

HISTORIC AND DESIGN REVIEW COMMISSION

September 07, 2022

HDRC CASE NO: 2022-434
ADDRESS: 115 AUDITORIUM CIRCLE
LEGAL DESCRIPTION: NCB 180 BLK LOT 16 (BEXAR COUNTY PERFORMING ARTS CENTER)
ZONING: D S, H, RIO-3
CITY COUNCIL DIST.: 1
DISTRICT: Auditorium Circle Historic District
LANDMARK: Individual Landmark
APPLICANT: Mary Bartlett/Marmon Mok Architecture
OWNER: Jack Freeman/BEXAR COUNTY PERFORMING ARTS CENTER FOUNDATION
TYPE OF WORK: Window replacement
APPLICATION RECEIVED: August 05, 2022
60-DAY REVIEW: Not applicable due to City Council Emergency Orders
CASE MANAGER: Hannah Leighner

REQUEST:

The applicant is requesting a Certificate of Appropriateness for approval to replace thirty (30) of the existing wood windows with double-hung, clad pine wood windows of matching profiles to include:

1. All seven (7) single-hung wood windows on the east elevation
2. All nineteen (19) single-hung wood windows on the south elevation
3. All four (4) single-hung wood windows and one six-pane wood transom window on the west elevation

APPLICABLE CITATIONS:

Historic Design Guidelines, Chapter 2, Exterior Maintenance and Alterations

6. Architectural Features: Doors, Windows, and Screens

A. MAINTENANCE (PRESERVATION)

- Openings*—Preserve existing window and door openings. Avoid enlarging or diminishing to fit stock sizes or air conditioning units. Avoid filling in historic door or window openings. Avoid creating new primary entrances or window openings on the primary façade or where visible from the public right-of-way.
- Doors*—Preserve historic doors including hardware, fanlights, sidelights, pilasters, and entablatures.
- Windows*—Preserve historic windows. When glass is broken, the color and clarity of replacement glass should match the original historic glass.
- Screens and shutters*—Preserve historic window screens and shutters.
- Storm windows*—Install full-view storm windows on the interior of windows for improved energy efficiency. Storm window may be installed on the exterior so long as the visual impact is minimal and original architectural details are not obscured.

B. ALTERATIONS (REHABILITATION, RESTORATION, AND RECONSTRUCTION)

- Doors*—Replace doors, hardware, fanlight, sidelights, pilasters, and entablatures in-kind when possible and when deteriorated beyond repair. When in-kind replacement is not feasible, ensure features match the size, material, and profile of the historic element.
- New entrances*—Ensure that new entrances, when necessary to comply with other regulations, are compatible in size, scale, shape, proportion, material, and massing with historic entrances.
- Glazed area*—Avoid installing interior floors or suspended ceilings that block the glazed area of historic windows.
- Window design*—Install new windows to match the historic or existing windows in terms of size, type, configuration, material, form, appearance, and detail when original windows are deteriorated beyond repair.
- Muntins*—Use the exterior muntin pattern, profile, and size appropriate for the historic building when replacement windows are necessary. Do not use internal muntins sandwiched between layers of glass.
- Replacement glass*—Use clear glass when replacement glass is necessary. Do not use tinted glass, reflective glass, opaque glass, and other non-traditional glass types unless it was used historically. When established by the architectural style of the building, patterned, leaded, or colored glass can be used.

- vii. *Non-historic windows*—Replace non-historic incompatible windows with windows that are typical of the architectural style of the building.
- viii. *Security bars*—Install security bars only on the interior of windows and doors.
- ix. *Screens*—Utilize wood screen window frames matching in profile, size, and design of those historically found when the existing screens are deteriorated beyond repair. Ensure that the tint of replacement screens closely matches the original screens or those used historically.
- x. *Shutters*—Incorporate shutters only where they existed historically and where appropriate to the architectural style of the house. Shutters should match the height and width of the opening and be mounted to be operational or appear to be operational. Do not mount shutters directly onto any historic wall material.

OHP Window Policy Document

Individual sashes should be replaced where possible. Should a full window unit require replacement, inserts should:

- Match the original materials;
- Maintain the original dimension and profile;
- Feature clear glass. Low-e or reflective coatings are not recommended for replacements;
- Maintain the original appearance of window trim or sill detail.

FINDINGS:

- a. The structure located at 115 Auditorium Cr is a two-story structure. The building features mission-revival sandstone elements at the entries on the south, east, and west facades, and combines beaux arts and federal style influences such as Romanesque arched columns on the first floor, and inset one-over-one square wood windows on the second floor and limestone cladding. The structure contributes to the Auditorium Circle Historic District.
- b. WINDOW REPLACEMENT: EAST ELEVATION – The applicant has proposed to replace seven existing wood windows on the east elevation with clad wood windows of the same profile. The windows requested for replacement include five, three-over-three windows on the second floor, and one, three-over-three and one, two-over-two window on the first floor. According to the Historic Design Guidelines, wood windows should not be replaced, unless there is substantial evidence that the windows are deteriorated beyond repair. Guideline 6.B.iv for Exterior Maintenance and Alterations states that new windows should be installed to match the historic or existing windows in terms of size, type, configuration, material, form, appearance, and detail when original windows are deteriorated beyond repair.
- c. WINDOW REPLACEMENT: SOUTH ELEVATION – The applicant has proposed to nineteen existing wood windows on the south elevation with clad wood windows of the same profile. The windows requested for replacement include fifteen three-over-three windows on the second floor, and two small, four-over-four windows on the first floor. The applicant is also requesting to replace two sets of grouped windows on this elevation on the first floor that each feature two two-over-two windows and one six-over-six windows. According to the Historic Design Guidelines, wood windows should not be replaced, unless there is substantial evidence that the windows are deteriorated beyond repair. Guideline 6.B.iv for Exterior Maintenance and Alterations states that new windows should be installed to match the historic or existing windows in terms of size, type, configuration, material, form, appearance, and detail when original windows are deteriorated beyond repair.
- d. WINDOW REPLACEMENT: WEST ELEVATION – The applicant has proposed to replace five existing wood windows with clad wood windows of the same profile. The windows requested for replacement include four three-over-three wood windows on the second floor, and one six-pane transom window on the first floor. According to the Historic Design Guidelines, wood windows should not be replaced, unless there is substantial evidence that the windows are deteriorated beyond repair. Guideline 6.B.iv for Exterior Maintenance and Alterations states that new windows should be installed to match the historic or existing windows in terms of size, type, configuration, material, form, appearance, and detail when original windows are deteriorated beyond repair.
- a. WINDOW REPLACEMENT: EXISTING CONDITION – Staff performed a site visit on August 26, 2022, to assess the condition of the windows requested for replacement. From the photos submitted to date and the site visit, the wood windows proposed for replacement appear to be of historic-age, fully wood windows. Due to access restrictions in an active administrative building, not all of the windows were assessed. Staff viewed many of the windows on the second floor from the interior, and the windows on the first floor from the exterior. More than half of the windows assessed showed signs of wood rot, wood damage, and severe

deterioration of the bottom rails of both sashes. Staff finds that the wood windows may be in repairable condition based on the documentation provided; however, has asked the applicant to provide a percentage-based estimate of elements in need of replacement. The applicant also commented that continuous water infiltration may have resulted in more extensive damage that may not be revealed until the windows are removed for repair. Staff finds that some windows may be deteriorated beyond repair and finds their replacement with new wood windows of a matching profile to be appropriate, however stipulates that, prior to approval, the applicant provides an updated window schedule for which windows can be repaired and which require full replacement based on a quoted cost comparison.

- b. **WINDOW REPLACEMENT: WASTE AND LIFESPAN** – Over 112 million windows end up in landfills each year, and about half are under 20 years old. Historic wood windows were constructed to last 100+ years with old growth wood, which is substantially more durable than modern wood and clad products, and original windows that are restored and maintained over time can last for decades. Replacement window products have a much shorter lifespan, around 10-20 years, and cannot be repaired once they fail. On average, over the lifetime of an original wood window, replacement windows will need to be again replaced at least 4 times. The total lifecycle cost of replacement windows is also much more energy intensive than the restoration of existing windows, including material sourcing and the depletion of natural resources and forests, petroleum-heavy manufacturing methods, transportation, and installation. Finally, window repair and restoration utilize the local labor and expertise of craftspeople versus off-the-shelf, non-custom composite products. Staff generally encourages the repair and restoration of original windows whenever possible.
- c. **WINDOW REPLACEMENT: ENERGY EFFICIENCY AND MAINTENANCE** – In terms of efficiency, in most cases, windows only account for a fraction of heat gain/loss in a building. Improving the energy efficiency of historic windows should be considered only after other options have been explored such as improving attic and wall insulation. The original windows feature single-pane glass which is subject to radiant heat transfer. Products are available to reduce heat transfer such as window films, interior storm windows, and thermal shades. Additionally, air infiltration can be mitigated through weather-stripping or readjusting the window assembly within the frame, as assemblies can settle or shift over time. The wood windows were designed specifically for this structure and can accommodate the natural settling and movement of the structure throughout seasons. Modern replacement products are extremely rigid, often resulting in the creation of gaps, cracks, and major points of air infiltration at the window frames and other areas of the exterior wall plane over time due to material incompatibility when considering the structure as whole integrated system.
- d. **ADMINISTRATIVE APPROVAL**: The following scopes of work were requested in addition to the request which do not require review by the HDRC: Repair and repainting of the existing burglar bars; repair of the existing metal store front windows; in-kind replacement of four exterior metal doors; cleaning and repointing of the existing masonry; in-kind leak repairs and replacement of the existing flat roofing.

RECOMMENDATION:

Based on a representative assessment of accessible windows, some window elements are deteriorated beyond repair, Staff recommends their replacement with new wood windows of a matching profile with the following stipulations:

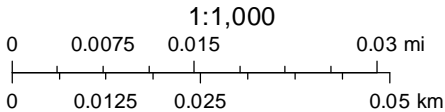
- i. That the applicant provides an updated window schedule for which windows can be repaired and which require full replacement for staff review prior to the issuance of a Certificate of Appropriateness.
- ii. That the applicant installs new wood windows consistently with staff's standards as noted in the citations. All existing details of the original windows should be replicated in a replacement window.

City of San Antonio One Stop



September 2, 2022

— User drawn lines



TOBIN ADMINISTRATION BUILDING - EXISTING PHOTOS



SOUTH FACADE



NORTH FACADE



WEST FACADE



EAST FACADE

TOBIN ADMINISTRATION BUILDING - EXISTING PHOTOS



SOUTH FACADE



WINDOW A - EXTERIOR



WINDOW A - EXTERIOR



WINDOW B - EXTERIOR



WINDOW A - INTERIOR



WINDOW A - EXTERIOR SILL



WINDOW B - EXTERIOR TRIM



WINDOW B - INTERIOR



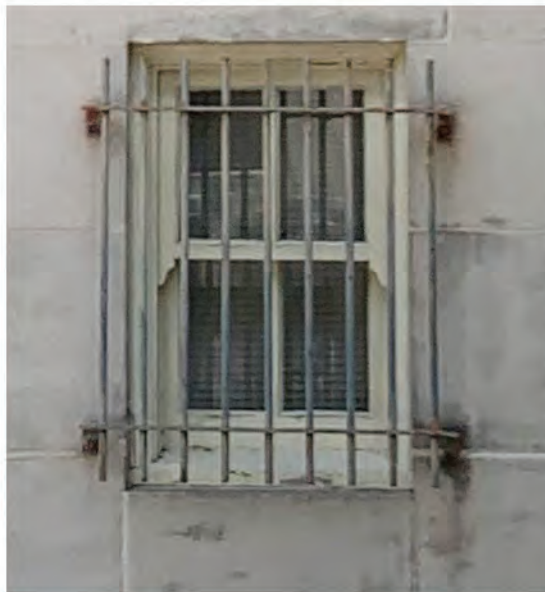
WEST FACADE



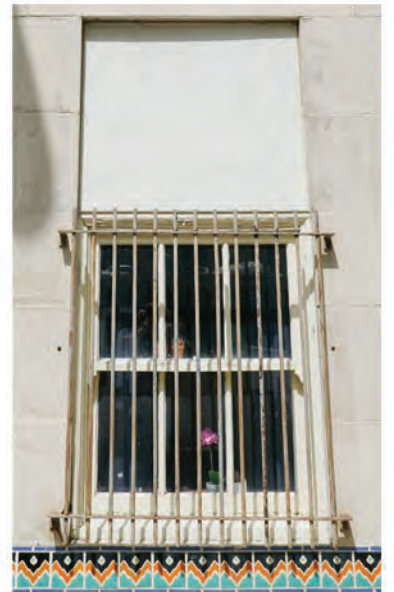
EAST FACADE



WINDOW E - EXTERIOR - 2ND FLOOR



WINDOW C - EXTERIOR



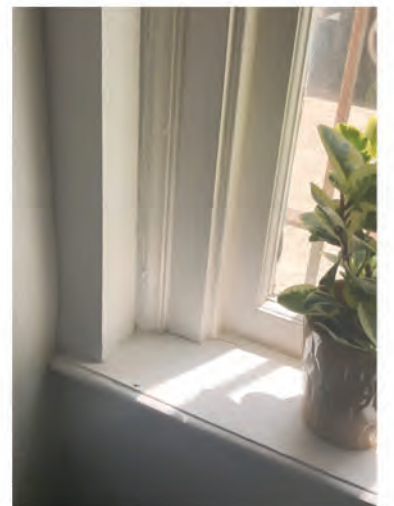
WINDOW D - EXTERIOR



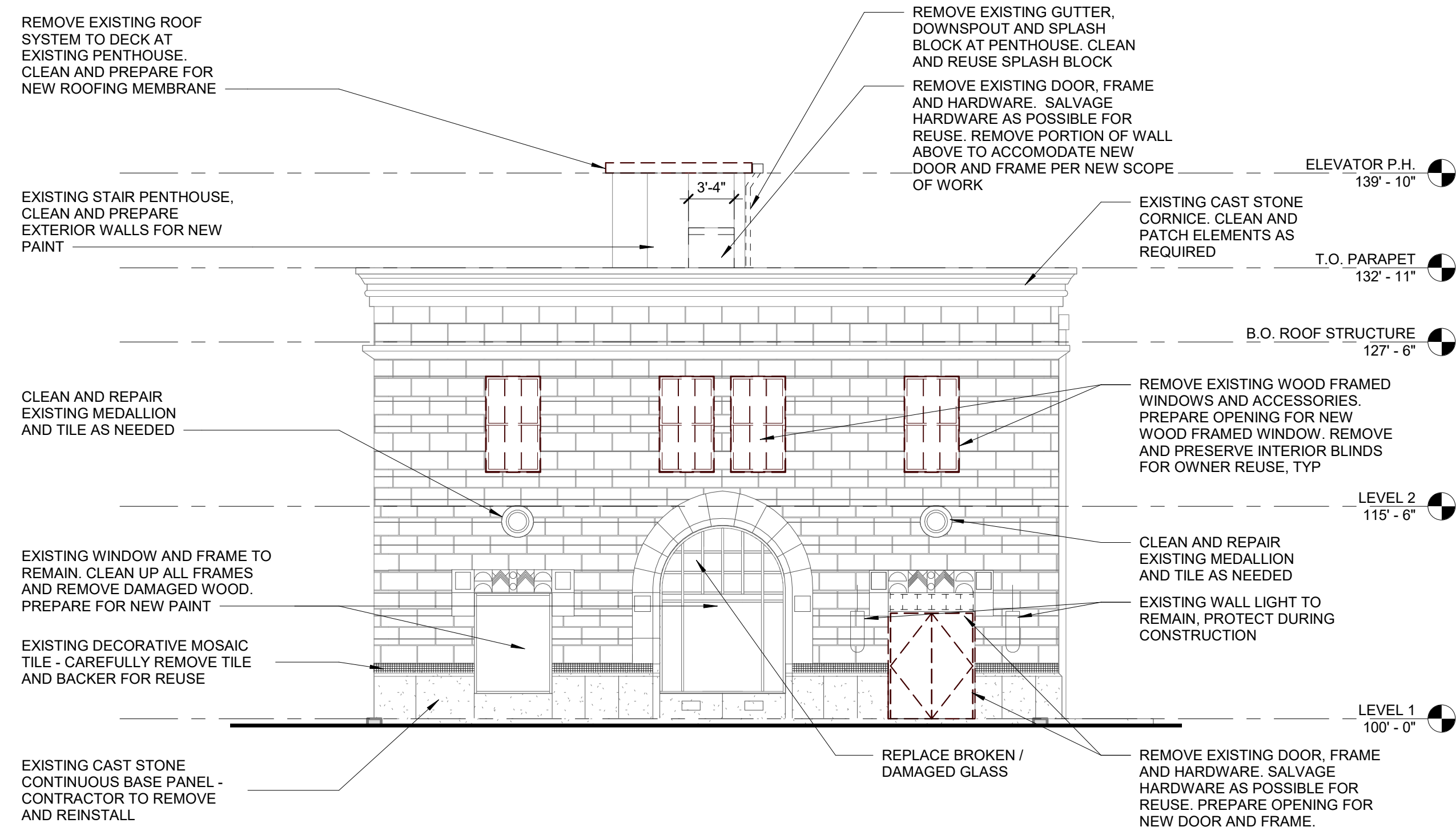
WINDOW E - INTERIOR - 2ND FLOOR



WINDOW C - INTERIOR



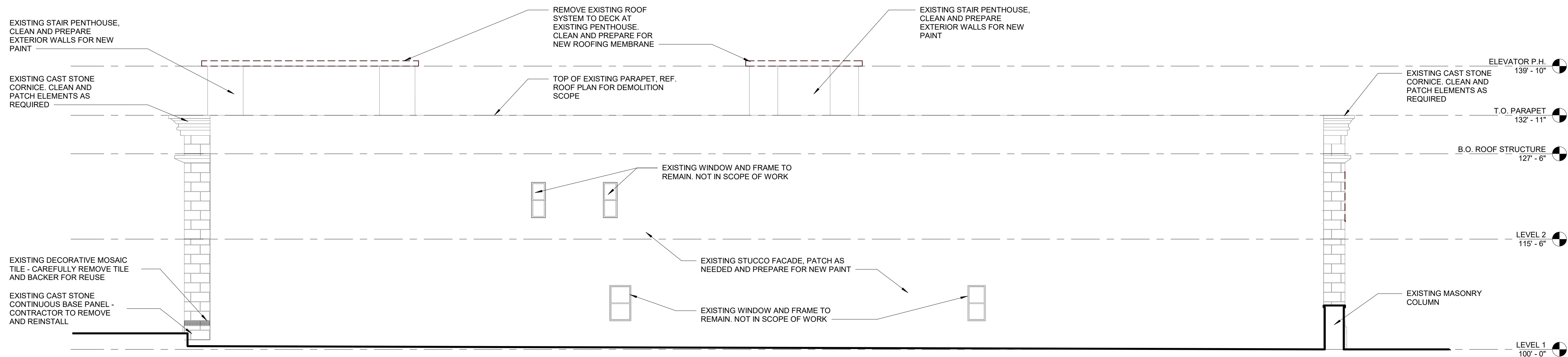
WINDOW D - INTERIOR



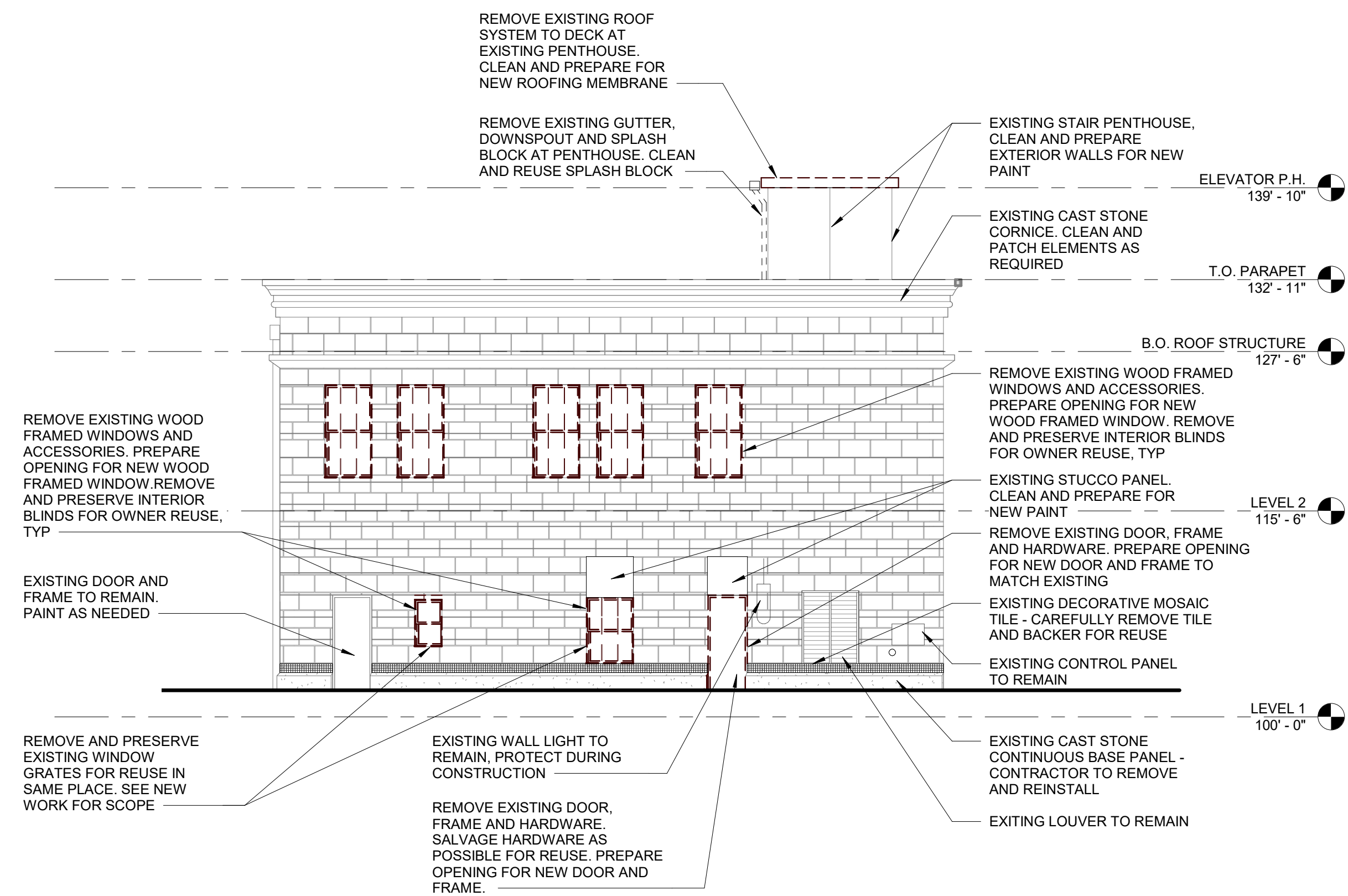
B1 DEMO - WEST ELEVATION
1/8" = 1'-0"



D1 PHOTO - EXISTING WEST ELEVATION (NAVARRO ST)
NTS



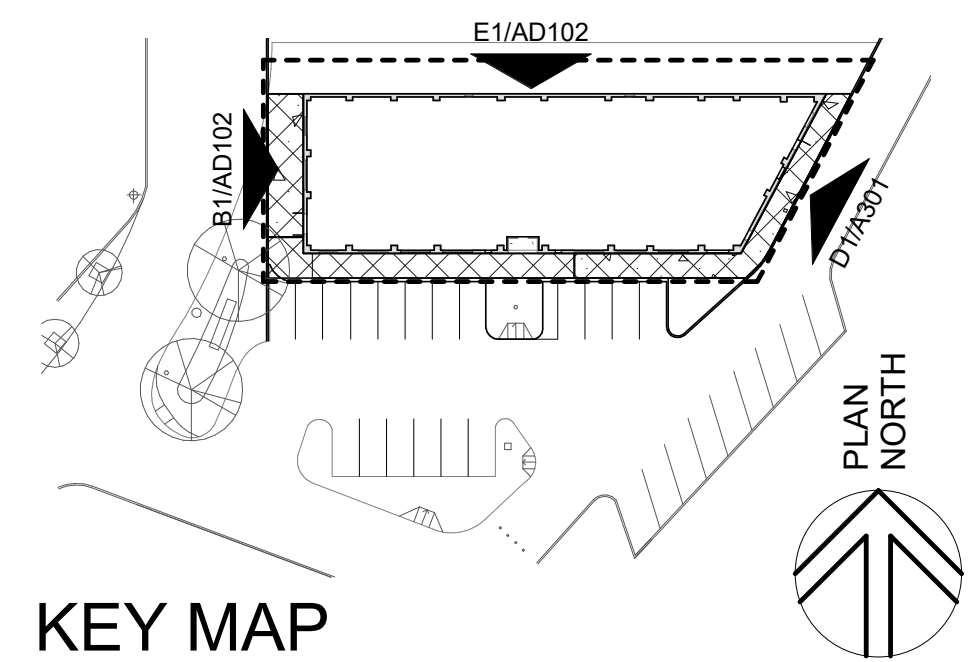
E1 DEMO - NORTH ELEVATION
1/8" = 1'-0"



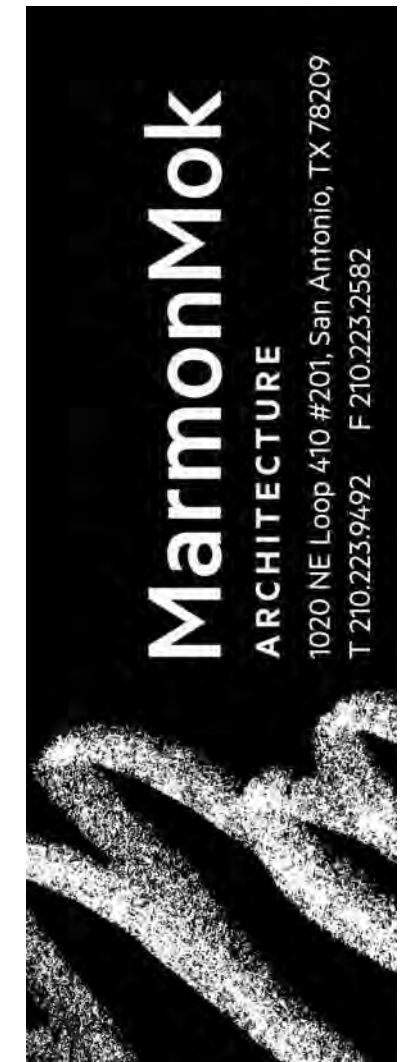
B4 DEMO - EAST ELEVATION
1/8" = 1'-0"



D4 PHOTO - EXISTING EAST ELEVATION (AUDITORIUM CIRCLE)
NTS



HDRC REVIEW



PRICING SET

NOT FOR REGULATORY APPROVAL
PERMITTING OR CONSTRUCTION
ARCHITECT REGISTRATION NO. 00000

08/05/2022



TOBIN ADMINISTRATION BUILDING
STABILIZATION PROJECT

115 AUDITORIUM CIRCLE - SAN ANTONIO, TX - 78205

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Drawn AF
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Date 08/05/2022
Project No. 22016
Revisions

SHEET TITLE
EXTERIOR
ELEVATIONS
DEMOLITION

SHEET NO.

AD102



WINDOW GENERAL NOTES:

1. WINDOW MANUFACTURER MARVIN AS QUOTED BY MARVIN - Q005649, PRODUCT LINE: ULTIMATE DOUBLE HUNG G2 WITH CASING AND SUBSILL, PROFILES AS NOTED ON HEAD/JAMB/SILL DETAILS.
2. CONTRACTOR TO FIELD VERIFY EACH WINDOW OPENING AND SILL HEIGHTS PRIOR TO ORDER AND INSTALLATION. PROVIDE SUBMITTAL TO ARCHITECT FOR REVIEW.
3. PATCH AND REPAIR EXISTING CAST STONE AROUND NEW WINDOWS AS NOTED ON EXTERIOR ELEVATIONS. INFILL ALL HOLES.
4. CONTRACTOR TO MATCH EXISTING WINDOW FRAME PAINT AND PROVIDE COLOR SAMPLES FOR VERIFICATION.

GLAZING SCHEDULE	
IG-1	1" INSULATED GLAZING, LOW E2 WITH ARGON (1/2" AIRSPACE WITH 1/4" GLASS EACH SIDE)

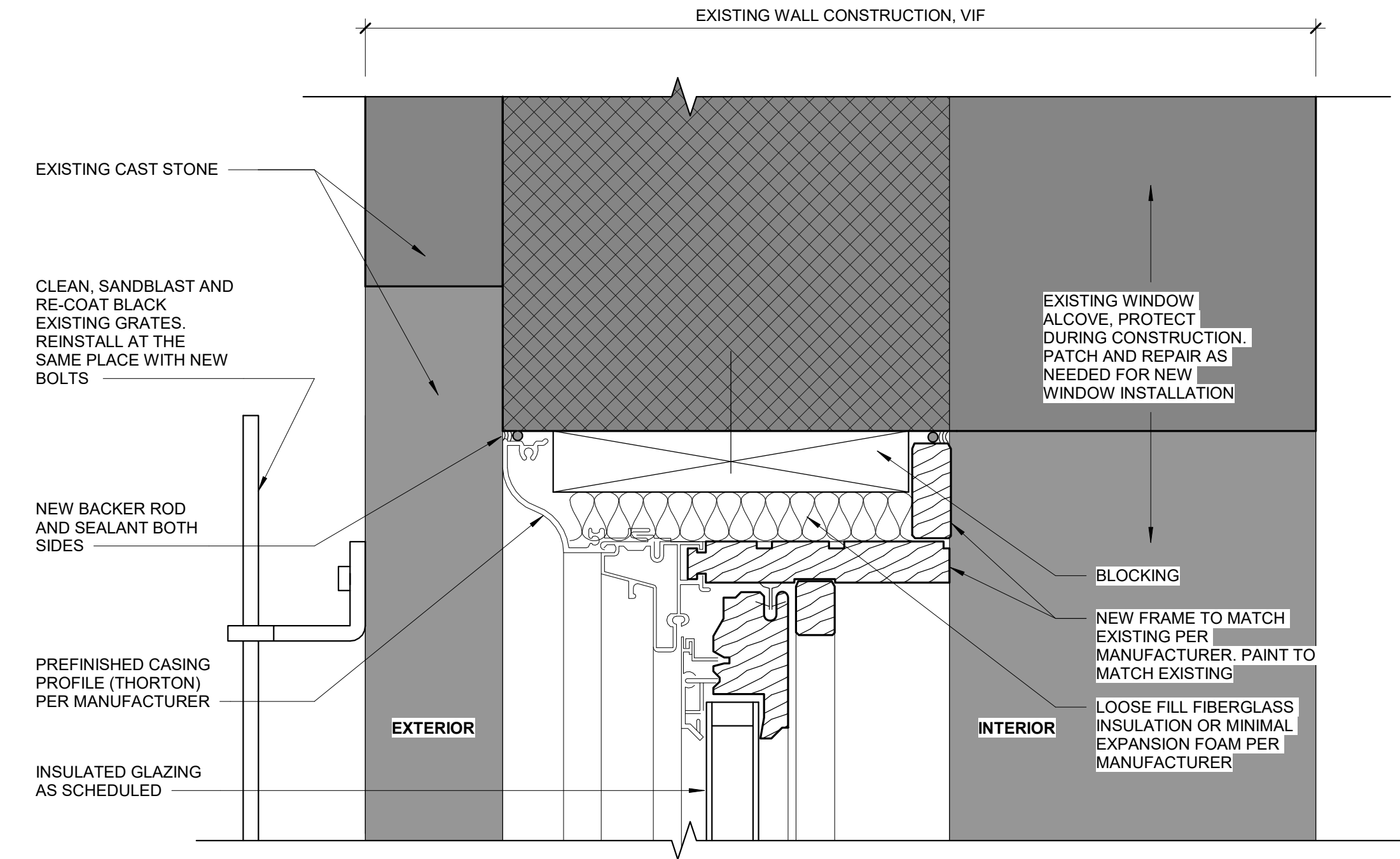
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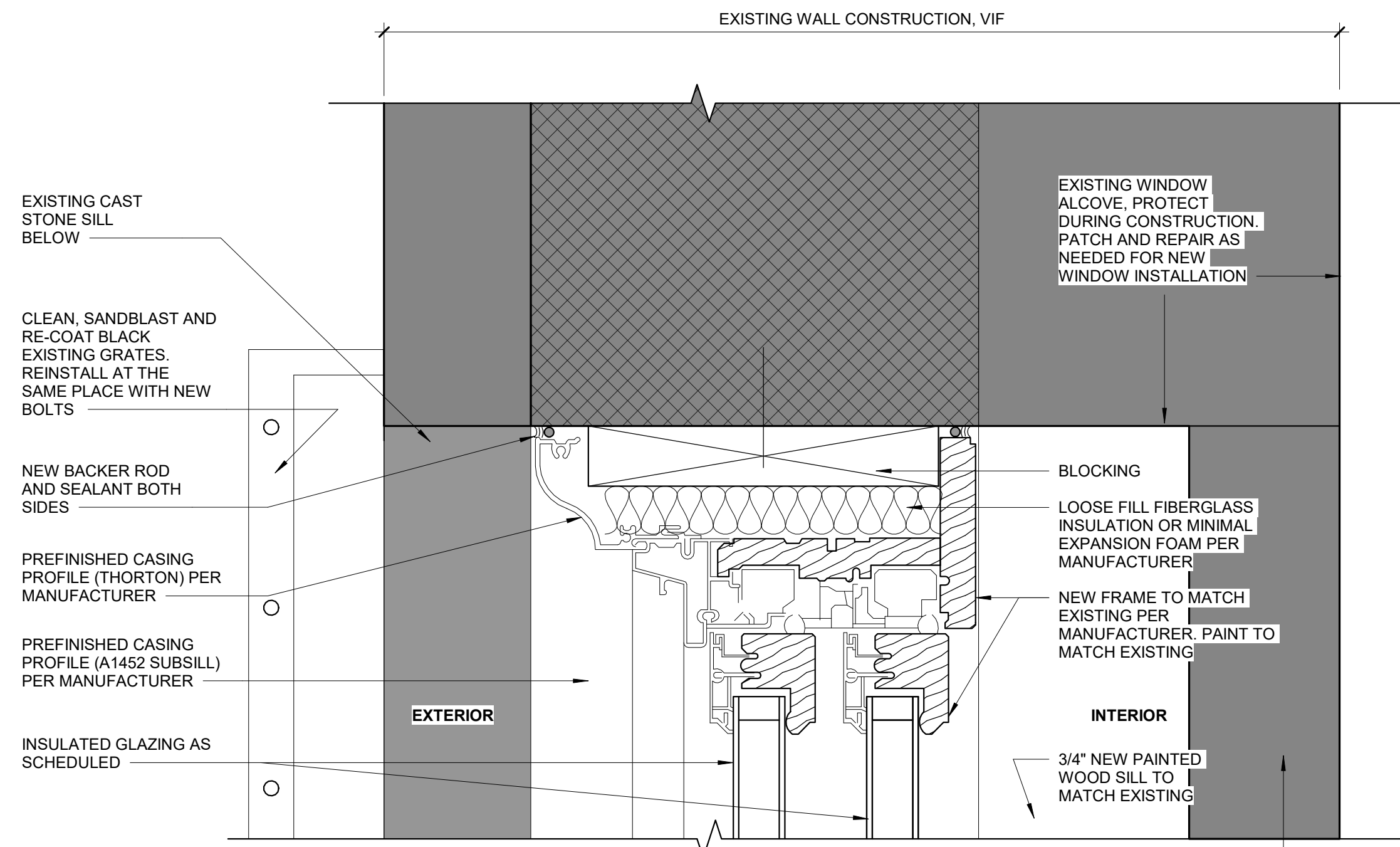
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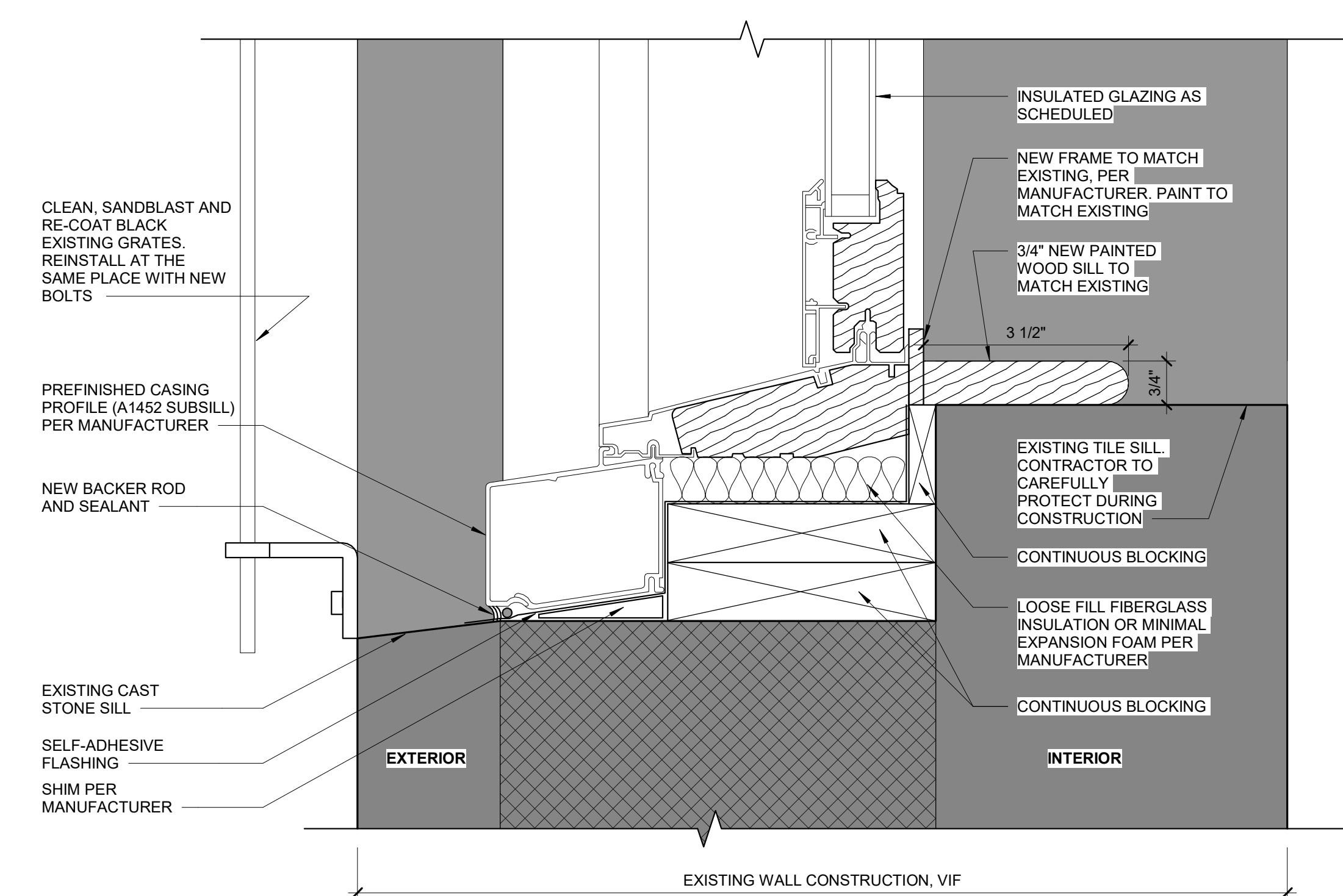
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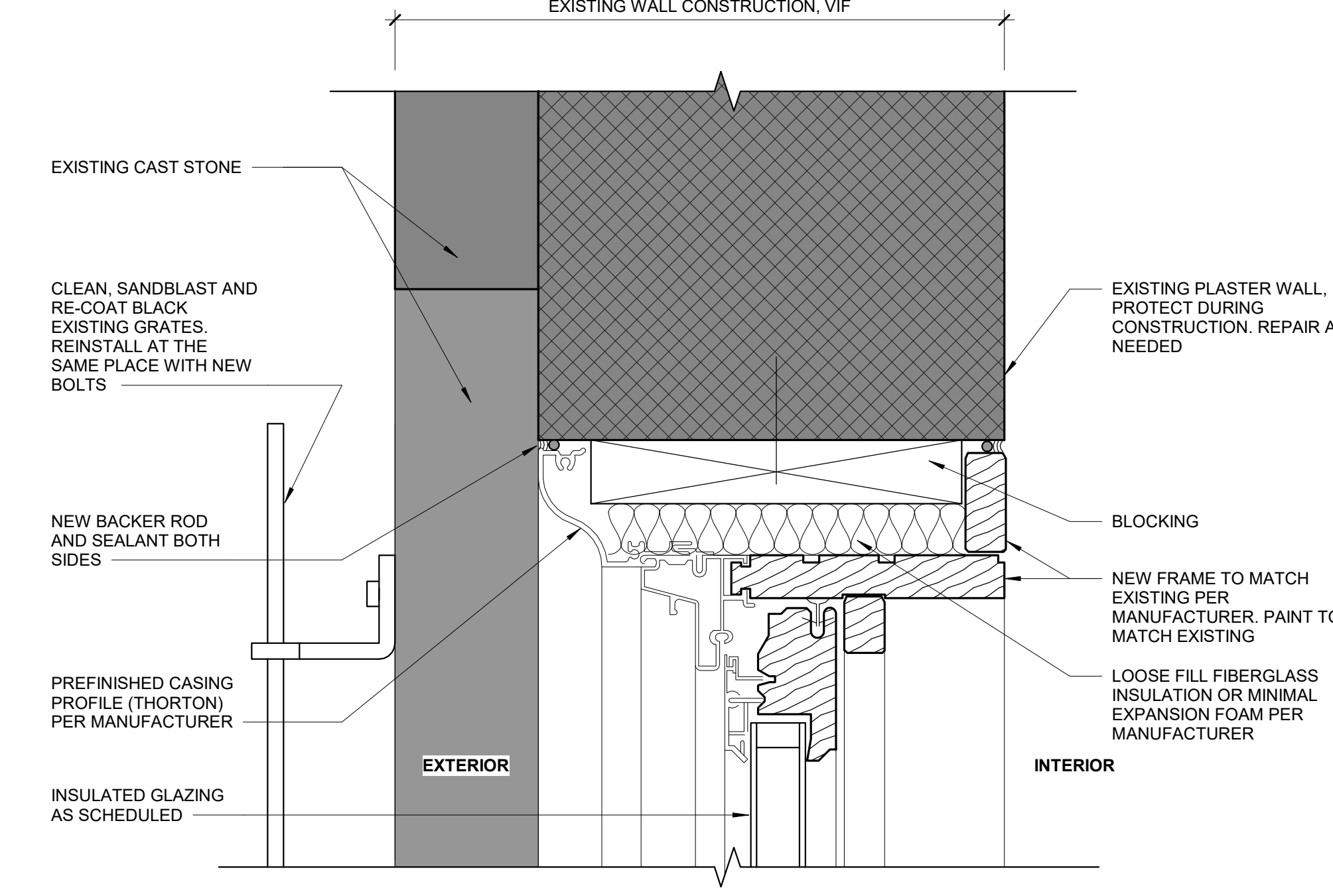
B1 WINDOW HEAD AT EXISTING STONE
A203 6" = 1'-0"



