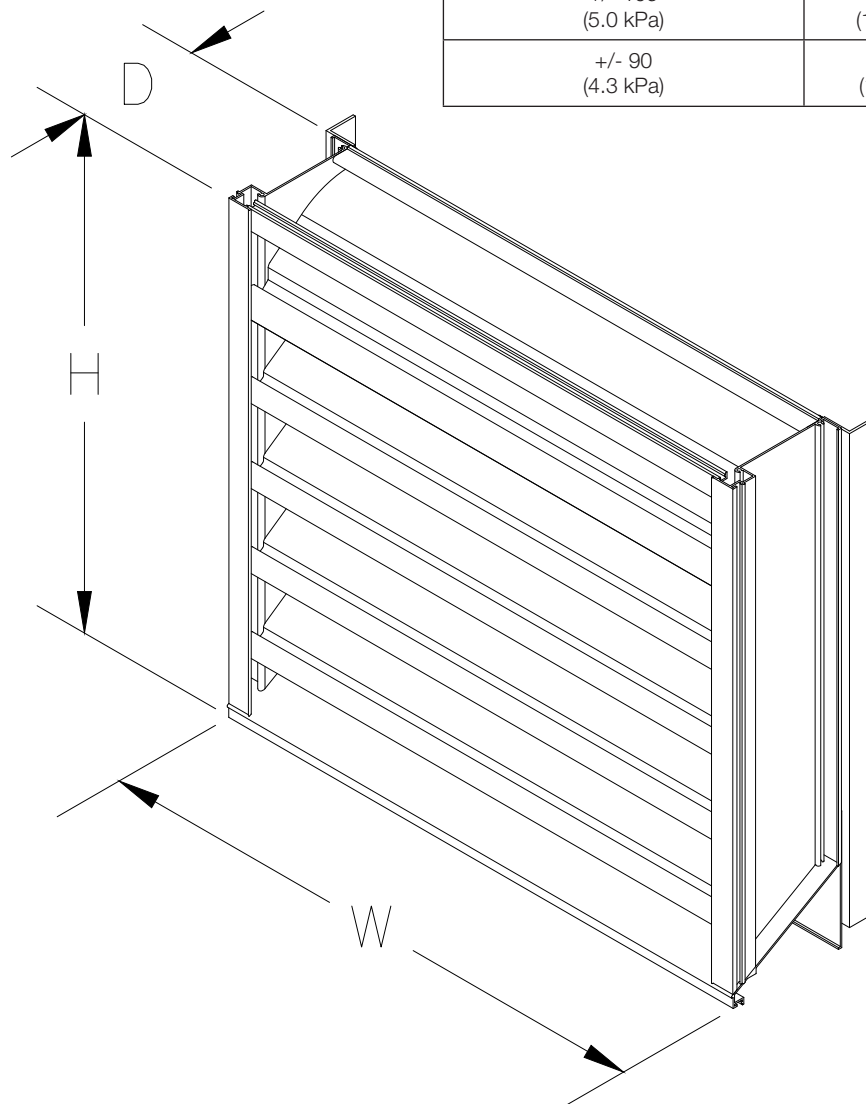


## Installation, Operation and Maintenance Manual

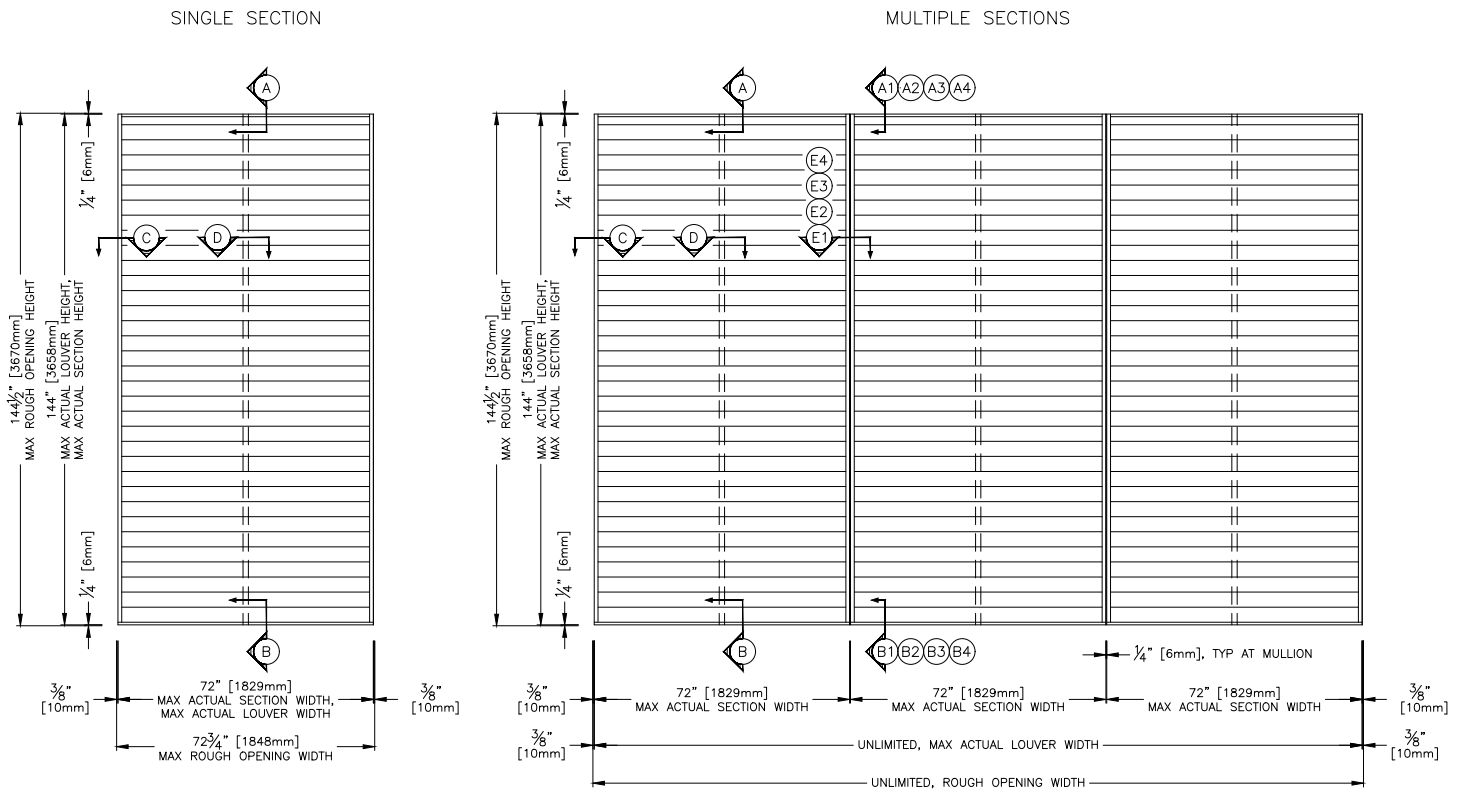
Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.

Wind Load Table	
Design Pressure Rating	Maximum Single Section Size
+/- 150 PSF (7.2 kPa)	43 in. W x 144 in. H (1092 mm W x 3658 mm H)
+/- 130 (6.2 kPa)	49.5 in. W x 144 in. H (1257 mm W x 3658 mm H)
+/- 105 (5.0 kPa)	61.5 in. W x 144 in. H (1562 mm W x 3658 mm H)
+/- 90 (4.3 kPa)	72 in. W x 144 in. H (1829mm W x 3658 mm H)



## Maximum Size and Installation Information

Model ESD-635D is a Miami-Dade Qualified and Florida Product Approved louver and must be installed in accordance with the installation instructions shown herein. Model ESD-635D is qualified for installation within concrete/masonry, steel stud, and structural steel framed building conditions. The maximum design wind load for model ESD-635D varies depending on configuration (reference wind load table). The maximum single section rough opening width is 72.75 in. The maximum single section rough opening height is 144.50 in. While the maximum rough opening height is limited to 144.50 in., the rough opening width is limited to 1,000 in. as multiple sections may be installed side by side in accordance with installation instructions.



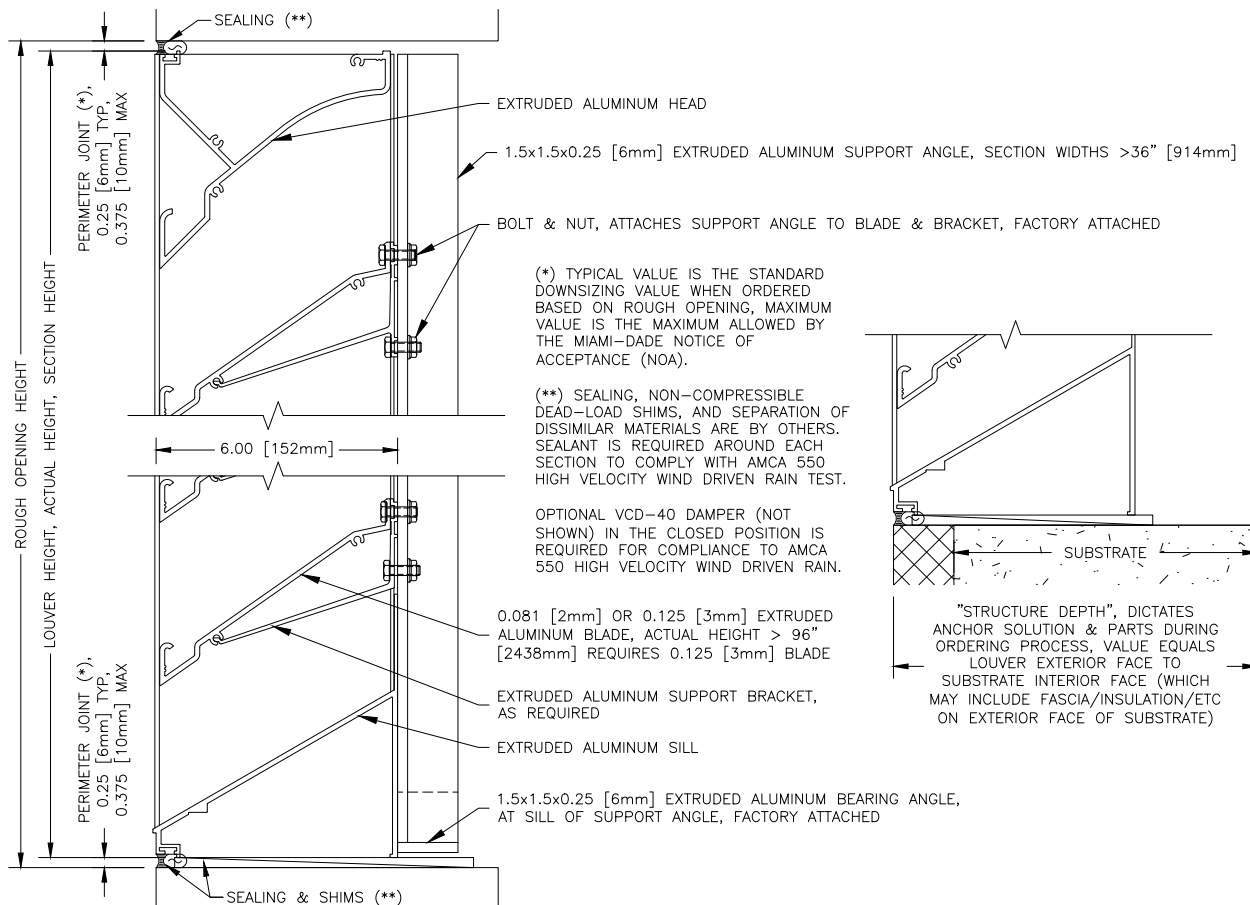
**Minimum Rough  
Opening Size**  
12 in. W x 12 in. H

