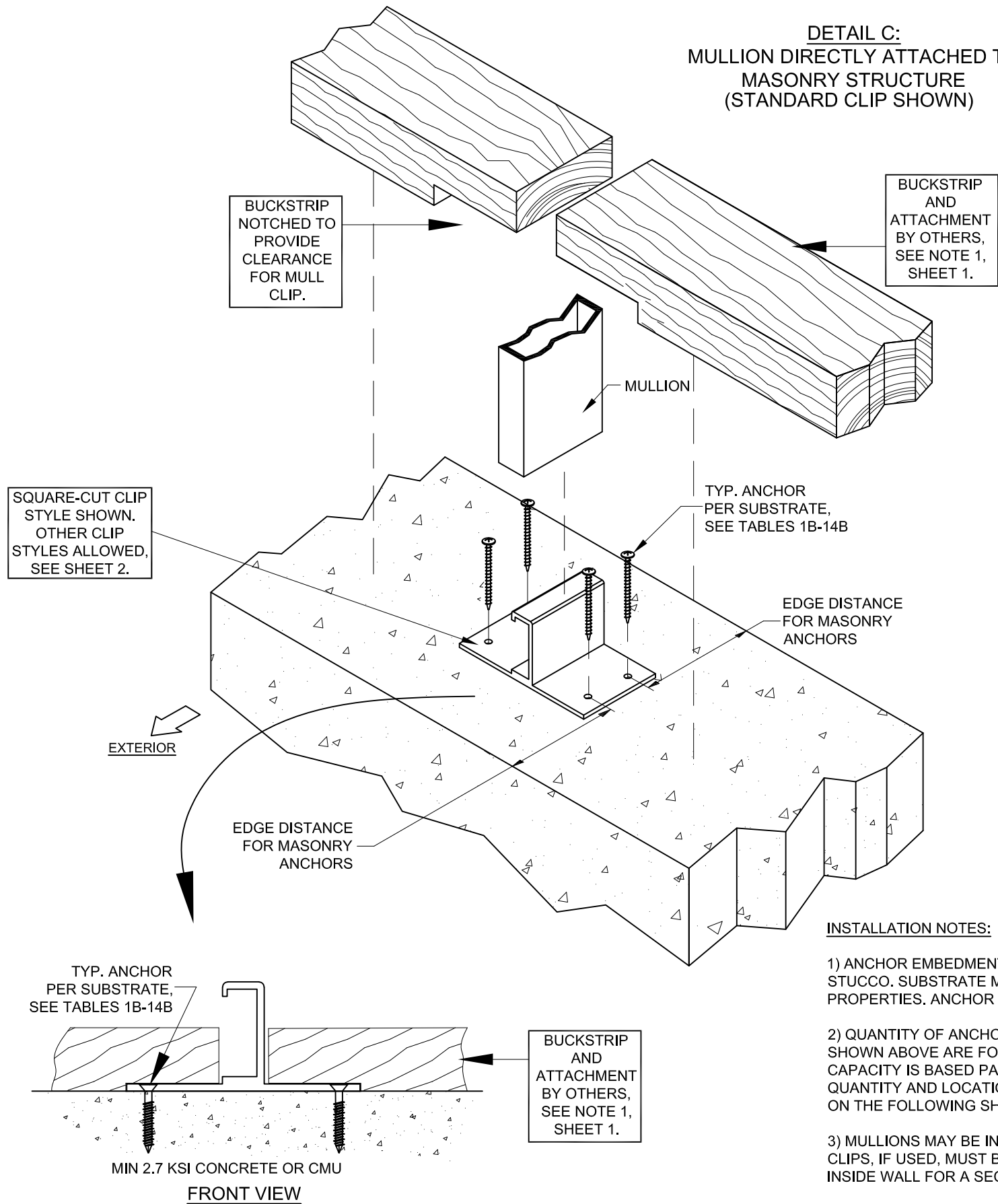
PREPARED BY A. LYNN MILLER 1070 TECHNOLOGY DRIVE N. VENICE, FL 34275 (941) 480-1600	REGISTRATION #29296	DATE	02/02/23	REV.	
		BY	JENS ROSOWSKI	DWG NO.	TUBEMULL-1
<b>Impact Resistant Windows &amp; Doors</b> WE'RE STRONGER™ 3780 W 104TH STREET HIALEAH, FL 33018 (305) 593-6590	ALUMINUM TUBE MULLIONS, CLIPPED (LM)	INSTALLATION INSTRUCTIONS	MULLS	SHEET	3 OF 23
				TITLE	NTS



A. LYNN MILLER, P.E., P.E.# 58705



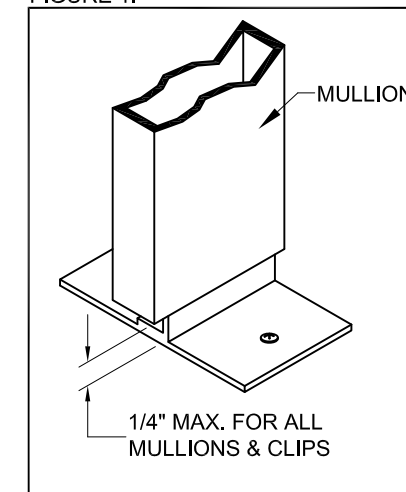
**DETAIL C:  
MULLION DIRECTLY ATTACHED TO  
MASONRY STRUCTURE  
(STANDARD CLIP SHOWN)**



**INSTALLATION NOTES:**

- 1) ANCHOR EMBEDMENT TO SUBSTRATE SHALL BE BEYOND WALL DRESSING OR STUCCO. SUBSTRATE MAY VARY FROM DETAILS, SEE TABLES 1B-14B FOR SUBSTRATE PROPERTIES. ANCHOR HEAD TYPE MAY BE PANHEAD, HEXHEAD OR FLATHEAD.
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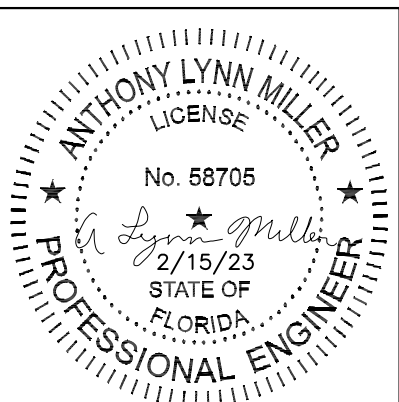
FIGURE 1:



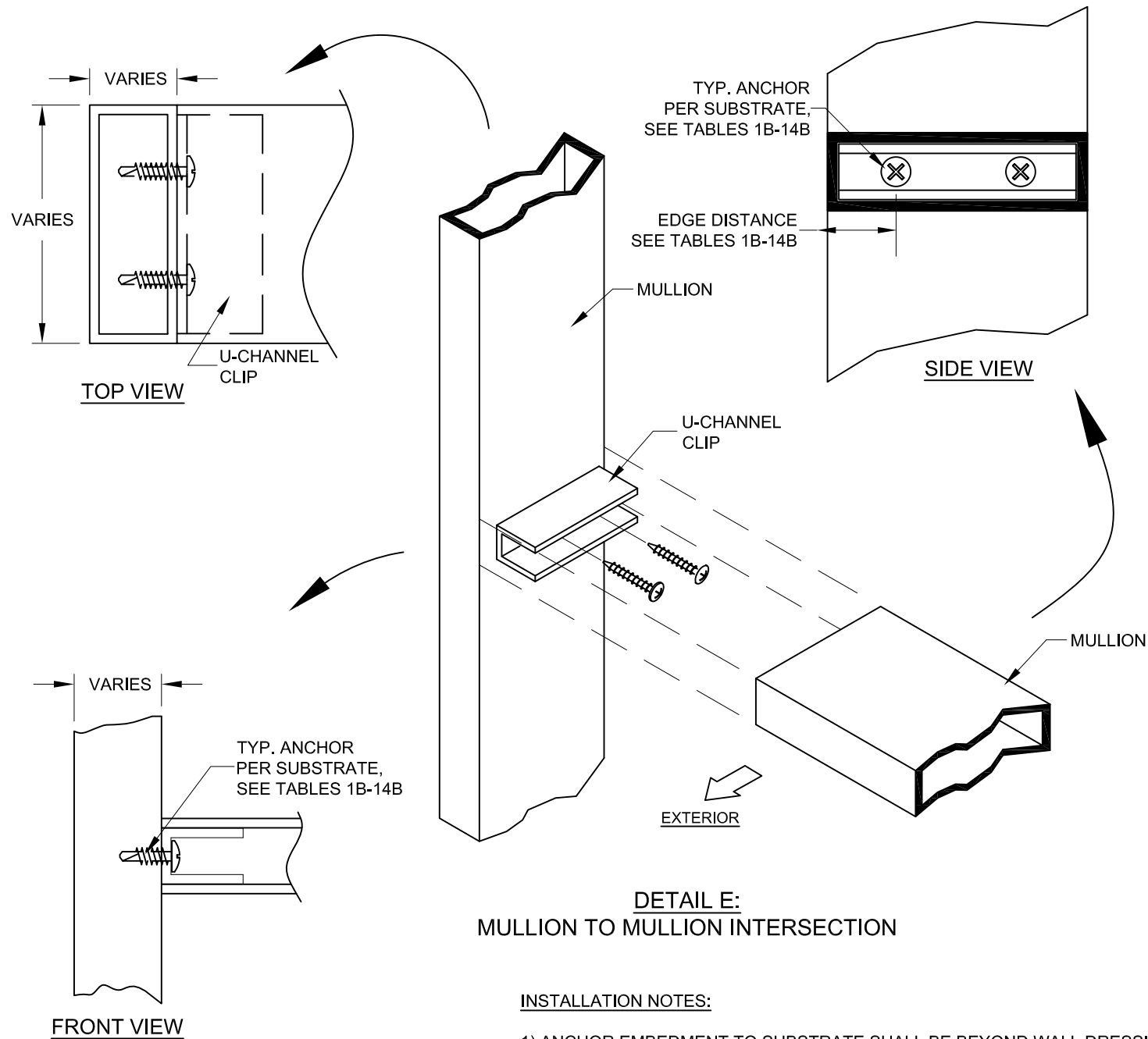
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Expiration Date: **03/28/2028**  
By: *Manuel Perez*  
Miami-Dade Product Control

Revision:

PREPARED BY A. LYNN MILLER 1070 TECHNOLOGY DRIVE N. VENICE, FL 34275 (941) 480-1600	REGISTRATION #29296	Date	02/02/23	Rev.
	ALUMINUM TUBE MULLIONS, CLIPPED (LM)	By	JENS ROSOWSKI	TUBEMULL-1
<b>Impact Resistant Windows &amp; Doors</b> WE'RE STRONGER™ 3780 W 104TH STREET HIALEAH, FL 33018 (305) 593-6590	INSTALLATION INSTRUCTIONS	DWG No.	4 OF 23	Sheet
	MULLS	Scale	NTS	
TITLE ALUMINUM TUBE MULLIONS, CLIPPED (LM)		SERIES MULLS		



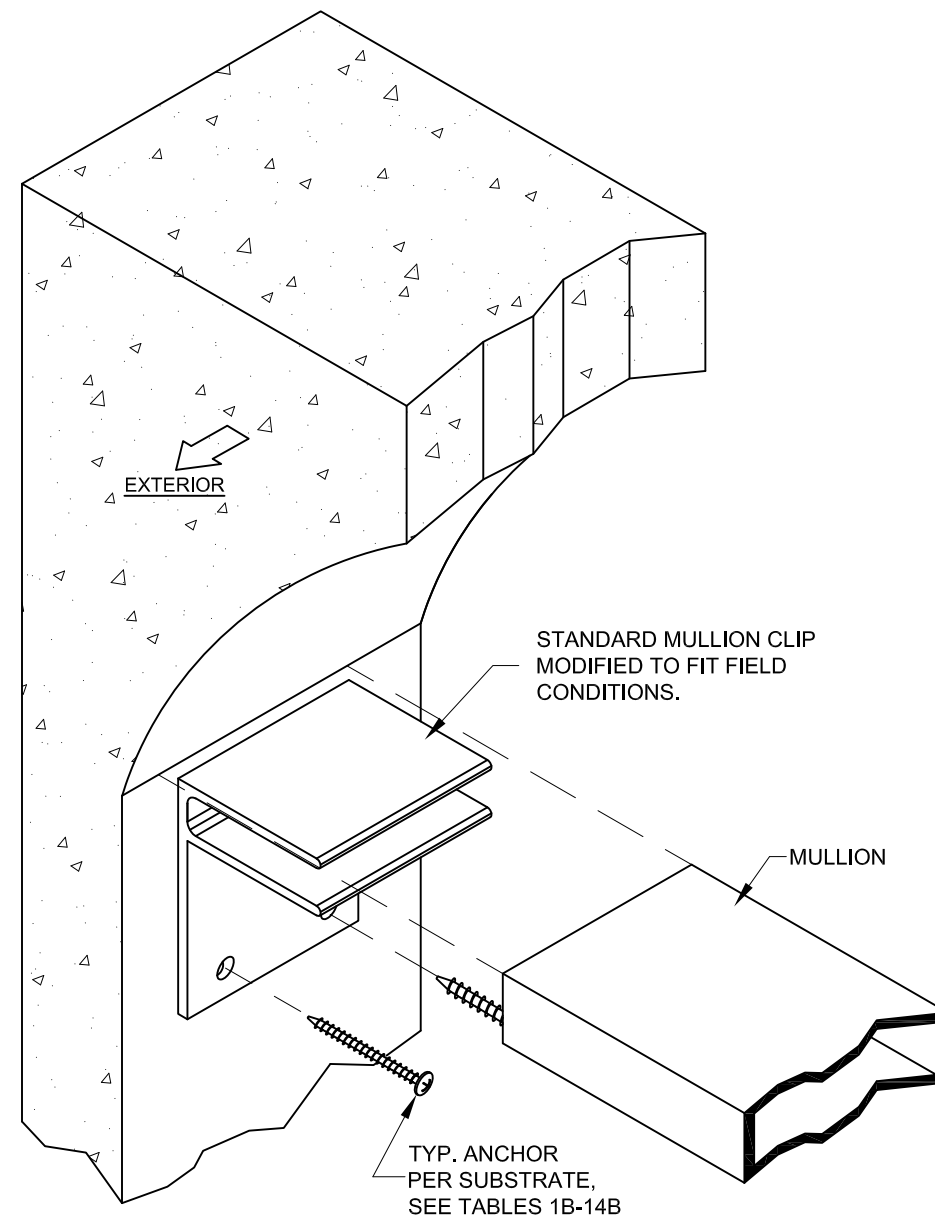
A. LYNN MILLER, P.E., P.E.# 58705



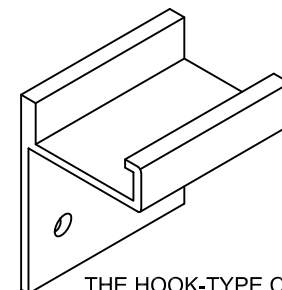
**DETAIL E:  
MULLION TO MULLION INTERSECTION**

**INSTALLATION NOTES:**

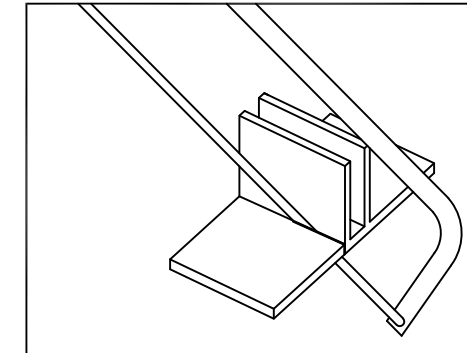
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**DETAIL F:  
OPTIONAL FIELD-MODIFIED  
MULLION F-CLIP**



