

THESE DOORS ARE RATED FOR SMALL MISSILE IMPACT.
F.B.C. APPROVED IMPACT RESISTANT SHUTTERS REQUIRED
FOR INSTALLATIONS UP TO 30 FT. OF GRADE.
SHUTTERS NOT REQD. FOR INSTALLATIONS ABOVE 30 FT. OF GRADE.

SERIES ES-SD451
THERMAL ALUMINUM SLIDING GLASS DOOR

DESIGN LOAD RATING FOR DOORS TO BE AS PER CHARTS
SHOWN ON SHEET 3.

THIS PRODUCT HAS BEEN DESIGNED AND TESTED TO COMPLY WITH THE
REQUIREMENTS OF THE 2023 (8TH EDITION)/2026 (9TH EDITION) FLORIDA
BUILDING CODE INCLUDING HIGH VELOCITY HURRICANE ZONE (HVHZ).

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 LOAD-BEARING, (HIGH DENSITY PLASTIC/COMPOSITE, METAL
OR OTHER RIGID MATERIALS).

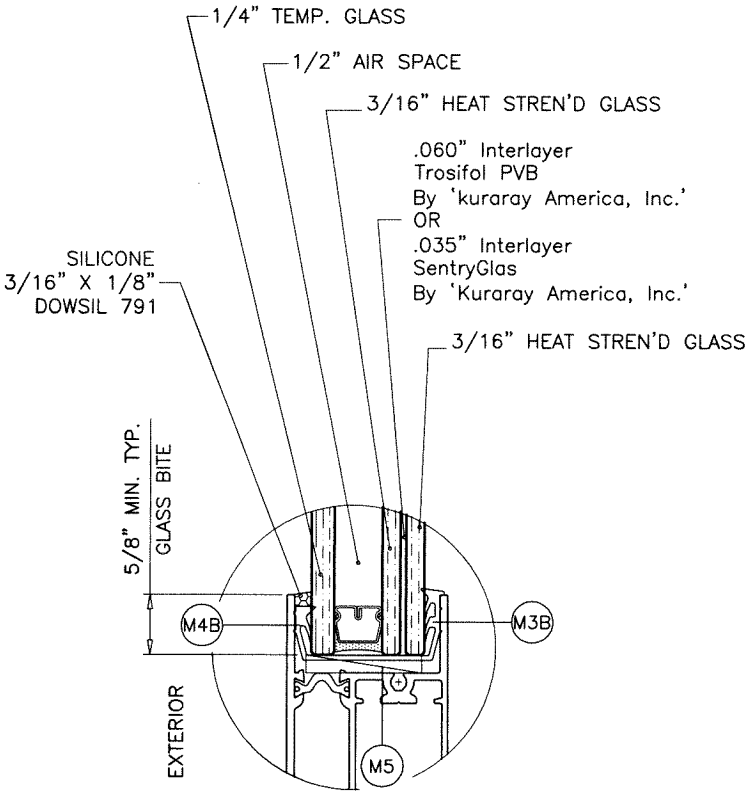
MATERIALS INCLUDING BUT NOT LIMITED TO STEEL/METAL SCREWS, THAT
COME INTO CONTACT WITH OTHER DISSIMILAR MATERIALS SHALL MEET THE
REQUIREMENTS OF THE 2023/2026 FLORIDA BLDG. CODE & ADOPTED STANDARDS.

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.

NOTE:
GLASS CAPACITIES ARE
BASED ON ASTM E1300-16 (3 SEC. GUSTS)
AND FLORIDA BUILDING COMMISSION
DECLARATORY STATEMENT DCA05-DEC-219



GLAZING DETAIL

1-1/4" OVERALL INSUL. LAM. GLASS

1/2" AIR SPACE CONSISTING OF:

SPACER:

'HELIMA' LOW PROFILE ALUMINUM SPACER
BY 'LINGERMANN GMBH'
AROUND THE PERIMETER OF THE GLASS.

PERIMETER SEALANT:

SILICONE
DOWSIL 791
GE 2000

FASTENERS AND CONNECTORS (AS APPLICABLE) SHOWN IN THIS APPROVAL MAY NOT MEET
CORROSION RESISTANCE REQUIREMENTS FOR COASTAL OR SALT WATER EXPOSURE ZONES.
COMPLIANCE WITH THESE CONDITIONS TO BE CHECKED PER FBC 1711.

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- 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
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FAX. (305) 262-6978
(C.A.N. 3538)

ES-SD451 THERMAL ALUM SLIDING GL. DOOR (S.M.I.)

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

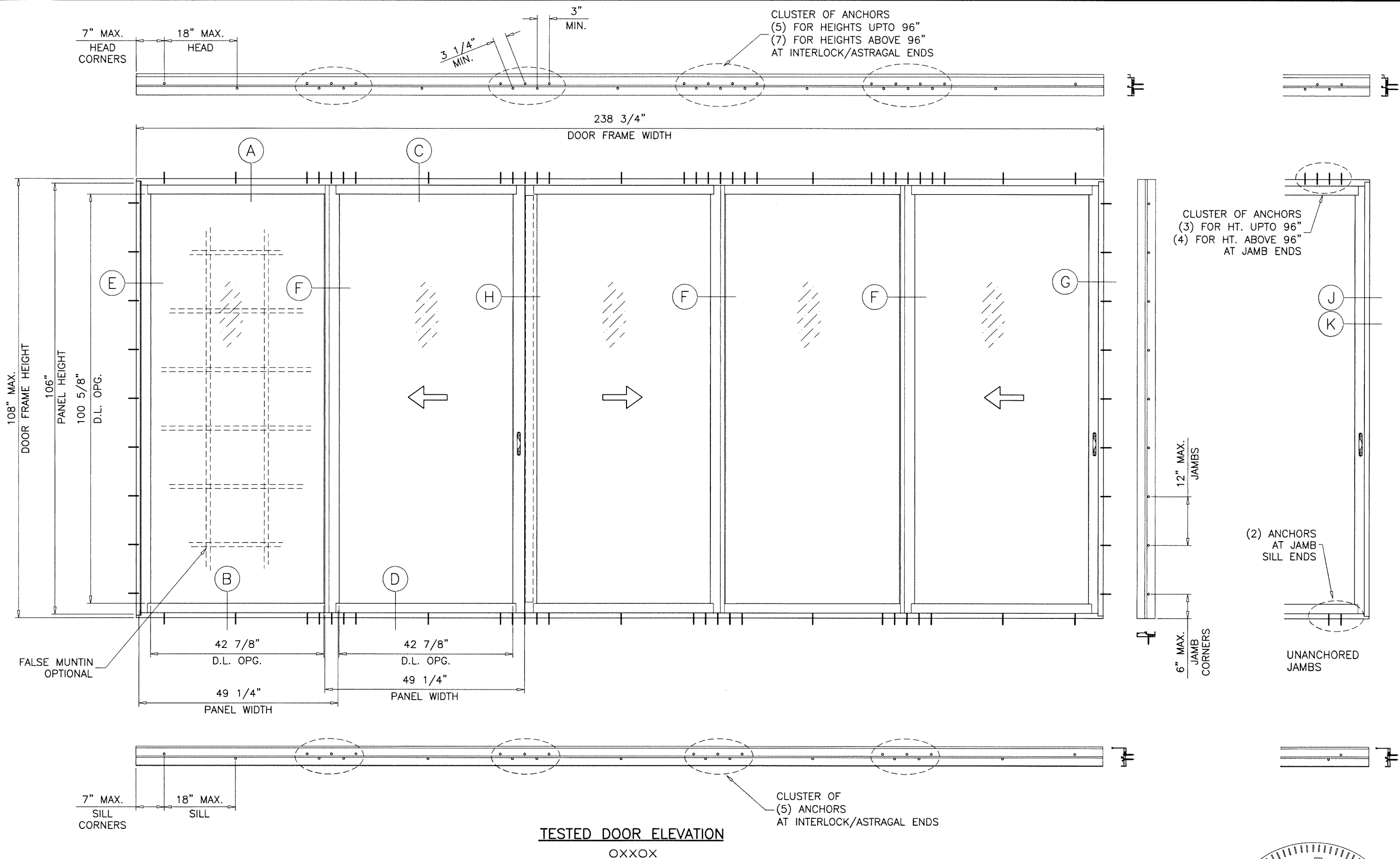
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	A	02.13.18	UPDATED TO 2017 FBC	
	B	01.18.21	UPDATED TO 2020 FBC	
	C	09.27.23	UPDATED TO 2023 FBC	
	D	09.09.26	UPDATED TO 2026 FBC	

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dr. by: TARIQ
chk. by:

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DAYLITE OPENINGS:
 D.L.O. HEIGHT = PANEL HEIGHT - 4.375"
 D.L.O. WIDTH = PANEL WIDTH - 5.375"
 PANEL HEIGHT = DOOR FRAME HEIGHT - 2.0"