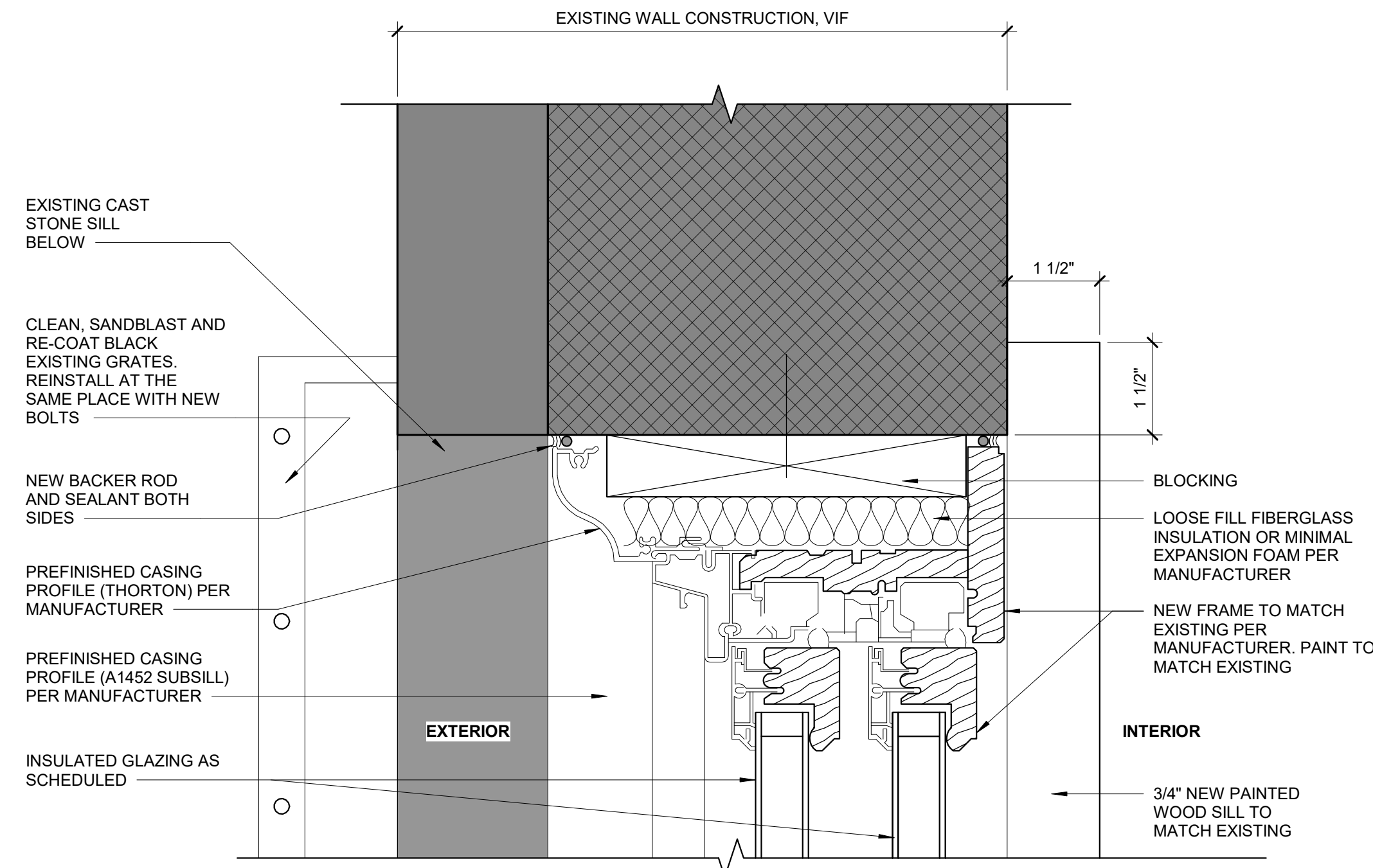
D1 WINDOW JAMB AT EXISTING STONE
A203 6" = 1'-0"



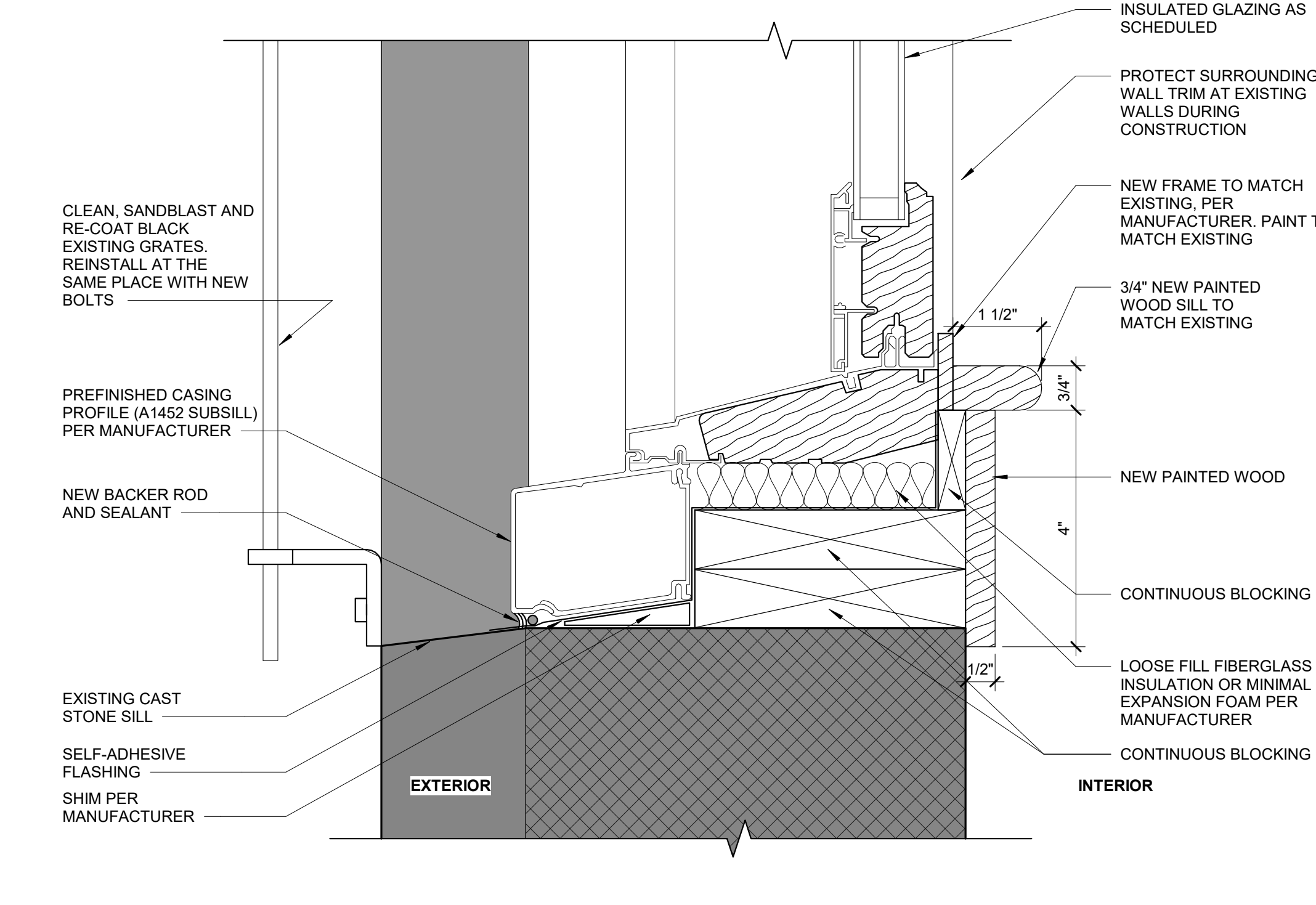
E1 WINDOW SILL AT EXISTING STONE
A203 6" = 1'-0"



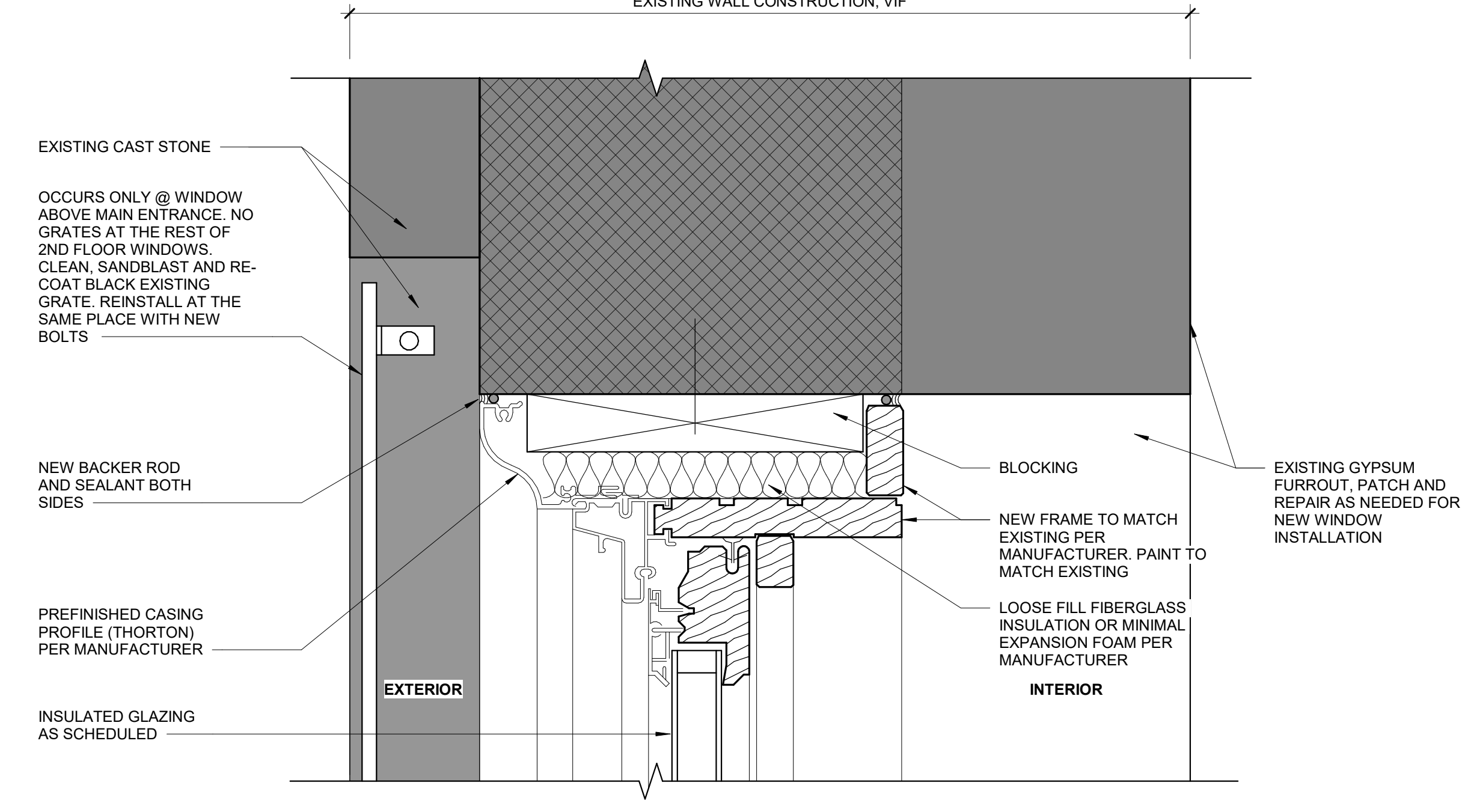
B3 WINDOW HEAD
A203 6" = 1'-0"



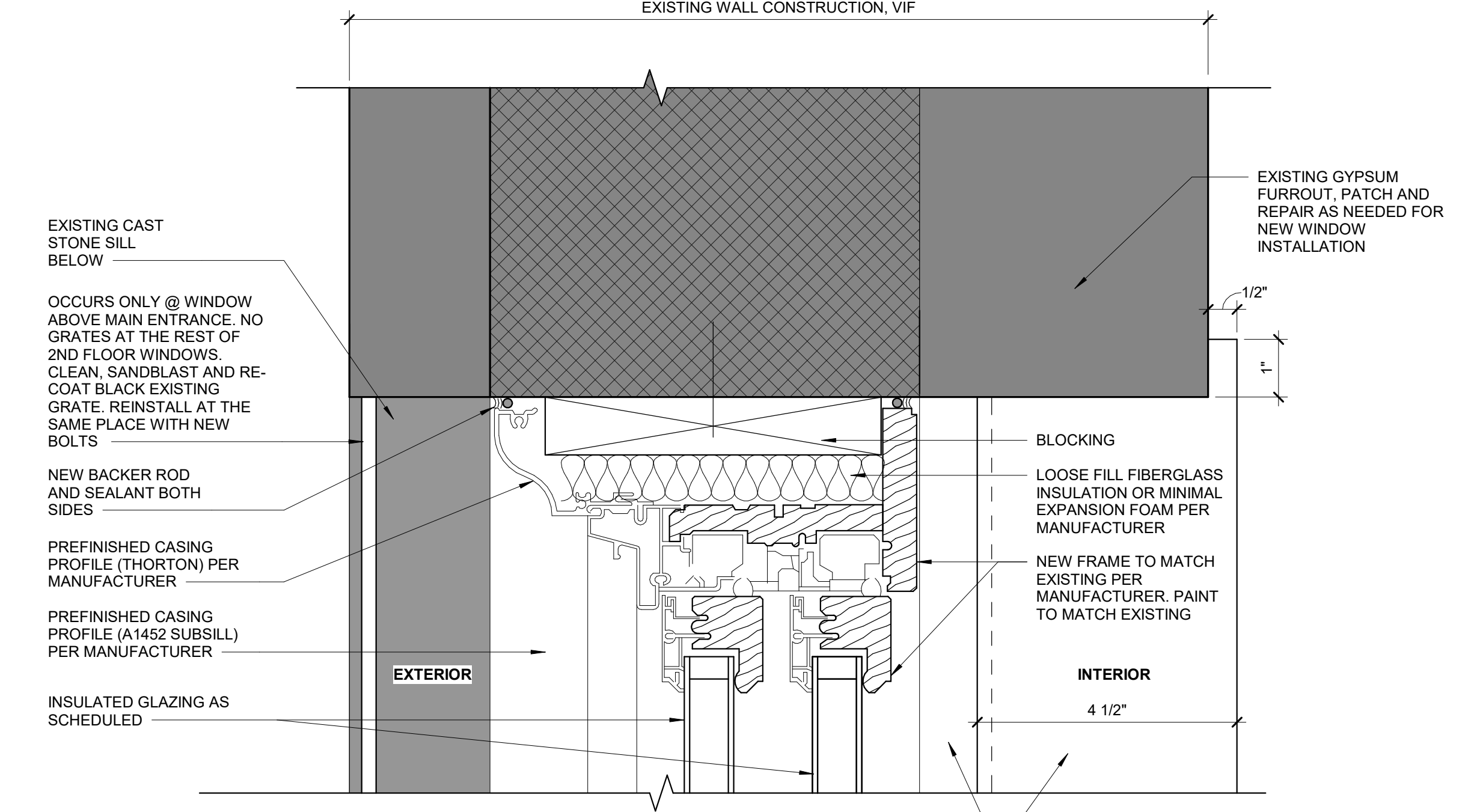
D3 WINDOW JAMB
A203 6" = 1'-0"



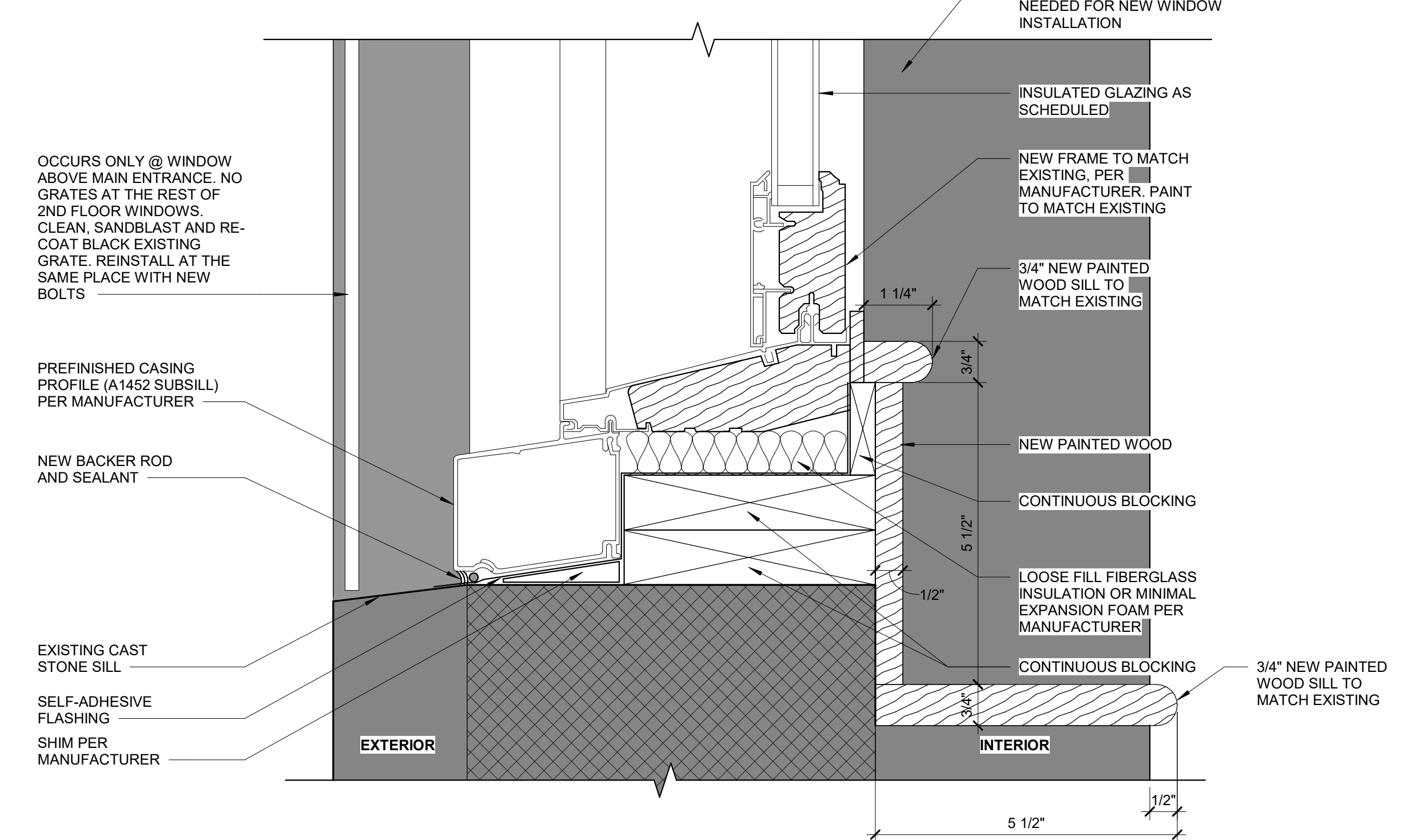
E3 WIDOW SILL
A203 6" = 1'-0"



B5 WINDOW HEAD - 2ND FLOOR
A203 6" = 1'-0"



D5 WINDOW JAMB - 2ND FLOOR
A203 6" = 1'-0"



E5 WINDOW SILL - 2ND FLOOR
A203 6" = 1'-0"

HDRC REVIEW



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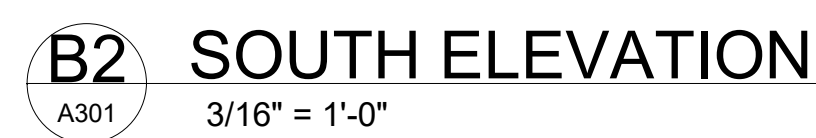
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STABILIZATION PROJECT

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Project No. 22016
Revisions

SHEET TITLE
WINDOW
DETAILS

SHEET NO.
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HDRC REVIEW



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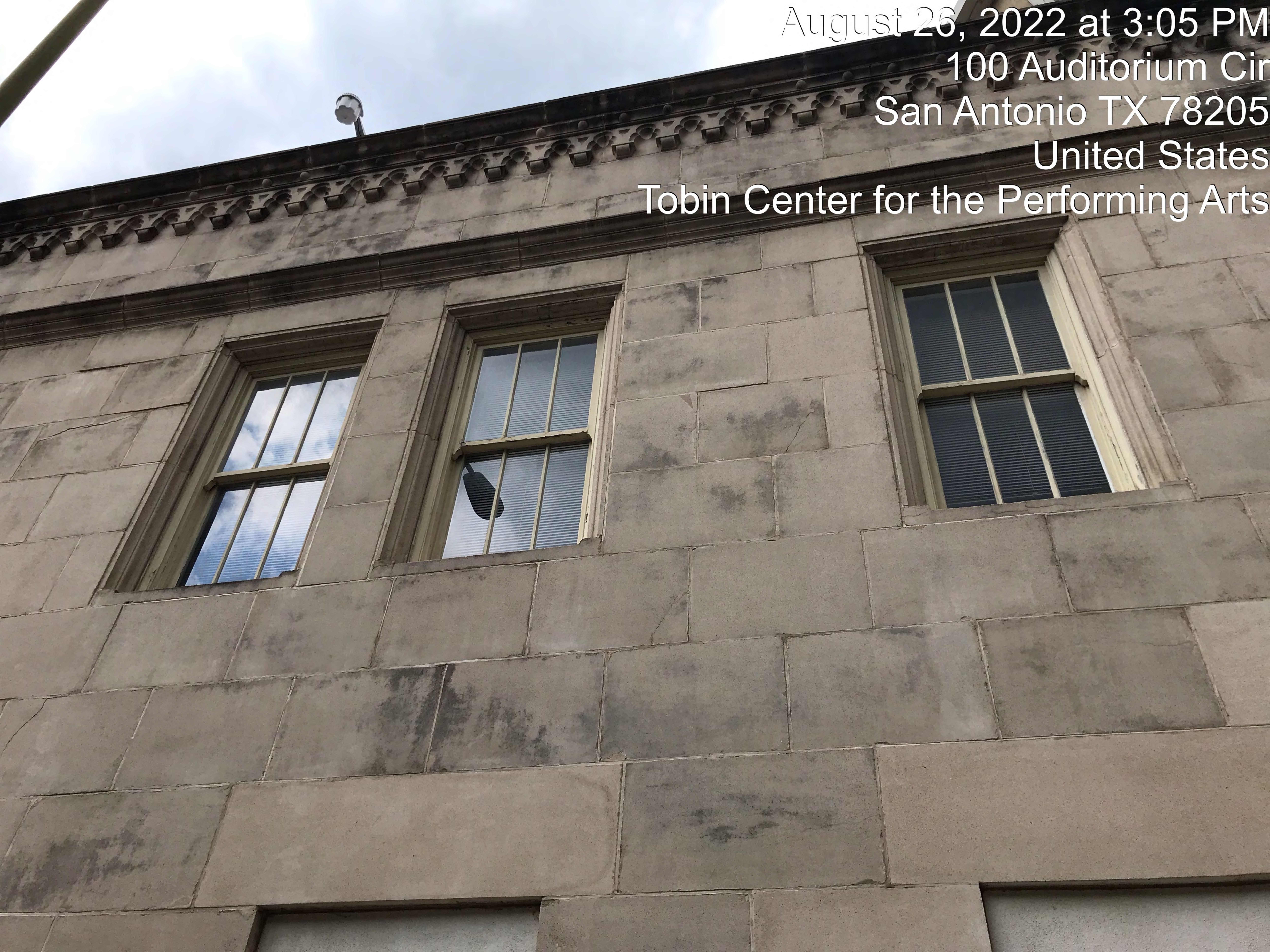
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100 Auditorium Cir

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Tobin Center for the Performing Arts



