Landmarks Commission

Agenda Number: 4
Project #: HCOA-2025-00009
Hearing Date: April 9, 2025

Staff Report

Agent	Richard Pham
Applicant	Martha O'Neil
Request	Certificate of Appropriateness – Major for Alterations
Legal Description	Block 16, South half of Lots 17, 23, 24, 25, Perea Addition
Address/Location	305 13th Street NW
Size	0.15 acres
Zoning	R-1A
Historic Location	Fourth Ward Historic Protection Overlay Zone (HPO-4)

Staff Recommendation

APPROVAL of Project HCOA-2025-00009, a request for a Certificate of Appropriateness for Alterations, based on the Findings beginning on page 15 and subject to the conditions of approval on page 17.

Silvia Bolivar, PLA ASLA
Senior Planner

Summary of Analysis

The application for a Certificate of Appropriateness requests approval for exterior alterations to a contributing property within the Fourth Ward Historic Protection Overlay Zone (HPO-4). The subject site is approximately 0.15 acres, located at 305 13th Street NW, and legally described as Block 16, South half of Lots 17, 23, 24, 25, Perea Addition. Proposed changes include replacing deteriorated wood shaker shingles, window replacements that will match the original style, and reconfiguring the front entry to improve architectural articulation while restoring the façade. Additional work includes correcting window headers, removing non-original security bars, and adjusting window placement for visual continuity.

Staff initially raised concerns regarding the proposed use of horizontal siding in place of the original shingles. In response, the applicant revised the plans to reflect the use of appropriate replacement materials that match the original in design, dimension, and texture.

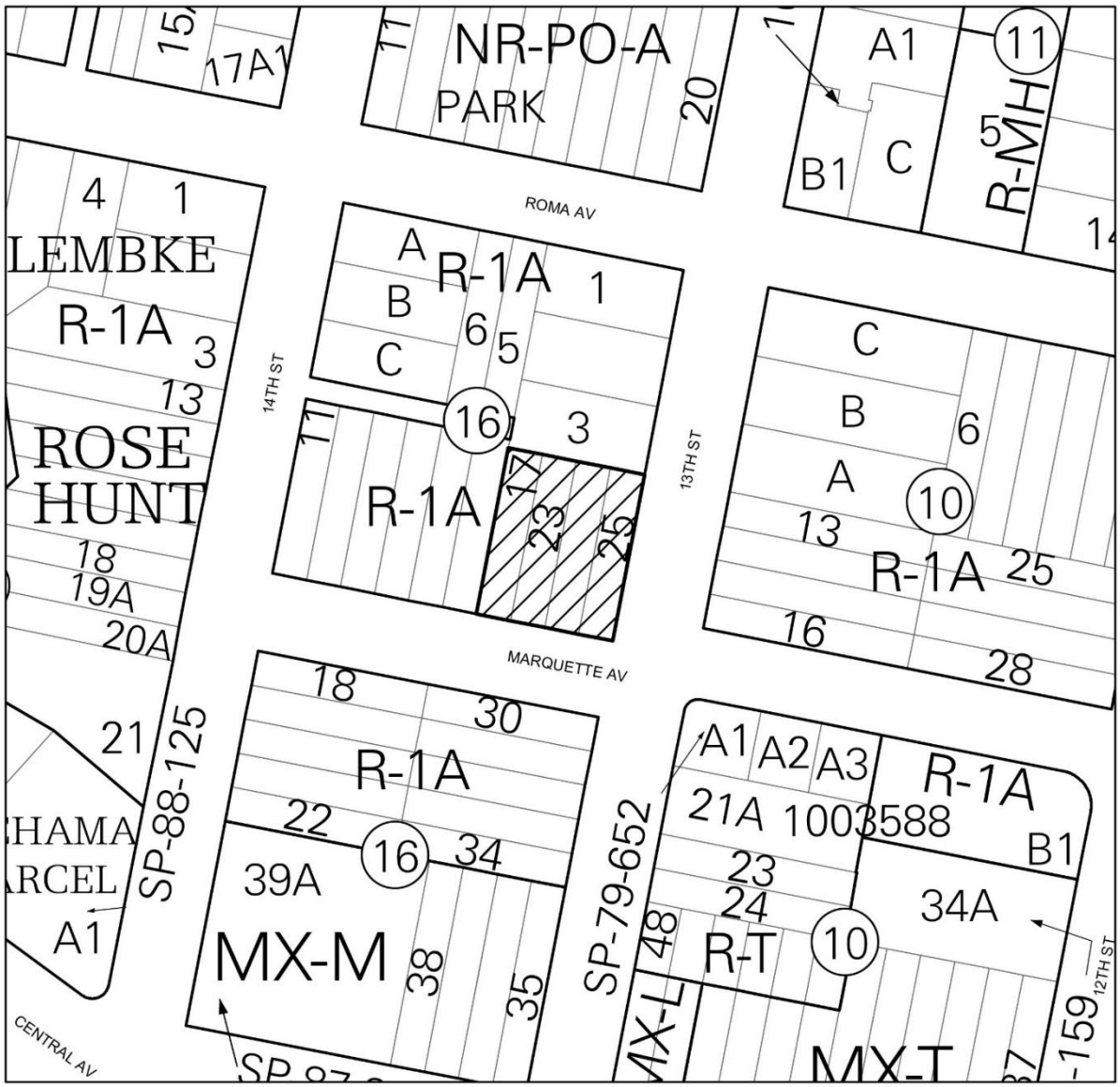
The application was reviewed against relevant guidelines for the Fourth Ward HPO and the Review and Decision Criteria of a Certificate of Appropriateness in the Integrated Development Ordinance (IDO) §14-16-6-6(D)(3).

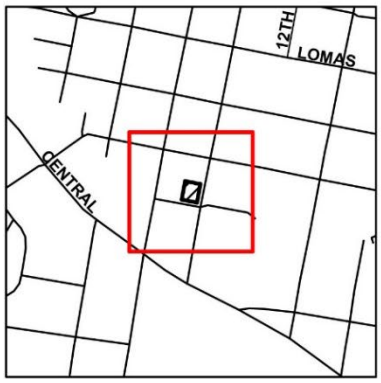
Subject to conditions of approval, Staff considers the proposal consistent with the guidelines and the criteria.

Table of Contents

I. Maps

IDO Zoning Map





IDO ZONING MAP

Note: Gray shading indicates County.

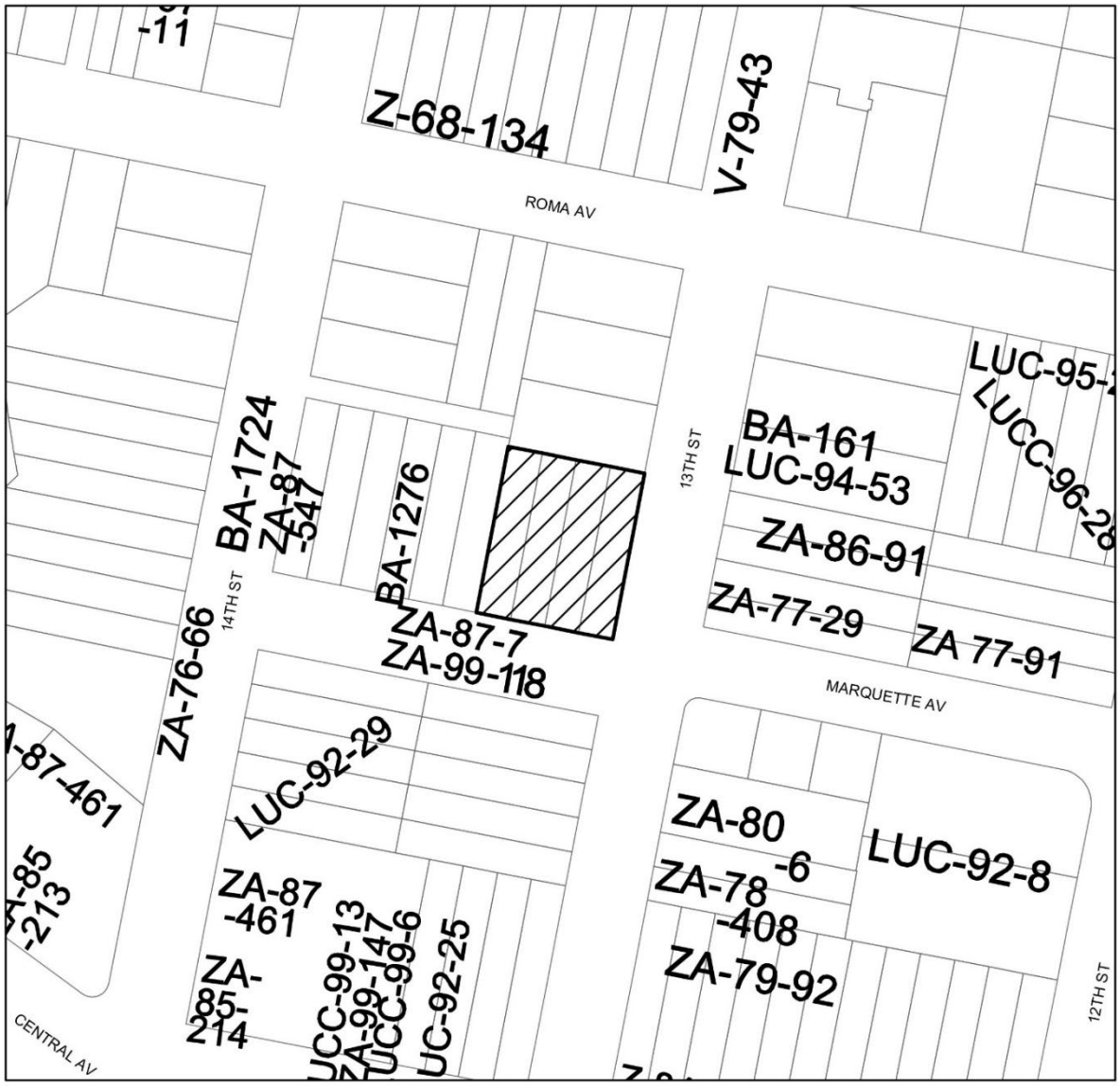
1 inch = 100 feet

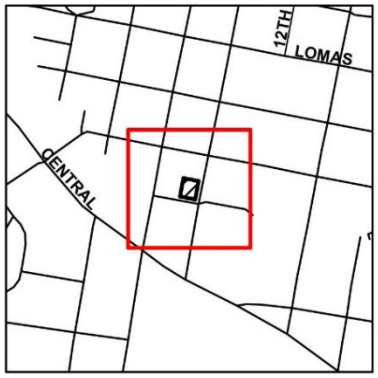
Hearing Date:
4/9/2025
Project Number:

Case Numbers:
HCOA-2025-00009

Zone Atlas Page:
J-13

History





HISTORY MAP

Note: Gray shading indicates County.

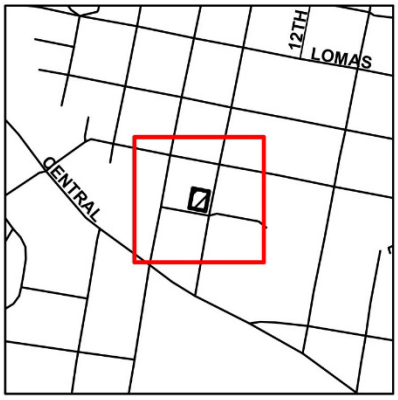
1 inch = 100 feet

Hearing Date:
4/9/2025
Project Number:

Case Numbers:
HCOA-2025-00009

Zone Atlas Page:
J-13

Land Use



LAND USE MAP

Note: Gray shading indicates County.

Key to Land Use Abbreviations

LDRES | Low-density Residential	APRT | Airport
MULT | Multi-family	TRANS | Transportation
COMM | Commercial Retail	AGRI | Agriculture
CMSV | Commercial Services	PARK | Parks and Open Space
OFC | Office	DRNG | Drainage
IND | Industrial	VAC | Vacant
INSMED | Institutional / Medical	UTIL | Utilities
ED | Educational	CMTY | Community
	KAFB | Kirtland Air Force Base

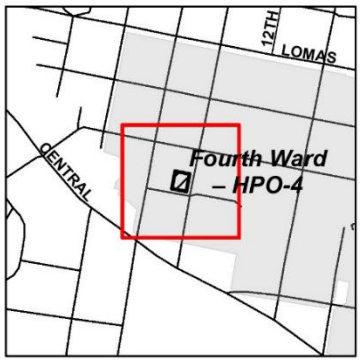
1 inch = 100 feet

Hearing Date:
4/9/2025
Project Number:

Case Numbers:
HCOA-2025-00009

Zone Atlas Page:
J-13

Historic Area



Historic Area

Note: Gray shading indicates County.

