

ES-8860i
ALUMINUM WINDOW WALL SYSTEM

THIS SYSTEM MAY BE USED IN CONJUNCTION WITH F.B.C. APPR'D
LARGE MISSILE IMPACT RESISTANT DOORS.

LOWER DESIGN PRESSURE FROM WINDOW WALL OR DOOR APPROVAL
WILL APPLY TO ENTIRE SYSTEM.

THIS PRODUCT HAS BEEN DESIGNED AND TESTED TO COMPLY WITH THE
REQUIREMENTS OF THE 2020 (7TH EDITION)/2023 (8TH EDITION) FLORIDA
BUILDING CODE INCLUDING HIGH VELOCITY HURRICANE ZONE (HVHZ).

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.

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 2020/2023 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)'.

INSTRUCTIONS:

USE CHARTS AS FOLLOWS.

- STEP 1** DETERMINE DESIGN WIND PRESSURE REQUIREMENTS BASED
ON WIND VELOCITY, BLDG. HEIGHT, WIND ZONE USING
APPLICABLE ASCE 7 STANDARD.
- STEP 2** SEE CHARTS ON SHEET 3 FOR GLASS DESIGN LOAD
CAPACITY.
- STEP 3** CHECK MULLION DESIGN LOAD CAPACITY FOR A GIVEN
SPACING AND HEIGHT USING CHARTS ON SHEET 4
THE CAPACITY SHOULD EXCEED THE DESIGN LOAD.
- STEP 4** THE LOWEST VALUE RESULTING FROM STEPS 2 AND 3
THAT EXCEED THE DESIGN WIND PRESSURES DETERMINED
THRU STEP 1 SHALL APPLY TO ENTIRE SYSTEM.
- STEP 5** FOR UNANCHORED JAMBS, USING SHEET 6, DETERMINE
THE MIN. & MAX. GAP DIMENSIONS.
- STEP 6** WHEN USING THIS SYSTEM WITH DOORS, THE LOWER
VALUE OF THE DESIGN PRESSURE RATING FOR THE
SYSTEM AND THE DOOR SHALL APPLY.

NOTE:
GLASS CAPACITIES ARE BASED ON
ASTM E1300-09 (3 SEC. GUSTS).

THIS SYSTEM IS RATED FOR LARGE & SMALL MISSILE IMPACT.
SHUTTERS ARE NOT REQUIRED.

PRODUCT COMPLIES WITH REQUIREMENTS OF ANSI Z97.1.

INSUL. LAM. GLASS
LARGE MISSILE IMPACT

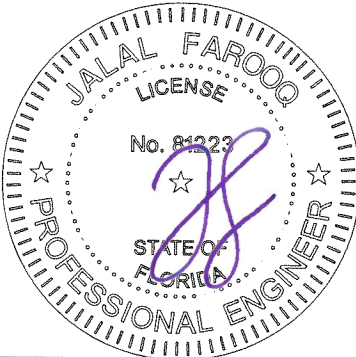
Sealed: 8/1/2023 FL #29877

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.

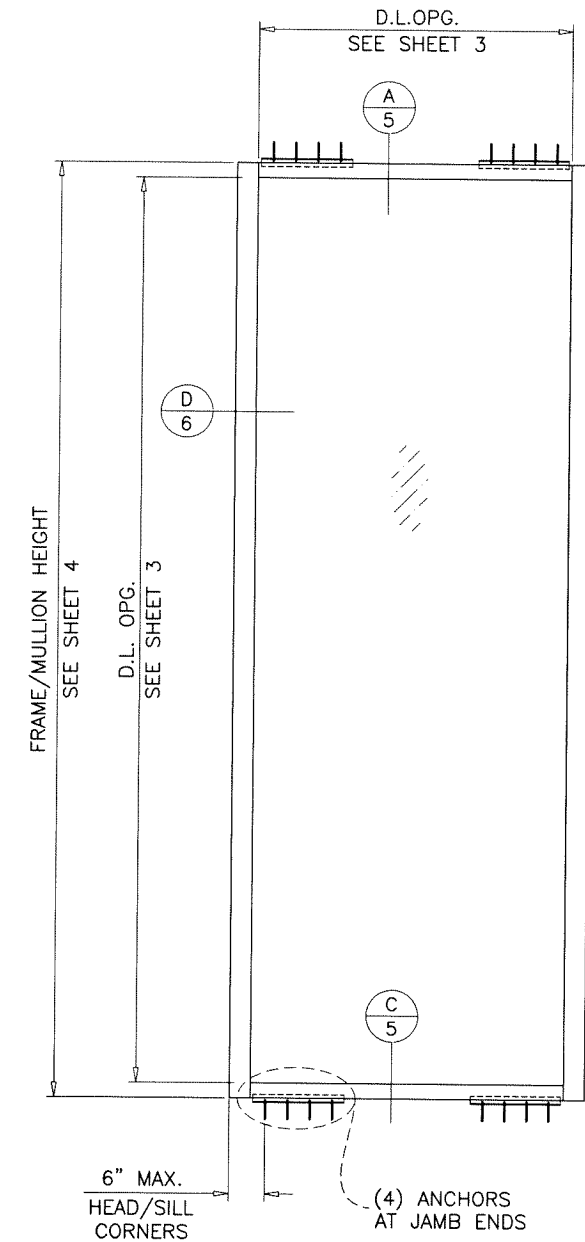
B- THIS PRODUCT EVALUATION DOCUMENT WILL BE CONSIDERED INVALID IF
ALTERED BY ANY MEANS.

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.



a f 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	
STORE \ 19-11F-ES	
ES-8860i ALUMINUM WINDOW WALL SYSTEM (L.M.I.)	
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
A	10.09.20 UPDATED TO 2020 FBC
B	07.31.23 UPDATED TO 2023 FBC
date: 02-25-19	
scale: 3/8"=1'-0"	
dr. by: TARIO	
chk. by:	
drawing no. 19-11F	
sheet 1 of 9	



SINGLE 'O' PANEL:
 FRAME WIDTH = D.L.O. WIDTH + 7.00"
 FRAME HEIGHT = D.L.O. HEIGHT + 5.00"

A circular professional engineer seal for the State of Florida. The outer ring contains the text "JALAL FAROOQ" at the top and "PROFESSIONAL ENGINEER" at the bottom, separated by two stars on each side. Inside this ring, the word "LICENSE" is at the top, "No. 84523" is in the center, and "STATE OF FLORIDA" is at the bottom, also separated by two stars. A large, stylized purple signature is written across the center of the seal, overlapping the license number and the state name.

date:	02-25-19
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dfr. by:	TARIQ
chk. by:	