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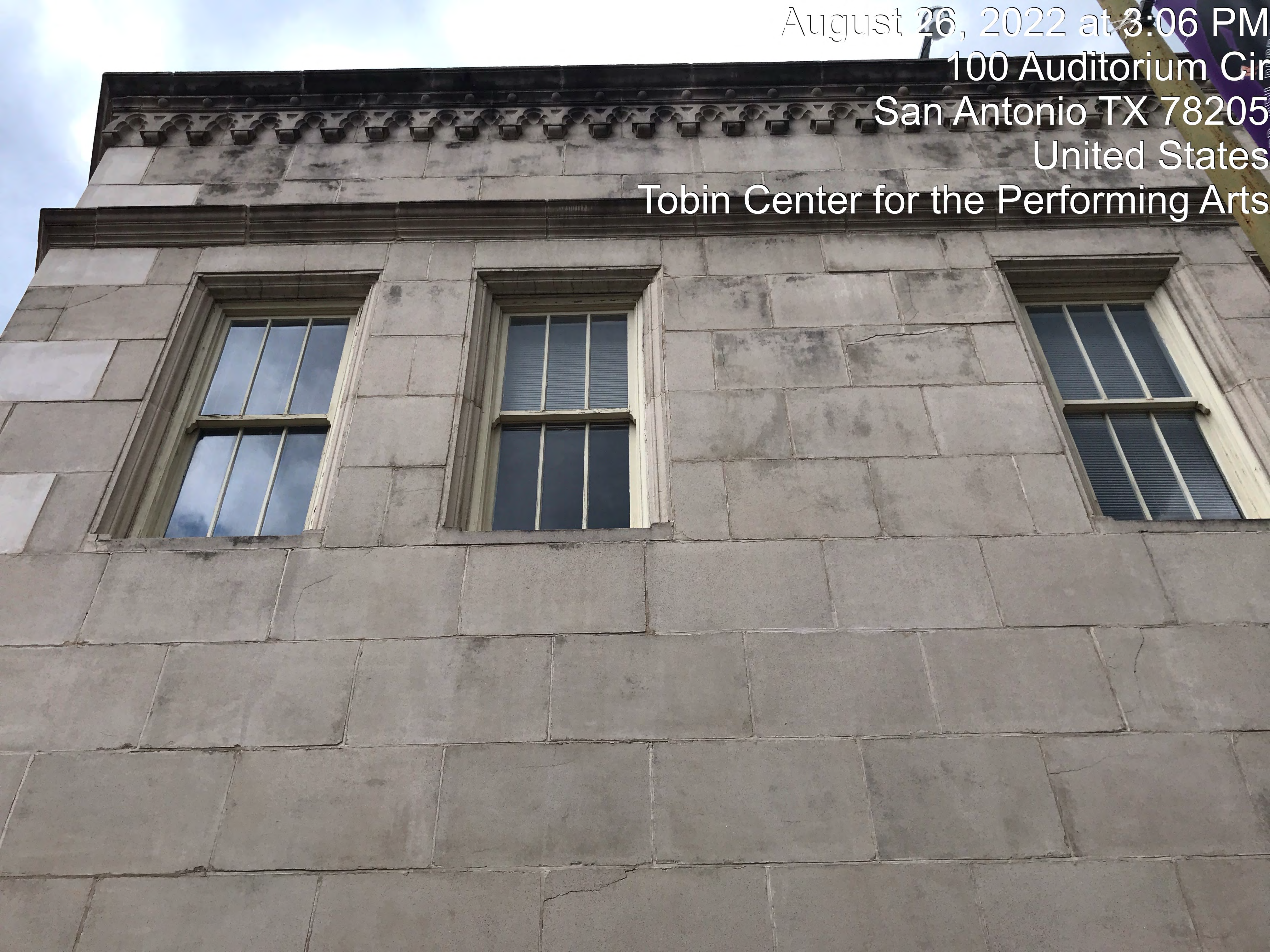
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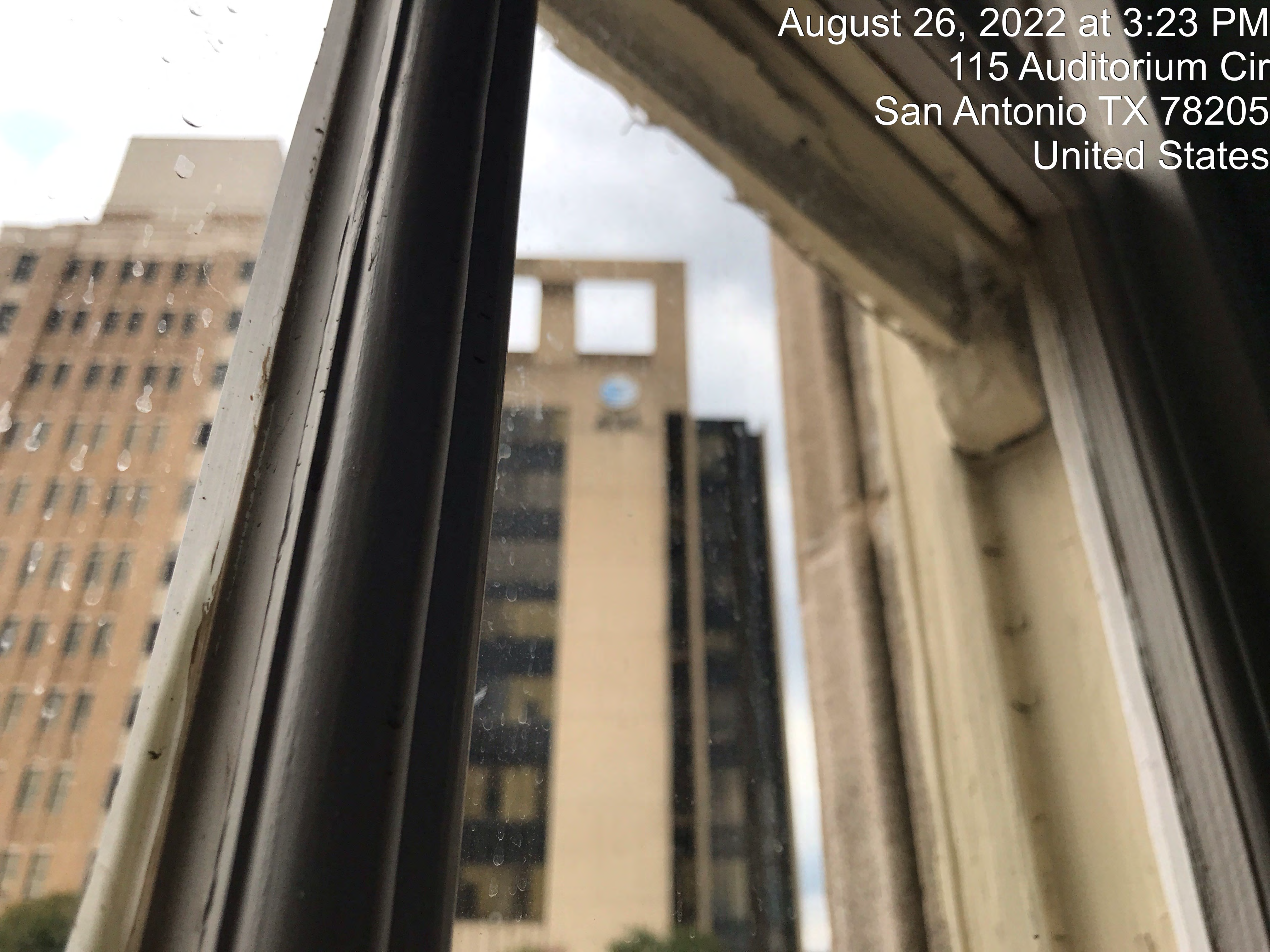
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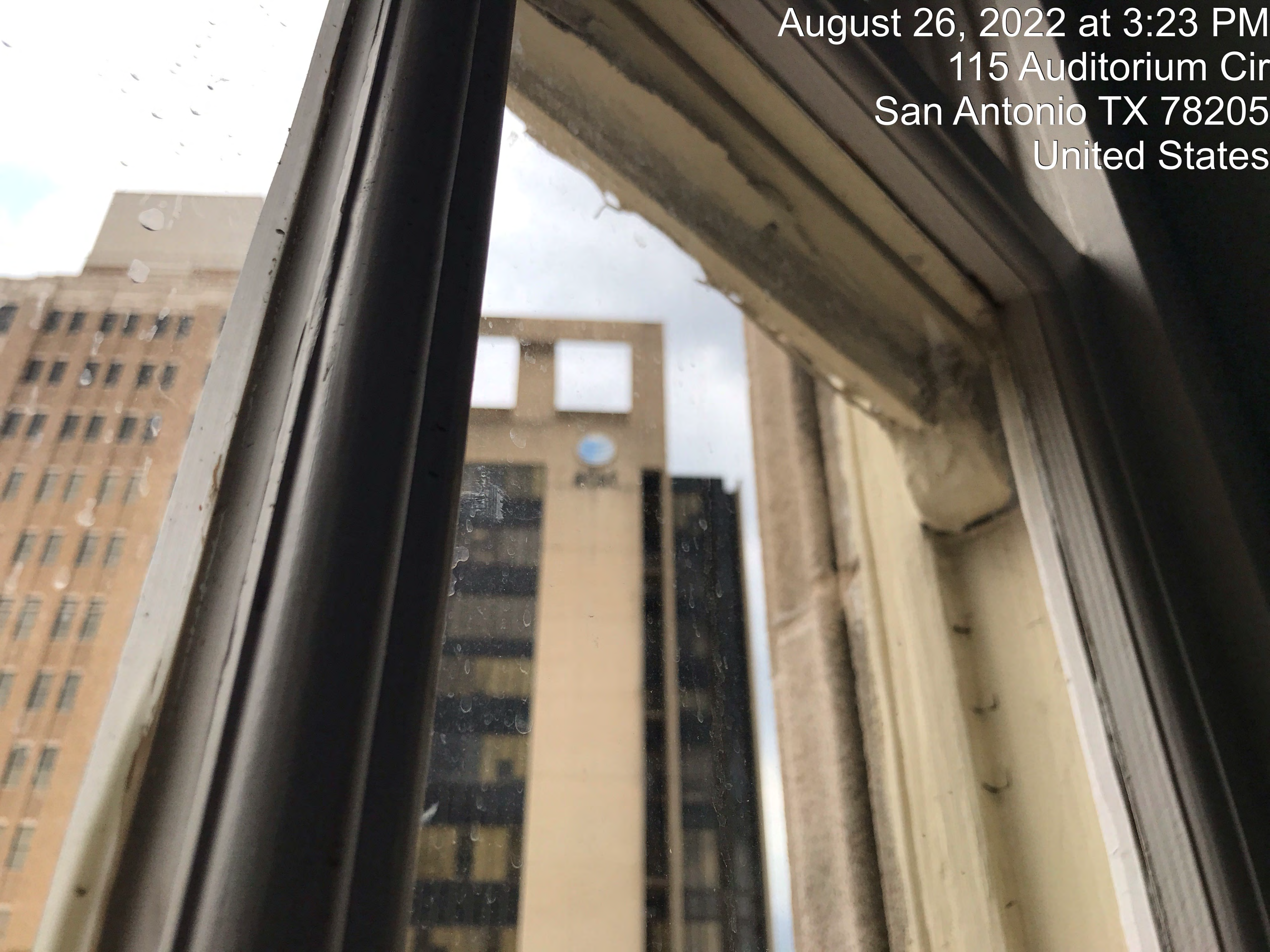
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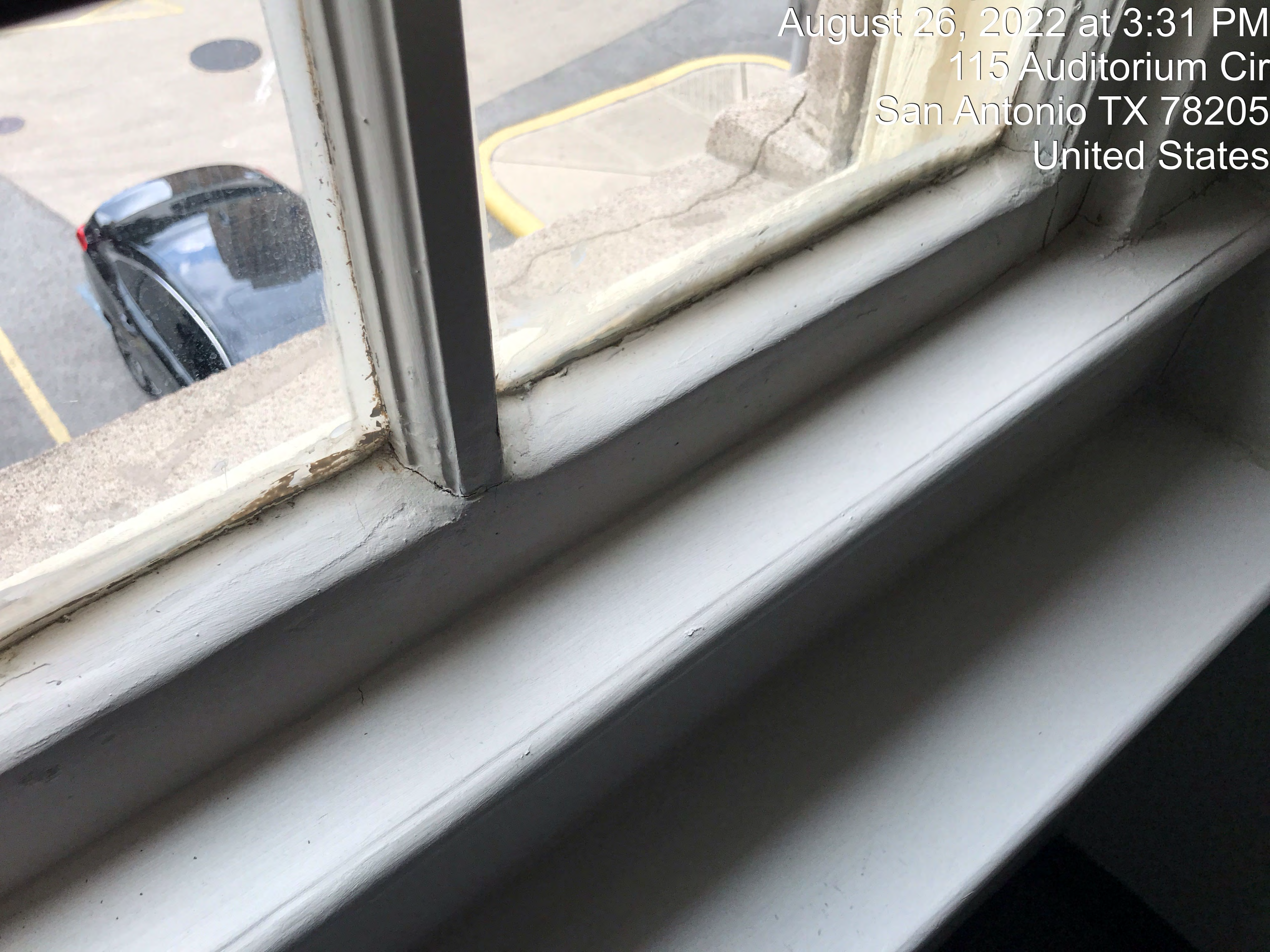
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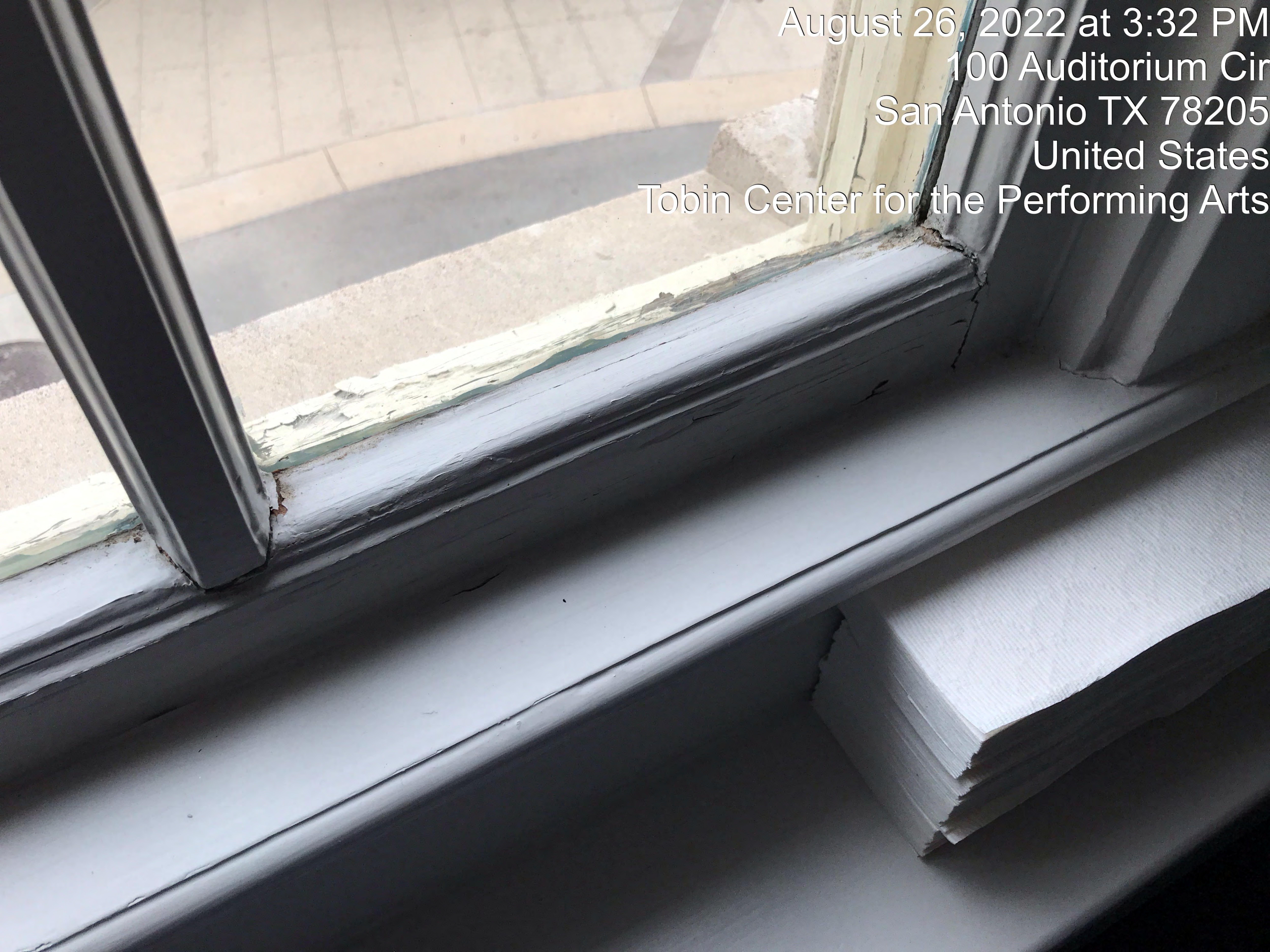
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August 26, 2022 at 4:02 PM
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MarmonMok

ARCHITECTURE

August 5, 2022

City of San Antonio
Office of Historic Preservation
100 W. Houston
San Antonio, Texas 78205

Re: Tobin Administration Stabilization Project No. 22016
Certificate of Appropriateness Application – Project description

Dear Office of Historic Preservation:

Attached please find our submittal for the above referenced project..

The scope of work for stabilization includes the following:

1. Replacement of existing single pane, single hung wood windows to energy efficient double pane, double hung clad pine wood windows. Replacement includes all 2nd floor windows on east, west and south façades; 2 windows on level 1 east facade, and 3 windows on level 1 south façade. The remaining existing windows are being repaired as needed and repainted to match existing.
2. Existing window grates refinish black to match Tobin Center Auditorium
3. Replacing 4 existing hollow metal doors to match
4. Existing masonry cleaning and minor repoint/repair where needed
5. Existing leaky roof replacement to more energy efficient TPO
6. Replacement of failing electrical and mechanical systems
7. Existing elevator modernization with new electrical and mechanical components

Supporting items submitted with narrative:

1. Existing façade photos
2. Window replacement and repair cost proposal and cut sheet
3. Architectural demolition and stabilization drawings
4. Existing interior and exterior window photos

Sincerely,

A handwritten signature in blue ink, appearing to read "Mary B. Smith", with a stylized, flowing script.

Partner

TOBIN CENTER ADMIN BUILDING 100 AUDI LORIUM CIRCLE

Quote #: HPQKTWA

A Proposal for Window and Door Products prepared for:

Job Site:

78216

Shipping Address:

GUIDO LUMBER COMPANY

8526 VIDOR AVE

SAN ANTONIO, TX 78216-6045

TOM BRASWELL
GUIDO LUMBER COMPANY
8526 VIDOR AVE
SAN ANTONIO, TX 78216-6045
Phone: (210) 344-8321
Fax: (210) 344-4343
Email: tbraswell@guidoco.com

This report was generated on 3/23/2018 2:36:29 PM using the Marvin Order Management System, version 0002.19.00 (Current). Price in USD. Unit availability and price are subject to change. Dealer terms and conditions may apply.

Featuring products from:



UNIT SUMMARY

The following is a schedule of the windows and doors for this project. For additional unit details, please see Line Item Quotes.

Additional charges, tax or Terms and Conditions may apply. Detail pricing is per unit.

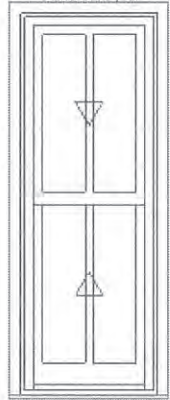
NUMBER OF LINES: 6	TOTAL UNIT QTY: 29	EXT NET PRICE: USD 45,772.96
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LINE	MARK UNIT	BRAND	ITEM	NET PRICE	QTY	EXTENDED NET PRICE
1	A SOUTH ELEV FIRST FLOOR	Marvin	Clad Ultimate Double Hung - Next Generation 2.0 RO 21 5/8" X 58 1/32" Entered as OC 24" X 60"	1,065.93	2	2,131.86
2	B SOUTH ELEV FIRST FLOOR	Marvin	Clad Marvin Assembly RO 69" X 71 1/2" Entered as Size by Units	3,384.22	1	3,384.22
3	C EAST ELEV FIRST FLOOR	Marvin	Clad Ultimate Double Hung - Next Generation 2.0 RO 25 5/8" X 40 17/32" Entered as OC 28" X 42 1/2"	963.70	1	963.70
4	D EAST ELEV FIRST FLOOR	Marvin	Clad Ultimate Double Hung - Next Generation 2.0 RO 45 5/8" X 58 1/32" Entered as OC 48" X 60"	1,292.95	1	1,292.95
5	E 2ND FLOOR	Marvin	Clad Ultimate Double Hung - Next Generation 2.0 RO 45 5/8" X 82 1/32" Entered as OC 48" X 84"	1,650.01	23	37,950.23
6	DELIVERY	Non-Marvin	Other DELIVER THE WINDOWS	50.00	1	50.00

LINE ITEM QUOTES

The following is a schedule of the windows and doors for this project. For additional unit details, please see Line Item Quotes. Additional charges, tax or Terms and Conditions may apply. Detail pricing is per unit.

Line #1	Mark Unit: A SOUTH ELEV FIRST FLOOR	Net Price:	1,065.93
Qty: 2		Ext. Net Price: USD	2,131.86



As Viewed From
The Exterior

Entered As: OC

MO 24 1/2" X 60 1/4"

FS 20 5/8" X 57 17/32"

OC 24" X 60"

RO 21 5/8" X 58 1/32"

Egress Information

Width: 17 1/32" Height: 23 45/64"

Net Clear Opening: 2.80 SqFt

Performance Information

U-Factor: 0.3

Solar Heat Gain Coefficient: 0.24

Visible Light Transmittance: 0.4

Condensation Resistance: 56

CPD Number: MAR-N-425-17193-00001

ENERGY STAR: NC, SC, S

Performance Grade

Licensee #1127

AAMA/WDMA/CSA/101/ I.S.2/A440-08

LC-PG50 1149X2223 mm (45.25X87.5 in)

LC-PG50 DP +50/-50

FL17635

Coconut Cream Clad Exterior	
Primed Pine Interior.....	28.57
Clad Ultimate Double Hung - Next Generation 2.0	618.66
Outside of Exterior Casing 24" X 60"	
Rough Opening 21 5/8" X 58 1/32"	
Top Sash	
Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	
IG -	
Low E2 w/Argon	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	48.11
Rectangular - Special Cut 2W1H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
Bottom Sash	
Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	
IG	
Low E2 w/Argon	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	48.11
Rectangular - Special Cut 2W1H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
White Interior Weather Strip Package	
Beige Exterior Weather Strip Package	
White Sash Lock	
White Top Sash Strike Plate Assembly Color	
Ogee Exterior Sash Lugs	78.93
No Screen	18.79
4 9/16" Jambs	
Casing with Subsill.....	252.58
Coconut Cream Thorton A1443 Clad Casing	
Coconut Cream A1450 Subsill	9.77
No Installation Method	
***Note: When installing units with casing, always install, flash, and seal (including the use of backer rod in masonry applications) the window or door per the installation instructions included with the unit. Review the impact the casing has on the wall thickness. An exterior casing can extend beyond the frame of the unit and require additional wall thickness.	

Initials required

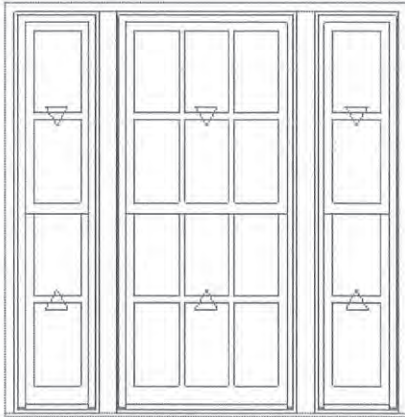
Seller: _____

Buyer: _____

Line #2	Mark Unit: B SOUTH ELEV FIRST FLOOR	Net Price:	3,384.22
Qty: 1		Ext. Net Price: USD	3,384.22



Coconut Cream Clad Exterior	
Primed Pine Interior.....	85.70
3W1H - Rectangle Assembly	
Assembly Rough Opening	
69" X 71 1/2"	



As Viewed From The Exterior

Entered As: Size by Units

MO 71 7/8" X 73 23/32"

FS 68" X 71"

OC 71 3/8" X 73 15/32"

RO 69" X 71 1/2"

Egress Information A1, A3

Width: 11 13/32" Height: 30 7/16"

Net Clear Opening: 2.41 SqFt

Egress Information A2

Width: 28 13/32" Height: 30 7/16"

Net Clear Opening: 6.00 SqFt

Performance Information A1, A3

U-Factor: 0.33

Solar Heat Gain Coefficient: 0.24

Visible Light Transmittance: 0.4

Condensation Resistance: 55

CPD Number: MAR-N-425-17192-00001

ENERGY STAR: S

Performance Information A2

U-Factor: 0.3

Solar Heat Gain Coefficient: 0.24

Visible Light Transmittance: 0.4

Condensation Resistance: 56

CPD Number: MAR-N-425-17193-00001

ENERGY STAR: NC, SC, S

Performance Grade A1, A2, A3

Licensee #1127

AAMA/WDMA/CSA/101/ I.S.2/A440-08

LC-PG50 1149X2223 mm (45.25X87.5 in)

LC-PG50 DP +50/-50

FL17635

Unit: A1	638.21
Clad Ultimate Double Hung - Next Generation 2.0	
Basic Frame 15" X 71"	
Rough Opening 16" X 71 1/2"	
Top Sash	
Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	
IG	
Low E2	
Capillary Tube	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	48.11
Rectangular - Special Cut 1W2H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
Bottom Sash	
Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	
IG	
Low E2	
Capillary Tube	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	48.11
Rectangular - Special Cut 1W2H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
White Interior Weather Strip Package	
Beige Exterior Weather Strip Package	
White Sash Lock	
White Top Sash Strike Plate Assembly Color	
Ogee Exterior Sash Lugs	78.93
No Screen	-19.54

Unit: A2	780.28
Clad Ultimate Double Hung - Next Generation 2.0	
Basic Frame 32" X 71"	
Rough Opening 33" X 71 1/2"	
Top Sash	
Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	
IG	
Low E2 w/Argon	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	162.37
Rectangular - Special Cut 3W2H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
Bottom Sash	
Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	
IG	
Low E2 w/Argon	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	162.37
Rectangular - Special Cut 3W2H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
White Interior Weather Strip Package	
Beige Exterior Weather Strip Package	
White Sash Lock	
White Top Sash Strike Plate Assembly Color	
Ogee Exterior Sash Lugs	78.93
No Screen	-24.81

Unit: A3	638.21
Clad Ultimate Double Hung - Next Generation 2.0	
Basic Frame 15" X 71"	
Rough Opening 16" X 71 1/2"	
Top Sash	

Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	
IG	
Low E2	
Capillary Tube	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	48.11
Rectangular - Special Cut 1W2H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
Bottom Sash	
Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	
IG	
Low E2	
Capillary Tube	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	48.11
Rectangular - Special Cut 1W2H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
White Interior Weather Strip Package	
Beige Exterior Weather Strip Package	
White Sash Lock	
White Top Sash Strike Plate Assembly Color	
Ogee Exterior Sash Lugs	78.93
No Screen	19.54
Vertical Space Mull 3"	136.81
Factory Mull Charge	52.62
4 9/16" Jamb	
Casing with Subsill	332.26
Coconut Cream Thorton A1443 Clad Casing	
Coconut Cream A1450 Subsill	30.07
No Installation Method	
***Note: When installing units with casing, always install, flash, and seal (including the use of backer rod in masonry applications) the window or door per the installation instructions included with the unit. Review the impact the casing has on the wall thickness. An exterior casing can extend beyond the frame of the unit and require additional wall thickness.	
***Note: Non-certified mull: check with local code officials for project specific requirements.	

Initials required

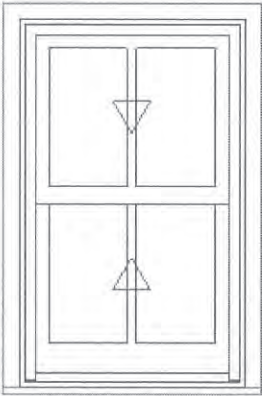
Seller: _____

Buyer: _____

Line #3	Mark Unit: C EAST ELEV FIRST FLOOR	Net Price:		963.70
Qty: 1		Ext. Net Price:	USD	963.70



Coconut Cream Clad Exterior	
Primed Pine Interior	28.57
Clad Ultimate Double Hung - Next Generation 2.0	529.21
Outside of Exterior Casing 28" X 42 1/2"	
Rough Opening 25 5/8" X 40 17/32"	
Top Sash	
Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	
IG	
Low E2 w/Argon	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	48.11
Rectangular - Special Cut 2W1H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
Bottom Sash	
Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	



As Viewed From The
Exterior

Entered As: OC

MO 28 1/2" X 42 3/4"

FS 24 5/8" X 40 1/32"

OC 28" X 42 1/2"

RO 25 5/8" X 40 17/32"

Egress Information

Width: 21 1/32" Height: 14 61/64"

Net Clear Opening: 2.18 SqFt

Performance Information

U-Factor: 0.3

Solar Heat Gain Coefficient: 0.24

Visible Light Transmittance: 0.4

Condensation Resistance: 56

CPD Number: MAR-N-425-17193-00001

ENERGY STAR: NC, SC, S

Performance Grade

Licensee #1127

AAMA/WDMA/CSA/101/ I.S.2/A440-08

LC-PG50 1149X2223 mm (45.25X87.5 in)

LC-PG50 DP +50/-50

FL17635

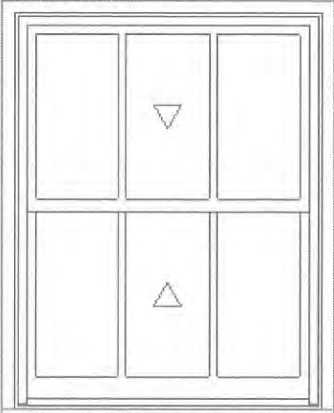
IG	
Low E2 w/Argon	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	48.11
Rectangular - Special Cut 2W1H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
White Interior Weather Strip Package	
Beige Exterior Weather Strip Package	
White Sash Lock	
White Top Sash Strike Plate Assembly Color	
Ogee Exterior Sash Lugs	78.93
No Screen	14.28
4 9/16" Jamb	
Casing with Subsill	233.78
Coconut Cream Thorton A1443 Clad Casing	
Coconut Cream A1450 Subsill	11.28
No Installation Method	
***Note: When installing units with casing, always install, flash, and seal (including the use of backer rod in masonry applications) the window or door per the installation instructions included with the unit. Review the impact the casing has on the wall thickness. An exterior casing can extend beyond the frame of the unit and require additional wall thickness.	

Initials required

Seller: _____

Buyer: _____

Line #4	Mark Unit: D EAST ELEV FIRST FLOOR	Net Price:		1,292.95
Qty: 1		Ext. Net Price:	USD	1,292.95



As Viewed From The Exterior

Entered As: OC

MO 48 1/2" X 60 1/4"

FS 44 5/8" X 57 17/32"

OC 48" X 60"

RO 45 5/8" X 58 1/32"

Egress Information

Coconut Cream Clad Exterior	
Primed Pine Interior	28.57
Clad Ultimate Double Hung - Next Generation 2.0	780.28
Outside of Exterior Casing 48" X 60"	
Rough Opening 45 5/8" X 58 1/32"	
Top Sash	
Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	
IG	
Low E2 w/Argon	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	71.41
Rectangular - Special Cut 3W1H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
Bottom Sash	
Coconut Cream Clad Sash Exterior	
Primed Pine Sash Interior	
IG	
Low E2 w/Argon	
Stainless Perimeter and Spacer Bar	
1 1/8" SDL - With Spacer Bar - Stainless	71.41
Rectangular - Special Cut 3W1H	
Coconut Cream Clad Ext - Primed Pine Int	
Ogee Interior Glazing Profile	
White Interior Weather Strip Package	

Width: 41 1/32" Height: 23 45/64"
Net Clear Opening: 6.75 SqFt
Performance Information
U-Factor: 0.3
Solar Heat Gain Coefficient: 0.24
Visible Light Transmittance: 0.4
Condensation Resistance: 56
CPD Number: MAR-N-425-17193-00001
ENERGY STAR: NC, SC, S
Performance Grade
Licensee #1127
AAMA/WDMA/CSA/101/ I.S.2/A440-08
LC-PG50 1149X2223 mm (45.25X87.5 in)
LC-PG50 DP +50/-50
FL17635

Beige Exterior Weather Strip Package
White Sash Lock
White Top Sash Strike Plate Assembly Color
Ogee Exterior Sash Lugs 78.93
No Screen -24.81
4 9/16" Jamb
Casing with Subsill..... 266.86
Coconut Cream Thorton A1443 Clad Casing
Coconut Cream A1450 Subsill 20.30
No Installation Method
***Note: When installing units with casing, always install, flash, and seal (including the use of backer rod in masonry applications) the window or door per the installation instructions included with the unit. Review the impact the casing has on the wall thickness. An exterior casing can extend beyond the frame of the unit and require additional wall thickness.

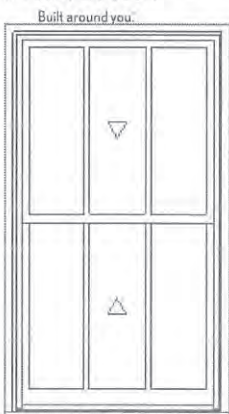
Initials required

Seller: _____

Buyer: _____

Line #5	Mark Unit: E 2ND FLOOR	Net Price:		1,650.01
Qty: 23		Ext. Net Price:	USD	37,950.23

MARVIN
Windows and Doors



As Viewed From The
Exterior

Entered As: OC
MO 48 1/2" X 84 1/4"
FS 44 5/8" X 81 17/32"
OC 48" X 84"
RO 45 5/8" X 82 1/32"
Egress Information
Width: 41 1/32" Height: 35 13/32"
Net Clear Opening: 10.09 SqFt
Performance Information
U-Factor: 0.3
Solar Heat Gain Coefficient: 0.24
Visible Light Transmittance: 0.4
Condensation Resistance: 56
CPD Number: MAR-N-425-17193-00001
ENERGY STAR: NC, SC, S
Performance Grade
Licensee #1127
AAMA/WDMA/CSA/101/ I.S.2/A440-08
LC-PG50 1149X2223 mm (45.25X87.5 in)
LC-PG50 DP +50/-50
FL17635

Coconut Cream Clad Exterior
Primed Pine Interior 28.57
Clad Ultimate Double Hung - Next Generation 2.0 1,114.04
Outside of Exterior Casing 48" X 84"
Rough Opening 45 5/8" X 82 1/32"
Top Sash
Coconut Cream Clad Sash Exterior
Primed Pine Sash Interior
IG
Low E2 w/Argon
Stainless Perimeter and Spacer Bar
1 1/8" SDL - With Spacer Bar - Stainless 71.41
Rectangular - Special Cut 3W1H
Coconut Cream Clad Ext - Primed Pine Int
Ogee Interior Glazing Profile
Bottom Sash
Coconut Cream Clad Sash Exterior
Primed Pine Sash Interior
IG
Low E2 w/Argon
Stainless Perimeter and Spacer Bar
1 1/8" SDL - With Spacer Bar - Stainless 71.41
Rectangular - Special Cut 3W1H
Coconut Cream Clad Ext - Primed Pine Int
Ogee Interior Glazing Profile
White Interior Weather Strip Package
Beige Exterior Weather Strip Package
White Sash Lock
White Top Sash Strike Plate Assembly Color
Ogee Exterior Sash Lugs 78.93
No Screen -30.07
4 9/16" Jamb
Casing with Subsill..... 295.42
Coconut Cream Thorton A1443 Clad Casing
Coconut Cream A1450 Subsill 20.30
No Installation Method
***Note: When installing units with casing, always install, flash, and seal (including the use of backer rod in masonry applications) the window or door per the installation instructions included with the unit. Review the impact the casing has on the wall thickness. An exterior casing can extend beyond the frame of the unit and require additional wall thickness.

Initials required

Seller: _____

Buyer: _____

Line #6	Mark Unit: DELIVERY	Net Price:		50.00
Qty: 1		Ext. Net Price:	USD	50.00
Other	DELIVER THE WINDOWS			

Initials required

Seller: _____

Buyer: _____

Project Subtotal Net Price: USD	45,722.96
Non-Taxable Other: USD	50.00
8.250% Sales Tax: USD	3,772.14
Project Total Net Price: USD	49,545.10

Terms and Conditions

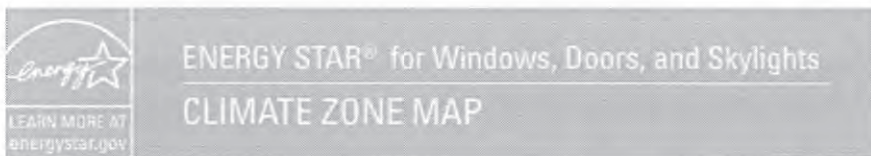
Product and Performance Information

NFRC energy ratings and values may vary depending on the exact configuration of glass thickness used on the unit. This data may change over time due to ongoing product changes or updated test results or requirements.

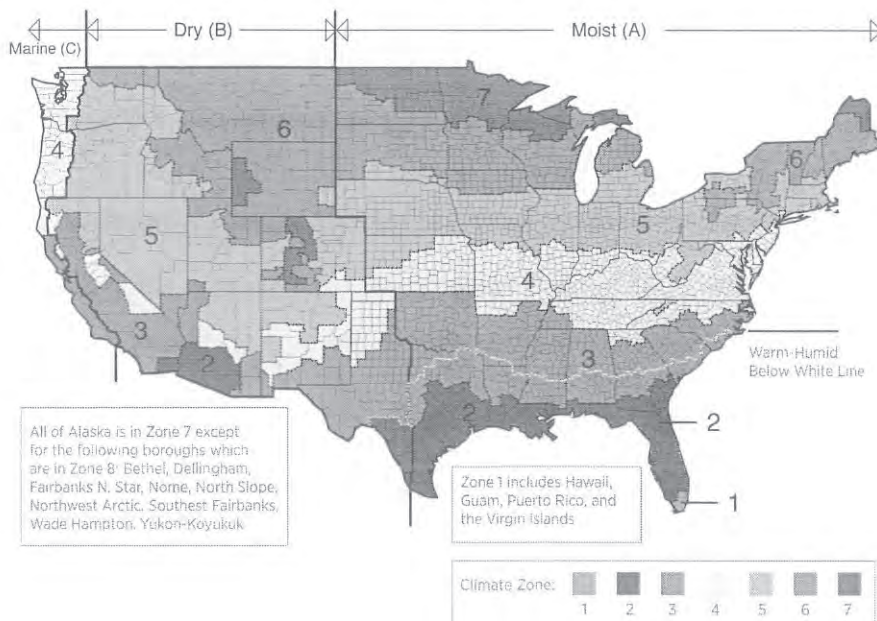
The National Fenestration Rating Council (NFRC) has developed and operates a uniform national rating system for the energy performance of fenestration products, including windows and doors. For additional information regarding this rating system, see www.nfrc.org/WindowRatings.

NFRC energy values and ratings may change over time due to ongoing product changes, updated test results or requirements.

Review the map below to determine if your units meet ENERGY STAR for your location.



International Energy Conservation Code (IECC) Climate Regions



PURCHASE APPROVAL/SIGN OFF

Project Subtotal Net Price: USD	45,722.96
Non-Taxable Other: USD	50.00
8.250% Sales Tax: USD	3,772.14
Project Total Net Price: USD	49,545.10

I have reviewed all line item quotes in detail and agree that the product specifications and pricing are accurate, and I approve the project for order. I acknowledge that additional charges, tax or Terms and Conditions may apply.

Seller: _____

Buyer: _____

DESIGN OPTIONS

Exterior Finish

Clad Color Options



Coconut Cream

A high-quality window deserves a dependable finish. Our low maintenance clad-wood products feature an extruded aluminum exterior finished in commercial-grade paint for superior resistance to fading and chalking. Our palette of nineteen color options spans from muted, earthy tones to bold, rich colors and three pearlescent finishes. Custom color matching is also available to meet any design vision.

Selected: Coconut Cream



**Custom Colors: Any color. Any window or door. You name it. No matter what your inspiration for a custom window or door color, Marvin will match it. You get any color your heart desires, with your own personal custom color name and a 20-year warranty. See your Marvin dealer for details and ask about special pricing.*

Ultimate Double Hung G2

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Unit Features

Ultimate Double Hung G2 Collection:

Ultimate Single Hung G2: USHG2

Ultimate Double Hung G2: UDHG2

Ultimate Double Hung Picture G2: UDHP G2

Ultimate Double Hung Transom G2: UDHTR G2

Ultimate Double Hung Bows and Bays G2: UDHBB G2

Ultimate Double Hung -G2 IZ3: UDH G2 IZ3

Ultimate Double Hung Picture G2 IZ3: UDHP G2 IZ3

Ultimate Double Hung Transom G2 IZ3: UDHTR G2 IZ3

NOTE: Ultimate Double Hung Bows and Bays G2, Ultimate Double Hung G2 IZ3, Ultimate Double Hung Picture G2 IZ3, and Ultimate Double Hung Transom G2 IZ3 are not available with CE mark.

