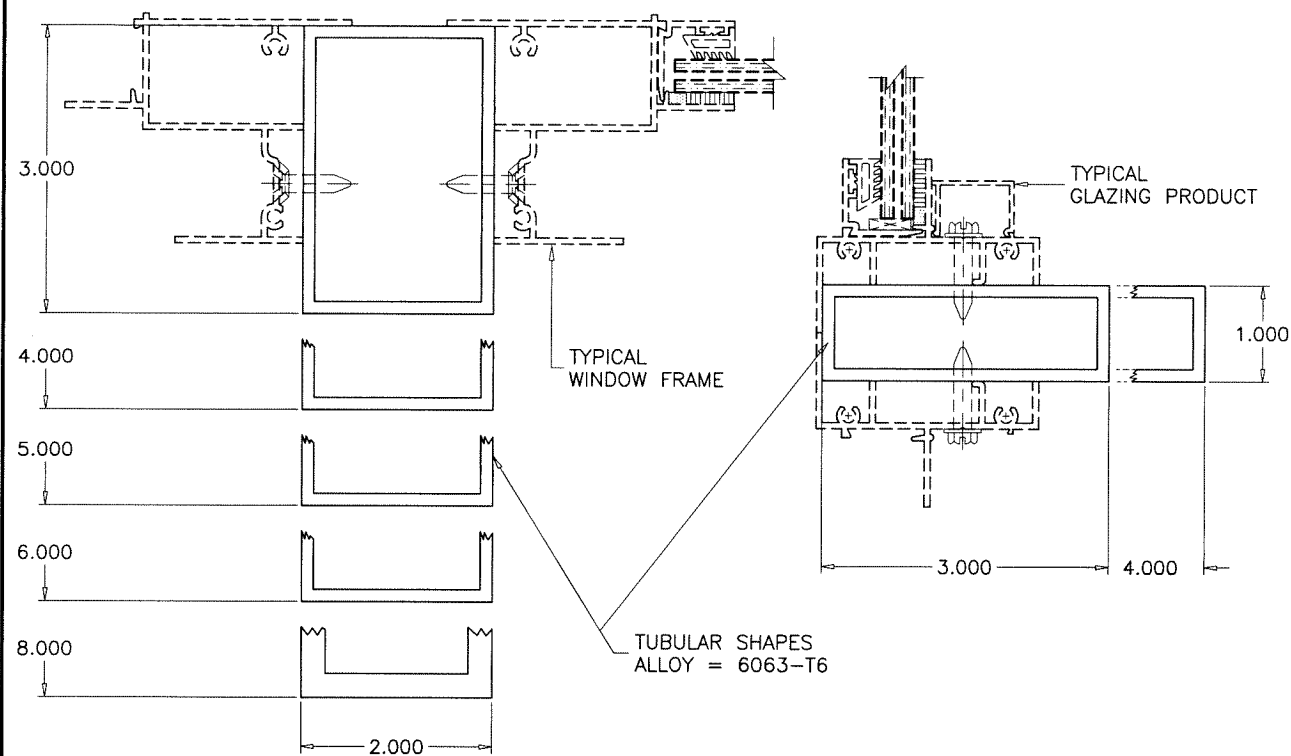
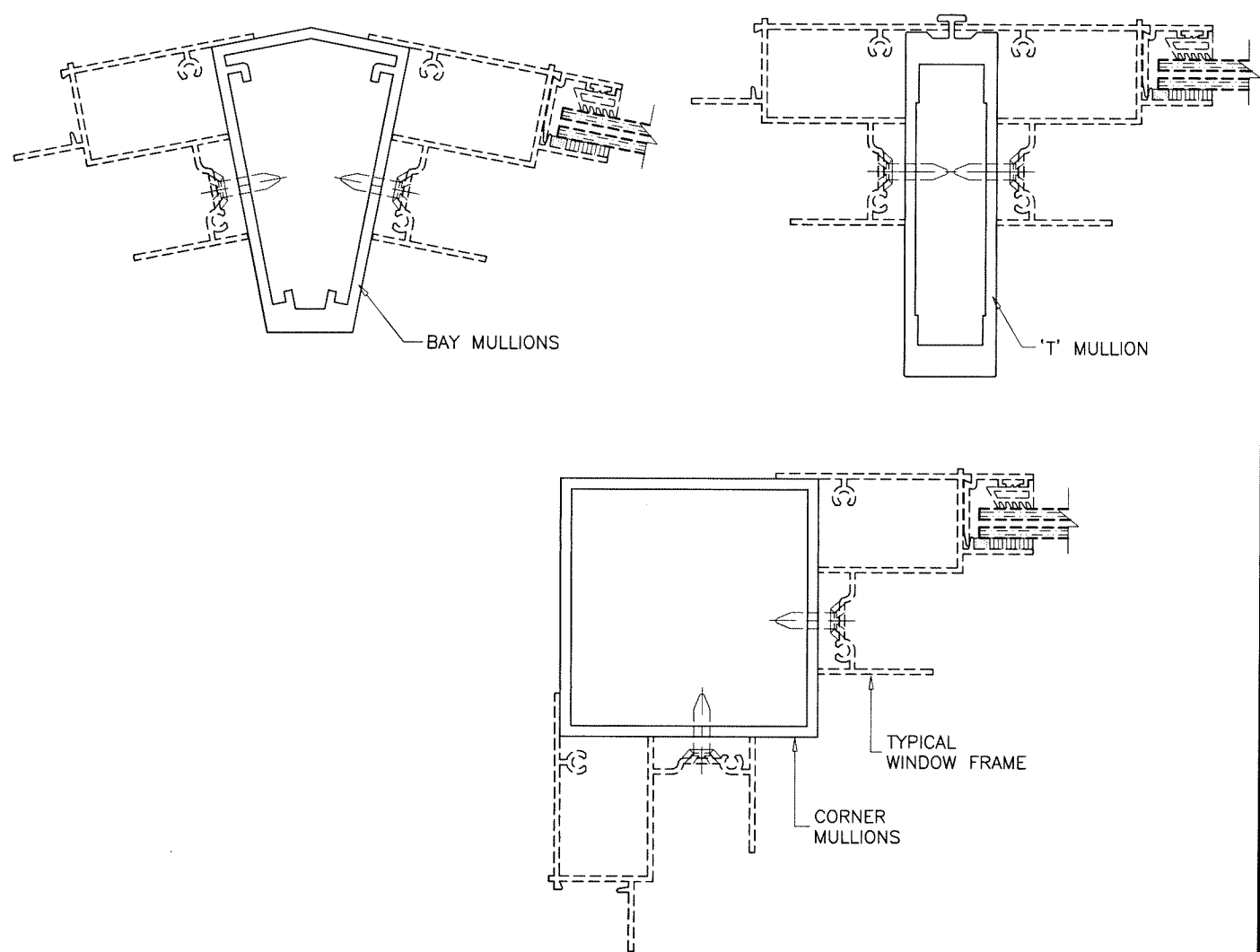




MULLIONS CONTAINING TYPICAL GLAZING PRODUCTS

SEE WINDOW OR DOOR APPROVAL FOR FASTENERS SIZES AND SPACING



ALUMINUM TUBE MULLIONS USING MULLION PROPERTIES ONLY

NOTES:

THIS PRODUCT HAS BEEN DESIGNED AND TESTED TO COMPLY WITH THE REQUIREMENTS OF THE 2023 (8TH EDITION) FLORIDA BUILDING CODE INCLUDING HIGH VELOCITY HURRICANE ZONE (HVHZ).

ALL GLAZING PRODUCTS USED WITH THESE MULLIONS MUST MEET THE APPLICABLE BUILDING CODE REQUIREMENTS I.E: WIND LOAD, WATER INFILTRATION, FORCED ENTRY RESISTANCE, SAFEGUARDS ETC.

1BY OR 2BY WOOD BUCKS & BUCK FASTENERS BY OTHERS, MUST BE DESIGNED AND INSTALLED ADEQUATELY TO TRANSFER APPLIED PRODUCT LOADS TO THE BUILDING STRUCTURE.

ANCHORS SHALL BE CORROSION RESISTANT, SPACED AS SHOWN ON DETAILS AND INSTALLED PER MANUF'S INSTRUCTIONS. SPECIFIED EMBEDMENT TO BASE MATERIAL SHALL BE BEYOND WALL DRESSING OR STUCCO.

A LOAD DURATION INCREASE IS USED IN DESIGN OF ANCHORS INTO WOOD ONLY.

ALL SHIMS TO BE HIGH IMPACT, NON-METALLIC AND NON-COMPRESSIBLE.

MATERIALS INCLUDING BUT NOT LIMITED TO STEEL/METAL SCREWS, THAT COME INTO CONTACT WITH OTHER DISSIMILAR MATERIALS SHALL MEET THE REQUIREMENTS OF THE 2023 FLORIDA BLDG. CODE & ADOPTED STANDARDS.

THIS PRODUCT APPROVAL IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SITE SPECIFIC PROJECT, I.E. LIFE SAFETY OF THIS PRODUCT, ADEQUACY OF STRUCTURE RECEIVING THIS PRODUCT AND SEALING AROUND OPENING FOR WATER INFILTRATION RESISTANCE ETC. CONDITIONS NOT SHOWN IN THIS DRAWING ARE TO BE ANALYZED SEPARATELY, AND TO BE REVIEWED BY BUILDING OFFICIAL.

DESIGN LOADS SHOWN ARE BASED ON 'ALLOWABLE STRESS DESIGN (ASD)'.

MANUFACTURER'S LABEL SHALL BE LOCATED ON A READILY VISIBLE LOCATION IN ACCORDANCE WITH SECTION 1709.9.3 OF FLORIDA BUILDING CODE. LABELING TO COMPLY WITH SECTION 1709.9.2.

INSTRUCTIONS:

USE CHARTS AS FOLLOWS.

- STEP 1** DETERMINE DESIGN LOAD REQUIRED PER ASCE 7 FOR PARTICULAR OPENING.
- STEP 2** USE F.B.C. APPROVED GLAZING PRODUCTS MEETING ABOVE LOAD REQUIREMENTS.
- STEP 3** USE CONNECTION TO MULLION AS PER PRODUCT APPROVAL.
- STEP 4** USING CHARTS ON SHEETS 4 & 5 SELECT MULLION SIZE WITH DESIGN RATING MORE THAN DESIGN LOAD SPECIFIED IN STEP 1 ABOVE.
- STEP 5** USING ANCHOR TYPES ON SHEETS 7 THRU 13 AND ANCHOR CHARTS ON SHEET 6, SELECT ANCHOR TYPE WITH DESIGN RATING MORE THAN THE DESIGN LOADS SPECIFIED IN STEP 1 ABOVE.

MULLION SYSTEM IS RATED FOR LARGE & SMALL MISSILE IMPACT. AND CAN BE USED WITH ALL F.B.C. APPROVED IMPACT AND NON-IMPACT RESISTANT PRODUCTS.

Sealed: 6/29/2026

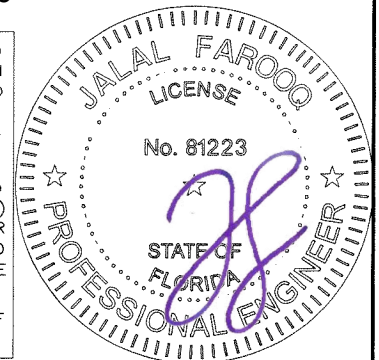
FL #39086

A- CONTRACTOR TO BE RESPONSIBLE FOR THE SELECTION, PURCHASE AND INSTALLATION OF THIS PRODUCT BASED ON THIS PRODUCT EVALUATION PROVIDED HE/SHE DOES NOT DEVIATE FROM THE CONDITIONS DETAILED ON THIS DOCUMENT.

B- THIS PRODUCT EVALUATION DOCUMENT WILL BE CONSIDERED INVALID IF ALTERED BY ANY MEANS.

C- SITE SPECIFIC PROJECTS SHALL BE PREPARED BY A FLORIDA REGISTERED ENGINEER OR ARCHITECT WHICH WILL BECOME THE ENGINEER OF RECORD (E.O.R.) FOR THE PROJECT AND WHO WILL BE RESPONSIBLE FOR THE PROPER USE OF THE P.E.D. ENGINEER OF RECORD, ACTING AS A DELEGATED ENGINEER TO THE P.E.D. ENGINEER SHALL SUBMIT TO THIS LATTER THE SITE SPECIFIC DRAWINGS FOR REVIEW.

D- THIS P.E.D. SHALL BEAR THE DATE AND ORIGINAL SEAL AND SIGNATURE OF THE PROFESSIONAL ENGINEER OF RECORD THAT PREPARED IT.



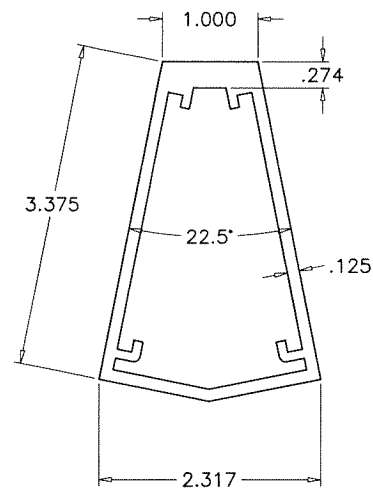
AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173
TEL. (305) 262-6978 FAX. (305) 262-6978
MULLION\21-45F-ESW

ALUMINUM TUBE MULLIONS
E.S. WINDOWS, LLC
3550 N.W. 49 STREET
MIAMI, FL. 33142
TEL. (305) 638-5151 FAX. (305) 638-5158

no.	date	by	description
A	07.07.23		UPDATED TO 2023 FBC
B	03.21.25		CUSTOM MULLION ADDED
C	06.27.25		MULL TO MULL DETAIL REV.
D	06.10.26		2X8 MULL ADDED

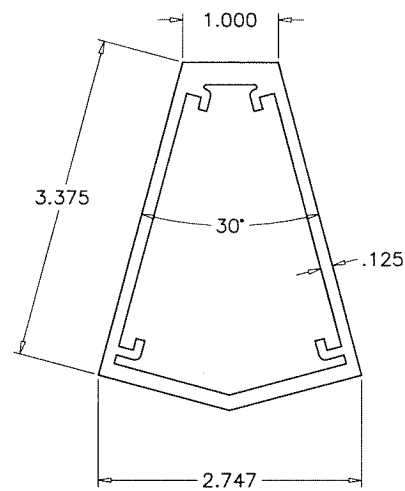
date: 05-21-21
scale: 1/2" = 1"
dr. by: TARIQ
chk. by:

drawing no.
21-45F
sheet 1 of 13



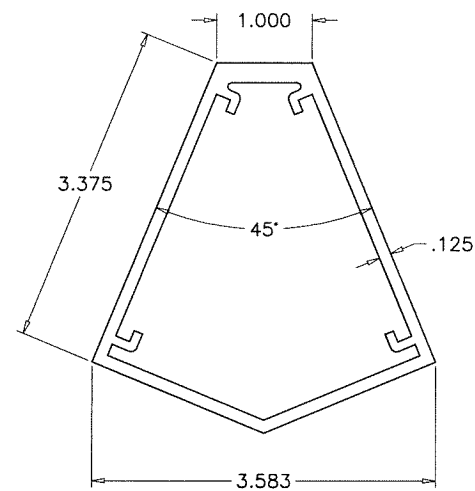
$I_x = 2.2762 \text{ IN}^4$
 $S_x = 1.2717 \text{ IN}^3$

22-1/2° BAY MULLION
 6063-T6



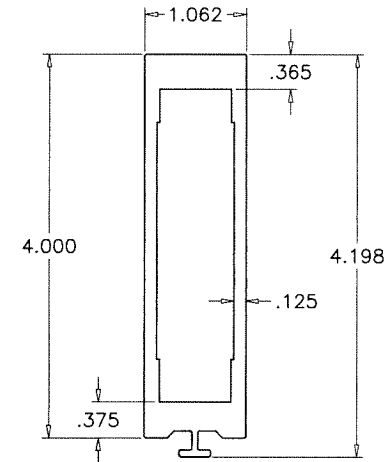
$I_x = 2.5623 \text{ IN}^4$
 $S_x = 1.3526 \text{ IN}^3$

30° BAY MULLION
 6063-T6



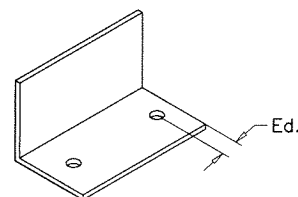
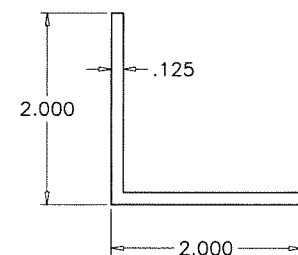
$I_x = 2.680 \text{ IN}^4$
 $S_x = 1.3827 \text{ IN}^3$

45° BAY MULLION
 6063-T6

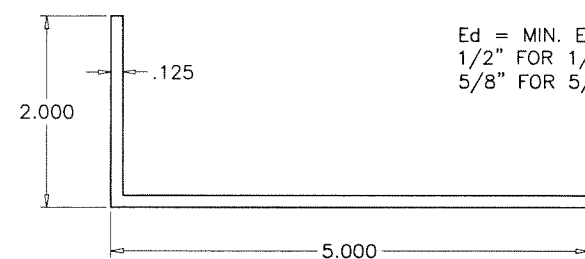


$I_x = 3.439 \text{ IN}^4$
 $S_x = 1.5754 \text{ IN}^3$

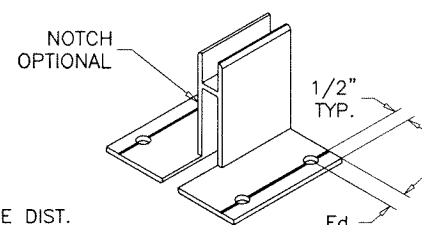
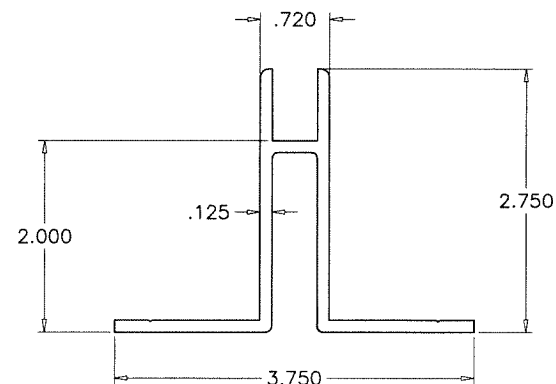
'T' MULLION
 6063-T6



Ed = MIN. EDGE DIST.
 1/2" FOR 1/4" DIA. ANCHORS
 5/8" FOR 5/16" DIA. ANCHORS

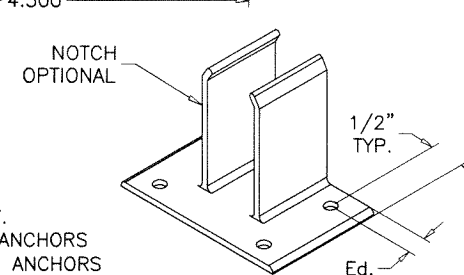
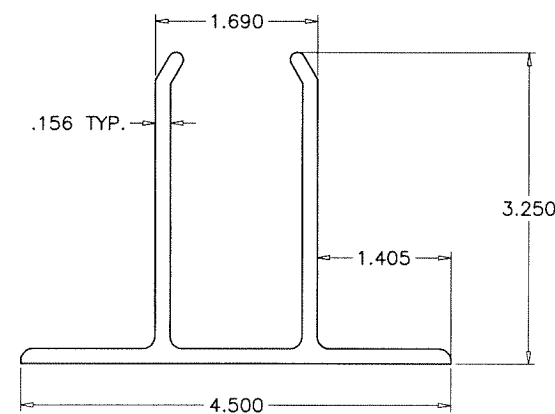