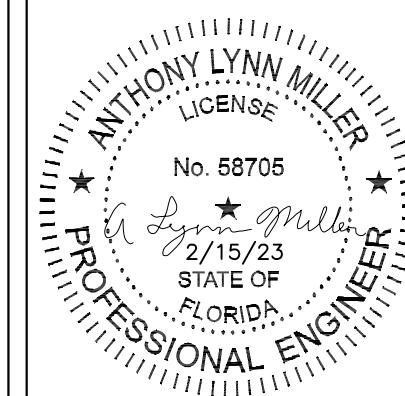
**MULLION CLIP TO BE MODIFIED IN-FIELD:**



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NOA-No. **23-0221.03**  
Expiration Date: **03/28/2028**  
By: *Manuel Perez*  
Miami-Dade Product Control

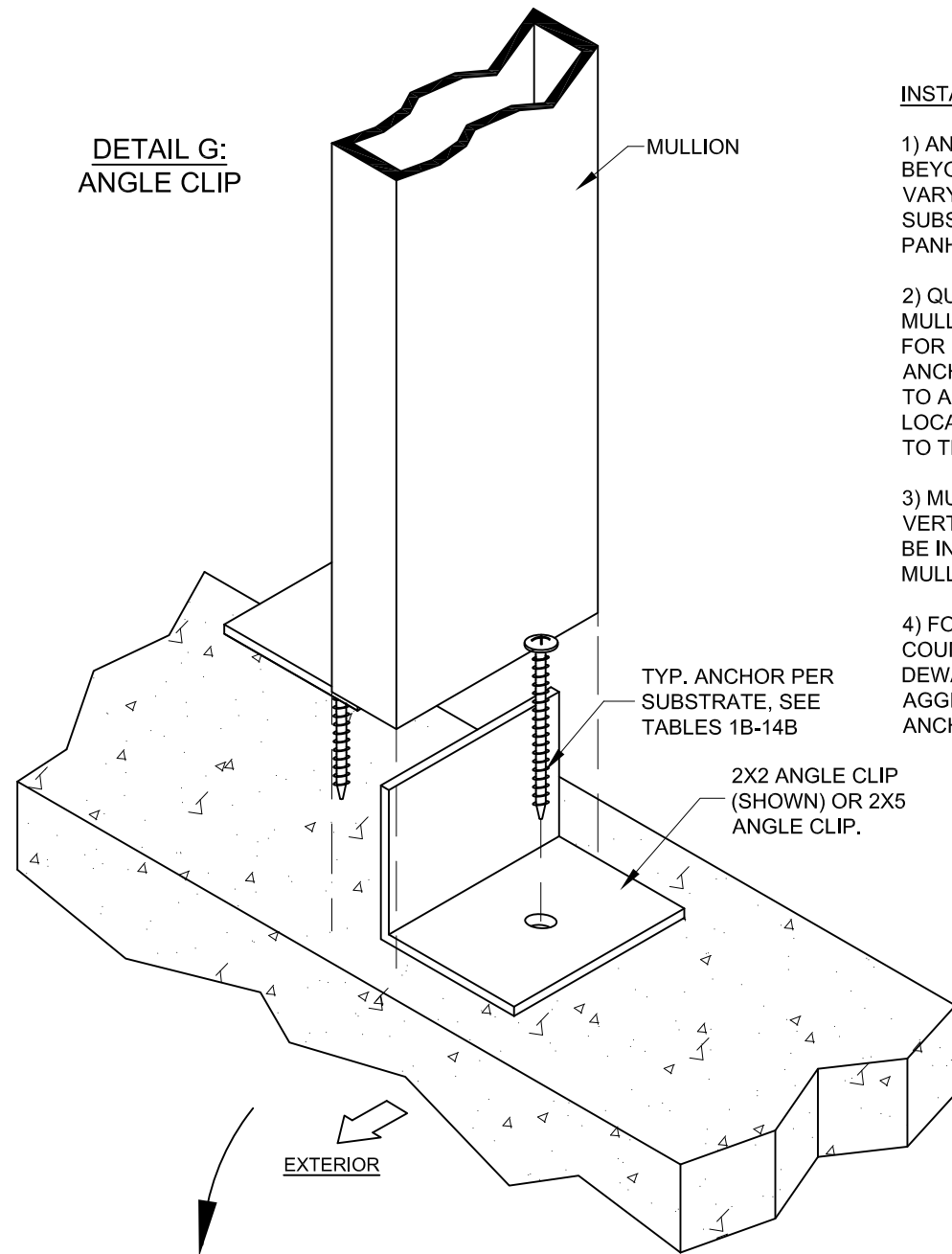
Revision:

PREPARED BY A. LYNN MILLER 1070 TECHNOLOGY DRIVE N. VENICE, FL 34275 (941) 480-1600	REGISTRATION #29296	DATE	02/02/23	REV.	
					TUBEMULL-1
<b>Impact Resistant Windows &amp; Doors</b> WE'RE STRONGER™ 3780 W 104TH STREET HIALEAH, FL 33018 (305) 593-6590	ALUMINUM TUBE MULLIONS, CLIPPED (LM)	JENS ROSOWSKI	INSTALLATION INSTRUCTIONS	DWG No.	5 OF 23
				SHEET	NTS
				SCALE	MULLS



A. LYNN MILLER, P.E., P.E.# 58705

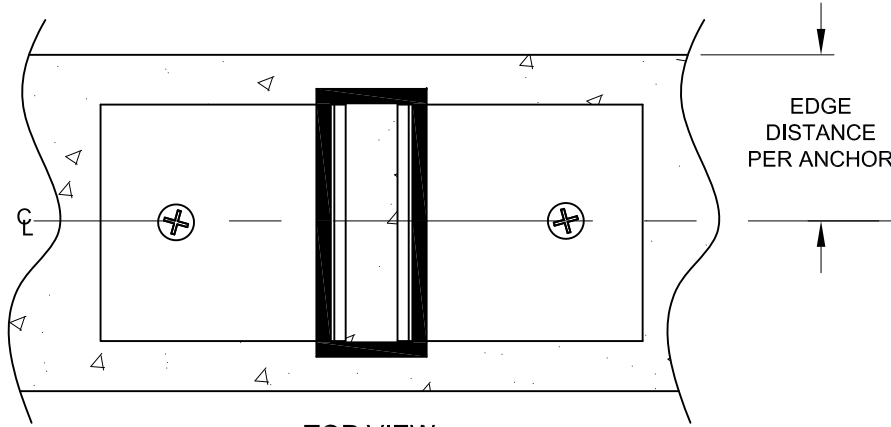
**DETAIL G:  
ANGLE CLIP**



TYP. ANCHOR PER  
SUBSTRATE, SEE  
TABLES 1B-14B

2X2 ANGLE CLIP  
(SHOWN) OR 2X5  
ANGLE CLIP.

EXTERIOR



**TOP VIEW**

**INSTALLATION NOTES:**

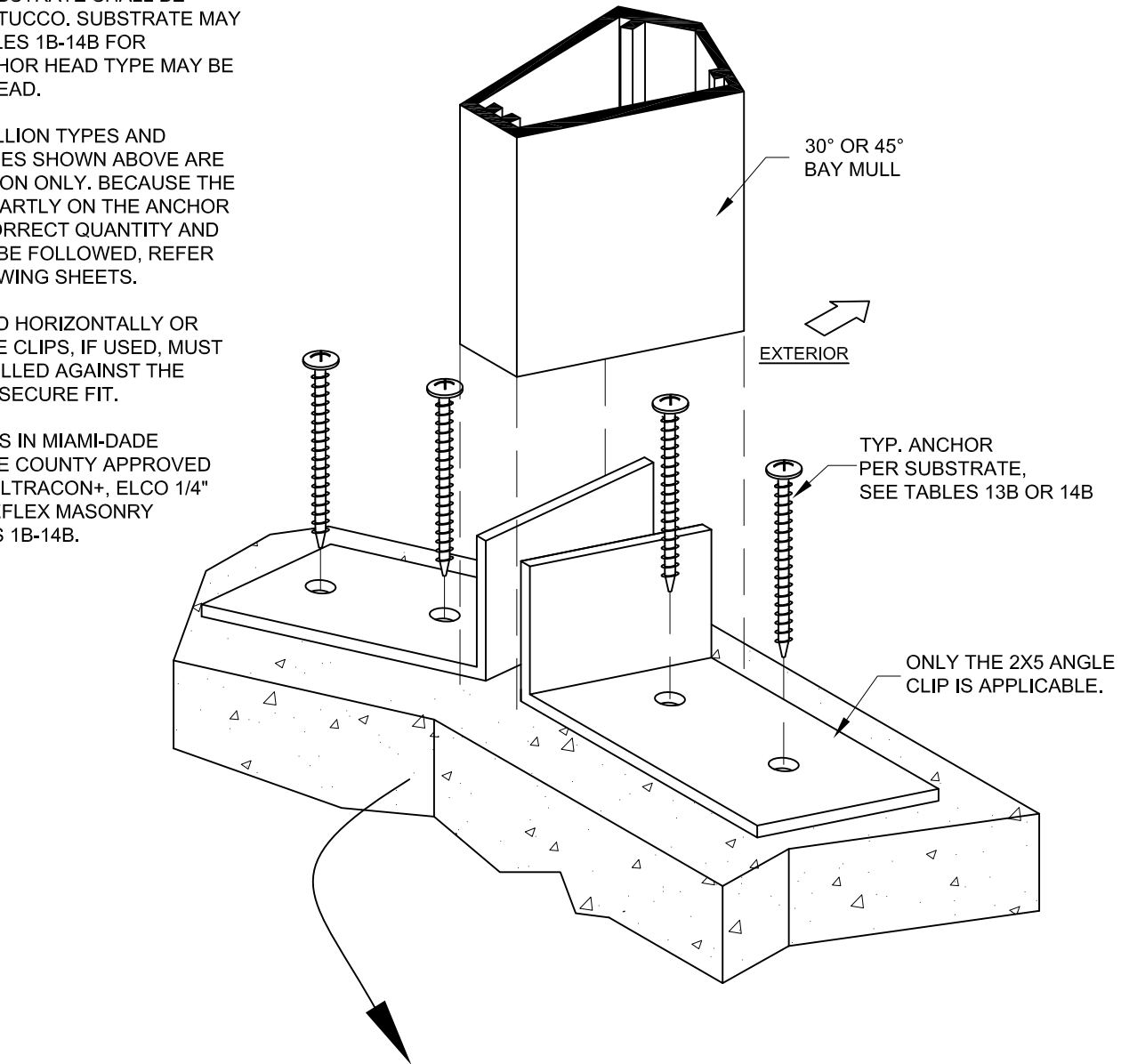
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**DETAIL H:  
BAY MULLION  
INSTALLATION**



30° OR 45°  
BAY MULL

EXTERIOR

TYP. ANCHOR  
PER SUBSTRATE,  
SEE TABLES 13B OR 14B

ONLY THE 2X5 ANGLE  
CLIP IS APPLICABLE.

INTO WOOD,  
STEEL, ALUM  
OR MASONRY

EXTERIOR

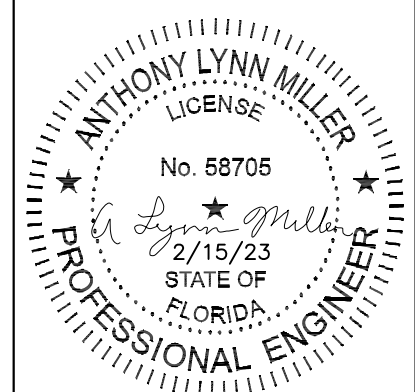
EDGE DISTANCE  
PER ANCHOR

**TOP VIEW**

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**NOA-No. 23-0221.03**  
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Miami-Dade Product Control

Revision:

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	DRAWN BY JENS ROSOWSKI	TITLE	TUBEMULL-1
<b>Impact Resistant Windows &amp; Doors</b> WE'RE STRONGER™ 3780 W 104TH STREET HIALEAH, FL 33018 (305) 593-6590	ALUMINUM TUBE MULLIONS, CLIPPED (LM)	SHEET	6 OF 23
	INSTALLATION INSTRUCTIONS	SCALE	NTS
SERIES MULLS	TITLE MULLS	DWG NO. 6 OF 23	REV. TUBEMULL-1



A. LYNN MILLER, P.E., P.E.# 58705

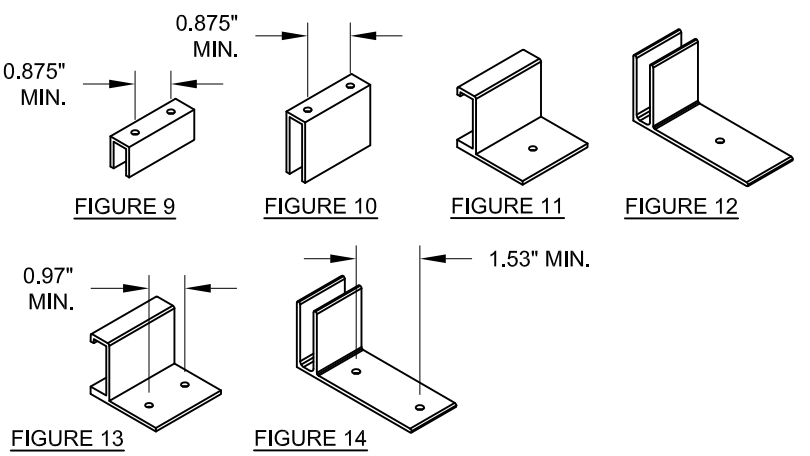
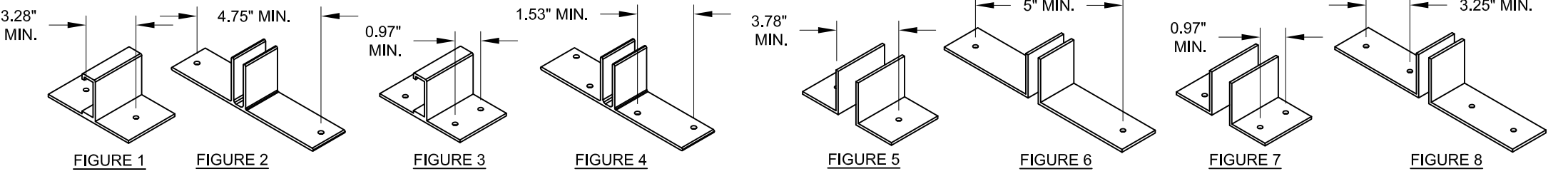
TABLE 1A:

1" x 2" x 1/8" Tube Mullion Design Pressure & Clip/Anchor Capacity Requirement	Opening Dimension																																			
	50 in				60 in				70 in				80 in				90 in				100 in				120 in				140 in				160 in			
	Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading					
Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)							
42 in	111.8	408	129.4	331	93.2	408	115.5	325	79.8	408	107.7	321	69.9	408	104.3	319	62.1	408	104.0	318	55.9	408	104.0	318	46.6	408	104.0	318	39.9	408	104.0	318	34.9	408	104.0	318
48 in	74.9	312	83.7	258	62.4	312	73.4	252	53.5	312	66.9	248	46.8	312	63.1	246	41.6	312	61.3	244	37.4	312	60.9	244	31.2	312	60.9	244	26.7	312	60.9	244	23.4	312	60.9	244
50-5/8 in	63.8	281	70.6	234	53.2	281	61.5	228	45.6	281	55.7	224	39.9	281	52.1	222	35.5	281	50.1	220	31.9	281	49.3	219	26.6	281	49.3	219	22.8	281	49.3	219	19.9	281	49.3	219
54 in	52.6	247	57.4	207	43.8	247	49.8	202	37.6	247	44.8	199	32.9	247	41.5	196	29.2	247	39.4	194	26.3	247	38.3	193	21.9	247	38.0	193	18.8	247	38.0	193	16.4	247	38.0	193
60 in	38.3	200	41.2	170	32.0	200	35.4	166	27.4	200	31.5	163	24.0	200	28.9	160	21.3	200	27.0	158	19.2	200	25.9	157	16.0	200	25.0	156	13.7	200	25.0	156	12.0	200	25.0	156
63 in	33.1	181	35.3	155	27.6	181	30.3	151	23.7	181	26.9	149	20.7	181	24.5	146	18.4	181	22.8	144	16.6	181	21.7	143	13.8	181	20.6	142	11.8	181	20.5	142	10.4	181	20.5	142
66 in	28.8	165	30.5	142	24.0	165	26.1	139	20.6	165	23.1	136	18.0	165	21.0	134	16.0	165	19.4	132	14.4	165	18.4	131	12.0	165	17.2	129	10.3	165	17.1	129	9.0	165	17.1	129
72 in	22.2	139	23.3	120	18.5	139	19.9	118	15.8	139	17.5	116																								
76 in	18.9	124	19.7	109	15.7	124	16.8	106																												
78 in	17.5	118	18.2	103																																

TABLE 1B:

Anchor/Clip Capacity (lbs) when using a 1" x 2" x 1/8" Tube Mullion	Substrate:	3k Concrete				3.5k Conc.		Hollow CMU				Filled CMU			Wood		Metal						
		Anchor Type:		3/16" DeWalt Ultracon+		1/4" DeWalt Ultracon+		5/16" Elco Ultracon		3/16" DeWalt Ultracon+		1/4" DeWalt Ultracon+		1/4" Elco CreteFlex		1/4" Elco AggreGator		3/16" DeWalt Ultracon+	1/4" DeWalt Ultracon+	1/4" Elco AggreGator	#12 Steel Screw	#14 Steel Screw	#12 Steel Screw
		Edge Distance (in):		1"		2-1/2"		1"		2-1/2"		1"		2-1/2"		2"		1"		1"		0.54"	0.60"
		Embedment (in):		1-3/4"		1-3/4"		2"		1-1/4"		1-1/4"		1-1/4"		1-1/4"		1"	1"	2"	1-3/8"	1-3/8"	See Sheet 1
2 Anchors @ 3.28" Min. O.C. / Mullion Clip (Fig. 1):		310 lbs	630 lbs	220 lbs	870 lbs	1105 lbs	230 lbs	370 lbs	320 lbs	580 lbs	497 lbs	374 lbs	170 lbs	347 lbs	946 lbs	442 lbs	537 lbs	536 lbs					
2 Anchors @ 4.75" Min. O.C. / Mullion Clip (Fig. 2):		310 lbs	630 lbs	220 lbs	870 lbs	1644 lbs	230 lbs	370 lbs	320 lbs	580 lbs	514 lbs	374 lbs	170 lbs	410 lbs	946 lbs	442 lbs	537 lbs	536 lbs					
4 Anchors @ 0.97" Min. O.C. / Mullion Clip (Fig. 3):		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	885 lbs	1073 lbs	1073 lbs					
4 Anchors @ 1.53" Min. O.C. / Mullion Clip (Fig. 4):		420 lbs	1260 lbs	400 lbs	1700 lbs	N/A	320 lbs	740 lbs	380 lbs	960 lbs	852 lbs	N/A	340 lbs	400 lbs	N/A	885 lbs	1073 lbs	1073 lbs					
2 Total Anchors @ 3.78" O.C. thru 2x2 Angle Clip Pair (Fig. 5):		310 lbs	630 lbs	220 lbs	870 lbs	1420 lbs	230 lbs	370 lbs	320 lbs	580 lbs	503 lbs	374 lbs	170 lbs	389 lbs	946 lbs	442 lbs	537 lbs	536 lbs					
2 Total Anchors @ 5" O.C. thru 2x5 Angle Clip Pair (Fig. 6):		310 lbs	630 lbs	220 lbs	870 lbs	1700 lbs	230 lbs	370 lbs	320 lbs	580 lbs	517 lbs	374 lbs	170 lbs	410 lbs	946 lbs	442 lbs	537 lbs	536 lbs					
4 Total Anchors @ 0.97" O.C. thru 2x2 Angle Clip Pair (Fig. 7):		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	885 lbs	1073 lbs	1073 lbs					
4 Total Anchors @ 3.25" O.C. thru 2x5 Angle Clip Pair (Fig. 8):		620 lbs	1260 lbs	440 lbs	1740 lbs	2211 lbs	460 lbs	740 lbs	640 lbs	1160 lbs	994 lbs	748 lbs	340 lbs	694 lbs	1892 lbs	885 lbs	1073 lbs	1073 lbs					
2 Anchors @ 0.875" Min. O.C. / U-Clip (Fig. 9 & 10):		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	442 lbs	537 lbs	536 lbs					
1 Anchor / F-Clip (Fig. 11 & 12):		155 lbs	315 lbs	110 lbs	435 lbs	850 lbs	115 lbs	185 lbs	160 lbs	290 lbs	258 lbs	187 lbs	85 lbs	205 lbs	473 lbs	221 lbs	268 lbs	268 lbs					
2 Anchors @ 0.97" Min. O.C. / F-Clip (Fig. 13):		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	442 lbs	537 lbs	536 lbs					
2 Anchors @ 1.53" Min. O.C. / F-Clip (Fig. 14):		210 lbs	630 lbs	200 lbs	850 lbs	N/A	160 lbs	370 lbs	190 lbs	480 lbs	426 lbs	N/A	170 lbs	200 lbs	N/A	442 lbs	537 lbs	536 lbs					

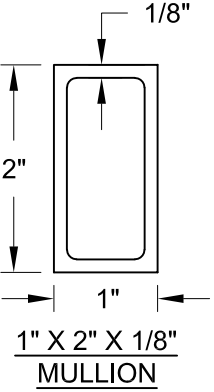
SEE SUBSTRATE PROPERTIES, SHEET 1.



**TABLE NOTES:**  
 1) LINEAR INTERPOLATION BETWEEN MULLION SPANS AND/OR OPENING DIMENSIONS IS ALLOWABLE.  
 2) MULLION AND MULLION CLIPS SHOWN ARE NOT TO SCALE. FOR EXACT DIMENSIONS, SEE SHEETS 21-23. HOLES MAY BE DRILLED IN THE FIELD FOLLOWING DIMENSIONAL RESTRICTIONS SHOWN ON THIS SHEET. FIGURES SHOW SUGGESTED, APPROXIMATE HOLE LOCATIONS. CLIP HOLES TO BE NO CLOSER THAN 3/8" O.C. FROM CLIP EDGE.  
 3) SEE SHEET 1 FOR ADDITIONAL ANCHOR/SUBSTRATE NOTES.

**ANCHOR CAPACITY ADJUSTMENT FORMULA:**  

$$(DP_{REQ}) \times \left( \frac{ANCHOR CAP. FROM TABLE}{MULLION CAP. FROM TABLE} \right) = ANCHOR CAP. REQ.$$
 USE THIS FORMULA TO OBTAIN THE "ANCHOR CAPACITY REQUIRED" CORRESPONDING TO AN ACTUAL PRESSURE REQUIREMENT FOR THE OPENING, WHEN IT IS LOWER THAN THE MULLION CAPACITY (FROM THE TABLE) OF THE SELECTED MULLION. IT WILL YIELD A MINIMUM ANCHOR CAPACITY WHICH MAY BE USED TO QUALIFY ADDITIONAL ANCHOR OPTIONS FROM THE CLIP/ANCHOR CAPACITY TABLE.



**PRODUCT REVISED**  
 as complying with the Florida Building Code  
**NOA-No. 23-0221.03**  
**Expiration Date: 03/28/2028**  
 By: *Manuel Perez*  
**Miami-Dade Product Control**

Revision:

PREPARED BY A. LYNN MILLER  
 1070 TECHNOLOGY DRIVE  
 N. VENICE, FL 34275  
 (941) 480-1600

REGISTRATION #29296

DATE: 02/02/23

DRAWN BY: JENS ROSOWSKI

NO. 7 OF 23

SHEET NTS

SERIES MULLS

TITLE 1 X 2 X 1/8 CAPACITIES

DESC. ALUMINUM TUBE MULLIONS, CLIPPED (LM)

**Impact Resistant Windows & Doors**  
 WE'RE STRONGER™

3780 W 104TH STREET  
 HIALEAH, FL 33018  
 (305) 593-6590

**ANTHONY LYNN MILLER**  
 LICENSE  
 No. 58705  
 2/15/23  
 STATE OF FLORIDA  
**PROFESSIONAL ENGINEER**

A. LYNN MILLER, P.E., P.E.# 58705

TABLE 2A:

1" x 2" x 3/8" Tube Mullion Design Pressure & Clip/Anchor Capacity Requirement	Opening Dimension																																				
	50 in				60 in				70 in				80 in				90 in				100 in				120 in				140 in				160 in				
	Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		
Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)				
42 in	170.0	620	170.0	435	151.3	662	170.0	478	129.7	662	170.0	506	113.5	662	169.5	518	100.9	662	168.9	517	90.8	662	168.9	517	75.7	662	168.9	517	64.9	662	168.9	517	56.7	662	168.9	517	
48 in	121.6	507	136.0	419	101.4	507	119.2	410	86.9	507	108.7	403	76.0	507	102.6	399	67.6	507	99.6	397	60.8	507	99.0	396	50.7	507	99.0	396	43.4	507	99.0	396	38.0	507	99.0	396	
50-5/8 in	103.7	456	114.6	379	86.4	456	99.9	371	74.1	456	90.5	364	64.8	456	84.6	360	57.6	456	81.3	357	51.8	456	80.0	356	43.2	456	80.0	356	37.0	456	80.0	356	32.4	456	80.0	356	
54 in	85.4	400	93.3	336	71.2	400	80.9	328	61.0	400	72.7	322	53.4	400	67.3	318	47.5	400	64.0	315	42.7	400	62.3	314	35.6	400	61.8	313	30.5	400	61.8	313	26.7	400	61.8	313	
60 in	62.3	324	66.9	276	51.9	324	57.5	270	44.5	324	51.2	264	38.9	324	46.9	260	34.6	324	43.9	257	31.1	324	42.0	255	26.0	324	40.5	253	22.2	324	40.5	253	19.5	324	40.5	253	
63 in	53.8	294	57.4	252	44.8	294	49.2	246	38.4	294	43.6	241	33.6	294	39.8	237	29.9	294	37.1	234	26.9	294	35.2	232	22.4	294	33.5	230	19.2	294	33.4	230	16.8	294	33.4	230	
66 in	46.8	268	49.6	230	39.0	268	42.4	225	33.4	268	37.5	221	29.2	268	34.1	218	26.0	268	31.6	215	23.4	268	29.8	212	19.5	268	28.0	210	16.7	268	27.7	209	14.6	268	27.7	209	
72 in	36.0	225	37.9	196	30.0	225	32.2	191	25.7	225	28.4	188	22.5	225	25.6	185	20.0	225	23.5	182	18.0	225	22.1	180	15.0	225	20.3	177	12.9	225	19.6	176	11.3	225	19.6	176	
76 in	30.6	202	32.0	177	25.5	202	27.2	173	21.9	202	23.9	170	19.2	202	21.5	167	17.0	202	19.7	165	15.3	202	18.4	163	12.8	202	16.7	160									
78 in	28.3	192	29.6	168	23.6	192	25.1	165	20.2	192	22.0	162	17.7	192	19.7	159	15.7	192	18.1	157	14.2	192	16.8	155													
90 in	18.5	144	19.0	128	15.4	144	16.1	126																													

TABLE 2B:

Anchor/Clip Capacity (lbs) when using a 1" x 2" x 3/8" Tube Mullion	Substrate:	3k Concrete				3.5k Conc.	Hollow CMU				Filled CMU			Wood		Metal		
	Anchor Type:	3/16" DeWalt Ultracon+		1/4" DeWalt Ultracon+		5/16" Elco Ultracon	3/16" DeWalt Ultracon+		1/4" DeWalt Ultracon+		1/4" Elco CreteFlex	1/4" Elco AggreGator	3/16" DeWalt Ultracon+	1/4" DeWalt Ultracon+	1/4" Elco AggreGator	#12 Steel Screw	#14 Steel Screw	#12 Steel Screw
	Edge Distance (in):	1"	2-1/2"	1"	2-1/2"	3-1/8"	1"	2-1/2"	1"	2-1/2"	2-1/2"	2"	1"	1"	2"	0.54"	0.60"	0.324"
Embedment (in):	1-3/4"	1-3/4"	1-3/4"	1-3/4"	2"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-3/4"	1-3/4"	2"	1-3/8"	1-3/8"	See Sheet 1	
2 Anchors @ 4.75" Min. O.C. / Mullion Clip (Fig. 1):	310 lbs	630 lbs	220 lbs	870 lbs	1644 lbs	230 lbs	370 lbs	320 lbs	580 lbs	514 lbs	374 lbs	170 lbs	410 lbs	946 lbs	442 lbs	537 lbs	536 lbs	
4 Anchors @ 1.3" Min. O.C. / Mullion Clip (Fig. 2):	353 lbs	1260 lbs	380 lbs	N/A	N/A	N/A	740 lbs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	885 lbs	1073 lbs	1073 lbs	
4 Total Anchors @ 3.25" O.C. thru 2x5 Angle Clip Pair (Fig. 3):	620 lbs	1260 lbs	440 lbs	1740 lbs	2211 lbs	460 lbs	740 lbs	640 lbs	1160 lbs	994 lbs	748 lbs	340 lbs	694 lbs	1892 lbs	885 lbs	1073 lbs	1073 lbs	
2 Anchors @ 0.437" Min. O.C. / U-Clip (Fig. 4):	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	536 lbs	
1 Anchor / F-Clip (Fig. 5):	155 lbs	315 lbs	110 lbs	435 lbs	850 lbs	115 lbs	185 lbs	160 lbs	290 lbs	258 lbs	187 lbs	85 lbs	205 lbs	473 lbs	221 lbs	268 lbs	268 lbs	
2 Anchors @ 1.3" Min. O.C. / F-Clip (Fig. 6):	177 lbs	630 lbs	190 lbs	N/A	N/A	N/A	370 lbs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	442 lbs	537 lbs	536 lbs	

SEE SUBSTRATE PROPERTIES, SHEET 1.