**Maximum Single Section  
Rough Opening Size**  
72.75 in. W x 144.50 in. H

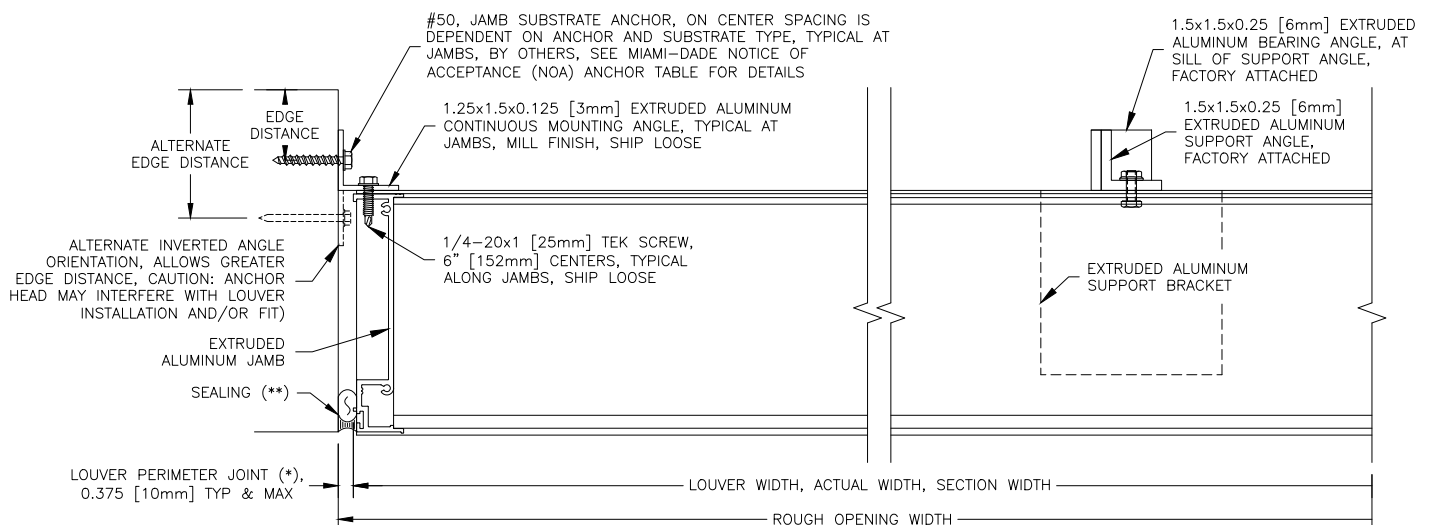
## Building Condition/Substrate Limitations

- All structural steel and steel stub substrate shall be min. 0.125 in. thick FY = 36 KSI
- All concrete substrate shall be min. 3000 PSI
- Concrete masonry shall be ASTM C90, Type II, 2000 PSI, grout-filled

**A** HEAD DETAIL, CHANNEL FRAME  
SUPPORT ANGLE



**B** SILL DETAIL, CHANNEL FRAME  
SUPPORT ANGLE

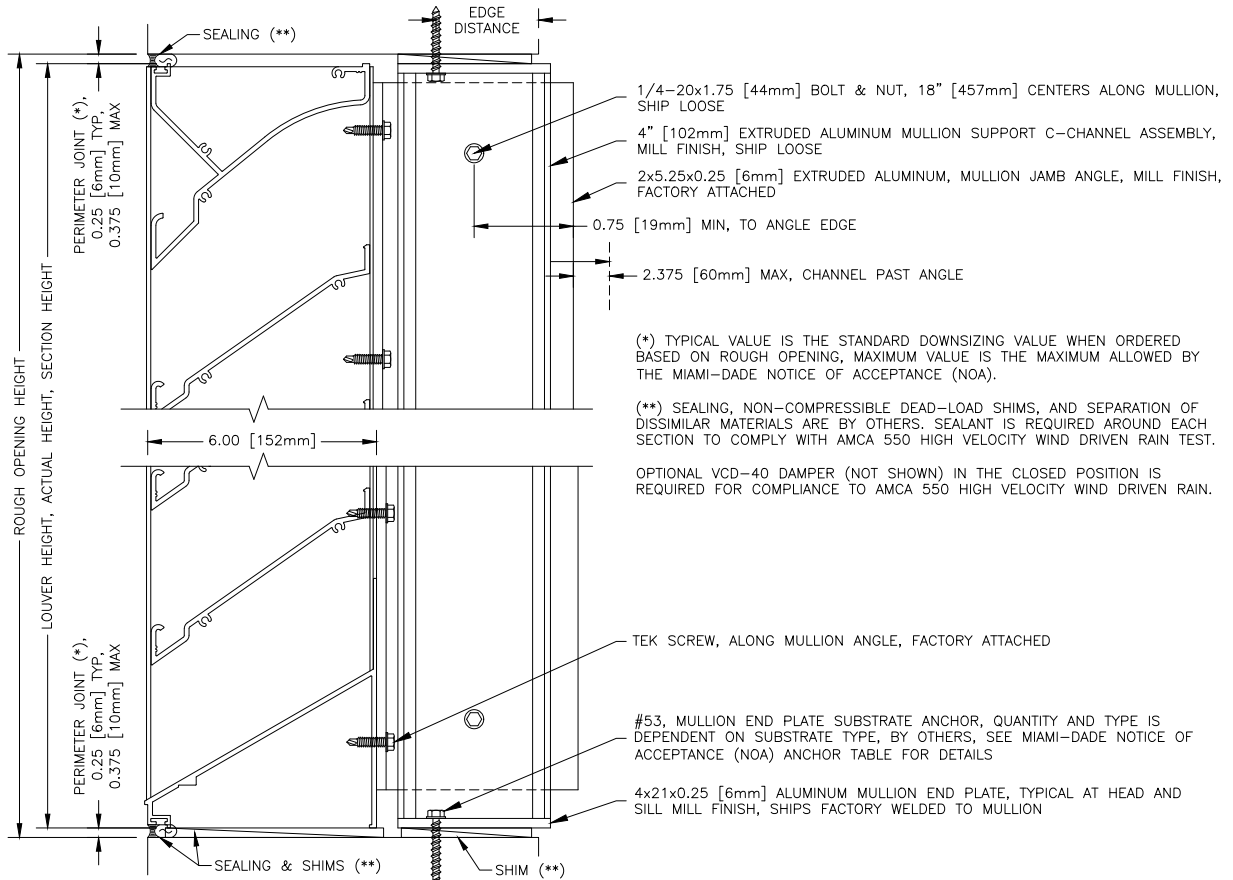


**C** JAMB DETAIL, CHANNEL FRAME

**D** SUPPORT DETAIL, CHANNEL FRAME  
SECTION WIDTHS >36" [914mm]

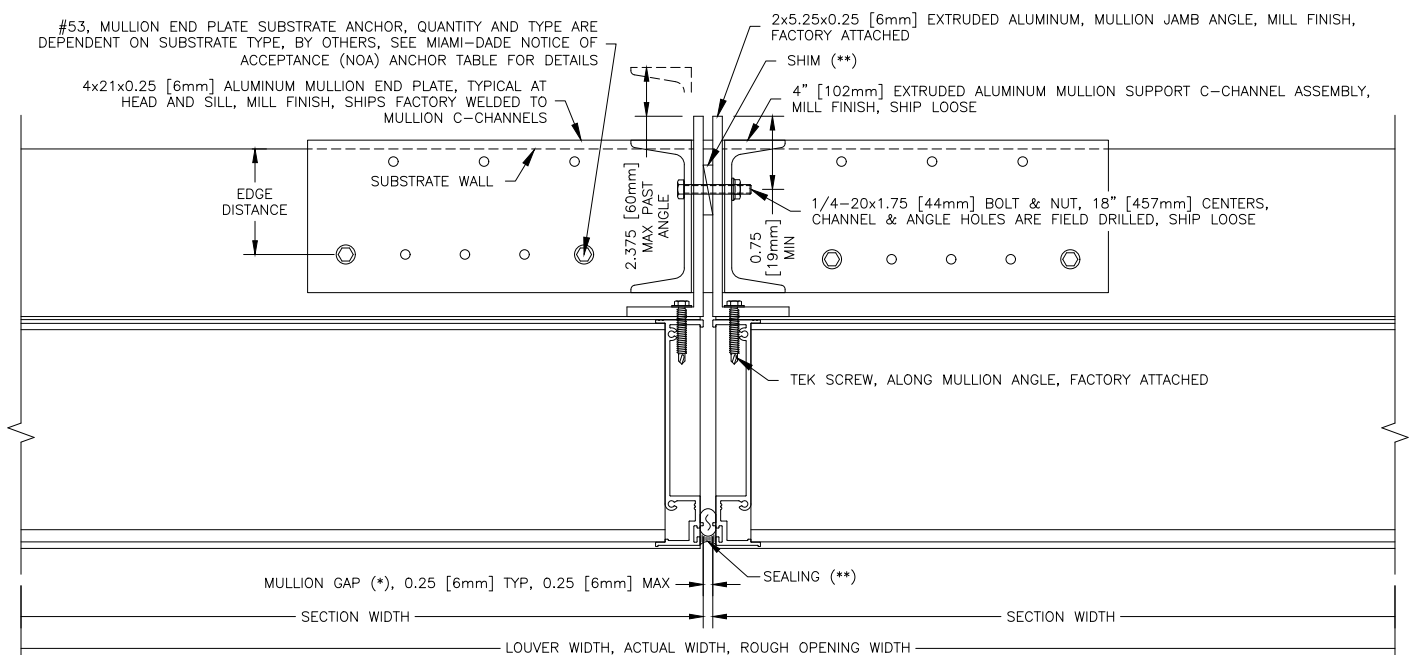
### A1 HEAD DETAIL, MULLION, CHANNEL FRAME

ROUGH OPENING HEIGHT  $\leq 96.5"$  [2451mm]



### B1 SILL DETAIL, MULLION, CHANNEL FRAME

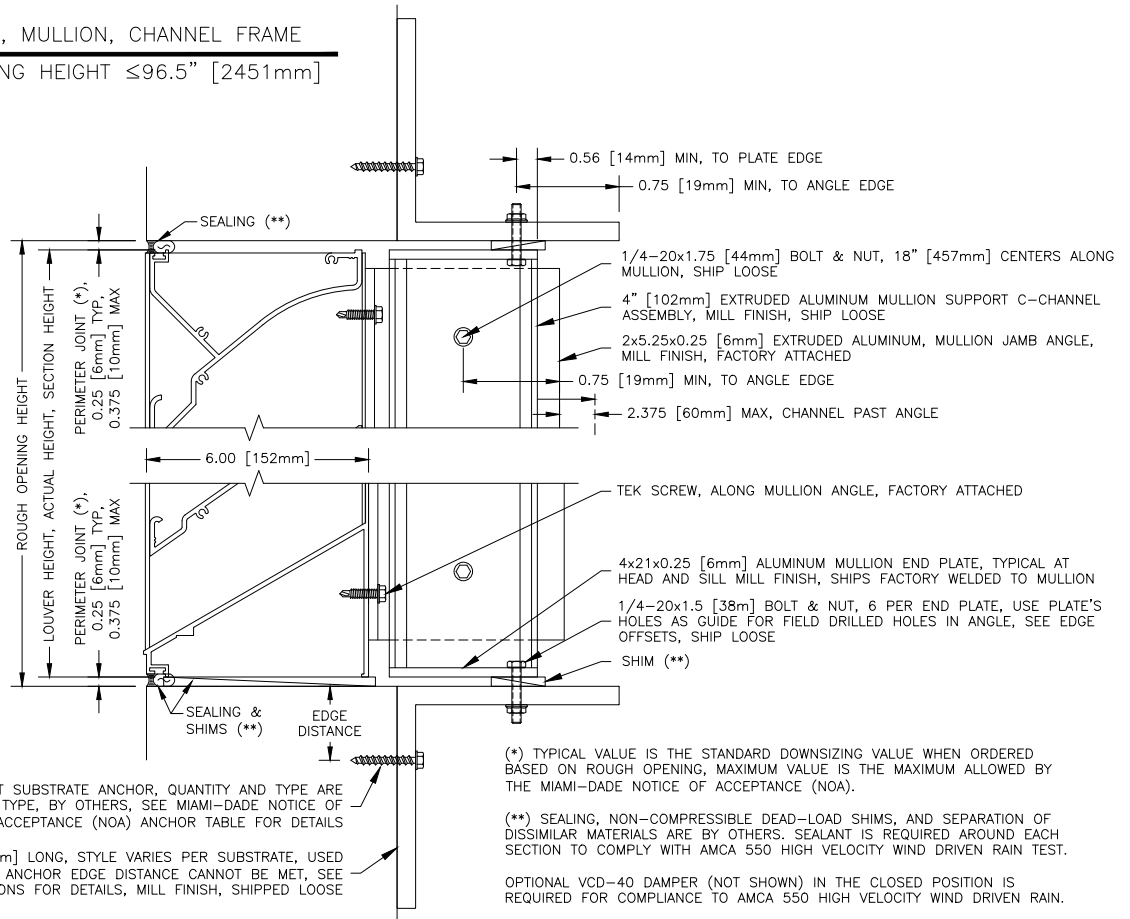
ROUGH OPENING HEIGHT  $\leq 96.5"$  [2451mm]



