FL #	FL21461-R6
Application Type	Revision
Code Version	2023
Application Status	Approved
Comments	
Archived	☐
Product Manufacturer	E.S. Windows, Inc.
Address/Phone/Email	10653 NE Quaybridge Ct. Miami, FL 33138 (305) 624-7775 achamorro@eswllc.com
Authorized Signature	Jalal Farooq veronica@afceng.com
Technical Representative	Samir Sabagh
Address/Phone/Email	3550 NW 49th St. Miami, FL 33142 (305) 638-5151 ssabagh@energiasolarsa.com
Quality Assurance Representative	
Address/Phone/Email	
Category	Windows
Subcategory	Fixed
Compliance Method	Evaluation Report from a Florida Registered Architect or a Licensed Florida Professional Engineer ☐ Evaluation Report - Hardcopy Received
Florida Engineer or Architect Name who developed the Evaluation Report	Jalal Farooq
Florida License	PE-81223
Quality Assurance Entity	Keystone Certifications, Inc.
Quality Assurance Contract Expiration Date	07/16/2025
Validated By	Abel Carrasco, PE ☑ Validation Checklist - Hardcopy Received
Certificate of Independence	FL21461_R6_COI_SS - Certificate of Independence 2023.pdf

Referenced Standard and Year (of Standard)

Standard	Year
TAS 201	1994
TAS 202	1994
TAS 203	1994

Equivalence of Product Standards Certified By

Sections from the Code

Product Approval Method	Method 1 Option D
Date Submitted	10/23/2023
Date Validated	10/23/2023
Date Pending FBC Approval	11/01/2023
Date Approved	12/13/2023

Summary of Products

FL #	Model, Number or Name	Description
21461.1	Series ES-EL150 Aluminum Fixed Window	Large missile impact resistant aluminum fixed window.
Limits of Use **Approved for use in HVHZ:** Yes **Approved for use outside HVHZ:** Yes **Impact Resistant:** Yes **Design Pressure:** +80/-105 **Other:** See drawing W16-76 for span vs. load combinations and installation details.		**Installation Instructions** FL21461_R6_II_SS- ES-EL150 Alum FW (LMI) - DWG W16-76 (2023) R1.pdf Verified By: Jalal Farooq PE # 81223 Created by Independent Third Party: Yes **Evaluation Reports** FL21461_R6_AE_SS - ES-EL150 Alum FW (LMI)-PAE 2023 R1.pdf Created by Independent Third Party: Yes
21461.2	Series ES-EL150 Aluminum Fixed Window	Non-impact resistant aluminum fixed window.
Limits of Use **Approved for use in HVHZ:** Yes **Approved for use outside HVHZ:** Yes **Impact Resistant:** No **Design Pressure:** +80/-100 **Other:** See drawing 20-61F for span vs. load combinations and installation details		**Installation Instructions** FL21461_R6_II_SS - ES-EL150 Alum FW (NI)-DWG 20-61F 2023.1.pdf Verified By: Jalal Farooq PE # 81223 Created by Independent Third Party: Yes **Evaluation Reports** FL21461_R6_AE_SS- ES-EL150 Alum FW (NI)-PAE 2023.1.pdf Created by Independent Third Party: Yes
21461.3	Series ES-EL150-HP Aluminum Fixed Window	Large missile impact resistant aluminum fixed window.
Limits of Use **Approved for use in HVHZ:** Yes **Approved for use outside HVHZ:** Yes **Impact Resistant:** Yes **Design Pressure:** +100/-140 **Other:** See drawing 23-53F for span vs. load combinations and installation details		**Installation Instructions** FL21461_R6_II_SS- ES-EL150-HP Alum FW (LMI) - DWG 23-53F 2023.pdf Verified By: Jalal Farooq PE 81223 Created by Independent Third Party: Yes **Evaluation Reports** FL21461_R6_AE_SS - ES-EL150-HP Alum FW (LMI)-PAE 2023.pdf Created by Independent Third Party: Yes

Back Next

AL-FAROOQ CORPORATION

CONSULTING ENGINEERS & PRODUCT DEVELOPMENT

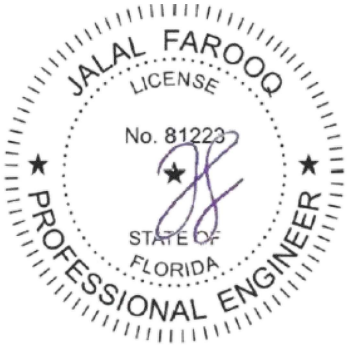
January 23, 2023

Product Approval Administrator
Building Codes & Standards Section
Department of Business & Professional Regulations
1940 North Monroe Street, Suite 90
Tallahassee, FL 32399-2100

To whom it may concern,

As the design engineer retained to prepare the product approval(s) associated with this letter as shown below on this same web page, I do hereby declare that I do not have and will not have any financial interest in any company manufacturing or distributing the referenced product(s), nor do I have or will have any financial interest with any other entity involved in the approval process of the referenced product(s).

Sincerely,



Jalal Farooq, P.E.
CFO

Sealed: 1/23/2023

9360 Sunset Drive, Suite 220 | Miami, FL 33173 | T: 305.264.8100 | F: 305.262.6978 | www.afceng.com | alfarooq@afceng.com

AL-FAROOQ CORPORATION

CONSULTING ENGINEERS & PRODUCT DEVELOPMENT

PRODUCT APPROVAL EVALUATION
RULE CHAPTER #61G20-3 • METHOD 1 OPTION D

FL 21461

Detailed Product Description: **Date: 10/19/2023**

Manufacturer: E.S. WINDOWS, LLC

Manufacturer Address: 3550 NW 49 STREET. MIAMI, FL 33142

Model Name: SERIES ES-EL150 FIXED ALUMINUM WINDOW

Maximum Load: +80 PSF, -105 PSF (Large Missile Impact)

Installation Drawings # W16-76

This product complies with the High Velocity Hurricane Zone (HVHZ) testing requirements.

For maximum sizes, combination of span vs loads and anchor type refer to installation drawings.

Comparative analysis used _X_ Yes ___ No

Mandatory Tests (Tested in accordance with AAMA 101/I.S.2/NAFS/TAS-202)

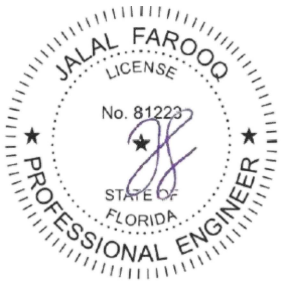
Test	Description	Test Location	Test Report Date	Test Report #	Test Sealed By
ASTM E283	Air Infiltration Leakage	Blackwater Testing, Inc	11/14/2016 8/30/2023	BT-ESW-16-004 BT-ESW-23-014	Constantin Bortes, PE Michael D. Caldwell, PE
		Fenestration Testing Laboratory, Inc	4/23/2020 4/30/2020 4/30/2020	FTL-11027 FTL-12002 FTL-11035	Idalmis Ortega, PE
ASTM E331 OR ASTM E547 & TAS 202	Water Penetration	Blackwater Testing, Inc	11/14/2016 8/30/2023	BT-ESW-16-004 BT-ESW-23-014	Constantin Bortes, PE Michael D. Caldwell, PE
		Fenestration Testing Laboratory, Inc	4/23/2020 4/30/2020 4/30/2020	FTL-11027 FTL-12002 FTL-11035	Idalmis Ortega, PE
ASTM E330 & TAS 202	Uniform Static Air Press.	Blackwater Testing, Inc	11/14/2016 8/30/2023	BT-ESW-16-004 BT-ESW-23-014	Constantin Bortes, PE Michael D. Caldwell, PE
		Fenestration Testing Laboratory, Inc	4/23/2020 4/30/2020 4/30/2020	FTL-11027 FTL-12002 FTL-11035	Idalmis Ortega, PE

Supplemental Tests (Tested in accordance with TAS-201 and TAS-203)

Test	Description	Test Location	Test Report Date	Test Report#	Test Sealed By
FBC 1626.2 (TAS 201 & 203) ANSI Z97.1	Large Missile Impact & Cyclic	Blackwater Testing, Inc	11/14/2016 8/30/2023	BT-ESW-16-004 BT-ESW-23-014	Constantin Bortes, PE Michael D. Caldwell, PE
		Fenestration Testing Laboratory, Inc	4/23/2020 4/30/2020 4/30/2020	FTL-11027 FTL-12002 FTL-11035	Idalmis Ortega, PE

Under the limitations of the attached installation drawings, to the best of my knowledge and ability, the above product conforms to the requirements of the 2023 Florida Building Code.