Frame:

- Frame thickness:
 - 11/16" (17) thick at head and jambs
 - 1 13/32" (36) thick at sill
- Frame Width: 4 9/16" (116)

Sash:

- Operating / Stationary Sash (Single Hung, Double Hung, Transom):
 - Sash thickness: 1 3/4" (44), corner slot and tenoned
 - Top rail height: 2 13/32" (61)
 - Stiles width: 1 21/32" (42)
 - Bottom rail height (operating): 3 1/4" (83)
 - Bottom rail height (transom): 2 3/4" (70)
- Stationary Picture Sash:
 - Sash thickness: 1 3/4" (44), corner slot and tenoned
 - Top rail height: 2 13/32" (61)
 - Stile width: 2 13/32" (61)
 - Bottom rail height: 3 1/4" (83)
- Optional CW (Commercial Window) certified product
- Sash Options
 - Standard: Equal
 - Optional: Unequal, Both Sash Stationary
- Standard exterior cope profile: Putty
- Standard interior wood cope sticking: Ogee
- Optional interior wood cope sticking: Square

Unit Features

Glass and Glazing:

- Glazing method: Insulating - Dual Pane or Tri Pane
- Glazing seal: Silicone glazed
- Standard glass is Insulating Low E2 Argon or air
- Optional dual-pane glass make-ups:
 - Low E1 Argon or Air,
 - Low E3 Argon or Air,
 - Low E2/ERS Argon or Air,
 - Low E3/ERS Argon or air, Laminated, Tempered, Obscure, Bronze tint, Gray tint, Green tint, Reflective Bronze and decorative glass options
- Optional Tri Pane glass make-ups:
 - Low E2/E1 Argon or Krypton-Argon, or Air
 - Low E3/E1 Argon or Krypton-Argon, or Air
 - Low E1 Argon, Krypton-Argon, or Air
- Available glass types:
 - Laminated
 - Tempered
 - Obscure
 - Clear
- Tints
 - Bronze
 - Gray
 - Green
 - Reflective Bronze
- Decorative glass options:
 - Frost
 - 1/2 English Reed
 - Rain
 - Sandblasted
 - Glue Chip
- Glazing will be altitude adjusted for higher elevations with capillary tubes. Argon, Argon-Krypton, and Krypton gas not included
- IZ3 has annealed exterior pane is default with the option to temper
- CUDHP-NG 2.0 IZ3 product requires tempered glass on units above a glass square footage of 33.1.
- Egress may be affected when selecting specialty glass, please contact your Marvin representative
- For additional specialty glazing options, please contact your Marvin representatives.

CE Optional Glazing:

- Glazing method: Insulating
- Glazing seal: Silicone glazed
- Standard glass is 7/8" (22) insulating Low E2 Argon or air
- Optional dual glazing available: Low E1 Argon or air, Low E3 Argon or air, Low E2/ERS argon or air, Low E3/ERS Argon or air, clear, laminated clear and tints, tempered, sandblasted
- Optional Tripane glass types: Low E1/E1 Argon or Krypton-Argon, Low E2/E2 Argon or Krypton-Argon, Low E3/E1 Argon or Krypton-Argon
- Glass panes available in 3, 4, and 6 mm thicknesses
- Laminated panes available in 7.0 and 7.8 mm thicknesses
- Glazing will be altitude adjusted for higher elevations, Argon, Argon-Krypton, and Krypton gas not included

Unit Features

Weather Strip:

- Operating units:
 - Jambs: Foam-filled bulb
 - Color: beige, black, and white
 - Head Jamb: Continuous dual leaf
 - Color: beige, black, and white
 - Check rail: Hollow bulb
 - Color: beige, black, and white
 - Bottom rail: Hollow bulb
 - Color: black
- Picture units:
 - Jambs: Foam
 - Header and bottom rail: Hollow bulb

Hardware:

- Locking system that provides locking, unlocking, balancing, and tilting of the sash members. Lock automatically locks when both sash are closed.
- Lock Actuator Assembly:
 - Material
 - Zinc die cast
 - Standard finish: Satin Taupe
 - Optional finish: White, Bronze, Matte Black, Brass, Antique Brass, Polished Chrome, Satin Chrome, Oil Rubbed Bronze, or Satin Nickel
 - Design features or components
 - To unlock the unit, turn the handle 135°
 - To lock the unit, both sash must be moved to the closed position
 - To tilt the bottom sash for wash-mode, the bottom sash must be open; push the button on top of lock handle and rotate the handle 180°
 - To tilt the top sash for wash-mode, the bottom sash must be tilted and/or removed from frame; lower the top sash to a good working height, retract the tilt latches on the top rail and tilt sash out of the frame
 - Options
 - Non-tilt hardware is standard on units with performance brackets
 - Custodial hardware colors: satin taupe, white, bronze, matte black
- Lift Lock (Option for Single Hung Only)
 - Available with one or two locks
 - Lift lock handle assembly is integrated into the bottom rail of the sash and controls locking, unlocking and facilitates operation of the bottom sash.
 - Two locks are not available on sash less than CN26 width
 - Material
 - Zinc die-cast
 - Finishes
 - Lift and Escutcheon components - Bronze, Satin Taupe, White, Matte Black, Oil Rubbed Bronze, Antique Brass, Brass, Polished Chrome, Satin Chrome, Satin Nickel
 - Sill Strike: White, Black, Beige
- Latches
 - Bottom sash latch, top sash tilt latch
 - Latches accommodate locking/un-locking, travel of sash in frame, and tilting into wash-mode
 - Injection-molded plastic
 - Color: beige
- Cord guide assembly
 - Injection-molded plastic and die-cast zinc
 - One cord guide inserted into bottom check rail
 - Cord guide is driven by lock handle, accounts for cord travel to retract latches
 - Plunger drives auto-lock feature to lock position when both sash are closed
- Strike Assembly
 - Zinc die-cast strike plate and injection-molded Acetal housing and button
 - Strike assembly accommodates locking/unlocking

Unit Features

- Balance system
 - Block & tackle balance
 - Hybrid spiral balance

Balance type is dependent on sash weight. Unit size, glass type, and options can all impact sash weight. General balance selection is as follows (some exceptions exist based on unit size):

Sash	Sash Weight	Balance Tube Type
Top	up to 35 lbs	Block and Tackle
	>35 lbs	Hybrid Spiral
Bottom	up to 30.6 lbs	Block and Tackle
	>30.6 lbs	Hybrid Spiral

- Sash Limiter
 - Bottom sash limiter:
 - Available on all operator configurations, and IZ3
 - Selectable bottom sash locations, 4", 6" or 8" Net Clear Opening (NCO)
 - Non-tilt hardware is default, and a sash removal tool is required in order to by-pass the Sash limiter for sash removal (tilt wash mode)
 - Standard application is factory applied. Available for retrofit applications.
 - Color: Will align with the Interior Weather Strip Package selection
 - Top Sash Limiter
 - Available on all operator configurations, with the exception Single Hung configurations. This includes IZ3
 - Selectable bottom sash locations, 4", 6" or 8" Net Clear Opening (NCO)
 - Standard application is factory applied. Available for field applications
 - Color: Will align with the Exterior Weather Strip Package selection
- Optional factory applied Window Opening Control Device is available on operating units.
 - Two devices will be applied to each window and will default color match the lock handle color.
 - WOCD is a device consisting of a zinc lever housed in a zinc shell on the top sash stile of the secondary sash and an acetal stop on the bottom check rail of the primary sash.
 - Color: Satin Taupe, White, Bronze, Matte Black, Brass, Antique Brass, Polished Chrome, Satin Chrome, Oil Rubbed Bronze, and Satin Nickel.
 - This device works in accordance to ASTM F2090-17 Standard Specification for Window Fall Prevention Devices with Emergency Escape (Egress) Release Mechanisms.
- Exterior Sash Lugs - Standard Option
 - Standard Profile: Ogee
 - Available on Top Sash
 - Color: Available in all exterior clad color options
 - Color shall be the same as top sash clad color
 - Standard application is factory applied. Available for field applications
- Optional Finger Pull
 - Single or double (not available on units less than CN26: Frame OM 31 1/4" (794))
 - Not available with Lift Lock
- Performance Rating Option
 - Option to eliminate performance brackets on specific size units to allow for standard tilt hardware. Reduces performance from an LC-PG50 to LC-PG35.
 - Option for a CW (Commercial Window) performance rating.

Mulling:

- For mull performance, refer to the General Mulling chapter of the ADM.

Unit Features

Insect Screens:

- Standard screen frame is roll formed aluminum
- Aluminum screen: Full screen standard, half screen optional
- Aluminum surround to match exterior frame clad color
- Units with a glass height of 20" (508) or greater will have a center cross bar
- Screen mesh:
 - Standard: Charcoal Fiberglass
 - Optional: Charcoal High Transparency Fiberglass Mesh, Charcoal Aluminum Wire, Black Aluminum Wire, Bright Aluminum Wire, or Bright Bronze Aluminum Wire
 - Optional Double Hung Magnum screen, extruded aluminum

Combination Storm Sash and Screen:

- Frame: Extruded aluminum frame .045"(1.1) thick. Color: Stone White, Bahama Brown, Pebble Gray and Evergreen
- Insect screen:
 - Standard Screen mesh: Charcoal Aluminum Wire
 - Optional screen material: Charcoal Fiberglass Mesh, Black Aluminum Wire, Bright Aluminum Wire, Bright Bronze Wire, Optional Charcoal High Transparency Fiberglass Mesh (CH Hi-Tran)
- Weather strip: Pile weather strip between operating panels and at stiles of main frame
- Hardware: Spring-loaded latches to secure storm panel
- Max size: 45 1/4" x 79 1/2" frame size

Lock Status Sensor (Optional):

- Refer to **Lock Status Sensor Installation Instructions** for requirements.
- The Lock Status Sensor detects an open or closed status on Clad Ultimate Double Hung - Next Generation 2.0 units and Ultimate Single Hung units. A "locked" status is inferred from the presence of the Auto-Lock feature which activates the locking mechanism when the operating panels are closed. It allows easy integration with home automation systems through a wired or wireless connection.
 - For wired option, check with local codes on potential contractor requirements for low voltage networking connections.
 - Wireless option available. Requires purchase of secondary transmitter for operation. Marvin will prep for this option.
- Wireless Lock Status Sensor is located within the width and height of the frame.
- Sensor Location
 - Will always be located on the right-hand side of the check rail (from the exterior) for the bottom sash. For the top sash, the sensor will be located in the header parting stop of the frame on the right side (from the exterior).
- For Wired or Wireless, Black or White Magnet Covers only visible on secondary surface. Cover color dependent upon interior finish.
 - White: Prime and White Painted Interior Finish
 - Black: Bare and all other finish options

Unit Features

Cottage Unit:

The following formula will properly size a standard cottage style double hung:

Formula

1. Select the standard size double hung that will fit the rough opening
2. Subtract 7 1/2" (191) from the frame size height to get total glass height
3. Multiply the total glass height by the desired top sash ratio, this is the top sash glass height
4. Subtract the top sash height from the total glass height, this is the bottom sash glass height

Example

1. CUDH-NG 2.0 with a 0.400 top sash ratio (2/5 - 3/5) cottage style. If the rough opening is 2'-4 1/4" x 4' (RO for a CUDH-NG 2.0 2020) the frame size will be 25 1/4" x 47 1/2"
2. $47 \frac{1}{2}" - 7 \frac{1}{2}" = 40"$
3. $40"$ multiplied by 0.400 (2/5) = 16"
4. $40" - 16" = 24"$
5. The top sash will be a 2016 and the bottom sash will be a 2024. The call number for the example is: CUDH-NG 2.0 2016/24.

CE Mulling Options

- Muller assemblies up to 120" (3048) x 79 1/2" (2019) as a 1H x multi-width assembly
- Muller assemblies up to 59 1/4" (1505) x 119 1/2" (3035) as a multi-high x 1W assembly
- Muller assemblies with 1" (25) LVL or 3/8" (10) aluminum mull reinforcement up to 120" (3048) x 100 3/8" (2550) as a multi-wide or multi-high assembly

Egress/Vent and Daylight Openings: Operable

CN	Opening Width		Opening Height		Egress Opening		Daylight Opening Width		Daylight Opening Height		Daylight Opening	
	ft - in	mm	ft - in	mm	ft ²	m ²	ft-in	mm	ft-in	mm	sq. ft.	m ²
1612	1-5 21/32	(449)	0-10 11/16	(271)	1.31	(0.12)	1-2 47/64	(374)	0-10 3/4	(273)	1.10	(0.10)
1614	1-5 21/32	(449)	1-0 11/16	(322)	1.56	(0.14)	1-2 47/64	(374)	1-0 3/4	(324)	1.30	(0.12)
1616	1-5 21/32	(449)	1-2 11/16	(373)	1.80	(0.17)	1-2 47/64	(374)	1-2 3/4	(375)	1.51	(0.14)
1618	1-5 21/32	(449)	1-4 11/16	(424)	2.05	(0.19)	1-2 47/64	(374)	1-4 3/4	(425)	1.71	(0.16)
1620	1-5 21/32	(449)	1-6 11/16	(475)	2.29	(0.21)	1-2 47/64	(374)	1-6 3/4	(476)	1.92	(0.18)
1622	1-5 21/32	(449)	1-8 11/16	(525)	2.54	(0.24)	1-2 47/64	(374)	1-8 3/4	(527)	2.12	(0.20)
1624	1-5 21/32	(449)	1-10 11/16	(576)	2.78	(0.26)	1-2 47/64	(374)	1-10 3/4	(578)	2.33	(0.22)
1626	1-5 21/32	(449)	2-0 11/16	(627)	3.03	(0.28)	1-2 47/64	(374)	2-0 3/4	(629)	2.53	(0.24)
1628	1-5 21/32	(449)	2-2 11/16	(678)	3.27	(0.30)	1-2 47/64	(374)	2-2 3/4	(679)	2.74	(0.25)
1630	1-5 21/32	(449)	2-4 11/16	(729)	3.52	(0.33)	1-2 47/64	(374)	2-4 3/4	(730)	2.94	(0.27)
1632	1-5 21/32	(449)	2-6 11/16	(779)	3.76	(0.35)	1-2 47/64	(374)	2-6 3/4	(781)	3.15	(0.29)
1634	1-5 21/32	(449)	2-8 11/16	(830)	4.01	(0.37)	1-2 47/64	(374)	2-8 3/4	(832)	3.35	(0.31)
1636	1-5 21/32	(449)	2-10 11/16	(881)	4.25	(0.40)	1-2 47/64	(374)	2-10 3/4	(883)	3.56	(0.33)
1640	1-5 21/32	(449)	3-2 11/16	(983)	4.74	(0.44)	1-2 47/64	(374)	3-2 3/4	(984)	3.97	(0.37)
1642	1-5 21/32	(449)	3-4 11/16	(1033)	4.99	(0.46)	1-2 47/64	(374)	3-4 3/4	(1035)	4.17	(0.39)
1650	1-5 21/32	(449)	4-0 25/64	(1229)	5.93	(0.55)	1-2 47/64	(374)	4-0 3/4	(1238)	4.99	(0.46)
1656	1-5 21/32	(449)	4-6 25/64	(1381)	6.67	(0.62)	1-2 47/64	(374)	4-6 3/4	(1391)	5.60	(0.52)
1660	1-5 21/32	(449)	4-10 25/64	(1483)	7.16	(0.67)	1-2 47/64	(374)	4-10 3/4	(1492)	6.01	(0.56)
2012	1-9 21/32	(550)	0-10 11/16	(271)	1.61	(0.15)	1-6 47/64	(476)	0-10 3/4	(273)	1.40	(0.13)
2014	1-9 21/32	(550)	1-0 11/16	(322)	1.91	(0.18)	1-6 47/64	(476)	1-0 3/4	(324)	1.66	(0.15)
2016	1-9 21/32	(550)	1-2 11/16	(373)	2.21	(0.21)	1-6 47/64	(476)	1-2 3/4	(375)	1.92	(0.18)
2018	1-9 21/32	(550)	1-4 11/16	(424)	2.51	(0.23)	1-6 47/64	(476)	1-4 3/4	(425)	2.18	(0.20)
2020	1-9 21/32	(550)	1-6 11/16	(475)	2.81	(0.26)	1-6 47/64	(476)	1-6 3/4	(476)	2.44	(0.23)
2022	1-9 21/32	(550)	1-8 11/16	(525)	3.11	(0.29)	1-6 47/64	(476)	1-8 3/4	(527)	2.70	(0.25)
2024	1-9 21/32	(550)	1-10 11/16	(576)	3.41	(0.32)	1-6 47/64	(476)	1-10 3/4	(578)	2.96	(0.27)
2026	1-9 21/32	(550)	2-0 11/16	(627)	3.71	(0.34)	1-6 47/64	(476)	2-0 3/4	(629)	3.22	(0.30)
2028	1-9 21/32	(550)	2-2 11/16	(678)	4.01	(0.37)	1-6 47/64	(476)	2-2 3/4	(679)	3.48	(0.32)
2030	1-9 21/32	(550)	2-4 11/16	(729)	4.32	(0.40)	1-6 47/64	(476)	2-4 3/4	(730)	3.74	(0.35)
2032	1-9 21/32	(550)	2-6 11/16	(779)	4.62	(0.43)	1-6 47/64	(476)	2-6 3/4	(781)	4.00	(0.37)
2034	1-9 21/32	(550)	2-8 11/16	(830)	4.92	(0.46)	1-6 47/64	(476)	2-8 3/4	(832)	4.26	(0.40)
2036	1-9 21/32	(550)	2-10 11/16	(881)	5.22	(0.48)	1-6 47/64	(476)	2-10 3/4	(883)	4.52	(0.42)
2040 E	1-9 21/32	(550)	3-2 11/16	(983)	5.82	(0.54)	1-6 47/64	(476)	3-2 3/4	(984)	5.04	(0.47)
2042 E	1-9 21/32	(550)	3-4 11/16	(1033)	6.12	(0.57)	1-6 47/64	(476)	3-4 3/4	(1035)	5.30	(0.49)
2050 E	1-9 21/32	(550)	4-0 25/64	(1229)	7.28	(0.68)	1-6 47/64	(476)	4-0 3/4	(1238)	6.34	(0.59)
2056 E	1-9 21/32	(550)	4-6 25/64	(1381)	8.18	(0.76)	1-6 47/64	(476)	4-6 3/4	(1391)	7.12	(0.66)
2060 E	1-9 21/32	(550)	4-10 25/64	(1483)	8.78	(0.82)	1-6 47/64	(476)	4-10 3/4	(1492)	7.64	(0.71)

NOTE: Refer to Product Performance Chapter for International Building Code. Net Clear Opening drawings are pictured with the conversion tables.

Sizes designated with "E" meet egress requirements based on standard and optional [Glass and Glazing](#). All other glass options, please contact a Marvin representative.

Egress/Vent and Daylight Opening: Operable

CN	Opening Width		Opening Height		Egress Opening		Daylight Opening Width		Daylight Opening Height		Daylight Opening	
	ft - in	mm	ft - in	mm	ft ²	m ²	ft-in	mm	ft-in	mm	sq. ft.	m ²
2412	2-1 21/32	(652)	0-10 11/16	(271)	1.90	(0.18)	1-10 47/64	(577)	0-10 3/4	(273)	1.70	(0.16)
2414	2-1 21/32	(652)	1-0 11/16	(322)	2.26	(0.21)	1-10 47/64	(577)	1-0 3/4	(324)	2.01	(0.19)
2416	2-1 21/32	(652)	1-2 11/16	(373)	2.62	(0.24)	1-10 47/64	(577)	1-2 3/4	(375)	2.33	(0.22)
2418	2-1 21/32	(652)	1-4 11/16	(424)	2.97	(0.28)	1-10 47/64	(577)	1-4 3/4	(425)	2.64	(0.25)
2420	2-1 21/32	(652)	1-6 11/16	(475)	3.33	(0.31)	1-10 47/64	(577)	1-6 3/4	(476)	2.96	(0.28)
2422	2-1 21/32	(652)	1-8 11/16	(525)	3.69	(0.34)	1-10 47/64	(577)	1-8 3/4	(527)	3.28	(0.30)
2424	2-1 21/32	(652)	1-10 11/16	(576)	4.04	(0.38)	1-10 47/64	(577)	1-10 3/4	(578)	3.59	(0.33)
2426	2-1 21/32	(652)	2-0 11/16	(627)	4.40	(0.41)	1-10 47/64	(577)	2-0 3/4	(629)	3.91	(0.36)
2428	2-1 21/32	(652)	2-2 11/16	(678)	4.76	(0.44)	1-10 47/64	(577)	2-2 3/4	(679)	4.22	(0.39)
2430	2-1 21/32	(652)	2-4 11/16	(729)	5.11	(0.47)	1-10 47/64	(577)	2-4 3/4	(730)	4.54	(0.42)
2432	2-1 21/32	(652)	2-6 11/16	(779)	5.47	(0.51)	1-10 47/64	(577)	2-6 3/4	(781)	4.86	(0.45)
2434 E	2-1 21/32	(652)	2-8 11/16	(830)	5.82	(0.54)	1-10 47/64	(577)	2-8 3/4	(832)	5.17	(0.48)
2436 E	2-1 21/32	(652)	2-10 11/16	(881)	6.18	(0.57)	1-10 47/64	(577)	2-10 3/4	(883)	5.49	(0.51)
2440 E	2-1 21/32	(652)	3-2 11/16	(983)	6.89	(0.64)	1-10 47/64	(577)	3-2 3/4	(984)	6.12	(0.57)
2442 E	2-1 21/32	(652)	3-4 25/64	(1026)	7.20	(0.67)	1-10 47/64	(577)	3-4 3/4	(1035)	6.43	(0.60)
2450 E	2-1 21/32	(652)	4-0 25/64	(1229)	8.62	(0.80)	1-10 47/64	(577)	4-0 3/4	(1238)	7.70	(0.72)
2456 E	2-1 21/32	(652)	4-6 25/64	(1381)	9.69	(0.90)	1-10 47/64	(577)	4-6 3/4	(1391)	8.64	(0.80)
2460 E	2-1 21/32	(652)	4-10 25/64	(1483)	10.40	(0.97)	1-10 47/64	(577)	4-10 3/4	(1492)	9.28	(0.86)
2612	2-3 21/32	(703)	0-10 11/16	(271)	2.05	(0.19)	2-0 47/64	(628)	0-10 3/4	(273)	1.85	(0.17)
2614	2-3 21/32	(703)	1-0 11/16	(322)	2.44	(0.23)	2-0 47/64	(628)	1-0 3/4	(324)	2.19	(0.20)
2616	2-3 21/32	(703)	1-2 11/16	(373)	2.82	(0.26)	2-0 47/64	(628)	1-2 3/4	(375)	2.53	(0.24)
2618	2-3 21/32	(703)	1-4 11/16	(424)	3.21	(0.30)	2-0 47/64	(628)	1-4 3/4	(425)	2.88	(0.27)
2620	2-3 21/32	(703)	1-6 11/16	(475)	3.59	(0.33)	2-0 47/64	(628)	1-6 3/4	(476)	3.22	(0.30)
2622	2-3 21/32	(703)	1-8 11/16	(525)	3.97	(0.37)	2-0 47/64	(628)	1-8 3/4	(527)	3.56	(0.33)
2624	2-3 21/32	(703)	1-10 11/16	(576)	4.36	(0.40)	2-0 47/64	(628)	1-10 3/4	(578)	3.91	(0.36)
2626	2-3 21/32	(703)	2-0 11/16	(627)	4.74	(0.44)	2-0 47/64	(628)	2-0 3/4	(629)	4.25	(0.39)
2628	2-3 21/32	(703)	2-2 11/16	(678)	5.13	(0.48)	2-0 47/64	(628)	2-2 3/4	(679)	4.60	(0.43)
2630	2-3 21/32	(703)	2-4 11/16	(729)	5.51	(0.51)	2-0 47/64	(628)	2-4 3/4	(730)	4.94	(0.46)
2632 E	2-3 21/32	(703)	2-6 11/16	(779)	5.89	(0.55)	2-0 47/64	(628)	2-6 3/4	(781)	5.28	(0.49)
2634 E	2-3 21/32	(703)	2-8 11/16	(830)	6.28	(0.58)	2-0 47/64	(628)	2-8 3/4	(832)	5.63	(0.52)
2636 E	2-3 21/32	(703)	2-10 11/16	(881)	6.66	(0.62)	2-0 47/64	(628)	2-10 3/4	(883)	5.97	(0.55)
2640 E	2-3 21/32	(703)	3-2 25/64	(975)	7.37	(0.69)	2-0 47/64	(628)	3-2 3/4	(984)	6.66	(0.62)
2642 E	2-3 21/32	(703)	3-4 25/64	(1026)	7.76	(0.72)	2-0 47/64	(628)	3-4 3/4	(1035)	7.00	(0.65)
2650 E	2-3 21/32	(703)	4-0 25/64	(1229)	9.29	(0.86)	2-0 47/64	(628)	4-0 3/4	(1238)	8.37	(0.78)
2656 E	2-3 21/32	(703)	4-6 25/64	(1381)	10.45	(0.97)	2-0 47/64	(628)	4-6 3/4	(1391)	9.40	(0.87)
2660 E	2-3 21/32	(703)	4-10 25/64	(1483)	11.21	(1.04)	2-0 47/64	(628)	4-10 3/4	(1492)	10.09	(0.94)

NOTE: Refer to Product Performance Chapter for International Building Code. Net Clear Opening drawings are pictured with the conversion tables.

Sizes designated with "E" meet egress requirements based on standard and optional [Glass and Glazing](#). All other glass options, please contact a Marvin representative.

Egress/Vent and Daylight Opening: Operable

CN	Opening Width		Opening Height		Egress Opening		Daylight Opening Width		Daylight Opening Height		Daylight Opening	
	ft - in	mm	ft - in	mm	ft ²	m ²	ft-in	mm	ft-in	mm	sq. ft.	m ²
2812	2-5 21/32	(753)	0-10 11/16	(271)	2.20	(0.20)	2-2 47/64	(679)	0-10 3/4	(273)	2.00	(0.19)
2814	2-5 21/32	(753)	1-0 11/16	(322)	2.61	(0.24)	2-2 47/64	(679)	1-0 3/4	(324)	2.37	(0.22)
2816	2-5 21/32	(753)	1-2 11/16	(373)	3.03	(0.28)	2-2 47/64	(679)	1-2 3/4	(375)	2.74	(0.25)
2818	2-5 21/32	(753)	1-4 11/16	(424)	3.44	(0.32)	2-2 47/64	(679)	1-4 3/4	(425)	3.11	(0.29)
2820	2-5 21/32	(753)	1-6 11/16	(475)	3.85	(0.36)	2-2 47/64	(679)	1-6 3/4	(476)	3.48	(0.32)
2822	2-5 21/32	(753)	1-8 11/16	(525)	4.26	(0.40)	2-2 47/64	(679)	1-8 3/4	(527)	3.85	(0.36)
2824	2-5 21/32	(753)	1-10 11/16	(576)	4.67	(0.43)	2-2 47/64	(679)	1-10 3/4	(578)	4.22	(0.39)
2826	2-5 21/32	(753)	2-0 11/16	(627)	5.08	(0.47)	2-2 47/64	(679)	2-0 3/4	(629)	4.60	(0.43)
2828	2-5 21/32	(753)	2-2 11/16	(678)	5.50	(0.51)	2-2 47/64	(679)	2-2 3/4	(679)	4.97	(0.46)
2830 E	2-5 21/32	(753)	2-4 11/16	(729)	5.91	(0.55)	2-2 47/64	(679)	2-4 3/4	(730)	5.34	(0.50)
2832 E	2-5 21/32	(753)	2-6 11/16	(779)	6.32	(0.59)	2-2 47/64	(679)	2-6 3/4	(781)	5.71	(0.53)
2834 E	2-5 21/32	(753)	2-8 11/16	(830)	6.73	(0.63)	2-2 47/64	(679)	2-8 3/4	(832)	6.08	(0.56)
2836 E	2-5 21/32	(753)	2-10 25/64	(873)	7.08	(0.66)	2-2 47/64	(679)	2-10 3/4	(883)	6.45	(0.60)
2840 E	2-5 21/32	(753)	3-2 25/64	(975)	7.91	(0.73)	2-2 47/64	(679)	3-2 3/4	(984)	7.19	(0.67)
2842 E	2-5 21/32	(753)	3-4 25/64	(1026)	8.32	(0.77)	2-2 47/64	(679)	3-4 3/4	(1035)	7.57	(0.70)
2850 E	2-5 21/32	(753)	4-0 25/64	(1229)	9.97	(0.93)	2-2 47/64	(679)	4-0 3/4	(1238)	9.05	(0.84)
2856 E	2-5 21/32	(753)	4-6 25/64	(1381)	11.20	(1.04)	2-2 47/64	(679)	4-6 3/4	(1391)	10.17	(0.94)
2860 E	2-5 21/32	(753)	4-10 25/64	(1483)	12.03	(1.12)	2-2 47/64	(679)	4-10 3/4	(1492)	10.91	(1.01)
3012	2-7 21/32	(804)	0-10 11/16	(271)	2.35	(0.22)	2-4 47/64	(730)	0-10 3/4	(273)	2.15	(0.20)
3014	2-7 21/32	(804)	1-0 11/16	(322)	2.79	(0.26)	2-4 47/64	(730)	1-0 3/4	(324)	2.54	(0.24)
3016	2-7 21/32	(804)	1-2 11/16	(373)	3.23	(0.30)	2-4 47/64	(730)	1-2 3/4	(375)	2.94	(0.27)
3018	2-7 21/32	(804)	1-4 11/16	(424)	3.67	(0.34)	2-4 47/64	(730)	1-4 3/4	(425)	3.34	(0.31)
3020	2-7 21/32	(804)	1-6 11/16	(475)	4.11	(0.38)	2-4 47/64	(730)	1-6 3/4	(476)	3.74	(0.35)
3022	2-7 21/32	(804)	1-8 11/16	(525)	4.55	(0.42)	2-4 47/64	(730)	1-8 3/4	(527)	4.14	(0.38)
3024	2-7 21/32	(804)	1-10 11/16	(576)	4.99	(0.46)	2-4 47/64	(730)	1-10 3/4	(578)	4.54	(0.42)
3026	2-7 21/32	(804)	2-0 11/16	(627)	5.43	(0.50)	2-4 47/64	(730)	2-0 3/4	(629)	4.94	(0.46)
3028 E	2-7 21/32	(804)	2-2 11/16	(678)	5.87	(0.55)	2-4 47/64	(730)	2-2 3/4	(679)	5.34	(0.50)
3030 E	2-7 21/32	(804)	2-4 11/16	(729)	6.31	(0.59)	2-4 47/64	(730)	2-4 3/4	(730)	5.74	(0.53)
3032 E	2-7 21/32	(804)	2-6 11/16	(779)	6.75	(0.63)	2-4 47/64	(730)	2-6 3/4	(781)	6.14	(0.57)
3034 E	2-7 21/32	(804)	2-8 25/64	(823)	7.12	(0.66)	2-4 47/64	(730)	2-8 3/4	(832)	6.54	(0.61)
3036 E	2-7 21/32	(804)	2-10 25/64	(873)	7.56	(0.70)	2-4 47/64	(730)	2-10 3/4	(883)	6.93	(0.64)
3040 E	2-7 21/32	(804)	3-2 25/64	(975)	8.44	(0.78)	2-4 47/64	(730)	3-2 3/4	(984)	7.73	(0.72)
3042 E	2-7 21/32	(804)	3-4 25/64	(1026)	8.88	(0.82)	2-4 47/64	(730)	3-4 3/4	(1035)	8.13	(0.76)
3050 E	2-7 21/32	(804)	4-0 25/64	(1229)	10.64	(0.99)	2-4 47/64	(730)	4-0 3/4	(1238)	9.73	(0.90)
3056 E	2-7 21/32	(804)	4-6 25/64	(1381)	11.96	(1.11)	2-4 47/64	(730)	4-6 3/4	(1391)	10.93	(1.02)
3060 E	2-7 21/32	(804)	4-10 25/64	(1483)	12.84	(1.19)	2-4 47/64	(730)	4-10 3/4	(1492)	11.72	(1.09)

NOTE: Refer to Product Performance Chapter for International Building Code. Net Clear Opening drawings are pictured with the conversion tables.

Sizes designated with "E" meet egress requirements based on standard and optional [Glass and Glazing](#). All other glass options, please contact a Marvin representative.

Egress/Vent and Daylight Opening: Operable

CN	Opening Width		Opening Height		Egress Opening		Daylight Opening Width		Daylight Opening Height		Daylight Opening	
	ft - in	mm	ft - in	mm	ft ²	m ²	ft-in	mm	ft-in	mm	sq. ft.	m ²
3212	2-9 21/32	(855)	0-10 11/16	(271)	2.50	(0.23)	2-6 47/64	(781)	0-10 3/4	(273)	2.29	(0.21)
3214	2-9 21/32	(855)	1-0 11/16	(322)	2.97	(0.28)	2-6 47/64	(781)	1-0 3/4	(324)	2.72	(0.25)
3216	2-9 21/32	(855)	1-2 11/16	(373)	3.43	(0.32)	2-6 47/64	(781)	1-2 3/4	(375)	3.15	(0.29)
3218	2-9 21/32	(855)	1-4 11/16	(424)	3.90	(0.36)	2-6 47/64	(781)	1-4 3/4	(425)	3.58	(0.33)
3220	2-9 21/32	(855)	1-6 11/16	(475)	4.37	(0.41)	2-6 47/64	(781)	1-6 3/4	(476)	4.00	(0.37)
3222	2-9 21/32	(855)	1-8 11/16	(525)	4.84	(0.45)	2-6 47/64	(781)	1-8 3/4	(527)	4.43	(0.41)
3224	2-9 21/32	(855)	1-10 11/16	(576)	5.30	(0.49)	2-6 47/64	(781)	1-10 3/4	(578)	4.86	(0.45)
3226 E	2-9 21/32	(855)	2-0 11/16	(627)	5.77	(0.54)	2-6 47/64	(781)	2-0 3/4	(629)	5.28	(0.49)
3228 E	2-9 21/32	(855)	2-2 11/16	(678)	6.24	(0.58)	2-6 47/64	(781)	2-2 3/4	(679)	5.71	(0.53)
3230 E	2-9 21/32	(855)	2-4 11/16	(729)	6.71	(0.62)	2-6 47/64	(781)	2-4 3/4	(730)	6.14	(0.57)
3231 E	2-9 21/32	(855)	2-5 25/64	(746)	6.87	(0.64)	2-6 47/64	(781)	2-5 3/4	(756)	6.35	(0.59)
3234 E	2-9 21/32	(855)	2-8 25/64	(823)	7.57	(0.70)	2-6 47/64	(781)	2-8 3/4	(832)	6.99	(0.65)
3236 E	2-9 21/32	(855)	2-10 25/64	(873)	8.04	(0.75)	2-6 47/64	(781)	2-10 3/4	(883)	7.42	(0.69)
3240 E	2-9 21/32	(855)	3-2 25/64	(975)	8.97	(0.83)	2-6 47/64	(781)	3-2 3/4	(984)	8.27	(0.77)
3242 E	2-9 21/32	(855)	3-4 25/64	(1026)	9.44	(0.88)	2-6 47/64	(781)	3-4 3/4	(1035)	8.70	(0.81)
3250 E	2-9 21/32	(855)	4-0 25/64	(1229)	11.31	(1.05)	2-6 47/64	(781)	4-0 3/4	(1238)	10.41	(0.97)
3256 E	2-9 21/32	(855)	4-6 25/64	(1381)	12.71	(1.18)	2-6 47/64	(781)	4-6 3/4	(1391)	11.69	(1.09)
3260 E	2-9 21/32	(855)	4-10 25/64	(1483)	13.65	(1.27)	2-6 47/64	(781)	4-10 3/4	(1492)	12.54	(1.16)
3612	3-1 21/32	(957)	0-10 11/16	(271)	2.79	(0.26)	2-10 47/64	(882)	0-10 3/4	(273)	2.59	(0.24)
3614	3-1 21/32	(957)	1-0 11/16	(322)	3.32	(0.31)	2-10 47/64	(882)	1-0 3/4	(324)	3.08	(0.29)
3616	3-1 21/32	(957)	1-2 11/16	(373)	3.84	(0.36)	2-10 47/64	(882)	1-2 3/4	(375)	3.56	(0.33)
3618	3-1 21/32	(957)	1-4 11/16	(424)	4.36	(0.41)	2-10 47/64	(882)	1-4 3/4	(425)	4.04	(0.38)
3620	3-1 21/32	(957)	1-6 11/16	(475)	4.89	(0.45)	2-10 47/64	(882)	1-6 3/4	(476)	4.52	(0.42)
3622	3-1 21/32	(957)	1-8 11/16	(525)	5.41	(0.50)	2-10 47/64	(882)	1-8 3/4	(527)	5.01	(0.47)
3624	3-1 21/32	(957)	1-10 11/16	(576)	5.93	(0.55)	2-10 47/64	(882)	1-10 3/4	(578)	5.49	(0.51)
3626 E	3-1 21/32	(957)	2-0 11/16	(627)	6.46	(0.60)	2-10 47/64	(882)	2-0 3/4	(629)	5.97	(0.55)
3628 E	3-1 21/32	(957)	2-2 25/64	(670)	6.90	(0.64)	2-10 47/64	(882)	2-2 3/4	(679)	6.45	(0.60)
3630 E	3-1 21/32	(957)	2-4 25/64	(721)	7.42	(0.69)	2-10 47/64	(882)	2-4 3/4	(730)	6.94	(0.64)
3632 E	3-1 21/32	(957)	2-6 25/64	(772)	7.95	(0.74)	2-10 47/64	(882)	2-6 3/4	(781)	7.42	(0.69)
3634 E	3-1 21/32	(957)	2-8 25/64	(823)	8.47	(0.79)	2-10 47/64	(882)	2-8 3/4	(832)	7.90	(0.73)
3636 E	3-1 21/32	(957)	2-10 25/64	(873)	8.99	(0.84)	2-10 47/64	(882)	2-10 3/4	(883)	8.38	(0.78)
3640 E	3-1 21/32	(957)	3-2 25/64	(975)	10.04	(0.93)	2-10 47/64	(882)	3-2 3/4	(984)	9.35	(0.87)
3642 E	3-1 21/32	(957)	3-4 25/64	(1026)	10.56	(0.98)	2-10 47/64	(882)	3-4 3/4	(1035)	9.83	(0.91)
3650 E	3-1 21/32	(957)	4-0 25/64	(1229)	12.65	(1.18)	2-10 47/64	(882)	4-0 3/4	(1238)	11.76	(1.09)
3656 E	3-1 21/32	(957)	4-6 25/64	(1381)	14.22	(1.32)	2-10 47/64	(882)	4-6 3/4	(1391)	13.21	(1.23)
3660 E	3-1 21/32	(957)	4-10 25/64	(1483)	15.27	(1.42)	2-10 47/64	(882)	4-10 3/4	(1492)	14.17	(1.32)

NOTE: Refer to Product Performance Chapter for International Building Code. Net Clear Opening drawings are pictured with the conversion tables.