ANGLE CLIP
 6063-T5



Ed = MIN. EDGE DIST.
 1/2" FOR 1/4" DIA. ANCHORS
 5/8" FOR 5/16" DIA. ANCHORS

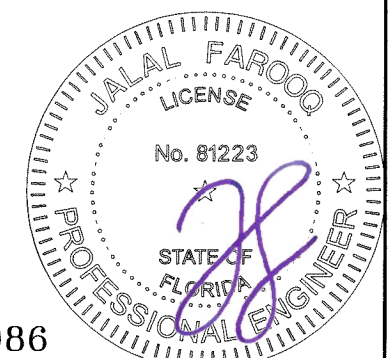
MULLION CLIP
 6063-T6



Ed = MIN. EDGE DIST.
 1/2" FOR 1/4" DIA. ANCHORS
 5/8" FOR 5/16" DIA. ANCHORS

MULLION CLIP
 6063-T6

Sealed: 6/29/2026



FL #39086

af c
AL-FAROOQ CORPORATION
 ENGINEERS & PRODUCT DEVELOPMENT
 9360 SUNSET DRIVE, SUITE 220
 MIAMI, FLORIDA 33173 (C.A.N. 3538)
 TEL. (305) 264-8100 FAX. (305) 262-6978
 MULLION\21-45F-ESW

ALUMINUM TUBE MULLIONS

E.S. WINDOWS, LLC
 3550 N.W. 49 STREET
 MIAMI, FL. 33142
 TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:
 no. date by description

date: 05-21-21
 scale: 1/2" = 1"
 dr. by: TARIQ
 chk. by:

drawing no.
21-45F
 sheet 3 of 13

DESIGN LOAD CAPACITY - PSF (TUBE MULLIONS)								
WINDOW DIMS. WIDTH (W) MULL SPAN		1 X 3 STD.	1 X 4 STD.	1 X 3 CUSTOM	1 X 4 CUSTOM	2 X 5 STD.	2 X 6 STD.	2 X 6 HEAVY
		3-1/4 CUSTOM		2 X 3 STD.	2 X 4 STD.			
		1 X 3-1/4 CUSTOM		3 X 3 STD.	4 X 4 STD.			
19-1/8"	38-3/8"	150.0	150.0	150.0	150.0	150.0	150.0	150.0
26-1/2"		150.0	150.0	150.0	150.0	150.0	150.0	150.0
30"		150.0	150.0	150.0	150.0	150.0	150.0	150.0
37"		150.0	150.0	150.0	150.0	150.0	150.0	150.0
42"		150.0	150.0	150.0	150.0	150.0	150.0	150.0
48"		140.6	150.0	150.0	150.0	150.0	150.0	150.0
54"		124.9	150.0	150.0	150.0	150.0	150.0	150.0
60"		112.5	150.0	150.0	150.0	150.0	150.0	150.0
66"		102.2	150.0	150.0	150.0	150.0	150.0	150.0
72"		93.7	149.3	142.0	150.0	150.0	150.0	150.0
19-1/8"	50-5/8"	150.0	150.0	150.0	150.0	150.0	150.0	150.0
26-1/2"		143.9	150.0	150.0	150.0	150.0	150.0	150.0
30"		127.1	150.0	150.0	150.0	150.0	150.0	150.0
37"		103.0	150.0	150.0	150.0	150.0	150.0	150.0
42"		90.8	144.4	137.1	150.0	150.0	150.0	150.0
48"		79.4	126.4	119.9	150.0	150.0	150.0	150.0
54"		70.6	112.3	106.6	150.0	150.0	150.0	150.0
60"		63.5	101.1	95.9	144.4	150.0	150.0	150.0
66"		57.8	91.9	87.2	131.3	150.0	150.0	150.0
72"		53.0	84.2	80.0	120.4	150.0	150.0	150.0
96"	54"	-	-	-	-	100.0	100.0	100.0
19-1/8"	58"	150.0	150.0	150.0	150.0	150.0	150.0	150.0
26-1/2"		108.6	150.0	150.0	150.0	150.0	150.0	150.0
30"		95.9	150.0	144.6	150.0	150.0	150.0	150.0
37"		77.8	123.6	117.2	150.0	150.0	150.0	150.0
42"		68.5	108.9	103.3	150.0	150.0	150.0	150.0
48"		60.0	95.3	90.4	135.9	150.0	150.0	150.0
54"		53.3	84.7	80.3	120.8	150.0	150.0	150.0
60"		48.0	76.2	72.3	108.7	150.0	150.0	150.0
66"		43.6	69.3	65.7	98.9	150.0	150.0	150.0
72"		40.0	63.5	60.2	90.6	137.8	150.0	150.0
19-1/8"	63"	123.3	150.0	150.0	150.0	150.0	150.0	150.0
26-1/2"		89.0	145.3	137.3	150.0	150.0	150.0	150.0
30"		78.6	128.4	121.3	150.0	150.0	150.0	150.0
37"		63.7	104.1	98.3	148.3	150.0	150.0	150.0
42"		56.1	91.7	86.6	130.7	150.0	150.0	150.0
48"		49.1	80.2	75.8	114.3	150.0	150.0	150.0
54"		43.7	71.3	67.4	101.6	150.0	150.0	150.0
60"		39.3	64.2	60.6	91.5	139.7	150.0	150.0
66"		35.7	58.4	55.1	83.1	127.0	150.0	150.0
72"		32.7	53.5	50.5	76.2	116.4	150.0	150.0

NOTE:
MULLIONS RATED IN THESE CHARTS MAY BE ORIENTED VERTICALLY OR HORIZONTALLY.
(INTERPOLATION BETWEEN WIDTHS ALLOWED)

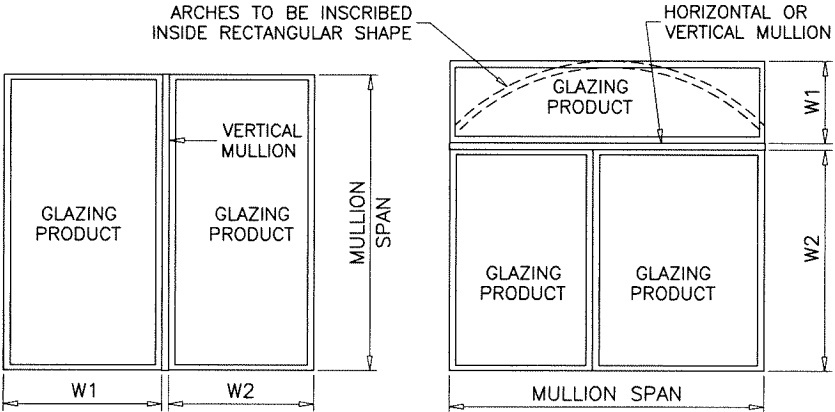
ANCHORS TYPE 'D' AND 'E' APPLICABLE TO 4", 5" AND 6" TUBE MULLIONS.
ANCHORS TYPE 'A', 'B', 'C', 'F' AND 'G' APPLICABLE TO ALL TUBE MULLIONS.

SEE SHEET 6.1 FOR 8" TUBE MULLION ANCHORS.

DESIGN LOAD CAPACITY - PSF (TUBE MULLIONS)								
WINDOW DIMS. WIDTH (W) MULL SPAN		1 X 3 STD.	1 X 4 STD.	1 X 3 CUSTOM	1 X 4 CUSTOM	2 X 5 STD.	2 X 6 STD.	2 X 6 HEAVY
		3-1/4 CUSTOM		2 X 3 STD.	2 X 4 STD.			
		1 X 3-1/4 CUSTOM		3 X 3 STD.	4 X 4 STD.			
19-1/8"	74-1/4"	75.3	143.0	116.2	150.0	150.0	150.0	150.0
26-1/2"		54.3	103.2	83.9	146.6	150.0	150.0	150.0
30"		48.0	91.1	74.1	129.5	150.0	150.0	150.0
37"		38.9	73.9	60.1	105.0	150.0	150.0	150.0
42"		34.3	65.1	52.9	92.5	142.5	150.0	150.0
48"		30.0	57.0	46.3	81.0	124.7	150.0	150.0
54"		26.7	50.6	41.2	72.0	110.8	146.2	150.0
60"		24.0	45.6	37.0	64.8	99.7	131.6	150.0
66"		21.8	41.4	33.7	58.9	90.7	119.6	150.0
72"		20.0	38.0	30.9	54.0	83.1	109.7	150.0
19-1/8"	84"	52.0	110.4	80.3	150.0	150.0	150.0	150.0
26-1/2"		37.5	79.7	57.9	113.0	150.0	150.0	150.0
30"		33.2	70.4	51.2	99.8	150.0	150.0	150.0
37"		26.9	57.1	41.5	81.0	125.6	150.0	150.0
42"		23.7	50.3	36.5	71.3	110.6	145.9	150.0
48"		20.7	44.0	32.0	62.4	96.8	127.6	150.0
54"		-	39.1	28.4	55.5	86.0	113.5	150.0
60"		-	35.2	25.6	49.9	77.4	102.1	150.0
66"		-	32.0	23.3	45.4	70.4	92.8	150.0
72"		-	29.3	21.3	41.6	64.5	85.1	150.0
19-1/8"	96"	34.8	74.7	53.8	109.1	150.0	150.0	150.0
26-1/2"		25.1	53.9	38.8	78.7	133.2	150.0	150.0
30"		22.2	47.6	34.3	69.6	117.7	150.0	150.0
37"		-	38.6	27.8	56.4	95.4	125.8	150.0
42"		-	34.0	24.5	49.7	84.1	110.8	150.0
48"		-	29.8	21.4	43.5	73.5	97.0	150.0
54"		-	26.5	-	38.6	65.4	86.2	150.0
60"		-	23.8	-	34.8	58.8	77.6	142.0
66"		-	21.6	-	31.6	53.5	70.5	129.0
72"		-	-	-	29.0	49.0	64.6	118.3
19-1/8"	108"	-	52.5	37.8	76.6	134.0	150.0	150.0
26-1/2"		-	37.9	27.3	55.3	96.7	137.7	150.0
30"		-	33.4	24.1	48.9	85.5	121.7	150.0
37"		-	27.1	-	39.6	69.3	98.7	150.0
42"		-	23.9	-	34.9	61.0	86.9	150.0
48"		-	20.9	-	30.5	53.4	76.0	139.1
54"		-	-	-	27.1	47.5	67.6	123.7
60"		-	-	-	24.4	42.7	60.8	111.3
66"		-	-	-	22.2	38.8	55.3	101.2
72"		-	-	-	20.4	35.6	50.7	92.7

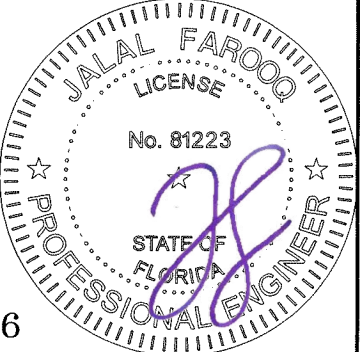
ALL LOADS ARE EXT.(+)/INT.(-).

DESIGN LOAD CAPACITY - PSF (TUBE MULLIONS)								
WINDOW DIMS. WIDTH (W) MULL SPAN		1 X 3 STD.	1 X 4 STD.	1 X 3 CUSTOM	1 X 4 CUSTOM	2 X 5 STD.	2 X 6 STD.	2 X 6 HEAVY
		3-1/4 CUSTOM		2 X 3 STD.	2 X 4 STD.			
		1 X 3-1/4 CUSTOM		3 X 3 STD.	4 X 4 STD.			
19-1/8"	120"	-	38.2	27.5	55.9	97.7	150.0	150.0
26-1/2"		-	27.6	-	40.3	70.5	110.8	150.0
30"		-	24.4	-	35.6	62.3	97.9	150.0
37"		-	-	-	28.9	50.5	79.3	145.1
42"		-	-	-	25.4	44.5	69.9	127.8
48"		-	-	-	22.3	38.9	61.2	111.9
54"		-	-	-	-	34.6	54.4	99.4
60"		-	-	-	-	31.1	48.9	89.5
66"		-	-	-	-	28.3	44.5	81.4
72"		-	-	-	-	26.0	40.8	74.6
19-1/8"	132"	-	28.7	20.7	42.0	73.4	116.8	150.0
26-1/2"		-	20.7	-	30.3	53.0	84.3	150.0
30"		-	-	-	26.8	46.8	74.4	136.7
37"		-	-	-	21.7	37.9	60.3	110.9
42"		-	-	-	-	33.4	53.2	97.7
48"		-	-	-	-	29.3	46.5	85.5
54"		-	-	-	-	26.0	41.4	76.0
60"		-	-	-	-	23.4	37.2	68.4
66"		-	-	-	-	21.3	33.8	62.1
72"		-	-	-	-	-	31.0	57.0
19-1/8"	144"	-	-	-	32.3	56.5	89.9	150.0
26-1/2"		-	-	-	23.3	40.8	64.9	119.2
30"		-	-	-	20.6	36.0	57.3	105.3
37"		-	-	-	-	29.2	46.5	85.4
42"		-	-	-	-	25.7	41.0	75.2
48"		-	-	-	-	22.5	35.8	65.8
54"		-	-	-	-	20.0	31.9	58.5
60"		-	-	-	-	-	28.7	52.7
66"		-	-	-	-	-	26.1	47.9
72"		-	-	-	-	-	23.9	43.9



TYPICAL MULLION ARRANGEMENTS

$$\text{WIDTH (W)} = \frac{W1 + W2}{2}$$



Sealed: 6/29/2026

FL #39086

af c

AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173
TEL. (305) 264-8100 FAX. (305) 262-6978

MULLION\21-45F-ESW

ALUMINUM TUBE MULLIONS

E.S. WINDOWS, LLC
3550 N.W. 49 STREET
MIAMI, FL. 33142
TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:

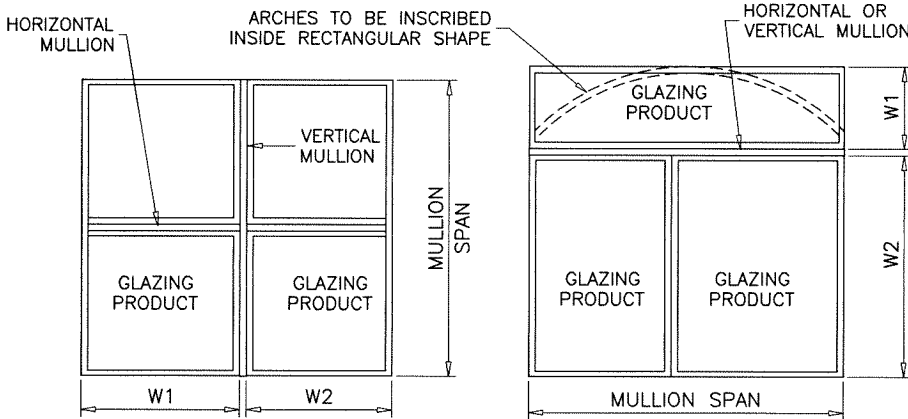
no	date	by	description

date: 05-21-21 scale: dr. by: TARIQ chk. by:
drawing no. **21-45F**
sheet 4 of 13

DESIGN LOAD CAPACITY - PSF		
WINDOW DIMS.		2 X 8 HEAVY
WIDTH (W)	MULL SPAN	
30"	108"	150.0
36"		150.0
42"		150.0
48"		150.0
54"		150.0
60"		150.0
66"		150.0
72"		147.7
78"		136.3
84"		126.6
90"		118.1
96"		110.8
30"	120"	150.0
36"		150.0
42"		150.0
48"		150.0
54"		150.0
60"		142.4
66"		129.4
72"		118.7
78"		109.5
84"		101.7
30"	132"	150.0
36"		150.0
42"		150.0
48"		146.0
54"		129.8
60"		116.8
66"		106.2
72"		97.3
78"		89.8
30"	144"	150.0
36"		150.0
42"		139.2
48"		121.8
54"		108.2
60"		97.4
66"		88.6
72"		81.2
30"	156"	150.0
36"		137.4
42"		117.7
48"		103.0
54"		91.6
60"		82.4
66"		74.9
30"	168"	140.8
36"		117.4
42"		100.6
48"		88.0
54"		78.2
60"		70.4

DESIGN LOAD CAPACITY - PSF		
WINDOW DIMS.		2 X 8 HEAVY
WIDTH (W)	MULL SPAN	
30"	180"	112.5
36"		93.7
42"		80.4
48"		70.3
54"		62.5
30"	192"	91.2
36"		76.0
42"		65.2
48"		57.0
54"		50.7

ALL LOADS ARE EXT.(+)/INT.(−).



TYPICAL MULLION ARRANGEMENTS

WIDTH (W) = $\frac{W1 + W2}{2}$

NOTE:
MULLIONS RATED IN THESE CHARTS MAY BE ORIENTED
VERTICALLY OR HORIZONTALLY.
(INTERPOLATION BETWEEN WIDTHS ALLOWED)

MULLIONS

Sealed: 6/29/2026



FL #39086

AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173 (C.A.N. 3538)
TEL. (305) 264-8100 FAX. (305) 262-6978

ALUMINUM TUBE MULLIONS

E.S. WINDOWS, LLC
3550 N.W. 49 STREET
MIAMI, FL. 33142
TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:	
no	date by description

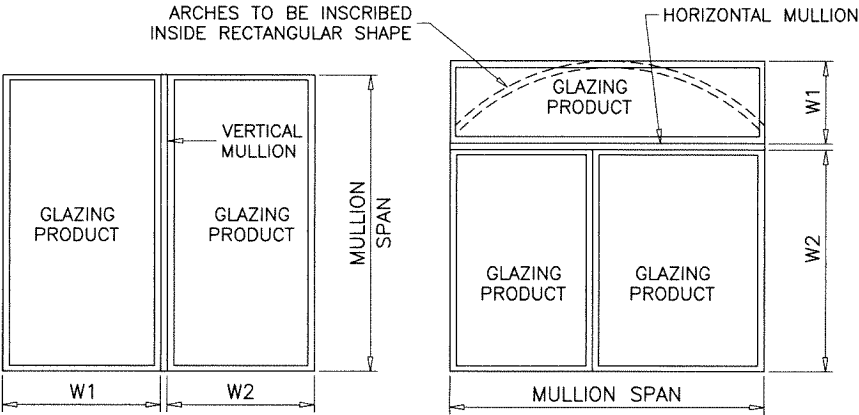
date: 05-21-21	scale:	dr. by: TARIQ	chk. by:
----------------	--------	---------------	----------

drawing no.
21-45F
sheet 4.1 of 13

DESIGN LOAD CAPACITY - PSF (BAY MULLIONS)					
WINDOW DIMS.		22-1/2°	30°	45°	'T'
WIDTH (W)	MULL SPAN	BAY MULL	BAY MULL	BAY MULL	MULL
19-1/8"	38-3/8"	150.0	150.0	150.0	150.0
26-1/2"		150.0	150.0	150.0	150.0
30"		150.0	150.0	150.0	150.0
36"		150.0	150.0	150.0	150.0
42"		150.0	150.0	150.0	150.0
48"		150.0	150.0	150.0	150.0
54"		150.0	150.0	150.0	150.0
60"		150.0	150.0	150.0	150.0
66"	50-5/8"	150.0	150.0	150.0	150.0
72"		150.0	150.0	150.0	150.0
19-1/8"		150.0	150.0	150.0	150.0
26-1/2"		150.0	150.0	150.0	150.0
30"		150.0	150.0	150.0	150.0
36"		150.0	150.0	150.0	150.0
42"		150.0	150.0	150.0	150.0
48"		150.0	150.0	150.0	150.0
54"		150.0	150.0	150.0	150.0
60"		143.0	140.4	145.1	150.0
66"		130.0	127.7	131.9	137.9
72"		119.2	117.0	120.9	126.4
19-1/8"	58"	150.0	150.0	150.0	150.0
26-1/2"		150.0	150.0	150.0	150.0
30"		150.0	150.0	150.0	150.0
36"		150.0	150.0	150.0	150.0
42"		150.0	150.0	150.0	150.0
48"		136.1	132.9	137.4	142.7
54"		121.0	118.1	122.1	126.8
60"		108.9	106.3	109.9	114.1
66"	63"	99.0	96.6	99.9	103.8
72"		90.8	88.6	91.6	95.1
19-1/8"		150.0	150.0	150.0	150.0
26-1/2"		150.0	150.0	150.0	150.0
30"		150.0	150.0	150.0	150.0
36"		150.0	149.5	150.0	150.0
42"		131.8	128.1	132.6	137.1
48"		115.3	112.1	116.0	119.9
54"	74-1/4"	102.5	99.7	103.1	106.6
60"		92.3	89.7	92.8	96.0
66"		83.9	81.5	84.4	87.2
72"		76.9	74.8	77.3	80.0
19-1/8"		150.0	150.0	150.0	150.0
26-1/2"		130.2	144.9	150.0	150.0
30"		115.0	128.0	132.6	135.8
36"		95.8	106.7	110.5	113.1
42"	84"	82.2	91.4	94.7	97.0
48"		71.9	80.0	82.8	84.8
54"		63.9	71.1	73.6	75.4
60"		57.5	64.0	66.3	67.9
66"		52.3	58.2	60.3	61.7
72"		47.9	53.3	55.2	56.6