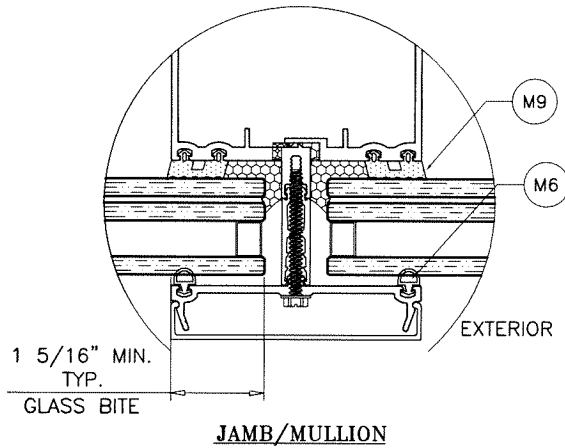
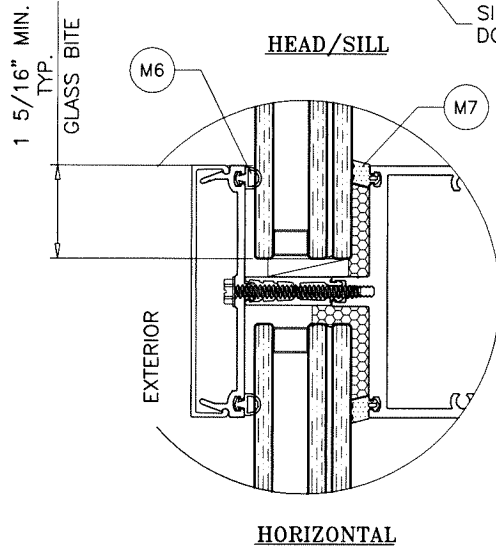
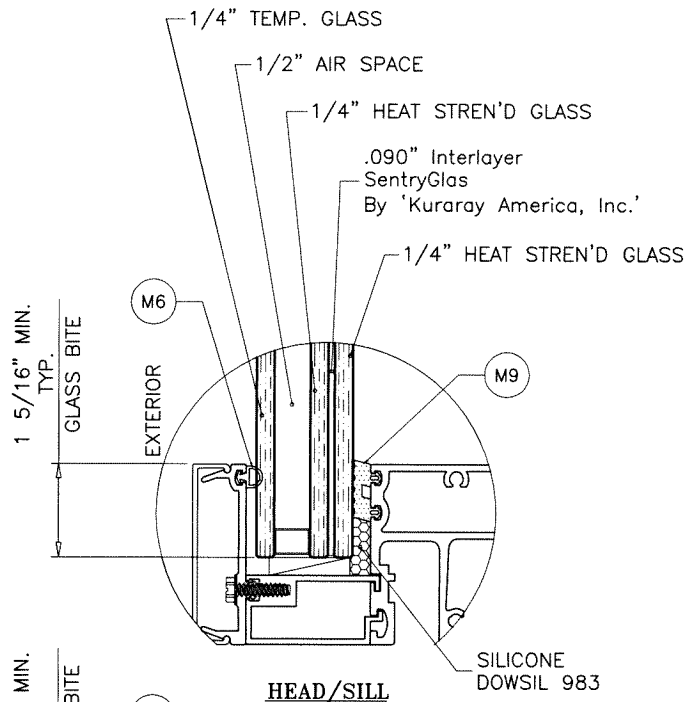
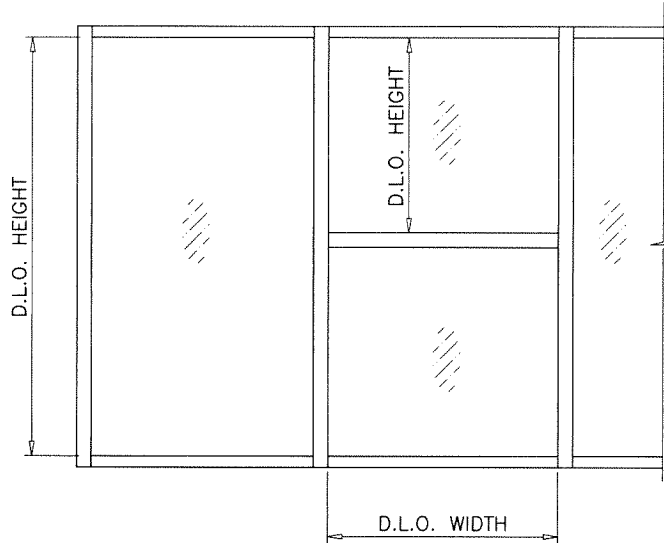
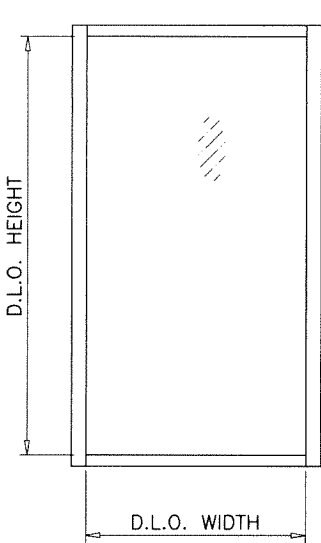
drawing no.

19-11F

sheet 2 of 9

DESIGN LOAD CAPACITY - PSF			
NOMINAL DIMS.		1-5/16" INSUL. LAM. GLASS	
D.L.O. WIDTH	D.L.O. HEIGHT	EXT.(+)	INT.(-)
23"	115"	55.0	55.0
29"		55.0	55.0
35"		55.0	55.0
41"		55.0	55.0
47"		55.0	55.0
49"		55.0	55.0
53"		51.3	51.3
59"		46.7	46.7
65"		42.8	42.8
23"	121"	55.0	55.0
29"		55.0	55.0
35"		55.0	55.0
41"		55.0	55.0
47"		55.0	55.0
49"		55.0	55.0
53"		51.3	51.3
59"		46.7	46.7
23"	127"	55.0	55.0
29"		55.0	55.0
35"		55.0	55.0
41"		55.0	55.0
47"		55.0	55.0
49"		55.0	55.0
53"		51.3	51.3
59"		46.7	46.7
23"	133"	55.0	55.0
29"		55.0	55.0
35"		55.0	55.0
41"		55.0	55.0
47"		55.0	55.0
49"		55.0	55.0
53"		51.3	51.3
59"		46.7	46.7
23"	139"	55.0	55.0
29"		55.0	55.0
35"		55.0	55.0
41"		55.0	55.0
47"		55.0	55.0
49"		55.0	55.0
53"		51.3	51.3
59"		46.7	46.7
23"	145"	55.0	55.0
29"		55.0	55.0
35"		55.0	55.0
41"		55.0	55.0
47"		55.0	55.0
49"		55.0	55.0
53"		51.3	51.3
59"		46.7	46.7
23"	151"	55.0	55.0
29"		55.0	55.0
35"		55.0	55.0
41"		55.0	55.0
47"		55.0	55.0
49"		55.0	55.0
53"		51.3	51.3
59"		46.7	46.7

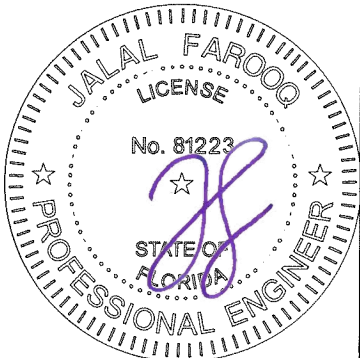
INTERPOLATION BETWEEN WIDTHS OR HEIGHTS ALLOWED.