1 inch = 100 feet

Hearing Date:
4/9/2025
Project Number:

Case Numbers:
HCOA-2025-00009

Zone Atlas Page:
J-13

II. Introduction

Request	*Certificate of Appropriateness – Alterations*
Historic Location	*Fourth Ward Historic Protection Overlay Zone (HPO-4)*

Area History and Character

	Subject Site	Site to the North	Site to the South	Site to the East	Site to the West
# of Stories	**1**	1 1/2	1 1/2	1	1
Roof Configuration	**Hipped**	Hipped	Hipped	Gabled	Flat
Architectural Style	**Bungaloid**	Bungaloid	Bungaloid	Mediterranean	California Mission Revival
Age of Construction (approx.)	**1913**	c. 1913	c. 1912	1924	c. 1923
Historic Classification	**Contributing**	Contributing	Contributing	Contributing	Contributing
Land Use	**Residential**	Residential	Residential	Residential	Residential

Request

The Certificate of Appropriateness application requests approval for exterior alterations to a contributing property located within the Fourth Ward Historic Protection Overlay Zone (HPO-4). The original proposal included repairing stucco up to the finish floor level to address water damage, replacing deteriorated siding, and upgrading windows to meet International Energy Conservation Code (IECC) standards while preserving the original styles and muntin patterns. The project also proposed reconfiguring the front entry by removing the secondary door, realigning the main entry door with the front façade, and introducing a redesigned front porch façade with a stucco exterior.

The subject property, a Bungaloid-style residence, was originally constructed in 1913 and reflects characteristic elements of early 20th-century residential architecture. The structure features a wood frame with staggered shaker shingles and a 1'-0" stucco finish at the ground level, adding to the building's textured exterior. The roof is hipped with a perpendicular gable and is covered in asphalt shingles. The fenestration consists of a combination of original single-pane windows and later-added sliding windows that do not reflect the home's original design.

A significant modification occurred in 1978 when the property was listed as a duplex, likely prompting substantial alterations to the front façade, including the addition of a secondary entrance. The home retains defining architectural features such as a low-pitched roof with wide eaves and an recessed entrance, elements that contribute to its historical character despite the later modifications.

The 1979 inventory sheet for the property provides limited information, noting only that it is designated as a contributing property to the Fourth Ward Historic District, that significant alterations were made to the front (without further detail), and that the windows are single-pane with some sliding windows.

On March 20, 2025, the applicant/agent received Project Memorandum #2, which addressed concerns regarding discrepancies between the existing and proposed exterior materials shown in the elevation drawings. The current condition of the home reflects the use of wood shaker shingles, while the proposed elevations specified the installation of horizontal wood siding.

This proposed change raised concerns about the potential loss of historic integrity, as the use of horizontal wood siding is not consistent with the building's original materials and character-defining features. As a contributing property within a historic district, maintaining materials and textures consistent with the original design is essential to preserving the structure's historic value.

Site inspection and documentation revealed that the existing wood shingles are in a state of significant deterioration. The condition has rendered repair impractical and financially unfeasible, making full replacement necessary. In light of this, the agent was provided with *Preservation Brief #16: The Use of Substitute Materials on Historic Building Exteriors* (revised 2023), published by the National Park Service, to inform their approach to material replacement in a manner consistent with preservation best practices. Additionally, the applicant received a PDF copy of the Fourth Ward Historic District Guidelines to further assist in evaluation appropriate alternatives that are sympathetic to the district's historic character.

On March 31, 2025, the applicant provided updated drawings and PDFs detailing the proposed material replacements. This review is based on the revised submittal.

The proposal will affect the elevations in the following manner:

<u>East Elevation</u>

The existing concrete steps will remain in place but will be repainted. The secondary wood door and its accompanying steel security gate will be removed. The main entry door, currently located to the left of the recessed porch, will be relocated to face the street, and a new 36-inch wood door will be installed in its place. The depth of the reconfigured porch will be approximately 3'-3 ½".

An existing wood post will be exposed and replicated to help frame the front porch. The current sliding window will be replaced with two single-hung windows, matching those on the south and west elevations. While the applicant is proposing stucco for the porch, the existing front porch is clad in shaker shingles.

Initially, the applicant proposed applying stucco up to the finished floor level to mitigate water damage; however, this approach would compromise the building's historic integrity. As a compromise, staff recommends that the wood shingles on the 13th Street-facing elevation begin 1'-0" above the base of the stairs – replicating existing conditions – rather than starting at the top. This approach will preserve the original design where stucco is present. On the remaining elevations, the use of stucco at the base will be appropriate, as these sides are not visible from the street.

West Elevation

The headers of three windows will be reframed, and the windows will be replaced to match three others on the same façade that are also scheduled for replacement. Staff has noted that if the existing sunporch windows are not retained, they should be replaced with 2/2 double-hung windows to maintain consistency. A condition of approval will be added to ensure compliance with this requirement.

North Elevation

Two sliding glass windows will be replaced with combinations of paired and triple single-hung windows. Similar to the west elevation, the headers of three corner windows will be reframed, and the new windows will match those used throughout the home. The existing stucco exterior will remain intact.

South Elevation

The header of the sliding glass window will be reframed, and the window will be replaced with three single-hung windows. The chimney's existing stucco will remain unchanged, while new wood siding and stucco are proposed.

Landmark Commission's Role

The Landmarks Commission (LC) is reviewing this case because the property is located within an HPO. Pursuant to §14-16-6-2(H)(3)(e): The Landmarks Commission will make decisions on applications for Certificates of Appropriateness – Major for alteration, new construction, or demolition in HPO zones, in accordance with the procedures established in the IDO.

Procedure

Pursuant to IDO §14-16-6-6(D)(2)(c), the Landmarks Commission shall conduct a public hearing on the application and shall make a decision on the application.

Site History

There are no previous cases for the subject site.

Area History

The Fourth Ward Historic District is described in the State and National Register nomination from 1980 as "primarily important for its architecture, for its great variety of fine homes built between 1880 and 1930. As Albuquerque's finest residential area between 1905 and 1923, it also has a cultural significance as the home of many of the city's most influential citizens. Currently, Fourth Ward is valuable as a stable, well-preserved neighborhood on the fringes of the downtown business district."

The original Fourth Ward comprised a much larger area than it does now. The city had been divided into four quadrants demarcated by the railroad running North and South and Central Avenue, then called Railroad Avenue, running East and West. The current Fourth Ward district represents an area located between Villa de Albuquerque or Old Town and the New Town built around the railroad itself.

The area of the current Fourth Ward Historic District became available for development after being sold by the Perea estate in 1887 to the Albuquerque Townsite Company. The area did not begin to flourish until after 1900. By 1908, a number of large homes had been built, making it the more fashionable neighborhood of town. Although it was never exclusively upper-middle class, it was exclusively residential, contrary to other city neighborhoods that had a mix of uses. The area prospered until after the Second World War, when resources went into building new neighborhoods to the east.

The National Registry nomination goes on to say that, "The architectural character and interest of the Fourth Ward District come from the leisurely pace with which it developed and the high quality of houses built there over the years so that the neighborhood boasts a great variety of styles and forms, finely executed. While only one or two houses can claim to be mansions, most are substantial, well-designed homes of well-to-do people. Styles range from Italianate to Period Revival and Prairie School to Bungalow to Pueblo Revival, with building dates for significant and contributing buildings from 1882-1941."

III. Integrated Development Ordinance (IDO)

The application for this request was submitted subsequent to the effective date of August 3, 2024 of the Integrated Development Ordinance (IDO) and is therefore subject to its regulations and processes.

IDO Zoning

In May 2018, the Integrated Development Ordinance replaced the City's Zoning Code, and Article 12: Landmarks and Urban Conservation. The property's zoning converted from SU-2 to R-1A (Single-Family Zone District), §14-16-2-3(B).

Overlay Zones

Historic Protection Overlay (HPO) Zones

The property is located within the Fourth Ward Historic Protection Overlay Zone. The Integrated Development Ordinance (IDO), §14-16-3-5 establishes controls and procedures for Historic Protection Overlay Zones. §14-16-3-5(K) identifies standards and guidelines for HPO-4 (Fourth Ward).

IV. Certificate of Appropriateness – Major

IDO Review and Decision Criteria

Pursuant to IDO §14-16-6-6(D)(3) (Review and Decision Criteria), "An application for a Historic Certificate of Appropriateness – Major shall be approved if it meets all of the following criteria."

(a) The change is consistent with §14-16-3-5 (Historic Protection Overlay Zones), the ordinance designating the specific HPO zone where the property is located, and any specific development guidelines for the landmark or the specific HPO zone where the property is located.

Analysis: Subject to Conditions, the proposal is consistent with the designation ordinance and specific development guidelines for the historic protection overlay zone.

(b) The architectural character, historical value, or archaeological value of the structure or site itself or of any HPO zone in which it is located will not be significantly impaired or diminished.

Analysis: Subject to Conditions, the proposal will not impair or diminish the architectural character, historical value, or archaeological value of the Old Town historic zone.

(c) The change qualifies as a "certified rehabilitation" pursuant to the Tax Reform Act of 1976, if applicable.

Analysis: Not applicable.

(d) The structure or site's distinguished original qualities or character will not be altered. For the purposes of §14-16-3-5 (Historic Protection Overlay Zones) and this §14-16-6-6(D), "original" shall mean as it was at the time of initial construction or as it has developed over the course of the history of the structure.

Analysis: The proposed work is consistent with this criterion. Subject to Conditions, the project will preserve the structure's defining architectural elements and the overall form as they were at the time of initial construction. No alterations are proposed that would obscure or irreversibly alter character-defining features.

(e) Deteriorated architectural features shall be repaired rather than replaced, if possible. If replacement is necessary, the new material shall match the original as closely as possible in material and design.

Analysis: The existing shaker shingles have been evaluated and found to be beyond repair due to extensive deterioration. As a result, replacement is necessary to maintain the integrity of the structure. The new shingles will match the original in shape, size, and design to the greatest extent possible, ensuring consistency with the character of the building.

(f) Additions to existing structures and new construction may be of contemporary design if such design is compatible with its landmark status (if any) or the HPO zone in which it is to be located.

Analysis: The request does not include an addition to the existing structure.

(g) If the application is for a Historic Certificate of Appropriateness – Major for demolition of a landmark or a contributing structure in an HPO zone, demolition shall only be allowed if it is determined that the property is incapable of producing a reasonable economic return as presently controlled and that no means of preserving the structure has been found. In making a determination regarding reasonable economic return, the LC or City Council may consider the estimated market value of the building, land, and any proposed replacement structures; financial details of the property, including but not limited to income and expense statements, current mortgage balances, and appraisals; the length of time that the property has been on the market for sale or lease; potential return based on projected future market conditions; the building's structural condition; and other items determined to be relevant to the application.

Analysis: The request does not include a demolition.

Resolution -046-1991 Designating the Fourth Ward and Eighth and Forrester Historic Overlay Zones (1991)

This resolution designated, mapped, and provided general guidelines for the establishment of the Fourth Ward and Eighth and Forrester Historic Overlay Zones. For this case, this resolution will be referred to only as it applies to the Fourth Ward Historic Overlay Zone and the subject property contained therein, excluding references to the Eighth and Forrester Historic Overlay Zone. Contained within this resolution are general guidelines, from which the specific Fourth Ward Historic Overlay Zone Design Guidelines are derived.

Section 4.A of the designation ordinance states "Alterations or renovations to structures listed as contributing in the Historic Overlay Zones should strive to retain significant, character-defining architectural features of the structure and utilize exterior materials similar to those originally found on the structure. Additions to structures listed as contributing in the Historic Overlay Zones should utilize exterior materials and window alignment similar to those of the original structure and should match the general style and massing of that structure, with the regulations of the underlying zoning determining the maximum allowable building size."

Analysis: Subject to minor design amendments, the proposal is consistent with the designation ordinance.