Evaluation Report Engineer:

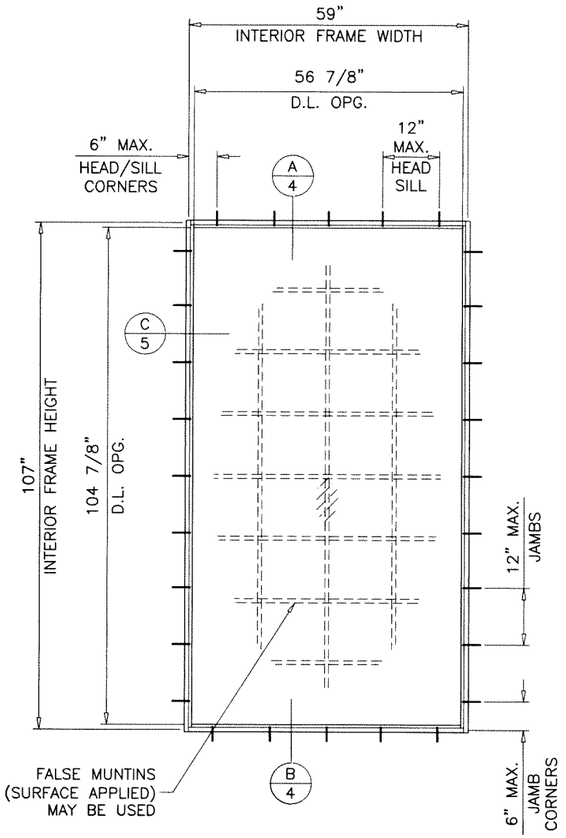


Jalal Farooq PE # 81223

Al-Farooq Corporation EB # 3538

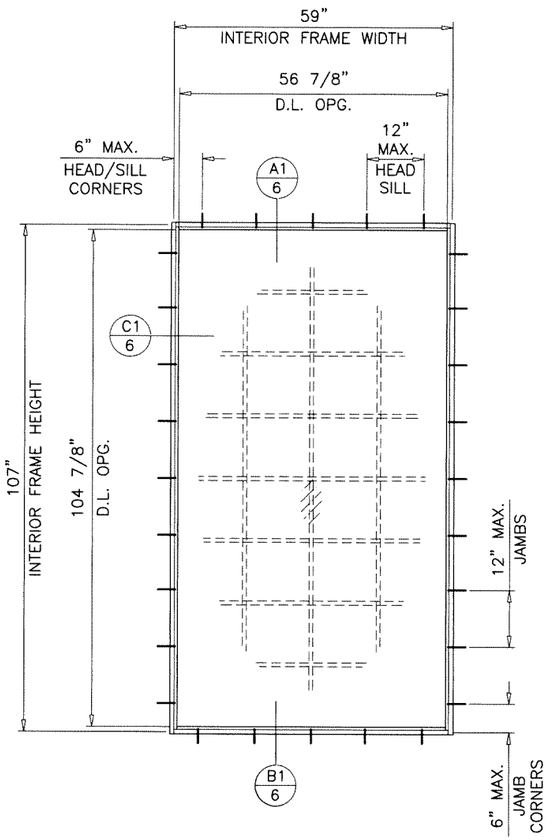
Sealed: 10/20/2023

9360 Sunset Drive STE 220 | Miami, FL 33173 | T: 305.264.8100 | F: 305.262.6978 | www.afceng.com | alfarooq@afceng.com



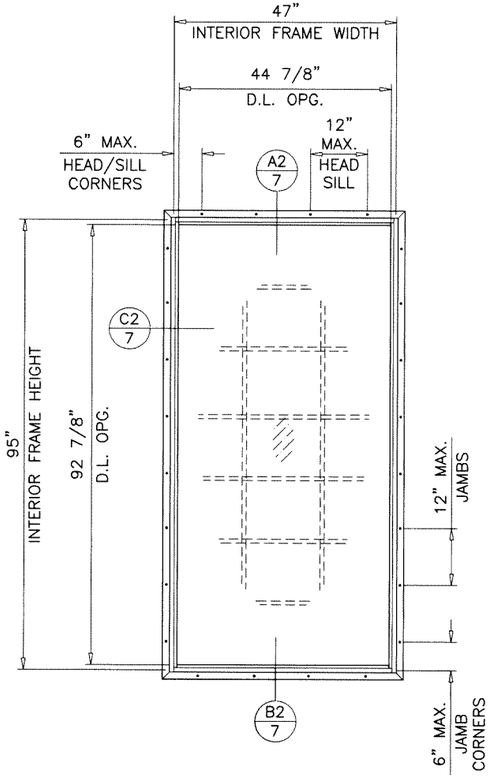
TYPICAL ELEVATION

FLANGE FRAMES



TYPICAL ELEVATION

FLANGE FRAMES WITH FLUSH ADAPTER



TYPICAL ELEVATION

FLANGE FRAMES WITH FIN ADAPTER

WINDOWS WITH FIN FRAME ADAPTERS LIMITED TO GLASS TYPES 'A', 'Ai', 'B', 'Di' & 'Ei' ONLY

ES-EL150
FIXED ALUMINUM WINDOW

DESIGN LOAD RATINGS FOR THESE WINDOWS TO BE AS PER CHARTS SHOWN ON SHEETS 3 AND 3.1.

APPROVAL APPLIES TO SINGLE UNITS OR SIDE BY SIDE COMBINATIONS OF FIX./FIX. OR FIXED WITH OTHER WINDOW TYPES IN MODULES OF TWO OR MORE WINDOWS USING F.B.C. APPROVED MULLIONS IN BETWEEN.
LOWER DESIGN PRESSURE FROM WINDOWS OR MULLION 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).

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 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)'.

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.

DAYLITE OPENINGS:
D.L.O. HEIGHT = WINDOW HEIGHT – 3.125"
D.L.O. WIDTH = WINDOW WIDTH – 3.125"

WINDOWS WITH GLASS TYPES 'AA', 'BB' & 'AAi' COMPLY WITH REQUIREMENTS OF ANSI Z97.1.

THESE WINDOWS ARE RATED FOR LARGE & SMALL MISSILE IMPACT. SHUTTERS ARE NOT REQUIRED.

Sealed: 10/23/2023

FL #21461

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.

JALAL FAROOQ
LICENSE
No. 81223
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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

COMP-ANL\W16-76ES

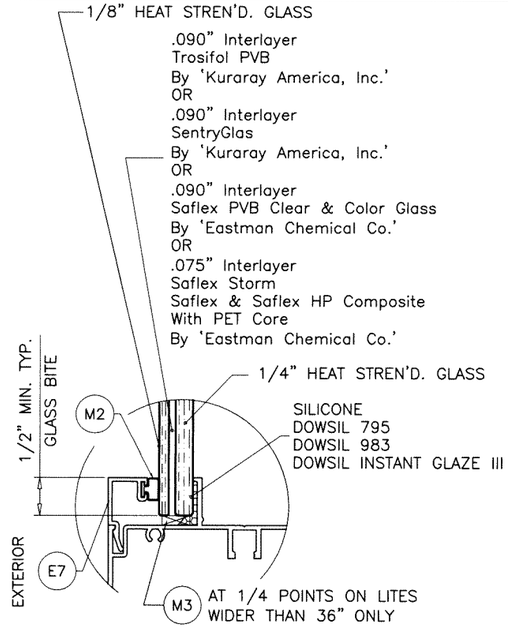
ES-EL150 FIXED ALUMINUM WDW. (L.M.I.)

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	12.05.17		UPDATED TO 2017 FBC
B	05.11.20		GENERAL REVISION
C	06.15.21		WDW. SIZES ADDED
D	07.07.23		UPDATED TO 2023 FBC
E	10.13.23		WDW. FRAME REV.

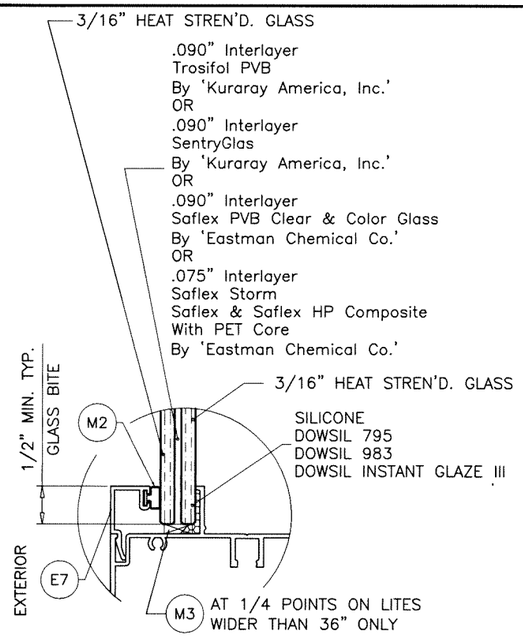
date: 11-29-16
scale: 3/8"=1'-0"
dr. by: TARIQ
chk. by:

drawing no. W16-76



GLASS TYPE 'A'

7/16" OVERALL LAM. GLASS



GLASS TYPE 'B'

7/16" OVERALL LAM. GLASS

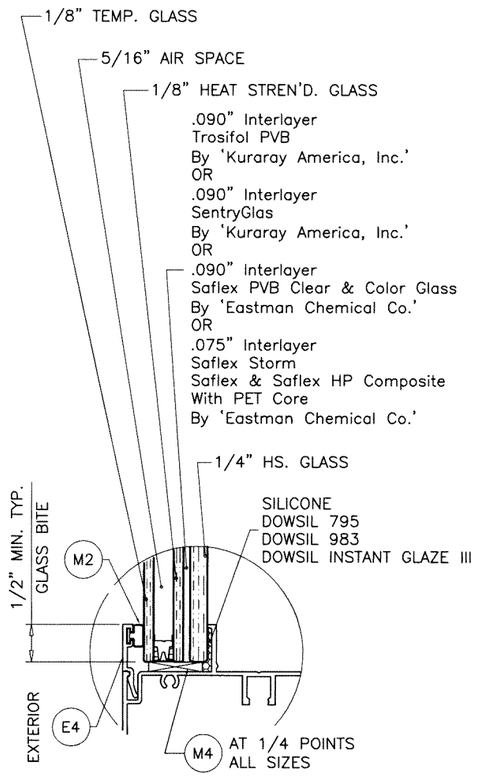
5/16" OR 3/8" AIR SPACE CONSISTING OF:

SPACER:

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

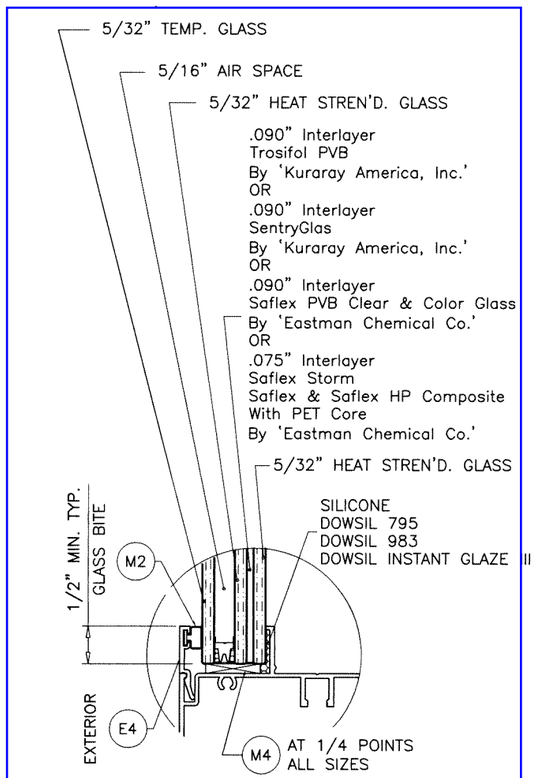
PERIMETER SEALANT:

SILICONE
DOW CORNING 791
GE 2000



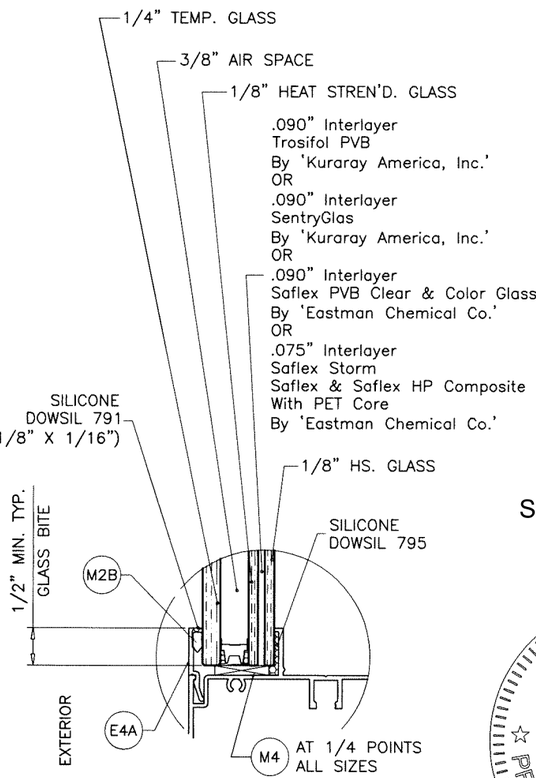
GLASS TYPE 'Ai'

7/8" OVERALL INSUL. LAM. GLASS



GLASS TYPE 'Di'

7/8" OVERALL INSUL. LAM. GLASS



GLASS TYPE 'Ei'

7/8" OVERALL INSUL. LAM. GLASS

GLAZING OPTIONS

Sealed: 10/23/2023

FL #21461

JALAL FAROOQ LICENSE No. 81223 STATE OF FLORIDA PROFESSIONAL ENGINEER

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

COMP-ANL\W16-76ES

ES-EL150 FIXED ALUMINUM WDW. (L.M.I.)

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

revisions:			
no	date	by	description

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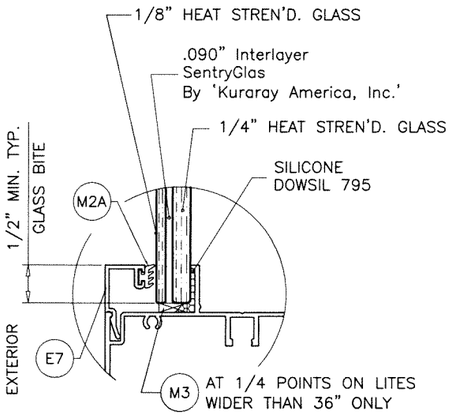
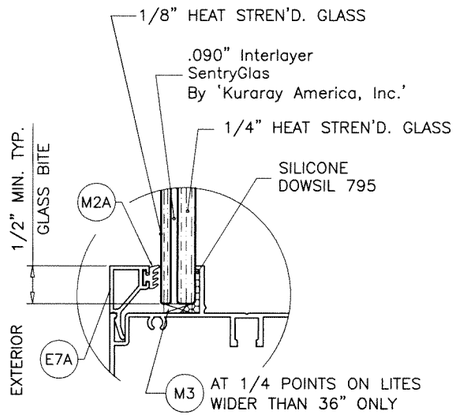
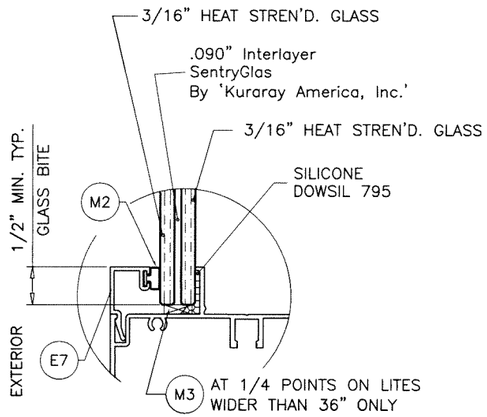
scale: 1/2" = 1"
dr. by: TARIQ
chk. by:

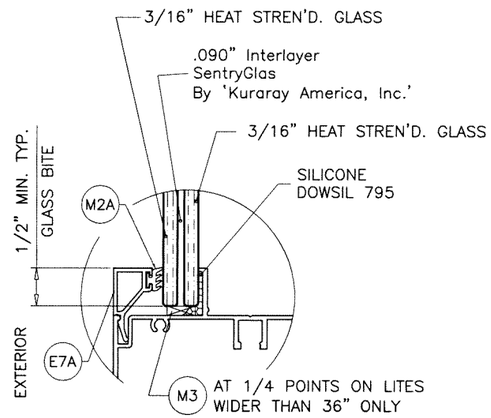
drawing no. W16-76



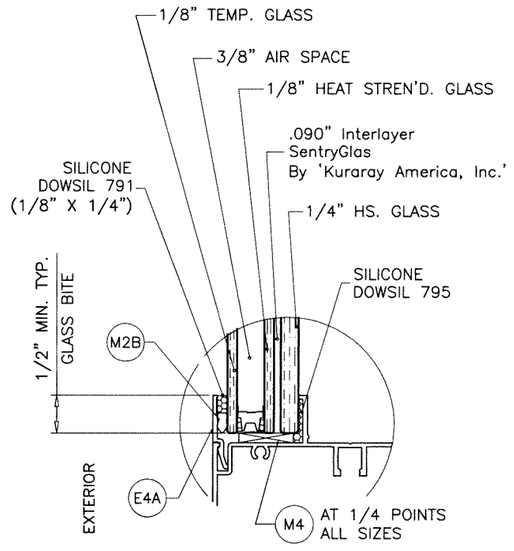


GLASS TYPE 'AA'
7/16" OVERALL LAM. GLASS





GLASS TYPE 'BB'
7/16" OVERALL LAM. GLASS



GLASS TYPE 'AAi'
7/8" OVERALL INSUL. LAM. GLASS

3/8" AIR SPACE CONSISTING OF:
SPACER:
'HELIMA' LOW PROFILE ALUMINUM SPACER
BY 'LINGERMANN GMBH'
AROUND THE PERIMETER OF THE GLASS.
PERIMETER SEALANT:
SILICONE
DOW CORNING 791
GE 2000

Sealed: 10/23/2023

JALAL FAROOQ LICENSE No. 81223 STATE OF FLORIDA PROFESSIONAL ENGINEER

FL #21461

GLAZING OPTIONS

AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
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TEL. (305) 638-5151 FAX. (305) 638-5158

revisions:

no	date	by	description

date: 11-29-16
scale: 1/2" = 1"
dr. by: TARIQ
chk. by:

drawing no. W16-76

sheet 2.1 of 9

DESIGN LOAD CAPACITY – PSF
FLANGE FRAMES, FLUSH FRAMES, FIN FRAMES

INTERIOR FRAME DIMS.		GLASS TYPE 'A'		GLASS TYPES 'B', 'Ai', 'Di', 'Ei'	
WIDTH	HEIGHT	EXT.(+)	1NT.(–)	EXT.(+)	1NT.(–)
29"	47"	60.0	80.0	80.0	80.0
35"		60.0	80.0	80.0	80.0
41"		60.0	68.6	80.0	80.0
47"		60.0	60.0	80.0	80.0
53"		60.0	60.0	80.0	80.0
59"		60.0	60.0	80.0	80.0
29"	53"	60.0	80.0	80.0	80.0
35"		60.0	80.0	80.0	80.0
41"		60.0	68.6	80.0	80.0
47"		60.0	60.0	80.0	80.0
53"		53.3	53.3	71.1	71.1
59"		53.3	53.3	71.1	71.1
29"	59"	60.0	80.0	80.0	80.0
35"		60.0	80.0	80.0	80.0
41"		60.0	68.6	80.0	80.0
47"		60.0	60.0	80.0	80.0
53"		53.3	53.3	71.1	71.1
59"		48.0	48.0	64.0	64.0
29"	65"	60.0	80.0	80.0	80.0
35"		60.0	80.0	80.0	80.0
41"		60.0	68.6	80.0	80.0
47"		60.0	60.0	80.0	80.0
53"		53.3	53.3	71.1	71.1
59"		48.0	48.0	64.0	64.0
29"	71"	60.0	80.0	80.0	80.0
35"		60.0	80.0	80.0	80.0
41"		60.0	68.6	80.0	80.0
47"		60.0	60.0	80.0	80.0
53"		53.3	53.3	71.1	71.1
59"		48.0	48.0	64.0	64.0
29"	77"	60.0	80.0	80.0	80.0
35"		60.0	78.0	80.0	80.0
41"		60.0	68.6	80.0	80.0
47"		60.0	60.0	80.0	80.0
53"		53.3	53.3	71.1	71.1
29"	83"	60.0	80.0	80.0	80.0
35"		60.0	76.4	80.0	80.0
41"		60.0	68.6	80.0	80.0
47"		60.0	60.0	80.0	80.0
53"		53.3	53.3	71.1	71.1
29"	89"	60.0	80.0	80.0	80.0
35"		60.0	75.0	80.0	80.0
41"		60.0	67.1	80.0	80.0
47"		60.0	60.0	80.0	80.0
29"	95"	60.0	80.0	80.0	80.0
35"		60.0	73.8	80.0	80.0
41"		60.0	65.8	80.0	80.0
47"		60.0	60.0	80.0	80.0