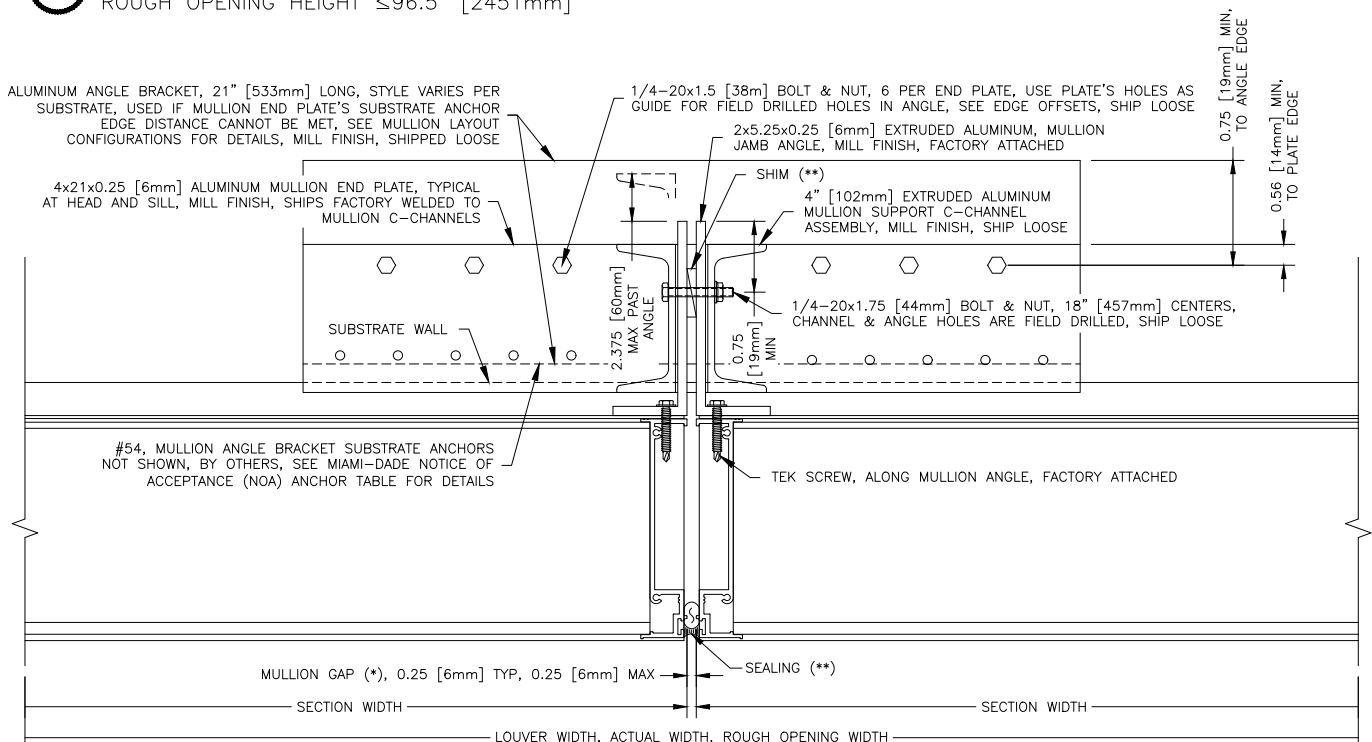
### E1 MULLION DETAIL, CHANNEL FRAME

ROUGH OPENING HEIGHT  $\leq 96.5"$  [2451mm]

**A2** HEAD DETAIL, MULLION, CHANNEL FRAME  
ROUGH OPENING HEIGHT  $\leq 96.5"$  [2451mm]



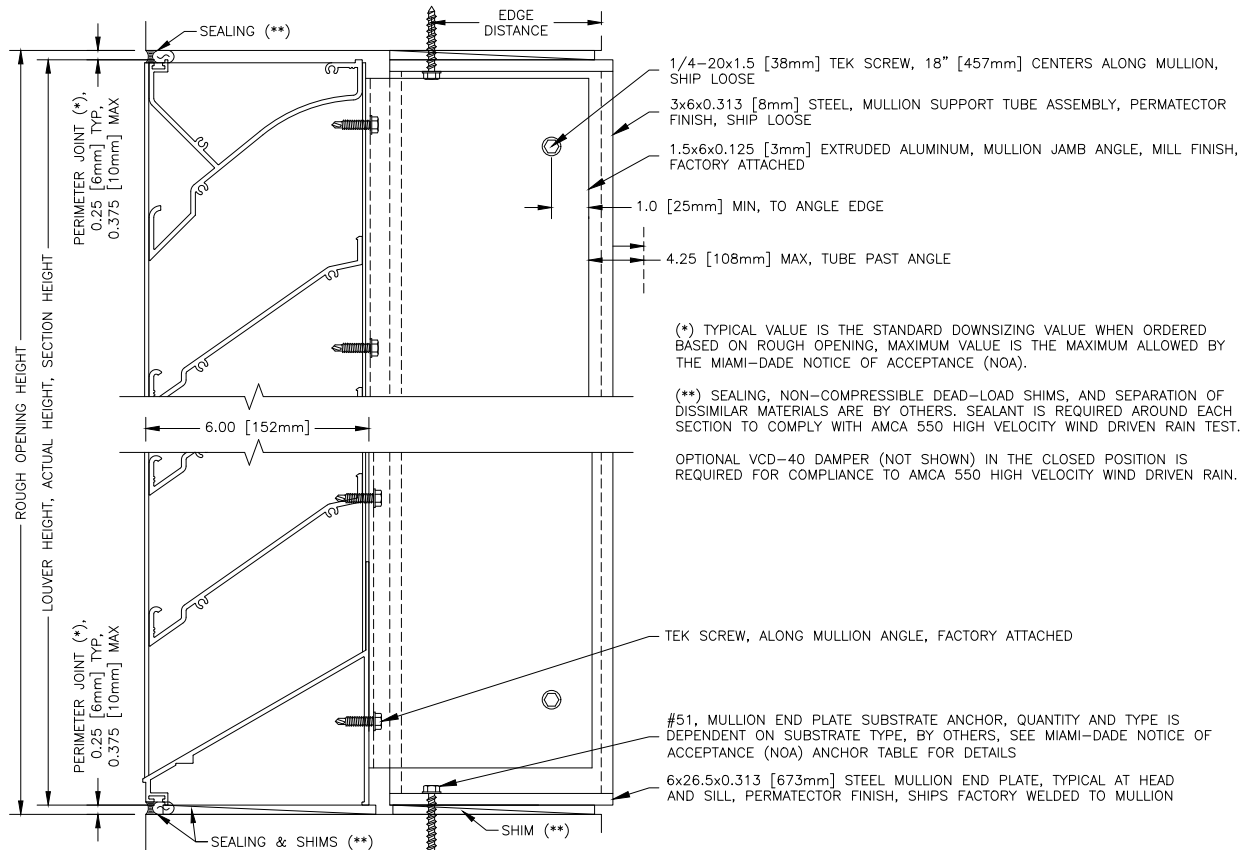
**B2** SILL DETAIL, MULLION, CHANNEL FRAME  
ROUGH OPENING HEIGHT  $\leq 96.5"$  [2451mm]



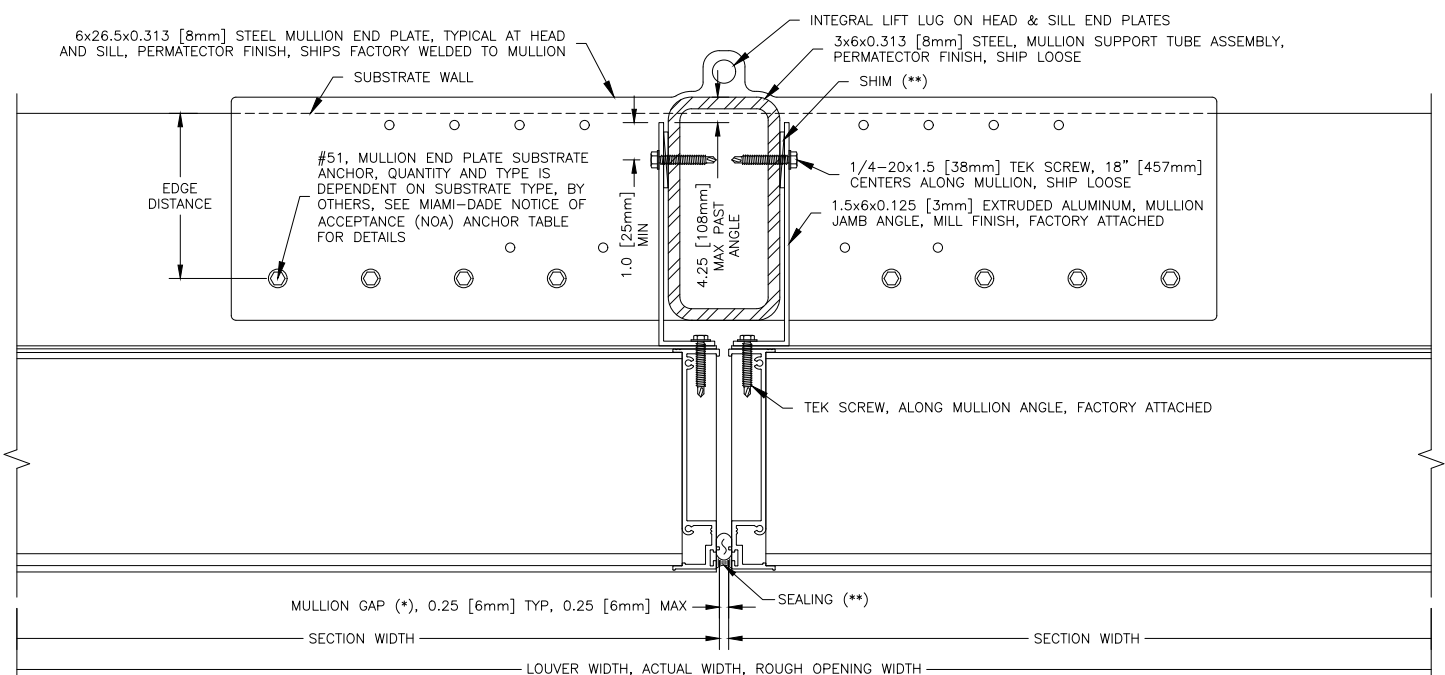
**E2** MULLION DETAIL, CHANNEL FRAME  
ROUGH OPENING HEIGHT  $\leq 96.5"$  [2451mm]

**A3** HEAD DETAIL, MULLION, CHANNEL FRAME

ROUGH OPENING HEIGHT &gt;96.5" [2451mm]

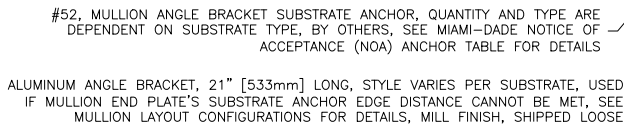
**B3** SILL DETAIL, MULLION, CHANNEL FRAME

ROUGH OPENING HEIGHT &gt;96.5" [2451mm]

**E3** MULLION DETAIL, CHANNEL FRAME

ROUGH OPENING HEIGHT &gt;96.5" [2451mm]

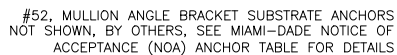
HEAD DETAIL, MULLION, CHANNEL FRAME  
ROUGH OPENING HEIGHT >96.5" [2451mm]



SILL DETAIL, MULLION, CHANNEL FRAME

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ROUGH OPENING HEIGHT >96.5" [2451mm]