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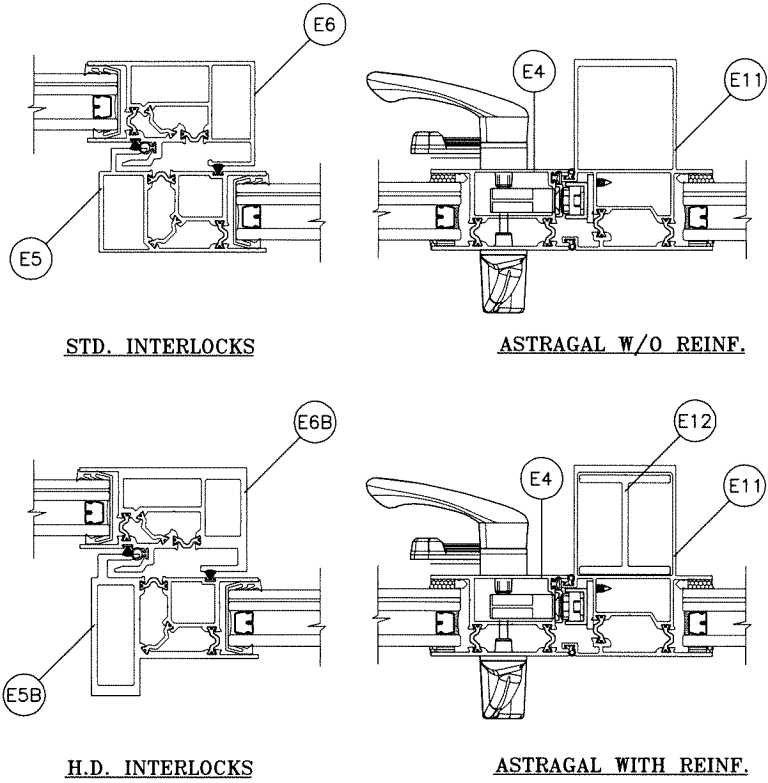
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DESIGN LOAD CAPACITY - PSF					
AVERAGE PANEL WIDTH INCHES	DOOR FRAME HEIGHT INCHES	STD. INTERLOCKS ASTRAGAL W/O REINF.		H.D. INTERLOCKS ASTRAGAL W/ REINF.	
		EXT.(+)	INT.(−)	EXT.(+)	INT.(−)
30	84	70.0	70.0	80.0	80.0
36		70.0	70.0	80.0	80.0
42		70.0	70.0	80.0	80.0
48		69.6	69.6	79.6	79.6
54		61.9	61.9	70.7	70.7
60		—	—	63.7	63.7
30	90	70.0	70.0	80.0	80.0
36		70.0	70.0	80.0	80.0
42		70.0	70.0	80.0	80.0
48		69.6	69.6	79.6	79.6
54		—	—	70.7	70.7
30	96	70.0	70.0	80.0	80.0
36		70.0	70.0	80.0	80.0
42		70.0	70.0	80.0	80.0
47-3/4		70.0	70.0	80.0	80.0
48		—	—	79.6	79.6
30	102	—	—	80.0	80.0
36		—	—	80.0	80.0
42		—	—	80.0	80.0
47-3/4		—	—	80.0	80.0
48		—	—	79.6	79.6
30	108	—	—	80.0	80.0
36		—	—	80.0	80.0
42		—	—	80.0	80.0
47-3/4		—	—	80.0	80.0

AVERAGE PANEL WIDTH = $\frac{\text{DOOR FRAME WIDTH}}{\text{NUMBER OF PANELS}}$

DOOR HEIGHT AND WIDTH SIZE MUST COMPLY
EGRESS REQUIREMENTS PER FBC AS REQUIRED.