GLAZING DETAILS
1-5/16" INSUL. LAM. GLASS

Sealed: 8/1/2023

GLASS



afcc

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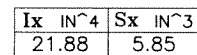
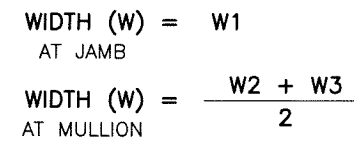
revisions:
no. date by description

date: 02-25-19
scale: -
dr. by: TARIQ
chk. by:

drawing no.
19-11F
sheet **3** of **9**

STORE 19-11F-ES

NOMINAL DIMS.		JAMB 'J1' MULLION 'M1'	
WIDTH (W)	FRAME HEIGHT	EXT.(+)	INT.(−)
30"	120"	55.0	55.0
36"		55.0	55.0
42"		55.0	55.0
48"		55.0	55.0
54"		55.0	55.0
56"		55.0	55.0
60"		55.0	55.0
66"		55.0	55.0
72"		55.0	55.0
30"	126"	55.0	55.0
36"		55.0	55.0
42"		55.0	55.0
48"		55.0	55.0
54"		55.0	55.0
56"		55.0	55.0
60"		55.0	55.0
66"		55.0	55.0
30"	132"	55.0	55.0
36"		55.0	55.0
42"		55.0	55.0
48"		55.0	55.0
54"		55.0	55.0
56"		55.0	55.0
60"		55.0	55.0
66"		55.0	55.0
30"	138"	55.0	55.0
36"		55.0	55.0
42"		55.0	55.0
48"		55.0	55.0
54"		55.0	55.0
56"		55.0	55.0
60"		55.0	55.0
30"	144"	55.0	55.0
36"		55.0	55.0
42"		55.0	55.0
48"		55.0	55.0
54"		55.0	55.0
56"		55.0	55.0
60"		55.0	55.0
30"	150"	55.0	55.0
36"		55.0	55.0
42"		55.0	55.0
48"		55.0	55.0
54"		55.0	55.0
56"		55.0	55.0
30"	156"	55.0	55.0
36"		55.0	55.0
42"		55.0	55.0
48"		55.0	55.0
54"		55.0	55.0
56"		54.1	54.1



INTERPOLATION BETWEEN WIDTHS OR HEIGHTS ALLOWED.

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MULLION

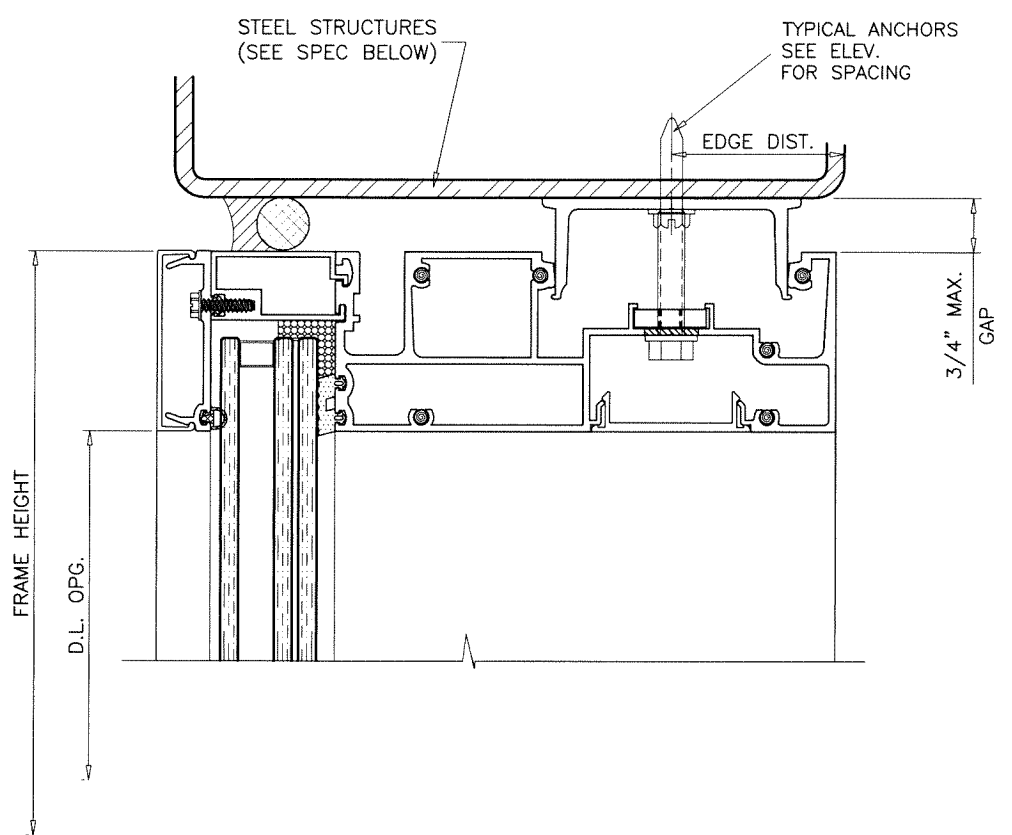
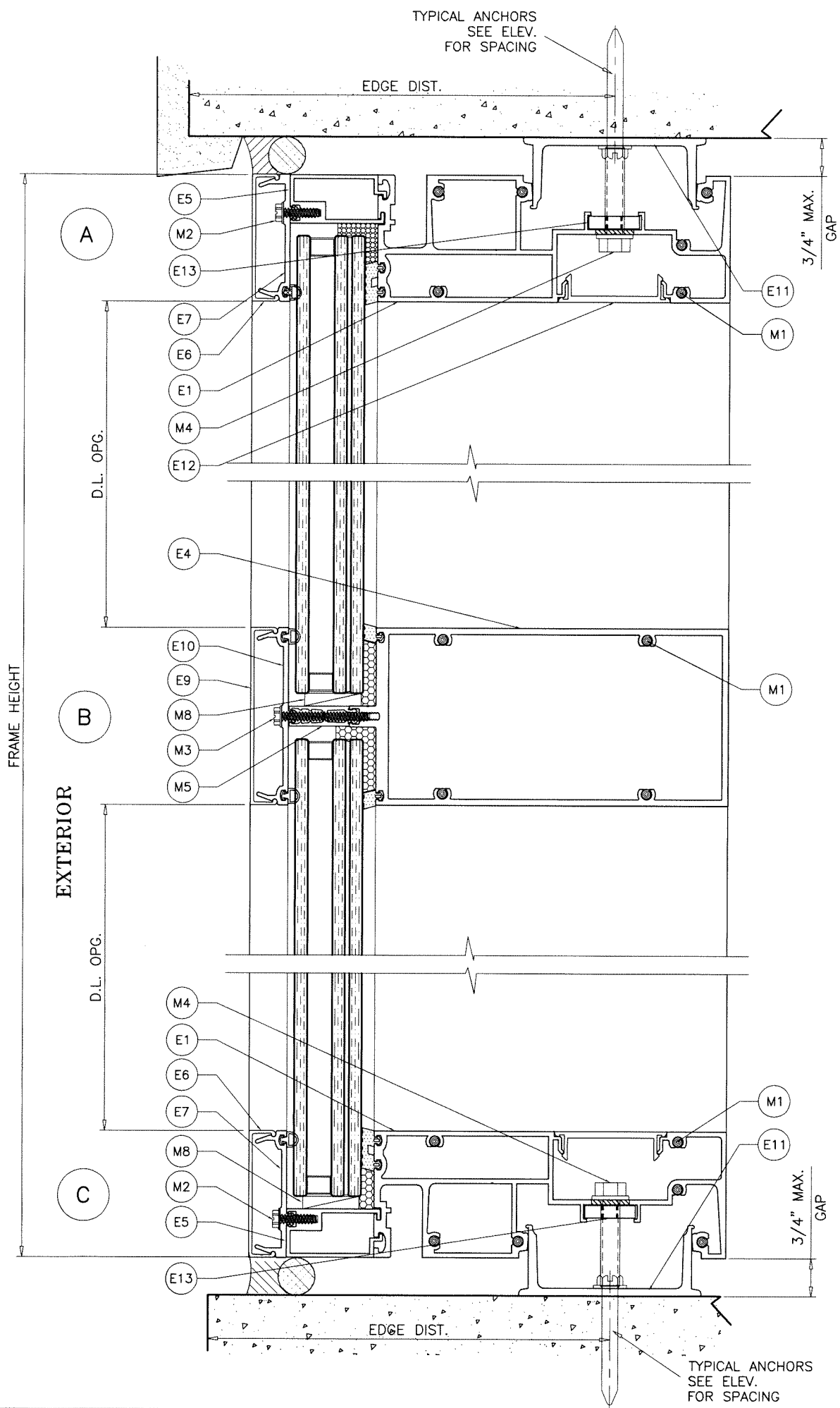
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chk. by:	