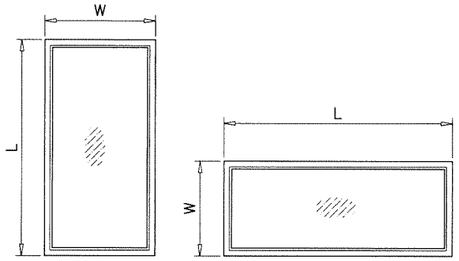
DESIGN LOAD CAPACITY – PSF
FLANGE FRAMES, FLUSH FRAMES, FIN FRAMES

INTERIOR FRAME DIMS.		GLASS TYPE 'A'		GLASS TYPES 'B', 'Ai', 'Di', 'Ei'	
WIDTH	HEIGHT	EXT.(+)	1NT.(–)	EXT.(+)	1NT.(–)
29"	101"	60.0	80.0	80.0	80.0
32"		60.0	78.1	80.0	80.0
35"		60.0	72.9	80.0	80.0
38"		60.0	68.5	80.0	80.0
41"		60.0	64.8	80.0	80.0
44"		60.0	61.6	80.0	80.0
29"	107"	60.0	80.0	80.0	80.0
32"		60.0	77.3	80.0	80.0
35"		60.0	72.0	80.0	80.0
38"		60.0	67.6	80.0	80.0
41"		60.0	63.8	80.0	80.0
29"	113"	60.0	80.0	80.0	80.0
32"		60.0	76.5	80.0	80.0
35"		60.0	71.3	80.0	80.0
38"		60.0	66.8	80.0	80.0
29"	119"	60.0	80.0	80.0	80.0
32"		60.0	75.9	80.0	80.0
35"		60.0	70.6	80.0	80.0
29"	125"	60.0	80.0	80.0	80.0
32"		60.0	75.3	80.0	80.0
35"		60.0	70.0	80.0	80.0
29"	131"	60.0	80.0	80.0	80.0
32"		60.0	74.8	80.0	80.0
29"	137"	60.0	80.0	80.0	80.0
32"		60.0	74.3	80.0	80.0
29"	143"	60.0	80.0	80.0	80.0

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

DESIGN LOAD CAPACITY – PSF
FLANGE FRAMES, FLUSH FRAMES, FIN FRAMES

INTERIOR FRAME DIMS.		GLASS TYPE 'A'		GLASS TYPES 'B', 'Ai', 'Di', 'Ei'	
WIDTH	HEIGHT	EXT.(+)	1NT.(–)	EXT.(+)	1NT.(–)
18–1/8"	25"	60.0	80.0	80.0	80.0
25–1/2"		60.0	80.0	80.0	80.0
36"		60.0	80.0	80.0	80.0
47"		60.0	80.0	80.0	80.0
52–1/8"		60.0	80.0	80.0	80.0
18–1/8"	37–3/8"	60.0	80.0	80.0	80.0
25–1/2"		60.0	80.0	80.0	80.0
36"		60.0	77.8	80.0	80.0
47"		60.0	75.0	80.0	80.0
52–1/8"		60.0	75.0	80.0	80.0
18–1/8"	49–5/8"	60.0	80.0	80.0	80.0
25–1/2"		60.0	80.0	80.0	80.0
36"		60.0	77.8	80.0	80.0
47"		60.0	60.0	80.0	80.0
52–1/8"		56.9	56.9	75.9	75.9
18–1/8"	57"	60.0	80.0	80.0	80.0
25–1/2"		60.0	80.0	80.0	80.0
36"		60.0	77.8	80.0	80.0
47"		60.0	60.0	80.0	80.0
52–1/8"		54.2	54.2	72.3	72.3
18–1/8"	62"	60.0	80.0	80.0	80.0
25–1/2"		60.0	80.0	80.0	80.0
36"		60.0	77.8	80.0	80.0
47"		60.0	60.0	80.0	80.0
52–1/8"		54.2	54.2	72.3	72.3
18–1/8"	75"	60.0	80.0	80.0	80.0
25–1/2"		60.0	80.0	80.0	80.0
36"		60.0	77.2	80.0	80.0
47"		60.0	60.0	80.0	80.0
52–1/8"		54.2	54.2	72.3	72.3



NOTE:
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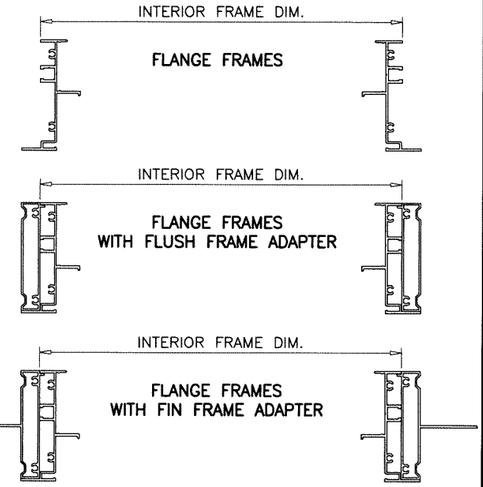

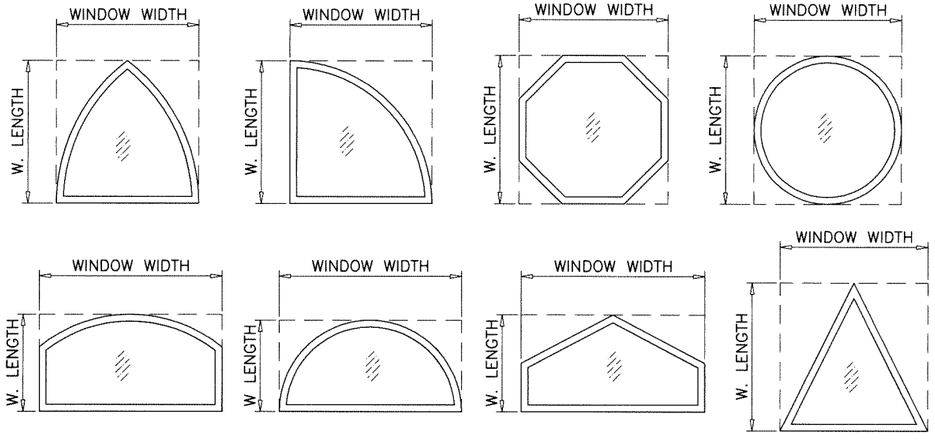

ALLOWABLE LOADS FOR ALTERNATE SHAPES AS SHOWN ABOVE OR SIMILAR CAN BE VERIFIED BY INSCRIBING PICTURE WINDOW SHAPE WITHIN SQUARE OR RECTANGLE AS SHOWN IN DOTTED LINES AND OBTAINING ALLOWABLE LOADS FROM THOSE SHAPES.

Sealed: 10/23/2023

JALAL FAROOQ LICENSE No. 81223 STATE OF FLORIDA PROFESSIONAL ENGINEER

FL #21461

afc
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ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
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COMP–ANL\W16–76ES

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revisions:

no	date	by	description

date: 11–29–16
scale: 1/2" = 1"
dr. by: TARIQ
chk. by:

drawing no. W16–76

DESIGN LOAD CAPACITY – PSF
FLANGE FRAMES & FLUSH FRAMES ONLY

INTERIOR FRAME DIMS.		GLASS TYPES 'AA' & 'AAi'		GLASS TYPE 'BB'	
WIDTH	HEIGHT	EXT.(+)	INT.(−)	EXT.(+)	INT.(−)
47"	47"	80.0	105.0	80.0	100.0
53"		80.0	105.0	80.0	100.0
59"		80.0	105.0	80.0	100.0
65"		80.0	105.0	80.0	100.0
71"		80.0	105.0	80.0	100.0
77"		80.0	105.0	80.0	100.0
47"	53"	80.0	105.0	80.0	100.0
53"		71.1	93.3	80.0	88.9
59"		71.1	93.3	80.0	88.9
65"		71.1	93.3	80.0	88.9
71"		–	–	80.0	88.9
77"		–	–	80.0	88.9
47"	59"	80.0	105.0	80.0	100.0
53"		71.1	93.3	80.0	88.9
59"		64.0	84.0	80.0	80.0
65"		–	–	80.0	80.0
71"		–	–	80.0	80.0
77"		–	–	80.0	80.0
47"	65"	80.0	105.0	80.0	100.0
53"		71.1	93.3	80.0	88.9
59"		–	–	80.0	80.0
65"		–	–	72.7	72.7
71"		–	–	72.7	72.7
77"		–	–	72.7	72.7
47"	71"	80.0	105.0	80.0	100.0
53"		–	–	80.0	88.9
59"		–	–	80.0	80.0
65"		–	–	72.7	72.7
71"		–	–	66.7	66.7
77"		–	–	66.7	66.7
47"	77"	80.0	105.0	80.0	100.0
53"		–	–	80.0	88.9
59"		–	–	80.0	80.0
65"		–	–	72.7	72.7
71"		–	–	66.7	66.7
77"		–	–	61.5	61.5
41"	83"	80.0	105.0	80.0	100.0
47"		–	–	80.0	100.0
53"		–	–	80.0	88.9
59"		–	–	80.0	80.0
65"		–	–	72.7	72.7
71"		–	–	66.7	66.7
41"	89"	80.0	105.0	80.0	100.0
47"		–	–	80.0	100.0
53"		–	–	80.0	80.0
59"		–	–	80.0	80.0
65"		–	–	72.7	72.7
71"		–	–	66.7	66.7
35"	95"	80.0	105.0	80.0	100.0
41"		–	–	80.0	100.0
47"		–	–	80.0	100.0
53"		–	–	80.0	80.0
59"		–	–	80.0	80.0
65"		–	–	72.7	72.7