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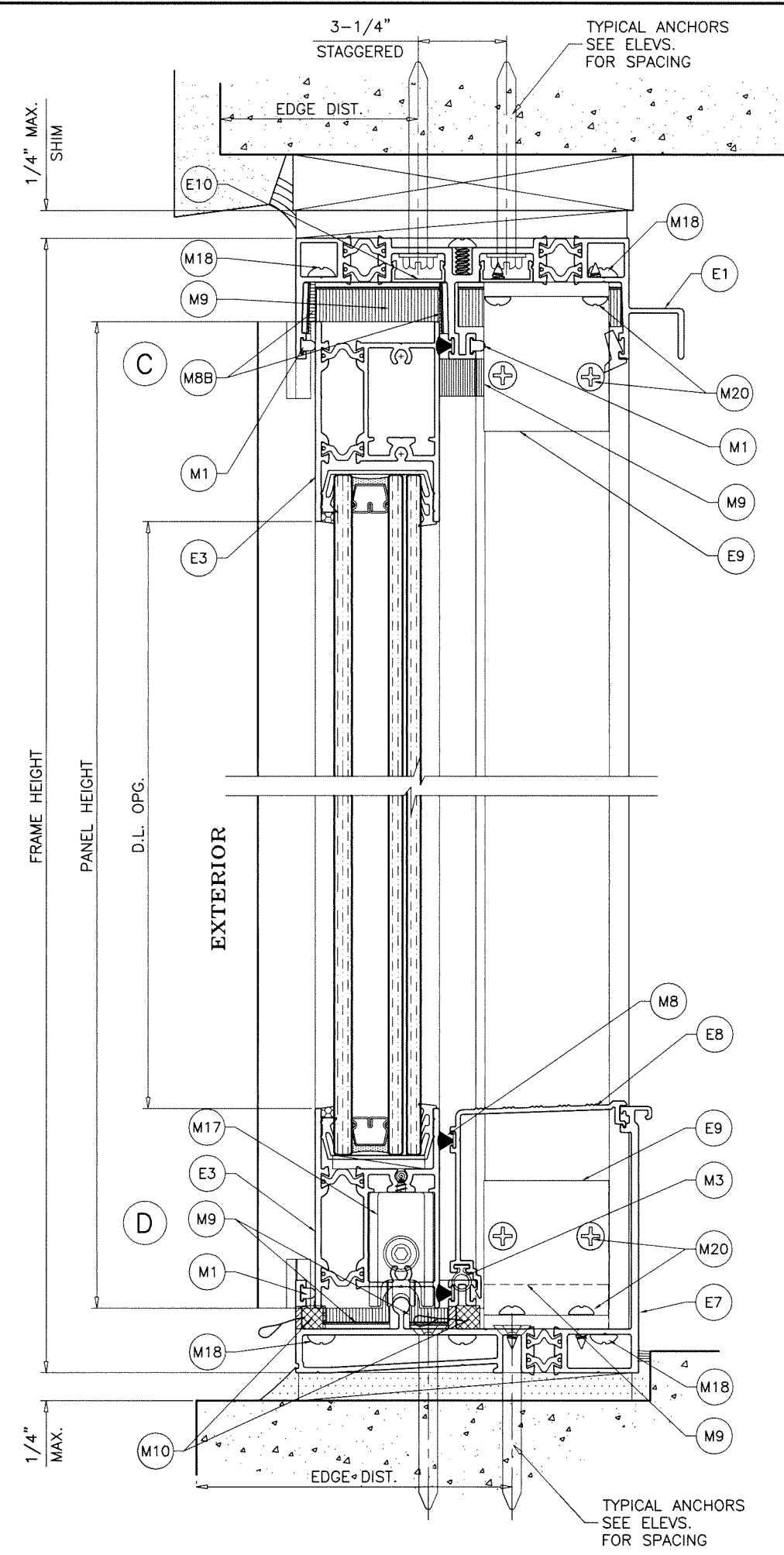
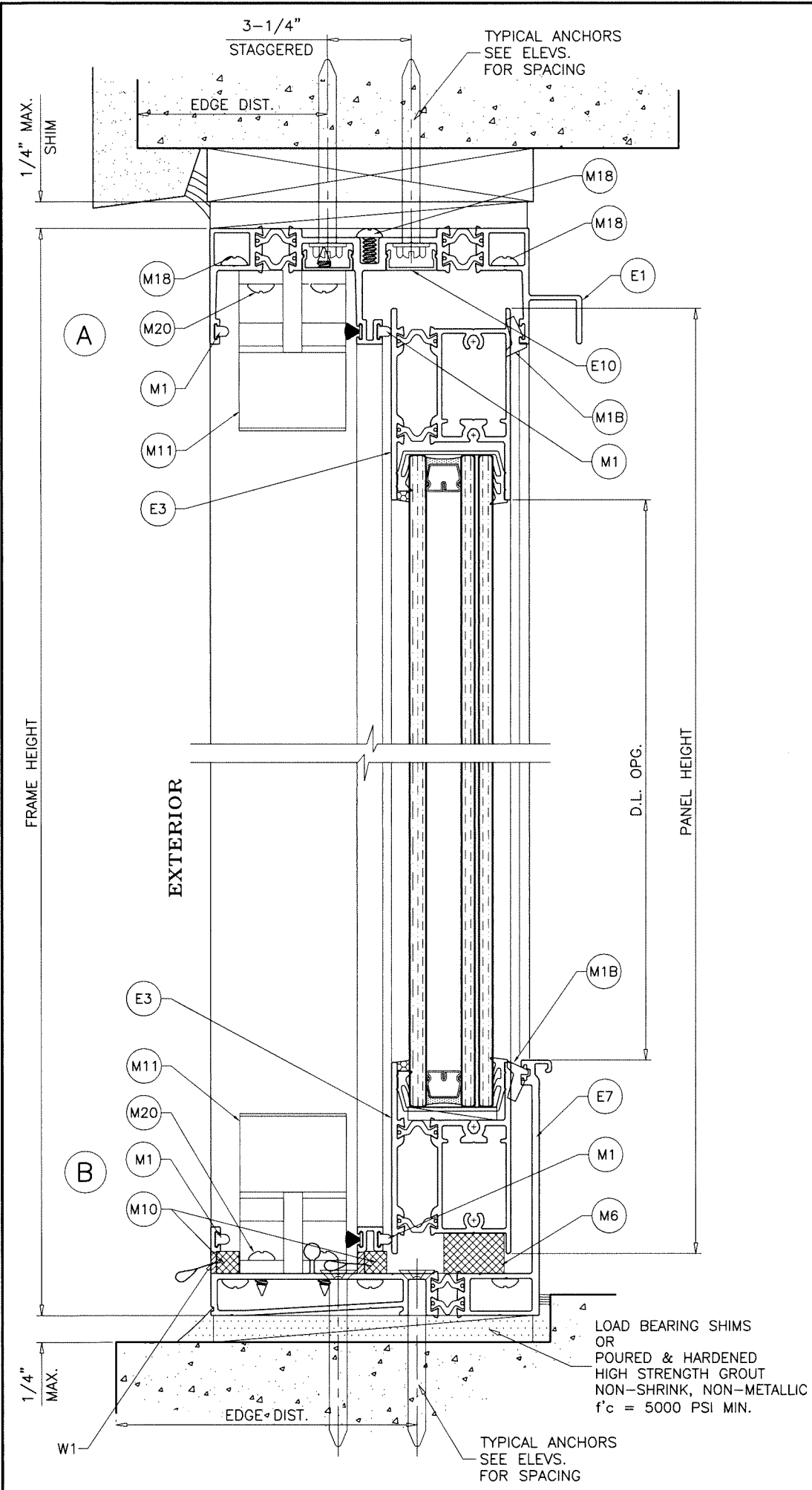
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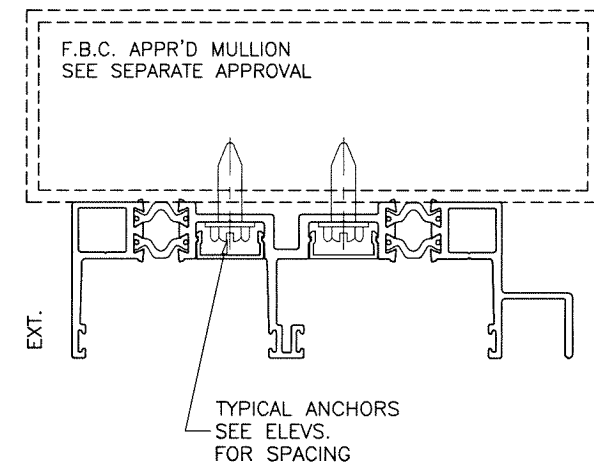
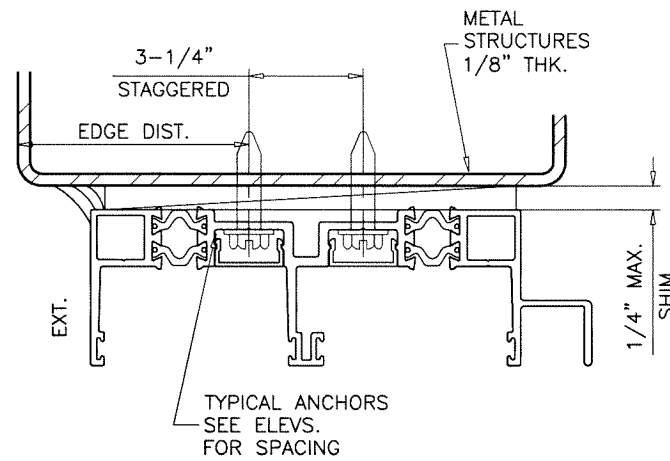
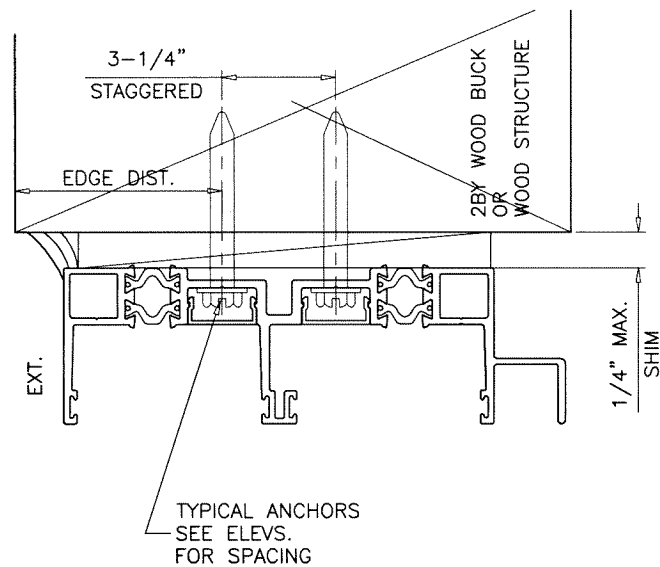
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TYPICAL ANCHORS: SEE ELEV. FOR SPACING

1/4" DIA. ULTRACON+ BY 'DEWALT' (Fu=164 KSI, Fy=148 KSI)

INTO 2BY WOOD BUCKS OR WOOD STRUCTURES
1-1/2" MIN. PENETRATION INTO WOOD (HEAD/JAMBS)

THRU 1BY BUCKS INTO CONC. OR BLOCKS
1-3/4" MIN. EMBED INTO CONCRETE (HEAD/JAMBS)
1-1/4" MIN. EMBED INTO BLOCKS (JAMBS)

DIRECTLY INTO CONCRETE OR GROUT FILLED BLOCKS
1-3/4" MIN. EMBED INTO CONCRETE (HEAD/SILL)
1-3/4" MIN. EMBED INTO GROUT FILLED BLOCKS (JAMBS)

1/4" DIA. TEKS OR SELF DRILLING SCREWS (GRADE 5 CRS)

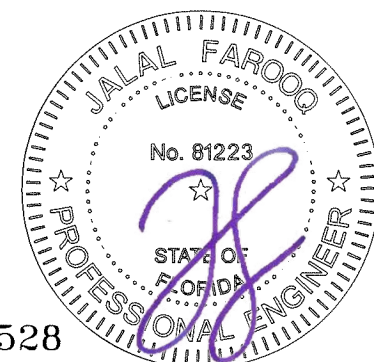
INTO F.B.C. APPROVED MULLIONS
OR
INTO METAL STRUCTURES (HEAD/JAMBS)
(3) THREADS MIN. PENETRATION BEYOND SUBSTRATE
ALUMINUM: 1/8" THK. MIN. (6063-T5 MIN.)
STEEL: 1/8" THK. MIN. (Fy = 36 KSI MIN.)
(STEEL IN CONTACT WITH ALUMINUM TO BE PLATED OR PAINTED)

TYPICAL EDGE DISTANCE

INTO CONCRETE AND MASONRY = 2-1/2" MIN.
 INTO WOOD STRUCTURE = 1" MIN.
 INTO METAL STRUCTURE = 3/4" MIN.

WOOD AT HEAD OR JAMBS $SG = 0.55$ MIN.
CONCRETE AT HEAD, SILL OR JAMBS $f'_c = 3000$ PSI MIN.
C-90 GROUT FILLED BLOCK AT JAMBS $f'_m = 2000$ PSI MIN.