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drawing no. **19-11F**

sheet **4** of **9**

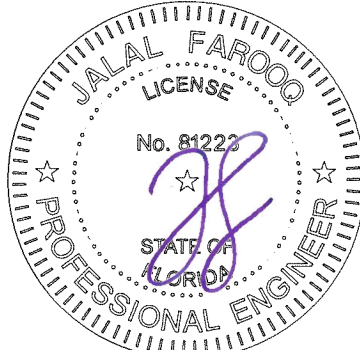
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METAL STRUCTURES NOT BY 'E.S. WDW.'
MUST SUPPORT LOADS IMPOSED BY GLAZING SYSTEM AND
TRANSFER THEM TO THE BUILDING STRUCTURE.

TYPICAL ANCHORS: SEE ELEV. FOR SPACING
5/16" DIA ULTRACON BY 'DEWALT' (Fu=177 KSI, Fy=155 KSI)
 DIRECTLY INTO CONCRETE (3000 PSI MIN.)
 WITH 1-3/4" MIN. EMBED INTO CONCRETE
ANCHOR EDGE DISTANCES
 INTO CONCRETE = 2-1/2" MIN.
5/16" DIA. DRIL-FLEX SELF DRILLING SCREWS BY 'DEWALT' (GRADE 5 CRS)
 INTO METAL STRUCTURES
 (3) THREADS MIN. PENETRATION BEYOND SUBSTRATE
 STEEL: 3/16" THK. MIN. (Fy = 36 KSI MIN.)
 (STEEL IN CONTACT WITH ALUMINUM TO BE PLATED OR PAINTED)
ANCHOR EDGE DISTANCES
 INTO METAL STRUCTURE = 1" MIN.

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STORE 19-11F-ES

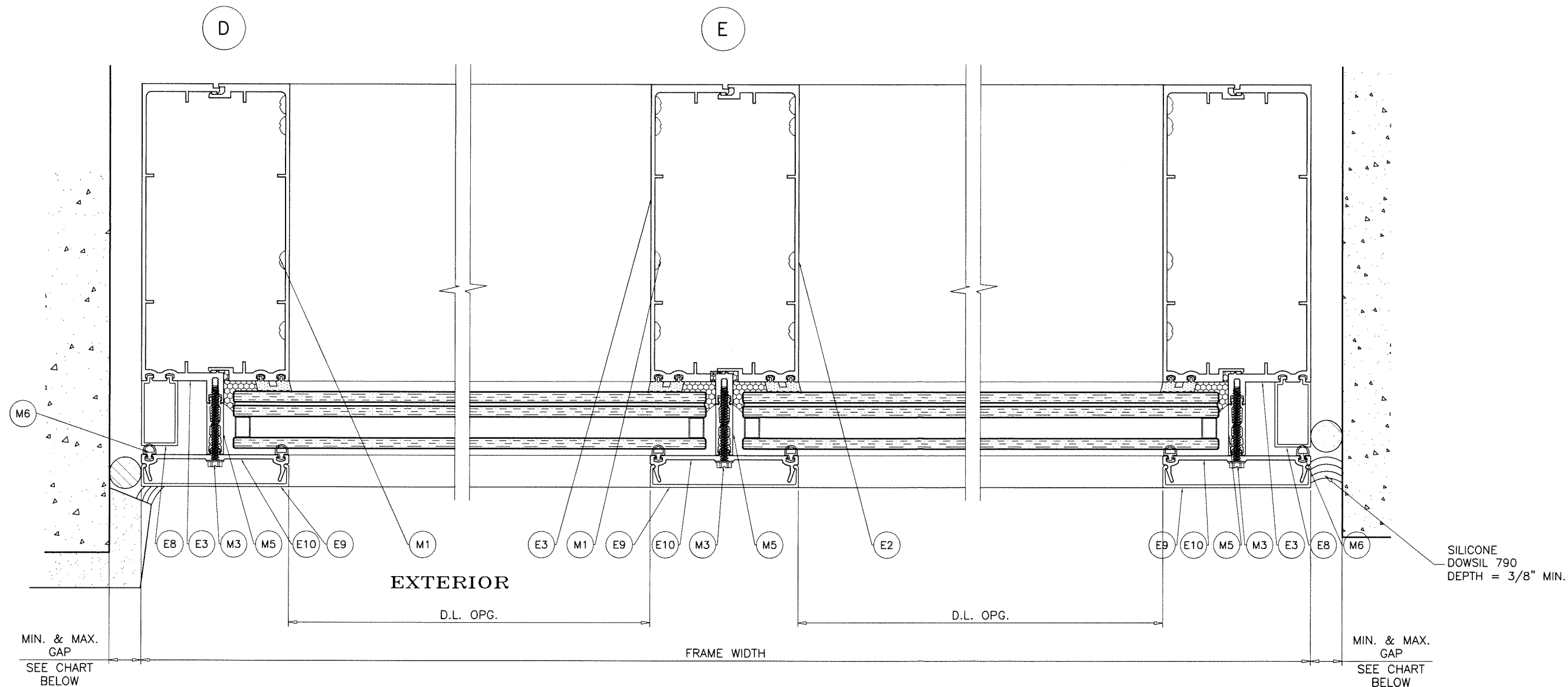
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19-11F
sheet 5 of 9