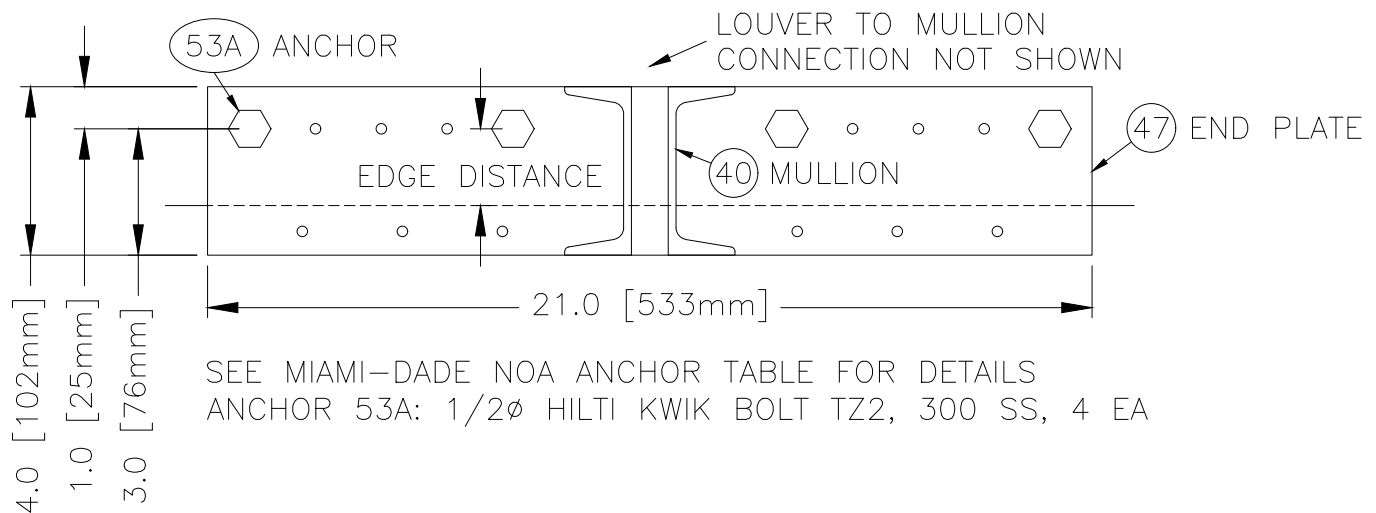


MULLION DETAIL, CHANNEL FRAME

MOUNTING: CHANNEL FRAME, AT MULLION END PLATE

ROUGH OPENING HEIGHT:  $\leq 96.5"$  [2451mm]

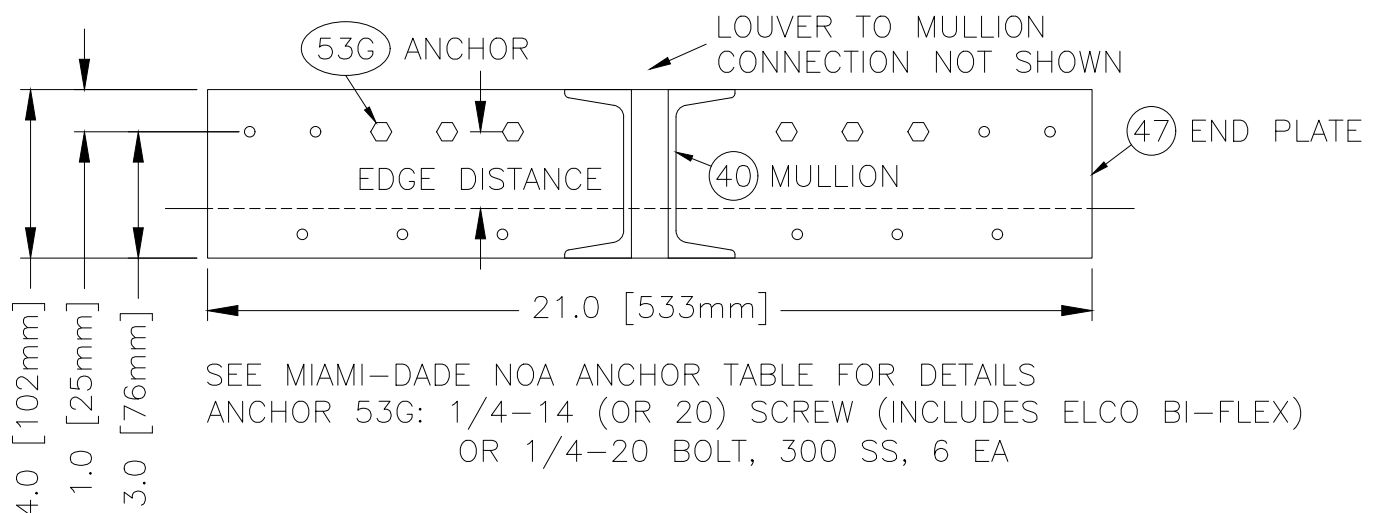
SUBSTRATE: CRACKED CONCRETE, MIN 5" [127mm] THICK



MOUNTING: CHANNEL FRAME, AT MULLION END PLATE

ROUGH OPENING HEIGHT:  $\leq 96.5"$  [2451mm]

SUBSTRATE: STEEL, MIN 0.125" [3.2mm] THICK



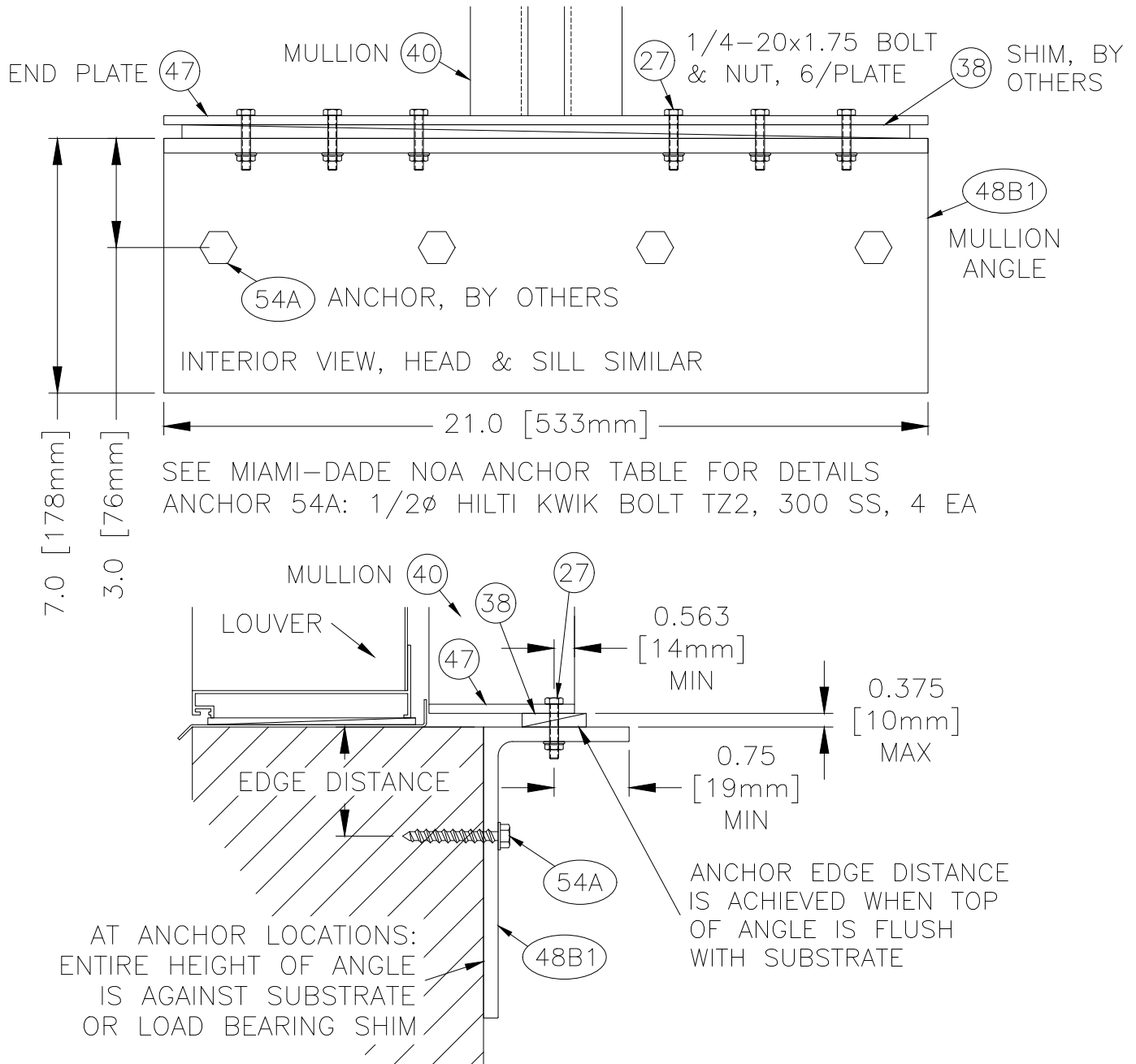
ALL ITEMS THIS PAGE: FACTORY PROVIDES PILOT OR FULL SIZE HOLES AT REQUIRED LOCATIONS PER SELECTED SUBSTRATE. NON-REQUIRED HOLES MAY STILL BE PRESENT IN MULLION END PLATE AND ANGLE. OTHER HOLES & PATTERNS CAN BE USED IF ANCHOR ON-CENTER & EDGE DISTANCE REQUIREMENTS ARE MET. ANCHOR PATTERNS SHALL BE MIRRORED WHEN POSSIBLE.



MOUNTING: CHANNEL FRAME, AT MULLION MOUNTING ANGLE

ROUGH OPENING HEIGHT:  $\leq 96.5"$  [2451mm]

SUBSTRATE: CRACKED CONCRETE, MIN 5" [127mm] THICK

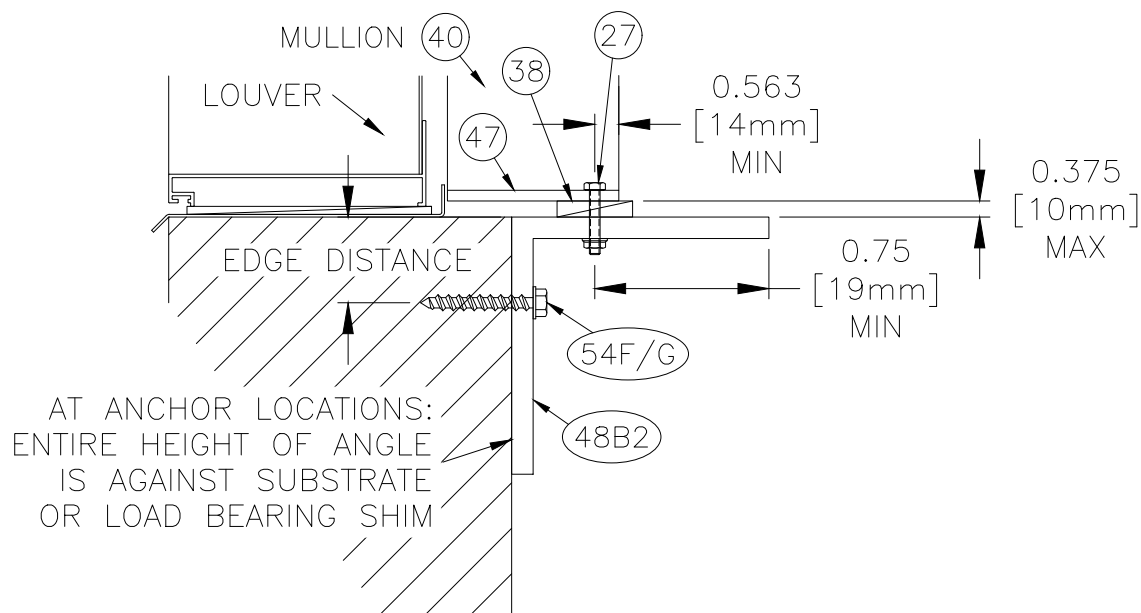
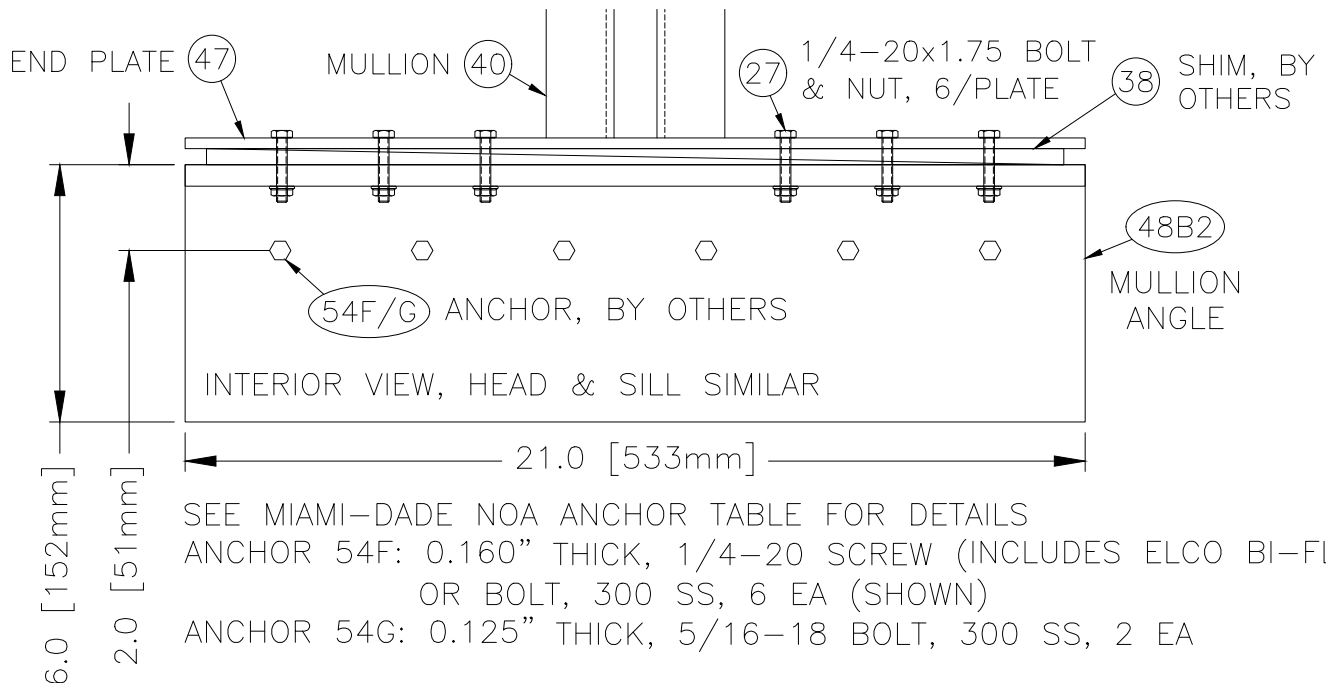


ALL ITEMS THIS PAGE: FACTORY PROVIDES PILOT OR FULL SIZE HOLES AT REQUIRED LOCATIONS PER SELECTED SUBSTRATE. NON-REQUIRED HOLES MAY STILL BE PRESENT IN MULLION END PLATE AND ANGLE. OTHER HOLES & PATTERNS CAN BE USED IF ANCHOR ON-CENTER & EDGE DISTANCE REQUIREMENTS ARE MET. ANCHOR PATTERNS SHALL BE MIRRORED WHEN POSSIBLE.