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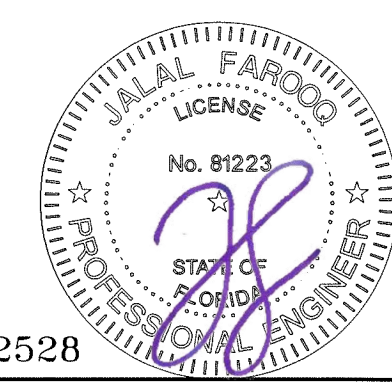
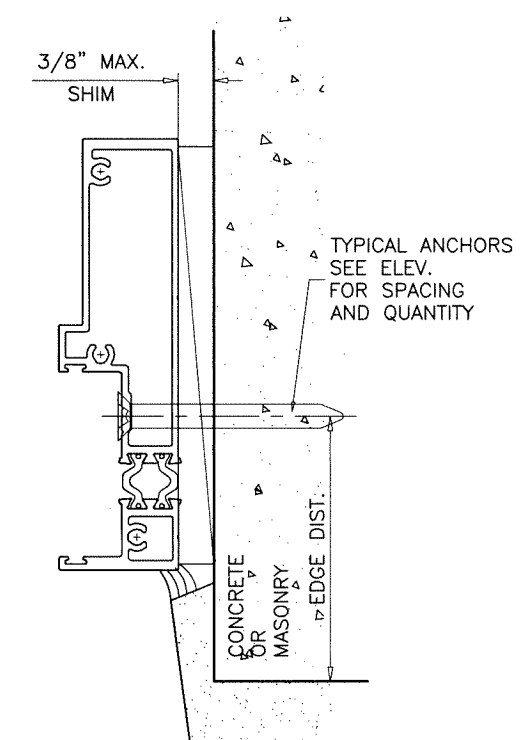
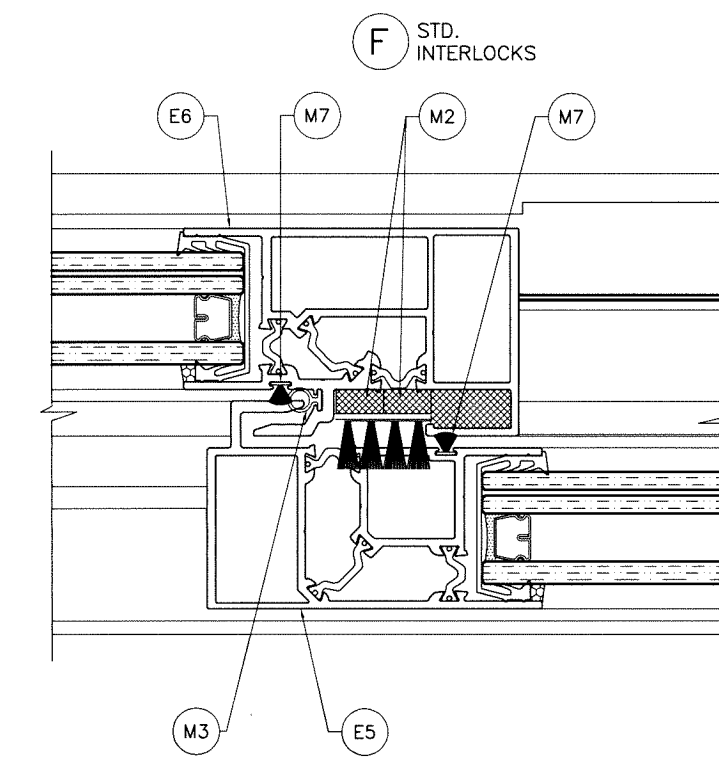
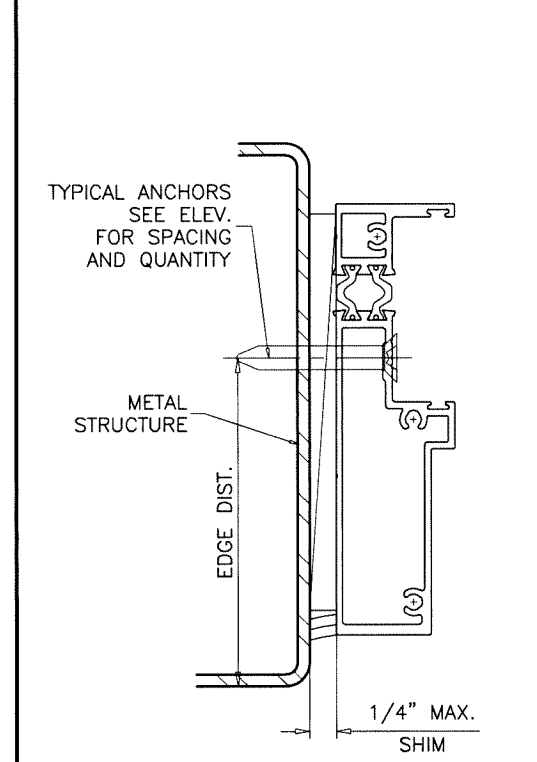
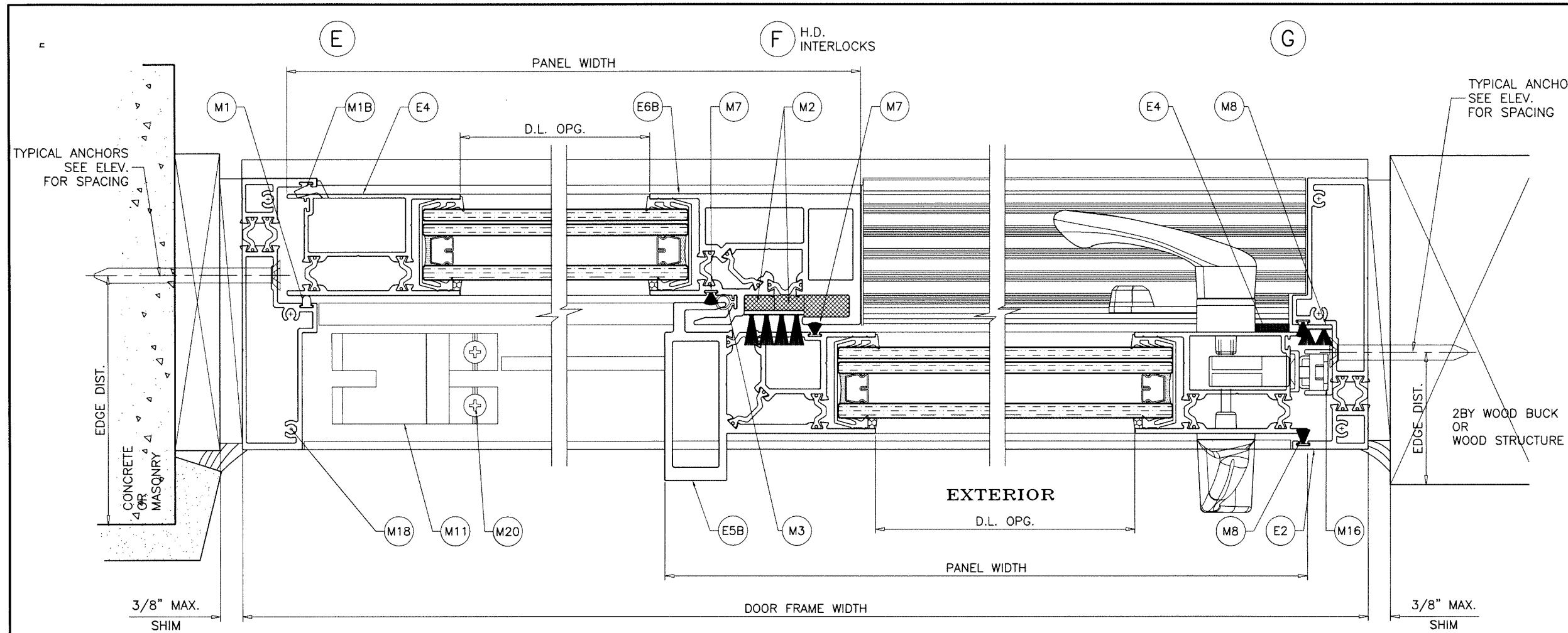
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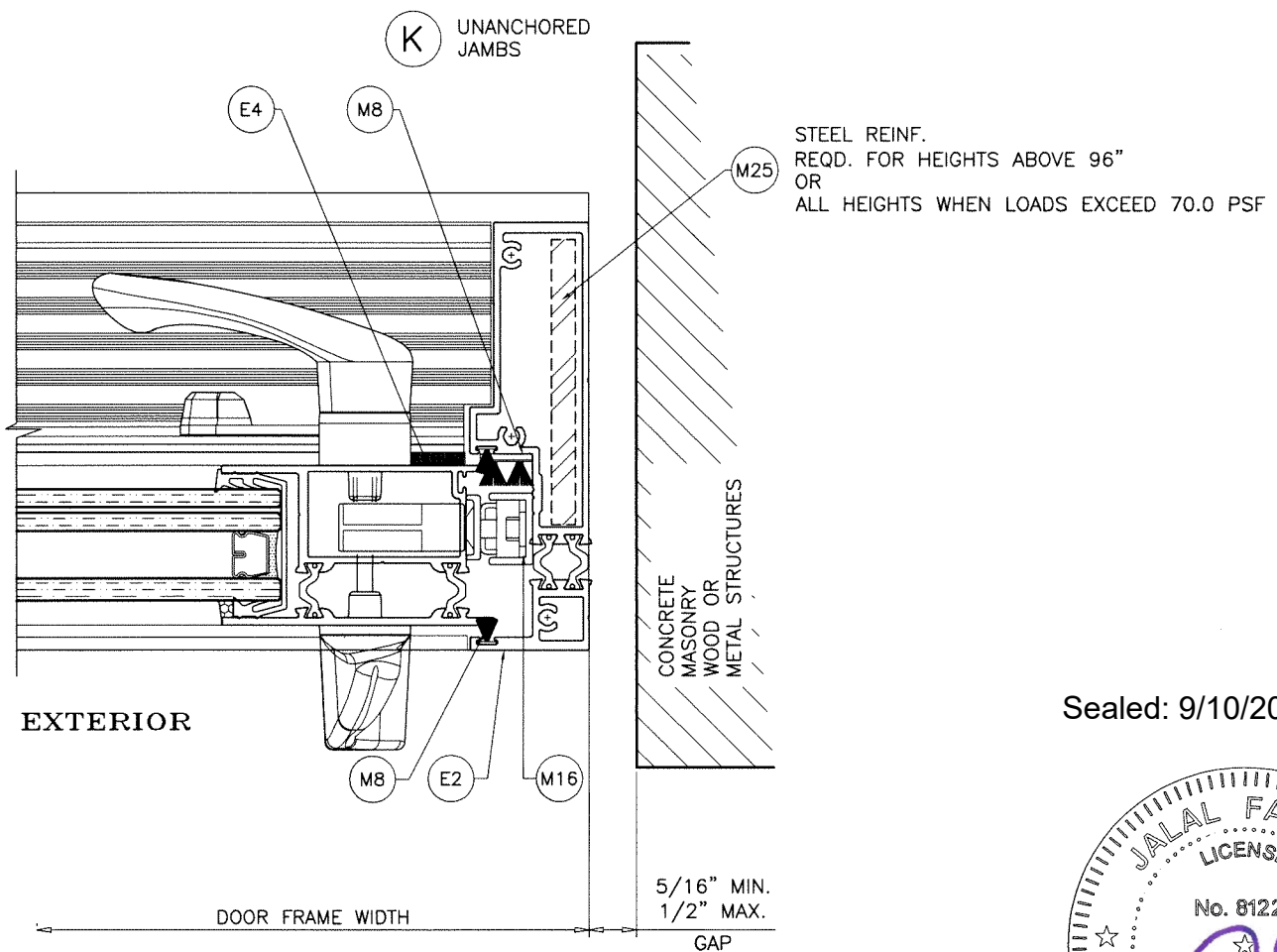
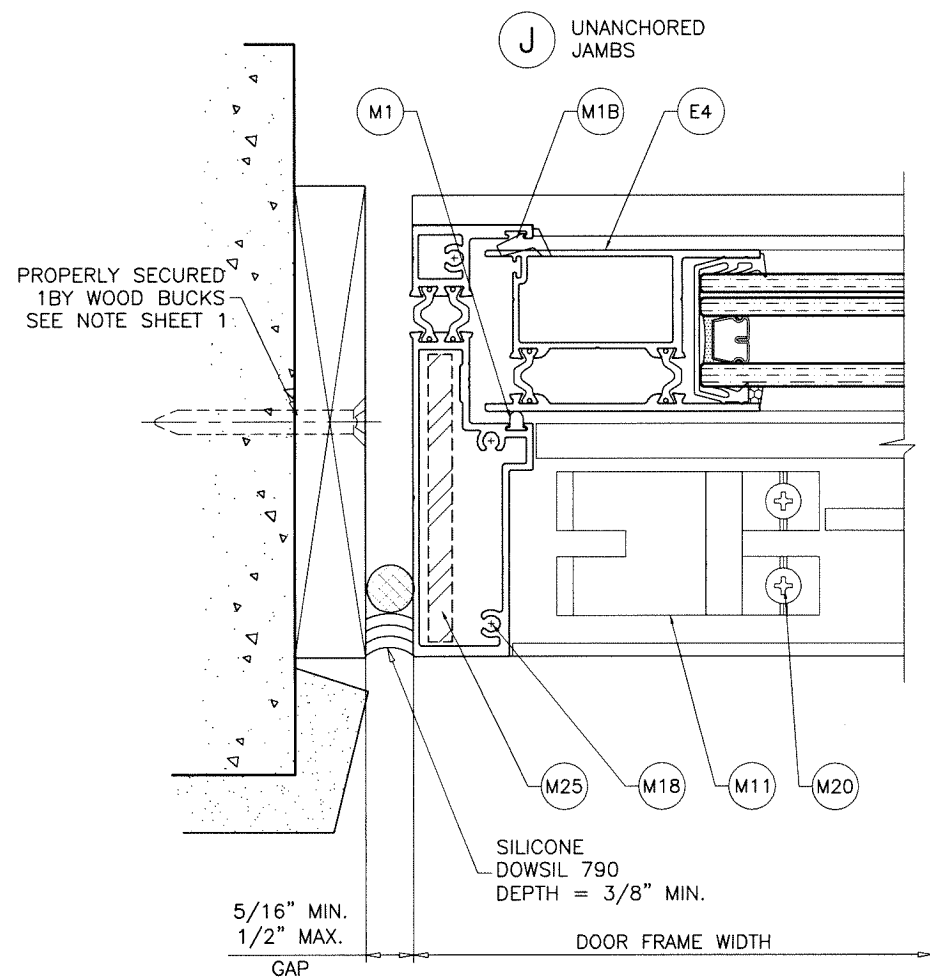
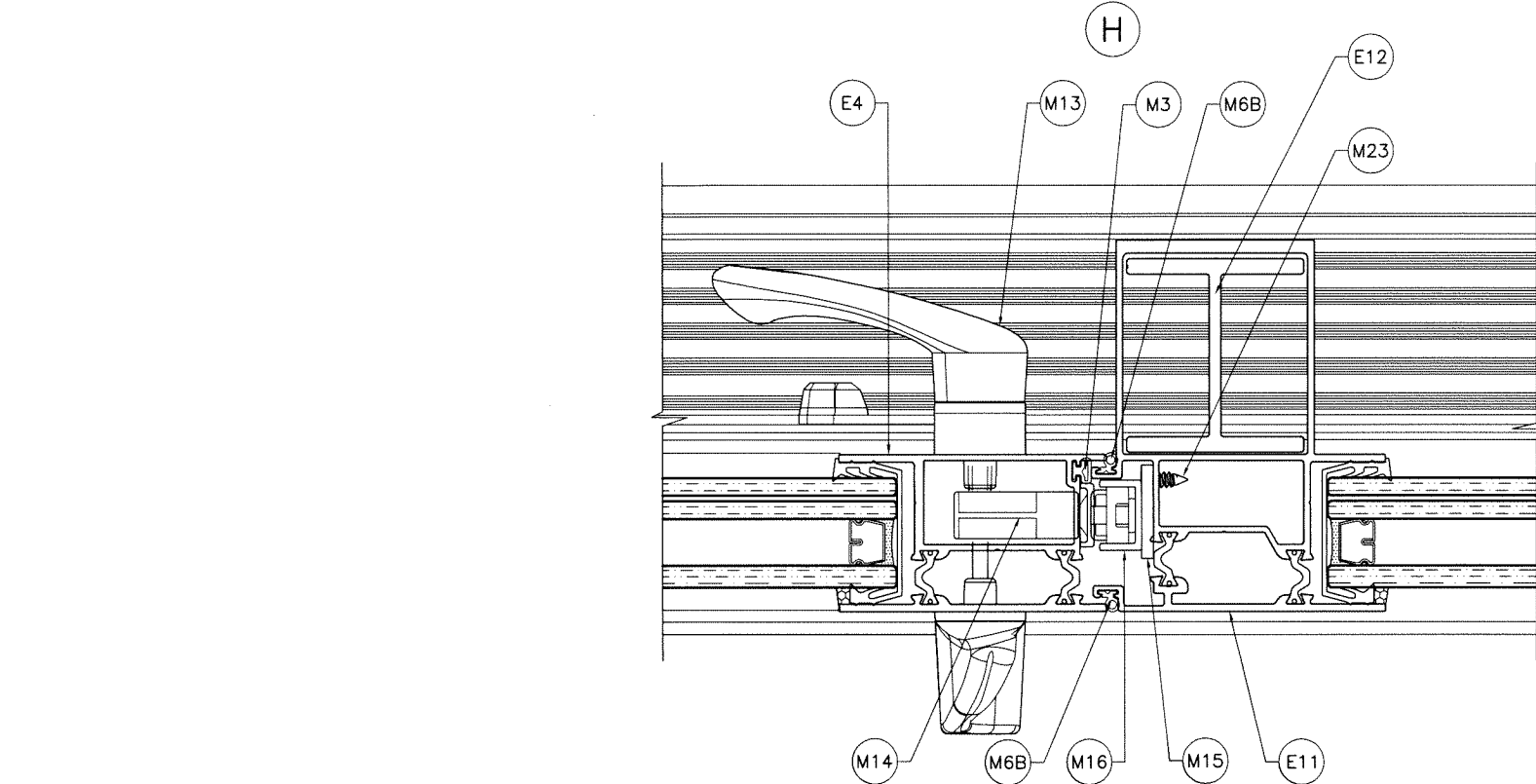
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ITEM #	PART #	QUANTITY	DESCRIPTION	MATERIAL	MANF./SUPPLIER/REMARKS
E1	ES-SD451-501	1	FRAME HEAD	6063-T6	-
E2	ES-SD451-503	2	FRAME JAMB	6063-T6	-
E3	ES-SD451-504	2/ PANEL	TOP & BOTTOM RAIL	6063-T6	-
E4	ES-SD451-505	2/ PANEL	VERTICAL STILE	6063-T6	-
E5	ES-SD451-506	AS REQD.	STD. EXTERIOR INTERLOCK	6063-T6	-
E5B	ES-SD451-507	AS REQD.	H.D. EXTERIOR INTERLOCK	6063-T6	-
E6	ES-SD451-508	AS REQD.	STD. INTERIOR INTERLOCK	6063-T6	-
E6B	ES-SD451-509	AS REQD.	H.D. INTERIOR INTERLOCK	6063-T6	-
E7	ES-SD451-512	1	FRAME SILL	6063-T6	-
E8	ES-SD451-025	AS REQD.	FRAME SILL COVER	6063-T6	-
E9	AAC-A-028	AS REQD.	FIXED PANEL CLIP	6063-T6	-
E10	ES-6011	AS REQD.	SCREW COVER	6063-T6	-
E11	ES-SD451-510	AS REQD.	ASTRAGAL STILE	6063-T6	-
E12	ES-SD451-021	AS REQD.	ASTRAGAL STIFFENER	6063-T6	-
M1	NC-4000I-PV-2	AS REQD.	INSULATION	PVC	-
M1B	NF-315-G06	AS REQD.	WEDGE GASKET	EODM	DUROMETER 70±5 SHORE A
M2	-	AS REQD.	TAPE (1/2" X 1/4")	-	-
M3	ES-5008	AS REQD.	BULB GASKET	EPDM	DUROMETER 70±5 SHORE A
M3B	ES-SD451-G01	AS REQD.	GLAZING GASKET	EPDM	DUROMETER 70±5 SHORE A
M5	ES-4520-B02A	2/ LITE	SETTING BLOCK	EPDM	DUROMETER 80±5 SHORE A