DESIGN LOAD CAPACITY - PSF (BAY MULLIONS)					
WINDOW DIMS.		22-1/2°	30°	45°	'T'
WIDTH (W)	MULL SPAN	BAY MULL	BAY MULL	BAY MULL	MULL
19-1/8"	84"	124.6	140.3	146.7	150.0
26-1/2"		89.9	101.2	105.9	118.4
30"		79.4	89.4	93.5	104.6
36"		66.2	74.5	77.9	87.1
42"		56.7	63.9	66.8	74.7
48"		49.6	55.9	58.5	65.3
54"		44.1	49.7	52.0	58.1
60"		39.7	44.7	46.8	52.3
66"	96"	36.1	40.6	42.5	47.5
72"		33.1	37.3	39.0	43.6
19-1/8"		83.5	94.0	98.3	123.5
26-1/2"		60.2	67.8	70.9	89.1
30"		53.2	59.9	62.7	78.7
36"		44.3	49.9	52.2	65.6
42"		38.0	42.8	44.8	56.2
48"		33.3	37.4	39.2	49.2
54"	108"	29.6	33.3	34.8	43.7
60"		26.6	30.0	31.3	39.4
66"		24.2	27.2	28.5	35.8
72"		22.2	25.0	26.1	32.8
19-1/8"		58.6	66.0	69.0	88.6
26-1/2"		42.3	47.6	49.8	63.9
30"		37.4	42.1	44.0	56.5
36"		31.1	35.1	36.7	47.1
42"	120"	26.7	30.1	31.4	40.3
48"		23.4	26.3	27.5	35.3
54"		20.8	23.4	24.4	31.4
60"		-	21.0	22.0	28.2
66"		-	-	20.0	25.7
72"		-	-	-	23.5
19-1/8"		42.7	48.1	50.3	64.6
26-1/2"		30.8	34.7	36.3	46.6
30"	132"	27.2	30.7	32.1	41.2
36"		22.7	25.6	26.7	34.3
42"		-	21.9	22.9	29.4
48"		-	-	20.1	25.7
54"		-	-	-	22.9
60"		-	-	-	20.6
19-1/8"		32.1	36.1	37.8	48.5
26-1/2"		23.2	26.1	27.3	35.0
30"	144"	20.5	23.0	24.1	30.9
36"		-	-	20.1	25.8
42"		-	-	-	22.1
19-1/8"		24.7	27.8	29.1	37.4
26-1/2"		-	20.1	21.0	27.0
30"		-	-	-	23.8

ALL LOADS ARE EXT.(+)/INT.(-).

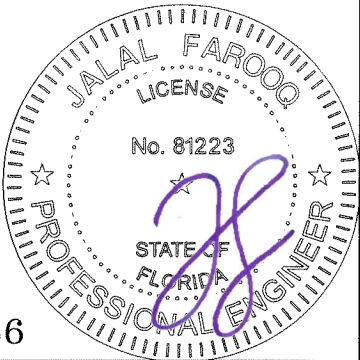


TYPICAL MULLION ARRANGEMENTS

$$\text{WIDTH (W)} = \frac{W1 + W2}{2}$$

NOTE:
'T' MULLION RATED IN THESE CHARTS MAY BE ORIENTED VERTICALLY OR HORIZONTALLY.
(INTERPOLATION BETWEEN WIDTHS ALLOWED)

Sealed: 6/29/2026



MULLIONS

FL #39086



AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173
TEL. (305) 264-8100 FAX. (305) 262-6978

ALUMINUM TUBE MULLIONS

E.S. WINDOWS, LLC
3550 N.W. 49 STREET
MIAMI, FL. 33142
TEL. (305) 638-5151 FAX. (305) 638-5158

Revisions:

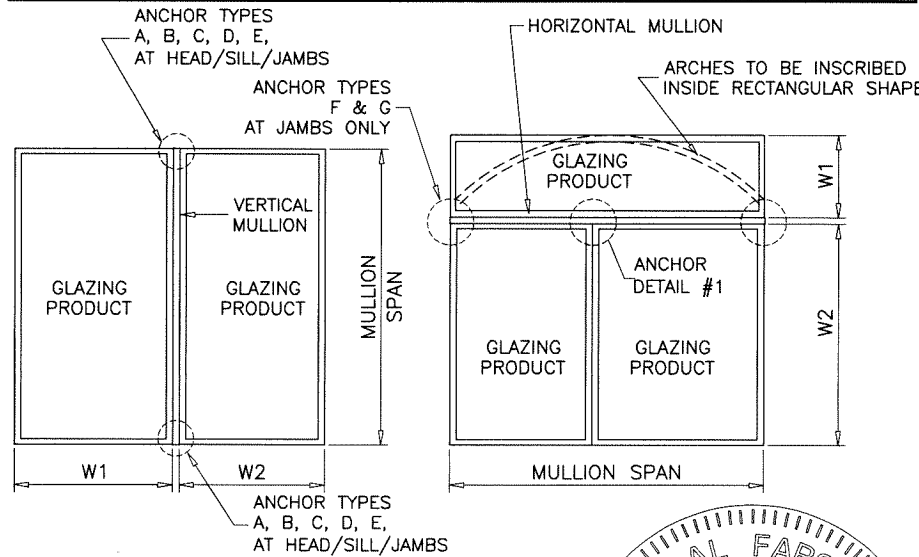
no	date	by	description

date: 05-21-21
scale:
dr. by: TARIQ
chk. by:
drawing no. **21-45F**
sheet **5** of **13**

DESIGN LOAD CAPACITY - PSF								
WINDOW DIMS.		ANCHORS TYPE						
WIDTH (W)	MULL SPAN	A	B	C	D	E	F	G
19-1/8"	38-3/8"	150.0	150.0	150.0	150.0	150.0	150.0	150.0
26-1/2"		143.9	150.0	150.0	150.0	150.0	150.0	150.0
30"		127.1	150.0	150.0	150.0	150.0	145.1	150.0
37"		103.0	150.0	140.8	150.0	150.0	117.6	150.0
42"		90.8	150.0	124.0	150.0	150.0	103.6	150.0
48"		79.4	150.0	108.5	150.0	150.0	90.7	150.0
54"		70.6	141.2	96.5	150.0	150.0	80.6	147.3
60"		63.5	127.1	86.8	150.0	150.0	72.5	132.6
66"		57.8	115.5	78.9	150.0	150.0	66.0	120.5
72"		53.0	105.9	72.3	144.7	150.0	60.5	110.5
19-1/8"	50-5/8"	150.0	150.0	150.0	150.0	150.0	150.0	150.0
26-1/2"		109.1	150.0	149.0	150.0	150.0	124.5	150.0
30"		96.3	150.0	131.6	150.0	150.0	110.0	150.0
37"		78.1	150.0	106.7	150.0	150.0	89.2	150.0
42"		68.8	137.6	94.0	150.0	150.0	78.6	143.6
48"		60.2	120.4	82.3	150.0	150.0	68.7	125.6
54"		53.5	107.0	73.1	146.2	150.0	61.1	111.7
60"		48.2	96.3	65.8	131.6	150.0	55.0	100.5
66"		43.8	87.6	59.8	119.6	139.3	50.0	91.4
72"		40.1	80.3	54.8	109.7	127.7	45.8	83.8
96"	54"	-	56.7	-	77.1	89.8	-	58.9
19-1/8"	58"	131.9	150.0	150.0	150.0	150.0	150.0	150.0
26-1/2"		95.2	150.0	130.0	150.0	150.0	108.7	150.0
30"		84.1	150.0	114.9	150.0	150.0	96.0	150.0
37"		68.2	136.4	93.1	150.0	150.0	77.8	142.3
42"		60.1	120.1	82.0	150.0	150.0	68.6	125.3
48"		52.6	105.1	71.8	143.6	150.0	60.0	109.7
54"		46.7	93.4	63.8	127.6	148.6	53.3	97.5
60"		42.0	84.1	57.4	114.9	133.7	48.0	87.7
66"		38.2	76.4	52.2	104.4	121.6	43.6	79.7
72"		35.0	70.1	47.9	95.7	111.4	40.0	73.1
19-1/8"	63"	121.4	150.0	150.0	150.0	150.0	138.6	150.0
26-1/2"		87.6	150.0	119.7	150.0	150.0	100.1	150.0
30"		77.4	150.0	105.8	150.0	150.0	88.4	150.0
37"		62.8	125.5	85.7	150.0	150.0	71.7	131.0
42"		55.3	110.6	75.5	150.0	150.0	63.1	115.4
48"		48.4	96.8	66.1	132.2	150.0	55.2	101.0
54"		43.0	86.0	58.8	117.5	136.8	49.1	89.7
60"		38.7	77.4	52.9	105.8	123.1	44.2	80.8
66"		35.2	70.4	48.1	96.1	111.9	40.2	73.4
72"		32.3	64.5	44.1	88.1	102.6	36.8	67.3

DESIGN LOAD CAPACITY - PSF								
WINDOW DIMS.		ANCHORS TYPE						
WIDTH (W)	MULL SPAN	A	B	C	D	E	F	G
19-1/8"	74-1/4"	103.0	150.0	140.8	150.0	150.0	117.6	150.0
26-1/2"		74.4	148.7	101.6	150.0	150.0	84.9	150.0
30"		65.7	131.4	89.7	150.0	150.0	75.0	137.1
37"		53.3	106.5	72.8	145.5	150.0	60.8	111.1
42"		46.9	93.8	64.1	128.2	149.2	53.6	97.9
48"		41.1	82.1	56.1	112.2	130.6	46.9	85.7
54"		36.5	73.0	49.8	99.7	116.1	41.7	76.1
60"		32.8	65.7	44.9	89.7	104.5	37.5	68.5
66"		29.9	59.7	40.8	81.6	95.0	34.1	62.3
72"		27.4	54.7	37.4	74.8	87.1	31.2	57.1
19-1/8"	84"	91.1	150.0	124.4	150.0	150.0	104.0	150.0
26-1/2"		65.7	131.5	89.8	150.0	150.0	75.0	137.1
30"		58.1	116.1	79.3	150.0	150.0	66.3	121.1
37"		47.1	94.1	64.3	128.6	149.7	53.7	98.2
42"		41.5	82.9	56.7	113.3	131.9	47.3	86.5
48"		36.3	72.6	49.6	99.1	115.4	41.4	75.7
54"		32.3	64.5	44.1	88.1	102.6	36.8	67.3
60"		29.0	58.1	39.7	79.3	92.3	33.1	60.6
66"		26.4	52.8	36.1	72.1	83.9	30.1	55.1
72"		24.2	48.4	33.0	66.1	77.0	27.6	50.5
19-1/8"	96"	79.7	150.0	108.9	150.0	150.0	91.0	150.0
26-1/2"		57.5	115.0	78.6	150.0	150.0	65.7	120.0
30"		50.8	101.6	69.4	138.8	150.0	58.0	106.0
37"		41.2	82.4	56.3	112.5	131.0	47.0	85.9
42"		36.3	72.6	49.6	99.1	115.4	41.4	75.7
48"		31.8	63.5	43.4	86.8	101.0	36.3	66.3
54"		28.2	56.4	38.6	77.1	89.8	32.2	58.9
60"		25.4	50.8	34.7	69.4	80.8	29.0	53.0
66"		23.1	46.2	31.5	63.1	73.5	26.4	48.2
72"		21.2	42.3	28.9	57.8	67.3	24.2	44.2
19-1/8"	108"	70.8	141.7	96.8	150.0	150.0	80.9	147.8
26-1/2"		51.1	102.2	69.8	139.7	150.0	58.4	106.7
30"		45.2	90.3	61.7	123.4	143.6	51.6	94.2
37"		36.6	73.2	50.0	100.0	116.5	41.8	76.4
42"		32.3	64.5	44.1	88.1	102.6	36.8	67.3
48"		28.2	56.4	38.6	77.1	89.8	32.2	58.9
54"		25.1	50.2	34.3	68.5	79.8	28.6	52.3
60"		22.6	45.2	30.8	61.7	71.8	25.8	47.1
66"		20.5	41.1	28.0	56.1	65.3	23.4	42.8
72"		-	37.6	25.7	51.4	59.9	21.5	39.3

DESIGN LOAD CAPACITY - PSF								
WINDOW DIMS.		ANCHORS TYPE						
WIDTH (W)	MULL SPAN	A	B	C	D	E	F	G
19-1/8"	120"	63.7	127.5	87.1	150.0	150.0	72.8	133.0
26-1/2"		46.0	92.0	62.9	125.7	146.4	52.5	96.0
30"		40.6	81.3	55.5	111.0	129.3	46.4	84.8
37"		33.0	65.9	45.0	90.0	104.8	37.6	68.8
42"		29.0	58.1	39.7	79.3	92.3	33.1	60.6
48"		25.4	50.8	34.7	69.4	80.8	29.0	53.0
54"		22.6	45.2	30.8	61.7	71.8	25.8	47.1
60"		20.3	40.6	27.8	55.5	64.6	23.2	42.4
66"		-	36.9	25.2	50.5	58.8	21.1	38.5
72"		-	33.9	23.1	46.3	53.9	-	35.3
19-1/8"	132"	58.0	115.9	79.2	150.0	150.0	66.2	120.9
26-1/2"		41.8	83.7	57.1	114.3	133.0	47.8	87.3
30"		36.9	73.9	50.5	100.9	117.5	42.2	77.1
37"		30.0	59.9	40.9	81.8	95.3	34.2	62.5
42"		26.4	52.8	36.1	72.1	83.9	30.1	55.1
48"		23.1	46.2	31.5	63.1	73.5	26.4	48.2
54"		20.5	41.1	28.0	56.1	65.3	23.4	42.8
60"		-	36.9	25.2	50.5	58.8	21.1	38.5
66"		-	33.6	22.9	45.9	53.4	-	35.0
72"		-	30.8	21.0	42.1	49.0	-	32.1
19-1/8"	144"	53.1	106.2	72.6	145.2	150.0	60.7	110.8
26-1/2"		38.3	76.7	52.4	104.8	122.0	43.8	80.0
30"		33.9	67.7	46.3	92.5	107.7	38.7	70.7
37"		27.5	54.9	37.5	75.0	87.4	31.4	57.3
42"		24.2	48.4	33.0	66.1	77.0	27.6	50.5
48"		-	42.3	28.9	57.8	67.3	24.2	44.2
54"		-	37.6	25.7	51.4	59.9	21.5	39.3
60"		-	33.9	23.1	46.3	53.9	-	35.3
66"		-	30.8	21.0	42.1	49.0	-	32.1
72"		-	28.2	-	38.6	44.9	-	29.4

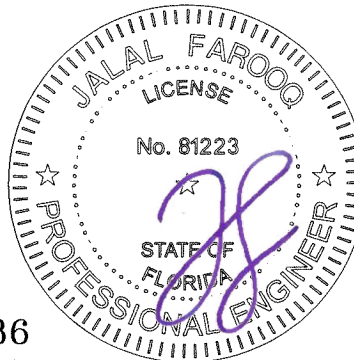


TYPICAL MULLION ARRANGEMENTS

$$\text{WIDTH (W)} = \frac{W1 + W2}{2}$$

Sealed: 6/29/2026

FL #39086



af c
AL-FAROOQ CORPORATION
 ENGINEERS & PRODUCT DEVELOPMENT
 9360 SUNSET DRIVE, SUITE 220
 MIAMI, FLORIDA 33173 (C.A.N. 3538)
 TEL. (305) 262-6978 FAX. (305) 262-8100

ALUMINUM TUBE MULLIONS
E.S. WINDOWS, LLC
 3550 N.W. 49 STREET
 MIAMI, FL. 33142
 TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:	no	date	by	description

date:	05-21-21
scale:	
dr. by:	TARIQ
chk. by:	

drawing no.	21-45F
sheet	6 of 13

NOTE:
 ANY ANCHOR CONDITION SHOWN HEREIN MAY COVER LOCATIONS AT HEAD, SILL OR JAMB ENDS.
 FOR ANCHORS DESCRIPTION SEE SHEETS 7 THRU 13.
 (INTERPOLATION BETWEEN WIDTHS OR SPANS ALLOWED)

ANCHORS TYPE 'D' AND 'E' APPLICABLE TO 4", 5" AND 6" TUBE MULLIONS.
 ANCHORS TYPE 'A', 'B', 'C', 'F' AND 'G' APPLICABLE TO ALL TUBE MULLIONS.