MOUNTING: CHANNEL FRAME, AT MULLION MOUNTING ANGLE

ROUGH OPENING HEIGHT:  $\leq 96.5"$  [2451mm]

SUBSTRATE: STEEL, MIN 0.125" [3.2mm] THICK

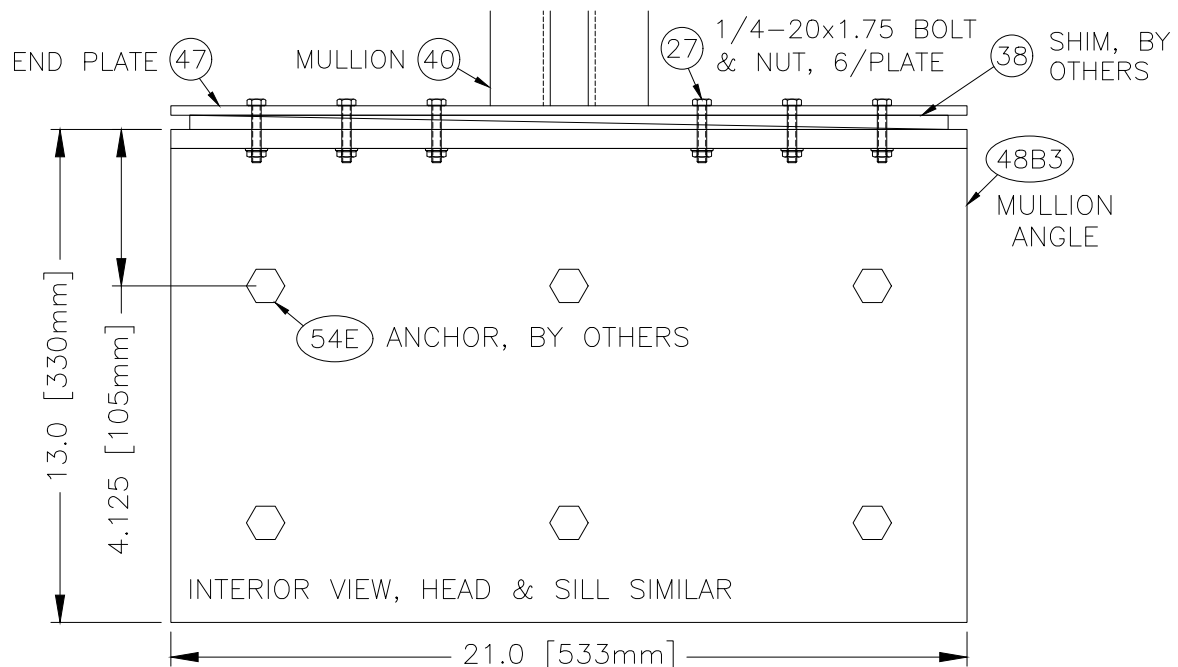


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MOUNTING: CHANNEL FRAME, AT MULLION MOUNTING ANGLE

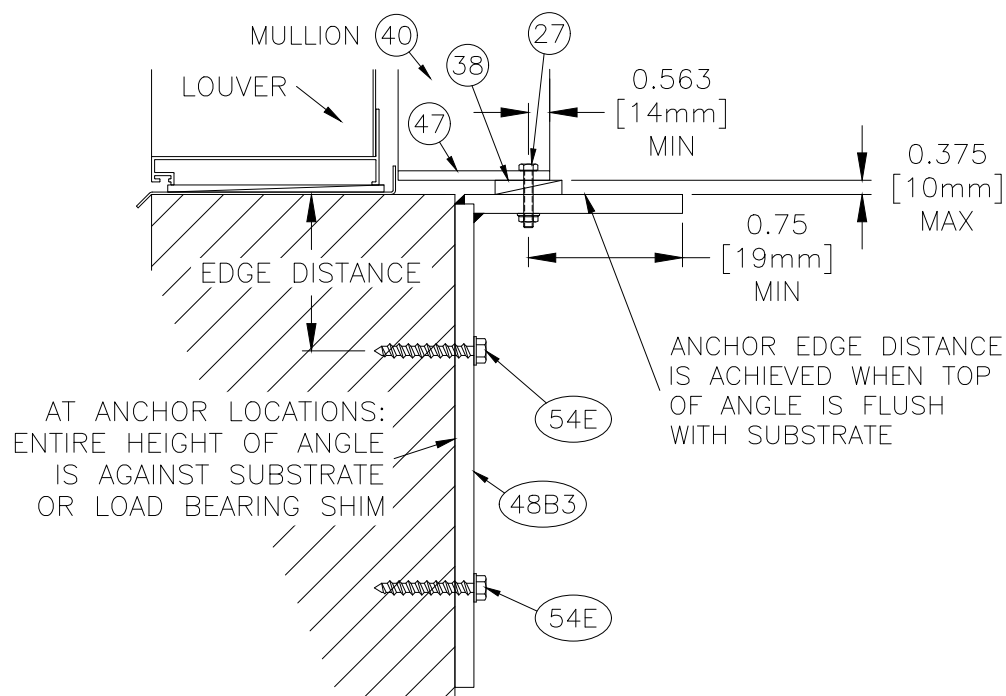
ROUGH OPENING HEIGHT:  $\leq 96.5"$  [2451mm]

SUBSTRATE: GROUT FILLED CMU, 8" [203mm] NOMINAL



SEE MIAMI-DADE NOA ANCHOR TABLE FOR DETAILS

ANCHOR 54E: W/ HILTI HY-100 EPOXY & 5/8 $\phi$  THREAD ROD, 300 SS, 6 EA

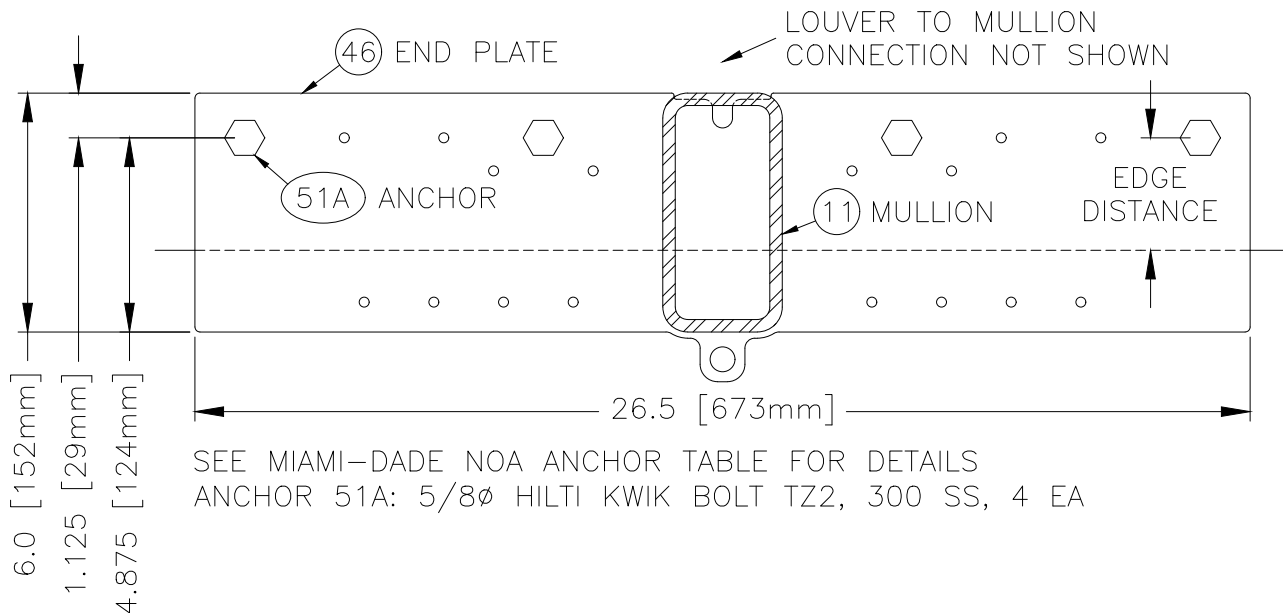


ALL ITEMS THIS PAGE: FACTORY PROVIDES PILOT OR FULL SIZE HOLES AT REQUIRED LOCATIONS PER SELECTED SUBSTRATE. NON-REQUIRED HOLES MAY STILL BE PRESENT IN MULLION END PLATE AND ANGLE. OTHER HOLES & PATTERNS CAN BE USED IF ANCHOR ON-CENTER & EDGE DISTANCE REQUIREMENTS ARE MET. ANCHOR PATTERNS SHALL BE MIRRORED WHEN POSSIBLE.

MOUNTING: CHANNEL FRAME, AT MULLION END PLATE

ROUGH OPENING HEIGHT: > 96.5" [2451mm]

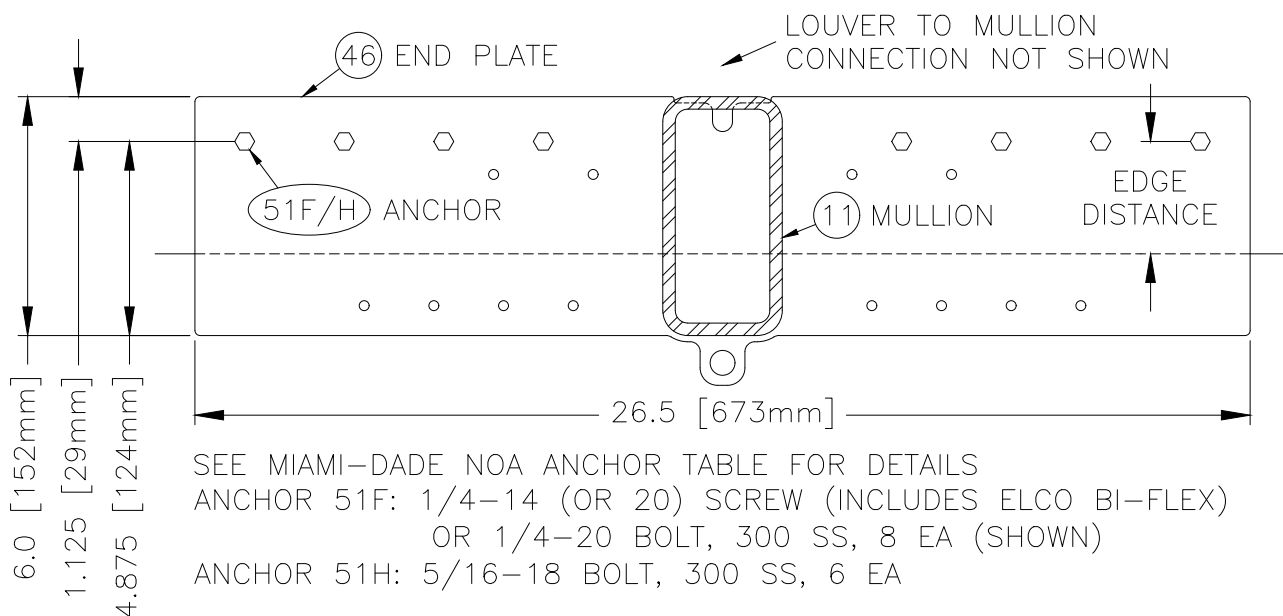
SUBSTRATE: CRACKED CONCRETE, MIN 6" [152mm] THICK