M5B	-	AS REQD.	TAPE FOR FIX. INTERLOCK (1/4" X 3/8")	-	-
M6	ES-21-B02	2/ LITE	SETTING BLOCK (FIXED PANEL)	EPDM	DUROMETER 80±5 SHORE A
M6B	ES-SD451-G03	AS REQD.	ASTRAGAL WEATHER SEAL	SILICONE	DUROMETER 70±5 SHORE A
M7	W22252NK	AS REQD.	INTERLOCK W'STRIPPING	PILE	-
M8	W22322NK	AS REQD.	INTERLOCK W'STRIPPING	PILE	-
M8B	P 3802 AFK	AS REQD.	ADHESIVE PILE PAD (3" X 0.55")	PILE	-
M9	P 6304 AFK	AS REQD.	ADHESIVE PILE PAD FOR INTERLOCK (4" X 1")	PILE	-
M10	ES-SD450-F01	AS REQD.	5/8" X 5/8" X 2" RETICULATED FOAM 30PPI	OPEN CELL FOAM	-
M11	SGD 1600	AS REQD.	BUMPER	ALUMINUM	-
M12	LUG 2-500	AS REQD.	PLUG FOR ROLLER SCREW	PVC	-
M13	PS01-0014-117	1	2 POINT LOCK HANDLE KIT	CAST ALUMINUM	-
M14	PS01-1020	1	2 POINT MORTISE LOCK	CAST ALUMINUM	-
M15	ES-SD450-P01	1	3/16" PLATE FOR STRIKE ASSEMBLY	ALUMINUM	-
M16	PS01-1015-00B	-	MORTISE LOCK KEEPER	-	-
M17	GTT-R34/3-01-A	2/ MOV. PANEL	ROLLER ASSEMBLY (ZAMAK WITH ACETAL WHEELS)	-	-
M18	#10 X 1-1/4"	AS REQD.	FRAME AND PANEL ASSEMBLY FASTENERS	ST/ST	PH SMS
M19	#10 X 1"	AS REQD.	MORTISE LOCK FASTENERS	ST/ST	FH SMS
M20	#10 X 1/2"	AS REQD.	BUMPER AND ROLLER ASSEMBLY FASTENERS	ST/ST	PH SMS
M21	#8 X 1"	AS REQD.	ALUMINUM PLATE ASSEMBLY FASTENERS	ST/ST	FH SMS
M22	#8 X 1"	AS REQD.	KEEPER FASTENERS	ST/ST	PH SMS
M23	#8 X 1/2"	AS REQD.	ASSEMBLY FASTENER AT STRIKE PLATE	ST/ST	FH SMS
M24	#8 X 5/8"	AS REQD.	KEEPER FASTENERS	ST/ST	PH SMS
M25	-	AS REQD.	JAMB REINFORCING	STEEL	-
M26	-	AS REQD.	INSULBAR 12MM OFFSET	POLYAMIDE	ENSINGER
M27	-	AS REQD.	INSULBAR 14MM OFFSET	POLYAMIDE	ENSINGER
M28	1673	AS REQD.	INSULBAR 20MM OFFSET	POLYAMIDE	ENSINGER