New Town Neighborhoods Development Guidelines for the Fourth Ward Historic Protection Overlay Zone

The Landmarks and Urban Conservation Commission approved specific development guidelines in 1991 as delegated by Resolution -46-1991. The guidelines were revised in 1998, and again in 2016 when the unform guidelines for New Town Neighborhoods were adopted. The guidelines include direction on such issues as building height, massing, proportion, scale, use of materials in new and existing buildings, relationship between buildings, landscaping, roadways, sidewalks, and the overall neighborhood character.

POLICY – Exterior Walls

Primary historic building materials should be preserved in place whenever feasible. When the material is damaged, then limited replacement, matching the original, may be considered. Primary historic building materials should never be covered or subjected to harsh cleaning treatments.

Guidelines

1. If replacement of deteriorated wall materials or details is necessary, replace only the deteriorated portion in kind rather than the entire feature. Match the original in design, dimension, detail, texture, patter, and material. Consider a compatible substitute material only if using the original is not feasible.

Analysis: The existing shaker shingles have been evaluated and found to be beyond repair due to extensive deterioration. As a result, replacement is necessary to maintain the integrity of the structure. The new shingles will match the original in shape, size, and design to the greatest extent possible, ensuring consistency with the character of the building.

4. Synthetic siding may be appropriate

- The substitute material is similar to the original material in design, dimension, detail, texture, and pattern.

Analysis: The proposed siding is appropriate, as the substitute material will closely match the original in design, dimension, detail, and pattern. The use of Bundle #1 Grade 18" Kiln-Dried Alaskan Yellow Cedar Shingles will be compatible with the existing shingles in appearance and character.

6. When a stuccoed building is to be restuccoed, the original textures, if known, are recommended.

Analysis: Similar textures will be used.

POLICY – Porches and Entrances

Where a porch is a primary character-defining picture of a front facing façade, it should be retained in its original form. If a new (replacement) porch is proposed, it should be in character with the historic building in terms of scale, materials, and detailing.

Guidelines

2. Retain and preserve functional and decorative details, such as porch columns, balustrades, brackets, steps, piers, rails, ceilings, floors, entrance sidelights, transoms, pilasters and pediments.

- If replacement of a deteriorated detail of an entrance or porch is necessary, replace only the deteriorated detail in kind. New details should match the original in design, material, dimension and historic placement on the building.

Analysis: The proposed work is generally consistent with the applicable design guidelines for porches and entrances, as it retains and restores key architectural features while ensuring compatibility with the historic character of the structure. The existing concrete steps will be preserved and repainted, and the removal of the secondary door and security gate will help restore a more historically appropriate configuration. Relocating the main entry door to face the street and installing a new 36-inch wood door maintains material and scale compatibility, while the porch reconfiguration and replication of the existing wood post are consistent with standards for in-kind replacement. The replacement of the non-original sliding window with two single-hung windows that match those on adjacent elevations further supports visual consistency.

POLICY – Windows and Doors

The character-defining features of historic windows and doors and their distinct arrangements shall be preserved. In addition, new windows and doors should be in character with the historic buildings. This is especially important on primary facades.

Guidelines

1. Retain and preserve the position, number, size and arrangement of historic windows and doors.

2. Replacement of windows and doors that have been altered and no longer match the historic appearance is recommended.

4. Retention and repair of original windows is the preferred option. If replacement of a historic window or door feature is necessary, consider replacing only the deteriorated feature in kind rather than the entire unit.

- If replacement of a historic window or door feature is necessary, the replacement window or door shall match the original as closely as possible in size, proportion, operation (i.e., sash or casement) mullion pattern and material. The size of the opening shall not be altered.
- Snap-in muntins and mullions may be acceptable for new or replacement window units on facades not visible from the public right-of-way. Snap in features should convey the scale and finish of true muntins and mullions. Snap-in muntins and mullions should be used on both the interior and exterior of the window.
- The use of plastic, vinyl, metal or other unsympathetic materials is discouraged; excepting that wood windows with exterior aluminum cladding may be approved. Metal frame windows may be used when replacing historic metal windows.

Analysis: The proposal will comply with the guidelines for preserving the position, number, size, and arrangement of historic windows and doors. Where replacement is proposed, it is in response to prior alterations or deterioration that have compromised the historic appearance and functionality. The proposed replacement windows and doors are intended to match the original features as closely as possible in size, proportion, operation, mullion pattern, and material.

On the east elevation, a new 36-inch wood door is proposed and the existing sliding windows will be replaced with single-hung windows which will match those on the south and west elevations, restoring consistency across the façade. On the west and north elevations, the headers will be reframed. Staff has noted that if the existing sunporch windows are not retained, they should be replaced with 2/2 double-hung windows to

maintain consistency. A condition of approval will be added to ensure compliance with this requirement.

Neighborhood/Public

Notification letters of the application were sent out on March 11, 2025. They were mailed to property owners within the 160-foot radius of the site. In addition, the Downtown Neighborhood Association, Raynolds Addition Neighborhood Association and the Huning Castle Neighborhood Association were notified of the application via email on March 12, 2025.

As of the writing of this staff report, no individuals have reached out to express either opposition or support for the request.

The requisite signs (two) were posted at the property giving notification of this application.

V. Conclusion

The proposed exterior modifications to this contributing property within the Fourth Ward Historic Protection Overlay Zone (HPO-4) are consistent with the applicable standards and guidelines of the Integrated Development Ordinance and the Fourth Ward Historic District. The revisions submitted in response to staff feedback demonstrate the applicant's willingness to align the project with preservation best practices, particularly with regard to material selection, window configuration, and porch design. While the replacement of original materials is not typically preferred, the applicant has provided sufficient documentation of deterioration and selected replacement materials that match the original in design, texture, and dimension, ensuring the continued preservation of the structure's historic character.

Staff concludes that the project is eligible for a Certificate of Appropriateness, subject to the Conditions of Approval.

Findings, Certificate of Appropriateness – Major

Project #: HCOA-2025-00009

1. The application is a request for a Certificate of Appropriateness for alterations at 305 13th Street NW, and legally described as Block 16, South half of Lots 17, 23, 24, 25, Perea Addition. The subject site is 0.15 acres and zoned R-1A.
2. The property is a contributing property within the Fourth Ward Historic Protection Overlay Zone (HPO-4).
3. The subject site is a Bungaloid-style residence, originally constructed in 1913 and reflects characteristic elements of early 20th-century residential architecture. The structure features a wood frame with staggered shaker shingles and a 1'-0" stucco finish at the ground level, adding to the building's textured exterior. The roof is hipped with a perpendicular gable and is covered in asphalt shingles. The fenestration consists of a combination of original single-pane windows and later-added sliding windows that do not reflect the home's original design.
4. Proposed changes include replacing deteriorated wood, shaker shingles, window replacements that will match the original style, and reconfiguring the front entry to improve architectural articulation while restoring the façade. Additional work includes correcting window headers, removing non-original security bars, and adjusting window placement for visual continuity.
5. Section 14-16-6-6(D) of the Integrated Development Ordinance states that within the boundaries of an HPO zone, the exterior appearance of any structure shall not be altered, new structures shall not be constructed, and existing structures shall not be demolished until a Certificate of Appropriateness has been duly approved.
6. Pursuant to IDO §14-16-6-6(D)(3) (Review and Decision Criteria), "An application for a Historic Certificate of Appropriateness – Major shall be approved if it meets all of the following criteria."

   (a) The change is consistent with §14-16-3-5 (Historic Protection Overlay Zones), the ordinance designating the specific HPO zone where the property is located, and any specific development guidelines for the landmark or the specific HPO zone where the property is located.

   Analysis: Subject to Conditions, the proposal is consistent with the designation ordinance and specific development guidelines for the historic protection overlay zone.

   (b) The architectural character, historical value, or archaeological value of the structure or site itself or of any HPO zone in which it is located will not be significantly impaired or diminished.

Analysis: Subject to Conditions, the proposal will not impair or diminish the architectural character, historical value, or archaeological value of the Old Town historic zone.

(c) The change qualifies as a "certified rehabilitation" pursuant to the Tax Reform Act of 1976, if applicable.

Analysis: Not applicable.

(d) The structure or site's distinguished original qualities or character will not be altered. For the purposes of §14-16-3-5 (Historic Protection Overlay Zones) and this §14-16-6-6(D), "original" shall mean as it was at the time of initial construction or as it has developed over the course of the history of the structure.

Analysis: The proposed work is consistent with this criterion. Subject to Conditions, the project will preserve the structure's defining architectural elements and the overall form as they were at the time of initial construction. No alterations are proposed that would obscure or irreversibly alter character-defining features.

(e) Deteriorated architectural features shall be repaired rather than replaced, if possible. If replacement is necessary, the new material shall match the original as closely as possible in material and design.

Analysis: The existing shaker shingles have been evaluated and found to be beyond repair due to extensive deterioration. As a result, replacement is necessary to maintain the integrity of the structure. The new shingles will match the original in shape, size, and design to the greatest extent possible, ensuring consistency with the character of the building.

(f) Additions to existing structures and new construction may be of contemporary design if such design is compatible with its landmark status (if any) or the HPO zone in which it is to be located.

Analysis: The request does not include an addition to the existing structure.

(g) If the application is for a Historic Certificate of Appropriateness – Major for demolition of a landmark or a contributing structure in an HPO zone, demolition shall only be allowed if it is determined that the property is incapable of producing a reasonable economic return as presently controlled and that no means of preserving the structure has been found. In making a determination regarding reasonable economic return, the LC or City Council may consider the estimated market value of the building, land, and any proposed replacement structures; financial details of the property, including but not limited to income and expense statements, current mortgage balances, and appraisals; the length of time that the property has been on the market for sale or lease; potential

return based on projected future market conditions; the building's structural condition; and other items determined to be relevant to the application.

Analysis: The request does not include a demolition.

7. Notification letters of the application were sent out on March 11, 2025. They were mailed to property owners within the 160-foot radius of the site. In addition, the Downtown Neighborhood Association, Raynolds Addition Neighborhood Association, and the Huning Castle Neighborhood Association were notified of the application via email on March 12, 2025.
8. As of the writing of this staff report, no individuals have reached out to express either opposition or support for the request.
9. The application was reviewed against relevant guidelines for the Fourth Ward HPO and the Review and Decision Criteria of a Certificate of Appropriateness in the Integrated Development Ordinance (IDO) §14-16-6-6(D)(3).
10. Subject to conditions of approval, Staff considers the proposal consistent with the Fourth Ward HPO guidelines and the Review and Decision Criteria for a Certificate of Appropriateness.

Recommendation

APPROVAL of Project #: HCOA-2025-00009, an application for a Certificate of Appropriateness – Major for Alterations, located at 305 13th Street NW, described as Block 16, South half of Lots 17, 23, 24, 25, Perea Addition in the Fourth Ward Historic Protection Overlay Zone (HPO-4), based on the above ten (10) Findings and subject to the following Conditions of Approval.

Recommended Conditions of Approval

1. The replacement siding must replicate the original design, texture, dimension, and pattern of the existing shaker shingles.
2. All replacement windows shall match the original size, configuration, and operation while maintaining or restoring the original muntin patterns.
3. All work shall be executed in accordance with the revised drawings and material specifications submitted on March 31, 2025. Any deviations must be reviewed and approved by Landmarks staff prior to implementation.
4. The applicant is responsible to acquire, and approval is contingent upon, all applicable permits and related approvals.
5. The sunporch windows are to be retained or replaced to match the 2/2 double hung windows.