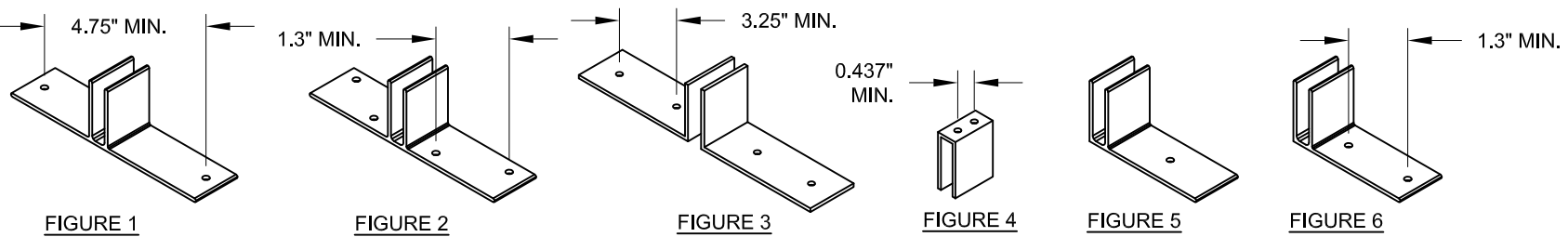


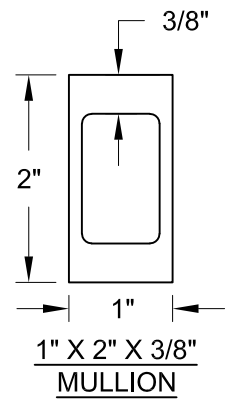
TABLE NOTES:

- 1) LINEAR INTERPOLATION BETWEEN MULLION SPANS AND/OR OPENING DIMENSIONS IS ALLOWABLE.
- 2) MULLION AND MULLION CLIPS SHOWN ARE NOT TO SCALE. FOR EXACT DIMENSIONS, SEE SHEETS 21-23. HOLES MAY BE DRILLED IN THE FIELD FOLLOWING DIMENSIONAL RESTRICTIONS SHOWN ON THIS SHEET. FIGURES SHOW SUGGESTED, APPROXIMATE HOLE LOCATIONS. CLIP HOLES TO BE NO CLOSER THAN 3/8" O.C. FROM CLIP EDGE.
- 3) SEE SHEET 1 FOR ADDITIONAL ANCHOR/SUBSTRATE NOTES.

ANCHOR CAPACITY ADJUSTMENT FORMULA:

$$(DP_{REG}) \times \left( \frac{\text{ANCHOR CAP.}_{FROM TABLE}}{\text{MULLION CAP.}_{FROM TABLE}} \right) = \text{ANCHOR CAP.}_{REQ.}$$

USE THIS FORMULA TO OBTAIN THE "ANCHOR CAPACITY REQUIRED" CORRESPONDING TO AN ACTUAL PRESSURE REQUIREMENT FOR THE OPENING, WHEN IT IS LOWER THAN THE MULLION CAPACITY (FROM THE TABLE) OF THE SELECTED MULLION. IT WILL YIELD A MINIMUM ANCHOR CAPACITY WHICH MAY BE USED TO QUALIFY ADDITIONAL ANCHOR OPTIONS FROM THE CLIP/ANCHOR CAPACITY TABLE.



**PRODUCT REVISED**  
as complying with the Florida Building Code  
**NOA-No. 23-0221.03**  
Expiration Date: **03/28/2028**  
By: *Manuel Perez*  
Miami-Dade Product Control

Revision:

PREPARED BY A. LYNN MILLER  
1070 TECHNOLOGY DRIVE  
N. VENICE, FL 34275  
(941) 480-1600

REGISTRATION #29296

DATE: 02/02/23

BY: JENS ROSOWSKI

NO. DWG: 8 OF 23

SHEET: NTS

SERIES: MULLS

DESCRIPTION: ALUMINUM TUBE MULLIONS, CLIPPED (LM)

1 X 2 X 3/8 CAPACITIES

TUBEMULL-1

**Impact Resistant Windows & Doors**  
WE'RE STRONGER™

3780 W 104TH STREET  
HIALEAH, FL 33018  
(305) 593-6590

ANTHONY LYNN MILLER  
LICENSE  
No. 58705  
2/15/23  
STATE OF FLORIDA  
PROFESSIONAL ENGINEER

A. LYNN MILLER, P.E., P.E.# 58705

TABLE 3A:

1" x 2-1/2" x 1/8" Tube Mullion Design Pressure & Clip/Anchor Capacity Requirement	Opening Dimension																																				
	50 in				60 in				70 in				80 in				90 in				100 in				120 in				140 in				160 in				
	Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading						
	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)							
42 in	170.0	620	170.0	435	163.1	714	170.0	478	139.8	714	170.0	506	122.4	714	170.0	519	108.8	714	170.0	521	97.9	714	170.0	521	81.6	714	170.0	521	69.9	714	170.0	521	61.2	714	170.0	521	
48 in	131.2	546	146.6	452	109.3	546	128.5	442	93.7	546	117.3	435	82.0	546	110.6	430	72.9	546	107.3	428	65.6	546	106.7	427	54.6	546	106.7	427	46.8	546	106.7	427	41.0	546	106.7	427	
50-5/8 in	111.8	491	123.6	409	93.2	491	107.7	400	79.9	491	97.6	393	69.9	491	91.2	388	62.1	491	87.7	385	55.9	491	86.3	384	46.6	491	86.3	384	39.9	491	86.3	384	34.9	491	86.3	384	
54 in	92.1	432	100.6	362	76.8	432	87.2	354	65.8	432	78.4	348	57.6	432	72.6	343	51.2	432	69.0	340	46.1	432	67.1	338	38.4	432	66.6	337	32.9	432	66.6	337	28.8	432	66.6	337	
60 in	67.2	350	72.1	297	56.0	350	62.0	291	48.0	350	55.2	285	42.0	350	50.5	281	37.3	350	47.3	277	33.6	350	45.3	275	28.0	350	43.7	273	24.0	350	43.7	273	21.0	350	43.7	273	
63 in	58.0	317	61.9	271	48.3	317	53.1	265	41.4	317	47.1	260	36.3	317	42.9	256	32.2	317	39.9	253	29.0	317	38.0	250	24.2	317	36.1	248	20.7	317	36.0	248	18.1	317	36.0	248	
66 in	50.5	289	53.5	248	42.0	289	45.3	243	36.0	289	40.5	238	31.5	289	36.7	235	28.0	289	34.1	231	25.2	289	32.2	229	21.0	289	30.2	226	18.0	289	29.9	226	15.8	289	29.9	226	
72 in	38.9	243	40.8	211	32.4	243	34.3	206	27.8	243	30.6	203	24.3	243	27.6	199	21.6	243	25.4	196	19.4	243	23.8	194	16.2	243	21.8	191	13.9	243	21.1	190	12.1	243	21.1	190	
76 in	33.0	218	34.5	190	27.5	218	29.3	186	23.6	218	25.7	183	20.7	218	23.1	180	18.4	218	21.2	177	16.5	218	19.8	175	13.8	218	18.0	172	11.8	218	17.1	171	10.3	218	17.0	170	
78 in	30.6	207	31.9	181	25.5	207	27.1	178	21.8	207	23.7	174	19.1	207	21.3	171	17.0	207	19.5	169	15.3	207	18.1	167	12.7	207	16.4	164									
90 in	19.9	155	20.5	138	16.6	155	17.3	136																													
96 in	16.4	137	16.8	122																																	

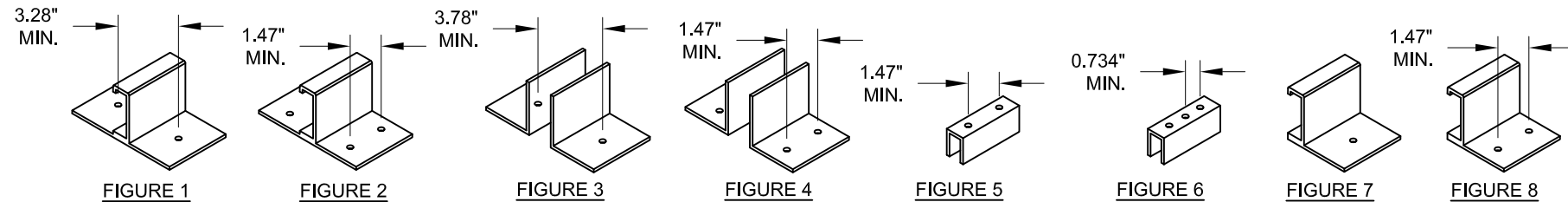
**PRODUCT REVISED**  
as complying with the Florida Building Code  
**NOA-No. 23-0221.03**  
**Expiration Date: 03/28/2028**  
By: *Manuel Perez*  
**Miami-Dade Product Control**

Revision:

TABLE 3B:

Anchor/Clip Capacity (lbs) when using a 1" x 2-1/2" x 1/8" Tube Mullion	Substrate:	3k Concrete				3.5k Conc.	Hollow CMU				Filled CMU			Wood		Metal				
		Anchor Type:		3/16" DeWalt Ultracon+		5/16" Elco Ultracon	3/16" DeWalt Ultracon+		1/4" DeWalt Ultracon+		1/4" Elco CreteFlex	1/4" Elco AggreGator	3/16" DeWalt Ultracon+	1/4" DeWalt Ultracon+	1/4" Elco AggreGator	#12 Steel Screw	#14 Steel Screw	#12 Steel Screw		
		Edge Distance (in):		1"	2-1/2"	1"	2-1/2"	3-1/8"	1"	2-1/2"	1"	2-1/2"	2"	1"	1"	2"	0.54"	0.60"	0.324"	
		Embedment (in):		1-3/4"	1-3/4"	1-3/4"	1-3/4"	2"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-3/4"	1-3/4"	2"	1-3/8"	1-3/8"	See Sheet 1
2 Anchors @ 3.28" Min. O.C. / Mullion Clip (Fig. 1):		310 lbs	630 lbs	220 lbs	870 lbs	1105 lbs	230 lbs	370 lbs	320 lbs	580 lbs	497 lbs	374 lbs	170 lbs	347 lbs	946 lbs	442 lbs	537 lbs	536 lbs		
4 Anchors @ 1.47" Min. O.C. / Mullion Clip (Fig. 2):		403 lbs	1260 lbs	395 lbs	N/A	N/A	N/A	740 lbs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	885 lbs	1073 lbs	1073 lbs		
2 Total Anchors @ 3.78" O.C. thru 2x2 Angle Clip Pair (Fig. 3):		310 lbs	630 lbs	220 lbs	870 lbs	1420 lbs	230 lbs	370 lbs	320 lbs	580 lbs	503 lbs	374 lbs	170 lbs	389 lbs	946 lbs	442 lbs	537 lbs	536 lbs		
4 Total Anchors @ 1.47" O.C. thru 2x2 Angle Clip Pair (Fig. 4):		403 lbs	1260 lbs	395 lbs	N/A	N/A	N/A	740 lbs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	885 lbs	1073 lbs	1073 lbs		
2 Anchors @ 1.47" Min. O.C. / U-Clip (Fig. 5):		202 lbs	630 lbs	198 lbs	N/A	N/A	N/A	370 lbs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	442 lbs	537 lbs	536 lbs		
3 Anchors @ 0.734" Min. O.C. / U-Clip (Fig. 6):		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	664 lbs	805 lbs	805 lbs		
1 Anchor / F-Clip (Fig. 7):		155 lbs	315 lbs	110 lbs	435 lbs	850 lbs	115 lbs	185 lbs	160 lbs	290 lbs	258 lbs	187 lbs	85 lbs	205 lbs	473 lbs	221 lbs	268 lbs	268 lbs		
2 Anchors @ 1.47" Min. O.C. / F-Clip (Fig. 8):		202 lbs	630 lbs	198 lbs	N/A	N/A	N/A	370 lbs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	442 lbs	537 lbs	536 lbs		

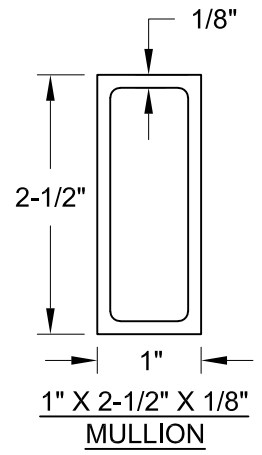
SEE SUBSTRATE PROPERTIES, SHEET 1.



**TABLE NOTES:**  
1) LINEAR INTERPOLATION BETWEEN MULLION SPANS AND/OR OPENING DIMENSIONS IS ALLOWABLE.  
2) MULLION AND MULLION CLIPS SHOWN ARE NOT TO SCALE. FOR EXACT DIMENSIONS, SEE SHEETS 21-23. HOLES MAY BE DRILLED IN THE FIELD FOLLOWING DIMENSIONAL RESTRICTIONS SHOWN ON THIS SHEET. FIGURES SHOW SUGGESTED, APPROXIMATE HOLE LOCATIONS. CLIP HOLES TO BE NO CLOSER THAN 3/8" O.C. FROM CLIP EDGE.  
3) SEE SHEET 1 FOR ADDITIONAL ANCHOR/SUBSTRATE NOTES.

**ANCHOR CAPACITY ADJUSTMENT FORMULA:**  

$$(DP_{REQ}) \times \left( \frac{ANCHOR CAP. FROM TABLE}{MULLION CAP. FROM TABLE} \right) = ANCHOR CAP. REQ.$$
USE THIS FORMULA TO OBTAIN THE "ANCHOR CAPACITY REQUIRED" CORRESPONDING TO AN ACTUAL PRESSURE REQUIREMENT FOR THE OPENING, WHEN IT IS LOWER THAN THE MULLION CAPACITY (FROM THE TABLE) OF THE SELECTED MULLION. IT WILL YIELD A MINIMUM ANCHOR CAPACITY WHICH MAY BE USED TO QUALIFY ADDITIONAL ANCHOR OPTIONS FROM THE CLIP/ANCHOR CAPACITY TABLE.