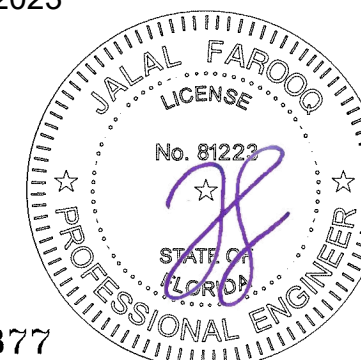
MAX. FRAME HEIGHT	GAP	
	MIN.	MAX.
120"	7/16"	3/4"
156"	1/2"	3/4"

NOTE:
 MAX. MOVEMENT CONSIDERED=100% STRETCH.
 PLEASE REFER TO SEALANT MANUFACTURER'S DATA AND APPLICATION MANUAL FOR COMPATABILITY OF SEALANT TO SUBSTRATE & WINDOWALL MATERIAL/FINISH AND COMPLIANCE FOR WARRANTY.
 REFER TO ACI-117-10 FOR CONSTRUCTION TOLERANCES.

ALTERNATE SEALANTS AT JAMB GAPS CAN BE DESIGNED BY ENGINEER OF RECORD BASED ON MANUFACTURER GUIDE LINES.

GAPS LESS THAN 1/4" MAY BE DESIGNED BY ENGINEER OF RECORD BY THE USE OF BOND BREAKER TAPE OR 15% OF GAP ALLOWED MOVEMENT.

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STORE \ 19-11F-ES

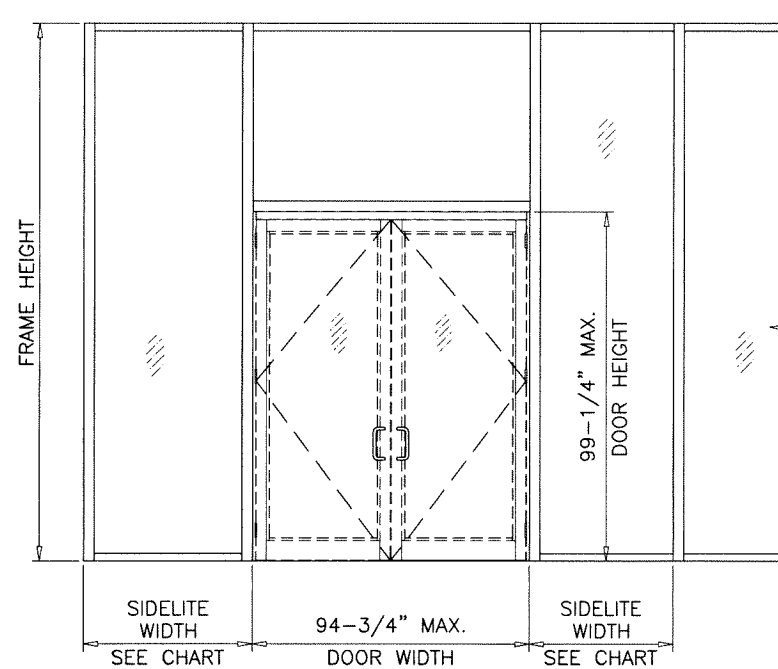
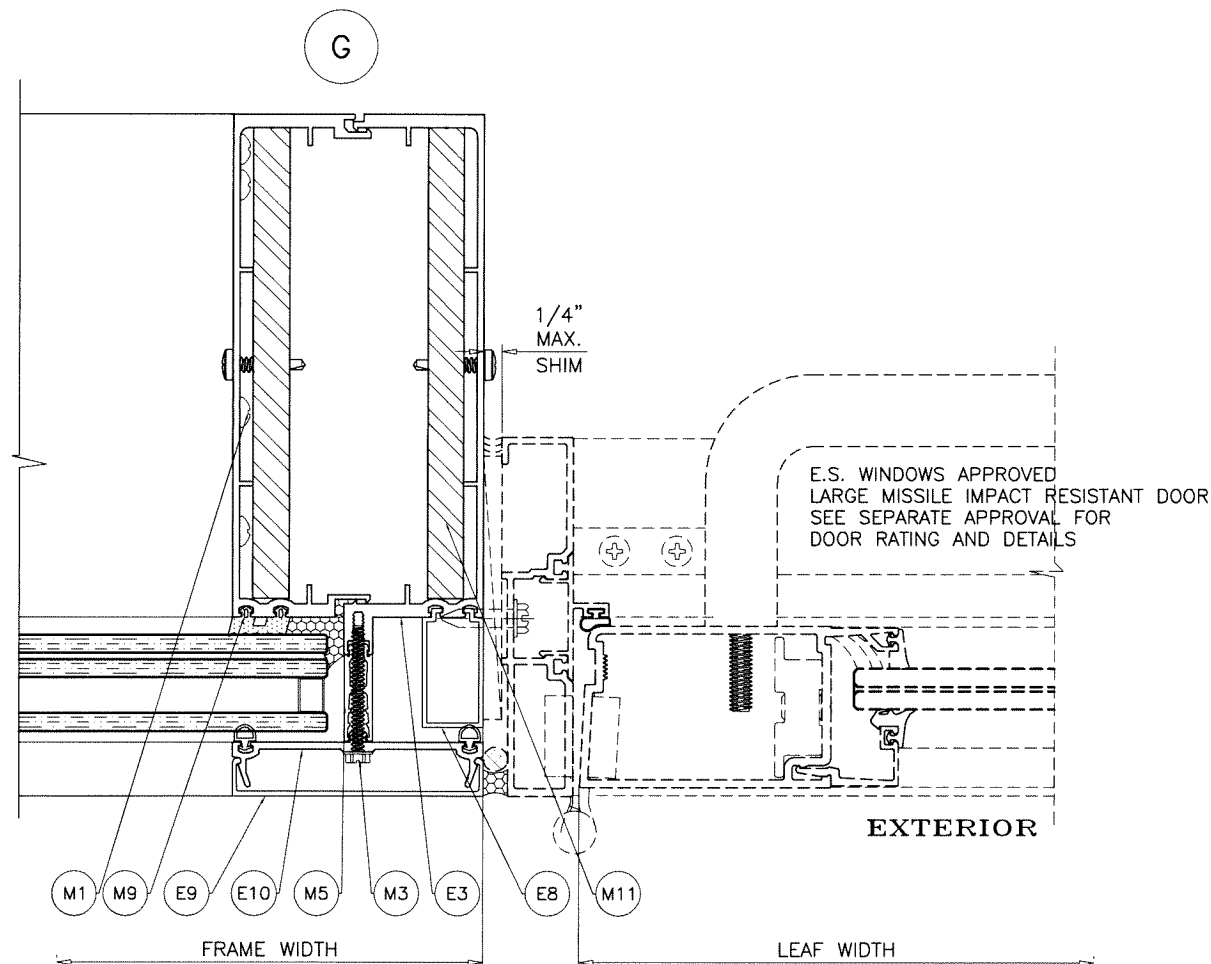
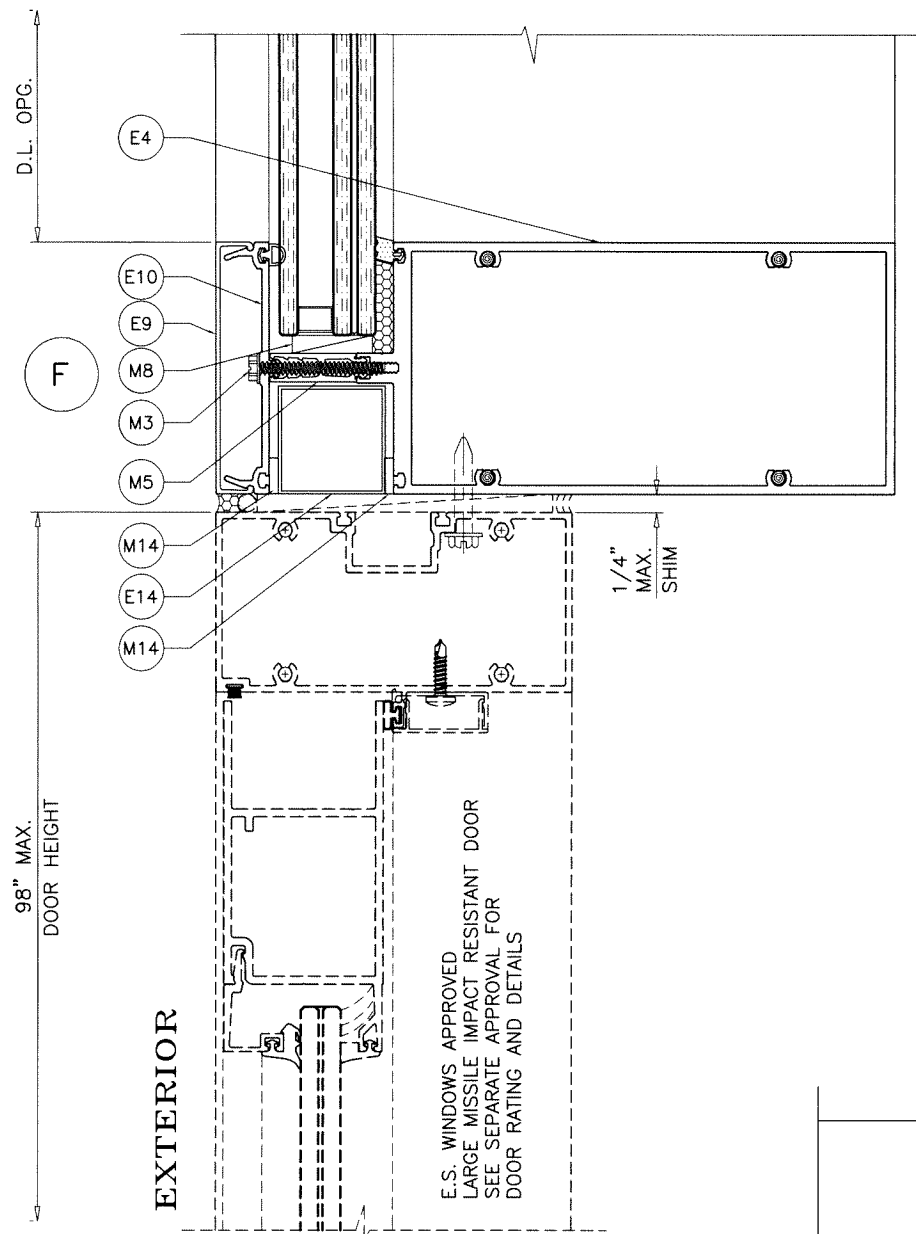
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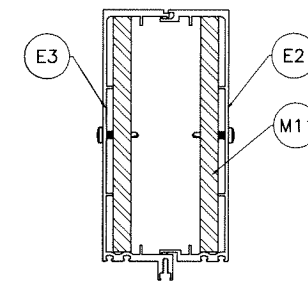
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drawing no.	no.
19-11F	19-11F
sheet 6 of 9	