Silvia Bolivar

Silvia Bolivar, PLA ASLA
Historic Preservation Planner
Urban Design and Development Division

Notice of Decision list:

Cc: Richard Pham
LC File
Legal Department

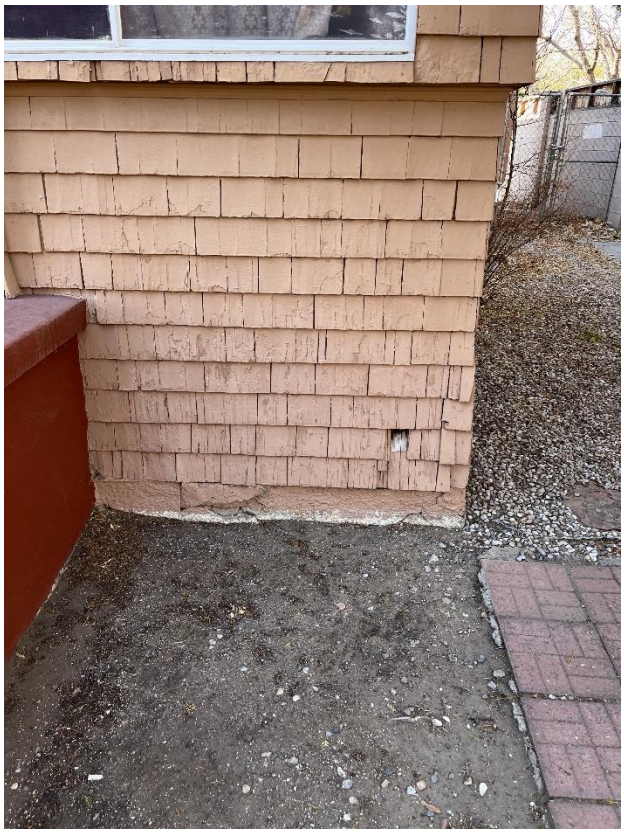
A) PHOTOGRAPHS

Figure 1: Existing Conditions

Figure 2: Existing Conditions

Figures 3-4: Existing Conditions

Figures 5-8: Existing Conditions



Figures 9-12: Existing Conditions

Figures 13-14: Posted Sign Request

B) APPLICANT INFORMATION

Gmail **Richard P <richnpham@gmail.com>**

305 13th St NW Upgrades

Richard P <richnpham@gmail.com> Tue, Mar 11, 2025 at 10:54 AM
To: "Naji, Leslie" <lnaji@cabq.gov>
Cc: "Bolivar, Silvia A." <sabolivar@cabq.gov>, "Hadi, Nasima Amin" <nhadi@cabq.gov>

Hi Leslie,

After reviewing the amount of work on the exterior, I believe this will push us to a Major Application, but please let me know otherwise. I believe the deadline for this month is tomorrow, so I'm hoping to put everything together today and early tomorrow. Would you be able to help me with getting everything together so that we can make it to this month's review session?

Below is a summary of work and attached are some photos to help illustrate.

General Changes:

- There currently is stucco at the base of the home. We are proposing to do new stucco up to the finish floor, aligned with the entry stairs. This is mainly to help alleviate water damage that has occurred at the base of exterior siding as well as water damage to the foundation.
- We propose to replace all exterior siding with new wood siding as the current siding is damaged in various places and the paint done in the past is flaking everywhere.
- Replace windows throughout to conform with IECC and current code (match window types and existing siles and muntins)

Front Entry (east side facing 13th St) Changes:

- We are proposing to redo the front entry area as there are a few issues which I am presuming conflict with its historic nature
- First, we are proposing to remove the secondary door which has a
- Currently the main entry door is recessed on the side of the deep entryway; we are proposing a new door at the face, and redoing the front porch facade to better articulate the front facade. I plan to include some drafted plans and elevations to better explain these changes (which are not ready at this time).
- New paint on the porch stairs

South Side Changes (facing Marquette):

- There is one window we would like to raise to match the window head heights on this elevation.
- Remove security bars that exist on one window

West Elevation Changes (along the backyard):

- We need to reframe a series of windows on the northwest corner of the home as these windows do not have headers. We plan to match the window head height of the adjacent.

If you don't mind, I'd like to give you call and talk through this in more detail as I know that getting all of this ready by tomorrow is a tall task to ask of. Appreciate all your help on this.

Kind regards,
Richard Pham

Photo Summary of Work.pdf
357K

FRONT FACADE
EAST ELEVATION FACING 13TH STREET


ROOF & ROOF ELEMENT TO REMAIN, NEW PAINT ON UNDERSIDE AND RAFETERS
WOOD SIDING
COLUMN MOTIF TO MATCH
NEW DOOR
REPLACE WINDOW TO MATCH
COLUMN MOTIF TO MATCH
WOOD SIDING
REMOVE DOOR
STUCCO
NEW PAINT


REPLACE WINDOW TO MATCH
NEW DOOR
WOOD SIDING
STUCCO


REPLACE SINGLE HUNG WINDOWS WITH NEW, MATCH STILES AND MUNTINS
REMOVE SECURITY BARS
SOUTH FACADE
FACING MARQUETTE AVE NW


REPLACE WINDOW &
RAISE TO MATCH HEAD OF
ADJACENT WINDOWS
WOOD
SIDING
STUCCO
SOUTH FACADE
FACING MARQUETTE AVE NW


WILL REMOVE AC AND REPLACE WINDOW TO MATCH
REPLACE WINDOW TO MATCH, BUT WILL NEED TO REDUCE HEIGHT TO CORRECT WINDOW HEADER.
REMOVE / RELOCATE THESE LINE IF POSSIBLE
WEST FACADE (BACK YARD)

LC PRE-APPLICATION MEETING

Landmarks Commission

APPLICANT: Richard Pham **DATE** March 11, 2025

AGENCY REPRESENTATIVES PRESENT AT MEETING:

X☐ **Leslie Naji**

☐ **Silvia Bolivar**

☐ **Others** _____

1. WHAT IS THE ADDRESS OF THE SUBJECT PROPERTY?

305 13th St NW

2. WHAT IS THE NATURE OF THE PROJECT

Replace existing wood shingle siding with horizontal wood siding;
Stucco base of house
Remove sliding aluminum windows with windows to match existing 6/1 double hung windows.
Reconfigure front porch
Replace windows in sunroom

3. SUMMARY OF DISCUSSION (continued over)

Provide better elevations and site plan.
Retain windows in sunporch or replace to match 2/2 double hung windows.
Consider maintaining/repairing wood shingles on the front porch area to acknowledge it was there and use horizontal siding that will be of the same dimension as a row of shingles, probably 4-6 inches. Planks over 6 inches will not be approved.

NOTE: **Pre-application discussions are provided to assist applicants in acquiring information on process, guidelines and requirements pertaining to their request. Interpretation of zoning requirements is the responsibility of the zoning enforcement officer, as provided for by the comprehensive zoning code. Any statements regarding zoning at the pre application discussion are intended solely to direct the applicant to seek further information.**

4. SIGN AND DATE TO VERIFY ATTENDANCE & RECEIPT OF THIS SUMMARY
(PRE-APPLICATION DISCUSSIONS ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE NON-BINDING)

Leslie Naji 3.11.25 — **STAFF / DATE**

Richard Pham 3.12.2025 — **APPLICANT OR AGENT / DATE**

PROJECT DRAWING CHECKLIST
Administrative Decision

Landmarks Commission

The following checked items indicate the minimum information that will be required for review of your application. You must submit all information indicated by the Planner.

1 copy for an Administrative Decision

Site Plan:

X Drawing scaled 1"=10' for 1 or 2 lots, 1"=20' for 3 or more lots. Features must be precisely located and dimensioned. The site plan must indicate ALL the following:

1. Existing and proposed structures on the subject property
2. Existing structures on adjacent properties if within 10'-0" of the property line for residential projects or within 25'-0" of the property line for nonresidential projects
3. Walls and fences -- location, height, material and design
4. Property lines
5. Parking requirements for non-residential projects
6. Public and private easements
7. Public and private streets and alleys -- correct names and dimensions
8. Graphic scale and dimensions of elements on the site plan
9. North arrow

Landscape Plan: Site includes 3 lots or more, OR the project is in Old Town or Old Town Buffer Zone.

__ Landscape Plan scaled 1" =10' for 1-2 lots or 1" =20' for 3 or more lots. It should include ALL existing and proposed hard surfaces, gravel or rock surfaces, shrubbery, trees, planting beds, grass areas, ground cover .

Building drawings: Building drawings scaled 1/4" =1' for residential or 1/8" =1' for nonresidential

___ **Floor plans** - existing and proposed, to indicate all existing and proposed door and window openings on floor plans

_X_ **Building or structure elevations** - existing and proposed, to indicate materials, heights and the locations of all new and existing windows, door openings and significant architectural elements. Must be dimensioned.

___ **Infill projects:** submittal must include:
for multi-unit or single-unit residential projects on 1 or 2 lots, a street elevation which includes adjacent lots and building elevations on either side.

__ **Door and window summary:** including materials, sizes and style

__ **Project is in Old Town or Buffer Zone**: Indicate all signs: locations, heights, dimensions, and colors.

Detail Drawings:

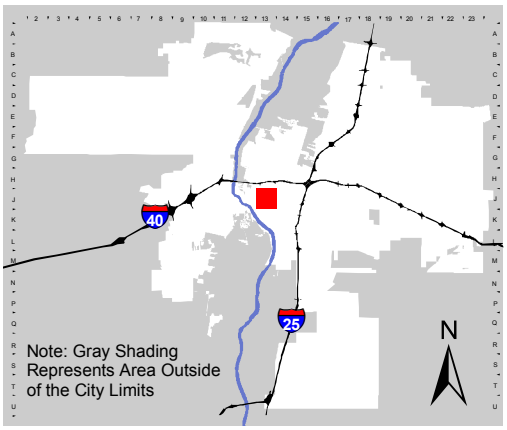
___	Building Sections	__	Window detail	__	Fencing
___	Wall Sections	__	Door details	_X_	Any drawings the contractor might use (if any) siding detail

Other supporting documentation:

X Pictures of existing buildings, structures and site conditions
__ Financial documents
__ Reports from other local, state and/or federal agencies
__ Other documentation as specified :

By :_____ L C Planner

For more current information and details visit: www.cabq.gov/gis



Address Map Page: Site: 305 13th St NW

J-13-Z

Map Amended through:
3/17/2017

Albuquerque Geographic Information System

These addresses are for informational purposes only and are not intended for address verification.

0 750 1,500 Feet

ANDERSEN™
WINDOWS & DOORS

100 SERIES

A MODERN LOOK
THAT'S EASY ON THE BUDGET.

2022 PRODUCT GUIDE FOR PROFESSIONALS

CONTENTS

For warranty information, visit **andersenwindows.com/warranty**.

ENERGY STAR AWARD 2021
PARTNER OF THE YEAR
Sustained Excellence

Andersen Corporation, including its subsidiaries, has been named a 2021 ENERGY STAR Partner of the Year – Sustained Excellence Award winner, the highest honor given by ENERGY STAR, for continued leadership in protecting the environment through superior energy efficiency achievements.

AMERICA'S MOST LOVED BRAND OF WINDOWS & DOORS.*

You want to give your customers a home they love, and we're here to make that easy for you. That's why we're proud to offer you products that rate #1 in quality and performance,** and to be the #1 trusted and recommended window and door brand** by pros.

100 SERIES PRODUCTS

The best way to give your customers a modern look that's within budget and lasts† The 100 Series product line is made from our proprietary Fibrex® material that's energy efficient, environmentally responsible and stronger than vinyl.

*2020 Andersen brand surveys of U.S. realtors, contractors and builders.
**2020 Andersen brand surveys of U.S. contractors, builders and architects. †See the limited warranty for details.

PERFORMANCE

100 Series products simply perform like modern windows and doors should. They're made from our proprietary Fibrex® material, which is extremely low maintenance and blocks thermal transfer 700 times better than aluminum to help your customers save money on heating and cooling costs.

ATTRACTIVE CORNER SEAMS

Low-visibility corner seams for a cleaner and more modern look.

COLORS THAT LAST

Durable factory-finished interiors and exteriors never need painting and won't fade, flake, blister or peel,* even in extreme cold or heat.

ATTRACTIVE MATTE INTERIORS

Premium matte finish isn't shiny like vinyl and is available in white, Sandtone, dark bronze and black.**

ENERGY EFFICIENT IN EVERY CLIMATE

Energy-efficient 100 Series products are available with options that make them ENERGY STAR® certified throughout the U.S. so they can help reduce heating and cooling bills.

Visit **andersenwindows.com/energystar** for more information and to verify that the product with your glass option is certified in your area.

ASK ABOUT ENERGY STAR

DESIGNED FOR PERFORMANCE

100 Series products are designed to meet or exceed performance requirements in all 50 states† See pages 103-104 for details.

PG50†† PERFORMANCE OPTIONAL PERFORMANCE UPGRADE
100SHS4066 DPUP +50/-50
(AAMA/WDMA/CSA 101/I.S.2/A440-08 & -11)

EASY TO OPERATE FOR YEARS TO COME

All 100 Series products are tested to the extreme to deliver years* of smooth, reliable operation.

SUPERIOR WEATHER RESISTANCE

Our weather-resistant construction seals out drafts, wind and water so well that your reputation is protected whatever the weather.