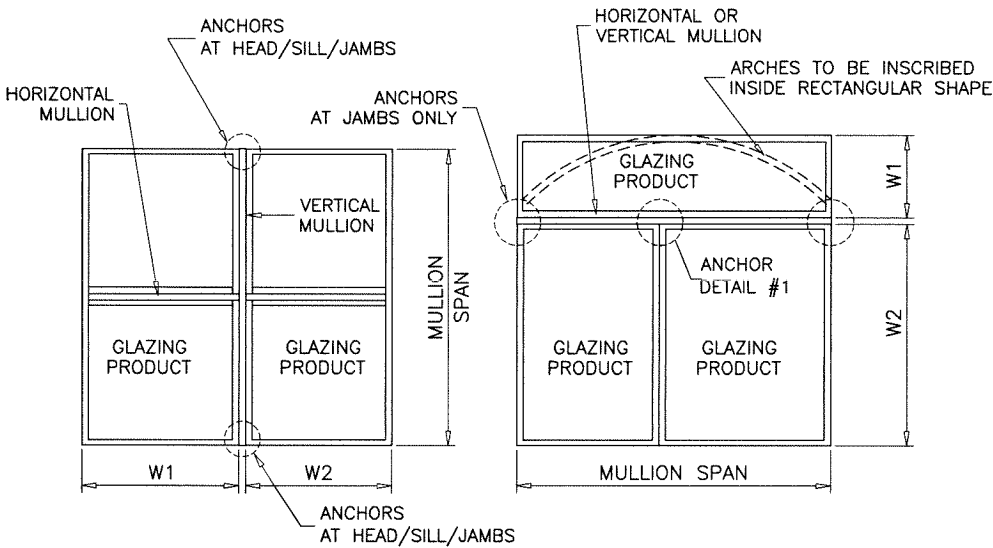
ANCHORS

MULLION\21-45F-ESW

DESIGN LOAD CAPACITY - PSF									
WINDOW DIMS.		ANCHORS TYPES							
WIDTH (W)	MULL SPAN	HW	iW	HC	iC	HB	iB	J	K
30"	108"	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0
36"		150.0	150.0	150.0	150.0	128.9	150.0	150.0	150.0
42"		150.0	150.0	150.0	150.0	110.5	133.6	150.0	150.0
48"		150.0	150.0	150.0	150.0	96.7	116.9	150.0	150.0
54"		150.0	150.0	150.0	150.0	85.9	103.9	150.0	150.0
60"		150.0	150.0	150.0	150.0	77.3	93.5	150.0	150.0
66"		150.0	150.0	150.0	150.0	70.3	85.0	150.0	150.0
72"		150.0	150.0	150.0	150.0	64.4	77.9	150.0	150.0
78"		150.0	150.0	150.0	150.0	59.5	71.9	150.0	150.0
84"		150.0	150.0	150.0	150.0	55.2	66.8	150.0	150.0
90"	120"	150.0	150.0	150.0	150.0	51.6	62.3	150.0	150.0
96"		150.0	150.0	150.0	150.0	48.3	58.4	150.0	150.0
30"		150.0	150.0	150.0	150.0	116.0	140.3	150.0	150.0
36"		150.0	150.0	150.0	150.0	112.0	136.5	150.0	150.0
42"		150.0	150.0	150.0	150.0	99.4	120.2	150.0	150.0
48"		150.0	150.0	150.0	150.0	87.0	105.2	150.0	150.0
54"		150.0	150.0	150.0	150.0	77.3	93.5	150.0	150.0
60"		150.0	150.0	150.0	150.0	69.6	84.2	150.0	150.0
66"		150.0	150.0	150.0	150.0	63.3	76.5	150.0	150.0
72"		150.0	150.0	150.0	150.0	58.0	70.1	150.0	150.0
78"		150.0	150.0	150.0	150.0	53.5	64.7	150.0	150.0
84"		150.0	150.0	150.0	150.0	49.7	60.1	150.0	150.0
30"	132"	150.0	150.0	150.0	150.0	105.5	127.5	150.0	150.0
36"		150.0	150.0	150.0	150.0	102.6	124.1	139.3	150.0
42"		150.0	150.0	150.0	150.0	90.4	109.3	119.4	150.0
48"		150.0	150.0	150.0	150.0	79.1	95.6	104.5	139.3
54"		150.0	150.0	150.0	150.0	70.3	85.0	92.8	123.8
60"		150.0	150.0	150.0	150.0	63.3	76.5	83.6	111.4
66"		150.0	150.0	150.0	150.0	57.5	69.6	76.0	101.3
72"		115.5	150.0	150.0	150.0	52.7	63.8	69.6	92.8
78"		102.0	150.0	150.0	150.0	48.7	58.9	64.3	85.7
30"	144"	85.0	113.3	115.7	150.0	116.0	140.3	127.7	150.0
36"		82.7	110.3	112.5	150.0	94.1	113.7	124.2	150.0
42"		72.9	97.1	99.1	132.2	82.9	100.2	109.4	145.9
48"		63.8	85.0	86.8	115.7	72.5	87.7	95.8	127.7
54"		56.7	75.6	77.1	102.8	64.4	77.9	85.1	113.5
60"		51.0	68.0	69.4	92.5	58.0	70.1	76.6	102.1
66"		46.4	61.8	63.1	84.1	52.7	63.8	69.6	92.8
72"		42.5	56.7	57.8	77.1	48.3	58.4	63.8	85.1
30"	156"	94.2	125.5	128.1	150.0	107.1	129.5	141.4	150.0
36"		78.5	104.6	106.8	142.4	89.2	107.9	117.8	150.0
42"		67.3	89.7	91.5	122.0	76.5	92.5	101.0	134.7
48"		58.8	78.5	80.1	106.8	66.9	80.9	88.4	117.8
54"		52.3	69.7	71.2	94.9	59.5	71.9	78.6	104.8
60"		47.1	62.8	64.1	85.4	53.5	64.7	70.7	94.3
66"		42.8	57.1	58.2	77.7	48.7	58.9	64.3	85.7
30"	168"	87.4	116.6	119.0	150.0	99.4	120.2	131.3	150.0
36"		72.9	97.1	99.1	132.2	82.9	100.2	109.4	145.9
42"		62.4	83.3	85.0	113.3	71.0	85.9	93.8	125.1
48"		54.6	72.9	74.4	99.1	62.1	75.1	82.1	109.4
54"		48.6	64.8	66.1	88.1	55.2	66.8	73.0	97.3
60"		43.7	58.3	59.5	79.3	49.7	60.1	65.7	87.5

DESIGN LOAD CAPACITY - PSF									
WINDOW DIMS.		ANCHORS TYPES							
WIDTH (W)	MULL SPAN	HW	iW	HC	iC	HB	iB	J	K
30"	180"	81.6	108.8	111.0	148.1	92.8	112.2	122.6	150.0
36"		68.0	90.7	92.5	123.4	77.3	93.5	102.1	136.2
42"		58.3	77.7	79.3	105.8	66.3	80.2	87.5	116.7
48"		51.0	68.0	69.4	92.5	58.0	70.1	76.6	102.1
54"		45.3	60.4	61.7	82.3	51.6	62.3	68.1	90.8
30"	192"	76.5	102.0	104.1	138.8	87.0	105.2	114.9	150.0
36"		63.8	85.0	86.8	115.7	72.5	87.7	95.8	127.7
42"		54.6	72.9	74.4	99.1	62.1	75.1	82.1	109.4
48"		47.8	63.8	65.1	86.8	54.4	65.8	71.8	95.8
54"		42.5	56.7	57.8	77.1	48.3	58.4	63.8	85.1

ALL LOADS ARE EXT.(+)/INT.(−).



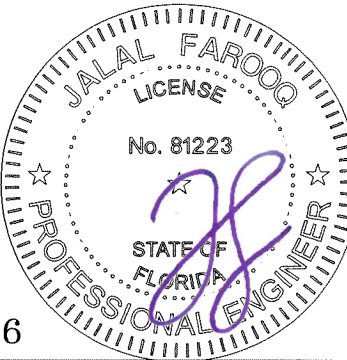
TYPICAL MULLION ARRANGEMENTS

$$\text{WIDTH (W)} = \frac{W1 + W2}{2}$$

NOTE:
ANY ANCHOR CONDITION SHOWN HEREIN MAY COVER
LOCATIONS AT HEAD, SILL OR JAMB ENDS.
FOR ANCHORS DESCRIPTION SEE SHEET 12.1 & 12.2
(INTERPOLATION BETWEEN WIDTHS OR SPANS ALLOWED)

ANCHORS

FL #39086



af c
AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173
TEL. (305) 264-8100 FAX. (305) 262-6978
MULLION\21-45F-ESW

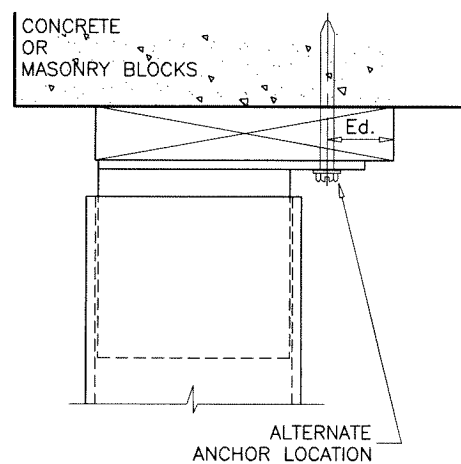
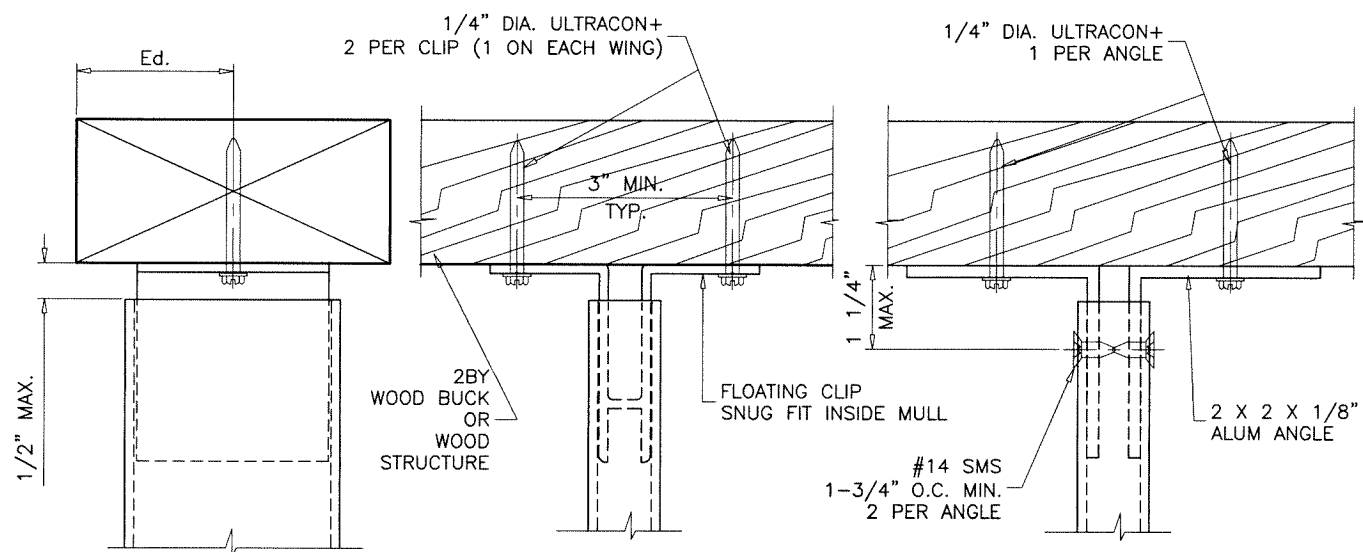
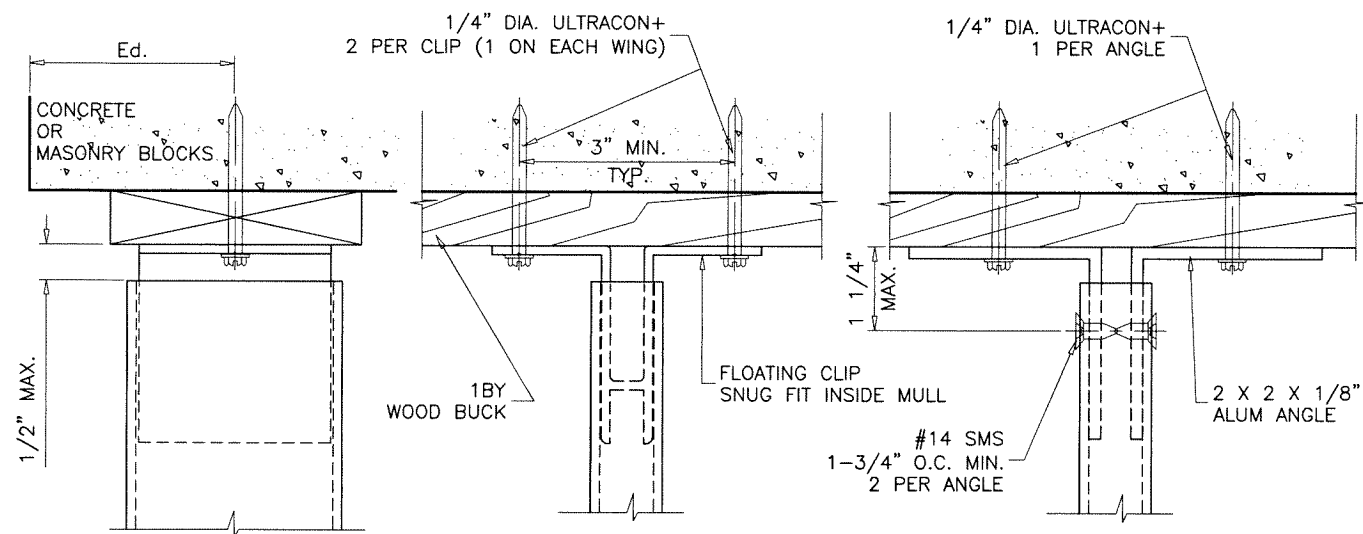
ALUMINUM TUBE MULLIONS

E.S. WINDOWS, LLC
3550 N.W. 49 STREET
MIAMI, FL. 33142
TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:
no date by description

date: 05-21-21
scale:
dr. by: TARIQ
chk. by:

drawing no.
21-45F
sheet 6.1 of 13

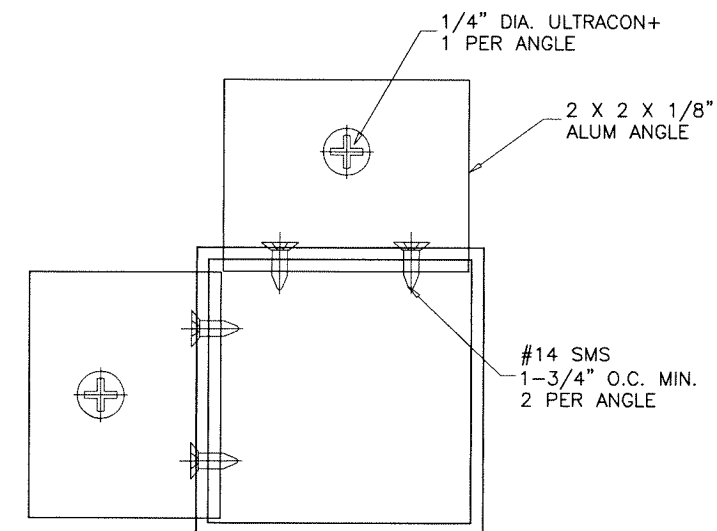
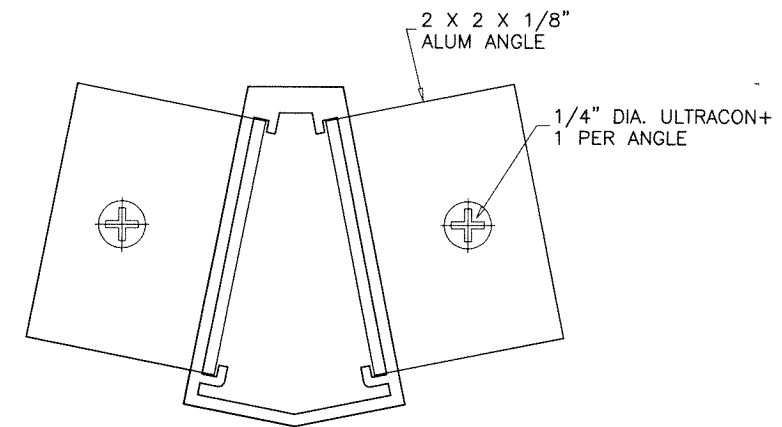


ANCHORS TYPE 'A'

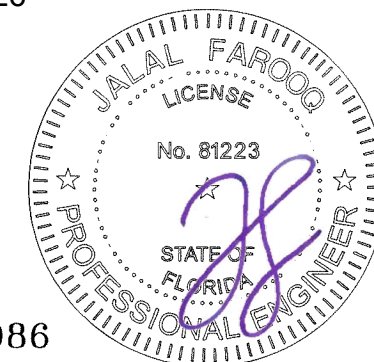
1/4" DIA. ULTRACON+ BY 'DEWALT'		
(Fu=164 KSI, Fy=148 KSI)		
ULTRACON+ MAY BE HEX OR FLAT HEAD		
SUBSTRATE	Ed. = MIN. EDGE DIST.	MIN. EMBEDMENT
WOOD	1"	1-1/2"
CONCRETE	2-1/2"	1-3/4"
BLOCK	2-1/2"	1-1/4"

WOOD = 2BY WOOD BUCKS OR WOOD STRUCTURE S.G. = 0.55 MIN.
 CONCRETE = f'c = 3000 PSI MIN.
 C-90 HOLLOW/FILLED BLOCKS f'm = 2000 PSI MIN.

ALL CLIPS AND ANGLES TO FIT SNUG INTO TUBE MULLIONS.
 CLIPS OR ANGLES CONNECTED DIRECTLY TO CONCRETE/BLOCKS TO BE PROTECTED WITH ALKALI-RESISTANT COATINGS, SUCH AS BITUMINOUS PAINT OR WATER-WHITE METHACRYLATE LACQUER.