Sizes designated with "E" meet egress requirements based on standard and optional [Glass and Glazing](#). All other glass options, please contact a Marvin representative.

Egress/Vent and Daylight Openings: Operable

CN	Opening Width		Opening Height		Egress Opening		Daylight Opening Width		Daylight Opening Height		Daylight Opening	
	ft - in	mm	ft - in	mm	ft ²	m ²	ft-in	mm	ft-in	mm	sq. ft.	m ²
4012	3-5 21/32	(1058)	0-10 11/16	(271)	3.09	(0.29)	3-2 47/64	(984)	0-10 3/4	(273)	2.89	(0.27)
4014	3-5 21/32	(1058)	1-0 11/16	(322)	3.67	(0.34)	3-2 47/64	(984)	1-0 3/4	(324)	3.43	(0.32)
4016	3-5 21/32	(1058)	1-2 11/16	(373)	4.25	(0.39)	3-2 47/64	(984)	1-2 3/4	(375)	3.97	(0.37)
4018	3-5 21/32	(1058)	1-4 11/16	(424)	4.83	(0.45)	3-2 47/64	(984)	1-4 3/4	(425)	4.51	(0.42)
4020	3-5 21/32	(1058)	1-6 11/16	(475)	5.41	(0.50)	3-2 47/64	(984)	1-6 3/4	(476)	5.04	(0.47)
4022	3-5 21/32	(1058)	1-8 11/16	(525)	5.98	(0.56)	3-2 47/64	(984)	1-8 3/4	(527)	5.58	(0.52)
4024	3-5 21/32	(1058)	1-10 11/16	(576)	6.56	(0.61)	3-2 47/64	(984)	1-10 3/4	(578)	6.12	(0.57)
4026 E	3-5 21/32	(1058)	2-0 25/64	(619)	7.06	(0.66)	3-2 47/64	(984)	2-0 3/4	(629)	6.66	(0.62)
4028 E	3-5 21/32	(1058)	2-2 25/64	(670)	7.63	(0.71)	3-2 47/64	(984)	2-2 3/4	(679)	7.20	(0.67)
4030 E	3-5 21/32	(1058)	2-4 25/64	(721)	8.21	(0.76)	3-2 47/64	(984)	2-4 3/4	(730)	7.73	(0.72)
4032 E	3-5 21/32	(1058)	2-6 25/64	(772)	8.79	(0.82)	3-2 47/64	(984)	2-6 3/4	(781)	8.27	(0.77)
4034 E	3-5 21/32	(1058)	2-8 25/64	(823)	9.37	(0.87)	3-2 47/64	(984)	2-8 3/4	(832)	8.81	(0.82)
4036 E	3-5 21/32	(1058)	2-10 25/64	(873)	9.95	(0.92)	3-2 47/64	(984)	2-10 3/4	(883)	9.35	(0.87)
4040 E	3-5 21/32	(1058)	3-2 25/64	(975)	11.11	(1.03)	3-2 47/64	(984)	3-2 3/4	(984)	10.42	(0.97)
4042 E	3-5 21/32	(1058)	3-4 25/64	(1026)	11.68	(1.09)	3-2 47/64	(984)	3-4 3/4	(1035)	10.96	(1.02)
4050 E	3-5 21/32	(1058)	4-0 25/64	(1229)	14. 0	(1.30)	3-2 47/64	(984)	4-0 3/4	(1238)	13.11	(1.22)
4056 E	3-5 21/32	(1058)	4-6 25/64	(1381)	15.73	(1.46)	3-2 47/64	(984)	4-6 3/4	(1391)	14.73	(1.37)
4060 E	3-5 21/32	(1058)	4-10 25/64	(1483)	16.89	(1.57)	3-2 47/64	(984)	4-10 3/4	(1492)	15.80	(1.47)
4412	3-9 21/32	(1160)	0-10 11/16	(271)	3.39	(0.31)	3-6 47/64	(1085)	0-10 3/4	(273)	3.19	(0.30)
4414	3-9 21/32	(1160)	1-0 11/16	(322)	4.02	(0.37)	3-6 47/64	(1085)	1-0 3/4	(324)	3.78	(0.35)
4416	3-9 21/32	(1160)	1-2 25/64	(365)	4.56	(0.42)	3-6 47/64	(1085)	1-2 3/4	(375)	4.38	(0.41)
4418	3-9 21/32	(1160)	1-4 11/16	(424)	5.29	(0.49)	3-6 47/64	(1085)	1-4 3/4	(425)	4.97	(0.46)
4420	3-9 21/32	(1160)	1-6 11/16	(475)	5.93	(0.55)	3-6 47/64	(1085)	1-6 3/4	(476)	5.56	(0.52)
4422	3-9 21/32	(1160)	1-8 11/16	(525)	6.56	(0.61)	3-6 47/64	(1085)	1-8 3/4	(527)	6.16	(0.57)
4424	3-9 21/32	(1160)	1-10 25/64	(569)	7.10	(0.66)	3-6 47/64	(1085)	1-10 3/4	(578)	6.75	(0.63)
4426 E	3-9 21/32	(1160)	2-0 25/64	(619)	7.73	(0.72)	3-6 47/64	(1085)	2-0 3/4	(629)	7.35	(0.68)
4428 E	3-9 21/32	(1160)	2-2 25/64	(670)	8.37	(0.78)	3-6 47/64	(1085)	2-2 3/4	(679)	7.94	(0.74)
4430 E	3-9 21/32	(1160)	2-4 25/64	(721)	9. 0	(0.84)	3-6 47/64	(1085)	2-4 3/4	(730)	8.53	(0.79)
4432 E	3-9 21/32	(1160)	2-6 25/64	(772)	9.63	(0.90)	3-6 47/64	(1085)	2-6 3/4	(781)	9.13	(0.85)
4434 E	3-9 21/32	(1160)	2-8 25/64	(823)	10.27	(0.95)	3-6 47/64	(1085)	2-8 3/4	(832)	9.72	(0.90)
4436 E	3-9 21/32	(1160)	2-10 25/64	(873)	10.90	(1.01)	3-6 47/64	(1085)	2-10 3/4	(883)	10.31	(0.96)
4440 E	3-9 21/32	(1160)	3-2 25/64	(975)	12.17	(1.13)	3-6 47/64	(1085)	3-2 3/4	(984)	11.50	(1.07)
4442 E	3-9 21/32	(1160)	3-4 25/64	(1026)	12.81	(1.19)	3-6 47/64	(1085)	3-4 3/4	(1035)	12.09	(1.12)
4450 E	3-9 21/32	(1160)	4-0 25/64	(1229)	15.34	(1.43)	3-6 47/64	(1085)	4-0 3/4	(1238)	14.47	(1.34)
4456 E	3-9 21/32	(1160)	4-6 25/64	(1381)	17.24	(1.60)	3-6 47/64	(1085)	4-6 3/4	(1391)	16.25	(1.51)
4460 E	3-9 21/32	(1160)	4-10 25/64	(1483)	18.51	(1.72)	3-6 47/64	(1085)	4-10 3/4	(1492)	17.44	(1.62)

NOTE: Refer to Product Performance Chapter for International Building Code. Net Clear Opening drawings are pictured with the conversion tables.

Sizes designated with "E" meet egress requirements based on standard and optional [Glass and Glazing](#). All other glass options, please contact a Marvin representative.

Egress/Vent and Daylight Openings: Operable

CN	Opening Width		Opening Height		Egress Opening		Daylight Opening Width		Daylight Opening Height		Daylight Opening	
	ft - in	mm	ft - in	mm	ft ²	m ²	ft-in	mm	ft-in	mm	sq. ft.	m ²
4812	4-1 21/32	(1261)	0-10 11/16	(271)	3.69	(0.34)	3-10 47/64	(1187)	0-10 3/4	(273)	3.49	(0.32)
4814	4-1 21/32	(1261)	1-0 25/64	(315)	4.27	(0.40)	3-10 47/64	(1187)	1-0 3/4	(324)	4.14	(0.38)
4816	4-1 21/32	(1261)	1-2 25/64	(365)	4.96	(0.46)	3-10 47/64	(1187)	1-2 3/4	(375)	4.79	(0.44)
4818	4-1 21/32	(1261)	1-4 11/16	(424)	5.75	(0.53)	3-10 47/64	(1187)	1-4 3/4	(425)	5.44	(0.51)
4820	4-1 21/32	(1261)	1-6 11/16	(475)	6.44	(0.60)	3-10 47/64	(1187)	1-6 3/4	(476)	6.09	(0.57)
4822	4-1 21/32	(1261)	1-8 25/64	(518)	7.03	(0.65)	3-10 47/64	(1187)	1-8 3/4	(527)	6.73	(0.63)
4824	4-1 21/32	(1261)	1-10 25/64	(569)	7.72	(0.72)	3-10 47/64	(1187)	1-10 3/4	(578)	7.38	(0.69)
4826 E	4-1 21/32	(1261)	2-0 25/64	(619)	8.41	(0.78)	3-10 47/64	(1187)	2-0 3/4	(629)	8.03	(0.75)
4828 E	4-1 21/32	(1261)	2-2 25/64	(670)	9.10	(0.85)	3-10 47/64	(1187)	2-2 3/4	(679)	8.68	(0.81)
4830 E	4-1 21/32	(1261)	2-4 25/64	(721)	9.79	(0.91)	3-10 47/64	(1187)	2-4 3/4	(730)	9.33	(0.87)
4832 E	4-1 21/32	(1261)	2-6 25/64	(772)	10.48	(0.97)	3-10 47/64	(1187)	2-6 3/4	(781)	9.98	(0.93)
4834 E	4-1 21/32	(1261)	2-8 25/64	(823)	11.17	(1.04)	3-10 47/64	(1187)	2-8 3/4	(832)	10.63	(0.99)
4836 E	4-1 21/32	(1261)	2-10 25/64	(873)	11.86	(1.10)	3-10 47/64	(1187)	2-10 3/4	(883)	11.28	(1.05)
4840 E	4-1 21/32	(1261)	3-2 25/64	(975)	13.24	(1.23)	3-10 47/64	(1187)	3-2 3/4	(984)	12.58	(1.17)
4842 E	4-1 21/32	(1261)	3-4 25/64	(1026)	13.93	(1.29)	3-10 47/64	(1187)	3-4 3/4	(1035)	13.23	(1.23)
4850 E	4-1 21/32	(1261)	4-0 25/64	(1229)	16.69	(1.55)	3-10 47/64	(1187)	4-0 3/4	(1238)	15.82	(1.47)
4856 E	4-1 21/32	(1261)	4-6 25/64	(1381)	18.76	(1.74)	3-10 47/64	(1187)	4-6 3/4	(1391)	17.77	(1.65)
4860 E	4-1 21/32	(1261)	4-10 25/64	(1483)	20.14	(1.87)	3-10 47/64	(1187)	4-10 3/4	(1492)	19.07	(1.77)
5412	4-7 21/32	(1414)	0-10 25/64	(264)	4.01	(0.37)	4-4 47/64	(1339)	0-10 3/4	(273)	3.94	(0.37)
5414	4-7 21/32	(1414)	1-0 25/64	(315)	4.79	(0.44)	4-4 47/64	(1339)	1-0 3/4	(324)	4.67	(0.43)
5416	4-7 21/32	(1414)	1-2 25/64	(365)	5.56	(0.52)	4-4 47/64	(1339)	1-2 3/4	(375)	5.40	(0.50)
5418	4-7 21/32	(1414)	1-4 25/64	(416)	6.33	(0.59)	4-4 47/64	(1339)	1-4 3/4	(425)	6.13	(0.57)
5420	4-7 21/32	(1414)	1-6 25/64	(467)	7.11	(0.66)	4-4 47/64	(1339)	1-6 3/4	(476)	6.87	(0.64)
5422	4-7 21/32	(1414)	1-8 25/64	(518)	7.88	(0.73)	4-4 47/64	(1339)	1-8 3/4	(527)	7.60	(0.71)
5424	4-7 21/32	(1414)	1-10 25/64	(569)	8.65	(0.80)	4-4 47/64	(1339)	1-10 3/4	(578)	8.33	(0.77)
5426 E	4-7 21/32	(1414)	2-0 25/64	(619)	9.43	(0.88)	4-4 47/64	(1339)	2-0 3/4	(629)	9.06	(0.84)
5428 E	4-7 21/32	(1414)	2-2 25/64	(670)	10.20	(0.95)	4-4 47/64	(1339)	2-2 3/4	(679)	9.80	(0.91)
5430 E	4-7 21/32	(1414)	2-4 25/64	(721)	10.97	(1.02)	4-4 47/64	(1339)	2-4 3/4	(730)	10.53	(0.98)
5432 E	4-7 21/32	(1414)	2-6 25/64	(772)	11.75	(1.09)	4-4 47/64	(1339)	2-6 3/4	(781)	11.26	(1.05)
5434 E	4-7 21/32	(1414)	2-8 25/64	(823)	12.52	(1.16)	4-4 47/64	(1339)	2-8 3/4	(832)	11.99	(1.11)
5436 E	4-7 21/32	(1414)	2-10 25/64	(873)	13.29	(1.23)	4-4 47/64	(1339)	2-10 3/4	(883)	12.73	(1.18)
5440 E	4-7 21/32	(1414)	3-2 25/64	(975)	14.84	(1.38)	4-4 47/64	(1339)	3-2 3/4	(984)	14.19	(1.32)
5442 E	4-7 21/32	(1414)	3-4 25/64	(1026)	15.61	(1.45)	4-4 47/64	(1339)	3-4 3/4	(1035)	14.92	(1.39)
5450 E	4-7 21/32	(1414)	4-0 25/64	(1229)	18.70	(1.74)	4-4 47/64	(1339)	4-0 3/4	(1238)	17.85	(1.66)
5456 E	4-7 21/32	(1414)	4-6 25/64	(1381)	21.02	(1.95)	4-4 47/64	(1339)	4-6 3/4	(1391)	20.05	(1.86)
5460 E	4-7 21/32	(1414)	4-10 25/64	(1483)	22.57	(2.10)	4-4 47/64	(1339)	4-10 3/4	(1492)	21.52	(2.00)

NOTE: Refer to Product Performance Chapter for International Building Code. Net Clear Opening drawings are pictured with the conversion tables.

Sizes designated with "E" meet egress requirements based on standard and optional [Glass and Glazing](#). All other glass options, please contact a Marvin representative.

Egress/Vent and Daylight Openings: Operable

CN	Opening Width		Opening Height		Egress Opening		Daylight Opening Width		Daylight Opening Height		Daylight Opening	
	ft - in	mm	ft - in	mm	ft ²	m ²	ft-in	mm	ft-in	mm	sq. ft.	m ²
6012	5-1 21/32	(1566)	0-10 25/64	(264)	4.45	(0.41)	4-10 47/64	(1492)	0-10 3/4	(273)	4.38	(0.41)
6014	5-1 21/32	(1566)	1-0 25/64	(315)	5.30	(0.49)	4-10 47/64	(1492)	1-0 3/4	(324)	5.20	(0.48)
6016	5-1 21/32	(1566)	1-2 25/64	(365)	6.16	(0.57)	4-10 47/64	(1492)	1-2 3/4	(375)	6.02	(0.56)
6018	5-1 21/32	(1566)	1-4 25/64	(416)	7.02	(0.65)	4-10 47/64	(1492)	1-4 3/4	(425)	6.83	(0.63)
6020	5-1 21/32	(1566)	1-6 25/64	(467)	7.87	(0.73)	4-10 47/64	(1492)	1-6 3/4	(476)	7.65	(0.71)
6022	5-1 21/32	(1566)	1-8 25/64	(518)	8.73	(0.81)	4-10 47/64	(1492)	1-8 3/4	(527)	8.46	(0.79)
6024	5-1 21/32	(1566)	1-10 25/64	(569)	9.59	(0.89)	4-10 47/64	(1492)	1-10 3/4	(578)	9.28	(0.86)
6026 E	5-1 21/32	(1566)	2-0 25/64	(619)	10.44	(0.97)	4-10 47/64	(1492)	2-0 3/4	(629)	10.10	(0.94)
6028 E	5-1 21/32	(1566)	2-2 25/64	(670)	11.30	(1.05)	4-10 47/64	(1492)	2-2 3/4	(679)	10.91	(1.01)
6030 E	5-1 21/32	(1566)	2-4 25/64	(721)	12.15	(1.13)	4-10 47/64	(1492)	2-4 3/4	(730)	11.73	(1.09)
6032 E	5-1 21/32	(1566)	2-6 25/64	(772)	13.01	(1.21)	4-10 47/64	(1492)	2-6 3/4	(781)	12.54	(1.17)
6034 E	5-1 21/32	(1566)	2-8 25/64	(823)	13.87	(1.29)	4-10 47/64	(1492)	2-8 3/4	(832)	13.36	(1.24)
6036 E	5-1 21/32	(1566)	2-10 25/64	(873)	14.72	(1.37)	4-10 47/64	(1492)	2-10 3/4	(883)	14.17	(1.32)
6040 E	5-1 21/32	(1566)	3-2 25/64	(975)	16.44	(1.53)	4-10 47/64	(1492)	3-2 3/4	(984)	15.81	(1.47)
6042 E	5-1 21/32	(1566)	3-4 25/64	(1026)	17.29	(1.61)	4-10 47/64	(1492)	3-4 3/4	(1035)	16.62	(1.54)
6050 E	5-1 21/32	(1566)	4-0 25/64	(1229)	20.72	(1.92)	4-10 47/64	(1492)	4-0 3/4	(1238)	19.88	(1.85)
6056 E	5-1 21/32	(1566)	4-6 25/64	(1381)	23.29	(2.16)	4-10 47/64	(1492)	4-6 3/4	(1391)	22.33	(2.07)
6060 E	5-1 21/32	(1566)	4-10 25/64	(1483)	25. 0	(2.32)	4-10 47/64	(1492)	4-10 3/4	(1492)	23.96	(2.23)

NOTE: Refer to Product Performance Chapter for International Building Code. Net Clear Opening drawings are pictured with the conversion tables.

Sizes designated with "E" meet egress requirements based on standard and optional [Glass and Glazing](#). All other glass options, please contact a Marvin representative.

NOTE: Clear Opening Height conversions are for units using block and tackle balances. Hybrid Spiral balanced units will exhibit reduced sash travel. Contact a Marvin representative for additional information.

Daylight Measurements: Transom

CN	Daylight Opening Width		Daylight Opening Height		Daylight Opening	
	ft-in	mm	ft-in	mm	sq. ft.	m ²
1612	1-2 47/64	(374)	1-0 3/4	(324)	1.30	(0.12)
1620	1-2 47/64	(374)	1-8 3/4	(527)	2.12	(0.20)
2012	1-6 47/64	(476)	1-0 3/4	(324)	1.66	(0.15)
2020	1-6 47/64	(476)	1-8 3/4	(527)	2.70	(0.25)
2412	1-10 47/64	(577)	1-0 3/4	(324)	2.01	(0.19)
2420	1-10 47/64	(577)	1-8 3/4	(527)	3.28	(0.30)
2612	2-0 47/64	(628)	1-0 3/4	(324)	2.19	(0.20)
2620	2-0 47/64	(628)	1-8 3/4	(527)	3.56	(0.33)
2812	2-2 47/64	(679)	1-0 3/4	(324)	2.37	(0.22)
2820	2-2 47/64	(679)	1-8 3/4	(527)	3.85	(0.36)
3012	2-4 47/64	(730)	1-0 3/4	(324)	2.54	(0.24)
3020	2-4 47/64	(730)	1-8 3/4	(527)	4.14	(0.38)
3212	2-6 47/64	(781)	1-0 3/4	(324)	2.72	(0.25)
3220	2-6 47/64	(781)	1-8 3/4	(527)	4.43	(0.41)
3612	2-10 47/64	(882)	1-0 3/4	(324)	3.08	(0.29)
3620	2-10 47/64	(882)	1-8 3/4	(527)	5.01	(0.47)
4012	3-2 47/64	(984)	1-0 3/4	(324)	3.43	(0.32)
4020	3-2 47/64	(984)	1-8 3/4	(527)	5.58	(0.52)
5412	4-4 47/64	(1339)	1-0 3/4	(324)	4.67	(0.43)
5420	4-4 47/64	(1339)	1-8 3/4	(527)	7.60	(0.71)

Daylight Measurements: Picture

CN	Daylight Opening Width		Daylight Opening Height		Daylight Opening	
	ft-in	mm	ft-in	mm	sq. ft.	m ²
4038	2-10 47/64	(882)	2-7 27/64	(798)	7.58	(0.70)
4042	2-10 47/64	(882)	2-11 27/64	(900)	8.54	(0.79)
4046	2-10 47/64	(882)	3-3 27/64	(1001)	9.51	(0.88)
4050	2-10 47/64	(882)	3-7 27/64	(1103)	10.47	(0.97)
4054	2-10 47/64	(882)	3-11 27/64	(1204)	11.44	(1.06)
4058	2-10 47/64	(882)	4-3 27/64	(1306)	12.40	(1.15)
4062	2-10 47/64	(882)	4-7 27/64	(1408)	13.37	(1.24)
4066	2-10 47/64	(882)	4-11 27/64	(1509)	14.33	(1.33)
4070	2-10 47/64	(882)	5-3 27/64	(1611)	15.30	(1.42)
4074	2-10 47/64	(882)	5-7 27/64	(1712)	16.26	(1.51)
4078	2-10 47/64	(882)	5-11 27/64	(1814)	17.23	(1.60)
4086	2-10 47/64	(882)	6-7 27/64	(2017)	19.16	(1.78)
4090	2-10 47/64	(882)	6-11 27/64	(2119)	20.12	(1.87)

4838	3-6 47/64	(1085)	2-7 27/64	(798)	9.32	(0.87)
4842	3-6 47/64	(1085)	2-11 27/64	(900)	10.51	(0.98)
4846	3-6 47/64	(1085)	3-3 27/64	(1001)	11.70	(1.09)
4850	3-6 47/64	(1085)	3-7 27/64	(1103)	12.89	(1.20)
4854	3-6 47/64	(1085)	3-11 27/64	(1204)	14.07	(1.31)
4858	3-6 47/64	(1085)	4-3 27/64	(1306)	15.26	(1.42)
4862	3-6 47/64	(1085)	4-7 27/64	(1408)	16.45	(1.53)
4866	3-6 47/64	(1085)	4-11 27/64	(1509)	17.63	(1.64)
4870	3-6 47/64	(1085)	5-3 27/64	(1611)	18.82	(1.75)
4878	3-6 47/64	(1085)	5-11 27/64	(1814)	21.19	(1.97)
4878	3-6 47/64	(1085)	5-11 27/64	(1814)	21.19	(1.97)
4886	3-6 47/64	(1085)	6-7 27/64	(2017)	23.57	(2.19)
4890	3-6 47/64	(1085)	6-11 27/64	(2119)	24.76	(2.30)

5238	3-10 47/64	(1187)	2-7 27/64	(798)	10.20	(0.95)
5242	3-10 47/64	(1187)	2-11 27/64	(900)	11.49	(1.07)
5246	3-10 47/64	(1187)	3-3 27/64	(1001)	12.79	(1.19)
5250	3-10 47/64	(1187)	3-7 27/64	(1103)	14.09	(1.31)
5254	3-10 47/64	(1187)	3-11 27/64	(1204)	15.39	(1.43)
5258	3-10 47/64	(1187)	4-3 27/64	(1306)	16.69	(1.55)
5262	3-10 47/64	(1187)	4-7 27/64	(1408)	17.99	(1.67)
5266	3-10 47/64	(1187)	4-11 27/64	(1509)	19.28	(1.79)
5270	3-10 47/64	(1187)	5-3 27/64	(1611)	20.58	(1.91)
5274	3-10 47/64	(1187)	5-7 27/64	(1712)	21.88	(2.03)
5278	3-10 47/64	(1187)	5-11 27/64	(1814)	23.18	(2.15)
5286	3-10 47/64	(1187)	6-7 27/64	(2017)	25.78	(2.39)
5290	3-10 47/64	(1187)	6-11 27/64	(2119)	27.07	(2.52)

CN	Daylight Opening Width		Daylight Opening Height		Daylight Opening	
	ft-in	mm	ft-in	mm	sq. ft.	m ²
6038	4-6 47/64	(1390)	2-7 27/64	(798)	11.94	(1.11)
6042	4-6 47/64	(1390)	2-11 27/64	(900)	13.46	(1.25)
6046	4-6 47/64	(1390)	3-3 27/64	(1001)	14.98	(1.39)
6050	4-6 47/64	(1390)	3-7 27/64	(1103)	16.50	(1.53)
6054	4-6 47/64	(1390)	3-11 27/64	(1204)	18.02	(1.67)
6058	4-6 47/64	(1390)	4-3 27/64	(1306)	19.54	(1.82)
6062	4-6 47/64	(1390)	4-7 27/64	(1408)	21.06	(1.96)
6066	4-6 47/64	(1390)	4-11 27/64	(1509)	22.58	(2.10)
6070	4-6 47/64	(1390)	5-3 27/64	(1611)	24.11	(2.24)
6074	4-6 47/64	(1390)	5-7 27/64	(1712)	25.63	(2.38)
6078	4-6 47/64	(1390)	5-11 27/64	(1814)	27.15	(2.52)
6086	4-6 47/64	(1390)	6-7 27/64	(2017)	30.19	(2.80)
6090	4-6 47/64	(1390)	6-11 27/64	(2119)	31.71	(2.95)

6838	5-2 47/64	(1593)	2-7 27/64	(798)	13.69	(1.27)
6842	5-2 47/64	(1593)	2-11 27/64	(900)	15.43	(1.43)
6846	5-2 47/64	(1593)	3-3 27/64	(1001)	17.17	(1.60)
6850	5-2 47/64	(1593)	3-7 27/64	(1103)	18.92	(1.76)
6854	5-2 47/64	(1593)	3-11 27/64	(1204)	20.66	(1.92)
6858	5-2 47/64	(1593)	4-3 27/64	(1306)	22.40	(2.08)
6862	5-2 47/64	(1593)	4-7 27/64	(1408)	24.14	(2.24)
6866	5-2 47/64	(1593)	4-11 27/64	(1509)	25.89	(2.40)
6870	5-2 47/64	(1593)	5-3 27/64	(1611)	27.63	(2.57)
6874	5-2 47/64	(1593)	5-7 27/64	(1712)	29.37	(2.73)
6878	5-2 47/64	(1593)	5-11 27/64	(1814)	31.11	(2.89)
6886	5-2 47/64	(1593)	6-7 27/64	(2017)	34.60	(3.21)
6890	5-2 47/64	(1593)	6-11 27/64	(2119)	36.34	(3.38)

Minimum and Maximum Guidelines

Minimum and Maximum Certified Frame Size												
Unit Type		Minimum				Maximum				Max Glass		
		Width		Height		Width		Height				
		in	mm	in	mm	in	mm	in	mm	Sash Size Glass Type	Sq. Feet	Sq. Meters
USH G2	Equal Sash	14 1/4	(362)	23 1/2	(597)	65 1/4	(1657)	127 1/2	(3239)	Equal	25	2.323
UDHG2	Equal Sash	14 1/4	(362)	23 1/2	(597)	65 1/4	(1657)	127 1/2	(3239)	Equal	25	2.323
UDHG2	Cottage	14 1/4	(362)	23 1/2	(597)	65 1/4	(1657)	127 1/2	(3239)	Small	7/16	0.041
										Large	25	2.323
UDHG2	Reverse Cottage	14 1/4	(362)	23 1/2	(597)	65 1/4	(1657)	127 1/2	(3238)	Small	7/16	0.041
										Large	25	2.323
UDHG2 / USH G2	w/ Combination	21 1/4	(540)	31 1/2	(800)	45 1/4	(1149)	79 1/2	(2019)			
UDHTRG2	One Sash	14 1/4	(362)	14 1/2	(368)	73 1/4	(1861)	27 11/16	(703)	Standard	10 25/64	0.965
UDHPG2	One Sash	14 1/4	(362)	14 27/32	(377)	61 1/4	(1556)	103 1/2	(2629)	Standard	37 19/32	3.492
						67 1/4	(1708)	69 1/2	(1765)	Standard	26 63/64	2.507

Minimum and Maximum Extended Frame Size								
Unit Type		Maximum				Max Glass		
		Width		Height				
		in	mm	in	mm	Sash Size Glass Type	Sq. Feet	Sq. Meters
UDHTRG2	One Sash	120	(3048)	127 1/2	(3239)	Standard Tempered	61	5.667
UDHPG2	One Sash	120	(3048)	127 1/2	(3239)	Standard Tempered	61	5.667

IZ3 Minimum and Maximum Frame Size									
Unit Type		Minimum				Maximum			
		Width		Height		Width		Height	
		in	mm	in	mm	in	mm	in	mm
USH G2	Equal Sash	14 1/4	(362)	23 1/2	(597)	53 1/4	(1353)	119 1/2	(3035)
UDHG2	Equal Sash	14 1/4	(362)	23 1/2	(597)	53 1/4	(1353)	119 1/2	(3035)
UDHTRG2	One Sash	14 1/4	(362)	14 1/2	(368)	73 1/4	(1861)	27 11/16	(703)
UDHPG2	One Sash	14 1/4	(362)	14 27/32	(377)	61 1/4	(1556)	103 1/2	(2629)

NOTE: CE mark not available on IZ3 units.

Certified Sizes and Ratings

Product	Air Test to PSF	Water Tested to psf	Structural Tested to psf	Certification Rating	Design Pressure	Overall Width		Overall Height	
						in	mm	in	mm
UDHG2 (4040)	1.57	7.5	75	LC-PG50	DP50	45 1/4	(1149)	87 1/2	(2223)
UDHG2 (4044)	1.57	7.5	75	LC-PG50	DP50	45 1/4	(1149)	95 1/2	(2426)
UDHG2 (4450)	1.57	7.5	75	LC-PG50	DP50	49 1/4	(1251)	107 1/2	(2731)
UDHG2 (5044) *	1.57	6	60	LC-PG35	DP35	55 1/4	(1403)	95 1/2	(2426)
UDHG2 (5456)	1.57	6	60	LC-PG35	DP35	59 1/4	(1505)	119 1/2	(3035)
UDHG2 (6060)	1.57	7.5	45	LC-PG30	DP30	65 1/4	(1657)	127 1/2	(3239)
UDHPG2 (6668)	1.57	7.5	75	CW-PG50	DP50	67 1/4	(1708)	69 1/2	(1765)
UDHPG2 (60102)	1.57	7.5	75	CW-PG50	DP50	61 1/4	(1556)	103 1/2	(2629)
UDHINRG2 (4020)	1.57	7.5	75	LC-PG50	DP50	45 1/4	(1149)	27 11/16	(703)
UDHINRG2 (6820)	1.57	7.5	75	LC-PG50	DP50	73 1/4	(1861)	27 11/16	(703)
UDHINRG2 (6820)	1.57	7.5	75	LC-PG50	DP50	73 1/4	(1861)	27 11/16	(703)
UDHG2 (5044) *	1.57	6	60	LC-PG35	DP35	55 1/4	(1403)	95 1/2	(2426)
UDHG2CW (4826)	1.57	7.5	75	CW-PG50	DP50	53 1/4	(1353)	59 1/2	(1511)
UDHG2CW (4848)	1.57	7.5	75	CW-PG50	DP50	53 1/4	(1353)	103 1/2	(2629)
UDHG2CW (5056)	1.57	7.5	60	CW-PG40	DP40	55 1/4	(1403)	119 1/2	(3035)
UDHG2CW (5456)	1.57	7.5	45	CW-PG30	DP30	59 1/4	(1505)	119 1/2	(3035)

NOTE: For CE ratings, please refer to CE Performance Section.

CE mark is not available on IZ3 units.

*Tested with the Performance Bracket removed\

CW Performance is an Option

Certified Sizes and Ratings (IZ3)

Product	Air Test to PSF	Water Tested to psf	Structural Tested to psf	Certification Rating	Design Pressure	Overall Width		Overall Height	
						in	mm	in	mm
UDHG2 (4036 - IZ3)	1.57	9.75	97.5	LC-PG65	DP65	45 1/4	(1149)	79 1/2	(2019)
UDHG2 (4450 - IZ3)	1.57	9.75	97.5	LC-PG65	DP65	49 1/4	(1251)	107 1/2	(2731)
UDHG2IZ3 (4256 - IZ3)	1.57	9.75	97.5	LC-PG65	DP65	47 1/4	(1200)	119 1/2	(3035)
UDHG2 (4848 - IZ3)	1.57	9.75	97.5	LC-PG65	DP65	53 1/4	(1353)	103 1/2	(2629)
UDHTRG2IZ3 (6820-IZ3)	1.57	9.75	97.5	LC-PG65	DP65	73 1/4	(1861)	27 11/16	(703)
UDHPG2IZ3 (60102-IZ3)	1.57	9.75	97.5	CW-PG65	DP65	61 1/4	(1556)	103 1/2	(2629)

NOTE: CE mark is not available on IZ3 units.