QUALITY SO SOLID, THE WARRANTY IS TRANSFERABLE*

Many other window and door warranties end when a home is sold, but our coverage — 20 years on glass, 10 years on non-glass parts — transfers from each owner to the next. And because it's not prorated, the coverage offers full benefits year after year, owner after owner. So it can add real value when you decide to sell your home.

OWNER2OWNER® LIMITED WARRANTY

*Visit andersenwindows.com/warranty for details.
**Products with Sandtone, dark bronze and black interiors have matching exteriors.
†See your local code official for code requirements in your area.
††100SHS4066 DPUP IG +50/50 (AAMA/WDMA/CSA 101/I.S.2/A440-08 & -11). Optional PG50 performance grade upgrade is available for most sizes. For more information, visit andersenwindows.com/100series.
"ENERGY STAR" is a registered trademark of the U.S. Environmental Protection Agency.

DURABILITY

Think vinyl, only stronger. The proprietary Fibrex® material in our 100 Series products has all the benefits of vinyl while holding up better to weather and wear. This way, your customers' windows and doors are better protected from warping and cracking, even in tough climates*.

FIBREX® MATERIAL 12X THICKER FINISH THAN PAINTED VINYL**

The finish on 100 Series products has superior scratch resistance compared to painted vinyl windows** so they'll look beautiful for years to come.

FIBREX® MATERIAL 2X STRONGER THAN VINYL

Fibrex material retains its stability and rigidity in all climates, delivering exceptional durability. It makes our 100 Series products rigid and strong so the weathertight seals stay weathertight.

FIBREX® MATERIAL WITHSTANDS 150° TEMPERATURES

100 Series products can withstand temperatures up to 150°F, even for dark colors, meaning they won't warp due to sun exposure.

*See the limited warranty for details.
**When 100 Series products were tested against five leading competitors' painted vinyl window products.

FIBREX® MATERIAL

Developed by Andersen, Fibrex material is a revolutionary structural composite material that blends the very best attributes of vinyl and wood. Fibrex material saves on natural resources because it's composed of 40% reclaimed wood fiber by weight. Special polymer formulations surround and fill each wood fiber, enabling top performance. The result is a material that provides uncommon value and enhances the quality of any project. In use for over two decades in Andersen® products, Fibrex material has proven its strength and durability in all types of climates.

REVOLUTIONARY BUILDING MATERIAL

- Twice as strong as vinyl so weathertight seals stay weathertight
- Blocks thermal transfer nearly 700 times better than aluminum to help reduce heating and cooling bills
- Retains its stability and rigidity in all climates for exceptional durability
- Offers superior scratch resistance compared to painted vinyl*

ENVIRONMENTALLY RESPONSIBLE

- Since Andersen developed the highly sustainable Fibrex material, reuse of waste wood fiber has prevented the harvesting of nearly 90 million board feet of timber
- 100 Series products can help builders earn LEED® points in three key categories: Energy & Atmosphere, Materials & Resources and Indoor Environmental Quality
- 100 Series products meet or exceed California Section 01350 Specification, a California indoor emission standard — one of the toughest in the country
- Like all Andersen products, 100 Series products are designed to last** and help reduce future waste streams

CERTIFIED INDOOR AIR QUALITY SCS GLOBAL SERVICES
INDOOR ADVANTAGE GOLD BUILDING MATERIALS

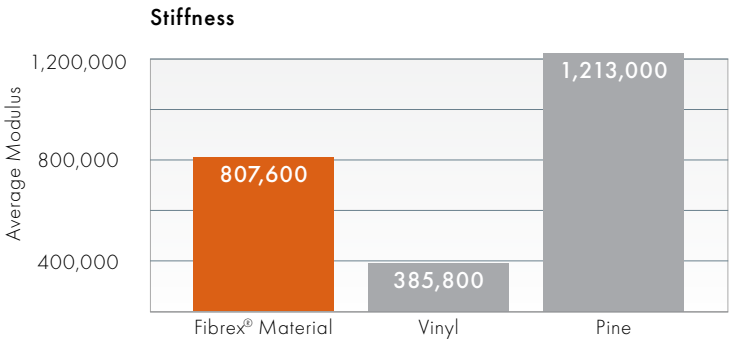
CERTIFIED RECYCLED CONTENT SCS GLOBAL SERVICES

See how Andersen created Fibrex material at **andersenwindows.com/fibrex**.

*Visit andersenwindows.com/warranty for details.
**When tested against five leading competitors' painted vinyl window products.

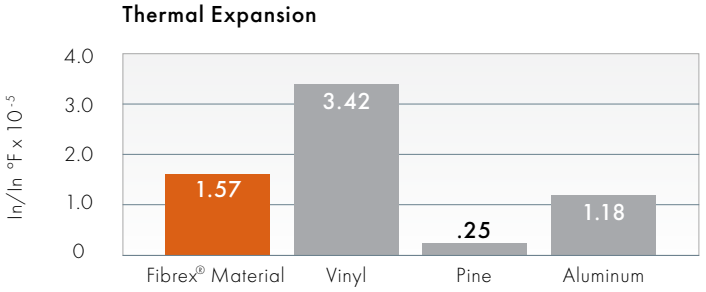
STABLE & PREDICTABLE

Fibrex® material is twice as stiff as vinyl. This strength makes it a better choice over time.



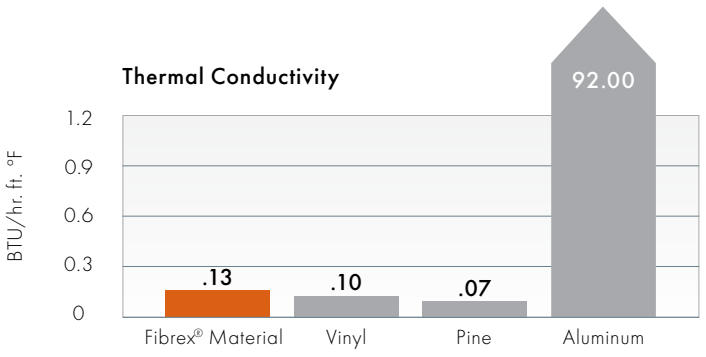
DURABLE & RELIABLE

All materials expand and contract when exposed to extreme temperatures. In these types of conditions, Fibrex material performs twice as well as vinyl, which can bow and crack over time.



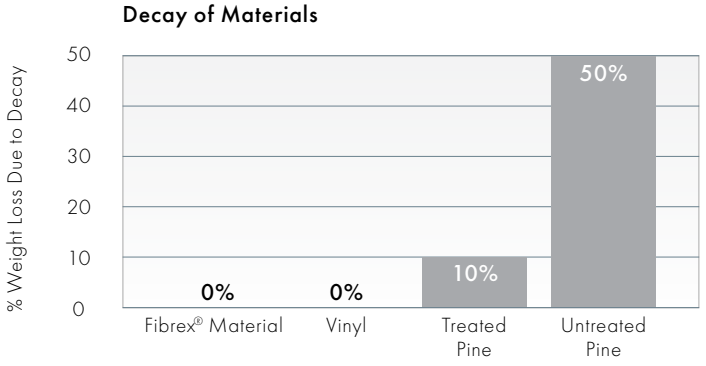
EXCELLENT INSULATOR

The built-in thermal qualities of Fibrex material mean that less heat and cold get transferred through the product into your customers' homes. As an insulator, it's on par with vinyl and far superior to aluminum.



MOISTURE RESISTANT

Because Fibrex material combines wood fiber and a special polymer formula, water has a tough time penetrating. The result is an increased resistance to rot.



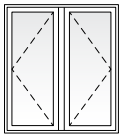
HEAT RESISTANT

Fibrex material can withstand temperatures in excess of 150°F, even for dark colors, making it a great fit for your projects in hot climates.

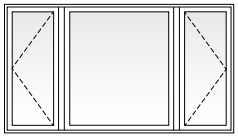
WINDOW & DOOR TYPES

CASEMENT & AWNING WINDOWS

Casement windows are hinged on the side and open outward to the left or right, while awning windows are hinged at the top and open outward. Both are also available as non-operating stationary windows.



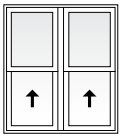
Twin Casement



Picture With Flanking Casements

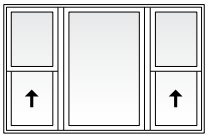
SINGLE-HUNG WINDOWS

Single-hung windows feature a fixed upper sash with an operable lower sash that slides up and down. For convenience, the hardware locks automatically when the window is closed. An arch single-hung is also available to add architectural interest.



Twin Single-Hung

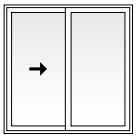
Arch Single-Hung



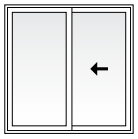
Picture With Flanking Single-Hungs

GLIDING WINDOWS

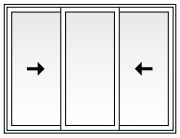
Gliding windows have one stationary sash and one operating sash that glides horizontally. A three-sash configuration, where two sash glide past a fixed center sash, is also available.



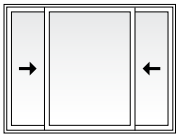
Gliding
Active-Stationary



Gliding
Stationary-Active



Gliding
Active-Stationary-Active, 1:1:1 Sash Ratio



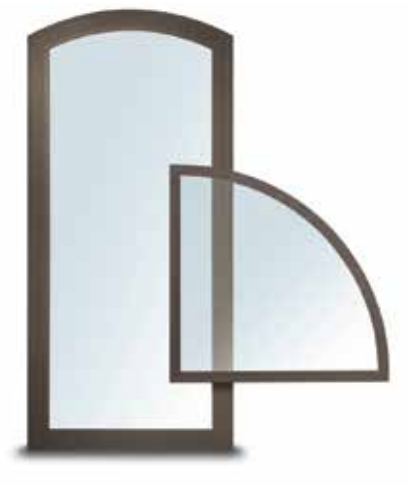
Gliding
Active-Stationary-Active, 1:2:1 Sash Ratio

CUSTOM SIZES

Available in custom sizes to fit all projects.

PICTURE, TRANSOM & SPECIALTY WINDOWS

Choose from a variety of shapes to make a signature statement or provide a delicate lighting accent. Shapes include picture, transom, half circle, quarter circle, circle, Springline™ and arch windows. Custom shapes are also available, including unequal leg arch, trapezoid, pentagon, octagon and triangle windows.



GLIDING PATIO DOORS

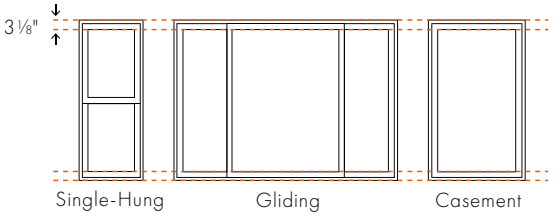
Patio doors feature one stationary panel and one operating panel that glides smoothly on adjustable rollers. They feature a multi-point locking system for enhanced security and an optional exterior keyed lock for convenience. Sidelights and transoms are also available.

FIBREX® MATERIAL

STRONG ON PERFORMANCE.

NEW CONSTRUCTION

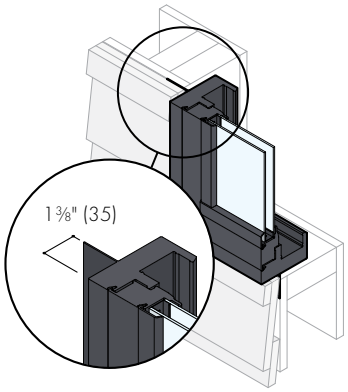
You'll find a 100 Series window or door to match any project from commercial to residential — no matter the location. And with uniform sight lines, it's easy to specify 100 Series products for the entire project.



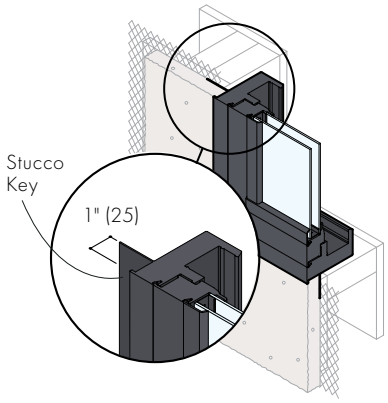
- 3⅛" (79) uniform sight lines allow for easy specification.
- An extension jamb attachment flange is available for easy application of extension jambs on the job site.
- Single-hung drywall pass-through windows have an upper sash that can be easily removed on the job site after the window is installed. With both sash removed, drywall can easily fit through upper floor windows.