Sealed: 6/29/2026



FL #39086

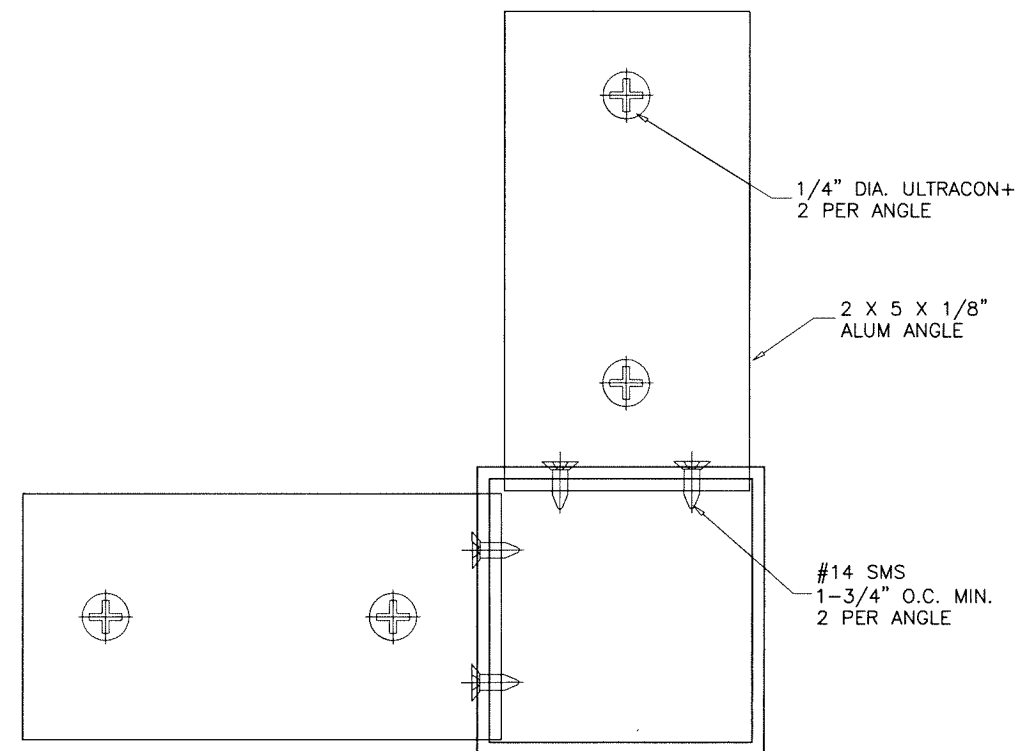
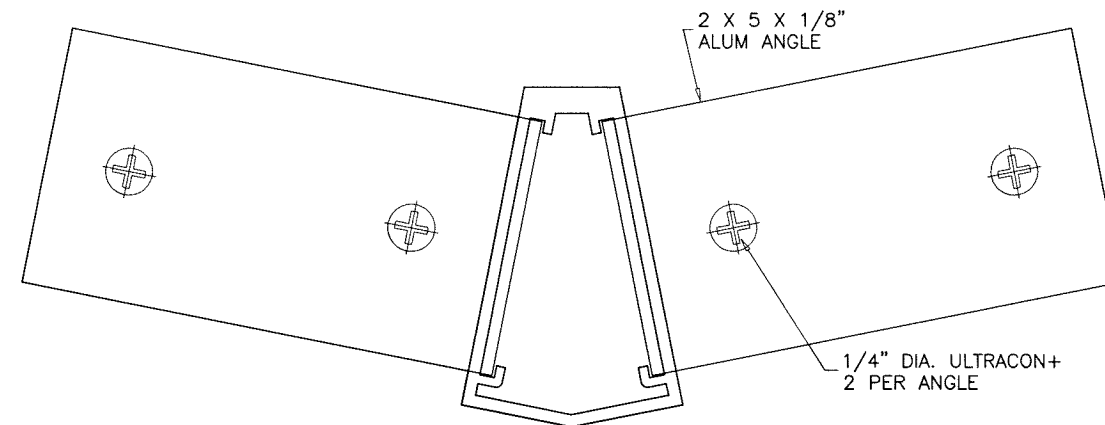
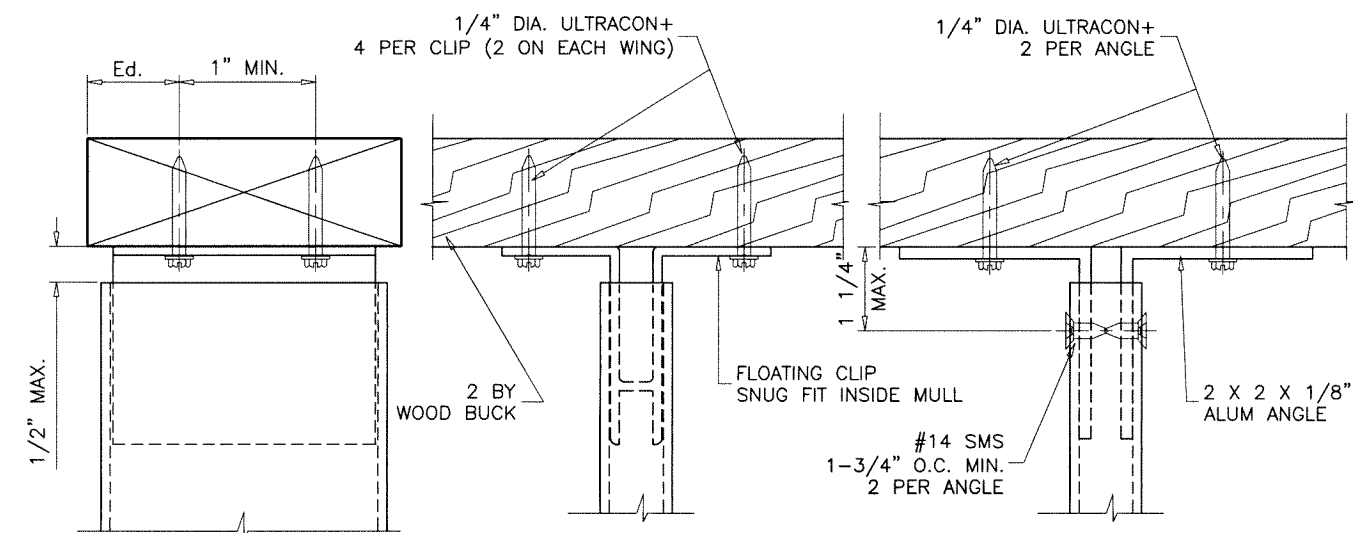
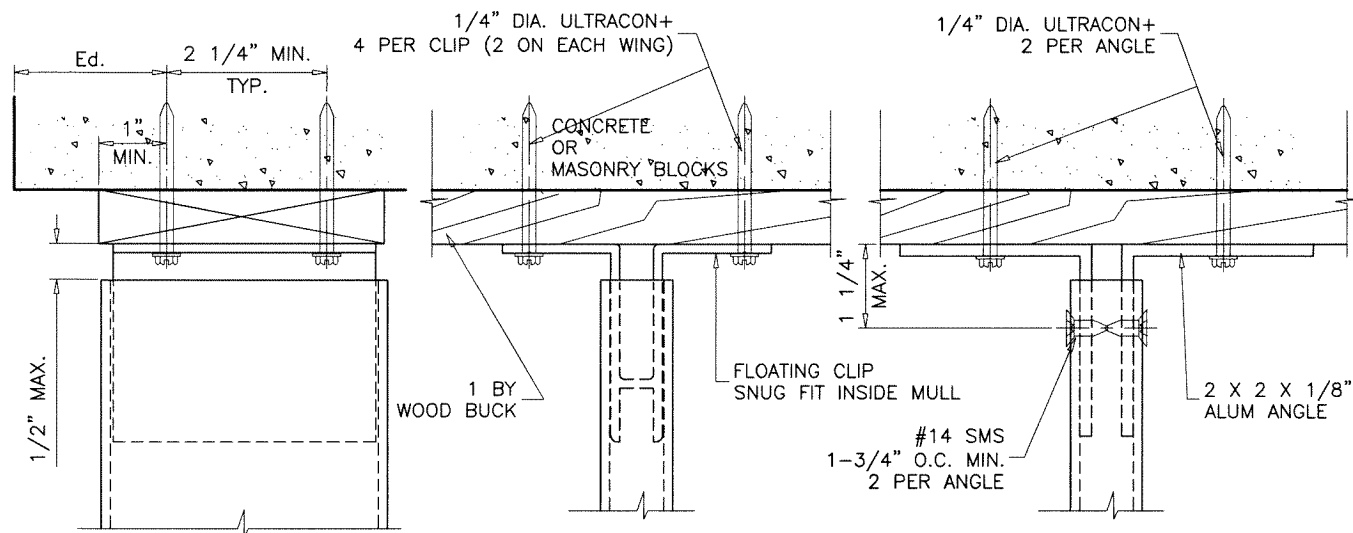
af c
AL-FAROOQ CORPORATION
 ENGINEERS & PRODUCT DEVELOPMENT
 9360 SUNSET DRIVE, SUITE 220
 MIAMI, FLORIDA 33173 (C.A.N. 3538)
 TEL. (305) 264-8100 FAX. (305) 262-6978
 MULLION\21-45F-ESW

ALUMINUM TUBE MULLIONS
E.S. WINDOWS, LLC
 3550 N.W. 49 STREET
 MIAMI, FL. 33142
 TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:	no	date	by	description

date: 05-21-21
 scale: 3/8" = 1"
 dr. by: TARIQ
 chk. by:

drawing no.
21-45F
 sheet 7 of 13



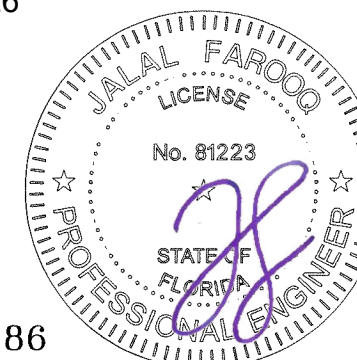
ANCHORS TYPE 'B'

1/4" DIA. ULTRAACON+ BY 'DEWALT'		
(Fu=164 KSI, Fy=148 KSI)		
ULTRAACON+ MAY BE HEX OR FLAT HEAD		
SUBSTRATE	Ed. = MIN. EDGE DIST.	MIN. EMBEDMENT
WOOD	1"	1-1/2"
CONCRETE	2-1/2"	1-3/4"
BLOCK	2-1/2"	1-1/4"

WOOD = 2BY WOOD BUCKS OR WOOD STRUCTURE S.G. = 0.55 MIN.
 CONCRETE = f'c = 3000 PSI MIN.
 C-90 HOLLOW/FILLED BLOCKS f'm = 2000 PSI MIN.

ALL CLIPS AND ANGLES TO FIT SNUG INTO TUBE MULLIONS.
 CLIPS OR ANGLES CONNECTED DIRECTLY TO CONCRETE/BLOCKS TO BE PROTECTED WITH ALKALI-RESISTANT COATINGS, SUCH AS BITUMINOUS PAINT OR WATER-WHITE METHACRYLATE LACQUER.

Sealed: 6/29/2026



FL #39086

af c
AL-FAROOQ CORPORATION
 ENGINEERS & PRODUCT DEVELOPMENT
 9360 SUNSET DRIVE, SUITE 220
 MIAMI, FLORIDA 33173 (C.A.N. 3538)
 TEL. (305) 264-8100 FAX. (305) 262-6978
 MULLION 21-45F-ESW

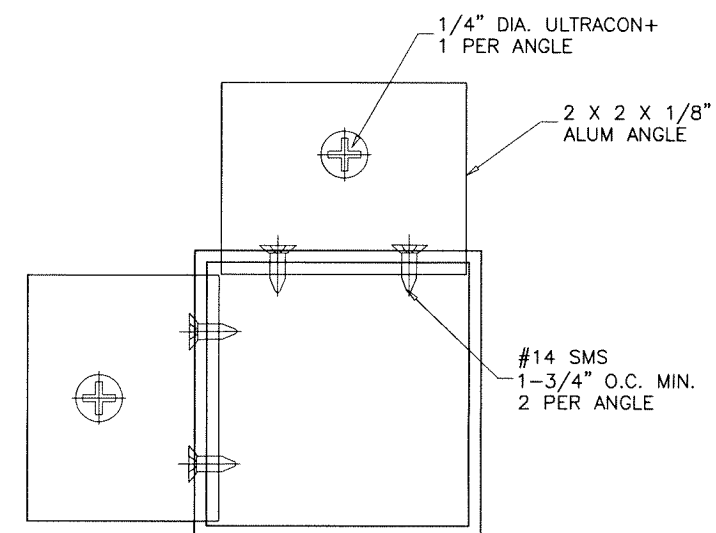
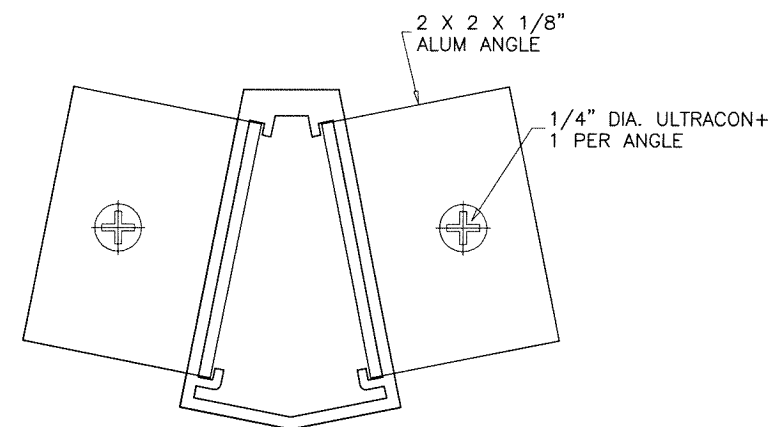
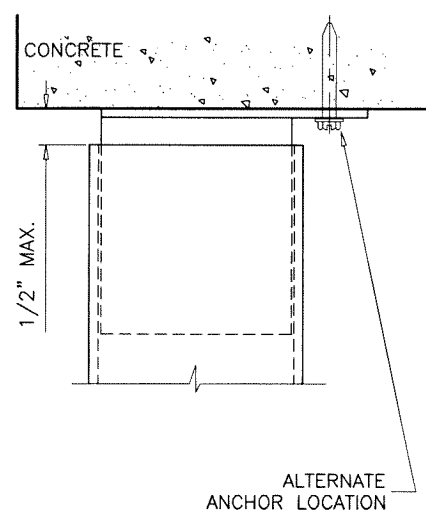
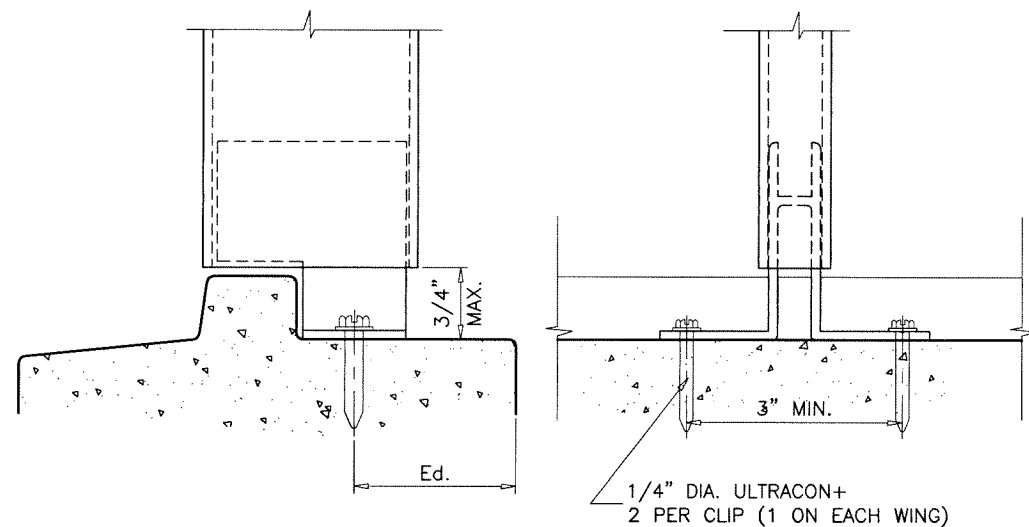
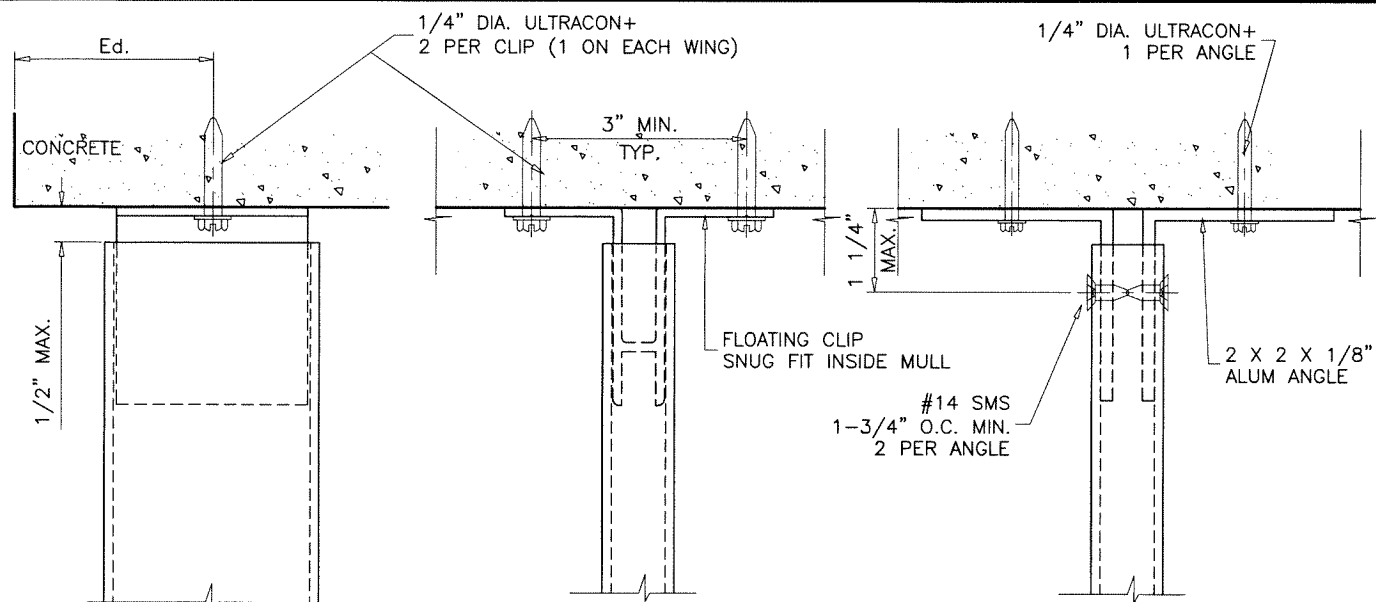
ALUMINUM TUBE MULLIONS

E.S. WINDOWS, LLC
 3550 N.W. 49 STREET
 MIAMI, FL. 33142
 TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:		by	description
no	date		

date: 05-21-21	scale: 3/8" = 1"	dr. by: TARIQ	chk. by:
----------------	------------------	---------------	----------

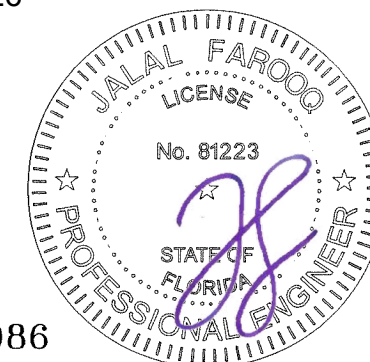
drawing no.
21-45F
 sheet 8 of 13



1/4" DIA. ULTRACON+ BY 'DEWALT' (Fu=164 KSI, Fy=148 KSI) ULTRACON+ MAY BE HEX OR FLAT HEAD		
SUBSTRATE	Ed. = MIN. EDGE DIST.	MIN. EMBEDMEN
CONCRETE	2-1/2"	1-3/4"

CONCRETE = f'_c = 3000 PSI MIN.

Sealed: 6/29/2026



ALL CLIPS AND ANGLES TO FIT SNUG INTO TUBE MULLIONS (EXCEPT AS NOTED).
CLIPS OR ANGLES CONNECTED DIRECTLY TO CONCRETE TO BE PROTECTED WITH
ALKALI-RESISTANT COATINGS, SUCH AS BITUMINOUS PAINT OR WATER-WHITE
METHACRYLATE LACQUER.