**Impact Resistant Windows & Doors**  
**WE'RE STRONGER™**  
3780 W 104TH STREET  
HIALEAH, FL 33018  
(305) 593-6590

REGISTRATION #29296

ALUMINUM TUBE MULLIONS, CLIPPED (LM) 02/02/23

JENS ROSOWSKI

1 X 2-1/2 X 1/8 CAPACITIES

MULLS

NTS

9 OF 23

TUBEMULL-1

**ANTHONY LYNN MILLER**  
LICENSE  
No. 58705  
2/15/23  
STATE OF FLORIDA  
**PROFESSIONAL ENGINEER**

A. LYNN MILLER, P.E., P.E.# 58705









TABLE 7A:

1" x 2-1/8" x 1/8" Fin Tube Mullion Design Pressure & Clip/Anchor Capacity Requirement	Opening Dimension																																				
	50 in				60 in				70 in				80 in				90 in				100 in				120 in				140 in				160 in				
	Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		
Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)				
Mullion Span	42 in	144.2	526	167.0	428	120.2	526	148.9	419	103.0	526	138.9	414	90.1	526	134.6	411	80.1	526	134.1	411	72.1	526	134.1	411	60.1	526	134.1	411	51.5	526	134.1	411	45.1	526	134.1	411
	48 in	96.6	403	108.0	333	80.5	403	94.7	325	69.0	403	86.4	320	60.4	403	81.4	317	53.7	403	79.1	315	48.3	403	78.6	314	40.3	403	78.6	314	34.5	403	78.6	314	30.2	403	78.6	314
	50-5/8 in	82.3	362	91.0	301	68.6	362	79.3	294	58.8	362	71.9	289	51.5	362	67.2	286	45.7	362	64.6	284	41.2	362	63.6	283	34.3	362	63.5	283	29.4	362	63.5	283	25.7	362	63.5	283
	54 in	67.8	318	74.1	267	56.5	318	64.2	261	48.5	318	57.7	256	42.4	318	53.5	253	37.7	318	50.8	250	33.9	318	49.5	249	28.3	318	49.1	248	24.2	318	49.1	248	21.2	318	49.1	248
	60 in	49.5	258	53.1	219	41.2	258	45.7	214	35.3	258	40.7	210	30.9	258	37.2	207	27.5	258	34.9	204	24.7	258	33.4	203	20.6	258	32.2	201	17.7	258	32.2	201	15.5	258	32.2	201
	63 in	42.7	234	45.6	200	35.6	234	39.1	195	30.5	234	34.7	192	26.7	234	31.6	189	23.7	234	29.4	186	21.4	234	28.0	184	17.8	234	26.6	183	15.3	234	26.5	183	13.4	234	26.5	183
	66 in	37.2	213	39.4	183	31.0	213	33.7	179	26.5	213	29.8	176	23.2	213	27.0	173	20.6	213	25.1	170	18.6	213	23.7	169	15.5	213	22.2	167	13.3	213	22.0	166	11.6	213	22.0	166
	72 in	28.6	179	30.1	155	23.9	179	25.6	152	20.4	179	22.5	149	17.9	179	20.3	147	15.9	179	18.7	145	14.3	179	17.5	143	11.9	179	16.1	141								
	76 in	24.3	161	25.4	140	20.3	161	21.6	137	17.4	161	19.0	135	15.2	161	17.0	133																				
78 in	22.5	152	23.5	133	18.8	152	19.9	131	16.1	152	17.5	128																									

TABLE 7B:

Anchor/Clip Capacity (lbs) when using a 1-1/4" x 2-1/8" x 1/8" Fin Tube Mullion	Substrate:	3k Concrete				3.5k Conc.	Hollow CMU				Filled CMU			Wood		Metal		
	Anchor Type:	3/16" DeWalt Ultracon+		1/4" DeWalt Ultracon+		5/16" Elco Ultracon	3/16" DeWalt Ultracon+		1/4" DeWalt Ultracon+		1/4" Elco CreteFlex	1/4" Elco AggreGator	3/16" DeWalt Ultracon+	1/4" DeWalt Ultracon+	1/4" Elco AggreGator	#12 Steel Screw	#14 Steel Screw	#12 Steel Screw
	Edge Distance (in):	1"	2-1/2"	1"	2-1/2"	3-1/8"	1"	2-1/2"	1"	2-1/2"	2-1/2"	2"	1"	1"	2"	0.54"	0.60"	0.324"
	Embedment (in):	1-3/4"	1-3/4"	1-3/4"	1-3/4"	2"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-3/4"	1-3/4"	2"	1-3/8"	1-3/8"	See Sheet 1
2 Total Anchors @ 5" O.C. thru 2x5 Angle Clip Pair (Fig. 1):	310 lbs	630 lbs	220 lbs	870 lbs	1700 lbs	230 lbs	370 lbs	320 lbs	580 lbs	517 lbs	374 lbs	170 lbs	410 lbs	946 lbs	442 lbs	537 lbs	536 lbs	
4 Total Anchors @ 3.25" O.C. thru 2x5 Angle Clip Pair (Fig. 2):	620 lbs	1260 lbs	440 lbs	1740 lbs	2211 lbs	460 lbs	740 lbs	640 lbs	1160 lbs	994 lbs	748 lbs	340 lbs	694 lbs	1892 lbs	885 lbs	1073 lbs	1073 lbs	

SEE SUBSTRATE PROPERTIES, SHEET 1.

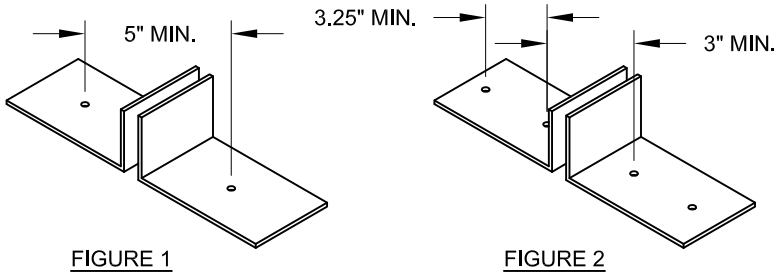


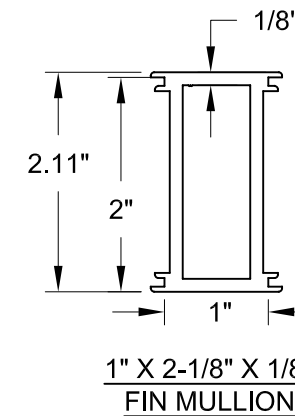
TABLE NOTES:

- 1) LINEAR INTERPOLATION BETWEEN MULLION SPANS AND/OR OPENING DIMENSIONS IS ALLOWABLE.
- 2) MULLION AND MULLION CLIPS SHOWN ARE NOT TO SCALE. FOR EXACT DIMENSIONS, SEE SHEETS 21-23. HOLES MAY BE DRILLED IN THE FIELD FOLLOWING DIMENSIONAL RESTRICTIONS SHOWN ON THIS SHEET. FIGURES SHOW SUGGESTED, APPROXIMATE HOLE LOCATIONS. CLIP HOLES TO BE NO CLOSER THAN 3/8" O.C. FROM CLIP EDGE.
- 3) SEE SHEET 1 FOR ADDITIONAL ANCHOR/SUBSTRATE NOTES.

ANCHOR CAPACITY ADJUSTMENT FORMULA:

$$(DP_{REQ}) \times \left( \frac{\text{ANCHOR CAP.}_{FROM TABLE}}{\text{MULLION CAP.}_{FROM TABLE}} \right) = \text{ANCHOR CAP.}_{REQ.}$$

USE THIS FORMULA TO OBTAIN THE "ANCHOR CAPACITY REQUIRED" CORRESPONDING TO AN ACTUAL PRESSURE REQUIREMENT FOR THE OPENING, WHEN IT IS LOWER THAN THE MULLION CAPACITY (FROM THE TABLE) OF THE SELECTED MULLION. IT WILL YIELD A MINIMUM ANCHOR CAPACITY WHICH MAY BE USED TO QUALIFY ADDITIONAL ANCHOR OPTIONS FROM THE CLIP/ANCHOR CAPACITY TABLE.



**PRODUCT REVISED**  
as complying with the Florida Building Code  
**NOA-No. 23-0221.03**  
**Expiration Date: 03/28/2028**  
By: *Manuel Perez*  
Miami-Dade Product Control

Revision:

PREPARED BY A. LYNN MILLER  
1070 TECHNOLOGY DRIVE  
N. VENICE, FL 34275  
(941) 480-1600

REGISTRATION #29296

DATE: 02/02/23

DESIGNED BY: JENS ROSOWSKI

DWG No. 13 OF 23

SHEET NTS

SCALE

SERIES: MULLS

TITLE: ALUMINUM TUBE MULLIONS, CLIPPED (LM)

DESCRIPTION: 1 X 2-1/8 X 1/8 FIN CAPACITIES

**Impact Resistant Windows & Doors**  
WE'RE STRONGER™

3780 W 104TH STREET  
HIALEAH, FL 33018  
(305) 593-6590

**ANTHONY LYNN MILLER**  
LICENSE  
No. 58705  
2/15/23  
STATE OF FLORIDA  
**PROFESSIONAL ENGINEER**

A. LYNN MILLER, P.E., P.E.# 58705











TABLE 13A:

30 Degree Tube Mullion Design Pressure & Clip/Anchor Capacity Requirement	Opening Dimension																																				
	50 in		60 in		70 in		80 in		90 in		100 in		120 in		140 in		160 in																				
	Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading		Rectangular Loading		Trap/Triang. Loading																		
Mullion Span	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)											
	42 in	170.0	620	170.0	435	170.0	744	170.0	478	170.0	868	170.0	506	170.0	992	170.0	519	170.0	1116	170.0	521	170.0	1240	170.0	521	170.0	1488	170.0	521	163.5	1670	170.0	521	143.1	1670	170.0	521
48 in	170.0	708	170.0	524	170.0	850	170.0	584	170.0	992	170.0	630	170.0	1133	170.0	661	170.0	1275	170.0	677	153.4	1278	170.0	680	127.8	1278	170.0	680	109.6	1278	170.0	680	95.9	1278	170.0	680	
50-5/8 in	170.0	747	170.0	563	170.0	896	170.0	631	170.0	1046	170.0	684	163.4	1149	170.0	723	145.3	1149	170.0	747	130.7	1149	170.0	756	109.0	1149	170.0	756	93.4	1149	170.0	756	81.7	1149	170.0	756	
54 in	170.0	797	170.0	612	170.0	956	170.0	691	153.9	1010	170.0	754	134.7	1010	169.8	802	119.7	1010	161.5	795	107.7	1010	157.1	791	89.8	1010	155.9	789	76.9	1010	155.9	789	67.3	1010	155.9	789	
60 in	157.1	818	168.6	695	130.9	818	145.0	680	112.2	818	129.1	667	98.2	818	118.2	657	87.3	818	110.7	649	78.5	818	105.9	644	65.4	818	102.3	639	56.1	818	102.3	639	49.1	818	102.3	639	
63 in	135.7	742	144.7	634	113.1	742	124.1	620	96.9	742	110.1	609	84.8	742	100.3	599	75.4	742	93.4	591	67.8	742	88.8	586	56.5	742	84.4	580	48.5	742	84.1	580	42.4	742	84.1	580	
66 in	118.0	676	125.1	581	98.3	676	107.0	569	84.3	676	94.6	558	73.8	676	85.9	549	65.6	676	79.6	541	59.0	676	75.3	536	49.2	676	70.6	530	42.1	676	69.8	528	36.9	676	69.8	528	
72 in	90.9	568	95.5	493	75.7	568	81.3	483	64.9	568	71.5	474	56.8	568	64.5	466	50.5	568	59.4	459	45.4	568	55.6	454	37.9	568	51.1	447	32.5	568	49.4	444	28.4	568	49.3	444	
76 in	77.3	510	80.8	445	64.4	510	68.6	436	55.2	510	60.2	428	48.3	510	54.1	421	42.9	510	49.6	415	38.6	510	46.3	410	32.2	510	42.0	403	27.6	510	40.1	399	24.2	510	39.7	398	
78 in	71.5	484	74.5	424	59.6	484	63.3	415	51.1	484	55.5	408	44.7	484	49.8	401	39.7	484	45.6	395	35.7	484	42.4	390	29.8	484	38.3	383	25.5	484	36.3	379	22.3	484	35.8	378	
90 in	46.5	364	48.0	323	38.8	364	40.6	317	33.2	364	35.4	312	29.1	364	31.5	307	25.9	364	28.7	302	23.3	364	26.4	298	19.4	364	23.3	292	16.6	364	21.5	288	14.5	364	20.5	285	
96 in	38.3	320	39.4	286	32.0	320	33.3	281	27.4	320	28.9	276	24.0	320	25.7	272	21.3	320	23.3	268	19.2	320	21.4	264	16.0	320	18.8	258	13.7	320	17.1	254	12.0	320	16.2	251	
108 in	26.9	252	27.5	228	22.4	252	23.2	224	19.2	252	20.1	221	16.8	252	17.8	218	15.0	252	16.1	215																	
111 in	24.8	239	25.3	216	20.7	239	21.3	213	17.7	239	18.5	210	15.5	239	16.3	207																					
120 in	19.6	205	20.0	186	16.4	205	16.8	183																													

TABLE 13B:

Anchor/Clip Capacity (lbs) when using a 30 Degree Tube Mullion	Substrate:		3k Concrete		3.5k Conc.	Wood		Metal		
	Anchor Type:		3/16" DeWalt Ultracon+	1/4" DeWalt Ultracon+	5/16" Elco Ultracon	#12 Steel Screw	#14 Steel Screw	#12 Steel Screw		
	Edge Distance (in):		1"	2-1/2"	1"	2-1/2"	3-1/8"	0.54"	0.60"	0.324"
	Embedment (in):		1-3/4"	1-3/4"	1-3/4"	1-3/4"	2"	1-3/8"	1-3/8"	See Sheet 1
2 Total Anchors @ 5" O.C. thru 2x5 Angle Clip Pair (Fig. 1):			310 lbs	630 lbs	220 lbs	870 lbs	1700 lbs	442 lbs	537 lbs	536 lbs
4 Total Anchors @ 3.25" O.C. thru 2x5 Angle Clip Pair (Fig. 2):			620 lbs	1260 lbs	440 lbs	1740 lbs	2211 lbs	885 lbs	1073 lbs	1073 lbs
6 Total Anchors @ 2.71" O.C. thru 2x5 Angle Clip Pair (Fig. 3):			930 lbs	1890 lbs	648 lbs	2598 lbs	2254 lbs	1327 lbs	1610 lbs	1609 lbs

SEE SUBSTRATE PROPERTIES, SHEET 1.