FRAME TYPES: 1⅜" Flange Setback or 1" Flange Setback With Stucco Key

For new construction, both frames have an integral installation flange that makes installation into a new opening easy and helps make sure the windows and doors are weathertight. For stucco exteriors, choose the frame with the stucco key to eliminate gaps that can result from the natural contraction of exterior stucco.



1⅜" (35) Flange Setback



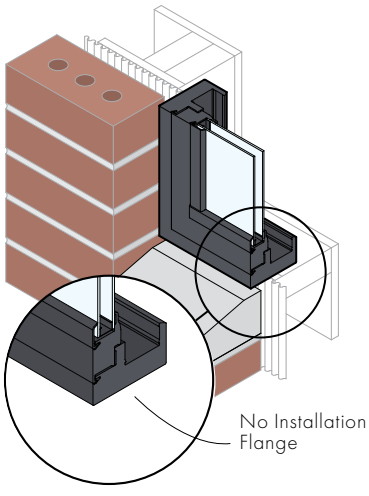
1" (25) Flange Setback With Stucco Key

REMODELING & REPLACEMENT

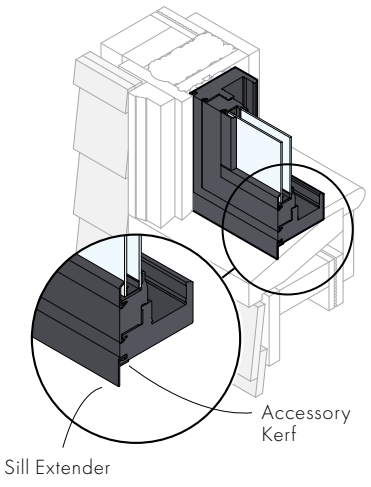
Whether you're adding or updating, Andersen® 100 Series windows and patio doors enhance any project with a variety of styles, shapes and colors, with custom sizing in ⅛" (3) increments. The no-flange frame options include pre-drilled, through-the-jamb installation holes and installation screws to save you time.

FRAME TYPES: No Flange or Insert

The no flange frame allows for full removal of an existing window in situations where the frame is rotten or damaged. The no flange window is then installed into the existing rough opening. The insert frame provides fast and easy window replacement when installing the window into an existing window frame without disturbing the interior or exterior trim, saving time and money. The exterior accessory kerf allows for convenient finishing of the window. An exterior sill extender is available to fill the gap at the sill. Exterior frame extenders and a head expander are also available.



No Flange



Insert

Dimensions in parenthesis are in millimeters.

EXTERIOR & INTERIOR COLORS

100 Series windows and patio doors come in five exterior colors, including dark bronze and black – colors that are darker and richer than those of most vinyl windows. The interiors feature a premium matte finish for an attractive appearance.

EXTERIOR COLORS

White | Sandtone | Terratone | Dark Bronze | Black

INTERIOR COLORS

White | Sandtone* | Dark Bronze* | Black*

*Products with Sandtone, dark bronze and black interiors have matching exteriors.
Printing limitations prevent exact duplication of colors. See your Andersen supplier for actual color samples.

HARDWARE

Casement & Awning Windows

Antique Brass | Black | Dark Bronze
Sandtone | Satin Nickel | White

Folding handles avoid interference with window treatments.

Single-Hung & Gliding Windows

Standard Lock Optional Lift/Pull

Hardware color matches the window's interior color. Shown in white.

Optional Metal Slim Line Lock

Antique Brass | Black | **Dark Bronze**
Sandtone | Satin Nickel | White

Both lock styles automatically engage when window is closed.

Bold name denotes finish shown.

Gliding Patio Doors

Standard Handle

TULSA

Exterior handle matches the door's exterior color. Interior handle matches the door's interior color. Dark bronze exterior and white interior shown.

Optional Handle

AFTON

Antique Brass | Black
Bright Brass | **Satin Nickel**

Optional auxiliary foot lock is available to secure the gliding panel and provides an extra measure of security when the door is in a locked position. See page 92.

Bold name denotes finish shown.

Printing limitations prevent exact replication of colors and finishes. See your Andersen supplier for actual color and finish samples.

GLASS OPTIONS

Andersen has the glass you need to get the performance you want, with options for every climate, project and customer. Check with your supplier for the selections that meet ENERGY STAR® requirements in your area.

GLASS		ENERGY		LIGHT	
		U-Factor How well a product prevents heat from escaping.	Solar Heat Gain Coefficient How well a product blocks heat caused by sunlight.	Visible Light Transmittance How much visible light comes through a product.	UV Protection How well a product blocks ultraviolet rays.
SmartSun™	Thermal control similar to tinted glass, with visible light transmittance similar to Low-E glass.	●●●○	●●●●	●●◐○	●●●●
SmartSun with HeatLock® Coating	Applied to the room-side surface, it reflects heat back into the home and improves U-Factor values.	●●●◐	●●●●	●●○○	●●●●
Low-E	Outstanding overall performance for climates where both heating and cooling costs are a concern.	●●●○	●●●○	●●●○	●●●○
Low-E with HeatLock Coating	Applied to the room-side surface, it reflects heat back into the home and improves U-Factor values.	●●●◐	●●●○	●●◐○	●●●○
Sun	Outstanding thermal control in southern climates where less solar heat gain is desired.	●●●○	●●●●	●○○○	●●●○
PassiveSun®	Ideal for northern, passive solar construction applications where solar heat gain is desired.	●●◐○	●○○○	●●●○	●●◐○
PassiveSun with HeatLock Coating	Applied to the room-side surface, it reflects heat back into the home and improves U-Factor values.	●●●○	●○○○	●●◐○	●●◐○
Clear Dual-Pane	High visibility with basic thermal performance.	●○○○	○○○○	●●●●	○○○○

Center of glass performance only. Ratings based on glass options as of January 2022. Visit andersenwindows.com/energystar for ENERGY STAR map and NFRC total unit performance data.

HEATLOCK TECHNOLOGY

Applied to the room-side glass surface, HeatLock coating reflects heat back into the home for improved performance.

TIME-SAVING FILM

We protect our products during delivery and construction with translucent film on the glass that peels away for a virtually spotless window.

For more details on our glass options, visit **andersenwindows.com/glass**.

ASK ABOUT ENERGY STAR

ADDITIONAL GLASS OPTIONS

Tempered safety glass is standard on patio doors and required for larger window sizes.

Patterned glass lets in light while obscuring vision and adds a unique, decorative touch. Cascade and Reed patterns can be ordered with either a vertical or horizontal orientation.


Cascade


Fern


Obscure


Reed


Satin Etch

GLASS SPACER OPTIONS

In addition to stainless steel glass spacers, black glass spacers are now available as a standard offering to provide another way to customize project designs and achieve a contemporary style. Black glass spacers blend in with the color of the window or door for a sleek design, or serve as a shadow line.

Add full divided light grilles, and the grille spacer bar between the glass will match the selected glass spacer color.

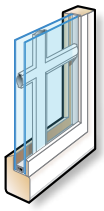

Black


Stainless Steel

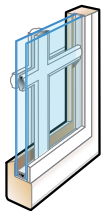
"ENERGY STAR" is a registered trademark of the U.S. Environmental Protection Agency.

GRILLE OPTIONS

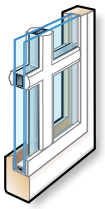
Grilles for Andersen® 100 Series windows and patio doors are available in a wide variety of patterns to complement virtually any style of home. Plus, they have options for easy cleaning and architectural authenticity many vinyl windows can't match.



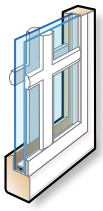
Finelight grilles-between-the-glass



Finelight grilles-between-the-glass with permanent exterior grilles



Permanent exterior and permanent interior grilles with spacer



Permanent exterior and permanent interior grilles with no spacer

FINELIGHT™ GRILLES BETWEEN-THE-GLASS

Make glass easy to clean and have an elegant, sculpted profile. Choose a two-sided color scheme to match both the interior and exterior of the window or patio door. Also available with exterior grilles to provide architectural style and detail.

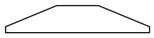
FULL DIVIDED LIGHT

Permanently applied to the exterior and interior of the window, with a spacer between the glass.

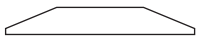
SIMULATED DIVIDED LIGHT

Permanently applied to the exterior and interior of the window, with no spacer between the glass.

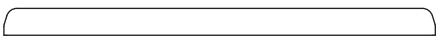
Grille Bar Widths Actual width shown.



¾" (19) width grille bar for windows.

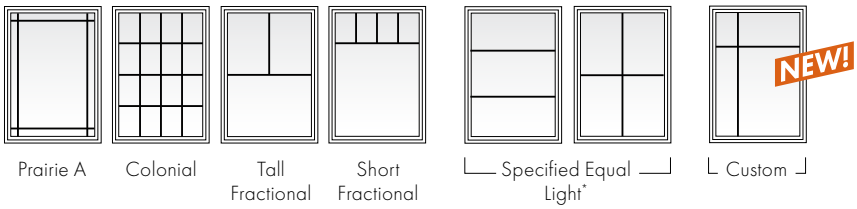


1" (25) width grille bar for patio doors.



A 2 ¼" (57) width profile is available for most units to simulate a meeting rail or a multi-unit combination, such as a transom over a window or patio door.

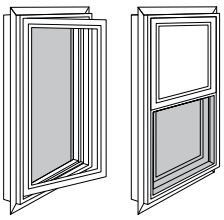
Grille Patterns



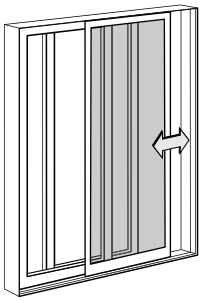
Prairie A | Colonial | Tall Fractional | Short Fractional | Specified Equal Light* | Custom

To see all of the standard patterns available for a specific window or door, refer to the detailed product sections in this product guide or contact your Andersen supplier.

INSECT SCREEN OPTIONS



Insect screens for venting windows have a fiberglass screen mesh. Optional TruScene® insect screens are made with a micro-fine stainless steel mesh, providing 50% greater clarity than our conventional insect screens. Insect screen frames for casement and awning windows are color matched to the product interior and for single-hung and gliding windows are matched to the product exterior.

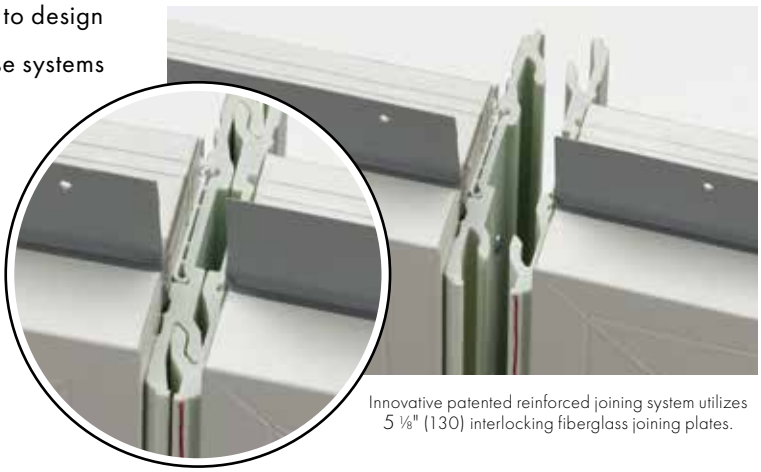


Gliding insect screens for 2-panel gliding patio doors have a fiberglass screen mesh. Insect screen frames for doors are color matched to the product exterior.

*Specify number of same-size rectangles across or down.
Dimensions in parentheses are in millimeters.

AN EASIER WAY TO BUILD BIGGER VIEWS

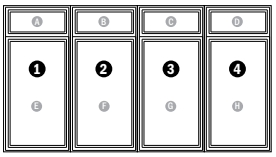
Our unique reinforced joining systems make it easier for you to design and install large window combinations in your projects. These systems use strong, fiberglass construction and can be joined at our factory, on the job site, or even within a rough opening — wherever works best for you. This way you can easily and confidently build bigger views for your customers. Non-reinforced joining options include factory-joined combinations or field joining kits. For more information, visit **andersenwindows.com/joining**.



Innovative patented reinforced joining system utilizes 5 ⅛" (130) interlocking fiberglass joining plates.