Measurement Conversions

Ultimate Double Hung G2 Operating Unit						
Unit Measurements		Width		Height		
From	To					
Rough Opening		in	mm		in	mm
OM of Frame	Rough Opening	+ 1	(25)		+ 1/2	(13)
Masonry Opening	Rough Opening	+ 1/2	(13)		+ 1/4	(06)
Masonry Opening w/BMC	Rough Opening	-2 1/8	(54)		-1 29/32	(48)
Masonry Opening w/Flat Casing	Rough Opening	-5 1/2	(140)		-3 19/32	(91)
Masonry Opening w/BMC (all sides)	Rough Opening	-2 1/8	(54)		-1 55/64	(47)
Masonry Opening w/Flat Casing (all sides)	Rough Opening	-5 1/2	(140)		-5 15/64	(133)
Frame		in	mm		in	mm
OM of BMC	OM of Frame	-2 5/8	(67)		-1 29/32	(48)
OM of Flat Casing	OM of Frame	-6	(152)		-3 19/32	(91)
Daylight Opening	OM of Frame	+ 6 33/64	(165)	× 2	+ 10	(254)
Glass Size	OM of Frame	+ 5 1/4	(133)	× 2	+ 7 1/2	(191)
Top Sash		in	mm		in	mm
OM of Frame	OM of Top Sash	-3 11/64	(81)	+ 2	-3/4	(19)
Daylight Opening	OM of Top Sash	+ 3 11/32	(85)		+ 4 1/4	(108)
Bottom Sash		in	mm		in	mm
OM of Frame	OM of Bottom Sash	-3 11/64	(81)	+ 2	-1/32	(01)
Daylight Opening	OM of Bottom Sash	+ 3 11/32	(85)		+ 4 31/32	(126)
Glass		in	mm		in	mm
Daylight Opening	Glass	+ 1 17/64	(32)		+ 1 1/4	(32)
Aluminum Screen		in	mm		in	mm
Daylight Opening	OM of Screen	+ 4 41/64	(118)		+ 8 1/4	(210)
Aluminum Half Screen		in	mm		in	mm
OM of Frame	OM of Screen	-1 7/8	(48)	÷ 2	+ 7/16	(11)
Daylight Opening	OM of Screen	+ 4 41/64	(118)		+ 5 7/16	(138)
Magnum Screen		in	mm		in	mm
Daylight Opening	OM of Screen	+ 4 41/64	(118)		+ 8 1/4	(210)
Magnum Half Screen		in	mm		in	mm
OM of Frame	OM of Screen	-1 7/8	(48)	÷ 2	+ 23/32	(18)
Daylight Opening	OM of Screen	+ 4 41/64	(118)		+ 5 45/64	(145)
Combination		in	mm		in	mm
OM of Frame	OM of Combination	-1 51/64	(45)		-1 11/16	(43)
Daylight Opening	OM of Combination	+ 4 23/32	(120)	× 2	+ 8 5/16	(211)

NOTE: For standard cottage style double hung conversion, see info under unit features

Measurement Conversions

Ultimate Double Hung G2 Transoms					
Unit Measurements		Width		Height	
From	To				
Rough Opening		in	mm	in	mm
OM of Frame	Rough Opening	+ 1	(25)	+ 1/2	(13)
Masonry Opening	Rough Opening	+ 1/2	(13)	+ 1/4	(06)
Masonry Opening w/BMC	Rough Opening	-2 1/8	(54)	-1 29/32	(48)
Masonry Opening w/Flat Casing	Rough Opening	-5 1/2	(140)	-3 19/32	(91)
Masonry Opening w/BMC (all sides)	Rough Opening	-2 1/8	(54)	-1 55/64	(47)
Masonry Opening w/Flat Casing (all sides)	Rough Opening	-5 1/2	(140)	-5 15/64	(133)
Frame		in	mm	in	mm
OM of BMC	OM of Frame	-2 5/8	(67)	-1 29/32	(48)
OM of Flat Casing	OM of Frame	-6	(152)	-3 19/32	(91)
Daylight Opening	OM of Frame	+ 6 33/64	(165)	+ 6 15/16	(176)
Glass Size	OM of Frame	+ 5 1/4	(133)	+ 5 11/16	(145)
Sash		in	mm	in	mm
OM of Frame	OM of Sash	-3 11/64	(81)	-1 51/64	(46)
Daylight Opening	OM of Sash	+ 3 11/32	(85)	+ 5 9/64	(131)
Glass Size		in	mm	in	mm
Daylight Opening	Glass	+ 1 17/64	(32)	+ 1 1/4	(32)

Double Hung Picture					
Unit Measurements		Width		Height	
From	To				
Rough Opening		in	mm	in	mm
OM of Frame	Rough Opening	+ 1	(25)	+ 1/2	(13)
Masonry Opening	Rough Opening	+ 1/2	(13)	+ 1/4	(06)
Masonry Opening w/BMC	Rough Opening	-2 1/8	(54)	-1 29/32	(48)
Masonry Opening w/Flat Casing	Rough Opening	-5 1/2	(140)	-3 19/32	(91)
Masonry Opening w/BMC (all sides)	Rough Opening	-2 1/8	(54)	-1 55/64	(47)
Masonry Opening w/Flat Casing (all sides)	Rough Opening	-5 1/2	(140)	-5 15/64	(133)
Frame		in	mm	in	mm
OM of BMC	OM of Frame	-2 5/8	(67)	-1 29/32	(48)
OM of Flat Casing	OM of Frame	-6	(152)	-3 19/32	(91)
Daylight Opening	OM of Frame	+ 6 33/64	(165)	+ 8 5/64	(205)
Glass Size	OM of Frame	+ 5 1/4	(133)	+ 6 53/64	(174)
Sash		in	mm	in	mm
OM of Frame	OM of Sash	-1 23/32	(44)	-2 7/16	(62)
Daylight Opening	OM of Sash	+ 4 51/64	(122)	+ 5 5/16	(135)
Glass		in	mm	in	mm
Daylight Opening	Glass	+ 1 17/64	(32)	+ 1 1/4	(32)

Measurement Conversions

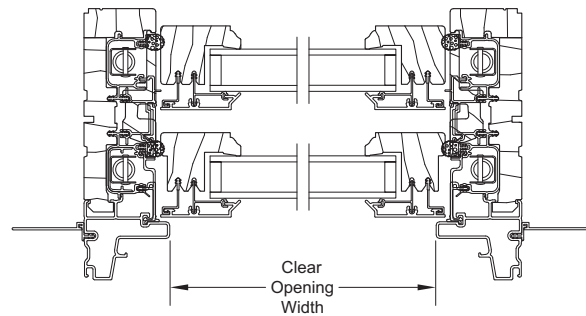
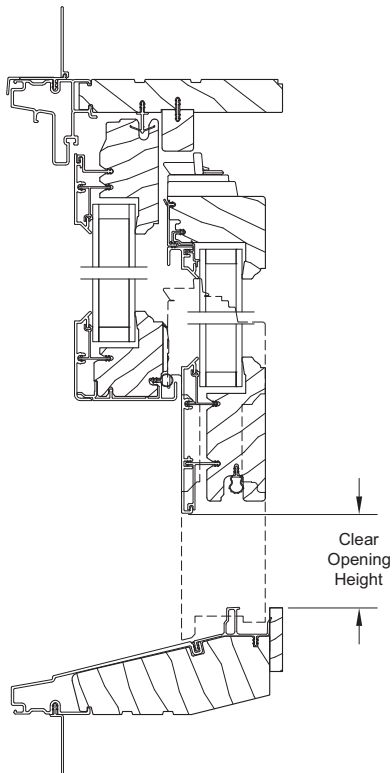
Egress Formulas with Standard Screen

Clear Opening Width:

- Clear Opening Width = Frame OM Width - 3 19/32" (91)

Clear Opening Height:

- Clear Opening Height = Glass Size Height - 1 5/16" (33)
- Clear Opening Area (ft²) = (clear Opening Width x Clear Opening Height) / 144



Standard Unit Measurements: Double Hung

CN	Masonry Opening		Rough Opening		Frame Size		Sash Size		Screen OM		1/2 Screen OM		Daylight Opening	
	ft - in	mm	ft - in	mm	ft - in	mm	ft - in	mm	ft - in	mm	ft - in	mm	ft - in	mm
16	1-9 3/4	(552)	1-10 1/4	(565)	1-9 1/4	(540)	1-6 5/64	(459)	1-7 3/8	(492)	1-7 3/8	(492)	14 47/64	(374)
20	2-1 3/4	(654)	2-2 1/4	(667)	2-1 1/4	(641)	1-10 5/64	(561)	1-11 3/8	(594)	1-11 3/8	(594)	18 47/64	(476)
24	2-5 3/4	(756)	2-6 1/4	(768)	2-5 1/4	(743)	2-2 5/64	(662)	2-3 3/8	(695)	2-3 3/8	(695)	22 47/64	(577)
26	2-7 3/4	(806)	2-8 1/4	(819)	2-7 1/4	(794)	2-4 5/64	(713)	2-5 3/8	(746)	2-5 3/8	(746)	24 47/64	(628)
28	2-9 3/4	(857)	2-10 1/4	(870)	2-9 1/4	(845)	2-6 5/64	(764)	2-7 3/8	(797)	2-7 3/8	(797)	26 47/64	(679)
30	2-11 3/4	(908)	3-0 1/4	(921)	2-11 1/4	(895)	2-8 5/64	(815)	2-9 3/8	(848)	2-9 3/8	(848)	28 47/64	(730)
32	3-1 3/4	(959)	3-2 1/4	(972)	3-1 1/4	(946)	2-10 5/64	(865)	2-11 3/8	(899)	2-11 3/8	(899)	30 47/64	(781)
36	3-5 3/4	(1060)	3-6 1/4	(1073)	3-5 1/4	(1048)	3-2 5/64	(967)	3-3 3/8	(1000)	3-3 3/8	(1000)	34 47/64	(882)
40	3-9 3/4	(1162)	3-10 1/4	(1175)	3-9 1/4	(1149)	3-6 5/64	(1069)	3-7 3/8	(1102)	3-7 3/8	(1102)	38 47/64	(984)
44	4-1 3/4	(1264)	4-2 1/4	(1276)	4-1 1/4	(1251)	3-10 5/64	(1170)	3-11 3/8	(1203)	3-11 3/8	(1203)	42 47/64	(1085)
48	4-5 3/4	(1365)	4-6 1/4	(1378)	4-5 1/4	(1353)	4-2 5/64	(1272)	4-3 3/8	(1305)	4-3 3/8	(1305)	46 47/64	(1187)
54	4-11 3/4	(1518)	5-0 1/4	(1530)	4-11 1/4	(1505)	4-8 5/64	(1424)	4-9 3/8	(1457)	4-9 3/8	(1457)	52 47/64	(1339)
60	5-5 3/4	(1670)	5-6 1/4	(1683)	5-5 1/4	(1657)	5-2 5/64	(1577)	4-9 3/8	(1457)	4-9 3/8	(1457)	58 47/64	(1492)

Standard Double Hung Unit Measurements																
Height																
CN	Masonry Opening		Rough Opening		Frame Size		Top Sash Size		Bottom Sash Size		Screen OM		1/2 Screen OM		Daylight Opening	
	ft - in	mm	ft - in	mm	ft - in	mm	ft - in	mm	ft-in	mm	ft - in	mm	ft - in	mm	ft - in	mm
12	2-7 3/4	(806)	2-8	(813)	2-7 1/2	(800)	1-3	(381)	1-3 23/32	(399)	2-5 3/4	(756)	1-4 3/16	(411)	10 3/4	(273)
14	2-11 3/4	(908)	3-0	(914)	2-11 1/2	(902)	1-5	(432)	1-5 23/32	(450)	2-9 3/4	(857)	1-6 3/16	(462)	12 3/4	(324)
16	3-3 3/4	(1010)	3-4	(1016)	3-3 1/2	(1003)	1-7	(483)	1-7 23/32	(501)	3-1 3/4	(959)	1-8 3/16	(513)	14 3/4	(375)
18	3-7 3/4	(1111)	3-8	(1118)	3-7 1/2	(1105)	1-9	(533)	1-9 23/32	(552)	3-5 3/4	(1060)	1-10 3/16	(564)	16 3/4	(425)
20	3-11 3/4	(1213)	4-0	(1219)	3-11 1/2	(1207)	1-11	(584)	1-11 23/32	(603)	3-9 3/4	(1162)	2-0 3/16	(614)	18 3/4	(476)
22	4-3 3/4	(1314)	4-4	(1321)	4-3 1/2	(1308)	2-1	(635)	2-1 23/32	(653)	4-1 3/4	(1264)	2-2 3/16	(665)	20 3/4	(527)
24	4-7 3/4	(1416)	4-8	(1422)	4-7 1/2	(1410)	2-3	(686)	2-3 23/32	(704)	4-5 3/4	(1365)	2-4 3/16	(716)	22 3/4	(578)
26	4-11 3/4	(1518)	5-0	(1524)	4-11 1/2	(1511)	2-5	(737)	2-5 23/32	(755)	4-11 3/4	(1518)	2-6 3/16	(767)	24 3/4	(629)
28	5-3 3/4	(1619)	5-4	(1626)	5-3 1/2	(1613)	2-7	(787)	2-7 23/32	(806)	5-1 3/4	(1568)	2-8 3/16	(818)	26 3/4	(679)
30	5-7 3/4	(1721)	5-8	(1727)	5-7 1/2	(1715)	2-9	(838)	2-9 23/32	(857)	5-5 3/4	(1670)	2-10 3/16	(868)	28 3/4	(730)
32	5-11 3/4	(1822)	6-0	(1829)	5-11 1/2	(1816)	2-11	(889)	2-11 23/32	(907)	5-9 3/4	(1772)	3-0 3/16	(919)	30 3/4	(781)
34	6-3 3/4	(1924)	6-4	(1930)	6-3 1/2	(1918)	3-1	(940)	3-1 23/32	(958)	6-1 3/4	(1873)	3-2 3/16	(970)	32 3/4	(832)
36	6-7 3/4	(2026)	6-8	(2032)	6-7 1/2	(2019)	3-3	(991)	3-3 23/32	(1009)	6-5 3/4	(1975)	3-4 3/16	(1021)	34 3/4	(883)
40	7-3 3/4	(2229)	7-4	(2235)	7-3 1/2	(2223)	3-7	(1092)	3-7 23/32	(1111)	7-1 3/4	(2178)	3-8 3/16	(1122)	38 3/4	(984)
42	7-7 3/4	(2330)	7-8	(2337)	7-7 1/2	(2324)	3-9	(1143)	3-9 23/32	(1161)	7-5 3/4	(2280)	3-10 3/16	(1173)	40 3/4	(1035)
50	8-11 3/4	(2737)	9-0	(2743)	8-11 1/2	(2731)	4-5	(1346)	4-5 23/32	(1365)	8-9 3/4	(2686)	4-6 3/16	(1376)	48 3/4	(1238)
56	9-11 3/4	(3042)	10-0	(3048)	9-11 1/2	(3035)	4-11	(1499)	4-11 23/32	(1517)	9-9 3/4	(2991)	5-0 3/16	(1529)	54 3/4	(1391)
60	10-7 3/4	(3245)	10-8	(3251)	10-7 1/2	(3239)	5-3	(1600)	5-3 23/32	(1619)	9-10 3/4	(3016)	5-4 3/16	(1630)	58 3/4	(1492)

Standard Unit Measurements: Picture

Standard Double Hung Picture Unit Measurements									
Width									
CN	Masonry Opening		Rough Opening		Frame Size		Sash Size		Daylight Opening
	ft - in	mm	ft - in	mm	ft - in	mm	ft-in	mm	ft - in mm
40	3-5 3/4	(1060)	3-6 1/4	(1073)	3-5 1/4	(1048)	3-3 17/32	(1004)	2-10 47/64 (882)
48	4-1 3/4	(1264)	4-2 1/4	(1276)	4-1 1/4	(1251)	3-11 17/32	(1207)	3-6 47/64 (1085)
52	4-5 3/4	(1365)	4-6 1/4	(1378)	4-5 1/4	(1353)	4-3 17/32	(1309)	3-10 47/64 (1187)
60	5-1 3/4	(1568)	5-2 1/4	(1581)	5-1 1/4	(1556)	4-11 17/32	(1512)	4-6 47/64 (1390)
68	5-9 3/4	(1772)	5-10 1/4	(1784)	5-9 1/4	(1759)	5-7 17/32	(1715)	5-2 47/64 (1593)

Standard Double Hung Picture Unit Measurements									
Height									
CN	Masonry Opening		Rough Opening		Frame Size		Sash Size		Daylight Opening
	ft - in	mm	ft - in	mm	ft - in	mm	ft-in	mm	ft - in mm
38	3-3 3/4	(1010)	3-4	(1016)	3-3 1/2	(1003)	3-1 1/16	(941)	2-7 27/64 (798)
42	3-7 3/4	(1111)	3-8	(1118)	3-7 1/2	(1105)	3-5 1/16	(1043)	2-11 27/64 (900)
46	3-11 3/4	(1213)	4-0	(1219)	3-11 1/2	(1207)	3-9 1/16	(1145)	3-3 27/64 (1001)
50	4-3 3/4	(1314)	4-4	(1321)	4-3 1/2	(1308)	4-1 1/16	(1246)	3-7 27/64 (1103)
54	4-7 3/4	(1416)	4-8	(1422)	4-7 1/2	(1410)	4-5 1/16	(1348)	3-11 27/64 (1204)
58	4-11 3/4	(1518)	5-0	(1524)	4-11 1/2	(1511)	4-9 1/16	(1449)	4-3 27/64 (1306)
62	5-3 3/4	(1619)	5-4	(1626)	5-3 1/2	(1613)	5-1 1/16	(1551)	4-7 27/64 (1408)
66	5-7 3/4	(1721)	5-8	(1727)	5-7 1/2	(1715)	5-5 1/16	(1653)	4-11 27/64 (1509)
70	5-11 3/4	(1822)	6-0	(1829)	5-11 1/2	(1816)	5-9 1/16	(1754)	5-3 27/64 (1611)
74	6-3 3/4	(1924)	6-4	(1930)	6-3 1/2	(1918)	6-1 1/16	(1856)	5-7 27/64 (1712)
78	6-7 3/4	(2026)	6-8	(2032)	6-7 1/2	(2019)	6-5 1/16	(1957)	5-11 27/64 (1814)
86	7-3 3/4	(2229)	7-4	(2235)	7-3 1/2	(2223)	7-1 1/16	(2161)	6-7 27/64 (2017)
90	7-7 3/4	(2330)	7-8	(2337)	7-7 1/2	(2324)	7-5 1/16	(2262)	6-11 27/64 (2119)

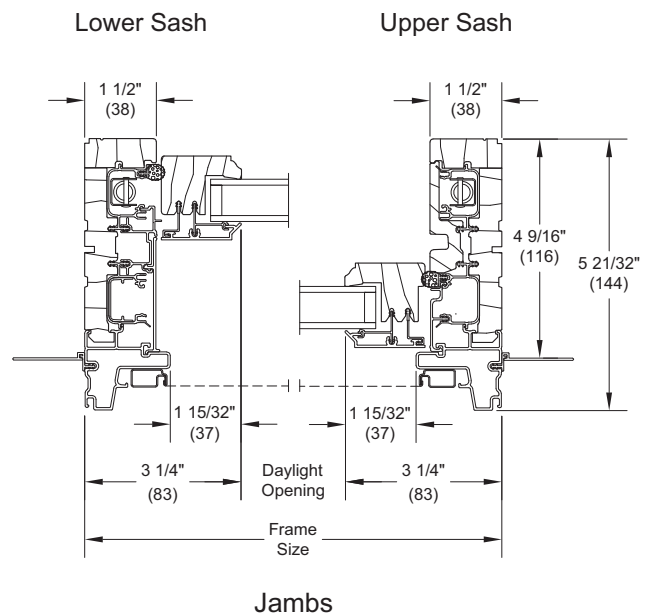
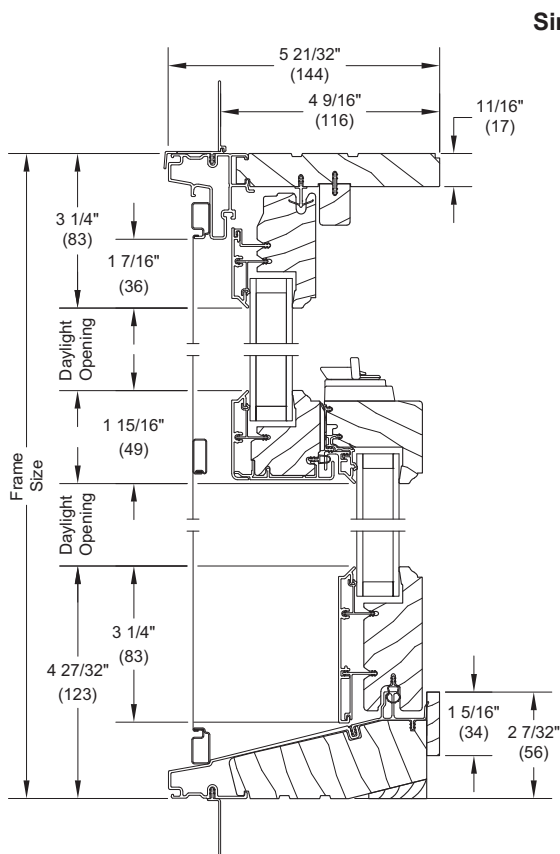
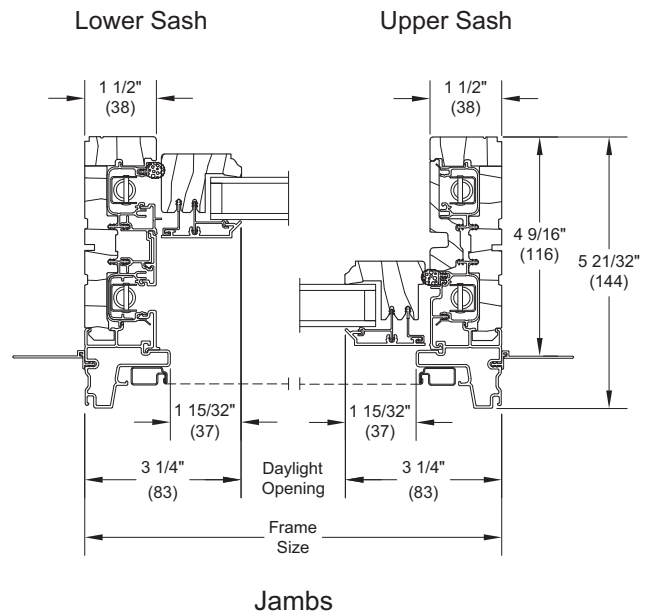
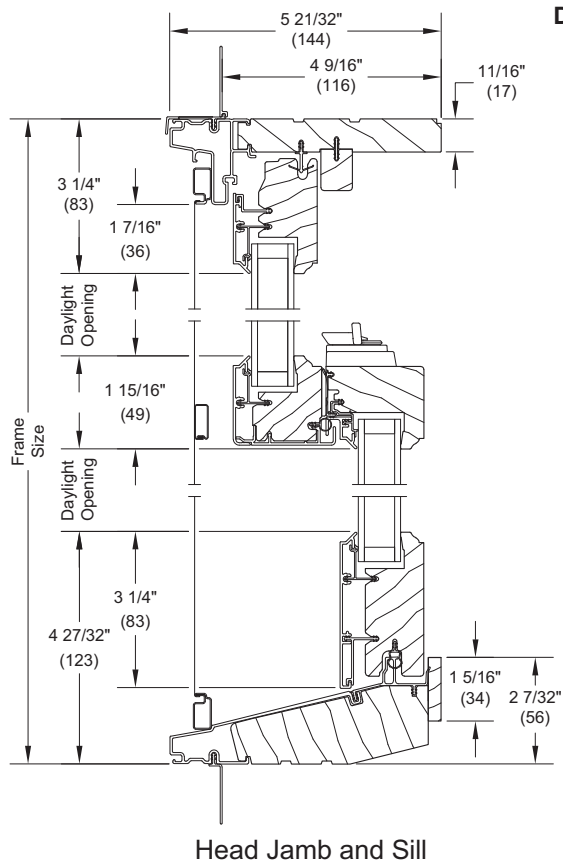
Standard Unit Measurements: Transom

Standard Double Hung Transom Unit Measurements										
Width										
CN	Masonry Opening		Rough Opening		Frame Size		Sash Size		Daylight Opening	
	ft - in	mm	ft - in	mm	ft - in	mm	ft-in	mm	ft - in	mm
16	1-9 3/4	(552)	1-10 1/4	(565)	1-9 1/4	(540)	1-6 1/16	(459)	1-2 47/64	(374)
20	2-1 3/4	(654)	2-2 1/4	(667)	2-1 1/4	(641)	1-10 1/16	(560)	1-6 47/64	(476)
24	2-5 3/4	(756)	2-6 1/4	(768)	2-5 1/4	(743)	2-2 1/16	(662)	1-10 47/64	(577)
26	2-7 3/4	(806)	2-8 1/4	(819)	2-7 1/4	(794)	2-4 1/16	(713)	2-0 47/64	(628)
28	2-9 3/4	(857)	2-10 1/4	(870)	2-9 1/4	(845)	2-6 1/16	(764)	2-2 47/64	(679)
30	2-11 3/4	(908)	3-0 1/4	(921)	2-11 1/4	(895)	2-8 1/16	(814)	2-4 47/64	(730)
32	3-1 3/4	(959)	3-2 1/4	(972)	3-1 1/4	(946)	2-10 1/16	(865)	2-6 47/64	(781)
36	3-5 3/4	(1060)	3-6 1/4	(1073)	3-5 1/4	(1048)	3-2 1/16	(967)	2-10 47/64	(882)
40	3-9 3/4	(1162)	3-10 1/4	(1175)	3-9 1/4	(1149)	3-6 1/16	(1068)	3-2 47/64	(984)
54	4-11 3/4	(1518)	5-0 1/4	(1530)	4-11 1/4	(1505)	4-8 1/16	(1424)	4-4 47/64	(1339)

Standard Double Hung Transom Unit Measurements										
Height										
CN	Masonry Opening		Rough Opening		Frame Size		Sash Size		Daylight Opening	
	ft - in	mm	ft - in	mm	ft - in	mm	ft-in	mm	ft - in	mm
12	1-7 15/16	(506)	1-8 3/16	(513)	1-7 11/16	(500)	1-5 7/8	(454)	1-0 3/4	(324)
20	2-3 15/16	(710)	2-4 3/16	(716)	2-3 11/16	(703)	2-1 7/8	(657)	1-8 3/4	(527)

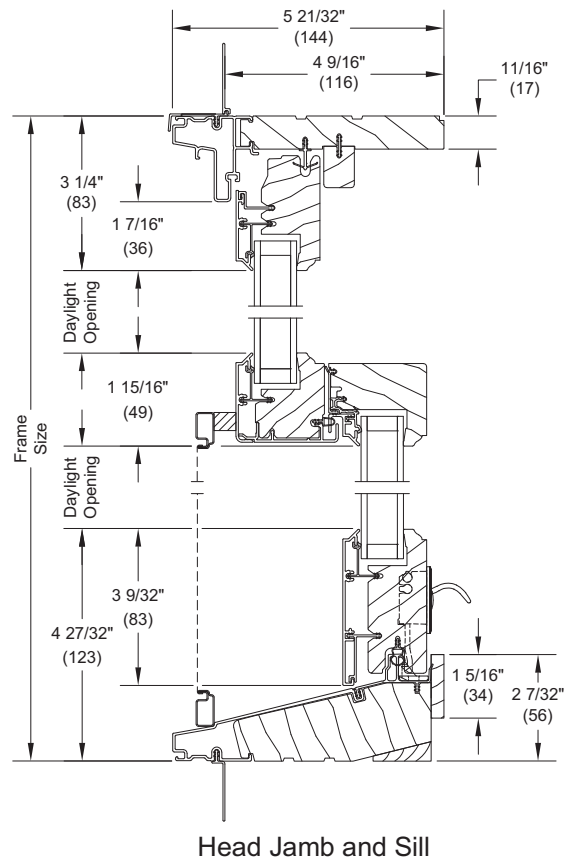
Section Details: Operating

Scale: 3" = 1' 0"



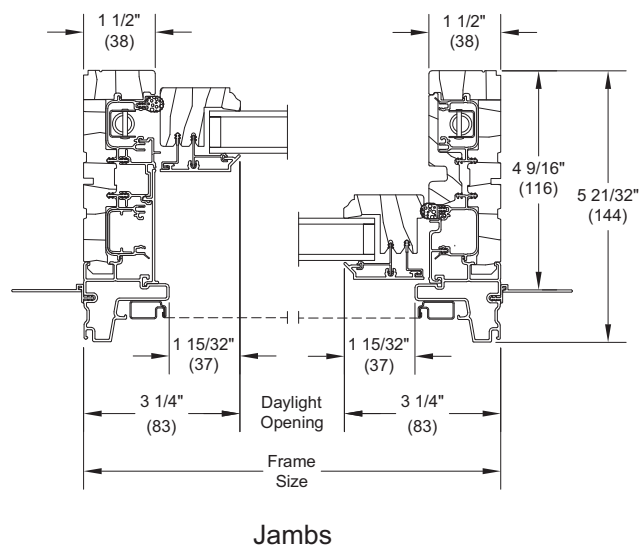
Section Details: Operating (with Optional Lift Lock Hardware)

Scale: 3" = 1' 0"



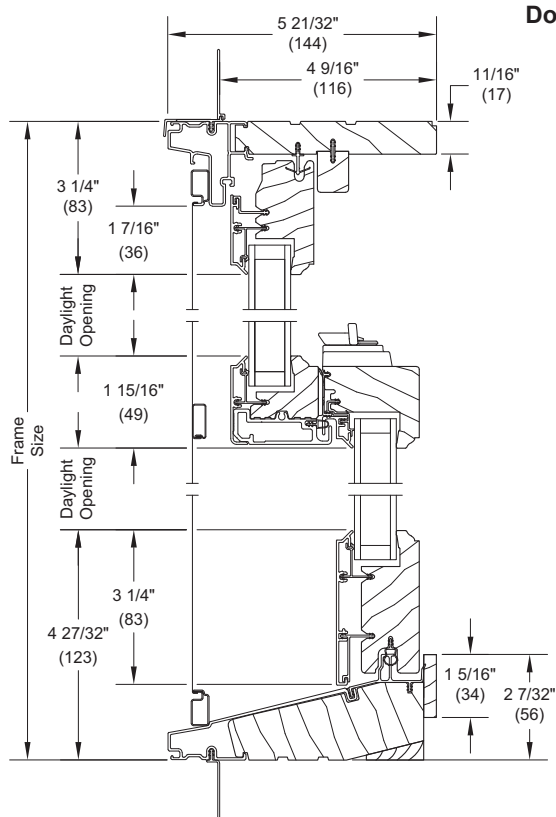
Lower Sash

Upper Sash



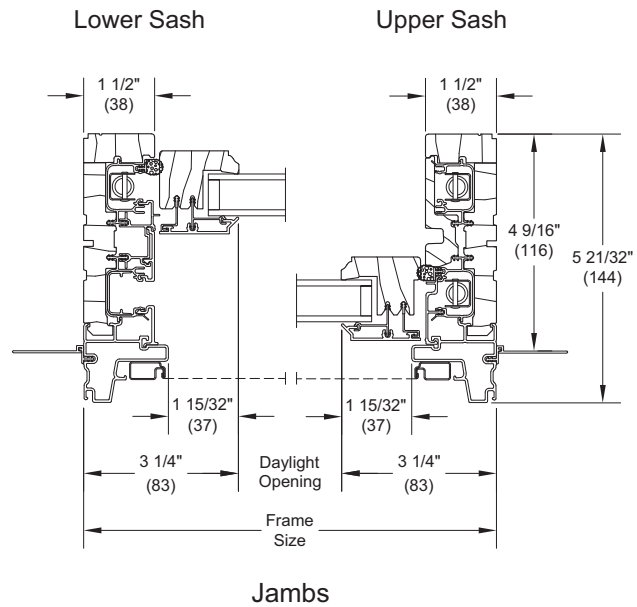
Section Details: Operating (Commercial Window Performance Rating)

Scale: 3" = 1' 0"

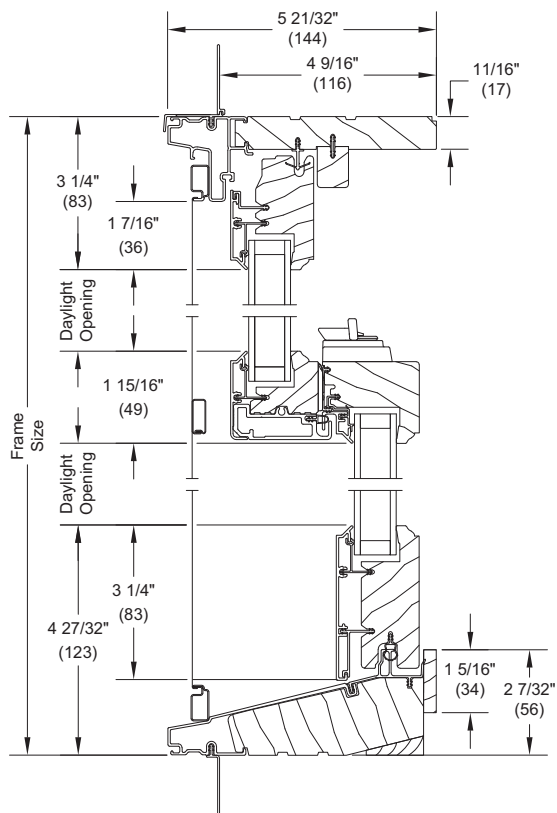


Head Jamb and Sill

Double Hung

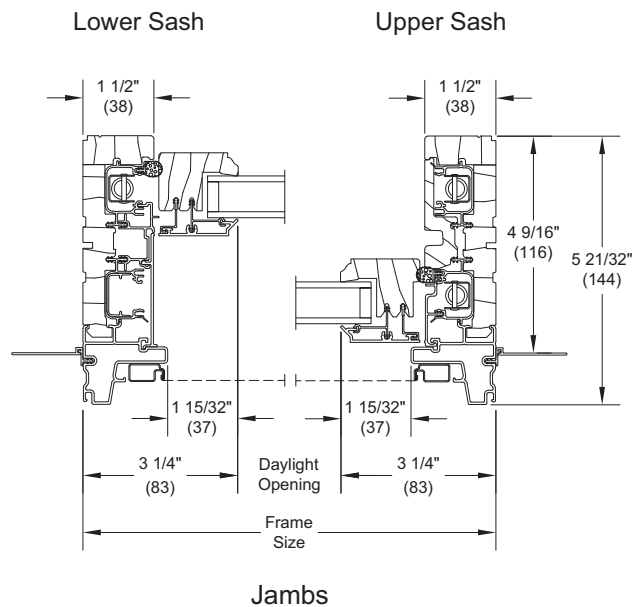


Jambs



Head Jamb and Sill

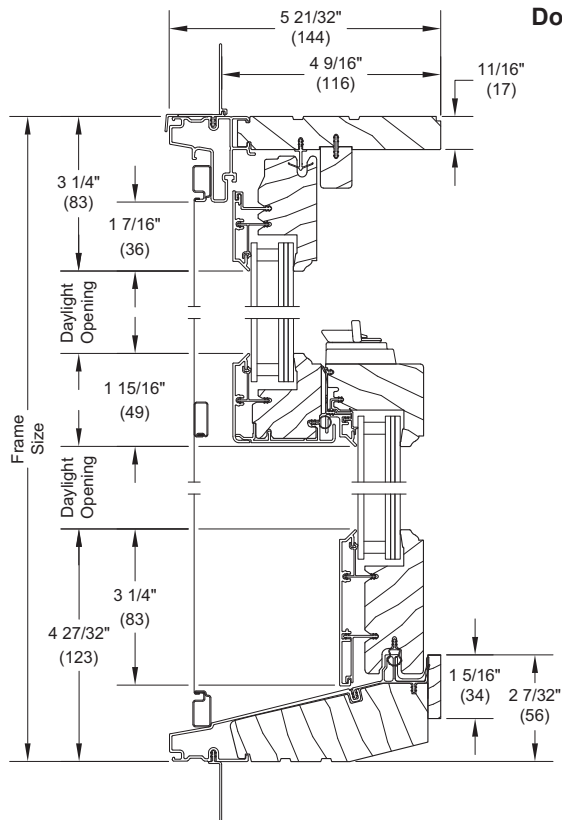
Single Hung



Jambs

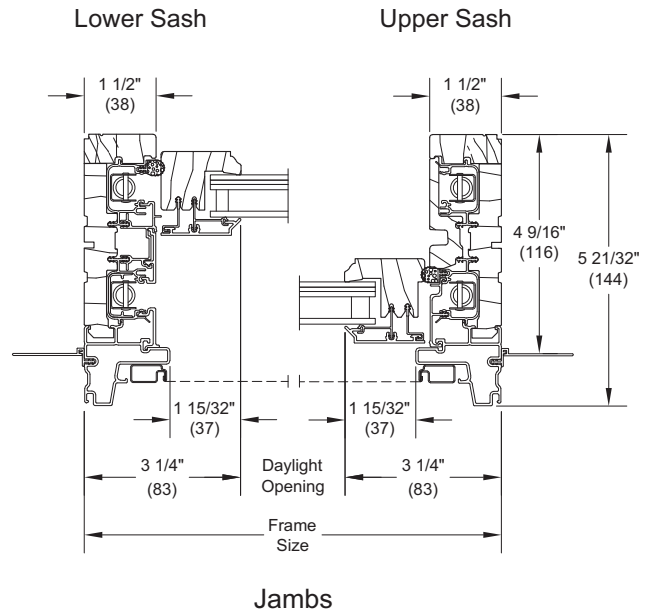
Section Details: IZ3 Operating

Scale: 3" = 1' 0"

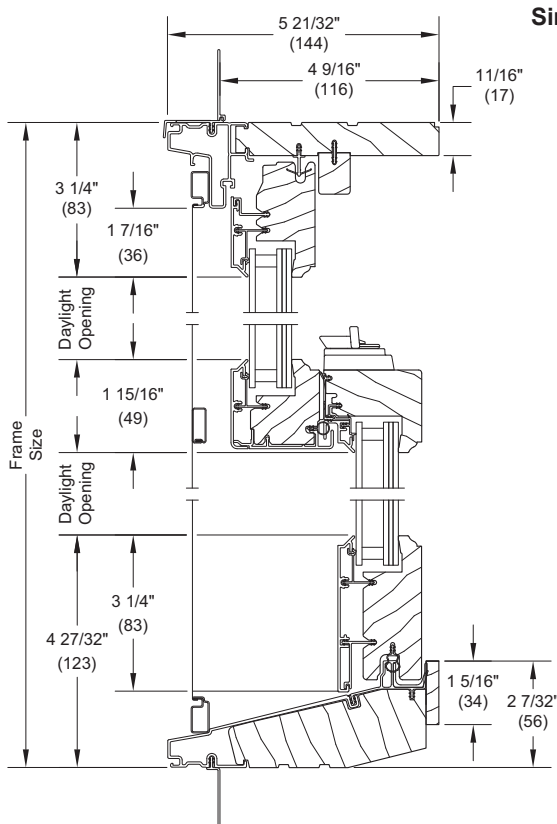


Head Jamb and Sill

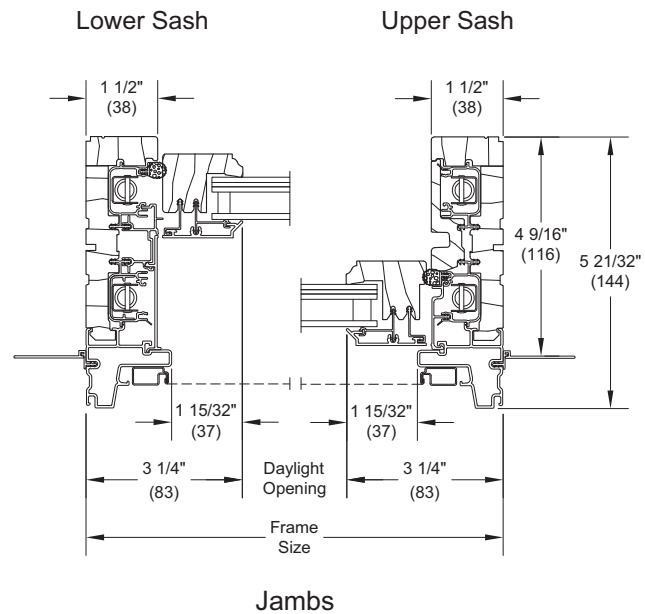
Double Hung



Jambs



Single Hung

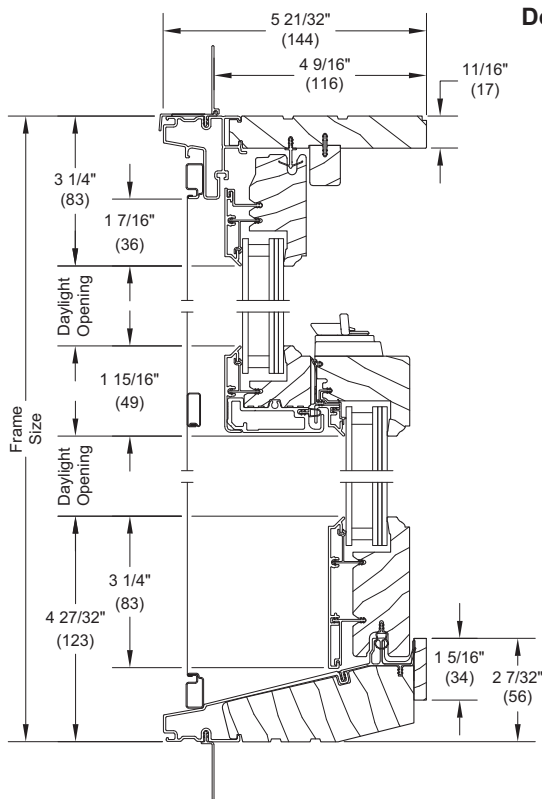


Jambs

NOTE: CE mark is not available on IZ3 units.