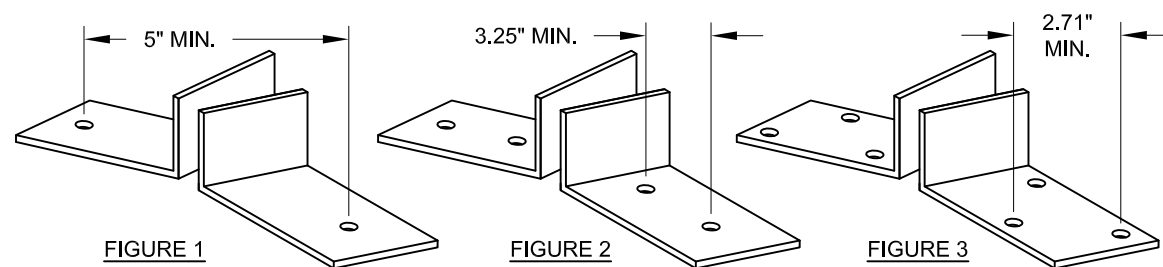


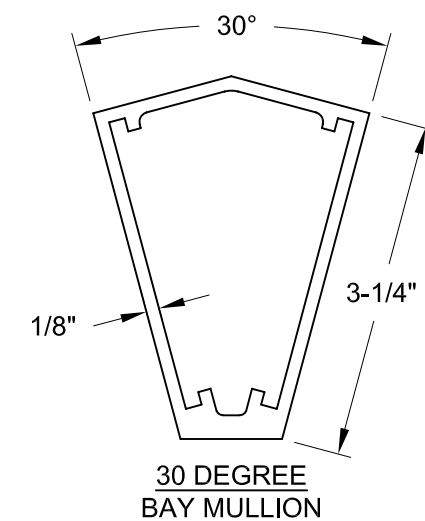
TABLE NOTES:

- 1) LINEAR INTERPOLATION BETWEEN MULLION SPANS AND/OR OPENING DIMENSIONS IS ALLOWABLE.
- 2) MULLION AND MULLION CLIPS SHOWN ARE NOT TO SCALE. FOR EXACT DIMENSIONS, SEE SHEETS 21-23. HOLES MAY BE DRILLED IN THE FIELD FOLLOWING DIMENSIONAL RESTRICTIONS SHOWN ON THIS SHEET. FIGURES SHOW SUGGESTED, APPROXIMATE HOLE LOCATIONS. CLIP HOLES TO BE NO CLOSER THAN 3/8" O.C. FROM CLIP EDGE.
- 3) SEE SHEET 1 FOR ADDITIONAL ANCHOR/SUBSTRATE NOTES.

ANCHOR CAPACITY ADJUSTMENT FORMULA:

$$(DP_{REQ}) \times \left( \frac{ANCHOR CAP. FROM TABLE}{MULLION CAP. FROM TABLE} \right) = ANCHOR CAP. REQ.$$

USE THIS FORMULA TO OBTAIN THE "ANCHOR CAPACITY REQUIRED" CORRESPONDING TO AN ACTUAL PRESSURE REQUIREMENT FOR THE OPENING, WHEN IT IS LOWER THAN THE MULLION CAPACITY (FROM THE TABLE) OF THE SELECTED MULLION. IT WILL YIELD A MINIMUM ANCHOR CAPACITY WHICH MAY BE USED TO QUALIFY ADDITIONAL ANCHOR OPTIONS FROM THE CLIP/ANCHOR CAPACITY TABLE.

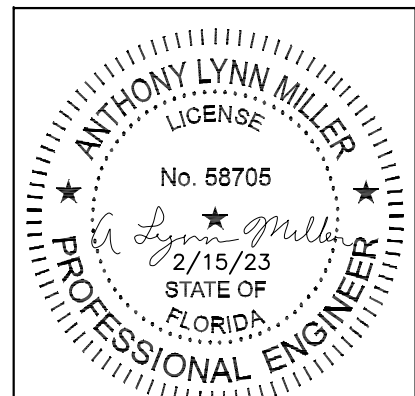


**PRODUCT REVISED**  
as complying with the Florida Building Code  
**NOA-No. 23-0221.03**  
**Expiration Date: 03/28/2028**  
By: *Manuel Perez*  
**Miami-Dade Product Control**

Revision:

<b>Impact Resistant Windows &amp; Doors</b> <b>WE'RE STRONGER™</b> 3780 W 104TH STREET HIALEAH, FL 33018 (305) 593-6590	REGISTRATION #29296 ALUMINUM TUBE MULLIONS, CLIPPED (LM) 30 DEGREE BAY CAPACITIES MULLS	Date	02/02/23
		Drawn By	JENS ROSOWSKI
		DWG No.	19 OF 23
		Sheet	NTS
		Scale	
		Series	TUBEMULL-1

PREPARED BY A. LYNN MILLER  
1070 TECHNOLOGY DRIVE  
N. VENICE, FL 34275  
(941) 480-1600



A. LYNN MILLER, P.E., P.E.# 58705



TABLE 14A:

45 Degree Tube Mullion Design Pressure & Clip/Anchor Capacity Requirement	Opening Dimension																																			
	50 in		60 in		70 in		80 in		90 in		100 in		120 in		140 in		160 in																			
	Rectangular Loading	Trap/Triang. Loading	Rectangular Loading	Trap/Triang. Loading	Rectangular Loading	Trap/Triang. Loading	Rectangular Loading	Trap/Triang. Loading	Rectangular Loading	Trap/Triang. Loading	Rectangular Loading	Trap/Triang. Loading	Rectangular Loading	Trap/Triang. Loading	Rectangular Loading	Trap/Triang. Loading	Rectangular Loading	Trap/Triang. Loading																		
Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)	Mullion Capacity (lbs/ft <sup>2</sup> )	Anchor Capacity Required (lbs)											
42 in	170.0	620	170.0	435	170.0	744	170.0	478	170.0	868	170.0	506	170.0	992	170.0	519	170.0	1116	170.0	521	170.0	1240	170.0	521	170.0	1488	170.0	521	170.0	1735	170.0	521	164.5	1919	170.0	521
48 in	170.0	708	170.0	524	170.0	850	170.0	584	170.0	992	170.0	630	170.0	1133	170.0	661	170.0	1275	170.0	677	170.0	1417	170.0	680	146.9	1469	170.0	680	125.9	1469	170.0	680	110.2	1469	170.0	680
50-5/8 in	170.0	747	170.0	563	170.0	896	170.0	631	170.0	1046	170.0	684	170.0	1195	170.0	723	167.0	1321	170.0	747	150.3	1321	170.0	756	125.2	1321	170.0	756	107.3	1321	170.0	756	93.9	1321	170.0	756
54 in	170.0	797	170.0	612	170.0	956	170.0	691	170.0	1116	170.0	754	154.8	1161	170.0	803	137.6	1161	170.0	837	123.8	1161	170.0	856	103.2	1161	170.0	861	88.4	1161	170.0	861	77.4	1161	170.0	861
60 in	170.0	885	170.0	701	150.5	940	166.7	782	129.0	940	148.4	767	112.8	940	135.9	755	100.3	940	127.3	746	90.3	940	121.8	740	75.2	940	117.5	735	64.5	940	117.5	735	56.4	940	117.5	735
63 in	156.0	853	166.3	729	130.0	853	142.6	713	111.4	853	126.5	700	97.5	853	115.3	683	86.6	853	107.4	680	78.0	853	102.1	673	65.0	853	97.0	667	55.7	853	96.7	666	48.7	853	96.7	666
66 in	135.6	777	143.8	668	113.0	777	123.0	654	96.9	777	108.8	641	84.8	777	98.7	631	75.4	777	91.5	622	67.8	777	86.5	616	56.5	777	81.2	609	48.4	777	80.3	607	42.4	777	80.3	607
72 in	104.5	653	109.8	567	87.1	653	93.5	555	74.6	653	82.2	545	65.3	653	74.2	535	58.0	653	68.3	528	52.2	653	64.0	522	43.5	653	58.7	514	37.3	653	56.8	511	32.7	653	56.7	510
76 in	88.8	586	92.8	512	74.0	586	78.9	501	63.5	586	69.2	492	55.5	586	62.2	484	49.4	586	57.1	477	44.4	586	53.2	471	37.0	586	48.3	463	31.7	586	46.1	459	27.8	586	45.7	458
78 in	82.2	556	85.7	487	68.5	556	72.8	477	58.7	556	63.7	469	51.4	556	57.2	461	45.7	556	52.4	454	41.1	556	48.7	449	34.2	556	44.0	440	29.3	556	41.7	436	25.7	556	41.2	435
90 in	53.5	418	55.2	371	44.6	418	46.6	364	38.2	418	40.7	358	33.4	418	36.3	352	29.7	418	32.9	347	26.7	418	30.4	343	22.3	418	26.8	335	19.1	418	24.7	330	16.7	418	23.6	328
96 in	44.1	367	45.3	328	36.7	367	38.2	322	31.5	367	33.2	317	27.5	367	29.6	312	24.5	367	26.8	308	22.0	367	24.6	304	18.4	367	21.6	297	15.7	367	19.7	292	13.8	367	18.6	289
108 in	31.0	290	31.6	262	25.8	290	26.6	258	22.1	290	23.1	254	19.3	290	20.5	250	17.2	290	18.5	247	15.5	290	16.9	244												
111 in	28.5	275	29.1	249	23.8	275	24.5	245	20.4	275	21.2	241	17.8	275	18.8	233	15.8	275	16.9	234																
120 in	22.6	235	23.0	214	18.8	235	19.3	211	16.1	235	16.7	208																								

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as complying with the Florida Building Code  
**NOA-No. 23-0221.03**  
Expiration Date: **03/28/2028**  
By: *Manuel Perez*  
**Miami-Dade Product Control**

Revision:

TABLE 14B:

Anchor/Clip Capacity (lbs) when using a 45 Degree Tube Mullion	Substrate:	3k Concrete				3.5k Conc.	Wood		Metal
	Anchor Type:	3/16" DeWalt Ultracon+		1/4" DeWalt Ultracon+		5/16" Elco Ultracon	#12 Steel Screw	#14 Steel Screw	#12 Steel Screw
	Edge Distance (in):	1"	2-1/2"	1"	2-1/2"	3-1/8"	0.54"	0.60"	0.324"
	Embedment (in):	1-3/4"	1-3/4"	1-3/4"	1-3/4"	2"	1-3/8"	1-3/8"	See Sheet 1
2 Total Anchors @ 5" O.C. thru 2x5 Angle Clip Pair (Fig. 1):	310 lbs	630 lbs	220 lbs	870 lbs	1700 lbs	442 lbs	537 lbs	536 lbs	
4 Total Anchors @ 3.25" O.C. thru 2x5 Angle Clip Pair (Fig. 2):	620 lbs	1260 lbs	440 lbs	1740 lbs	2211 lbs	885 lbs	1073 lbs	1073 lbs	
6 Total Anchors @ 2.71" O.C. thru 2x5 Angle Clip Pair (Fig. 3):	930 lbs	1890 lbs	648 lbs	2598 lbs	2254 lbs	1327 lbs	1610 lbs	1609 lbs	

SEE SUBSTRATE PROPERTIES, SHEET 1.

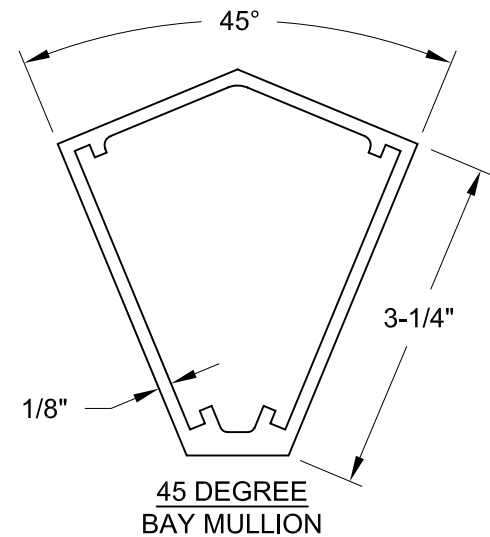
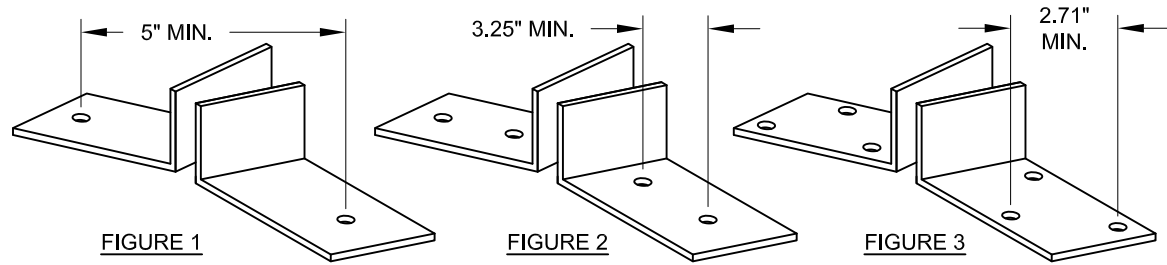


TABLE NOTES:

- 1) LINEAR INTERPOLATION BETWEEN MULLION SPANS AND/OR OPENING DIMENSIONS IS ALLOWABLE.
- 2) MULLION AND MULLION CLIPS SHOWN ARE NOT TO SCALE. FOR EXACT DIMENSIONS, SEE SHEETS 21-23. HOLES MAY BE DRILLED IN THE FIELD FOLLOWING DIMENSIONAL RESTRICTIONS SHOWN ON THIS SHEET. FIGURES SHOW SUGGESTED, APPROXIMATE HOLE LOCATIONS. CLIP HOLES TO BE NO CLOSER THAN 3/8" O.C. FROM CLIP EDGE.
- 3) SEE SHEET 1 FOR ADDITIONAL ANCHOR/SUBSTRATE NOTES.

ANCHOR CAPACITY ADJUSTMENT FORMULA:

$$(DP_{REQ}) \times \left( \frac{\text{ANCHOR CAP.}_{FROM TABLE}}{\text{MULLION CAP.}_{FROM TABLE}} \right) = \text{ANCHOR CAP.}_{REQ.}$$

USE THIS FORMULA TO OBTAIN THE "ANCHOR CAPACITY REQUIRED" CORRESPONDING TO AN ACTUAL PRESSURE REQUIREMENT FOR THE OPENING, WHEN IT IS LOWER THAN THE MULLION CAPACITY (FROM THE TABLE) OF THE SELECTED MULLION. IT WILL YIELD A MINIMUM ANCHOR CAPACITY WHICH MAY BE USED TO QUALIFY ADDITIONAL ANCHOR OPTIONS FROM THE CLIP/ANCHOR CAPACITY TABLE.

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REGISTRATION #29296

PREPARED BY A. LYNN MILLER  
1070 TECHNOLOGY DRIVE  
N. VENICE, FL 34275  
(941) 480-1600

ALUMINUM TUBE MULLIONS, CLIPPED (LM)  
45 DEGREE BAY CAPACITIES  
MULLS

Drawn By: JENS ROSOWSKI  
Date: 02/02/23  
Title: TUBEMULL-1  
Sheet: NTS  
Scale:  
DWG No.: 20 OF 23

**PROFESSIONAL ENGINEER**  
ANTHONY LYNN MILLER  
LICENSE  
No. 58705  
2/15/23  
STATE OF FLORIDA  
A. LYNN MILLER, P.E., P.E.# 58705

**EXAMPLE 1: MULTIPLE MULLIONS**

THE BUILDING SUBSTRATE IS KNOWN TO BE CMU ON THE JAMBS AND USES A CONCRETE HEADER AND SILL. THE WINDOW FRAME DEPTH IS 2-3/8". THE OPENING REQUIRES A DESIGN PRESSURE OF +50.0/-55.0 PSF.