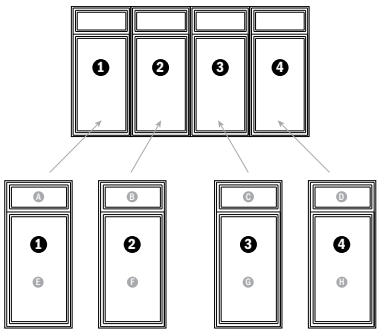
Reinforced Factory-Joined Combinations

Eliminate the need for job site assembly and receive fully joined, factory-assembled window combinations to fit rough openings up to 12' (3658) x 8' (2438) or 8' (2438) x 12' (3658).

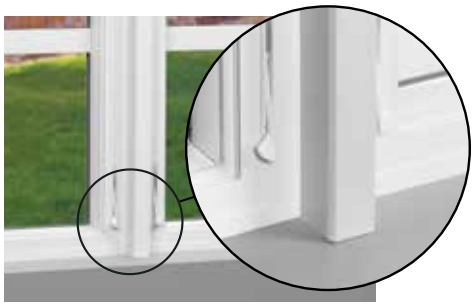


Reinforced Easy Connect Joining System

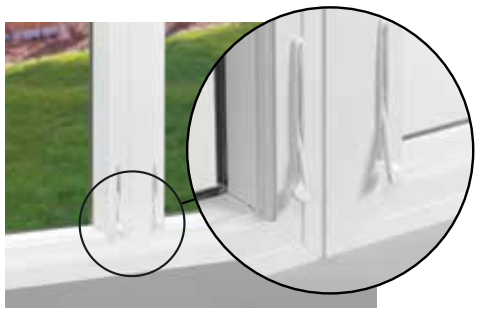
Receive lighter, easier-to-handle, pre-assembled smaller combinations that join as you install them into the rough opening, making it easier to install large combinations. In fact, most contractors surveyed said they could reduce the number of installers by 50% using the Andersen Easy Connect Joining System.*



Reinforced & Non-Reinforced Interiors



Appearance of a reinforced join.



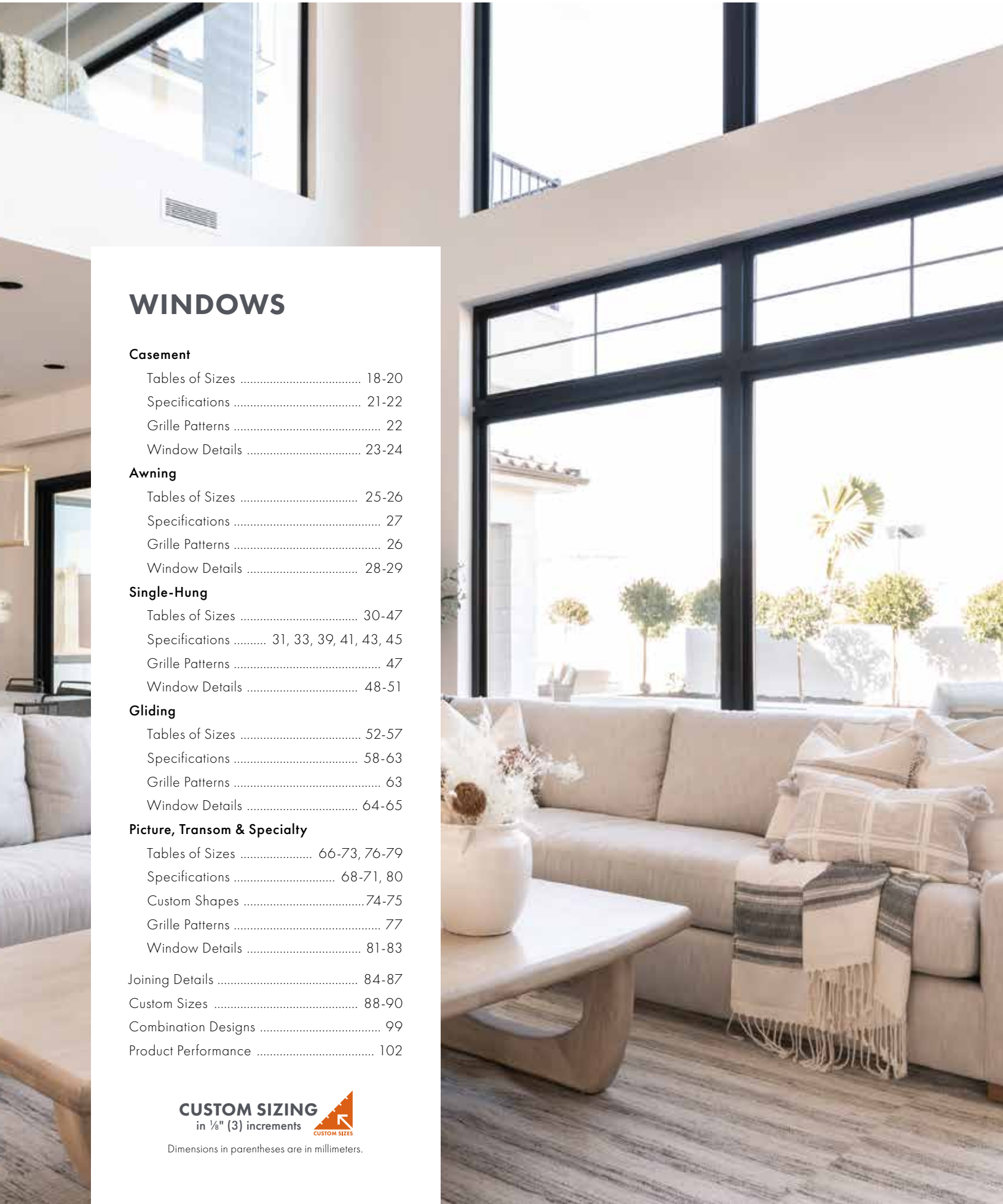
Appearance of a non-reinforced join.

	ASSEMBLY	READY TO INSTALL	NUMBER OF INSTALLERS*	HALLMARK CERTIFIED**	TESTED TO AAMA 450	PERFORMANCE	COMBINATION SIZE LIMITATIONS
REINFORCED FACTORY-JOINED COMBINATIONS	FACTORY	●	MORE	●	●	EXTENSIVE UNIT COMBINATION SIZE OPTIONS AVAILABLE CERTIFIED TO PG50**	MAX. JOIN LENGTH: 12' MAX. JOINED COMBINATION: 12' x 8' or 8' x 12' 96 sq. ft. or 8.92 m^2
REINFORCED JOINING KITS	JOB SITE		MORE	●	●	EXTENSIVE UNIT COMBINATION SIZE OPTIONS AVAILABLE CERTIFIED TO PG50**	MAX. JOIN LENGTH: 12' MAX. JOINED COMBINATION: 16' x 9' or 12' x 12' 144 sq. ft. or 13.34 m^2
REINFORCED FACTORY-PREPPED EASY CONNECT JOINING SYSTEM	IN THE OPENING	●	FEWER	●	●	EXTENSIVE UNIT COMBINATION SIZE OPTIONS AVAILABLE CERTIFIED TO PG50**	MAX. JOIN LENGTH: 12' MAX. JOINED COMBINATION HEIGHT: 16' NO MAXIMUM WIDTH
NON-REINFORCED FACTORY-JOINED COMBINATIONS	FACTORY	●	MORE	●	●	EXTENSIVE UNIT COMBINATION SIZE OPTIONS AVAILABLE CERTIFIED UP TO PG50**	MAX. JOIN LENGTH: 8' MAX. JOINED COMBINATION: 12' x 8' or 8' x 12' 96 sq. ft. or 8.92 m^2
NON-REINFORCED JOINING KITS	JOB SITE		MORE	●	●	EXTENSIVE UNIT COMBINATION SIZE OPTIONS AVAILABLE CERTIFIED UP TO PG50**	MAX. JOIN LENGTH: 8' MAX. JOINED COMBINATION: 12' x 8' or 8' x 12' 96 sq. ft. or 8.92 m^2

*69% of 156 builders/general contractors in a 2018 survey said they could reduce the number of installers by half using the Easy Connect Joining System when comparing the installation of a 12' (3658) wide x 8' (2438) high pre-assembled window combination unit with four 3' (914) wide x 8' (2438) high window combination units.

**When installed according to Andersen installation instructions.

Dimensions in parentheses are in millimeters.



WINDOWS

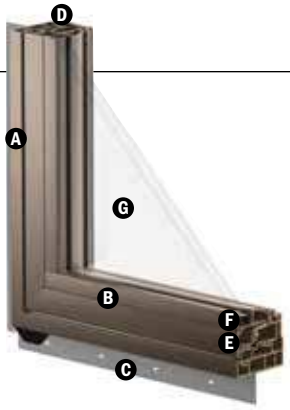
CUSTOM SIZING
in ⅛" (3) increments

CUSTOM SIZES

Dimensions in parentheses are in millimeters.

FEATURES

CASEMENT & AWNING



FRAME

Ⓐ The frame is constructed with Fibrex® composite material. This construction produces a rigid frame.

Ⓑ Durable, low-maintenance finish won't fade, flake, blister or peel.*

Concealed receiving brackets mounted on the hinge side of the frame keep the sash tightly secured within the window frame when closed.

Ⓒ Four frame options are available. See "Common Features" for details.

SASH

Ⓓ Fibrex material construction provides long-lasting performance.* The sash, finished with a durable capping, provides maximum protection and a matte, low-maintenance finish.

Ⓔ The dual weatherstrip system combines both an exterior watershed design and a bulb weatherstrip seal between the sash and frame. The result is a long-lasting,* energy-efficient barrier against wind, water and dust.

GLASS

Ⓕ A glazing bead and silicone provide superior weathertightness and durability.

Ⓖ See "Common Features" for details.

HARDWARE

Sash operator provides almost effortless opening and closing, regardless of window size. Long-lasting stainless steel hinge channels are used at the head and sill to provide easy operation.

Single-Action Casement Lock

A single-action lock easily releases all concealed locking points on the casement sash. The color or finish of the lock hardware matches the handle.

Awning Sash Locks

Awning sash locks provide an added measure of security and weathertightness. Awning hardware style and color options are compatible with 100 Series casement windows to ensure a consistent appearance when used in combination designs.

SINGLE-HUNG

FRAME

Ⓐ The frame is constructed with Fibrex composite material. This construction produces a rigid frame.

Ⓑ A durable, side-loaded balancer provides for easy sash opening and closing. The lower sash can be removed without the use of tools.

Ⓒ Durable, low-maintenance finish won't fade, flake, blister or peel.*

Ⓓ Four frame options are available. See "Common Features" for details.

Ⓔ Weep holes are located on the exterior nose of the sill for proper water management.

SASH

The lower sash has a meeting rail cover with a unique raised profile design, allowing the sash to be opened and closed easily.

Ⓕ Fibrex material construction provides long-lasting performance.* The sash, finished with a durable capping, provides maximum protection and a matte, low-maintenance finish.

Ⓖ Dual felt weatherstrip provides a long-lasting,* energy-efficient barrier against wind, water and dust.

GLASS

Ⓗ A glazing bead and silicone provide superior weathertightness and durability.

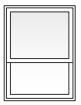
Ⓘ See "Common Features" for details.

HARDWARE

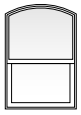
Sash Lock

The sash lock engages automatically when the lower sash is closed. The standard sash lock matches the window's interior color.

ADDITIONAL SASH & SHAPE OPTIONS



Reverse Cottage Sash



Arch Single-Hung

COMMON FEATURES

FRAME

Four frame options include:

- 1 3/8" (35) flange setback for siding applications. An integral rigid vinyl flange helps seal the unit to the structure.
- 1" (25) flange setback with stucco key. An integral rigid vinyl flange helps seal the unit to the structure.
- No-flange option for window replacement in an existing framed opening.
- Insert option for window replacement in an existing window frame.

GLASS

High-Performance options include:

- Low-E SmartSun™ glass
- Low-E SmartSun HeatLock® glass
- Low-E glass
- Low-E HeatLock glass
- Low-E Sun glass
- Low-E PassiveSun® glass
- Low-E PassiveSun HeatLock glass
- Clear Dual-Pane glass

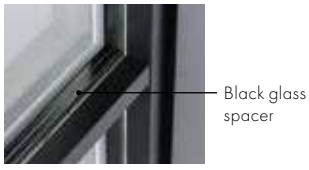
Tempered laminated and other glass options are available. Contact your Andersen supplier.