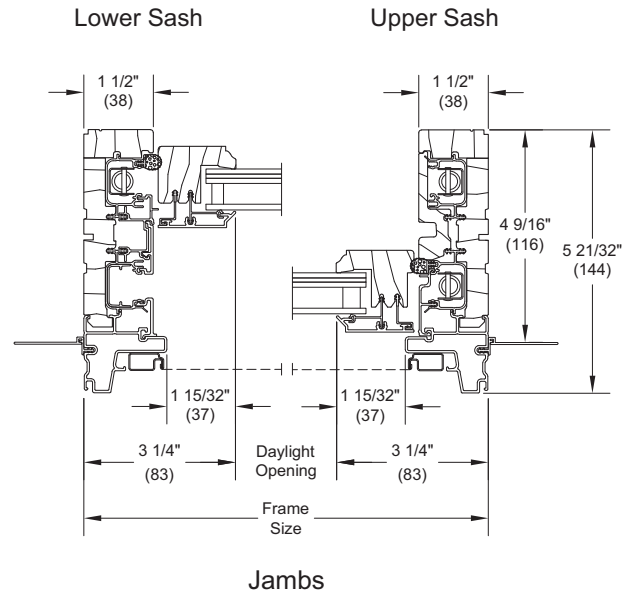
Section Details: IZ3 Operating

Scale: 3" = 1' 0"

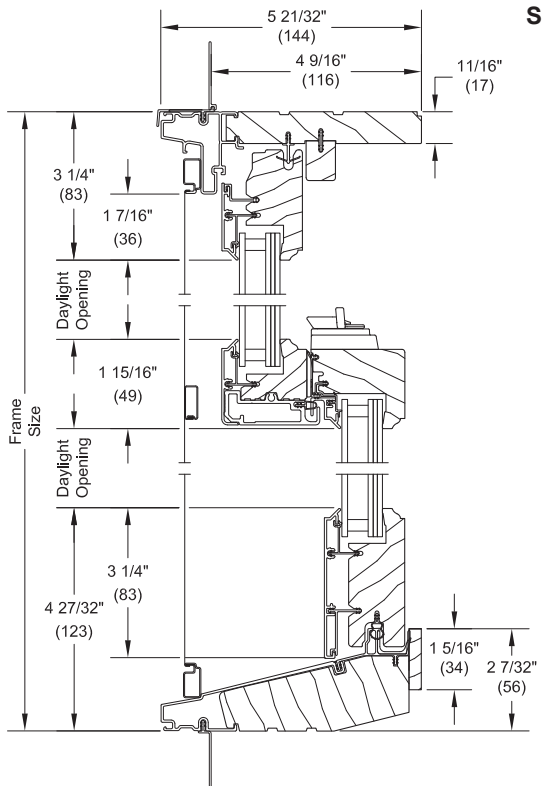


Head Jamb and Sill

Double Hung

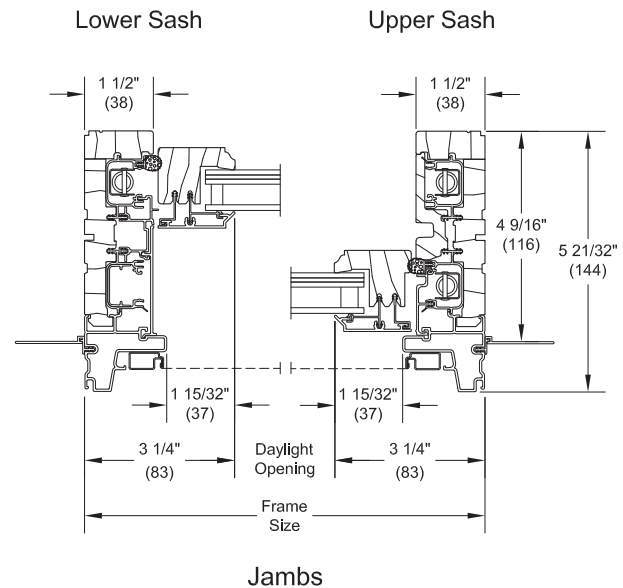


Jambs



Head Jamb and Sill

Single Hung



Jambs

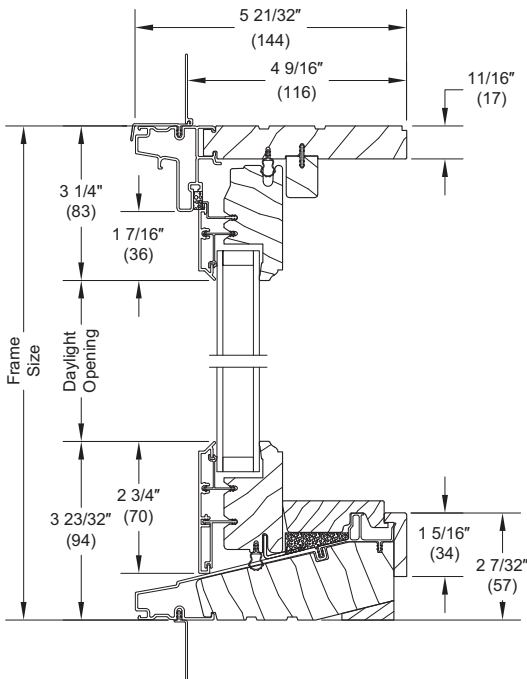
NOTE: CE mark is not available on IZ3 units.

Reinforced check rail required for applicable sizes)

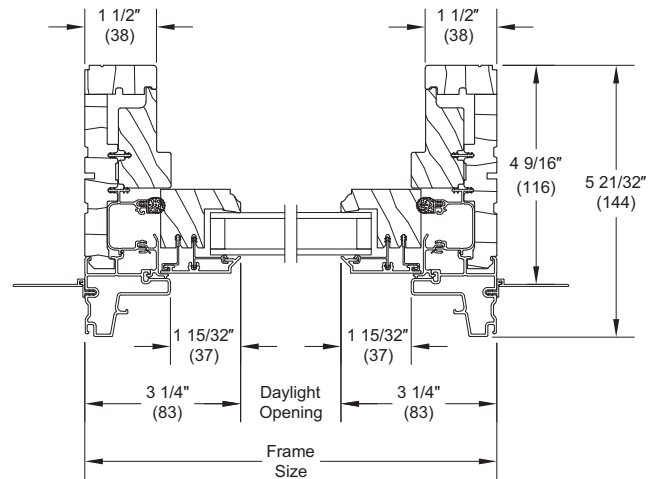
Section Details: Transom and Picture

Scale: 3" = 1' 0"

Transom

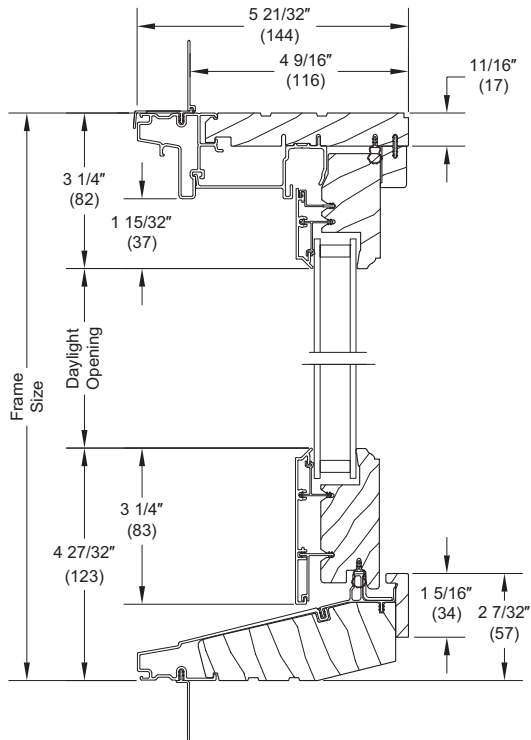


Head Jamb and Sill

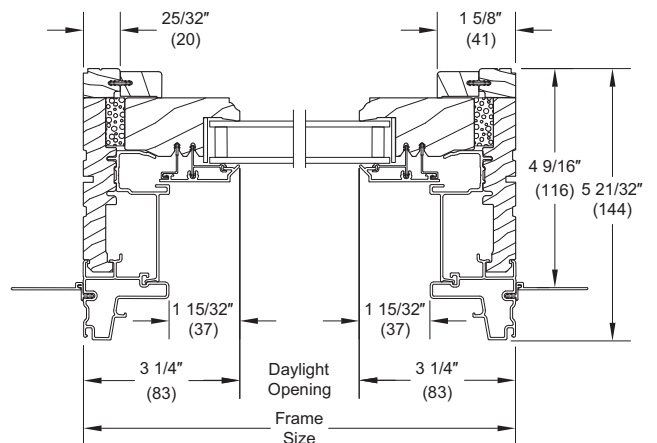


Jambs

Picture



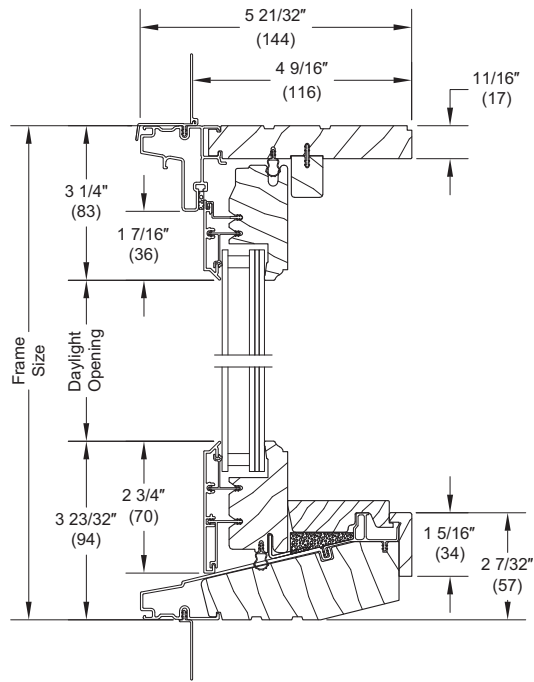
Head Jamb & Sill



Jambs

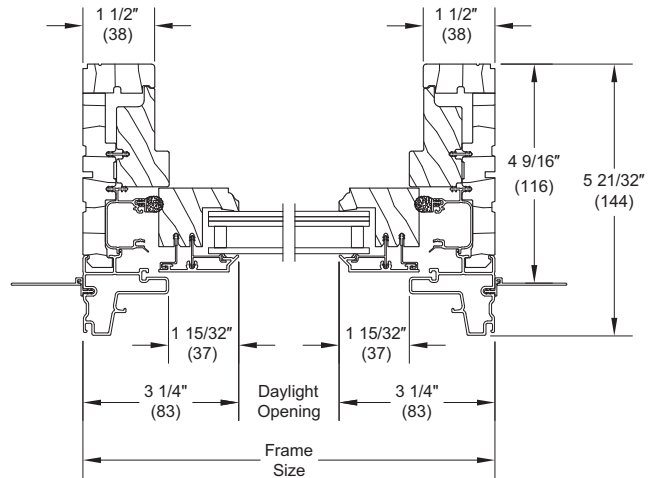
Section Details: IZ3 Transom and Picture

Scale: 3" = 1' 0"

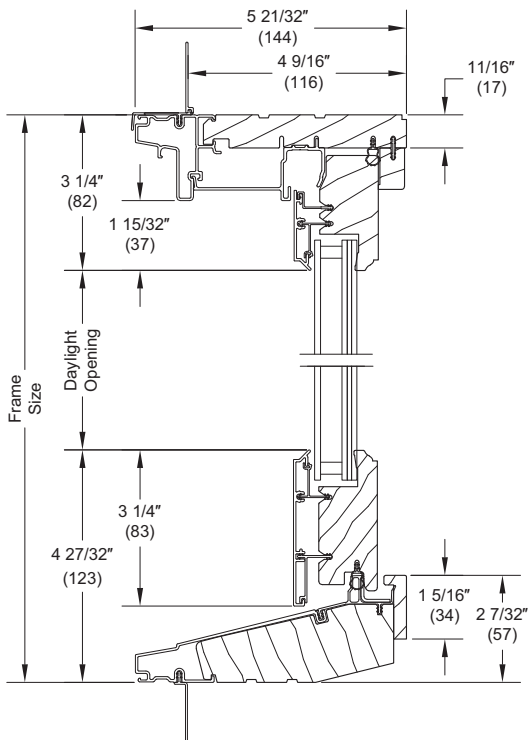


Head Jamb and Sill

Transom

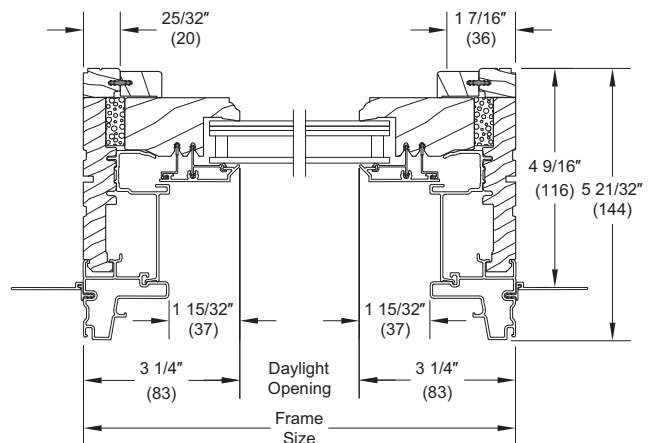


Jamb



Head Jamb & Sill

Picture

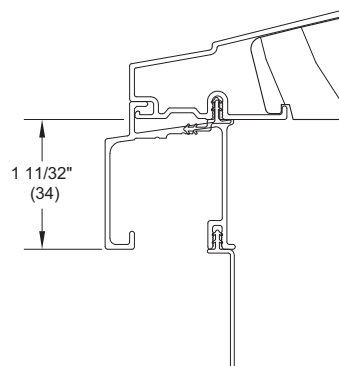
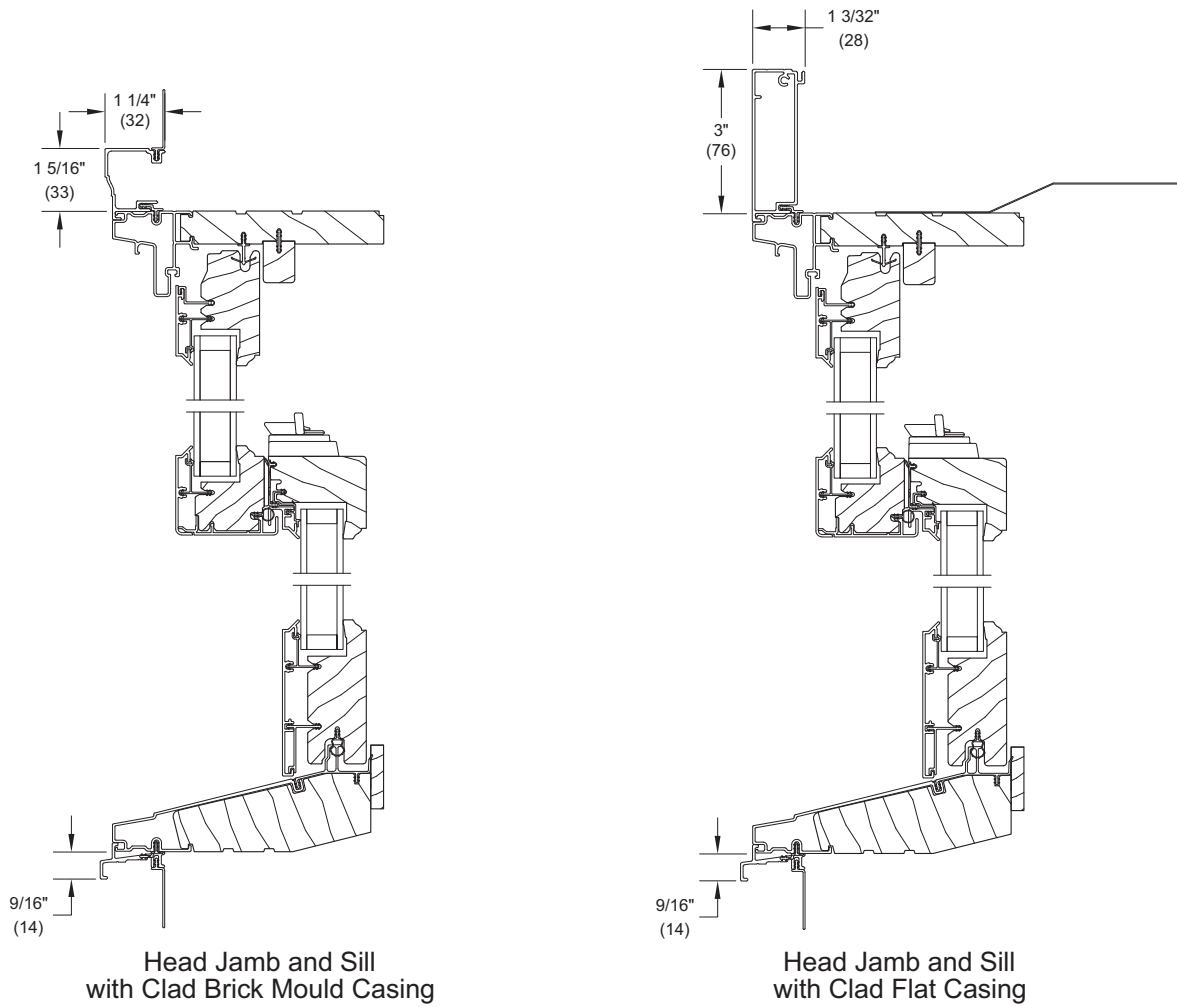


Jamb

NOTE: CE mark is not available on IZ3 units.

Section Details: Casings

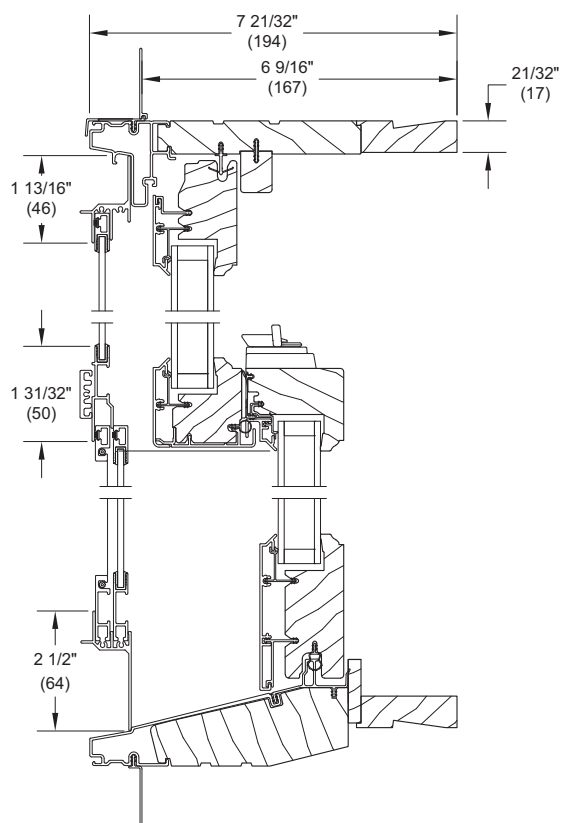
Scale: 3" = 1' 0"



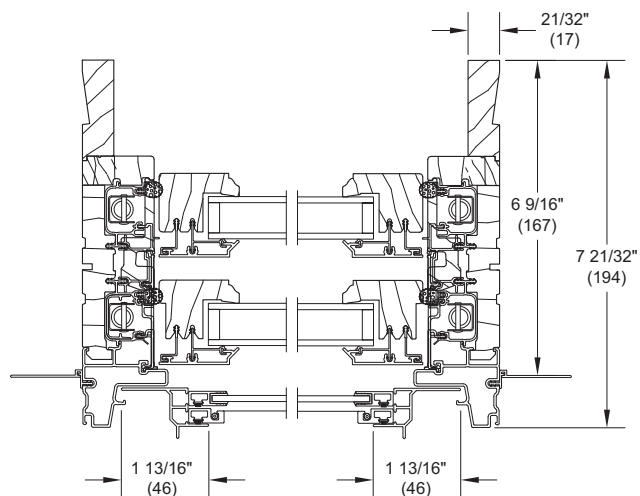
Sill with (A217) Simulated Thick Subsill
Scale: 2:1

Section Details: 6 9/16" Combination

Scale: 3" = 1' 0"



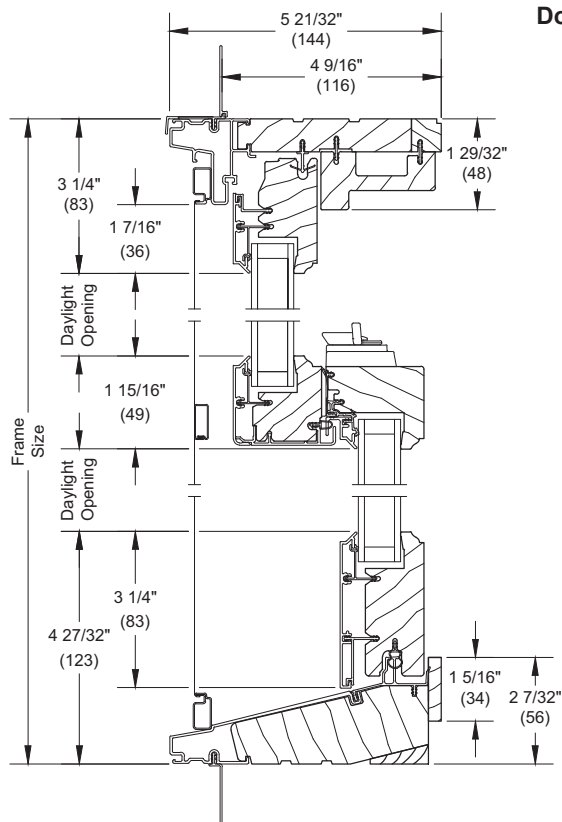
Head Jamb and Sill



Jambs

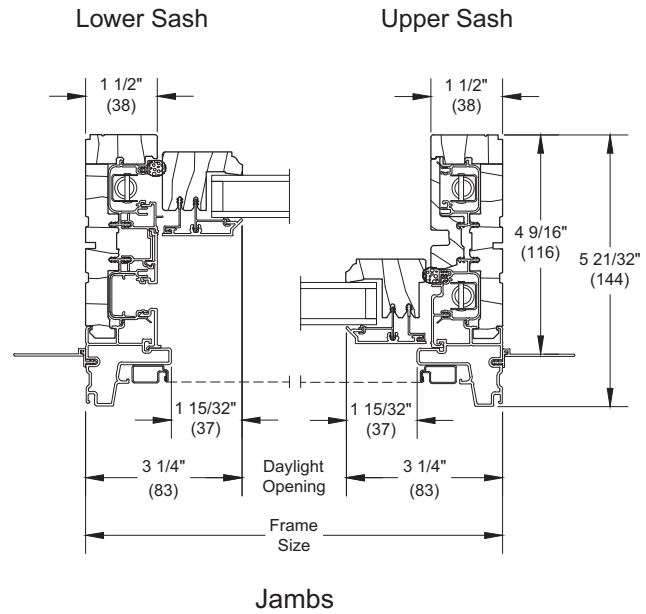
Section Details: Operating (with Lock Status Sensor)

Scale: 3" = 1' 0"

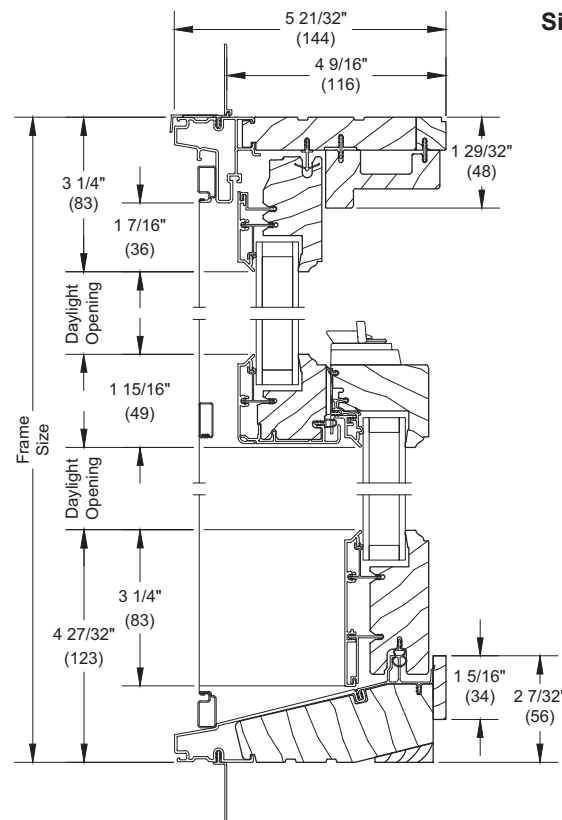


Head Jamb and Sill

Double Hung

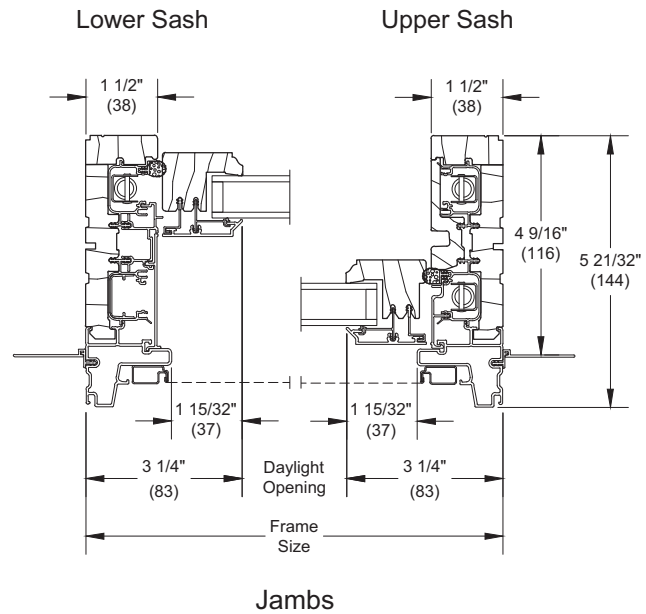


Jambs



Head Jamb and Sill

Single Hung



Jambs

Bows and Bays: Min/Max Sizing and Projection

Configuration	Rough Opening									
	Width		x	Height		Width		x	Height	
	in	mm		in	mm	in	mm		in	mm
Bow - 3 Wide	65 15/32	(1663)	x	33 5/32	(842)	136 7/16	(3466)	x	81 5/32	(2061)
Bow - 4 Wide	86 3/8	(2194)	x	33 5/32	(842)	164 3/16	(4170)	x	81 5/32	(2061)
Bow - 5 Wide	106 11/32	(2701)	x	33 5/32	(842)	163 3/4	(4159)	x	93 5/32	(2366)
Bow - 6 Wide	125 5/32	(3179)	x	33 5/32	(842)	147 5/8	(3750)	x	93 5/32	(2366)
Bay - 30°	63 11/32	(1609)	x	33 5/32	(842)	128 29/32	(3274)	x	81 5/32	(2061)
Bay - 45°	58 5/16	(1481)	x	33 5/32	(842)	116 1/4	(2953)	x	81 5/32	(2061)
Bay - 90°	23	(584)	x	32 7/8	(835)	47	(1194)	x	80 7/8	(2054)

Configuration	Projection Depth			
	Minimum		Maximum	
	in	mm	in	mm
Bow - 3 Wide	3 13/32	(87)	7 9/16	(192)
Bow - 4 Wide	6 7/8	(175)	15 1/8	(384)
Bow - 5 Wide	10 1/4	(260)	20 1/16	(510)
Bow - 6 Wide	15 1/4	(387)	26 7/32	(666)
Bay - 30°	8 5/8	(219)	18 5/8	(473)
Bay - 45°	12 21/32	(321)	26 13/16	(681)
Bay - 90°	22 1/16	(560)	42 1/16	(1068)

NOTE: CE mark is not available on Bow and Bay units.

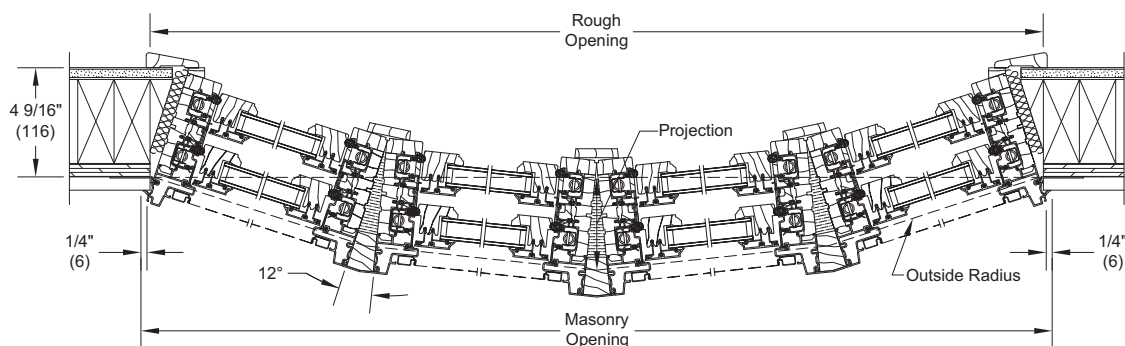
Bows and Bays: Measurement Conversions

Unit Measurements		Width		Height	
From	To				
Rough Opening - 30° Bay		in	mm	in	mm
Masonry Opening with BMC	Rough Opening (w/ head and seat boards)	-3 25/32	(96)	-1/4	(06)
Masonry Opening w/out BMC	Rough Opening (w/ head and seat boards)	-1 7/32	(31)	+ 3/8	(10)
Rough Opening - 45° Bay		in	mm	in	mm
Masonry Opening with BMC	Rough Opening (w/ head and seat boards)	-4 31/32	(126)	-1/4	(06)
Masonry Opening w/out BMC	Rough Opening (w/ head and seat boards)	-1 13/16	(46)	+ 3/8	(10)
Rough Opening - 90° Bay		in	mm	in	mm
Masonry Opening with BMC	Rough Opening (w/ head and seat boards)	-10 3/16	(259)	-1/4	(06)
Masonry Opening w/out BMC	Rough Opening (w/ head and seat boards)	-10 3/16	(259)	+ 3/8	(10)
Rough Opening - 3W Bow		in	mm	in	mm
Masonry Opening with BMC	Rough Opening (w/ head and seat boards)	-2 45/64	(69)	-25/32	(20)
Masonry Opening w/out BMC	Rough Opening (w/ head and seat boards)	-37/64	(15)	+ 1/4	(06)
Rough Opening - 4W Bow		in	mm	in	mm
Masonry Opening with BMC	Rough Opening (w/ head and seat boards)	-3 1/32	(77)	-25/32	(20)
Masonry Opening w/out BMC	Rough Opening (w/ head and seat boards)	-51/64	(20)	+ 1/4	(06)
Rough Opening - 5W Bow		in	mm	in	mm
Masonry Opening with BMC	Rough Opening (w/ head and seat boards)	-3 25/64	(86)	-25/32	(20)
Masonry Opening w/out BMC	Rough Opening (w/ head and seat boards)	-1 1/64	(26)	+ 1/4	(06)
Rough Opening - 6W Bow		in	mm	in	mm
Masonry Opening with BMC	Rough Opening (w/ head and seat boards)	-3 25/32	(96)	-25/32	(20)
Masonry Opening w/out BMC	Rough Opening (w/ head and seat boards)	-1 7/32	(31)	+ 1/4	(06)

NOTE: CE mark is not available on Bow and Bay units.