**FOR THE VERTICAL MULLION:**

1) INITIALLY ASSUMING THAT A 1" WIDE MULLION IS SUITABLE, THE MULLION SPAN IS 32"+72"+1"=105" AND THE OPENING DIMENSION IS 36"+36"+1" =73". REFERENCING SHEET 23, THE COLUMN USING RECTANGULAR LOADING SHALL BE USED. SCAN THE MULLION TABLES FOR A MULLION THAT IS AT LEAST THE WINDOW FRAME DEPTH OF 2-3/8" AND WILL MEET OR EXCEED THE REQUIRED DESIGN PRESSURE OF +50.0/-55.0 PSF. IF THE TABLE DOES NOT SHOW THE EXACT SIZE, USE THE NEXT LARGER SIZE AVAILABLE.

FROM TABLE 5A, SHEET 11, THE 1" X 4" X 1/8" MULLION (SPAN = 108", OPENING DIMENSION = 80") MEETS THE DEPTH REQUIRED, HOWEVER THE DESIGN PRESSURE IS ONLY +/-25.2 PSF AND WOULD NOT BE SUITABLE FOR THIS APPLICATION.

FROM TABLE 9A, SHEET 15, THE 2" X 4" X .250" MULLION (SPAN = 108", OPENING DIMENSION = 80") HAS A DESIGN PRESSURE OF +/-64.7 PSF WHICH EXCEEDS THE REQUIREMENTS FOR THE OPENING AND MAY BE USED IN THIS APPLICATION. NOTE THE ANCHOR CAPACITY REQUIRED OF 971 LBS.

BECAUSE IT IS NOW KNOWN THAT THE MULLION WILL ADD 2" TO THE WIDTH OF THE MULLED UNIT INSTEAD OF 1", THE ADJUSTED OPENING DIMENSION IS 36"+36"+2"=74", NOT 73" AS PREVIOUSLY ASSUMED. VERIFY THAT THE DESIGN PRESSURE IS STILL APPLICABLE FOR THE ADJUSTED OPENING. ALTERNATIVELY, THE WINDOW WIDTHS MAY BE REDUCED TO MAINTAIN THE 73" DIMENSION (35-1/2"+35-1/2"+2"=73").

2) USE TABLE 9B TO FIND THE ANCHOR TYPE, ANCHOR QUANTITY AND CLIP TYPE REQUIRED FOR THE CONCRETE SUBSTRATE. IN THIS EXAMPLE, ASSUME THE POURED CONCRETE HEADER AND SILL ARE 8" WIDE. IF THE MULLION CLIP WERE TO BE CENTERED WITHIN THE 8", CARE MUST BE TAKEN TO MAINTAIN THE FASTENER'S EDGE DISTANCE. USING THE STANDARD CLIP WITH (4) 3/16" ULTRACON+ ANCHORS AT AN EDGE DISTANCE OF 2-1/2" GIVES AN ANCHOR CAPACITY OF 1260 LBS WHICH IS GREATER, AND THEREFORE SUITABLE, FOR THE REQUIRED ANCHOR CAPACITY OF 971 LBS.

**FOR THE HORIZONTAL MULLIONS:**

BECAUSE THE VERTICAL MULL WILL BE A 2" X 4" X .250" MULLION, IN THIS EXAMPLE WE WILL MATCH THE HORIZONTAL AND VERTICAL MULLIONS, ALTERNATIVELY, ANOTHER MULLION TYPE COULD BE CHOSEN.

1) THE MULLION SPAN IS 36" AND THE OPENING DIMENSION IS 32"+72"+2" =106". REFERENCING SHEET 23, THE COLUMN USING TRAPEZOIDAL/TRIANGULAR LOADING MAY BE USED. FROM TABLE 9A, SHEET 15, THE 2" X 4" X .250" MULLION (@ SPAN = 42", OPENING DIMENSION = 120") HAS A DESIGN PRESSURE OF +/-170.0 PSF WHICH EXCEEDS THE REQUIREMENTS FOR THE OPENING AND MAY BE USED IN THIS APPLICATION. NOTE THE ANCHOR CAPACITY REQUIRED OF 521 LBS.

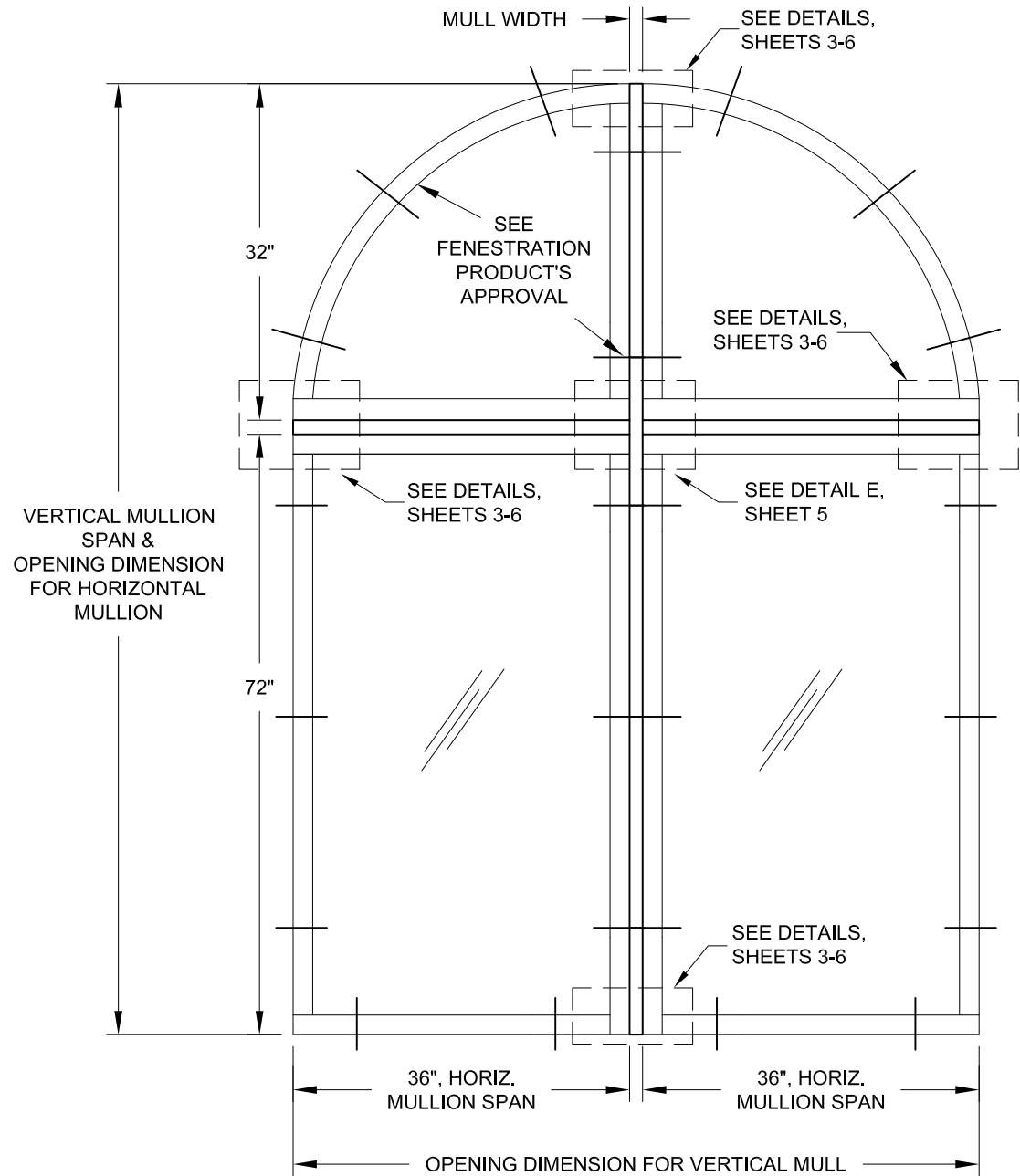
2) USE TABLE 9B TO FIND THE ANCHOR TYPE, ANCHOR QUANTITY AND CLIP TYPE REQUIRED FOR THE CMU SUBSTRATE. IN THIS EXAMPLE, ASSUME THE CMU JAMBS ARE 8" WIDE. IF THE MULLION CLIP WERE TO BE CENTERED WITHIN THE 8", CARE MUST BE TAKEN TO MAINTAIN THE FASTENER'S EDGE DISTANCE. USING THE STANDARD MULL CLIPS WITH (4) 3/16" ULTRACON+ ANCHORS AT AN EDGE DISTANCE OF 2-1/2" GIVES AN ANCHOR CAPACITY OF 740 LBS WHICH IS GREATER, AND THEREFORE SUITABLE, FOR THE REQUIRED ANCHOR CAPACITY OF 521 LBS. THE SAME ANCHOR TYPES WERE CHOSEN AS BEFORE FOR SIMPLICITY, HOWEVER ANY ANCHOR MEETING THE REQUIREMENTS COULD HAVE BEEN USED.

3) FOR THE U-CLIP IN THE HORIZONTAL MULLION TO VERTICAL MULLION, USE THE SAME ANCHOR CAPACITY OF 521 LBS. TABLE 9B FOR THE U-CLIP SHOWS THE ANCHOR CAPACITY IS 805 LBS WHEN USING 3 ANCHORS, WHICH IS GREATER, AND THEREFORE SUITABLE, FOR THE REQUIRED ANCHOR CAPACITY REQUIREMENT OF 521 LBS. THE ANCHOR TYPE IS A #12 STEEL SCREW.

FROM THE ABOVE STEPS, OUR MULLION DESIGN PRESSURE IS:

- +/-64.7 PSF FROM THE VERTICAL MULLION;
  - +/-170.0 PSF FROM THE 36" HORIZONTAL MULLION ATTACHING TO CMU;
  - +/-170.0 PSF FROM THE 36" HORIZONTAL MULLION ATTACHING TO THE VERTICAL MULLION (INTERSECTION).
- THE LOWEST DESIGN PRESSURE IS +/-64.7 PSF AND WOULD APPLY TO ALL OF THE MULLIONS.

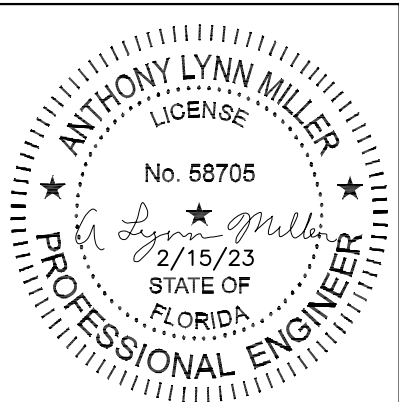
VERIFY THE DESIGN PRESSURE OF THE FENESTRATION PRODUCTS USED WITH THIS MULLION SYSTEM. THE LOWER DESIGN PRESSURE, OF MULLIONS OR FENESTRATION PRODUCTS, WILL APPLY TO THE OVERALL ASSEMBLY. FINAL DESIGN PRESSURE REQUIRES THAT THE BOTH THE MULLION AND THE FENESTRATION PRODUCT BE INSTALLED IN ACCORDANCE WITH THE INSTALLATION SPECIFICATIONS INTO RESPECTIVE SUBSTRATES AND FENESTRATION PRODUCTS TO MULLION.



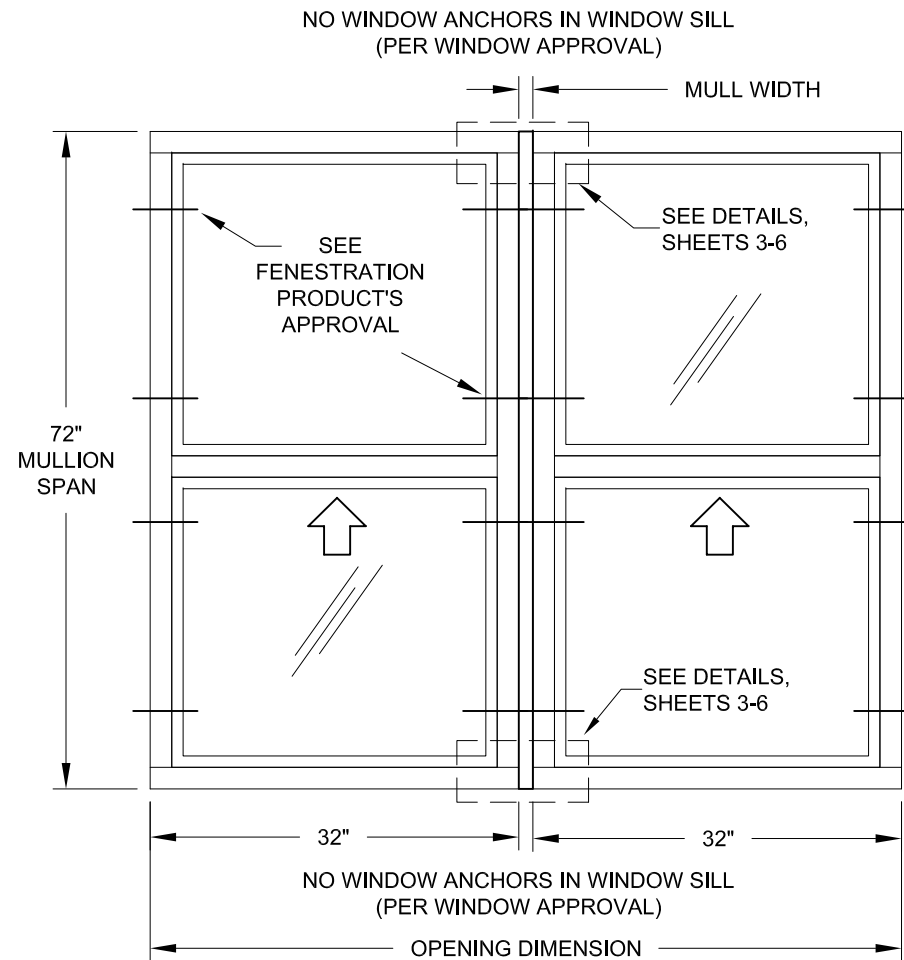
**PRODUCT REVISED**  
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Building Code  
**NOA-No. 23-0221.03**  
**Expiration Date: 03/28/2028**  
By: *Manuel Perez*  
**Miami-Dade Product Control**

Revision:

<b>Impact Resistant Windows &amp; Doors</b> <b>WE'RE STRONGER™</b> 3780 W 104TH STREET HIALEAH, FL 33018 (305) 593-6590	PREPARED BY A. LYNN MILLER 1070 TECHNOLOGY DRIVE N. VENICE, FL 34275 (941) 480-1600	REGISTRATION #29296	DATE 02/02/23	DRAWN BY JENS ROSOWSKI	DWG NO. 21 OF 23	SCALE NTS	SERIES TITLE EXAMPLE 1
	ALUMINUM TUBE MULLIONS, CLIPPED (LM)	TUBEMULL-1					



A. LYNN MILLER, P.E., P.E.# 58705



**EXAMPLE 2: SINGLE VERTICAL MULLION**

THE BUILDING SUBSTRATE IS KNOWN TO BE WOOD ON ALL FOUR SIDES. THE WINDOW FRAME DEPTH IS 2-3/4". THE OPENING REQUIRES A DESIGN PRESSURE OF +60.0/-60.0 PSF.