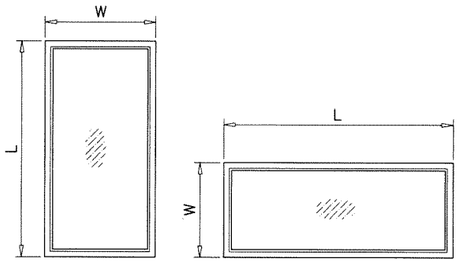
DESIGN LOAD CAPACITY – PSF
FLANGE FRAMES & FLUSH FRAMES ONLY

INTERIOR FRAME DIMS.		GLASS TYPES 'AA' & 'AAi'		GLASS TYPE 'BB'	
WIDTH	HEIGHT	EXT.(+)	INT.(−)	EXT.(+)	INT.(−)
35"	101"	80.0	105.0	80.0	100.0
41"		–	–	80.0	100.0
47"		–	–	80.0	80.0
53"		–	–	80.0	80.0
59"		–	–	80.0	80.0
29"	107"	80.0	105.0	80.0	100.0
41"		–	–	80.0	100.0
47"		–	–	80.0	80.0
53"		–	–	80.0	80.0
59"		–	–	80.0	80.0
29"	113"	80.0	105.0	80.0	100.0
47"		–	–	80.0	80.0
53"		–	–	80.0	80.0
29"	119"	80.0	105.0	80.0	100.0
47"		–	–	80.0	80.0
53"		–	–	80.0	80.0
29"	125"	80.0	105.0	80.0	100.0
23"	131"	80.0	105.0	80.0	100.0
41"		–	–	80.0	80.0
47"		–	–	80.0	80.0
23"	137"	80.0	105.0	80.0	100.0
41"		–	–	80.0	80.0
23"	143"	80.0	105.0	80.0	100.0
41"		–	–	80.0	80.0

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

DESIGN LOAD CAPACITY – PSF
FLANGE FRAMES & FLUSH FRAMES ONLY

INTERIOR FRAME DIMS.		GLASS TYPES 'AA' & 'AAi'		GLASS TYPE 'BB'	
WIDTH	HEIGHT	EXT.(+)	INT.(−)	EXT.(+)	INT.(−)
18–1/8"	25"	80.0	105.0	80.0	100.0
25–1/2"		80.0	105.0	80.0	100.0
36"		80.0	105.0	80.0	100.0
47"		80.0	105.0	80.0	100.0
52–1/8"		80.0	105.0	80.0	100.0
18–1/8"	37–3/8"	80.0	105.0	80.0	100.0
25–1/2"		80.0	105.0	80.0	100.0
36"		80.0	105.0	80.0	100.0
47"		80.0	105.0	80.0	100.0
52–1/8"		80.0	105.0	80.0	100.0
18–1/8"	49–5/8"	80.0	105.0	80.0	100.0
25–1/2"		80.0	105.0	80.0	100.0
36"		80.0	105.0	80.0	100.0
47"		80.0	105.0	80.0	100.0
52–1/8"		75.9	99.6	80.0	94.8
18–1/8"	57"	80.0	105.0	80.0	100.0
25–1/2"		80.0	105.0	80.0	100.0
36"		80.0	105.0	80.0	100.0
47"		80.0	105.0	80.0	100.0
52–1/8"		72.3	94.9	80.0	90.4
18–1/8"	62"	80.0	105.0	80.0	100.0
25–1/2"		80.0	105.0	80.0	100.0
36"		80.0	105.0	80.0	100.0
47"		80.0	105.0	80.0	100.0
52–1/8"		72.3	94.9	80.0	90.4
18–1/8"	75"	80.0	105.0	80.0	100.0
25–1/2"		80.0	105.0	80.0	100.0
36"		80.0	105.0	80.0	100.0
47"		80.0	105.0	80.0	100.0
52–1/8"		–	–	80.0	90.4



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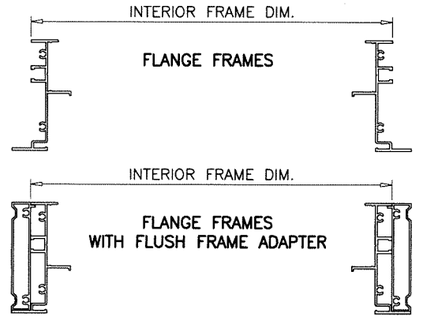

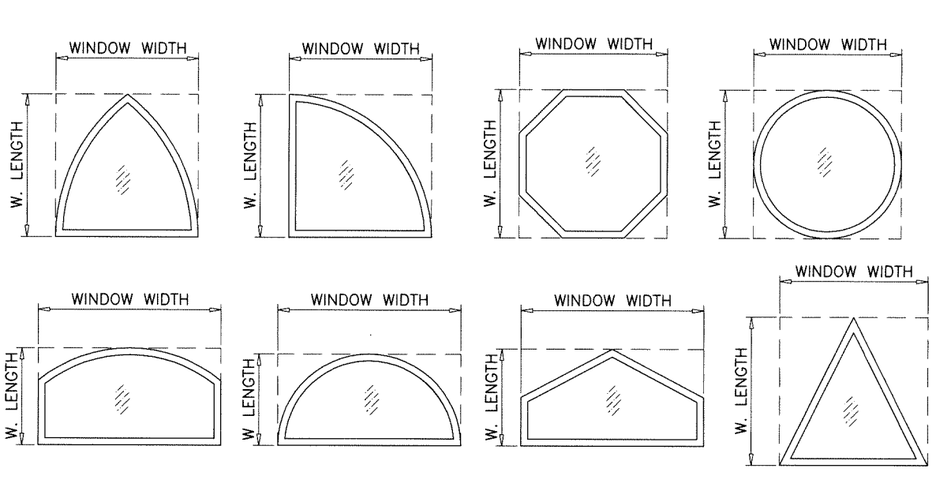

ALLOWABLE LOADS FOR ALTERNATE SHAPES AS SHOWN ABOVE OR SIMILAR CAN BE VERIFIED BY INSCRIBING PICTURE WINDOW SHAPE WITHIN SQUARE OR RECTANGLE AS SHOWN IN DOTTED LINES AND OBTAINING ALLOWABLE LOADS FROM THOSE SHAPES.