MOUNTING: CHANNEL FRAME, AT MULLION END PLATE

ROUGH OPENING HEIGHT: > 96.5" [2451mm]

SUBSTRATE: STEEL, MIN 0.125" [3.2mm] THICK

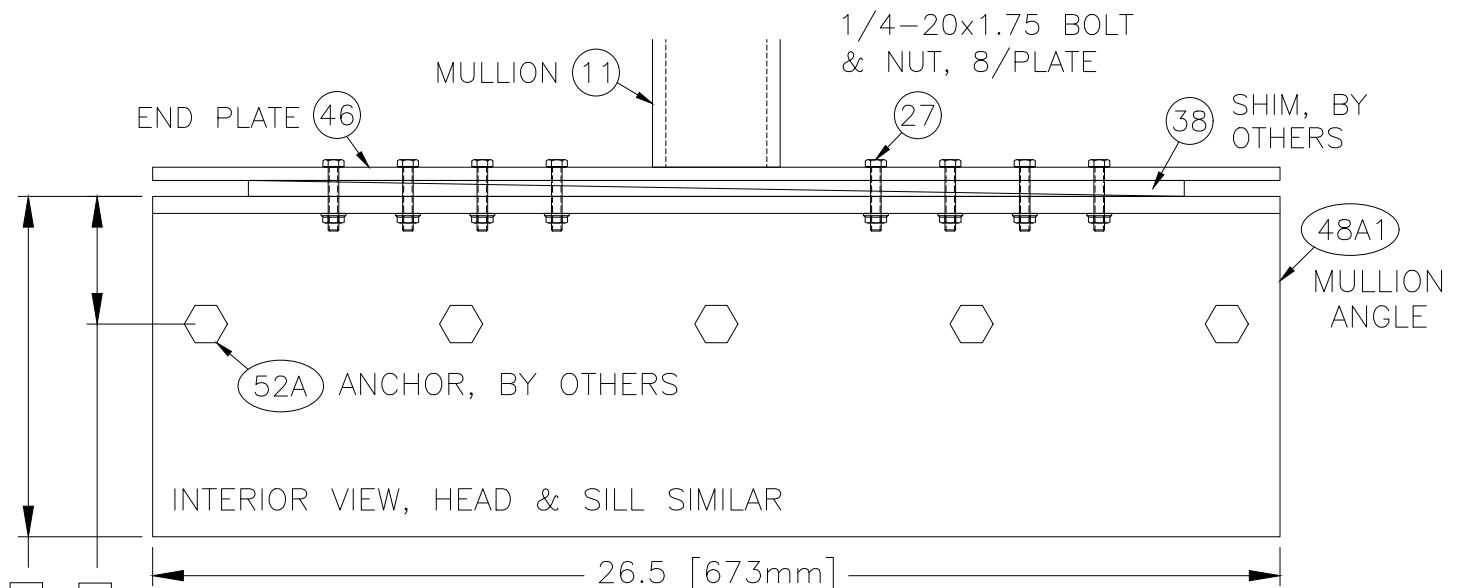


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MOUNTING: CHANNEL FRAME, AT MULLION MOUNTING ANGLE

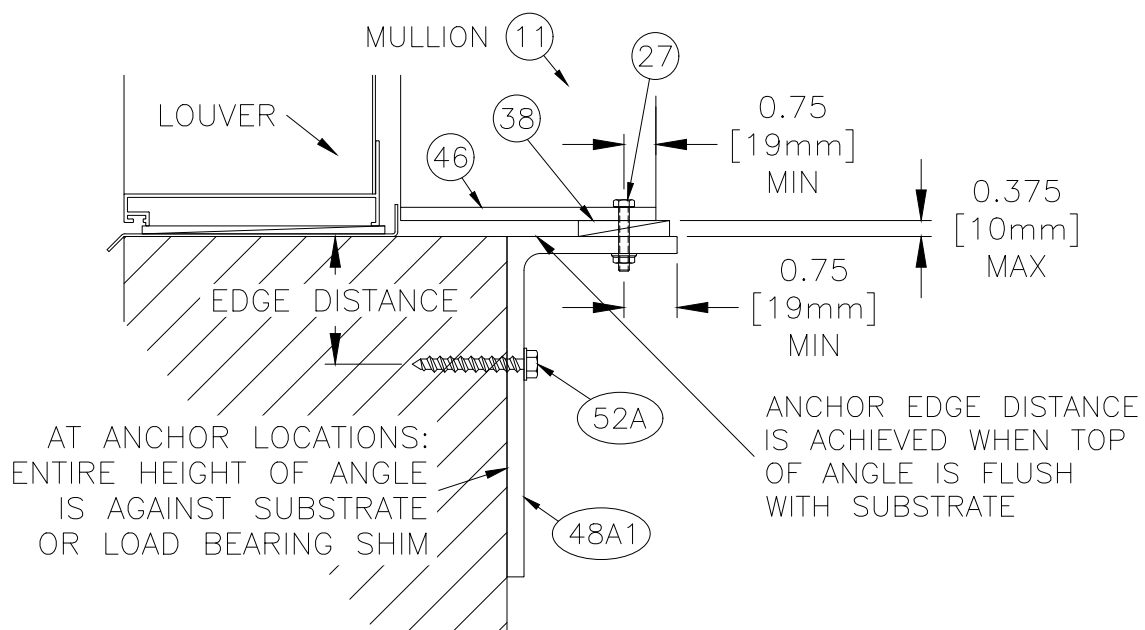
ROUGH OPENING HEIGHT: > 96.5" [2451mm]

SUBSTRATE: CRACKED CONCRETE, MIN 6" [152mm] THICK



SEE MIAMI-DADE NOA ANCHOR TABLE FOR DETAILS

ANCHOR 52A: 1/2" HILTI KWIK BOLT TZ2, 300 SS, 5 EA

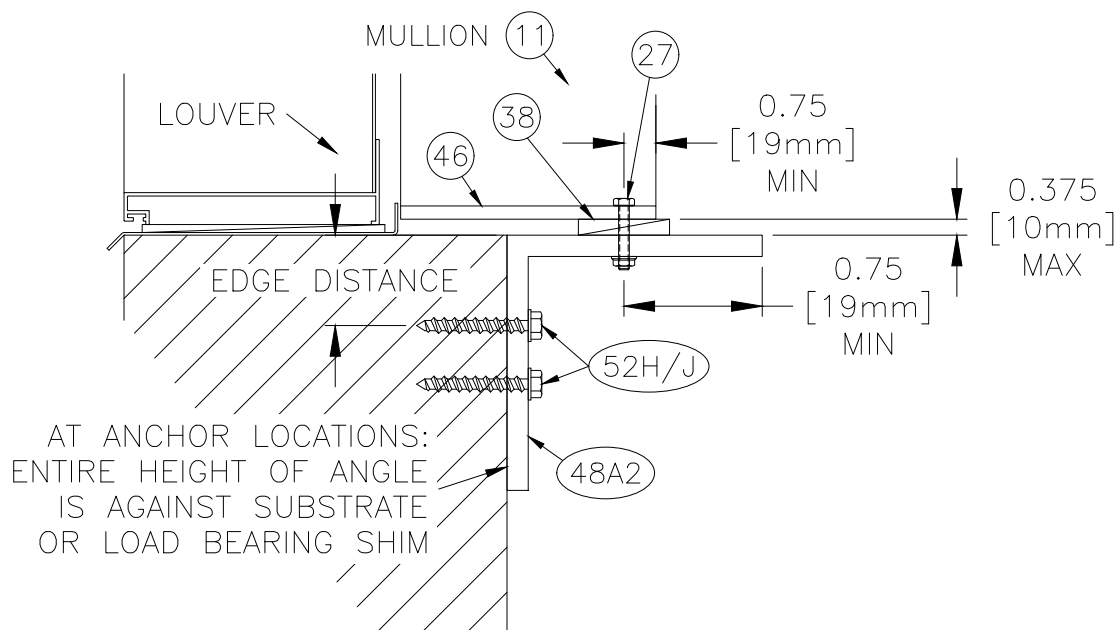
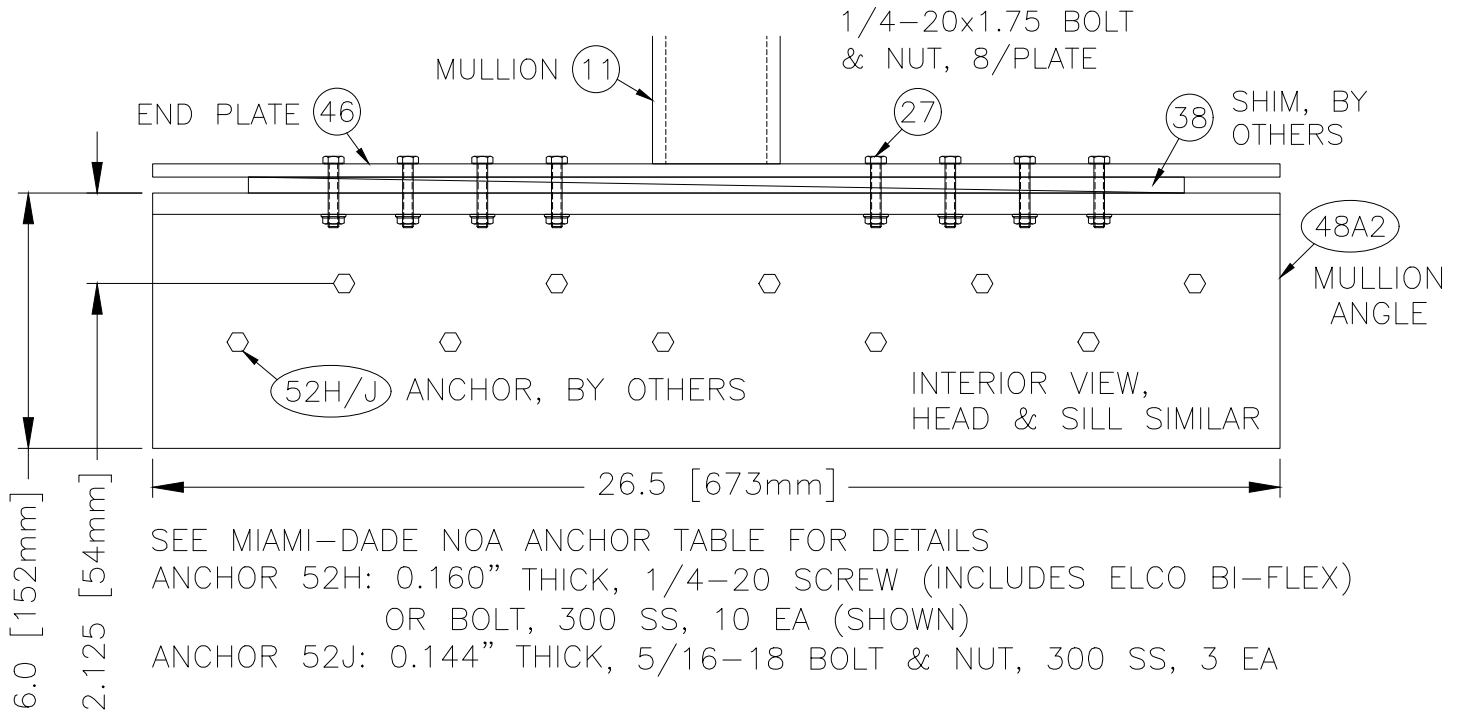


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MOUNTING: CHANNEL FRAME, AT MULLION MOUNTING ANGLE

ROUGH OPENING HEIGHT: > 96.5" [2451mm]