1) INITIALLY ASSUMING THAT A 1" WIDE MULLION IS SUITABLE, THE MULLION SPAN IS 72" AND THE OPENING DIMENSION IS 32"+32"+1" = 65". REFERENCING SHEET 23, THE COLUMN USING RECTANGULAR LOADING MUST BE USED. SCAN THE MULLION TABLES FOR A MULLION THAT IS AT LEAST THE WINDOW FRAME DEPTH OF 2-3/4" AND WILL MEET OR EXCEED THE REQUIRED DESIGN PRESSURE OF +60.0/-60.0 PSF. IF THE TABLE DOES NOT SHOW THE EXACT SIZE, USE THE NEXT LARGER SIZE AVAILABLE.

FROM TABLE 4A, SHEET 10, THE 1" X 3" X 1/8" MULLION (SPAN = 72", OPENING DIMENSION = 70") MEETS THE DEPTH REQUIRED, HOWEVER THE DESIGN PRESSURE IS ONLY +/-44.7 PSF AND WOULD NOT BE SUITABLE FOR THIS APPLICATION.

FROM TABLE 5A, SHEET 11, THE 1" X 4" X 1/8" MULLION (SPAN = 72", OPENING DIMENSION = 70") HAS A DESIGN PRESSURE OF +/-97.0 PSF WHICH EXCEEDS THE REQUIREMENTS FOR THE OPENING AND MAY BE USED IN THIS APPLICATION. NOTE THE ANCHOR CAPACITY REQUIRED OF 849 LBS.

2) USE TABLE 5B TO FIND THE ANCHOR TYPE, ANCHOR QUANTITY AND CLIP TYPE REQUIRED FOR THE WOOD SUBSTRATE. BOTH THE STANDARD CLIP WITH (4) #12 ANCHORS AND THE 2X5 ANGLE CLIPS WITH (4) #12 ANCHORS HAVE A CAPACITY OF 885 LBS. THOUGH EITHER ONE COULD BE USED, THE STANDARD CLIP IS EASIEST TO INSTALL.

3) VERIFY THE DESIGN PRESSURE OF THE FENESTRATION PRODUCTS USED WITH THIS MULLION SYSTEM. THE LOWER DESIGN PRESSURE, OF MULLIONS OR FENESTRATION PRODUCTS, WILL APPLY TO THE OVERALL ASSEMBLY. FINAL DESIGN PRESSURE REQUIRES THAT THE BOTH THE MULLION AND THE FENESTRATION PRODUCT BE INSTALLED IN ACCORDANCE WITH THE INSTALLATION SPECIFICATIONS INTO RESPECTIVE SUBSTRATES AND FENESTRATION PRODUCTS TO MULLION.

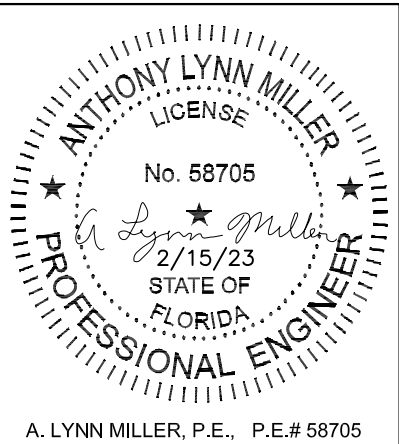
IN THIS EXAMPLE, THE DESIGN PRESSURE REQUIRED WAS +/-60.0 PSF. THE OVERALL MULLION SYSTEM WAS DETERMINED TO BE 97.0 PSF WITH AN ANCHOR CAPACITY OF 885 LBS. ALTERNATIVELY, THE ANCHOR CAPACITY ADJUSTMENT FORMULA COULD HAVE BEEN USED TO CALCULATE THE ANCHOR CAPACITY REQUIRED FOR THE EXACT DESIGN PRESSURE OF 60 PSF:

$$(60 \text{ PSF}) \times \left( \frac{885 \text{ LBS}}{97.0 \text{ PSF}} \right) = 547.4 \text{ LBS (I.E. YOU COULD USE A LOWER CAPACITY ANCHORAGE OPTION OF 547.4 LBS SINCE YOU ONLY REQUIRE A DESIGN PRESSURE OF 60 PSF.)}$$

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**Miami-Dade Product Control**

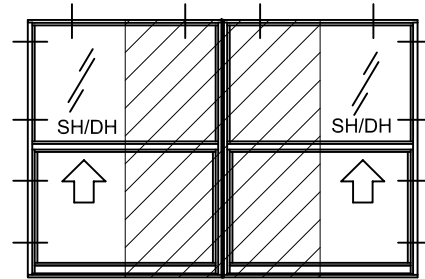
Revision:

PREPARED BY A. LYNN MILLER 1070 TECHNOLOGY DRIVE N. VENICE, FL 34275 (941) 480-1600	REGISTRATION #29296	DATE	02/02/23
	ALUMINUM TUBE MULLIONS, CLIPPED (LM)		
<b>Impact Resistant Windows &amp; Doors</b> WE'RE STRONGER™ 3780 W 104TH STREET HIALEAH, FL 33018 (305) 593-6590	DRAWN BY JENS ROSOWSKI	DWG NO. 22 OF 23	SHEET NTS
			SCALE MULLS
SERIES EXAMPLE 2	TITLE ALUMINUM TUBE MULLIONS, CLIPPED (LM)	NO. 22 OF 23	DWG NO. 22 OF 23
TUBEMULL-1	JENS ROSOWSKI	DATE 02/02/23	REGISTRATION #29296

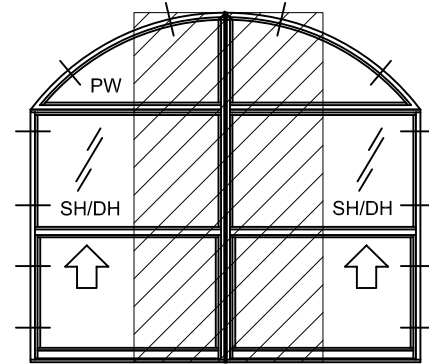


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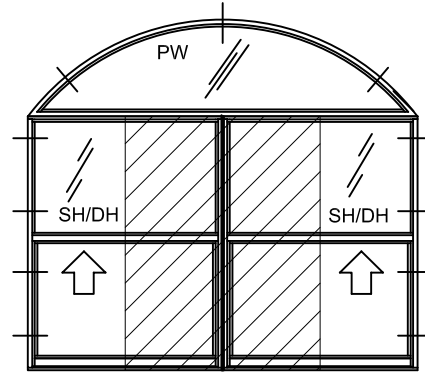
**EXAMPLES OF RECTANGULAR LOADING:**



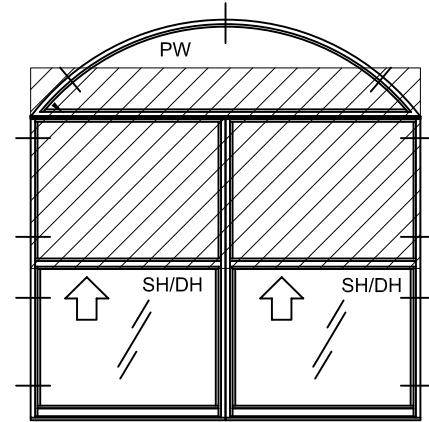
LOADING OF VERTICAL MULLION SILL OF WINDOWS NOT ANCHORED



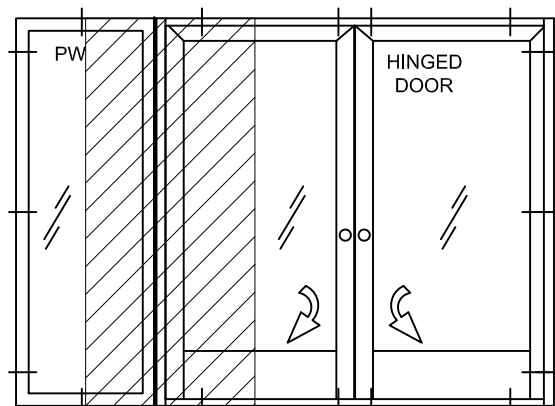
LOADING OF VERTICAL MULLION WITH INTERSECTING HORIZONTAL MULLIONS



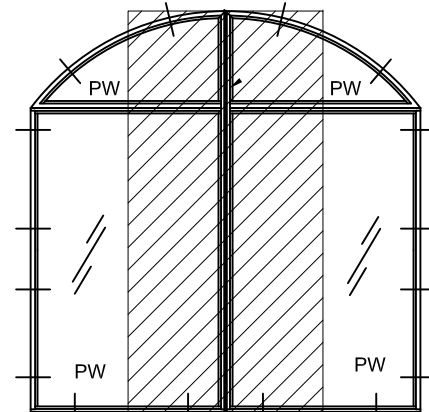
LOADING OF VERTICAL MULLION SILL OF WINDOWS NOT ANCHORED



LOADING OF HORIZONTAL MULLION WITH INTERSECTING VERTICAL MULLION

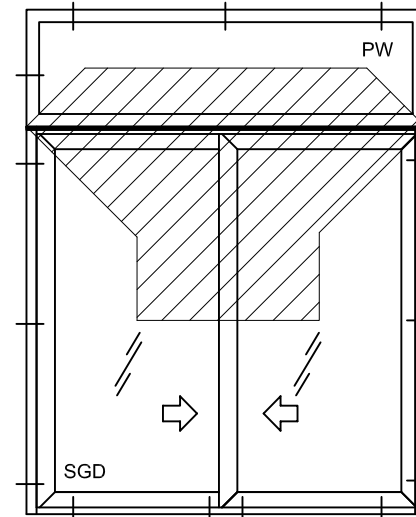


LOADING OF VERTICAL MULLION PANEL OF HINGED DOOR IS NOT CAPTURED OR ANCHORED

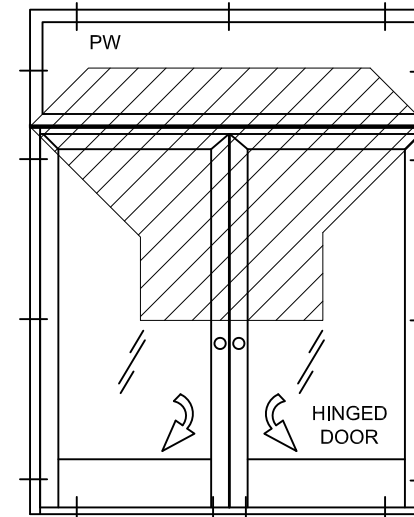


LOADING OF VERTICAL MULLION WITH INTERSECTING HORIZONTAL MULLIONS

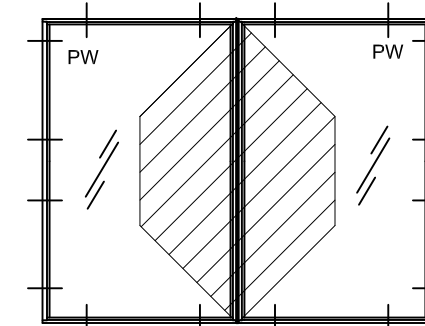
**EXAMPLES OF TRAPEZOIDAL/TRIANGULAR LOADING:**



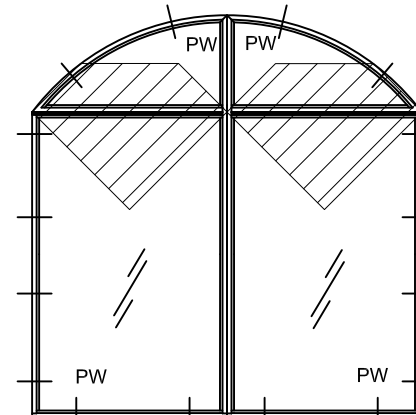
LOADING OF HORIZONTAL MULLION



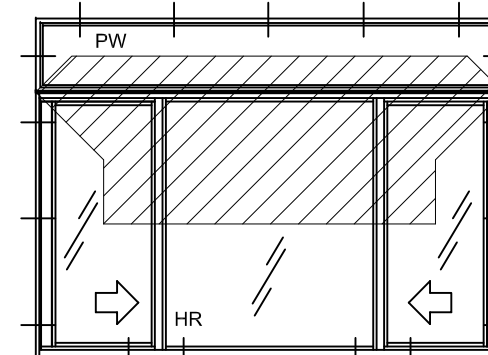
LOADING OF HORIZONTAL MULLION



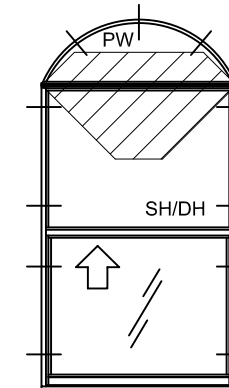
LOADING OF VERTICAL MULLION



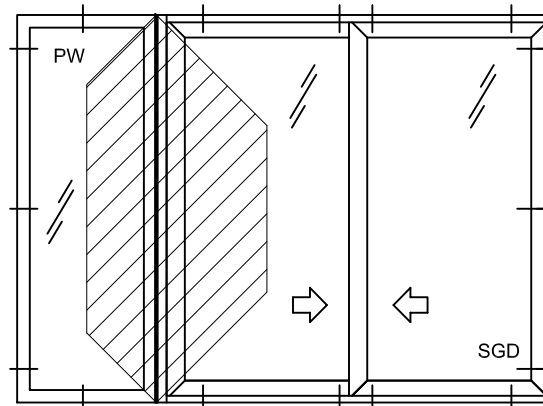
LOADING OF (2) HORIZONTAL MULLIONS



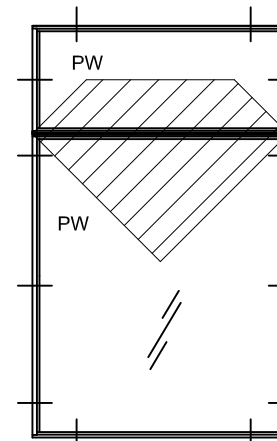
LOADING OF HORIZONTAL MULLION



LOADING OF HORIZONTAL MULLION



LOADING OF VERTICAL MULLION



LOADING OF HORIZONTAL MULLION

**NOTES:**

- 1) DRAWINGS ARE RERESENTATIONS OF TYPICAL CONFIGURATIONS. CONFIGURATIONS NOT SHOWN MAY BE EXTRAPOLATED FROM THOSE SHOWN.
- 2) IF THE LOADING TYPE CANNOT BE DETERMINED, USE RECTANGULAR LOADING.
- 3) SEE PRODUCTS' APPROVAL FOR ACTUAL ANCHOR LOCATIONS.

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 By: *Manuel Perez*  
 Miami-Dade Product Control

Revision:

PREPARED BY A. LYNN MILLER 1070 TECHNOLOGY DRIVE N. VENICE, FL 34275 (941) 480-1600	REGISTRATION #29296	Date: 02/02/23	Rev.
	ALUMINUM TUBE MULLIONS, CLIPPED (LM)	JENS ROSOWSKI	DWG No.
3780 W 104TH STREET HIALEAH, FL 33018 (305) 593-6590	TITLE	SHEET	SCALE
LOADING AREA EXAMPLES	23 OF 23	NTS	TUBEMULL-1
MULLS	23 OF 23	NTS	TUBEMULL-1

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