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COMP–ANL\W16–76ES

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dr. by: TARIQ
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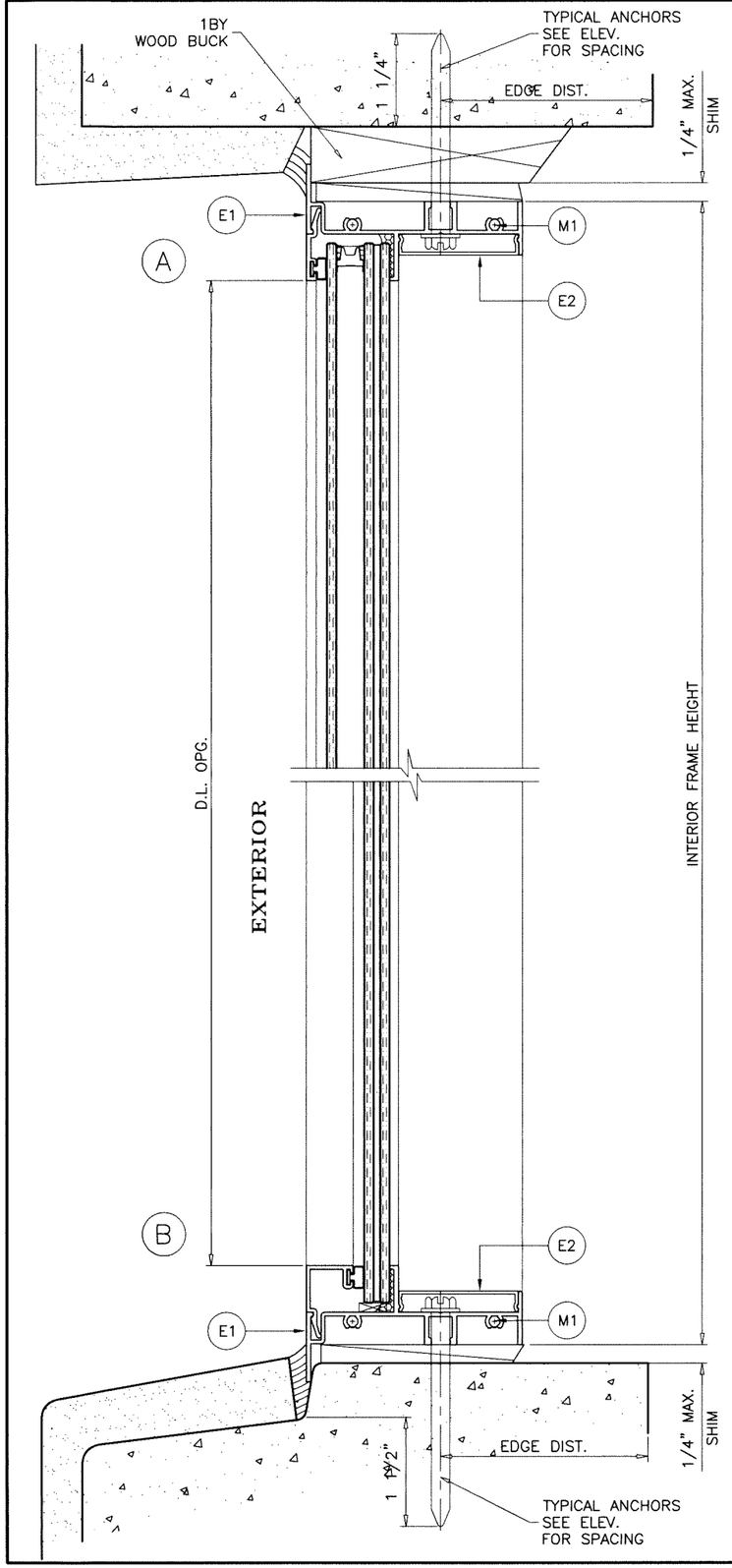
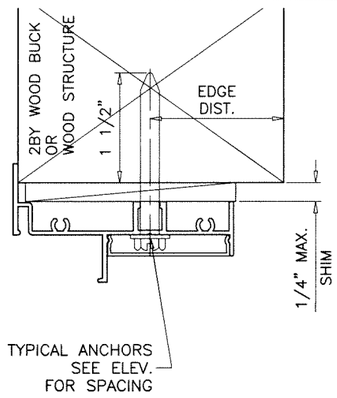
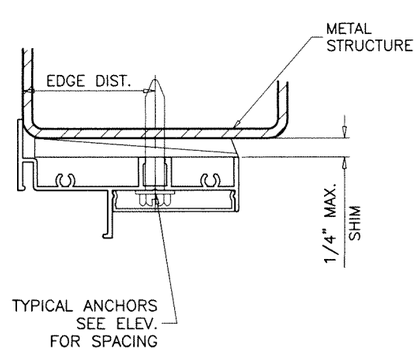
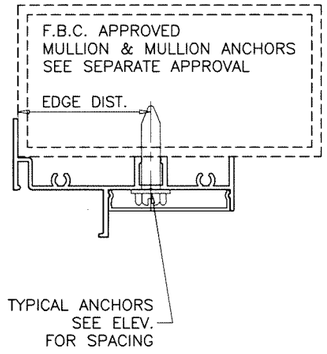
drawing no. W16–76

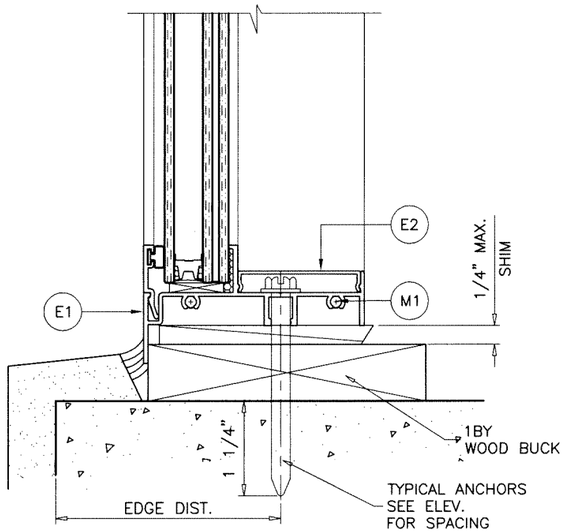
sheet 3.1 of 9











WOOD BUCKS AND METAL STRUCTURE NOT BY 'E.S. WINDOWS' MUST SUSTAIN LOADS IMPOSED BY GLAZING SYSTEM AND TRANSFER THEM TO THE BUILDING STRUCTURE.

TYPICAL ANCHORS: SEE ELEV. FOR SPACING

1/4" DIA. TAPCON BY 'ITW' (Fu=125 KSI, Fy=100 KSI)
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/SILL/JAMBS)

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

DIRECTLY INTO CONCRETE OR MASONRY
1-1/2" MIN. EMBED INTO CONCRETE (HEAD/SILL/JAMBS)
1-1/4" MIN. EMBED INTO MASONRY (JAMBS)

1/4" DIA. TEKS OR SELF DRILLING SCREWS (GRADE 5 CRS)
INTO F.B.C. APPROVED MULLIONS
OR
INTO METAL STRUCTURES (HEAD/SILL/JAMBS)
(3) THREADS MIN. TO EXTEND BEYOND METAL THICKNESS
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" MIN.
INTO WOOD STRUCTURE = 1" MIN.
INTO METAL STRUCTURE = 3/4" MIN.

WOOD AT HEAD, SILL OR JAMBS SG = 0.55 MIN.
CONCRETE AT HEAD, SILL OR JAMBS f'c = 3000 PSI MIN.
C-90 HOLLOW/FILLED BLOCK AT JAMBS f'm = 2000 PSI MIN.

Sealed: 10/23/2023

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no	date	by	description

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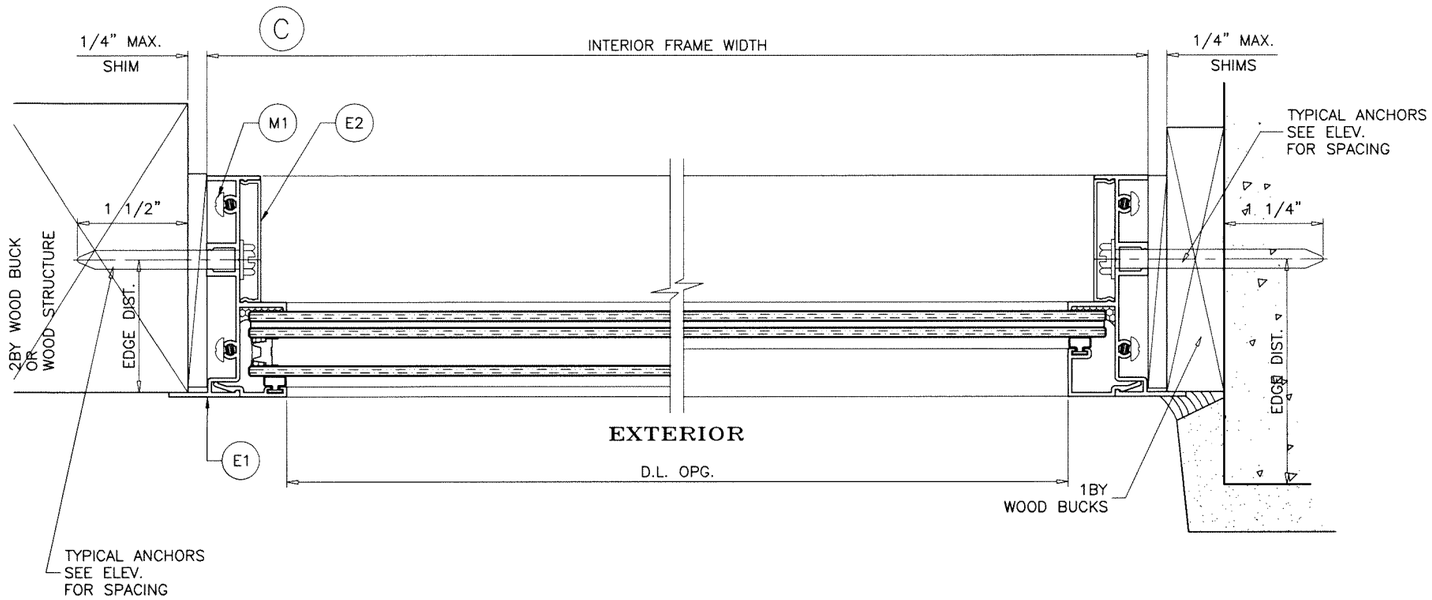
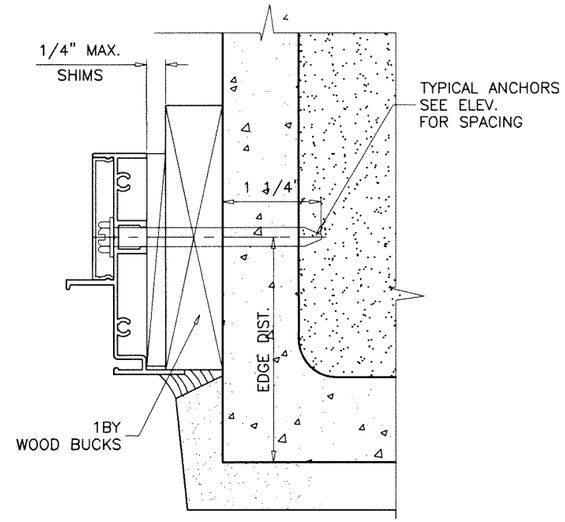
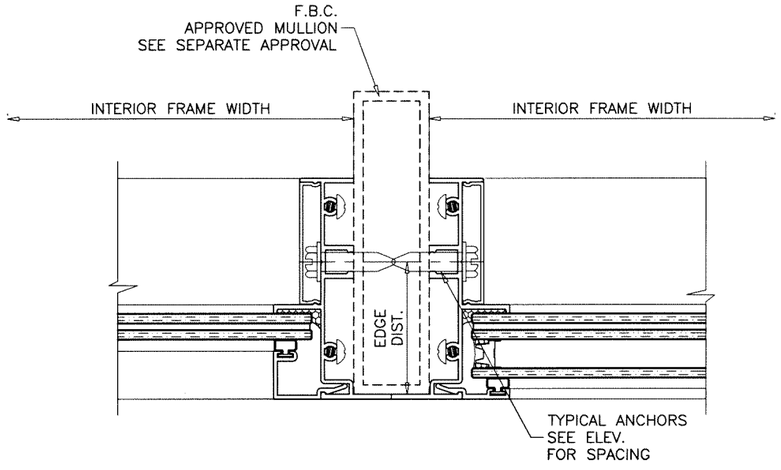
dr. by: TARIQ
chk. by:

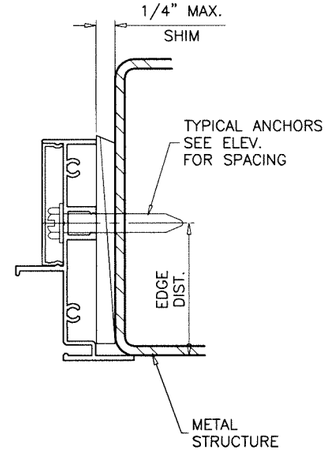
drawing no. W16-76

sheet 4 of 9









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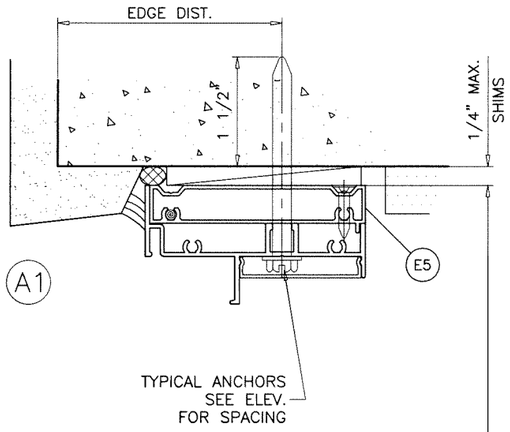
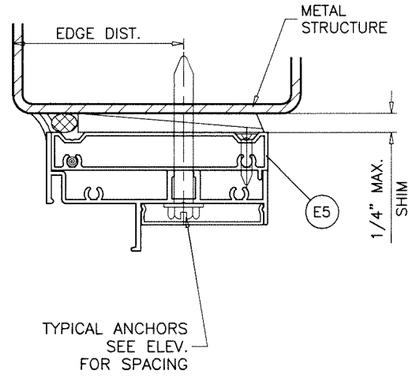
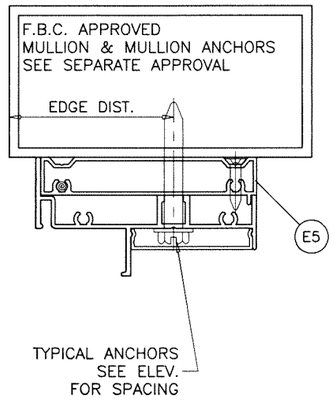
W16-76

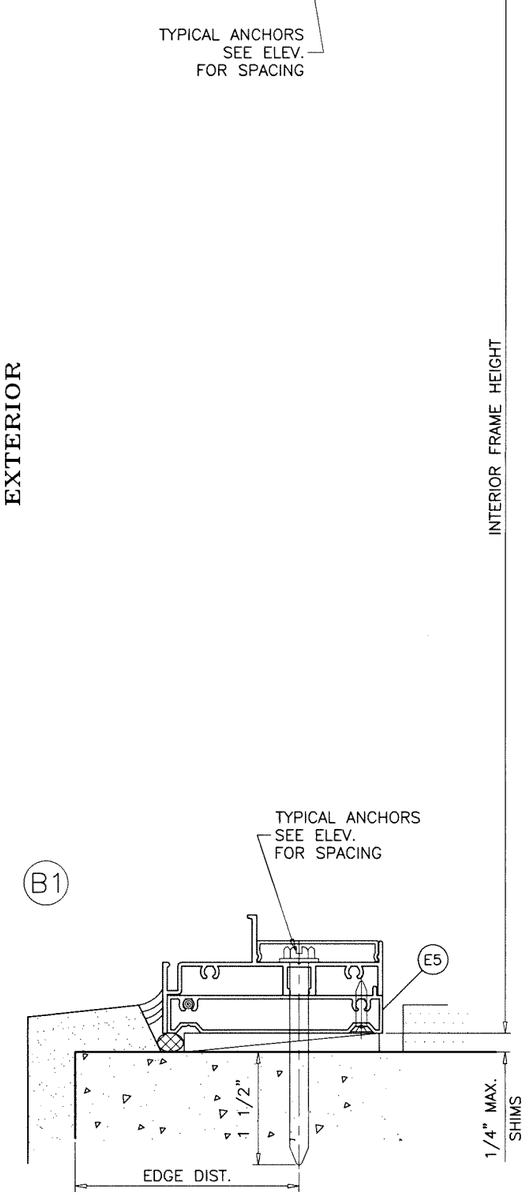
sheet 5 of 9



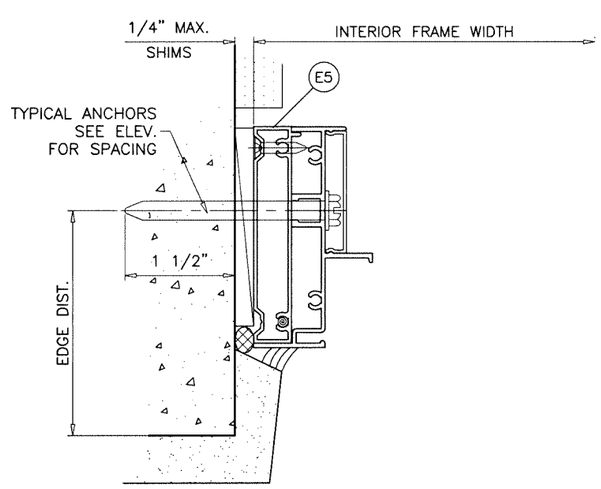




EXTERIOR



C1



INSTALLATION DETAILS WITH FLUSH FRAME ADAPTERS

SEE SHEETS 4 & 5 FOR WINDOW DETAILS

Sealed: 10/23/2023

FL #21461

JALAL FAROOQ LICENSE No. 81223 STATE OF FLORIDA PROFESSIONAL ENGINEER

AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173 (C.A.N. 3538)
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COMP-ANL\W16-76ES

ES-EL150 FIXED ALUMINUM WDW. (L.M.I.)

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revisions:

no	date	by	description

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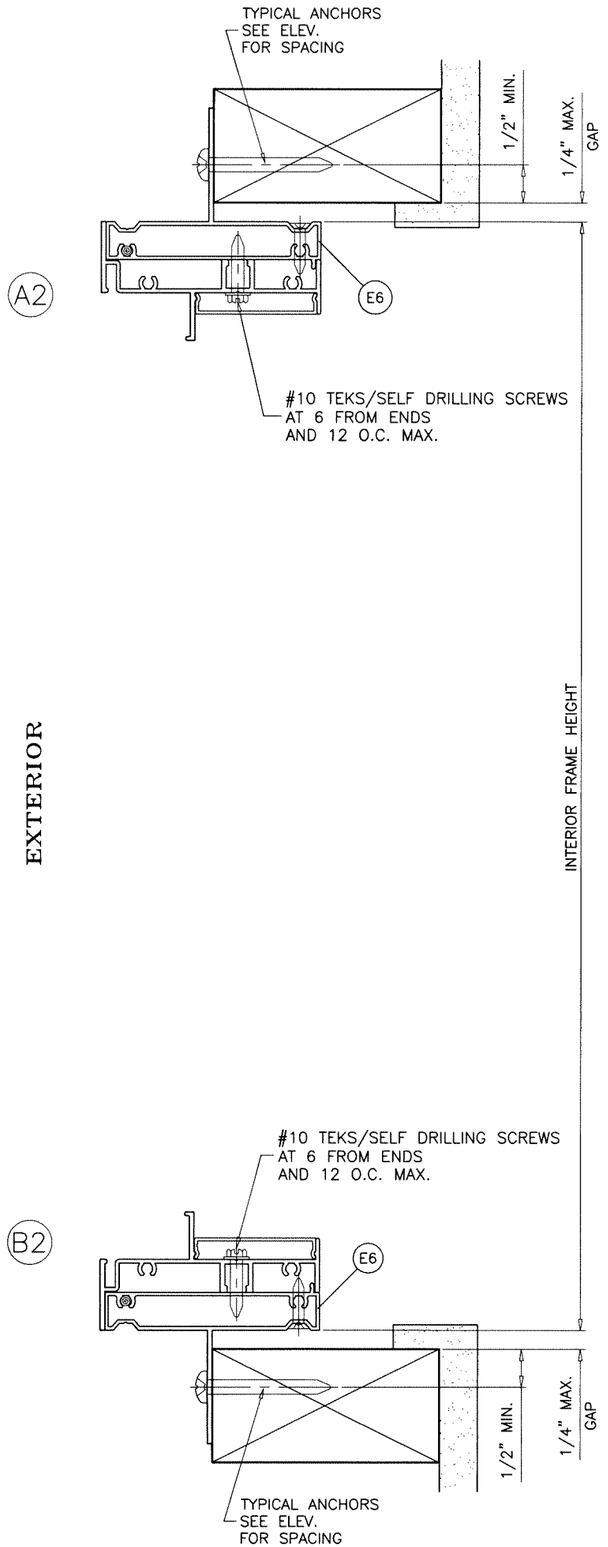
chk. by:

drawing no. W16-76

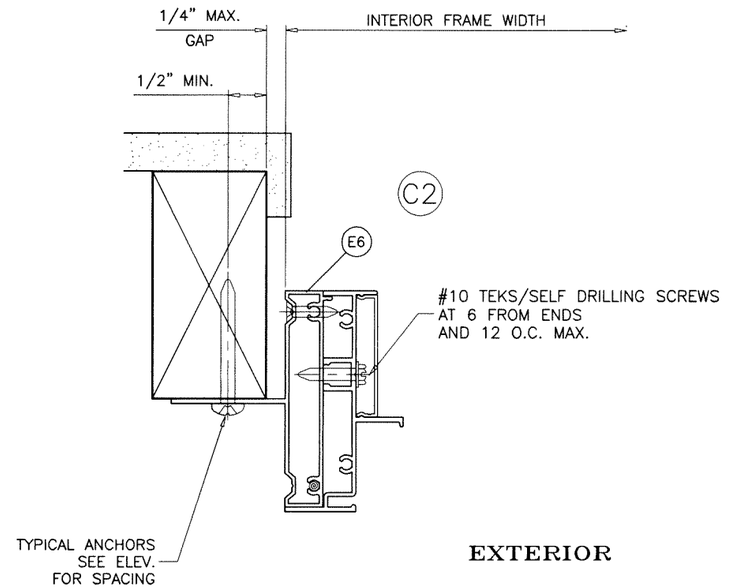
sheet 6 of 9



TYPICAL ANCHORS: SEE ELEV. FOR SPACING

#10 WOOD SCREWS (GRADE 2 CRS)

INTO 2BY WOOD BUCKS OR WOOD STRUCTURES
1–1/2" MIN. PENETRATION INTO WOOD



INSTALLATION DETAILS WITH FIN FRAME ADAPTERS

SEE SHEETS 4 & 5 FOR WINDOW DETAILS

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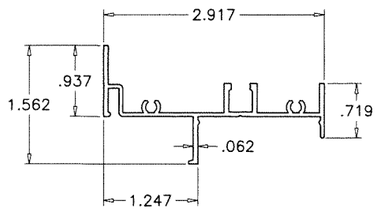
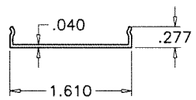
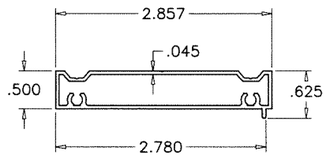


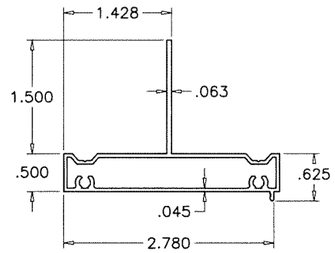
E1 FRAME



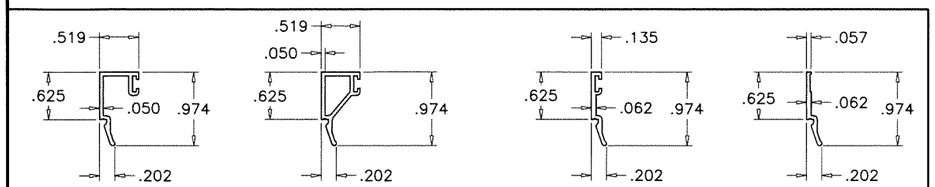
E2 FRAME SCREW COVER



E5 FLUSH FRAME ADAPTER



E6 FLUSH FRAME ADAPTER WITH FIN



E7 E7A E4 E4A GLAZING BEADS

ITEM #	PART #	REQD.	DESCRIPTION	MATERIAL	MANF./SUPPLIER/REMARKS
E1	ES–EL155	1	FRAME	6063–T6	–
E2	ES–EL156	AS REQD.	FRAME SCREW COVER	6063–T6	–
E4	ES–EL111	AS RQD.	GLAZING BEAD (INSUL. LAM. GLASS)	6063–T6	–
E4A	ES–EL116	AS RQD.	GLAZING BEAD (INSUL. LAM. GLASS)	6063–T6	–
E5	ES–EL112	AS REQD.	FLUSH FRAME ADAPTER	6063–T6	–
E6	ES–EL115	AS REQD.	FLUSH FRAME ADAPTER WITH FIN	6063–T6	–
E7	ES–EL110	AS RQD.	GLAZING BEAD (7/16" LAM. GLASS)	6063–T6	–
E7A	ES–EL123	AS RQD.	GLAZING BEAD (7/16" LAM. GLASS)	6063–T6	–
M1	#8 X 1"	–	FRAME ASSEMBLY FASTENERS	ST. STEEL	PH SMS
M2	ES–5008A	AS REQD.	EXTERIOR BULB GASKET	SILICONE	DUROMETER 60±5 SHORE A
M2A	EL100–G02	AS REQD.	EXTERIOR LEAF GASKET	SILICONE	DUROMETER 60±5 SHORE A
M2B	ES–H–340–G05	AS REQD.	EXTERIOR WEDGE GASKET	SILICONE	DUROMETER 65±5 SHORE A
M3	80–372A	2/ LITE	SETTING BLOCK AT 1/4 POINTS (LAM. GLASS)	SILICONE	DUROMETER 80±5 SHORE A
M4	EL100–B01	2/ LITE	SETTING BLOCK AT 1/4 POINTS (INSUL. LAM. GLASS)	SILICONE	DUROMETER 80±5 SHORE A
M5	#8 X 1"	–	FLUSH/FIN FRAME ADAPTER ASSEMBLY FASTENERS	ST. STEEL	FH SMS

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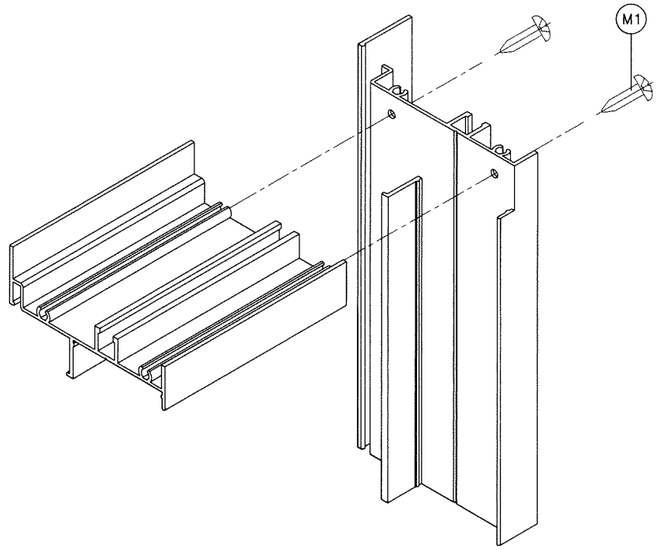
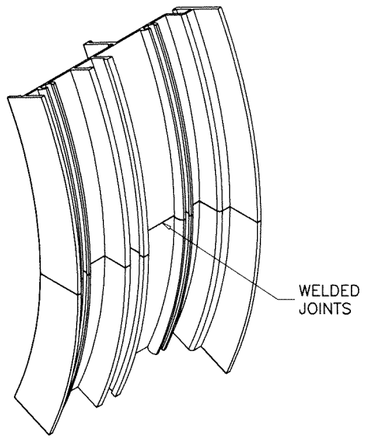
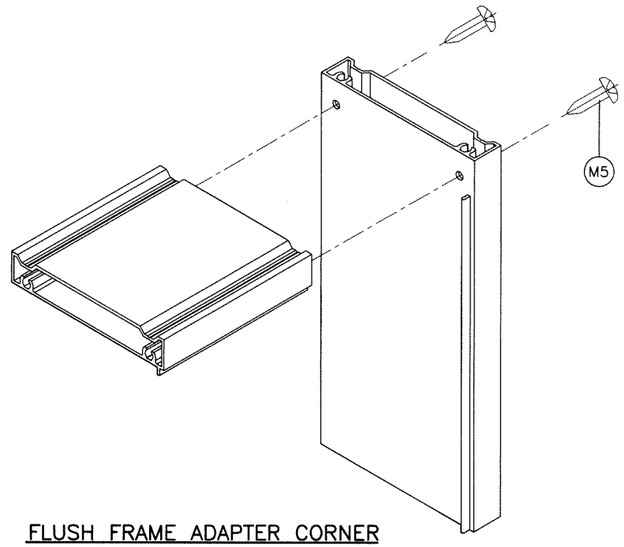


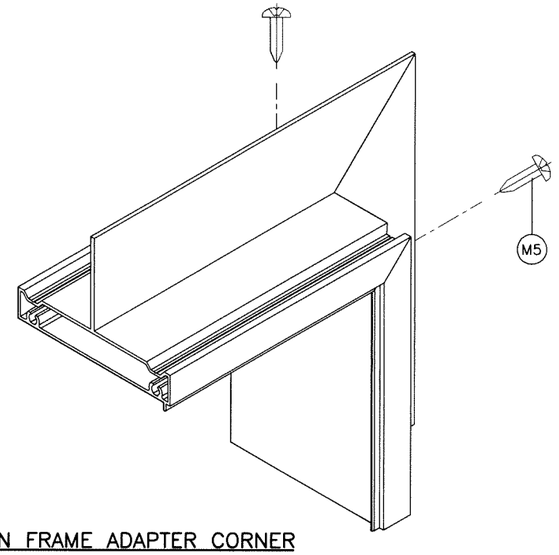
RECT. OR SQUARE WINDOWS



CIRCULAR WINDOWS



FLUSH FRAME ADAPTER CORNER



FIN FRAME ADAPTER CORNER

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