SUBSTRATE: STEEL, MIN 0.144" [3.7mm] THICK

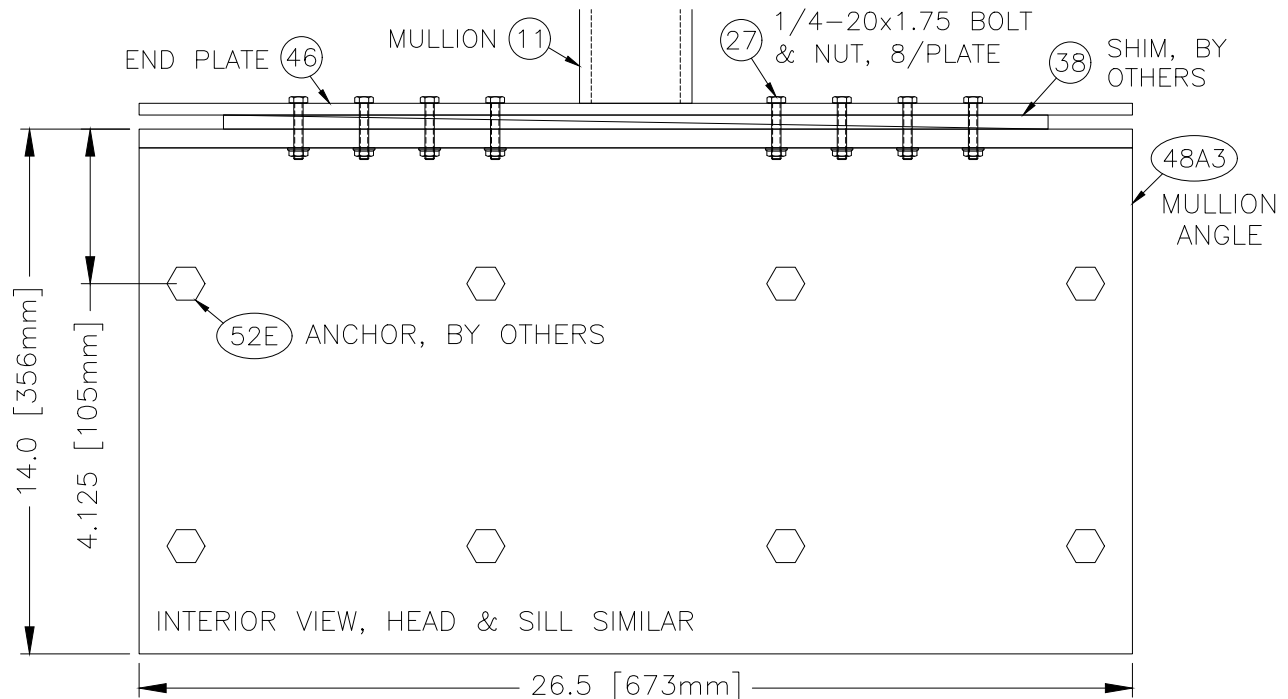


ALL ITEMS THIS PAGE: FACTORY PROVIDES PILOT OR FULL SIZE HOLES AT REQUIRED LOCATIONS PER SELECTED SUBSTRATE. NON-REQUIRED HOLES MAY STILL BE PRESENT IN MULLION END PLATE AND ANGLE. OTHER HOLES & PATTERNS CAN BE USED IF ANCHOR ON-CENTER & EDGE DISTANCE REQUIREMENTS ARE MET. ANCHOR PATTERNS SHALL BE MIRRORED WHEN POSSIBLE.

MOUNTING: CHANNEL FRAME, AT MULLION MOUNTING ANGLE

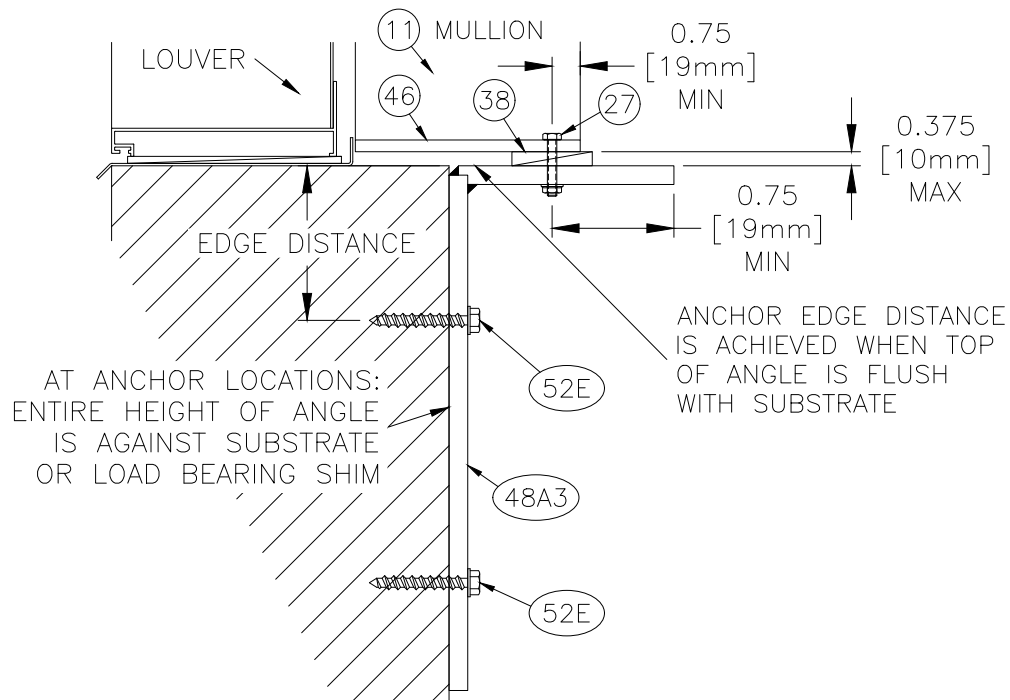
ROUGH OPENING HEIGHT: > 96.5" [2451mm]

SUBSTRATE: GROUT FILLED CMU, 8" [203mm] NOMINAL

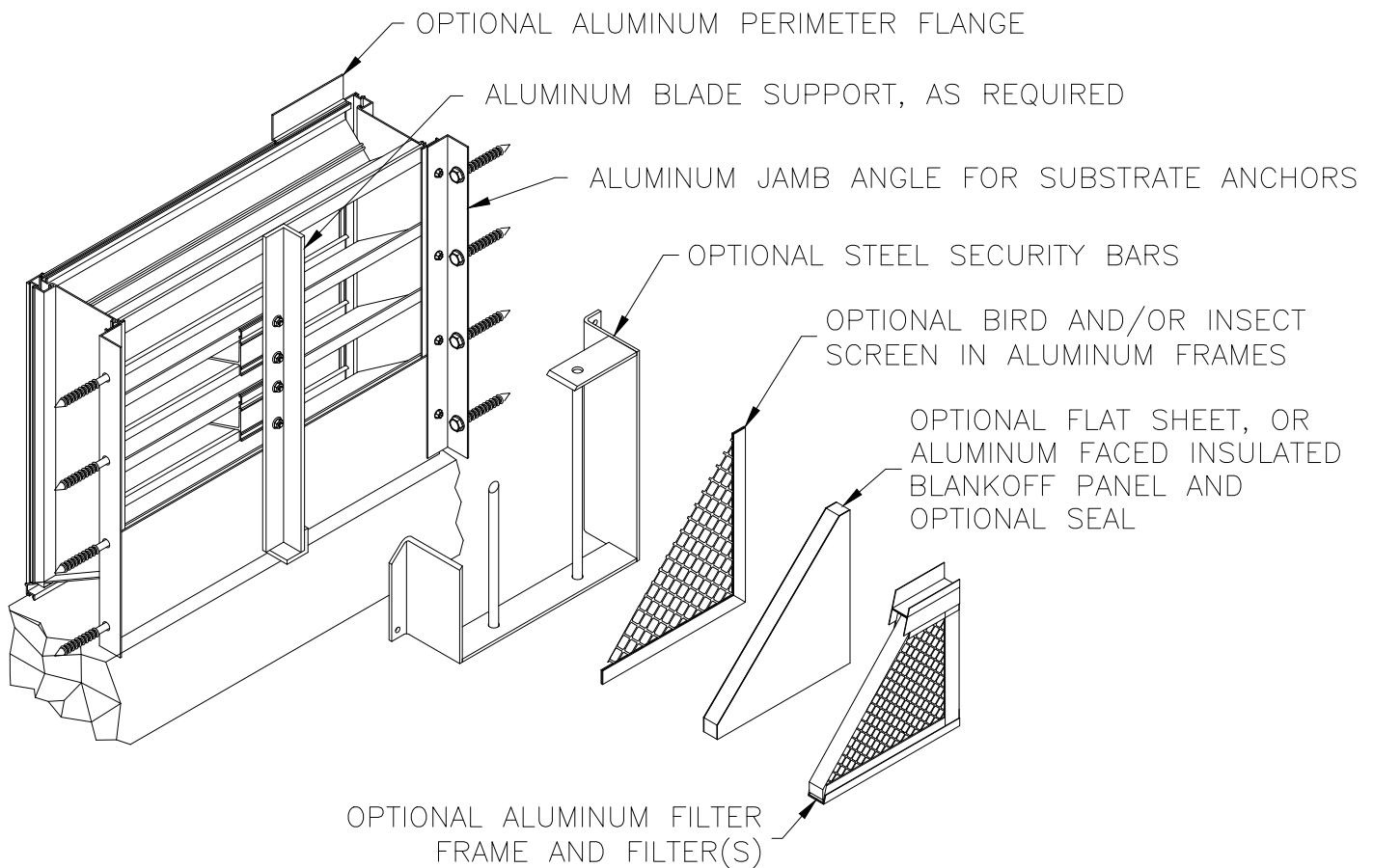


SEE MIAMI-DADE NOA ANCHOR TABLE FOR DETAILS

ANCHOR 52E: HILTI HY-100 EPOXY & 5/8 $\phi$  THREADED ROD, 300 SS, 8 EA



ALL ITEMS THIS PAGE: FACTORY PROVIDES PILOT OR FULL SIZE HOLES AT REQUIRED LOCATIONS PER SELECTED SUBSTRATE. NON-REQUIRED HOLES MAY STILL BE PRESENT IN MULLION END PLATE AND ANGLE. OTHER HOLES & PATTERNS CAN BE USED IF ANCHOR ON-CENTER & EDGE DISTANCE REQUIREMENTS ARE MET. ANCHOR PATTERNS SHALL BE MIRRORED WHEN POSSIBLE.



### **Structure Depth**

#### CMU/Concrete Substrate

- Min. structure depth 8.75 in.
- Max. structure depth infinite

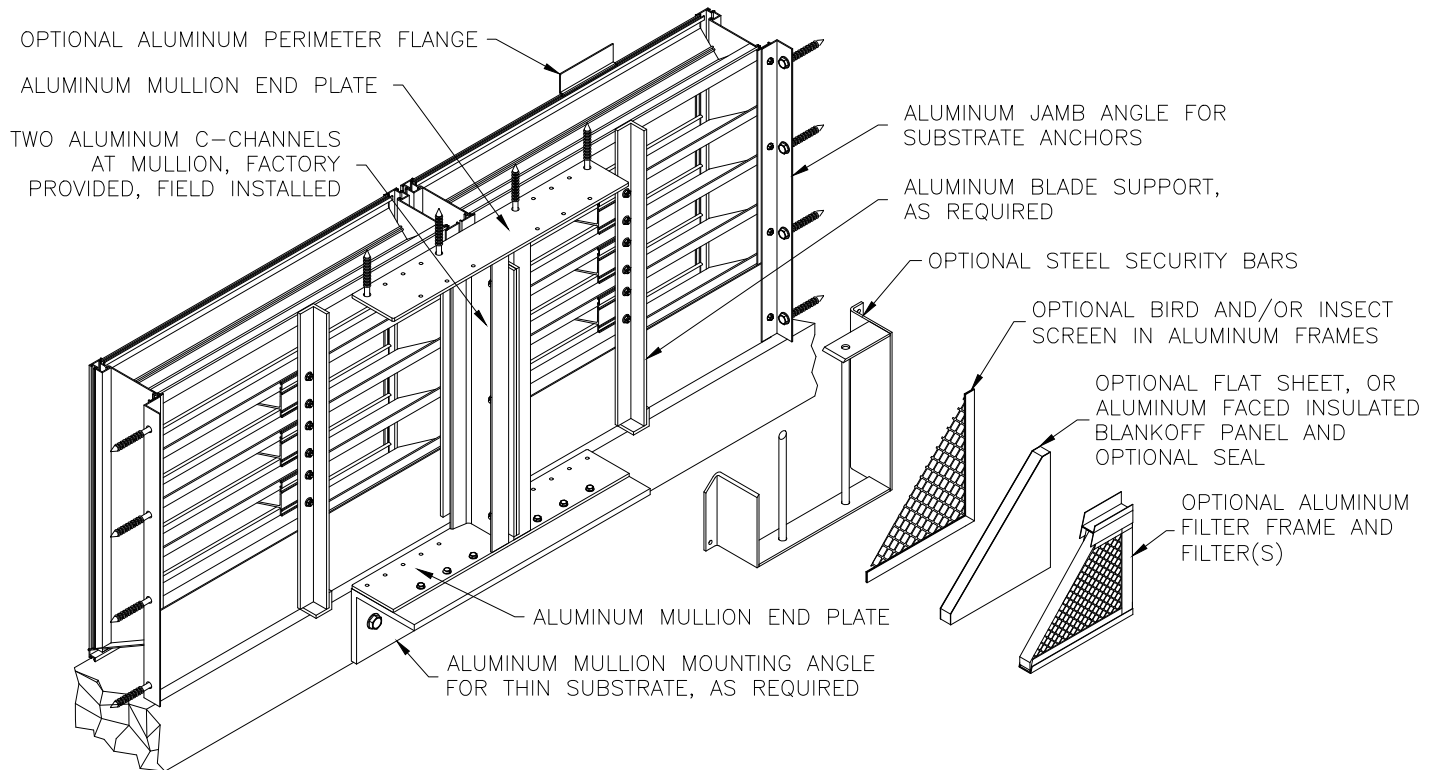
#### Steel Stud/Structural Steel Substrate

- Min. structure depth 7.5 in.
- Max. structure depth infinite



MULLION END PLATE MOUNT (SHOWN AT HEAD):

FOR SUBSTRATES WHERE MINIMUM FASTENER EDGE DISTANCE CAN BE ACHIEVED BY USE OF HOLES IN THE MULLION END CAP. SHOWN CONFIGURATION IS FOR ROUGH OPENING HEIGHTS  $\leq 96.5"$  [2451mm].