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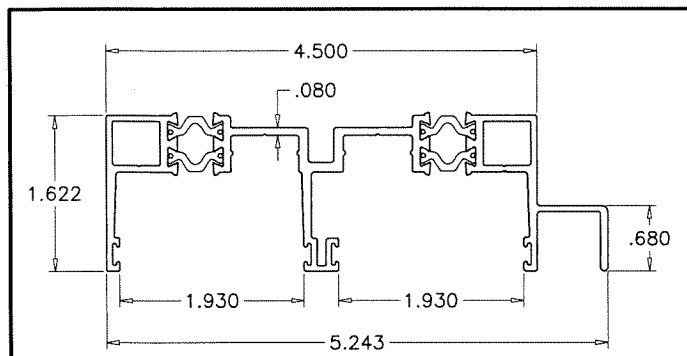
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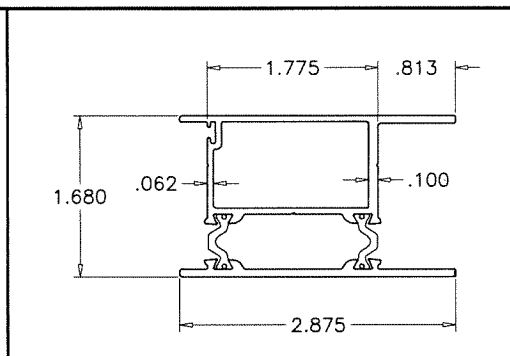
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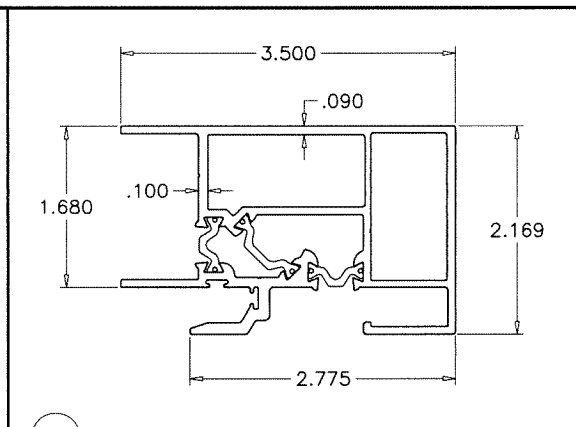
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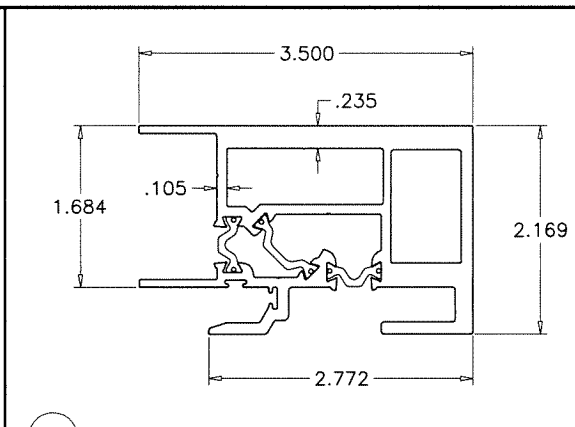
E1 FRAME HEAD