FL #39086

AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173 (C.A.N. 3538)
TEL. (305) 264-8100 FAX. (305) 262-6978

ALUMINUM TUBE MULLIONS

ALUMINUM TUBE IN
E.S. WINDOWS, LLC

3550 N.W. 49 STREET
MIAMI, FL. 33142

FAX. (305) 638-5158

no	date	by	description
revisions:			

date: 05-21-21

scale: $3/8" = 1"$

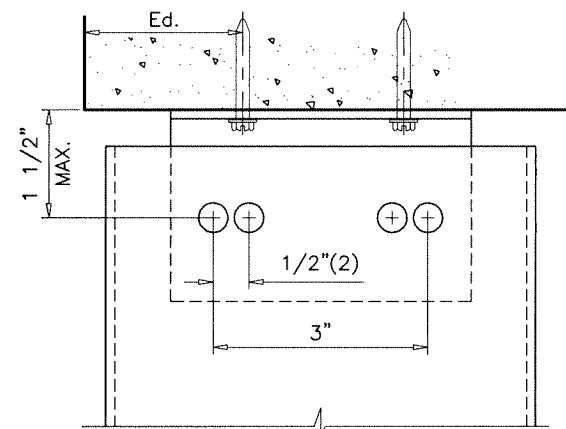
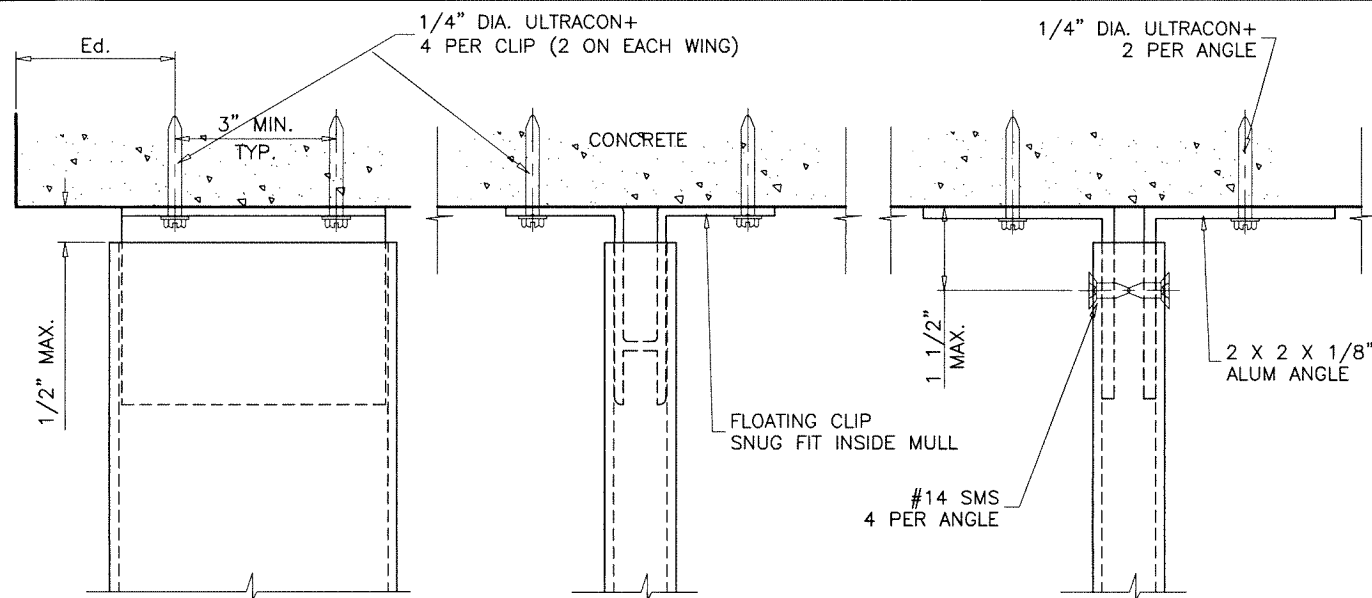
dr. by: TARIQ

chk. by:

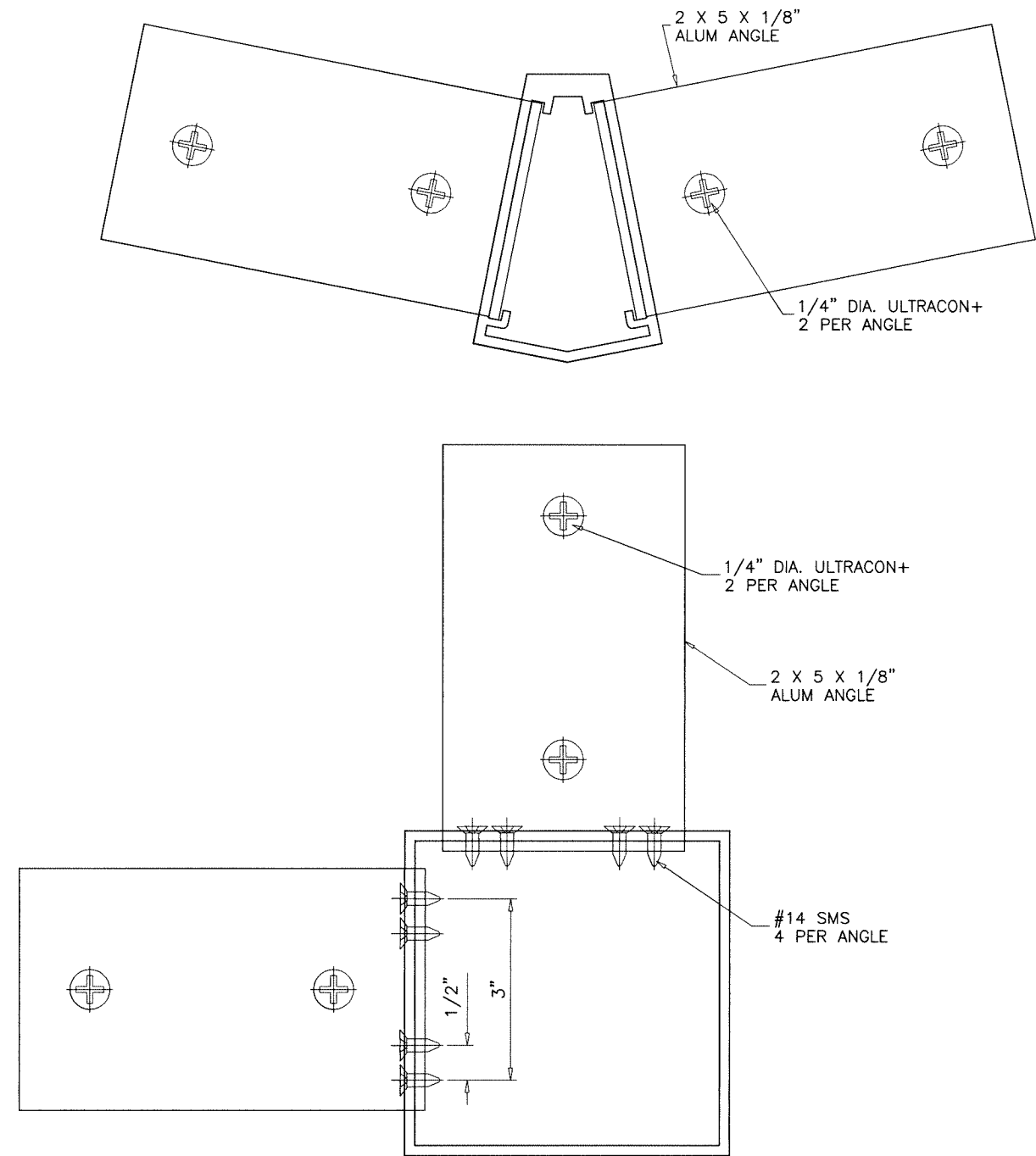
drawing no.

21-45F

sheet 9 of 13



LOCATION OF SCREWS CONNECTING ANGLES TO TUBES



ANCHORS TYPE 'D'

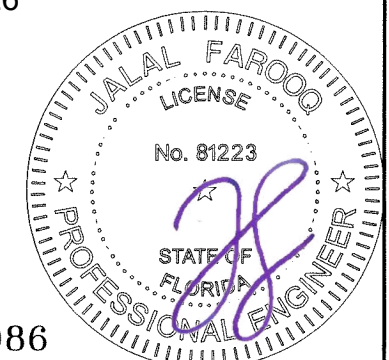
APPLICABLE FOR 4", 5" AND 6" TUBE MULLIONS

1/4" DIA. ULTRACON+ BY 'DEWALT'		
(Fu=164 KSI, Fy=148 KSI)		
ULTRACON+ MAY BE HEX OR FLAT HEAD		
SUBSTRATE	Ed. = MIN. EDGE DIST.	MIN. EMBEDMENT
CONCRETE	2-1/2"	1-3/4"

CONCRETE = f'c = 3000 PSI MIN.

ALL CLIPS AND ANGLES TO FIT SNUG INTO TUBE MULLIONS (EXCEPT AS NOTED). CLIPS OR ANGLES CONNECTED DIRECTLY TO CONCRETE TO BE PROTECTED WITH ALKALI-RESISTANT COATINGS, SUCH AS BITUMINOUS PAINT OR WATER-WHITE METHACRYLATE LACQUER.

Sealed: 6/29/2026



FL #39086

AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173
TEL. (305) 264-8100 FAX. (305) 262-6978
MULLION 21-45F-ESW

ALUMINUM TUBE MULLIONS

E.S. WINDOWS, LLC
3550 N.W. 49 STREET
MIAMI, FL. 33142
TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:
no date by description

date: 05-21-21
scale: 3/8" = 1"

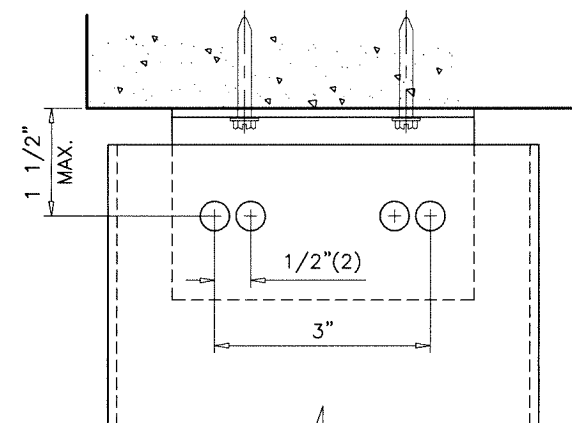
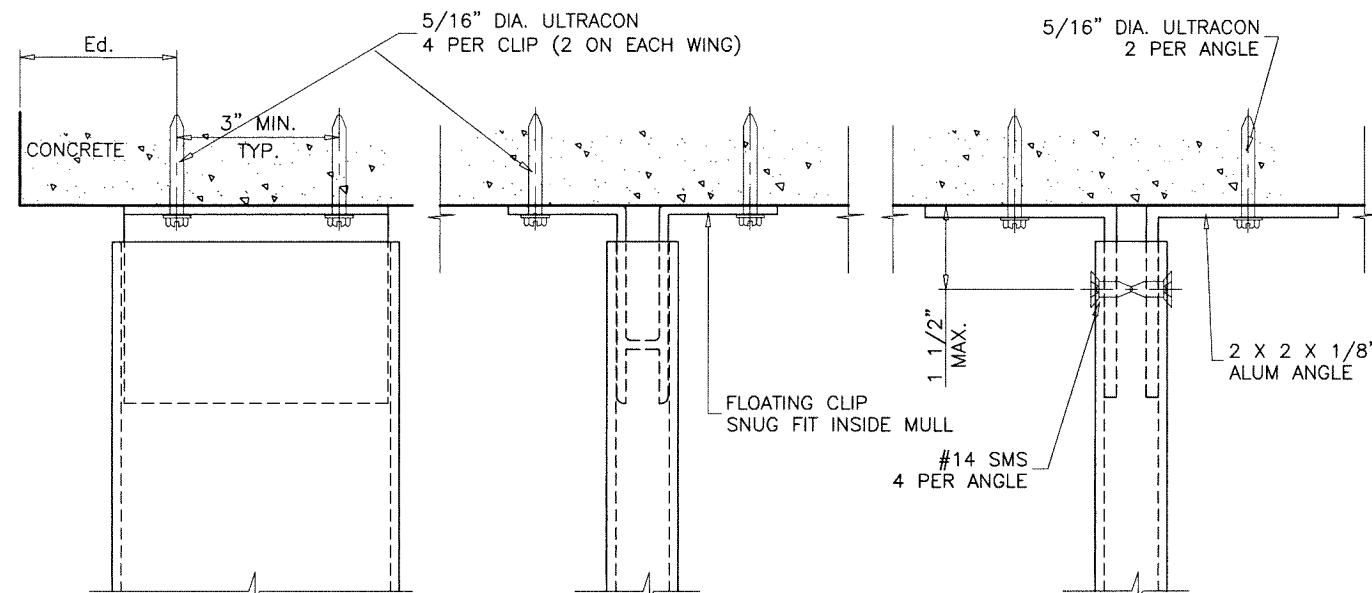
dr. by: TARIQ

chk. by:

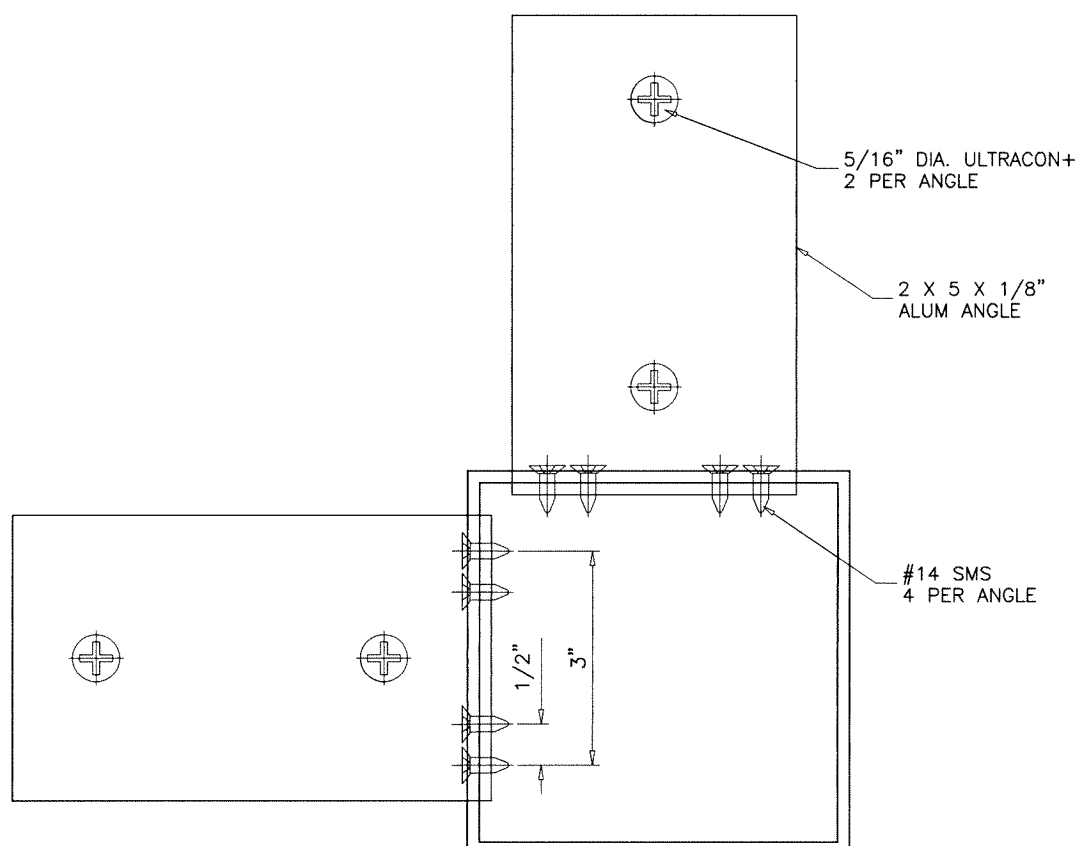
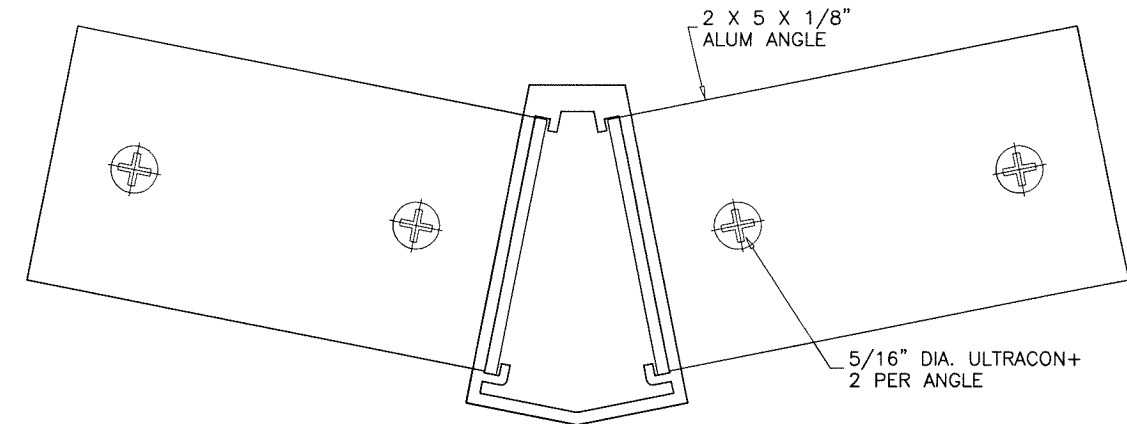
drawing no.

21-45F

sheet 10 of 13



LOCATION OF SCREWS CONNECTING ANGLES TO TUBES



ANCHORS TYPE 'E'

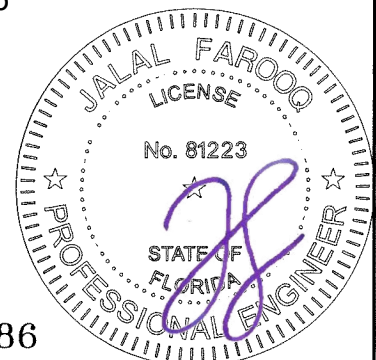
APPLICABLE FOR 4", 5" AND 6" TUBE MULLIONS

5/16" DIA. ULTRACON BY 'DEWALT'		
(Fu=177 KSI, Fy=155 KSI)		
ULTRACON MAY BE HEX OR FLAT HEAD		
SUBSTRATE	Ed. = MIN. EDGE DIST.	MIN. EMBEDMENT
CONCRETE	3-1/8"	2"

CONCRETE = f'c = 3000 PSI MIN.

ALL CLIPS AND ANGLES TO FIT SNUG INTO TUBE MULLIONS (EXCEPT AS NOTED). CLIPS OR ANGLES CONNECTED DIRECTLY TO CONCRETE TO BE PROTECTED WITH ALKALI-RESISTANT COATINGS, SUCH AS BITUMINOUS PAINT OR WATER-WHITE METHACRYLATE LACQUER.

Sealed: 6/29/2026



FL #39086

AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173
TEL. (305) 264-8100 FAX. (305) 262-6978

af c

MULLION 21-45F-ESW

ALUMINUM TUBE MULLIONS

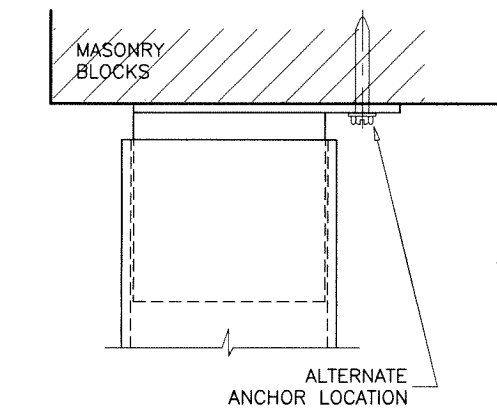
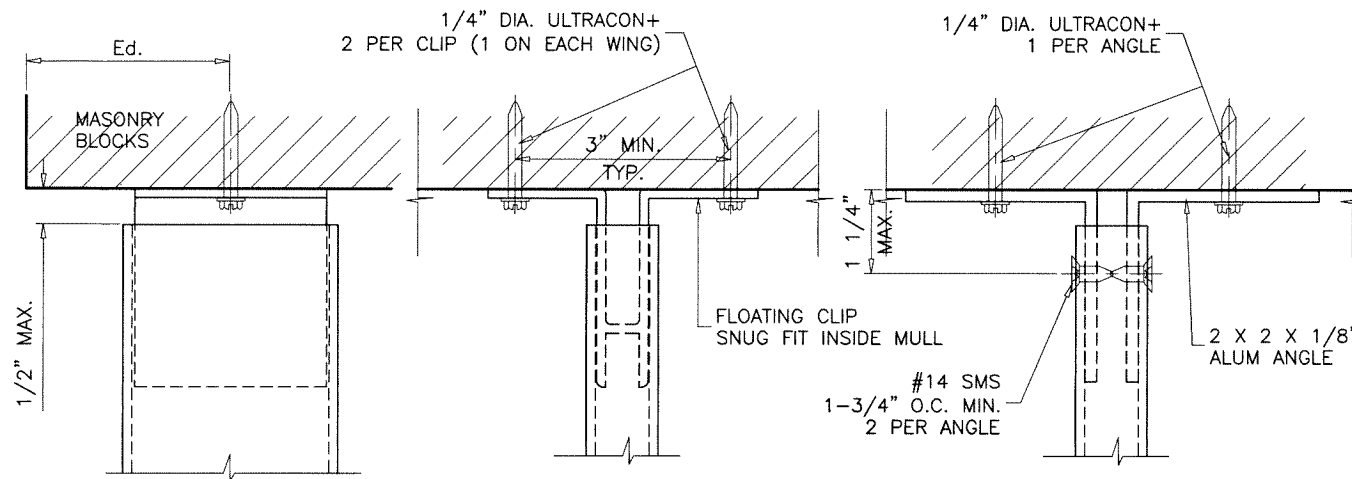
E.S. WINDOWS, LLC
3550 N.W. 49 STREET
MIAMI, FL. 33142
TEL. (305) 638-5151 FAX. (305) 638-5158