Bow Rough Opening and Projection

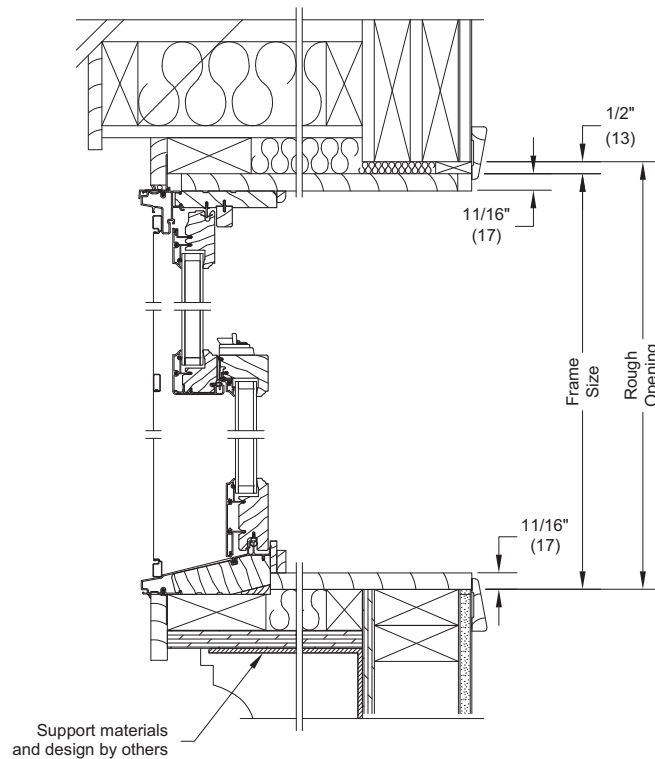
Call Number (Width)	Number Wide	Bow					
		MO		RO		Projection	
16	3	5-6 1/16	(1678)	5-5 31/64	(1663)	0-4 35/64	(115)
16	4	7-3 11/64	(2214)	7-2 23/64	(2194)	0-9 3/32	(231)
16	5	8-11 11/32	(2726)	8-10 21/64	(2701)	1-1 35/64	(344)
16	6	10-6 11/32	(3209)	10-5 1/8	(3178)	1-8 11/64	(512)
20	3	6-5 57/64	(1979)	6-5 5/16	(1964)	0-5 3/8	(137)
20	4	8-6 47/64	(2609)	8-5 59/64	(2589)	0-10 3/4	(273)
20	5	10-6 15/32	(3212)	10-5 29/64	(3187)	1-4	(406)
20	6	12-4 27/32	(3781)	12-3 5/8	(3750)	1-11 53/64	(605)
24	3	7-5 23/32	(2279)	7-5 9/64	(2264)	0-6 13/64	(158)
24	4	9-10 19/64	(3005)	9-9 1/2	(2984)	1-0 13/32	(315)
24	5	12-1 39/64	(3698)	12-0 19/32	(3673)	1-6 29/64	(469)
26	3	7-11 41/64	(2429)	7-11 1/16	(2414)	0-6 5/8	(168)
26	4	10-6 5/64	(3202)	10-5 9/32	(3182)	1-1 15/64	(336)
26	5	12-11 11/64	(3941)	12-10 5/32	(3915)	1-7 11/16	(500)
28	3	8-5 35/64	(2579)	8-4 31/32	(2565)	0-7 3/64	(179)
28	4	11-1 55/64	(3400)	11-1 1/16	(3380)	1-2 1/16	(357)
28	5	13-8 47/64	(4184)	13-7 23/32	(4158)	1-8 59/64	(531)
30	3	8-11 15/32	(2730)	8-10 57/64	(2715)	0-7 29/64	(189)
30	4	11-9 41/64	(3598)	11-8 27/32	(3577)	1-2 57/64	(378)
32	3	9-5 3/8	(2880)	9-4 51/64	(2865)	0-7 7/8	(200)
32	4	12-5 27/64	(3795)	12-4 5/8	(3775)	1-3 23/32	(399)
36	3	10-5 7/32	(3180)	10-4 5/8	(3166)	0-8 45/64	(221)
36	4	13-8 63/64	(4191)	13-8 3/16	(4170)	1-5 3/8	(441)
40	3	11-5 3/64	(3481)	11-4 29/64	(3466)	0-9 17/32	(242)



NOTE: CE mark is not available on Bow and Bay units.

Bows and Bays: Standard Heights

Call Number Height	MO Height (w/head&seat boards)		RO Height (w/ head & seat boards)		Frame Size Height (w/ head & seat boards)	
	ft-in	mm	ft-in	mm	ft-in	mm
12	2-8 29/32	(836)	2-9 5/32	(842)	2-8 3/8	(822)
14	3-0 29/32	(937)	3-1 5/32	(944)	3-0 3/8	(924)
16	3-4 29/32	(1039)	3-5 5/32	(1045)	3-4 3/8	(1026)
18	3-8 29/32	(1141)	3-9 5/32	(1147)	3-8 3/8	(1127)
20	4-0 29/32	(1242)	4-1 5/32	(1249)	4-0 3/8	(1229)
22	4-4 29/32	(1344)	4-5 5/32	(1350)	4-4 3/8	(1330)
24	4-8 29/32	(1445)	4-9 5/32	(1452)	4-8 3/8	(1432)
26	5-0 29/32	(1547)	5-1 5/32	(1553)	5-0 3/8	(1534)
28	5-4 29/32	(1649)	5-5 5/32	(1655)	5-4 3/8	(1635)
30	5-8 29/32	(1750)	5-9 5/32	(1757)	5-8 3/8	(1737)
32	6-0 29/32	(1852)	6-1 5/32	(1858)	6-0 3/8	(1838)
34	6-4 29/32	(1953)	6-5 5/32	(1960)	6-4 3/8	(1940)
36	6-8 29/32	(2055)	6-9 5/32	(2061)	6-8 3/8	(2042)
40	7-4 29/32	(2258)	7-5 5/32	(2265)	7-4 3/8	(2245)
42	7-8 29/32	(2360)	7-9 5/32	(2366)	7-8 3/8	(2346)



NOTE: CE mark is not available on Bow and Bay units.

Bay Standard Width Call Number: 30° - Operable Center Unit

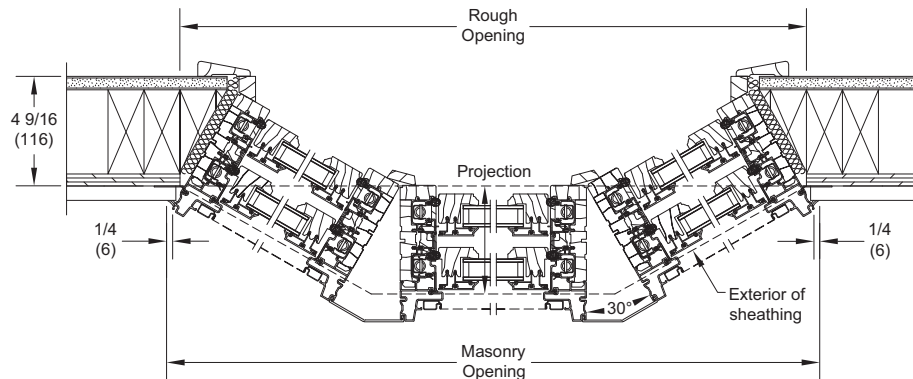
Call Number (Width)			30° Bay					
Side	Center	Side	MO		RO		Projection	
16	16	16	5-4 35/64	(1640)	5-3 21/64	(1609)	0-11 19/64	(287)
16	20	16	5-8 35/64	(1741)	5-7 21/64	(1710)	0-11 19/64	(287)
16	24	16	6-0 35/64	(1843)	5-11 21/64	(1812)	0-11 19/64	(287)
16	26	16	6-2 35/64	(1894)	6-1 21/64	(1863)	0-11 19/64	(287)
16	28	16	6-4 35/64	(1944)	6-3 21/64	(1914)	0-11 19/64	(287)
16	30	16	6-6 35/64	(1995)	6-5 21/64	(1964)	0-11 19/64	(287)
16	32	16	6-8 35/64	(2046)	6-7 21/64	(2015)	0-11 19/64	(287)
16	36	16	7-0 35/64	(2148)	6-11 21/64	(2117)	0-11 19/64	(287)
16	40	16	7-4 35/64	(2249)	7-3 21/64	(2218)	0-11 19/64	(287)
20	20	20	6-3 31/64	(1917)	6-2 17/64	(1886)	1-1 19/64	(338)
20	24	20	6-7 31/64	(2019)	6-6 17/64	(1988)	1-1 19/64	(338)
20	26	20	6-9 31/64	(2070)	6-8 17/64	(2039)	1-1 19/64	(338)
20	28	20	6-11 31/64	(2120)	6-10 17/64	(2089)	1-1 19/64	(338)
20	30	20	7-1 31/64	(2171)	7-0 17/64	(2140)	1-1 19/64	(338)
20	32	20	7-3 31/64	(2222)	7-2 17/64	(2191)	1-1 19/64	(338)
20	36	20	7-7 31/64	(2324)	7-6 17/64	(2293)	1-1 19/64	(338)
20	40	20	7-11 31/64	(2425)	7-10 17/64	(2394)	1-1 19/64	(338)
24	24	24	7-2 13/32	(2195)	7-1 3/16	(2164)	1-3 19/64	(389)
24	26	24	7-4 13/32	(2246)	7-3 3/16	(2215)	1-3 19/64	(389)
24	28	24	7-6 13/32	(2296)	7-5 3/16	(2265)	1-3 19/64	(389)
24	30	24	7-8 13/32	(2347)	7-7 3/16	(2316)	1-3 19/64	(389)
24	32	24	7-10 13/32	(2398)	7-9 3/16	(2367)	1-3 19/64	(389)
24	36	24	8-2 13/32	(2500)	8-1 3/16	(2469)	1-3 19/64	(389)
24	40	24	8-6 13/32	(2601)	8-5 3/16	(2570)	1-3 19/64	(389)
26	26	26	7-7 7/8	(2334)	7-6 21/32	(2303)	1-4 19/64	(414)
26	28	26	7-9 7/8	(2384)	7-8 21/32	(2353)	1-4 19/64	(414)
26	30	26	7-11 7/8	(2435)	7-10 21/32	(2404)	1-4 19/64	(414)
26	32	26	8-1 7/8	(2486)	8-0 21/32	(2455)	1-4 19/64	(414)
26	36	26	8-5 7/8	(2588)	8-4 21/32	(2557)	1-4 19/64	(414)
26	40	26	8-9 7/8	(2689)	8-8 21/32	(2658)	1-4 19/64	(414)
28	28	28	8-1 11/32	(2472)	8-0 1/8	(2441)	1-5 19/64	(439)
28	30	28	8-3 11/32	(2523)	8-2 1/8	(2492)	1-5 19/64	(439)
28	32	28	8-5 11/32	(2574)	8-4 1/8	(2543)	1-5 19/64	(439)
28	36	28	8-9 11/32	(2676)	8-8 1/8	(2645)	1-5 19/64	(439)
28	40	28	9-1 11/32	(2777)	9-0 1/8	(2746)	1-5 19/64	(439)
30	30	30	8-6 51/64	(2611)	8-5 37/64	(2580)	1-6 19/64	(465)
30	32	30	8-8 51/64	(2662)	8-7 37/64	(2631)	1-6 19/64	(465)
30	36	30	9-0 51/64	(2764)	8-11 37/64	(2733)	1-6 19/64	(465)
30	40	30	9-4 51/64	(2865)	9-3 37/64	(2834)	1-6 19/64	(465)
32	32	32	9-0 17/64	(2750)	8-11 3/64	(2719)	1-7 19/64	(490)
32	36	32	9-4 17/64	(2852)	9-3 3/64	(2821)	1-7 19/64	(490)
32	40	32	9-8 17/64	(2953)	9-7 3/64	(2922)	1-7 19/64	(490)
36	36	36	9-11 3/16	(3028)	9-9 31/32	(2997)	1-9 19/64	(541)
36	40	36	10-3 3/16	(3129)	10-1 31/32	(3098)	1-9 19/64	(541)
40	40	40	10-10 1/8	(3305)	10-8 29/32	(3274)	1-11 19/64	(592)

NOTE: CE mark is not available on Bow and Bay units.

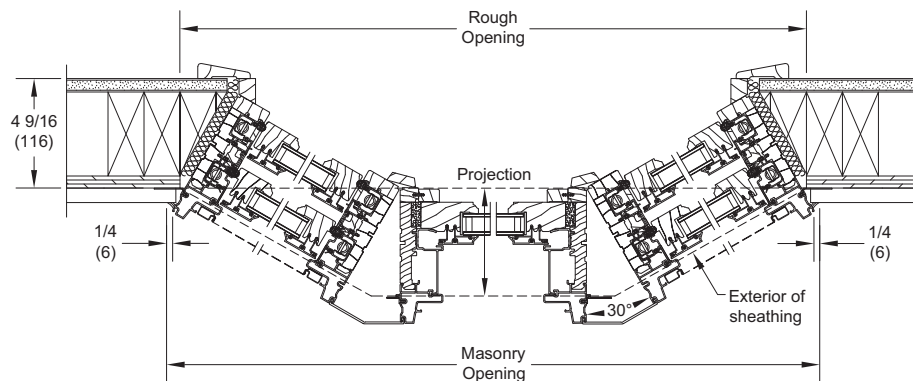
Bay Section Details: 30°

Not to Scale

Operating Center Unit



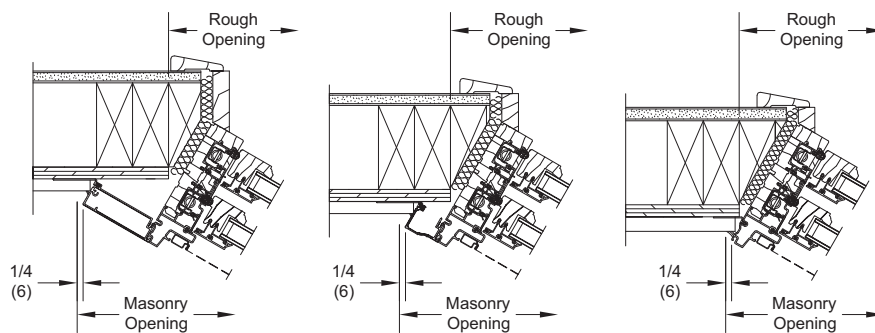
Picture Center Unit



Flat Casing

Brick Mould Casing

No Casing



NOTE: 30° UDHG2 Bay with optional Brick Mould Casing. Bow or Bay assemblies with clad brick mould casing use enclosed profile casing. For 30° bay masonry opening widths using clad brick mould casing, add 3 21/32" (93) to the rough opening width.

30° UDHG2 Bay with optional 3 1/2" (89) Flat Casing. Bow or bay assemblies with clad flat casing use enclosed profile casing. For 30° bay masonry opening widths using clad flat casing, add 6 7/16" (164) to the rough opening width.

CE mark is not available on Bow and Bay units.

Bay Rough Opening and Projection Calculations: 30°

Ultimate Double Hung G2 Bay	
30-Degree (no casing)	
Projection	(OM width of flanker unit PLUS 1.223) x 0.5
Rough Opening Width	(Projection x 1.732) x 2 PLUS 2.82 + Width of Center Unit
Masonry Opening Unit	Add 1 7/32" (31) to Rough Opening width
Rough Opening Height (with Head and Seat boards)	OM height on center unit(s) PLUS 25/32" (20)
Masonry Opening Height (with Head and Seat boards)	Rough Opening height PLUS 1/4" (6)

NOTE: If no head board, Deduct 11/16" (17) from Rough Opening Height

Clad BMC or Flat Casing will change Rough Opening and Projection. Contact your Marvin representative.

CE mark is not available on Bow and Bay units.

Bay Standard Width Call Number: 45° - Operable Center Unit

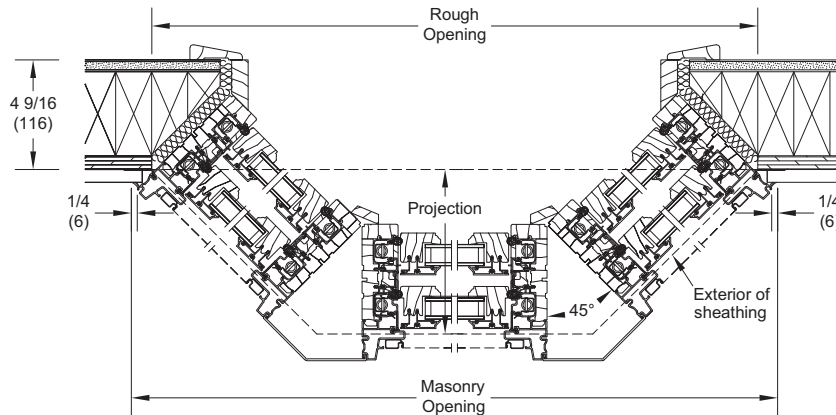
Call Number (Width)			45° Bay					
Side	Center	Side	MO		RO		Projection	
16	16	16	5-0 7/64	(1527)	4-10 5/16	(1481)	1-4 29/64	(418)
16	20	16	4-8 1/2	(1435)	4-6 45/64	(1389)	1-0 41/64	(321)
16	24	16	5-0 1/2	(1537)	4-10 45/64	(1491)	1-0 41/64	(321)
16	26	16	5-2 1/2	(1587)	5-0 45/64	(1542)	1-0 41/64	(321)
16	28	16	5-4 1/2	(1638)	5-2 45/64	(1593)	1-0 41/64	(321)
16	30	16	5-6 1/2	(1689)	5-4 45/64	(1643)	1-0 41/64	(321)
16	32	16	5-8 1/2	(1740)	5-6 45/64	(1694)	1-0 41/64	(321)
16	36	16	6-0 1/2	(1841)	5-10 45/64	(1796)	1-0 41/64	(321)
16	40	16	6-4 1/2	(1943)	6-2 45/64	(1897)	1-0 41/64	(321)
20	20	20	5-2 5/32	(1579)	5-0 23/64	(1533)	1-3 15/32	(393)
20	24	20	5-6 5/32	(1680)	5-4 23/64	(1635)	1-3 15/32	(393)
20	26	20	5-8 5/32	(1731)	5-6 23/64	(1685)	1-3 15/32	(393)
20	28	20	5-10 5/32	(1782)	5-8 23/64	(1736)	1-3 15/32	(393)
20	30	20	6-0 5/32	(1833)	5-10 23/64	(1787)	1-3 15/32	(393)
20	32	20	6-2 5/32	(1884)	6-0 23/64	(1838)	1-3 15/32	(393)
20	36	20	6-6 5/32	(1985)	6-4 23/64	(1939)	1-3 15/32	(393)
20	40	20	6-10 5/32	(2087)	6-8 23/64	(2041)	1-3 15/32	(393)
24	24	24	5-11 13/16	(1824)	5-10 1/64	(1778)	1-6 19/64	(465)
24	26	24	6-1 13/16	(1875)	6-0 1/64	(1829)	1-6 19/64	(465)
24	28	24	6-3 13/16	(1926)	6-2 1/64	(1880)	1-6 19/64	(465)
24	30	24	6-5 13/16	(1976)	6-4 1/64	(1931)	1-6 19/64	(465)
24	32	24	6-7 13/16	(2027)	6-6 1/64	(1982)	1-6 19/64	(465)
24	36	24	6-11 13/16	(2129)	6-10 1/64	(2083)	1-6 19/64	(465)
24	40	24	7-3 13/16	(2230)	7-2 1/64	(2185)	1-6 19/64	(465)
26	26	26	6-4 41/64	(1947)	6-2 27/32	(1901)	1-7 23/32	(501)
26	28	26	6-6 41/64	(1997)	6-4 27/32	(1952)	1-7 23/32	(501)
26	30	26	6-8 41/64	(2048)	6-6 27/32	(2003)	1-7 23/32	(501)
26	32	26	6-10 41/64	(2099)	6-8 27/32	(2053)	1-7 23/32	(501)
26	36	26	7-2 41/64	(2201)	7-0 27/32	(2155)	1-7 23/32	(501)
26	40	26	7-6 41/64	(2302)	7-4 27/32	(2257)	1-7 23/32	(501)
28	28	28	6-9 15/32	(2069)	6-7 43/64	(2024)	1-9 1/8	(537)
28	30	28	6-11 15/32	(2120)	6-9 43/64	(2074)	1-9 1/8	(537)
28	32	28	7-1 15/32	(2171)	6-11 43/64	(2125)	1-9 1/8	(537)
28	36	28	7-5 15/32	(2272)	7-3 43/64	(2227)	1-9 1/8	(537)
28	40	28	7-9 15/32	(2374)	7-7 43/64	(2328)	1-9 1/8	(537)
30	30	30	7-2 19/64	(2192)	7-0 1/2	(2146)	1-10 35/64	(573)
30	32	30	7-4 19/64	(2243)	7-2 1/2	(2197)	1-10 35/64	(573)
30	36	30	7-8 19/64	(2344)	7-6 1/2	(2299)	1-10 35/64	(573)
30	40	30	8-0 19/64	(2446)	7-10 1/2	(2400)	1-10 35/64	(573)
32	32	32	7-7 1/8	(2315)	7-5 21/64	(2269)	1-11 61/64	(609)
32	36	32	7-11 1/8	(2416)	7-9 21/64	(2370)	1-11 61/64	(609)
32	40	32	8-3 1/8	(2518)	8-1 21/64	(2472)	1-11 61/64	(609)
36	36	36	8-4 25/32	(2560)	8-2 63/64	(2514)	2-2 25/32	(680)
36	40	36	8-8 25/32	(2661)	8-6 63/64	(2616)	2-2 25/32	(680)
40	40	40	9-2 7/16	(2805)	9-0 41/64	(2759)	2-5 39/64	(752)

NOTE: CE mark is not available on Bow and Bay units.

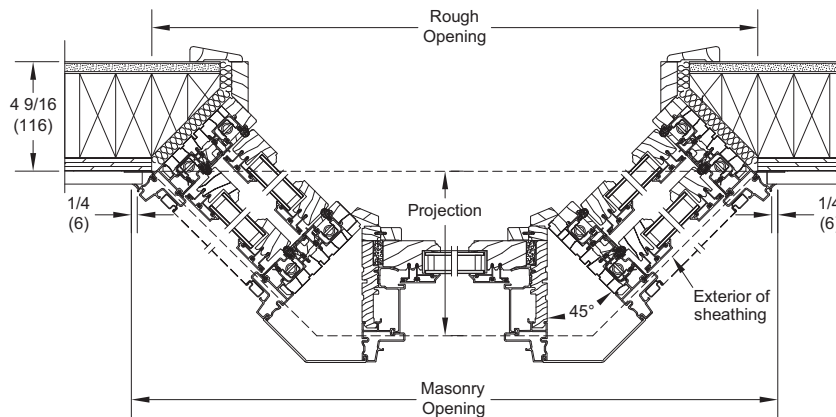
Bay Section Detail: 45°

Not to Scale

Operating Center Unit



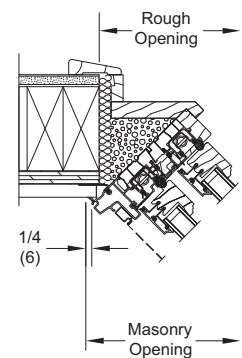
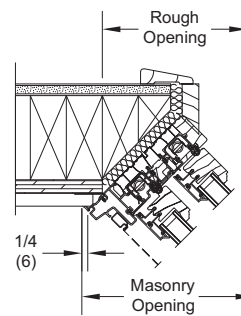
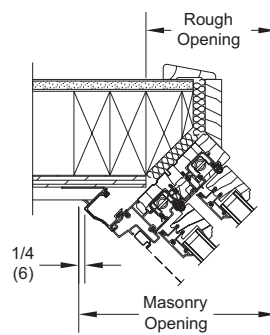
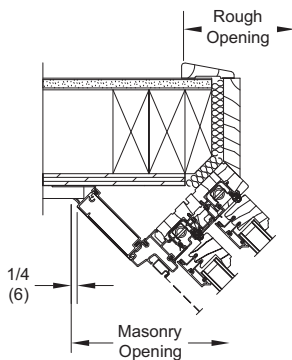
Picture Center Unit



Flat Casing

Brick Mould Casing

No Casing



NOTE: 45° UDHG2 Bay with optional Brick Mould Casing. Bow or bay assemblies with clad brick mould casing use enclosed profile casing. For 45° bay masonry opening widths using clad brick mould casing, add 3 7/8" (98) to the rough opening width.

45° UDHG2 Bay with optional Flat Casing. Bow or bay assemblies with clad flat casing use enclosed profile casing. For 45° bay masonry opening widths, using clad flat casing, add 6 1/16" (154) to the rough opening width.

CE mark is not available on Bow and Bay units.

Bay Rough Opening and Projection Calculations: 45°

Ultimate Double Hung G2 Bay	
45-Degree (no casing)	
Projection	OM width of flanker unit PLUS 1.89 x 0.707
Rough Opening Width	Projection x 2 + 4.03 Plus OM width of Center Unit
Masonry Opening Width	Add 1 13/16" (46) to Rough Opening width
Rough Opening Height (with Head and Seat Boards)	OM height on center unit(s) Plus 25/32" (20)
Masonry Opening Height (with Head and Seat Boards)	Rough Opening height Minus 1 /4" (6)

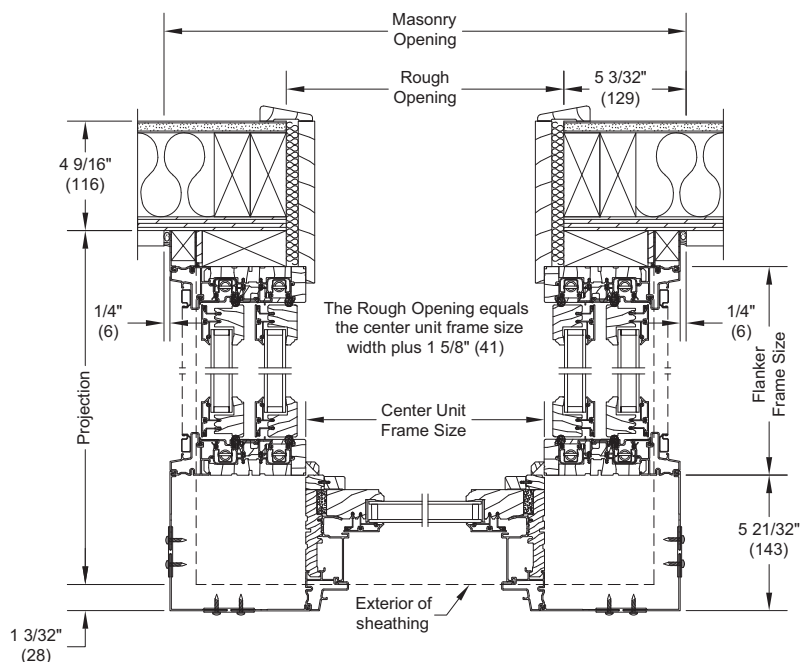
NOTE: If no head board, Deduct 11/16" (17) from Rough Opening Height

Clad BMC or Flat Casing will change Rough Opening and Projection. Contact your Marvin representative.

CE mark is not available on Bow and Bay units.

Bay Section Detail: 90°

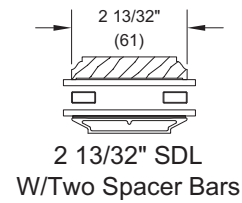
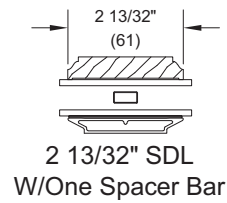
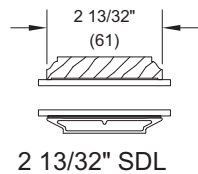
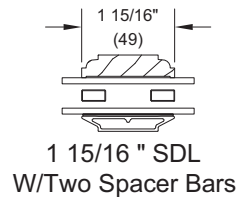
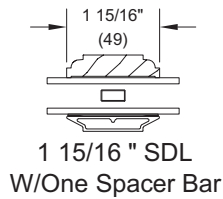
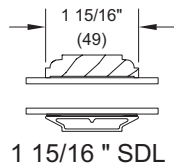
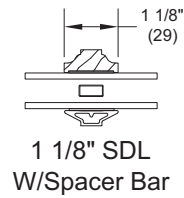
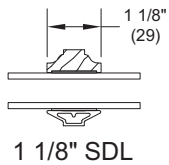
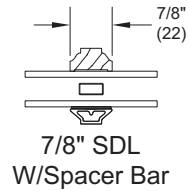
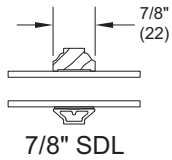
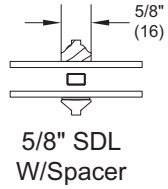
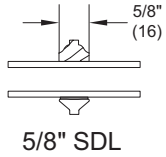
Not to Scale



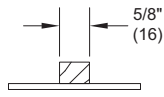
Ultimate Double Hung G2 Bay	
90-Degree (no casing)	
Projection	OM width of flanker unit PLUS 6 1/16" (154)
Rough Opening Width	OM width of Center Unit(s) PLUS 1 5/8" (41)
Masonry Opening Unit	Add 10 3/16" (259) to Rough Opening width
Rough Opening Height (with Head and Seat boards)	OM height on center unit(s) PLUS 25/32" (20)
Masonry Opening Height (with Head and Seat boards)	Rough Opening height MINUS 1/4" (6)

NOTE: CE mark is not available on Bow and Bay units.

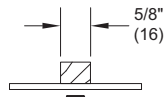
Lite Options



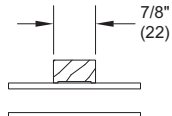
Optional Interior Square Simulated Divided Lite Option



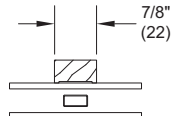
5/8" SDL



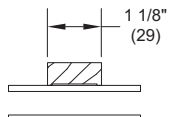
5/8" SDL
W/Spacer



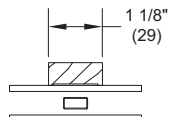
7/8" SDL



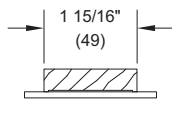
7/8" SDL
W/Spacer Bar



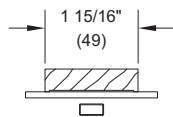
1 1/8" SDL



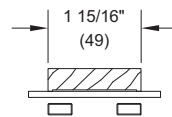
1 1/8" SDL
W/Spacer Bar



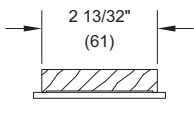
1 15/16" SDL



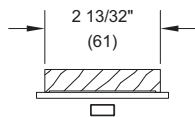
1 15/16" SDL
W/One Spacer Bar



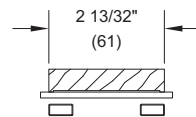
1 15/16" SDL
W/Two Spacer Bars



2 13/32" SDL



2 13/32" SDL
W/One Spacer Bar



2 13/32" SDL
W/Two Spacer Bars

Standard Divided Lite Options

SDL Patterns (5/8" or 7/8" SDL)

CN HEIGHT	CN Width												
	16	20	24	26	28	30	32	36	40	44	48	54	60
12	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	4W2H	4W2H	5W2H	5W2H
14	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	4W2H	4W2H	5W2H	5W2H
16	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	4W2H	4W2H	5W2H	5W2H
18	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	4W2H	4W2H	5W2H	5W2H
20	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	4W2H	4W2H	5W2H	5W2H
22	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	4W2H	4W2H	5W2H	5W2H
24	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	4W2H	4W2H	5W2H	5W2H
26	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	4W2H	4W2H	5W2H	5W2H
28	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	4W2H	4W2H	5W2H	5W2H
30	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	4W2H	4W2H	5W2H	5W2H
32	2W3H	3W3H	3W3H	3W3H	3W3H	3W3H	4W3H	4W3H	4W3H	4W3H	4W3H	5W3H	5W3H
34	2W3H	3W3H	3W3H	3W3H	3W3H	3W3H	4W3H	4W3H	4W3H	4W3H	4W3H	5W3H	5W3H
36	2W3H	3W3H	3W3H	3W3H	3W3H	3W3H	4W3H	4W3H	4W3H	4W3H	4W3H	5W3H	5W3H
40	2W4H	3W4H	3W4H	3W4H	3W4H	3W4H	4W4H	4W4H	4W4H	4W4H	4W4H	5W4H	5W4H
42	2W4H	3W4H	3W4H	3W4H	3W4H	3W4H	4W4H	4W4H	4W4H	4W4H	4W4H	5W4H	5W4H
50	2W4H	3W4H	3W4H	3W4H	3W4H	3W4H	4W4H	4W4H	4W4H	4W4H	4W4H	5W4H	5W4H
56	2W4H	3W4H	3W4H	3W4H	3W4H	3W4H	4W4H	4W4H	4W4H	4W4H	4W4H	5W4H	5W4H
60	2W4H	3W4H	3W4H	3W4H	3W4H	3W4H	4W4H	4W4H	4W4H	4W4H	4W4H	5W4H	5W4H

SDL Patterns (1 1/8" SDL)

CN HEIGHT	CN Width												
	16	20	24	26	28	30	32	36	40	44	48	54	60
12	2W1H	2W1H	3W1H	3W1H	3W1H	3W1H	3W1H	3W1H	4W1H	4W1H	4W1H	5W1H	5W1H
14	2W1H	2W1H	3W1H	3W1H	3W1H	3W1H	3W1H	3W1H	4W1H	4W1H	4W1H	5W1H	5W1H
16	2W1H	2W1H	3W1H	3W1H	3W1H	3W1H	3W1H	3W1H	4W1H	4W1H	4W1H	5W1H	5W1H
18	2W2H	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	5W2H	5W2H
20	2W2H	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	5W2H	5W2H
22	2W2H	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	5W2H	5W2H
24	2W2H	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	5W2H	5W2H
26	2W2H	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	5W2H	5W2H
28	2W2H	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	5W2H	5W2H
30	2W2H	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	5W2H	5W2H
32	2W3H	2W3H	3W3H	3W3H	3W3H	3W3H	3W3H	3W3H	4W3H	4W3H	4W3H	5W3H	5W3H
34	2W3H	2W3H	3W3H	3W3H	3W3H	3W3H	3W3H	3W3H	4W3H	4W3H	4W3H	5W3H	5W3H
36	2W3H	2W3H	3W3H	3W3H	3W3H	3W3H	3W3H	3W3H	4W3H	4W3H	4W3H	5W3H	5W3H
40	2W4H	2W4H	3W4H	3W4H	3W4H	3W4H	3W4H	3W4H	4W4H	4W4H	4W4H	5W4H	5W4H
42	2W4H	2W4H	3W4H	3W4H	3W4H	3W4H	3W4H	3W4H	4W4H	4W4H	4W4H	5W4H	5W4H
50	2W4H	2W4H	3W4H	3W4H	3W4H	3W4H	3W4H	3W4H	4W4H	4W4H	4W4H	5W4H	5W4H
56	2W4H	2W4H	3W4H	3W4H	3W4H	3W4H	3W4H	3W4H	4W4H	4W4H	4W4H	5W4H	5W4H
60	2W4H	2W4H	3W4H	3W4H	3W4H	3W4H	3W4H	3W4H	4W4H	4W4H	4W4H	5W4H	5W4H

Standard Divided Lite Options

Pictures

Picture - 1 1/8" SDL or 1 1/8" Grille					
CN HEIGHT	CN Width				
	40	48	52	60	68
38	3W2H	4W2H	4W2H	5W2H	6W2H
42	3W4H	4W4H	4W4H	5W4H	6W4H
46	3W4H	4W4H	4W4H	5W4H	6W4H
50	3W4H	4W4H	4W4H	5W4H	6W4H
54	3W4H	4W4H	4W4H	5W4H	6W4H
58	3W4H	4W4H	4W4H	5W4H	6W4H
62	3W4H	4W4H	4W4H	5W4H	6W4H
66	3W4H	4W4H	4W4H	5W4H	6W4H
70	3W6H	4W6H	4W6H	5W6H	6W6H
74	3W6H	4W6H	4W6H	5W6H	6W6H
78	3W6H	4W6H	4W6H	5W6H	6W6H
86	3W8H	4W8H	4W8H	5W8H	6W8H
90	3W8H	4W8H	4W8H	5W8H	6W8H

Picture - 5/8" or 7/8" SDL, 3/4" Grille, or GBG					
CN HEIGHT	CN Width				
	40	48	52	60	68
38	4W4H	5W4H	5W4H	6W4H	7W4H
42	4W4H	5W4H	5W4H	6W4H	7W4H
46	4W4H	5W4H	5W4H	6W4H	7W4H
50	4W4H	5W4H	5W4H	6W4H	7W4H
54	4W4H	5W4H	5W4H	6W4H	7W4H
58	4W4H	5W4H	5W4H	6W4H	7W4H
62	4W4H	5W4H	5W4H	6W4H	7W4H
66	4W4H	5W4H	5W4H	6W4H	7W4H
70	4W6H	5W6H	5W6H	6W6H	7W6H
74	4W6H	5W6H	5W6H	6W6H	7W6H
78	4W6H	5W6H	5W6H	6W6H	7W6H
86	4W8H	5W8H	5W8H	6W8H	7W8H
90	4W8H	5W8H	5W8H	6W8H	7W8H

Transoms

Transom - 1 1/8" SDL or 1 1/8" Grille										
CN HEIGHT	CN Width									
	16	20	24	26	28	30	32	36	40	54
12	2W1H	2W1H	3W1H	3W1H	3W1H	3W1H	3W1H	3W1H	4W1H	5W1H
20	2W2H	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	5W2H

TRANSOM - 5/8, or 7/8, SDL, 3/4, Grille, or GBG										
CN HEIGHT	CN Width									
	16	20	24	26	28	30	32	36	40	54
12	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	5W2H
20	2W2H	3W2H	3W2H	3W2H	3W2H	3W2H	4W2H	4W2H	4W2H	5W2H