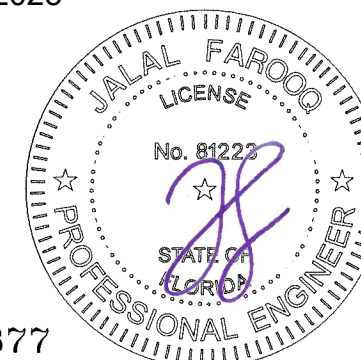
DOOR MULLION LOAD CAPACITY - PSF			
NOMINAL DIMS.		MULL 'DM'	
SIDELITE WIDTH INCHES	FRAME HEIGHT INCHES	EXT.(+)	INT.(-)
32	120.0	55.0	55.0
36		55.0	55.0
42		55.0	55.0
48		55.0	55.0
54		55.0	55.0
56		55.0	55.0
60	132	55.0	55.0
66		55.0	55.0
72		55.0	55.0
32	156	55.0	55.0
36		55.0	55.0
42		55.0	55.0
48		55.0	55.0
54		55.0	55.0
56		55.0	55.0



MULLION 'DM'

	Ix IN ⁴	Sx IN ³
ALUMINUM	20.3192	5.532
STEEL	11.4427	3.52
TOTAL		
Ix ALUM + Ix STL X 2.9	53.503	

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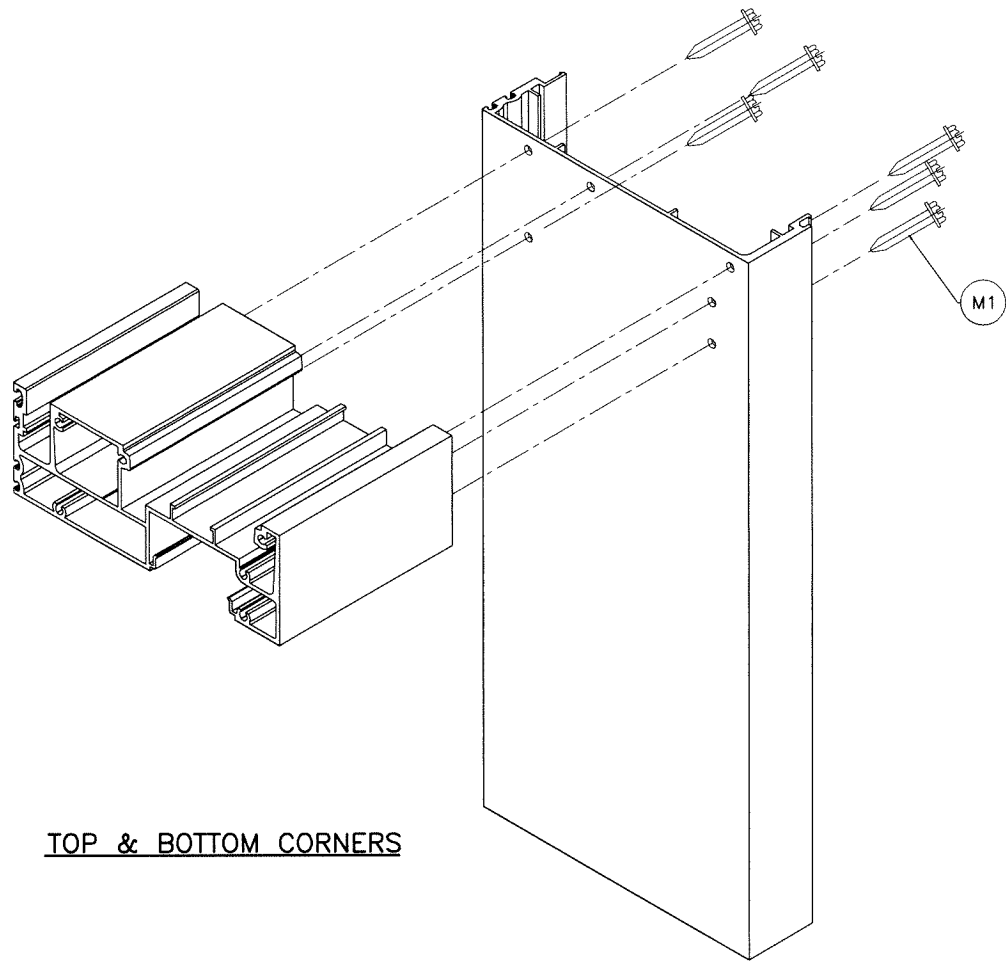
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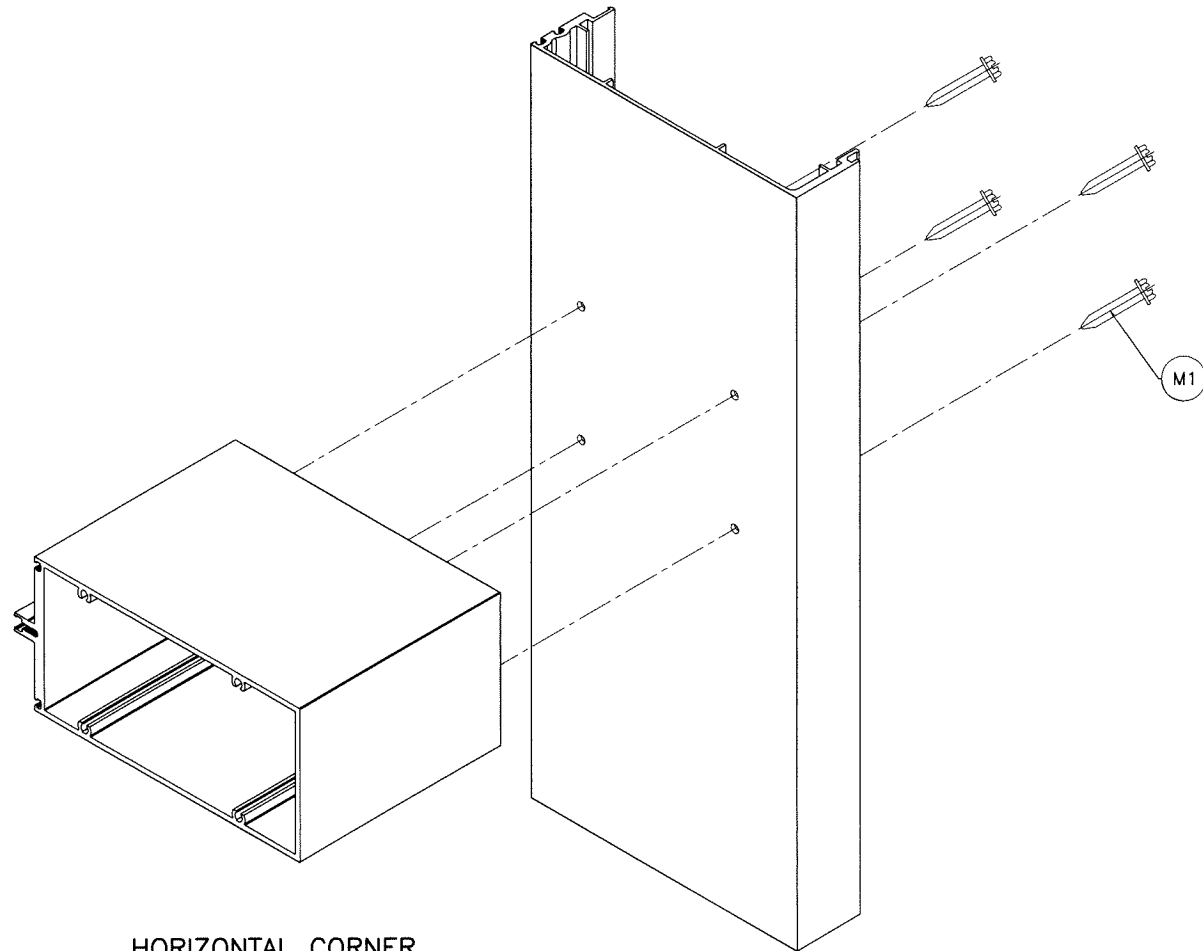
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19-11F