MULLION 21-45F-ESW

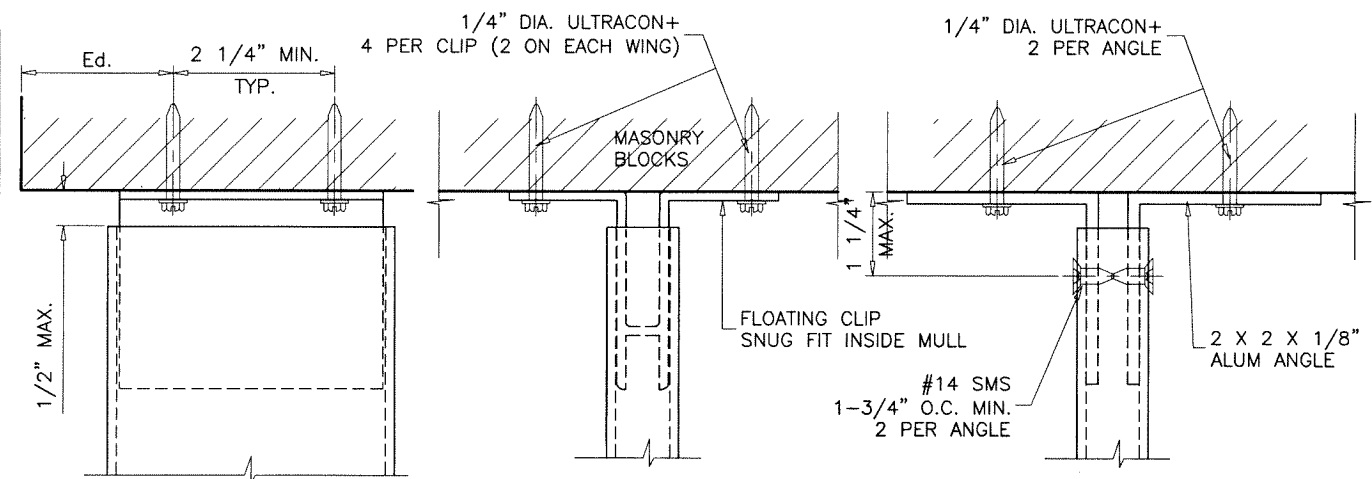
Revisions:		date		by description	
no	date	no	date	no	date

date: 05-21-21
scale: 3/8" = 1"
dr. by: TARIQ
chk. by:

drawing no.
21-45F
sheet 11 of 13



ANCHORS TYPE 'F'



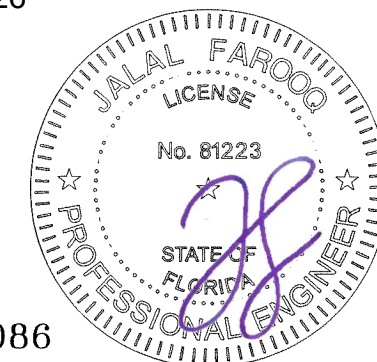
ANCHORS TYPE 'G'

1/4" DIA. ULTRACON+ BY 'DEWALT'		
(Fu=164 KSI, Fy=148 KSI)		
ULTRACON+ MAY BE HEX OR FLAT HEAD		
SUBSTRATE	Ed. = MIN. EDGE DIST.	MIN. EMBEDMENT
BLOCKS	2-1/2"	1-1/4"

C-90 HOLLOW/FILLED BLOCK f'm = 2000 PSI MIN.

ALL CLIPS AND ANGLES TO FIT SNUG INTO TUBE MULLIONS.
CLIPS OR ANGLES CONNECTED DIRECTLY TO BLOCKS TO BE PROTECTED
WITH ALKALI-RESISTANT COATINGS, SUCH AS BITUMINOUS PAINT OR
WATER-WHITE METHACRYLATE LACQUER.

Sealed: 6/29/2026



FL #39086

af c
AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173
TEL. (305) 264-8100 FAX. (305) 262-6978
(C.A.N. 3538)

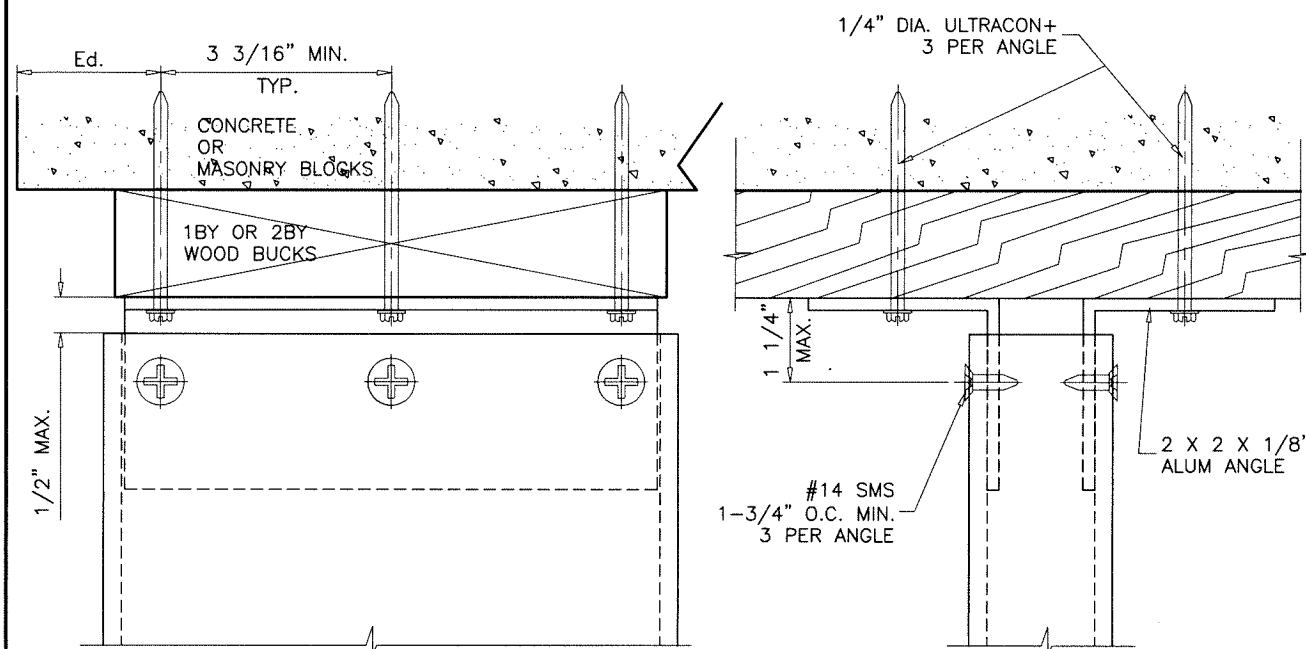
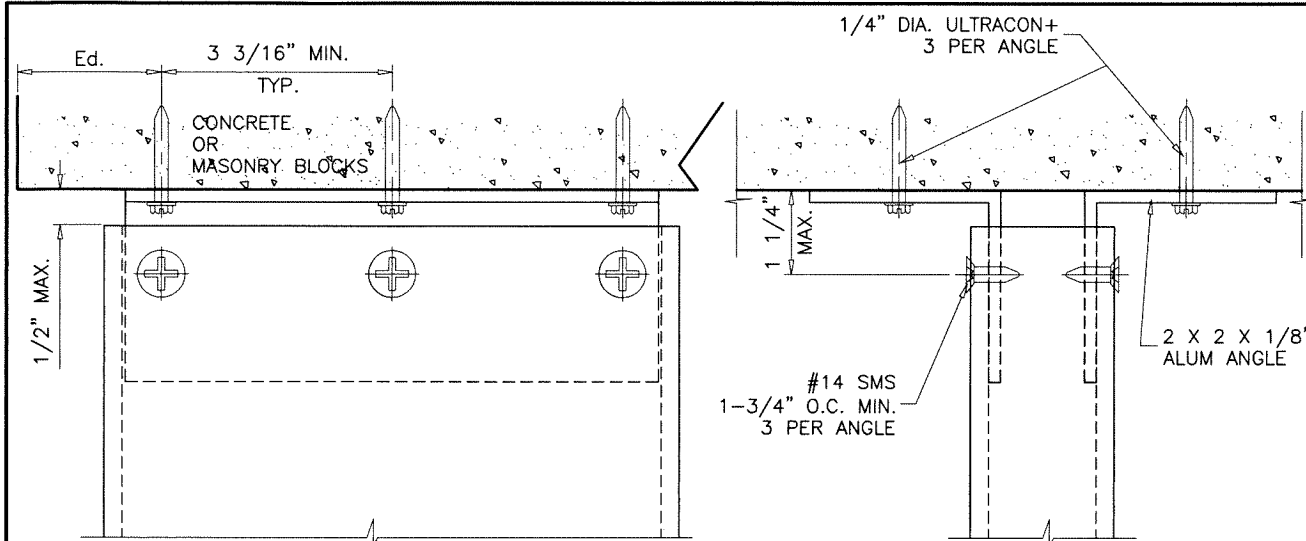
ALUMINUM TUBE MULLIONS
E.S. WINDOWS, LLC
3550 N.W. 49 STREET
MIAMI, FL. 33142
TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:	no	date	by	description

date: 05-21-21	scale: 3/8" = 1"	dr. by: TARIQ	chk. by:
----------------	------------------	---------------	----------

drawing no.
21-45F
sheet 12 of 13

MULLION 21-45F-ESW

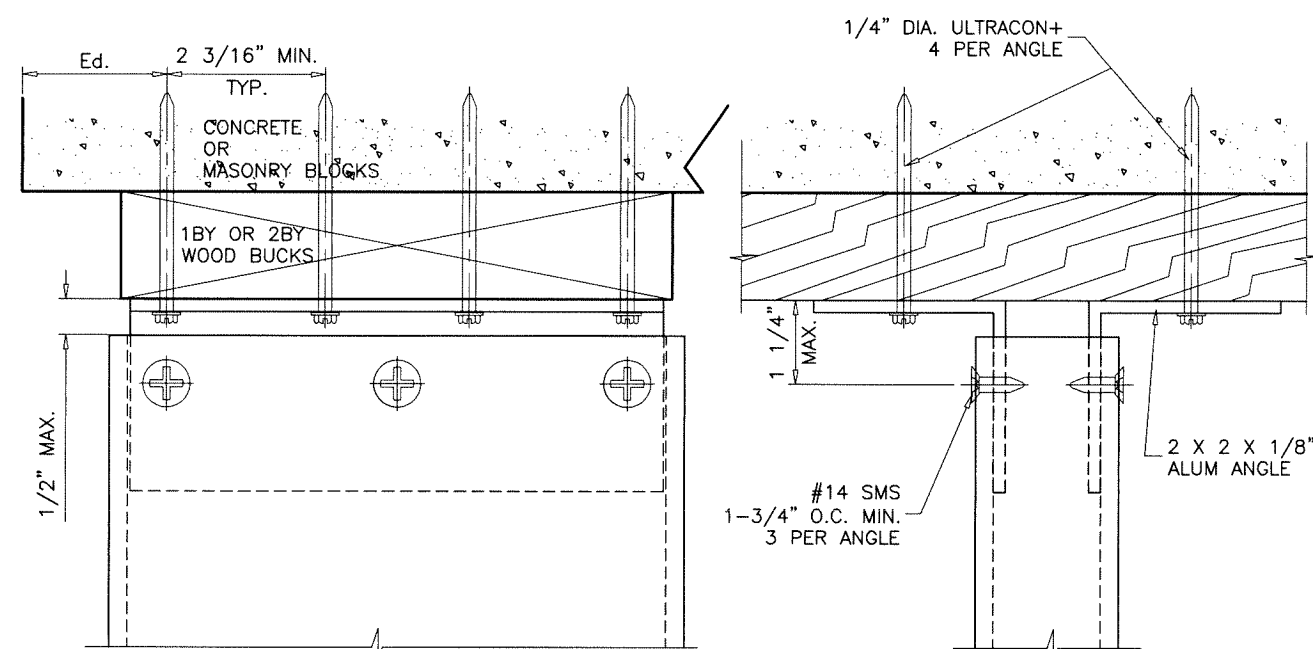
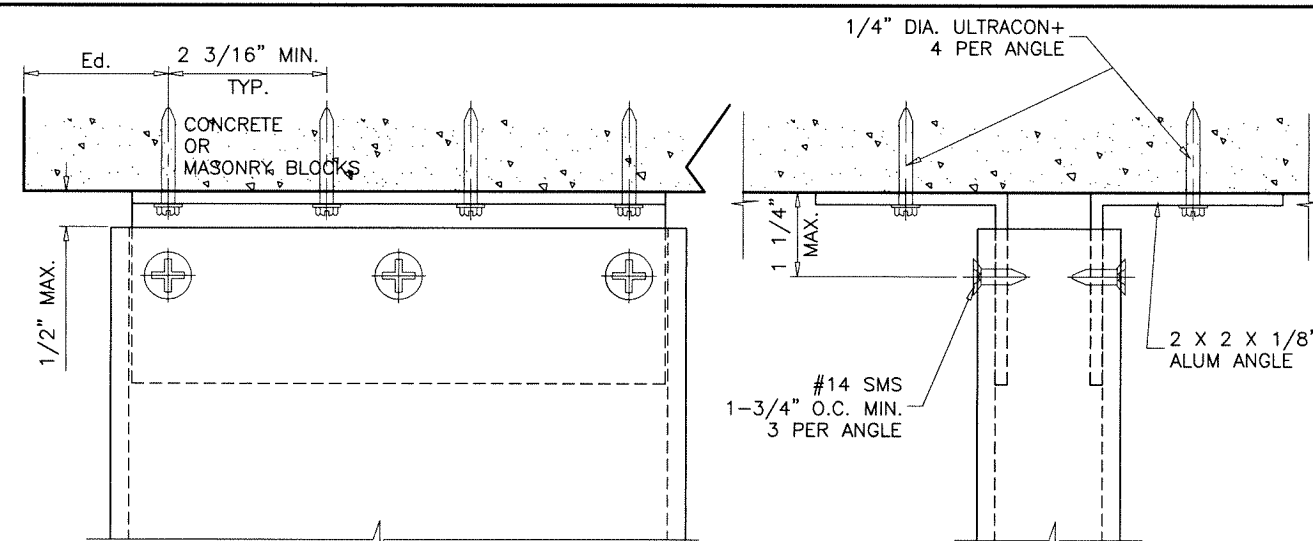


ANCHORS TYPE 'H'

1/4" DIA. ULTRACON+ BY 'DEWALT'			
(Fu=164 KSI, Fy=148 KSI)			
ULTRACON+ MAY BE HEX OR FLAT HEAD			
TYPES	SUBSTRATE	Ed. = MIN. EDGE DIST.	MIN. EMBEDMENT
HW	THRU WOOD	1"	1-1/2"
HC	CONCRETE	2-1/2"	1-3/4"
HB	BLOCK	2-1/2"	1-1/4"

WOOD = 1BY OR 2BY WOOD BUCKS S.G. = 0.55 MIN.
 CONCRETE = f'c = 3000 PSI MIN.
 C-90 HOLLOW/FILLED BLOCKS f'm = 2000 PSI MIN.

ALL ANGLES TO FIT SNUG INTO TUBE MULLIONS.
 ANGLES CONNECTED DIRECTLY TO CONCRETE/BLOCKS TO BE PROTECTED
 WITH ALKALI-RESISTANT COATINGS, SUCH AS BITUMINOUS PAINT OR
 WATER-WHITE METHACRYLATE LACQUER.

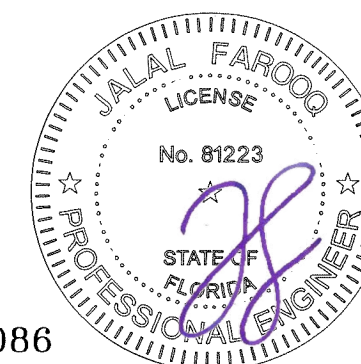


ANCHORS TYPE 'i'

1/4" DIA. ULTRACON+ BY 'DEWALT'			
(Fu=164 KSI, Fy=148 KSI)			
ULTRACON+ MAY BE HEX OR FLAT HEAD			
TYPES	SUBSTRATE	Ed. = MIN. EDGE DIST.	MIN. EMBEDMENT
iW	THRU WOOD	1"	1-1/2"
iC	CONCRETE	2-1/2"	1-3/4"
iB	BLOCK	2-1/2"	1-1/4"

WOOD = 1BY OR 2BY WOOD BUCKS S.G. = 0.55 MIN.
 CONCRETE = f'c = 3000 PSI MIN.
 C-90 HOLLOW/FILLED BLOCKS f'm = 2000 PSI MIN.