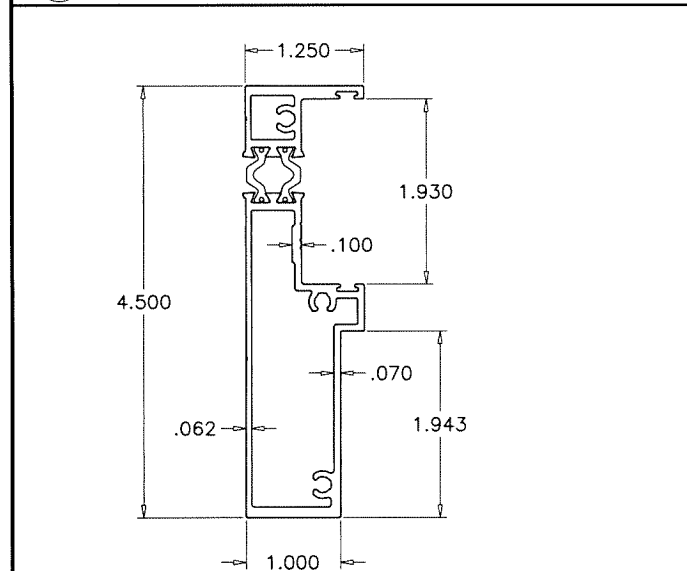
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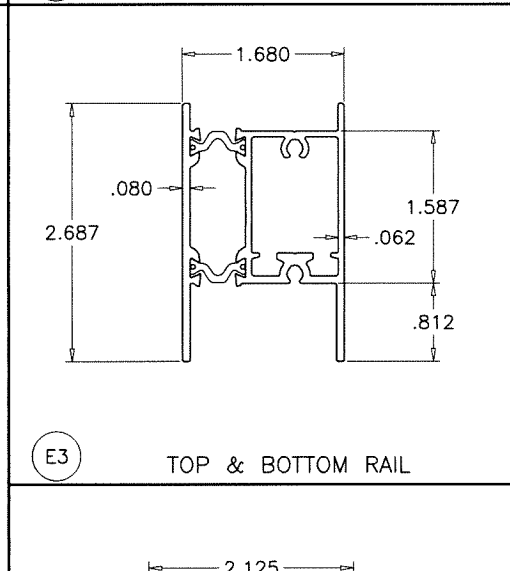
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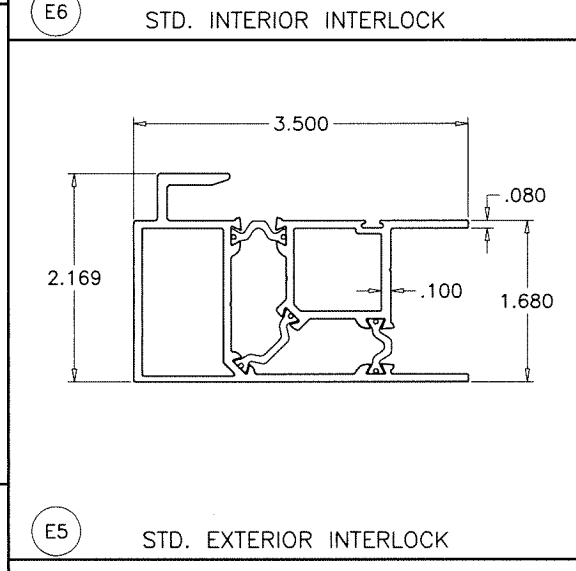
E6B H.D. INTERIOR INTERLOCK