sheet 7 of 9



TOP & BOTTOM CORNERS



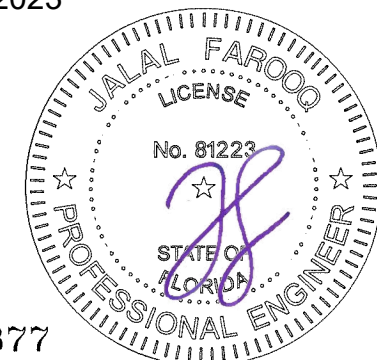
HORIZONTAL CORNER

ITEM NO.	PART NUMBER	QUANTITY	DESCRIPTION	MATERIAL	MANF./SUPPLIER/REMARKS
E1	ES-8860-007A	AS REQD.	FRAME HEAD AND SILL	6063-T6	-
E2	ES-8860-009	AS REQD.	MALE MULLION	6005-T5	-
E3	ES-8860-010	AS REQD.	FEMALE MULLION	6005-T5	-
E4	ES-8860-022	AS REQD.	FRAME HORIZONTAL	6063-T6	-
E5	ES-8860-045	AS REQD.	PRESSURE PLATE ADAPTER (HEAD/SILL)	6063-T6	-
E6	ES-8860-043	AS REQD.	PRESSURE PLATE COVER (HEAD/SILL)	6063-T6	-
E7	ES-8860-044	AS REQD.	PRESSURE PLATE	6063-T6	-
E8	ES-8860-047	AS REQD.	POCKET FILLER	6063-T5	-
E9	ES-8860-029	AS REQD.	PRESSURE PLATE COVER	6063-T6	-
E10	ES-8860-030	AS REQD.	PRESSURE PLATE	6063-T6	-
E11	ES-7004	AS REQD.	ANCHOR BASE	6005-T5	-
E12	ES-7003A	AS REQD.	SNAP COVER	6063-T5	-
E13	ALU-P-020	AS REQD.	SILL LEVELER	6063-T6	-
E14	TG-T-215	AS REQD.	FILLER TUBE	6063-T6	-
E15	ALU-A-044	AS REQD.	FIXING ANGLE	6063-T6	-
M1	#12 X 1-1/2"	AS REQD.	FRAME ASSEMBLY FASTENERS	ST/ST	PH SMS
M2	#10 X 5/8"	AS REQD.	HORIZONTAL PRESSURE PLATE FASTENERS	ST/ST	HWH SMS
M3	#10 X 1-3/4"	AS REQD.	VERTICAL PRESSURE PLATE FASTENERS	ST/ST	HWH SMS
M4	3/8-16 X 2"	AS REQD.	LEVELING SCREW	ST/ST	HWH TAP BOLT
M5	W5250-302	AS REQD.	SPACER	POLYAMIDE	-
M6	WW7000-NE003	AS REQD.	SPACER GASKET	SILICONE	DUROMETER 70±5 SHORE A
M7	WW5250-NS02	AS REQD.	INTERIOR GASKET	SILICONE	DUROMETER 60±5 SHORE A
M8	ES-7530-B02A	2/ LITE	SETTING BLOCKS AT 1/4 POINTS	SILICONE	DUROMETER 85±5 SHORE A
M9	ES-8860-G02	AS REQD.	INTERIOR GASKET	SILICONE	DUROMETER 70±5 SHORE A
M11	-	AS REQD.	MULLION REINF. BAR (1/2" X 6-1/2")	STEEL	A36, Fu MIN. 58 KSI
M14	-	AS REQD.	1/8" X 1/2" T-BOND	-	-

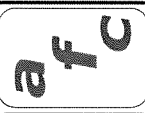
SEALANTS:

ALL FRAME CORNERS, JOINTS, MULLION SEAMS AND PERIMETER OF GLAZING BEAD TO FRAME SEALED WITH SILICONE SEALANT.

Sealed: 8/1/2023



FL #29877



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
STORE 19-11F-ES

ES-8860i ALUMINUM WINDOW WALL SYSTEM (L.M.I.)

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

revisions:	
no.	description

date: 02-25-19

scale: 3/8" = 1"

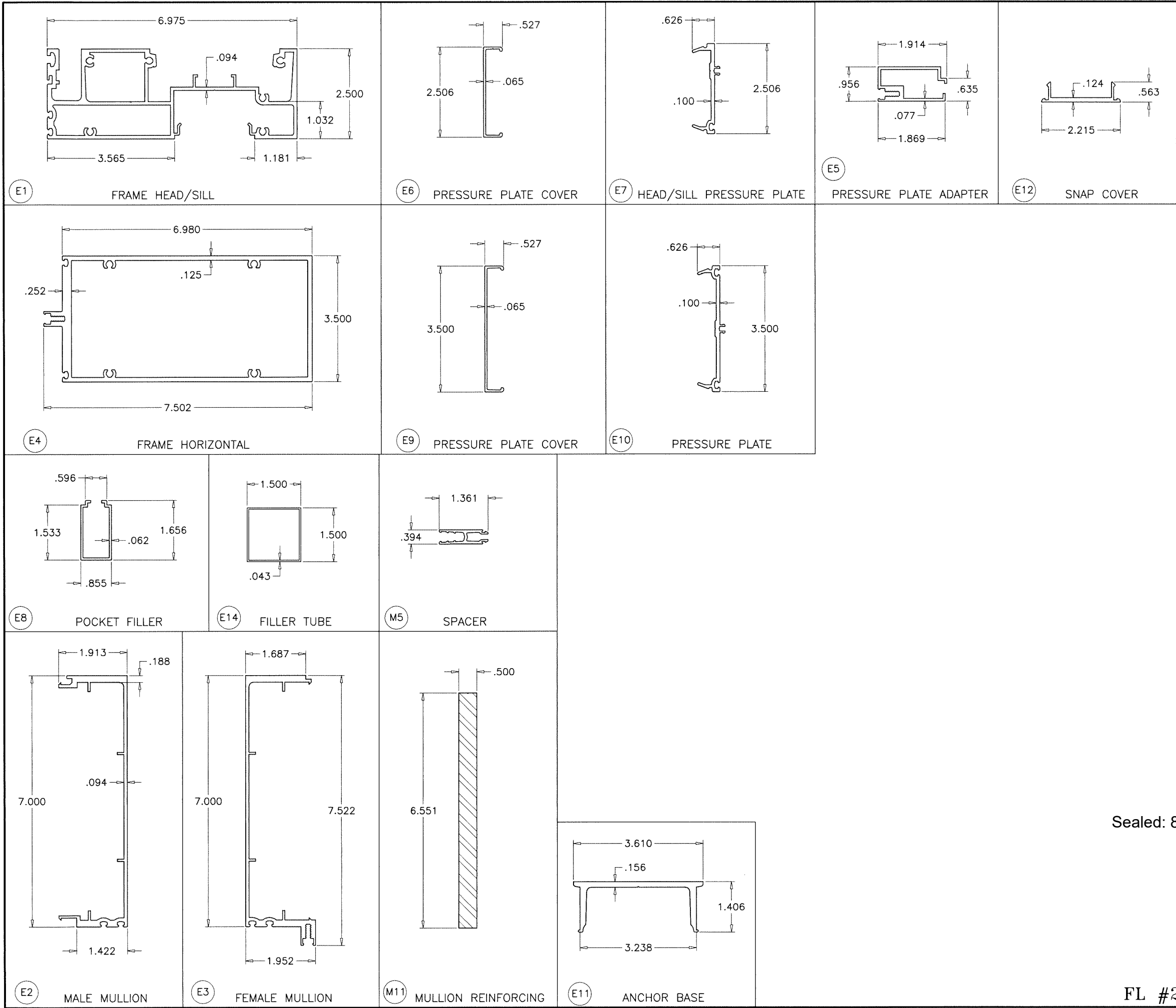
dr. by: TARIQ

chk. by:

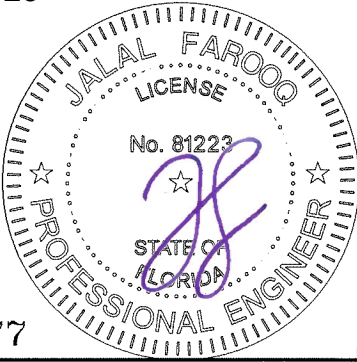
drawing no.

19-11F

sheet 8 of 9



Sealed: 8/1/2023



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19-11F

sheet 9 of 9