Sealed: 6/29/2026



FL #39086

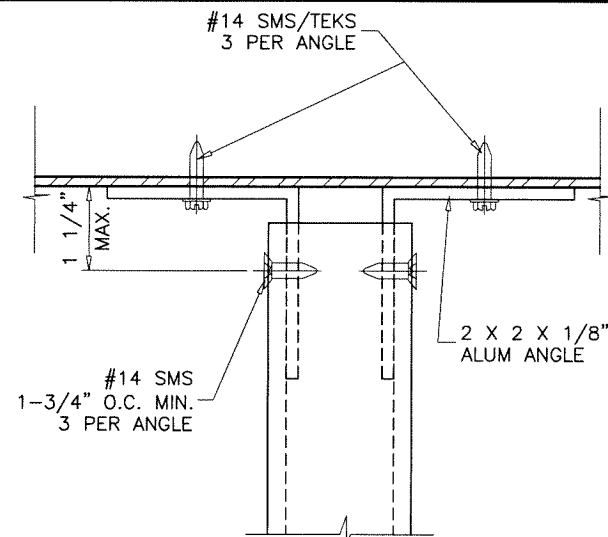
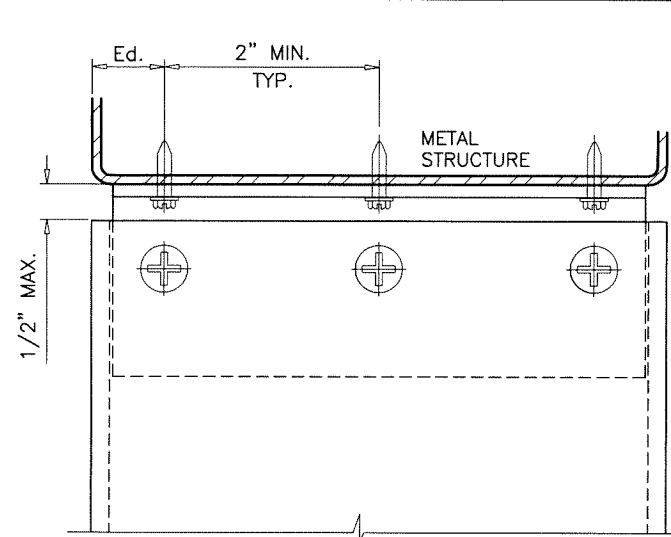
AL-FAROOQ CORPORATION
 ENGINEERS & PRODUCT DEVELOPMENT
 9360 SUNSET DRIVE, SUITE 220
 MIAMI, FLORIDA 33173
 TEL. (305) 264-8100 FAX. (305) 262-6978
 C.A.N. 3538

ALUMINUM TUBE MULLIONS
E.S. WINDOWS, LLC
 3550 N.W. 49 STREET
 MIAMI, FL. 33142
 TEL. (305) 638-5151 FAX. (305) 638-5158

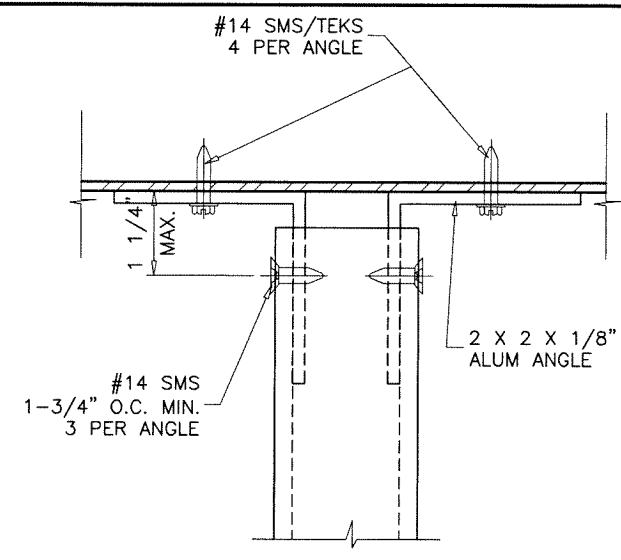
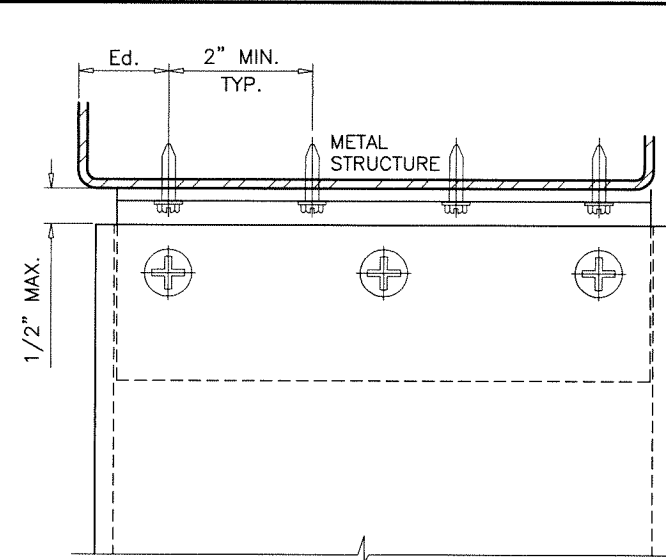
revisions:	no	date	by	description

date: 05-21-21
 scale: 3/8" = 1"
 dr. by: TARIQ
 chk. by:

drawing no.
21-45F
 sheet 12.1 of 13



ANCHORS TYPE 'J'

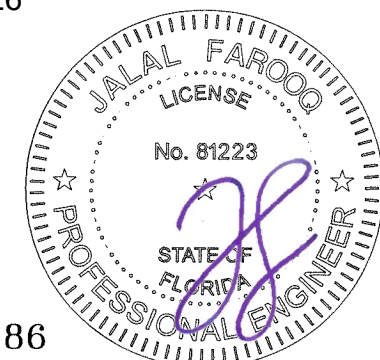


ANCHORS TYPE 'K'

#14 SMS/TEKS		
SUBSTRATE	Ed. = MIN. EDGE DIST.	MIN. CL TO CL SPACING
METAL	5/8"	2"

METAL = 1/8" MIN. THK. STEEL $F_y = 36$ KSI MIN.
1/8" MIN. THK. ALUMINUM (6063-T6 MIN.)

Sealed: 6/29/2026



FL #39086

af c
AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173
TEL. (305) 262-6978 FAX. (305) 262-6978
(C.A.N. 3538)

ALUMINUM TUBE MULLIONS
E.S. WINDOWS, LLC
3550 N.W. 49 STREET
MIAMI, FL. 33142
TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:		by description
no	date	

date: 05-21-21
scale: 3/8" = 1"
dr. by: TARIQ
chk. by:

drawing no.
21-45F

sheet 12.2 of 13

MULLION 21-45F-ESW

DESIGN LOAD CAPACITY - PSF					
WINDOW DIMS.		ANCHORS QUANTITY			
WIDTH (W)	MULL SPAN	2	3	4	6
19-1/8"	38-3/8"	150.0	150.0	150.0	150.0
26-1/2"		150.0	150.0	150.0	150.0
30"		150.0	150.0	150.0	150.0
37"		150.0	150.0	150.0	150.0
42"		136.9	150.0	150.0	150.0
48"		119.8	150.0	150.0	150.0
54"		106.5	150.0	150.0	150.0
60"		95.8	143.7	150.0	150.0
66"		87.1	130.7	150.0	150.0
72"		79.8	119.8	150.0	150.0
19-1/8"	50-5/8"	150.0	150.0	150.0	150.0
26-1/2"		150.0	150.0	150.0	150.0
30"		145.3	150.0	150.0	150.0
37"		117.8	150.0	150.0	150.0
42"		103.8	150.0	150.0	150.0
48"		90.8	136.2	150.0	150.0
54"		80.7	121.0	150.0	150.0
60"		72.6	108.9	145.3	150.0
66"		66.0	99.0	132.1	150.0
72"		60.5	90.8	121.0	150.0
96"	54"	-	-	85.1	127.7
19-1/8"	58"	150.0	150.0	150.0	150.0
26-1/2"		143.5	150.0	150.0	150.0
30"		126.8	150.0	150.0	150.0
37"		102.8	150.0	150.0	150.0
42"		90.6	135.8	150.0	150.0
48"		79.2	118.9	150.0	150.0
54"		70.4	105.7	140.9	150.0
60"		63.4	95.1	126.8	150.0
66"		57.6	86.4	115.3	150.0
72"		52.8	79.2	105.7	150.0
19-1/8"	63"	150.0	150.0	150.0	150.0
26-1/2"		132.1	150.0	150.0	150.0
30"		116.7	150.0	150.0	150.0
37"		94.6	142.0	150.0	150.0
42"		83.4	125.1	150.0	150.0
48"		73.0	109.4	145.9	150.0
54"		64.8	97.3	129.7	150.0
60"		58.4	87.5	116.7	150.0
66"		53.1	79.6	106.1	150.0
72"		48.6	73.0	97.3	145.9
19-1/8"	74-1/4"	150.0	150.0	150.0	150.0
26-1/2"		112.1	150.0	150.0	150.0
30"		99.0	148.6	150.0	150.0
37"		80.3	120.5	150.0	150.0
42"		70.7	106.1	141.5	150.0
48"		61.9	92.8	123.8	150.0
54"		55.0	82.5	110.0	150.0
60"		49.5	74.3	99.0	148.6
66"		45.0	67.5	90.0	135.1
72"		41.3	61.9	82.5	123.8

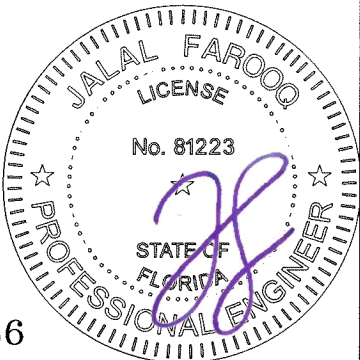
DESIGN LOAD CAPACITY - PSF					
WINDOW DIMS.		ANCHORS QUANTITY			
WIDTH (W)	MULL SPAN	2	3	4	6
19-1/8"	84"	137.3	150.0	150.0	150.0
26-1/2"		99.1	148.7	150.0	150.0
30"		87.5	131.3	150.0	150.0
37"		71.0	106.5	142.0	150.0
42"		62.5	93.8	125.1	150.0
48"		54.7	82.1	109.4	150.0
54"		48.6	73.0	97.3	145.9
60"		43.8	65.7	87.5	131.3
66"		39.8	59.7	79.6	119.4
72"		36.5	54.7	73.0	109.4
19-1/8"	96"	120.2	150.0	150.0	150.0
26-1/2"		86.7	130.1	150.0	150.0
30"		76.6	114.9	150.0	150.0
37"		62.1	93.2	124.2	150.0
42"		54.7	82.1	109.4	150.0
48"		47.9	71.8	95.8	143.6
54"		42.6	63.8	85.1	127.7
60"		38.3	57.5	76.6	114.9
66"		34.8	52.2	69.6	104.5
72"		31.9	47.9	63.8	95.8
19-1/8"	108"	106.8	150.0	150.0	150.0
26-1/2"		77.1	115.6	150.0	150.0
30"		68.1	102.1	136.2	150.0
37"		55.2	82.8	110.4	150.0
42"		48.6	73.0	97.3	145.9
48"		42.6	63.8	85.1	127.7
54"		37.8	56.7	75.7	113.5
60"		34.0	51.1	68.1	102.1
66"		30.9	46.4	61.9	92.8
72"		28.4	42.6	56.7	85.1
19-1/8"	120"	96.1	144.2	150.0	150.0
26-1/2"		69.4	104.1	138.7	150.0
30"		61.3	91.9	122.6	150.0
37"		49.7	74.5	99.4	149.1
42"		43.8	65.7	87.5	131.3
48"		38.3	57.5	76.6	114.9
54"		34.0	51.1	68.1	102.1
60"		30.6	46.0	61.3	91.9
66"		27.9	41.8	55.7	83.6
72"		25.5	38.3	51.1	76.6
19-1/8"	132"	87.4	131.1	150.0	150.0
26-1/2"		63.1	94.6	126.1	150.0
30"		55.7	83.6	111.4	150.0
37"		45.2	67.8	90.3	135.5
42"		39.8	59.7	79.6	119.4
48"		34.8	52.2	69.6	104.5
54"		30.9	46.4	61.9	92.8
60"		27.9	41.8	55.7	83.6
66"		25.3	38.0	50.6	76.0
72"		23.2	34.8	46.4	69.6

DESIGN LOAD CAPACITY - PSF					
WINDOW DIMS.		ANCHORS QUANTITY			
WIDTH (W)	MULL SPAN	2	3	4	6
19-1/8"	144"	80.1	120.2	150.0	150.0
26-1/2"		57.8	86.7	115.6	150.0
30"		51.1	76.6	102.1	150.0
37"		41.4	62.1	82.8	124.2
42"		36.5	54.7	73.0	109.4
48"		31.9	47.9	63.8	95.8
54"		28.4	42.6	56.7	85.1
60"		25.5	38.3	51.1	76.6
66"		23.2	34.8	46.4	69.6
72"		21.3	31.9	42.6	63.8

ALL LOADS ARE EXT.(+)/INT.(-).
SEE SHEET 13.1 FOR CONNECTION DETAILS

ANCHORS

Sealed: 6/29/2026



FL #39086

AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173
TEL. (305) 264-8100 FAX. (305) 262-6978
(C.A.N. 3538)

ALUMINUM TUBE MULLIONS

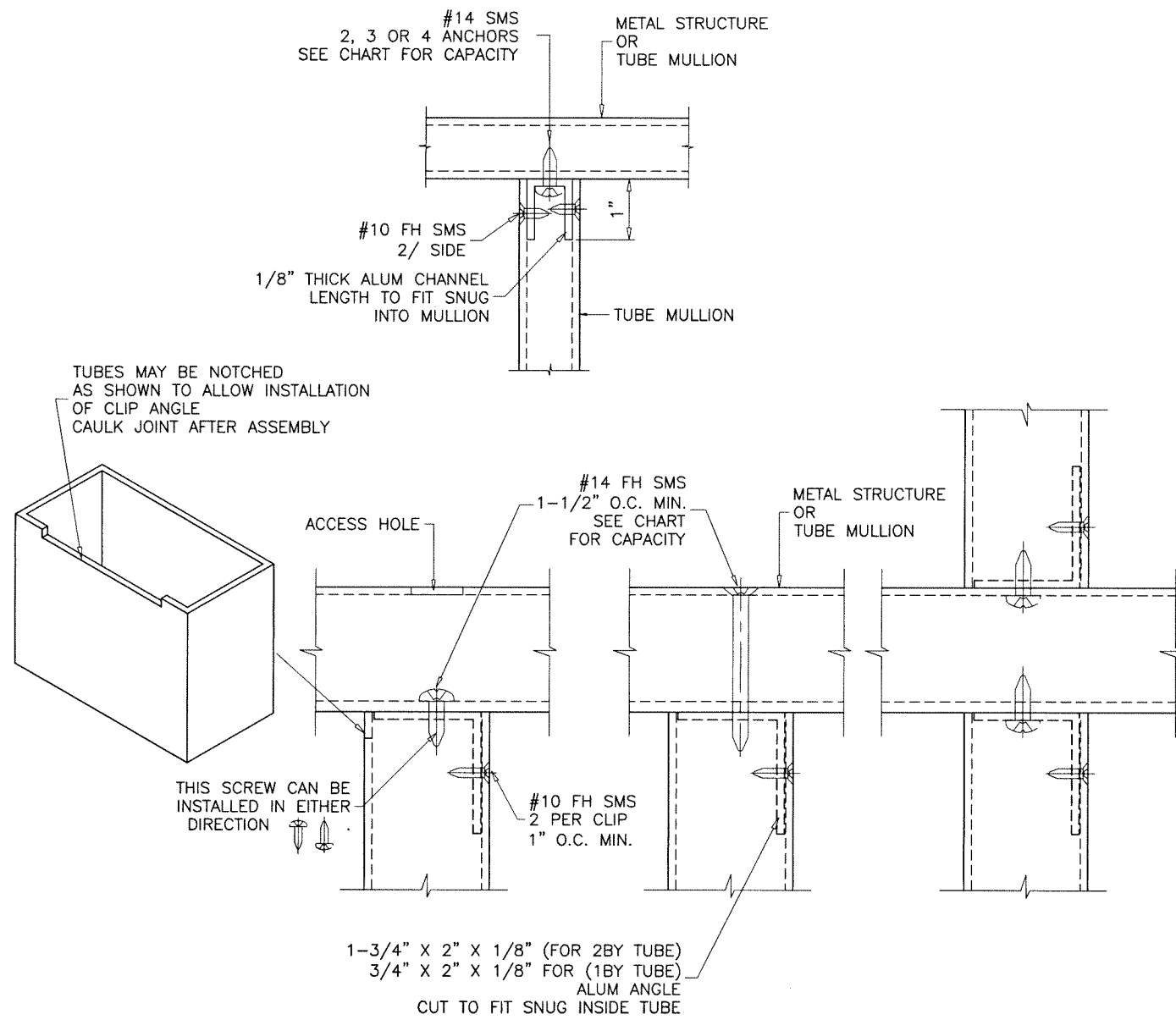
E.S. WINDOWS, LLC
3550 N.W. 49 STREET
MIAMI, FL. 33142
TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:

no	date	by	description

date: 05-21-21
scale: 3/8" = 1"
dr. by: TARIQ
chk. by:

drawing no.
21-45F
sheet 13 of 13

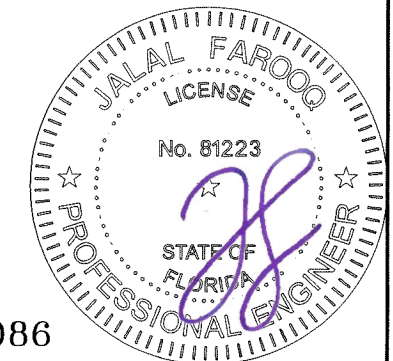
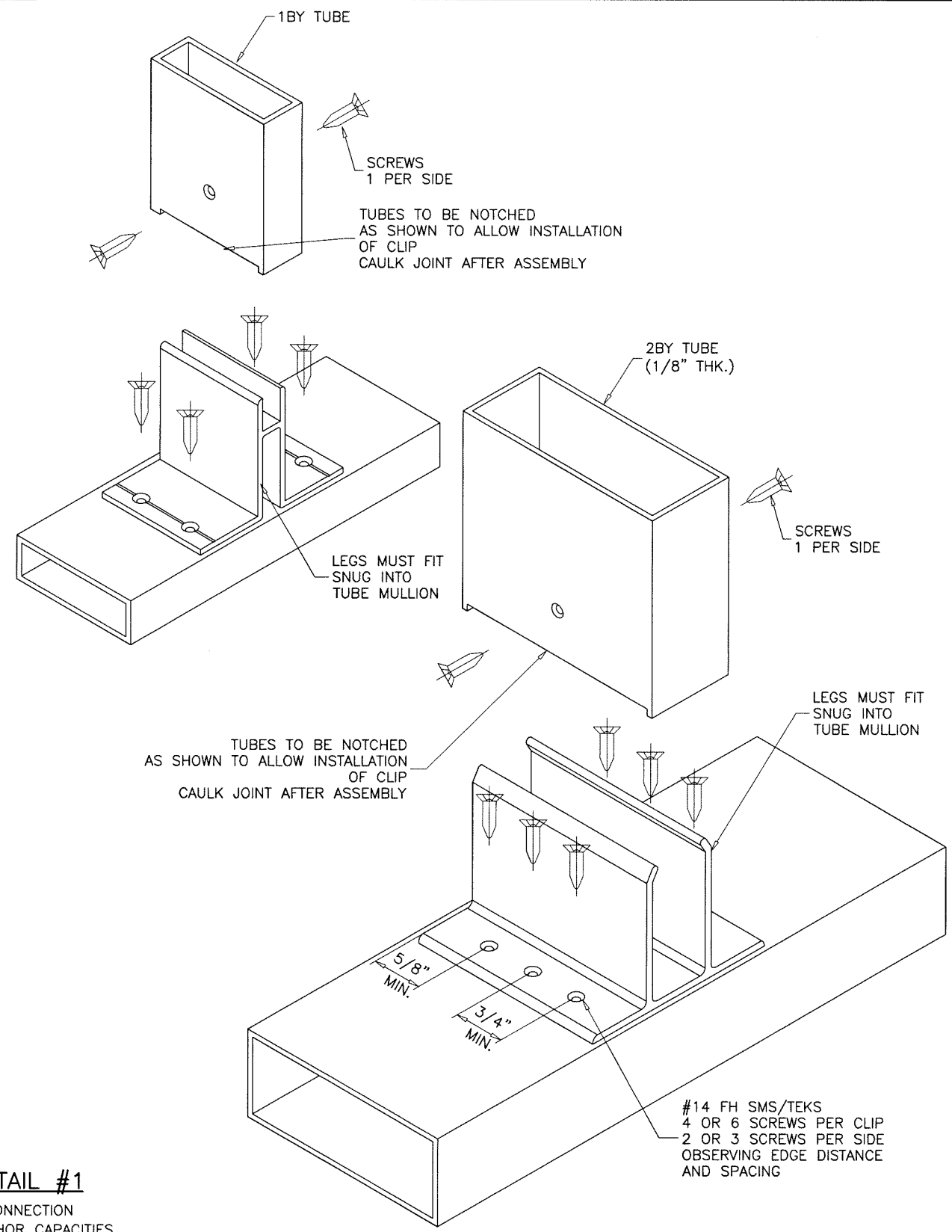


ANCHORS DETAIL #1

METAL TO METAL CONNECTION
SEE SHEET 13 FOR ANCHOR CAPACITIES

#14 SMS/TEKS		
SUBSTRATE	Ed. = MIN. EDGE DIST.	MIN. CL TO CL SPACING
METAL	5/8"	1/2"

METAL = 1/8" MIN. THK. STEEL Fy = 36 KSI MIN.
1/8" MIN. THK. ALUMINUM (6063-T6 MIN.)



Sealed: 6/29/2026

FL #39086

AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173
TEL. (305) 264-8100 FAX. (305) 262-6978

af c

(C.A.N. 3538)

MULLION\21-45F-ESW

ALUMINUM TUBE MULLIONS

E.S. WINDOWS, LLC
3550 N.W. 49 STREET
MIAMI, FL. 33142
TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:

no	date	by	description

date: 05-21-21
scale: 3/8" = 1"
dr. by: TARIQ
chk. by:

drawing no.
21-45F
sheet 13.1 of 13