MULLION MOUNTING ANGLE (SHOWN AT SILL):

FOR SUBSTRATES WHERE MINIMUM FASTENER EDGE DISTANCE CANNOT BE ACHIEVED BY USE OF HOLES IN THE MULLION END CAP. SHOWN CONFIGURATION IS FOR ROUGH OPENING HEIGHTS  $\leq 96.5"$  [2451mm].

**Structure Depth**

CMU Substrate

- Min. structure depth 8.75 in.
- Max. structure depth infinite in.

Concrete Substrate

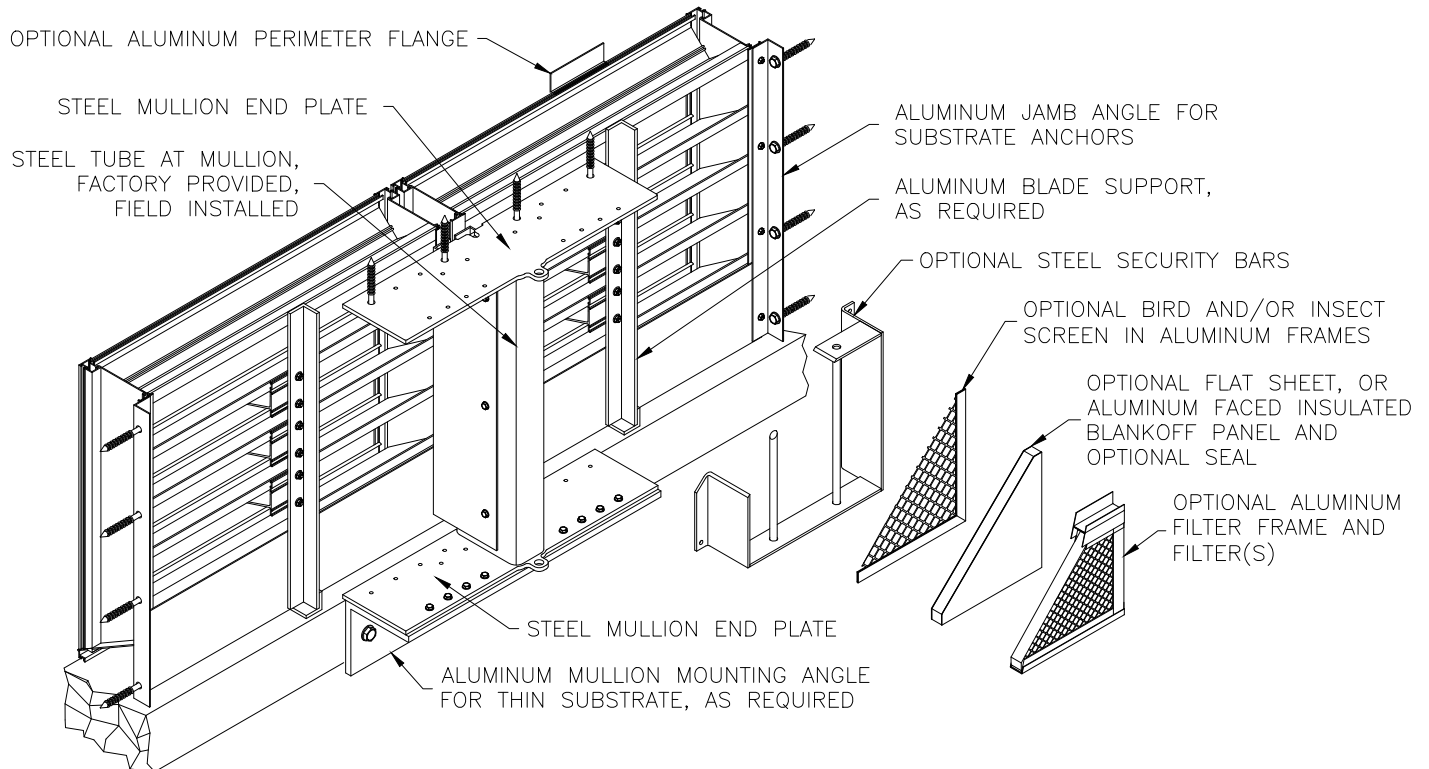
- Min. structure depth 8.25 in.
- Max. structure depth infinite

Steel Stud/Structural Steel Substrate

- Min. structure depth 7.5 in.
- Max. structure depth infinite

MULLION END PLATE MOUNT (SHOWN AT HEAD):

FOR SUBSTRATES WHERE MINIMUM FASTENER EDGE DISTANCE CAN BE ACHIEVED BY USE OF HOLES IN THE MULLION END CAP. SHOWN CONFIGURATION IS FOR ROUGH OPENING HEIGHTS > 96.5" [2451mm].



MULLION MOUNTING ANGLE (SHOWN AT SILL):

FOR SUBSTRATES WHERE MINIMUM FASTENER EDGE DISTANCE CANNOT BE ACHIEVED BY USE OF HOLES IN THE MULLION END CAP. SHOWN CONFIGURATION IS FOR ROUGH OPENING HEIGHTS > 96.5" [2451mm].

**Structure Depth**

CMU Substrate

- Min. structure depth 8.75 in.
- Max. structure depth 14.25 in.

Concrete Substrate

- Min. structure depth 8.25 in.
- Max. structure depth infinite

Steel Stud/Structural Steel Substrate

- Min. structure depth 7.5 in.
- Max. structure depth infinite

## MIAMI-DADE NOTICE OF ACCEPTANCE (NOA) ANCHOR TABLE (FIELD INSTALLED - BY OTHERS)

ITEM	CRACKED CONCRETE	GROUT FILLED CMU	STEEL	MIN VALUE	MIN THICKNESS	ANCHOR TYPE	ALL FASTENERS ARE STAINLESS STEEL				
ITEM 52: JAMB PERIMETER ANGLE ANCHOR, ALL HEIGHTS							DIAMETER	# REQ'D	CENTERS	MIN EMBED.	SUBSTRATE MIN EDGE (3)
52A	X			3 KSI	4" (1)	HILTI KWIK HUS EZ (KH-EZ), 300 SS	3/8"	VARIES	6" MIN/MAX	2.5" NOM.	1.5"
52E		X		1.5 KSI	3" (1)	DEWALT AGGRE-GATOR, 300 SS	1/4"	VARIES	3" MIN 6" MAX	2" NOM.	2"
52F			X	A36	1/8" (1)	BOLT OR SCREW, 300 SS, INCLUDES ELCO BI-FLEX	1/4-20	VARIES	6" MAX	1/8"	3/4"
52H			X	A36	1/8" (1)	BOLT, 300 SS	5/16-18	VARIES	6" MAX	1/8"	3/4"
ITEM 53: MULLION END PLATE ANCHOR, ROUGH OPENING HEIGHT > 96.5"							DIAMETER	# REQ'D	MIN CENTERS	MIN EMBED.	SUBSTRATE MIN EDGE (3)
53A	X			3 KSI	6" (1)	HILTI KWIK BOLT TZ2, 300 SS	5/8"	4/PLATE	7.5" & 9" MIN	3.25" NOM.	4"
53F			X	A36	1/8" (1)	BOLT OR SCREW, 300 SS, INCLUDES ELCO BI-FLEX	1/4-14 1/4-20	8/PLATE	1" MIN	1/8"	1/2"
53H			X	A36	1/8" (1)	BOLT, 300 SS	5/16-18	6/PLATE	1.5" MIN	1/8"	1/2"
ITEM 54: MULLION ANGLE MOUNT ANCHOR, ROUGH OPENING HEIGHT > 96.5"							DIAMETER	# REQ'D	MIN CENTERS	MIN EMBED.	SUBSTRATE MIN EDGE (3)
54A	X			3 KSI	6" (1)(2)	HILTI KWIK BOLT TZ2 (KB-TZ2), 300 SS	1/2"	5/ANGLE	6" MIN	3" NOM.	3" EDGE 1 4" EDGE 2
54E		X		2 KSI GROUT	8" NOM. (1)(2)	HILTI HIT-HY 100 EPOXY & THREADED ROD, 300 SS	5/8"	8/ANGLE	8" HOR. MIN 7" VER. MIN	5.625" ACT.	4.125"
54H			X	A36	3/16" (1)(2)	BOLT OR SCREW, 300 SS, INCLUDES ELCO BI-FLEX	1/4-20	10/ANGLE	1" MIN	3/16"	1/2"
54J			X	A36	0.144" (1)(2)	BOLT, 300 SS	5/16-18	3/ANGLE	1" MIN	0.144"	3/4"
ITEM 55: MULLION END PLATE ANCHOR, ROUGH OPENING HEIGHT <= 96.5"							DIAMETER	# REQ'D	MIN CENTERS	MIN EMBED.	SUBSTRATE MIN EDGE (3)
55A	X			3 KSI	5" (1)	HILTI KWIK BOLT TZ2, 300 SS	1/2"	4/PLATE	6.25" & 6.5" MIN	3" NOM.	2.5" EDGE 1 3.25" EDGE 2
55G			X	A36	1/8" (1)	BOLT OR SCREW, 300 SS, INCLUDES ELCO BI-FLEX	1/4-14 1/4-20	6/PLATE	1" MIN	1/8"	1/2"
ITEM 56: MULLION ANGLE MOUNT ANCHOR, ROUGH OPENING HEIGHT <= 96.5"							DIAMETER	# REQ'D	MIN CENTERS	MIN EMBED.	SUBSTRATE MIN EDGE (3)
56A	X			3 KSI	5" (1)(2)	HILTI KWIK BOLT TZ2, 300 SS	1/2"	4/ANG.	6" MIN	2.5" NOM.	3" EDGE 1 4" EDGE 2
56E		X		2 KSI GROUT	8" NOM. (1)(2)	HILTI HIT-HY 100 EPOXY & THREADED ROD, 300 SS	5/8"	6/ANG.	8" HOR. MIN 6.25" VER. MIN	5.625" ACT.	4.125"
56F			X	A36	0.160" (1)(2)	BOLT OR SCREW, 300 SS, INCLUDES ELCO BI-FLEX	1/4-20	6/ANG.	1" MIN	0.160"	1/2"
56G			X	A36	1/8" (1)(2)	BOLT, 300 SS	5/16-18	6/ANG.	1" MIN	1/8"	3/4"

NOTES: (1) IN DIRECTION OF ANCHOR PENETRATION. (2) SUBSTRATE THICKNESS IS ONE PORTION OF OVERALL WALL DEPTH.  
(3) EDGE 1 IS CLOSEST TO ANCHOR, AND EDGE 2 IS OPPOSITE EDGE 1. IF EDGE # NOT SPECIFIED, THEN MIN VALUE IS SAME TO BOTH EDGES.

## Our Commitment

*As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.*

Product warranties can be found online at [Greenheck.com](http://Greenheck.com), either on the specific product page or in the literature section of the website at [Greenheck.com/Resources/Library/Literature](http://Greenheck.com/Resources/Library/Literature).