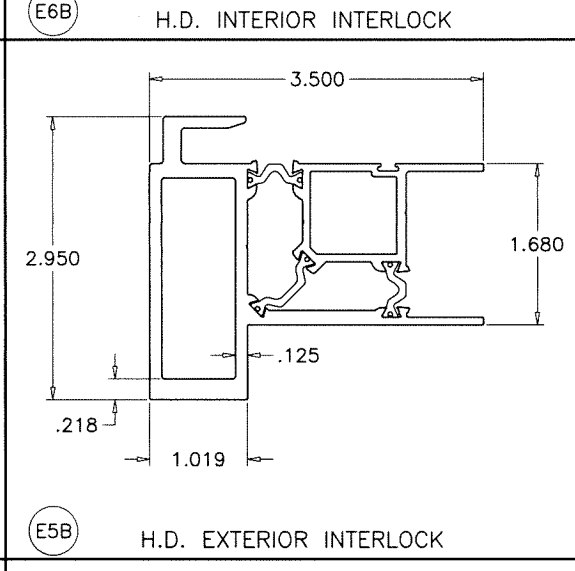
E2 FRAME JAMB



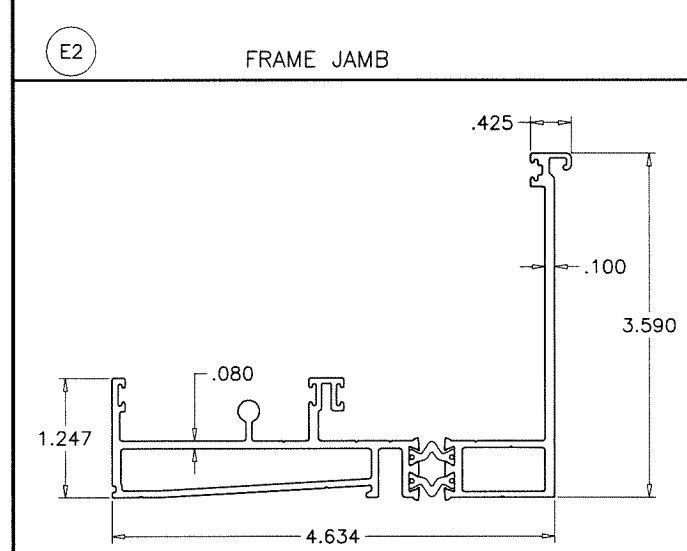
E3 TOP & BOTTOM RAIL



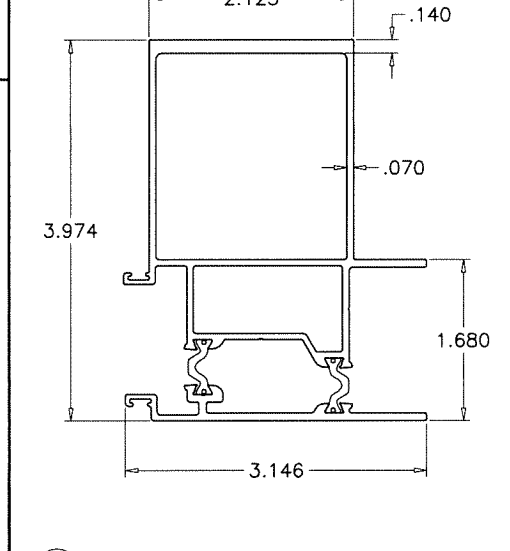
E5 STD. EXTERIOR INTERLOCK



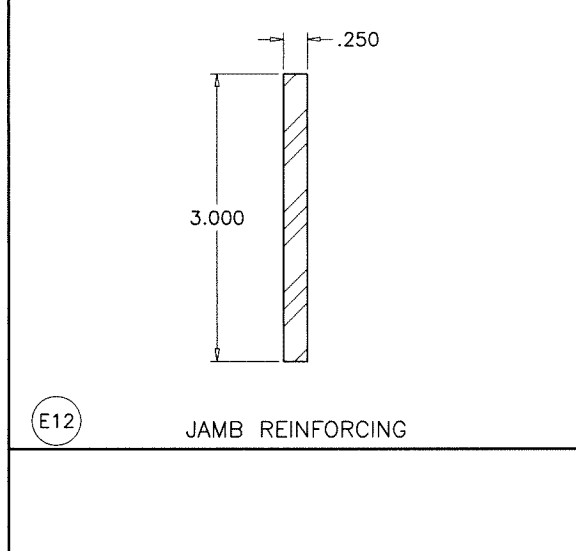
E5B H.D. EXTERIOR INTERLOCK



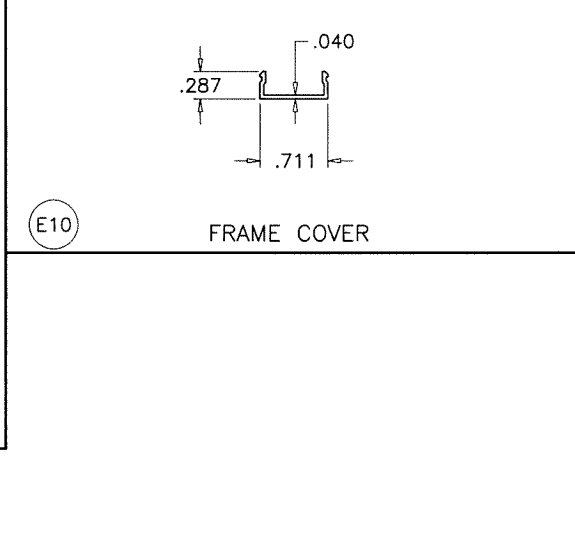
E7 FRAME SILL



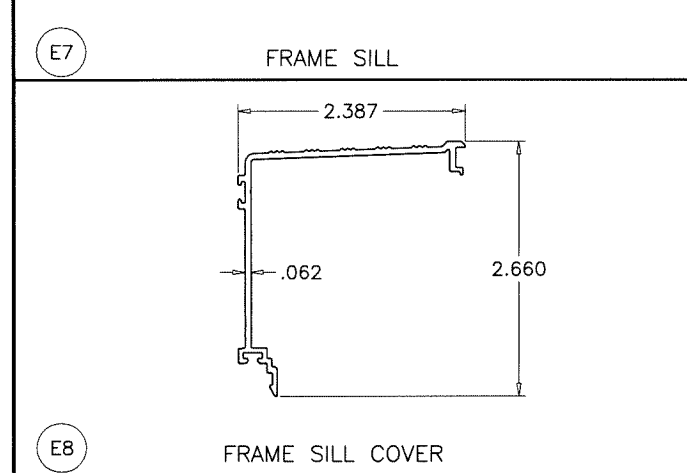
E11 ASTRAGAL STILE



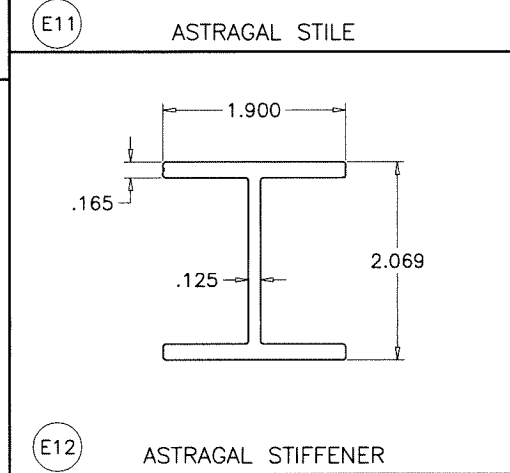
E12 JAMB REINFORCING



E10 FRAME COVER



E8 FRAME SILL COVER



E12 ASTRAGAL STIFFENER

M26 12MM OFFSET

M27 14MM OFFSET

M28 20MM OFFSET

TECATHERM® 66 GF INSULBARS
SCALE 1:1

MATERIAL = POLYAMIDE
TENSILE STRENGTH = 13031 PSI
RATE OF BURN = .752 IN./MIN.
SELF IGNITION TEMP. = 793° F
FLASH IGNITION TEMP. = 781°C
SMOKE DENSITY = 1.63

af c

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

ES-SD451 THERMAL ALUM SLIDING GL. DOOR (S.M.I.)

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

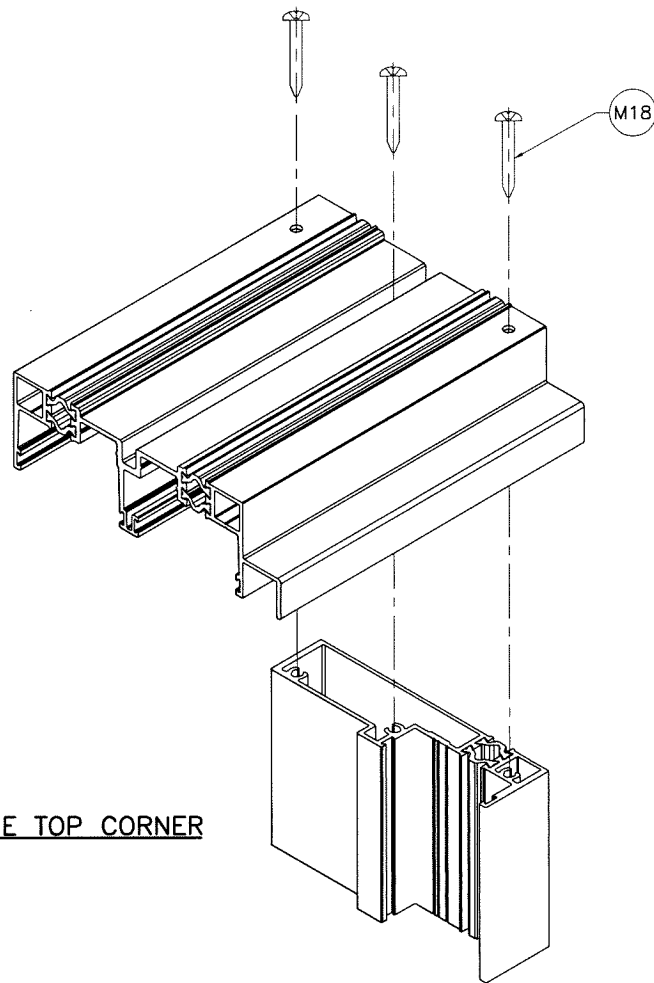
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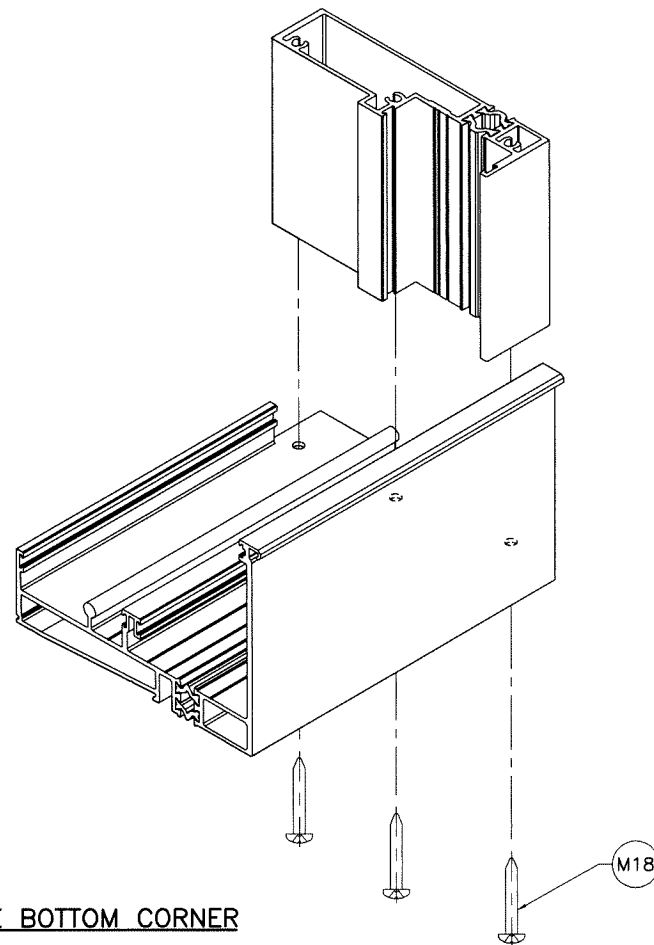
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no	date	no	date

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scale: 1/2" = 1"
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chk. by:
drawing no.
W17-58
sheet 10 of 11

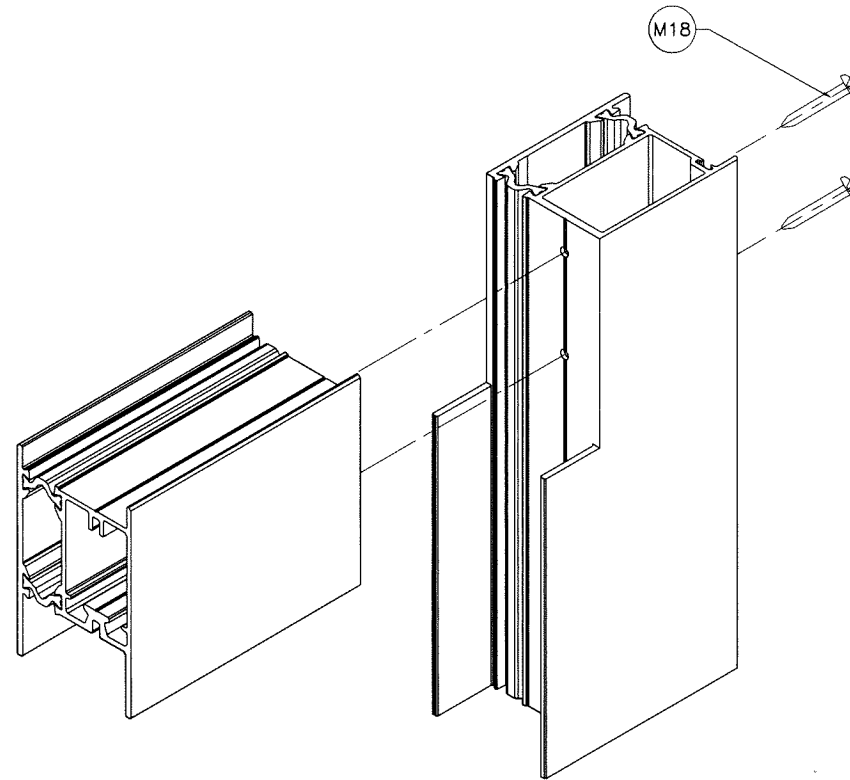
FL #22528



FRAME TOP CORNER



FRAME BOTTOM CORNER



PANEL TOP/BOTTOM CORNER

Sealed: 9/10/2026



FL #22528

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af c
(C.A.N. 3538)
COMP-ANL W17-58ES

ES-SD451 THERMAL ALUM SLIDING GL. DOOR (S.M.I.)

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

revisions:	
no	date by description

date: 01-02-17
scale: 3/8" = 1"
dr. by: TARIQ
chk. by:

drawing no.
W17-58
sheet 11 of 11