A removable translucent film helps shield the glass from damage during delivery and construction, and simplifies finishing at the job site.

Patterned Glass

Patterned glass options are available. See page 12 for more details.

Glass Spacers



Glass spacers are now available in black, in addition to stainless steel, to provide more ways to customize project designs and achieve a contemporary look. (E-Series window is shown above.)

Performance Grade (PG) Upgrades

Optional performance grade upgrades are available for select sizes allowing units to achieve PG50. Performance Grade (PG) ratings are more comprehensive than Design Pressure (DP) ratings for measuring product performance. Choosing the PG50 upgrade doesn't change the appearance of the unit.

*Visit andersenwindows.com/warranty for details.

**Products with Sandtone, dark bronze and black interiors have matching exteriors.

Dimensions in parentheses are in millimeters.

Printing limitations prevent exact duplications of colors. See your Andersen supplier for actual color samples.

COLOR OPTIONS

EXTERIOR COLORS

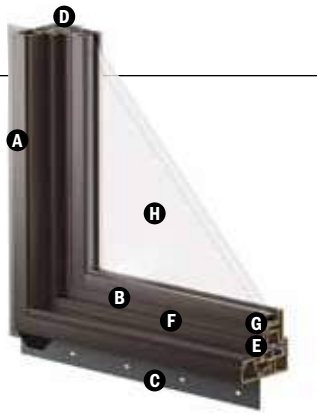
White | Sandtone | Terratone

Dark Bronze | Black

INTERIOR COLORS

White | Sandtone**

Dark Bronze** | Black**



GLIDING

FRAME

Ⓐ The frame is constructed with Fibrex® composite material. This construction produces a rigid frame.

Ⓑ Durable, low-maintenance finish won't fade, flake, blister or peel.*

Ⓒ Four frame options are available. See "Common Features" for details.

SASH

The operating sash has a meeting stile cover with a unique raised profile design, allowing the sash to be opened and closed easily.

Ⓓ Fibrex material construction provides long-lasting performance.* The sash, finished with a durable capping, provides maximum protection and a matte, low-maintenance finish.

Ⓔ Dual felt weatherstrip provides a long-lasting,* energy-efficient barrier against wind, water and dust.

Ⓕ Operating sash has four metal rollers mounted at the bottom for easy, smooth travel over the sill.

GLASS

Ⓖ A glazing bead and silicone provide superior weathertightness and durability.

Ⓗ See "Common Features" for details.

HARDWARE

Sash Lock

The sash lock engages automatically when the operable sash is closed. The standard sash lock matches the window's interior color.

PICTURE, TRANSOM & SPECIALTY

FRAME

Ⓐ The frame is constructed with Fibrex composite material. This construction produces a rigid frame.

Ⓑ Durable, low-maintenance finish won't fade, flake, blister or peel.*

Ⓒ Four frame options are available. See "Common Features" for details.

GLASS

Ⓓ A glazing bead and silicone provide superior weathertightness and durability.

Ⓔ See "Common Features" for details.

SHAPES

Along with rectangular windows, half circle, quarter circle, circle, Springline™ and arch windows are available in both standard and custom sizes. Custom windows are also available in unequal leg arch, trapezoid, pentagon, octagon and triangle shapes.

HARDWARE

Casement & Awning

Antique Brass | Black
Dark Bronze | Sandtone
Satin Nickel | White

Folding handles avoid interference with window treatments.

Single-Hung & Gliding

Standard Lock | Optional Lift/Pull

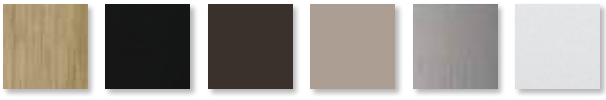
Hardware color matches the window's interior color.

Optional Slim Line Metal Lock

Antique Brass | Black | **Dark Bronze**
Sandtone | Satin Nickel | White

Bold name denotes color or finish shown.

HARDWARE FINISHES



Antique Brass | Black | Dark Bronze | Sandtone | Satin Nickel | White

ACCESSORIES Sold Separately

HARDWARE

Window Opening Control Device

A window opening control device is available for casement, single-hung and gliding windows, which limits sash travel to less than 4" (102) when the window is first opened. Available factory applied, or as a field-applied kit in stone, white and black.

Vent Limiter for Awning Windows

A vent limiter is available for awning windows, which prevents opening the sash more than 4" (102). Available factory applied or as a field-applied kit.

GRILLES

Grilles are available in a variety of configurations. See page 13 for details.

INSECT SCREENS

Conventional Insect Screens

Insect screens have charcoal gray fiberglass screen mesh. For casement and awning windows, frames are color matched to the product interior. For single-hung and gliding windows, stainless steel springs hold the insect screen tightly to the window frame, and their frames are available in colors to match the product exterior.

TruScene® Insect Screens

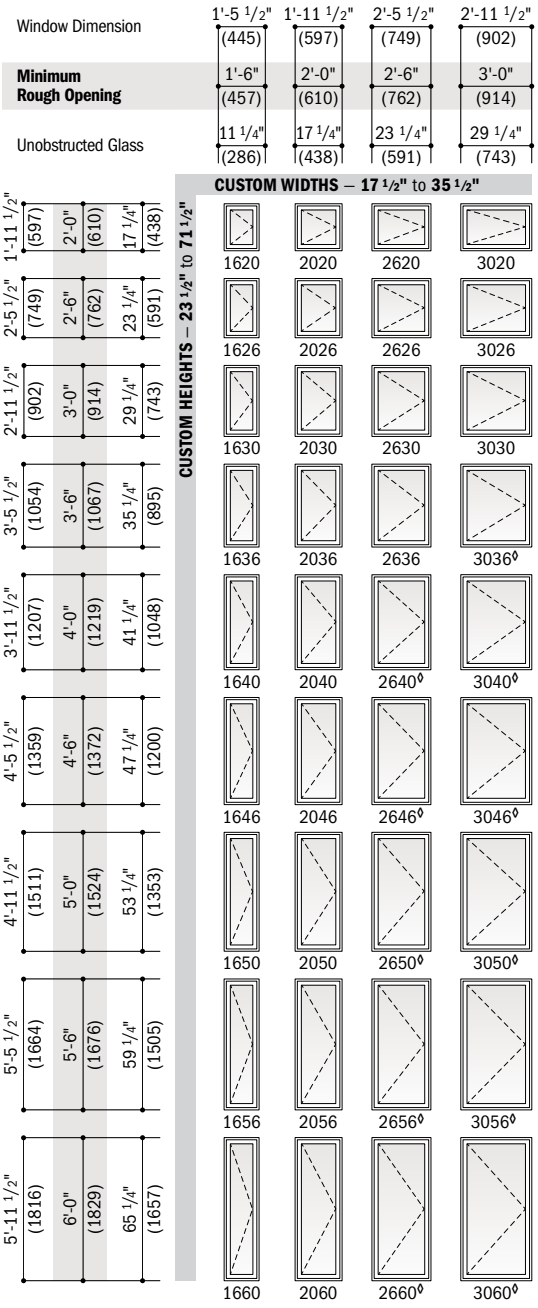
Andersen® TruScene insect screens let in over 25% more fresh air** and provide 50% greater clarity than conventional Andersen insect screens, all while keeping out unwanted small insects. For casement and awning windows, the frame color matches the product interior. For single-hung and gliding windows, the frame color matches the product exterior.

*Visit andersenwindows.com/warranty for details.
**TruScene insect screens let in over 25% more fresh air than standard Andersen fiberglass insect screens.

Dimensions in parentheses are in millimeters.
Printing limitations prevent exact replication of colors and finishes. See your Andersen supplier for actual color and finish samples.

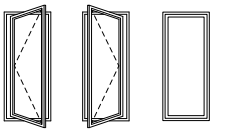
Table of Casement Window Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96



Custom-size windows are available in 1/8" (3) increments.

See page 88 for custom sizes and specifications.



Choose left, right or stationary as viewed from the exterior. Right venting shown in table.

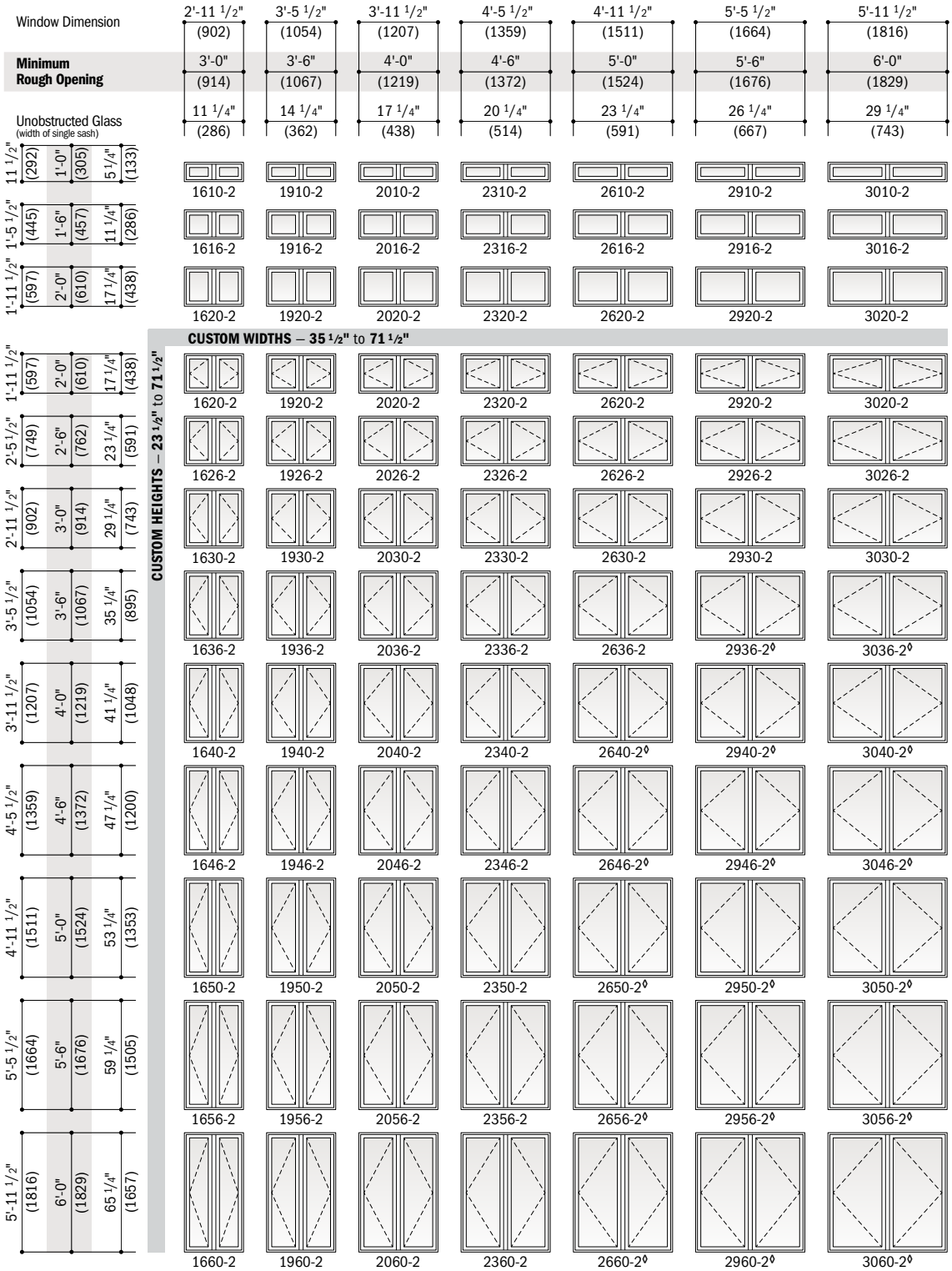
Details shown on pages 23-24.

Grille patterns shown on page 22.

• "Window Dimension" always refers to outside frame-to-frame dimension.
• "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
• Dimensions in parentheses are in millimeters.
◊ Meetss or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See table on page 21.

Table of Twin Casement Window Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96



Custom-size windows are available in 1/8" (3) increments. See page 88 for custom sizes and specifications.

Choose left, right or stationary as viewed from the exterior. In addition to venting shown, other standard configurations are available. Windows have one continuous outer frame.

Twin transoms are also shown. See pages 70-71 for more information.

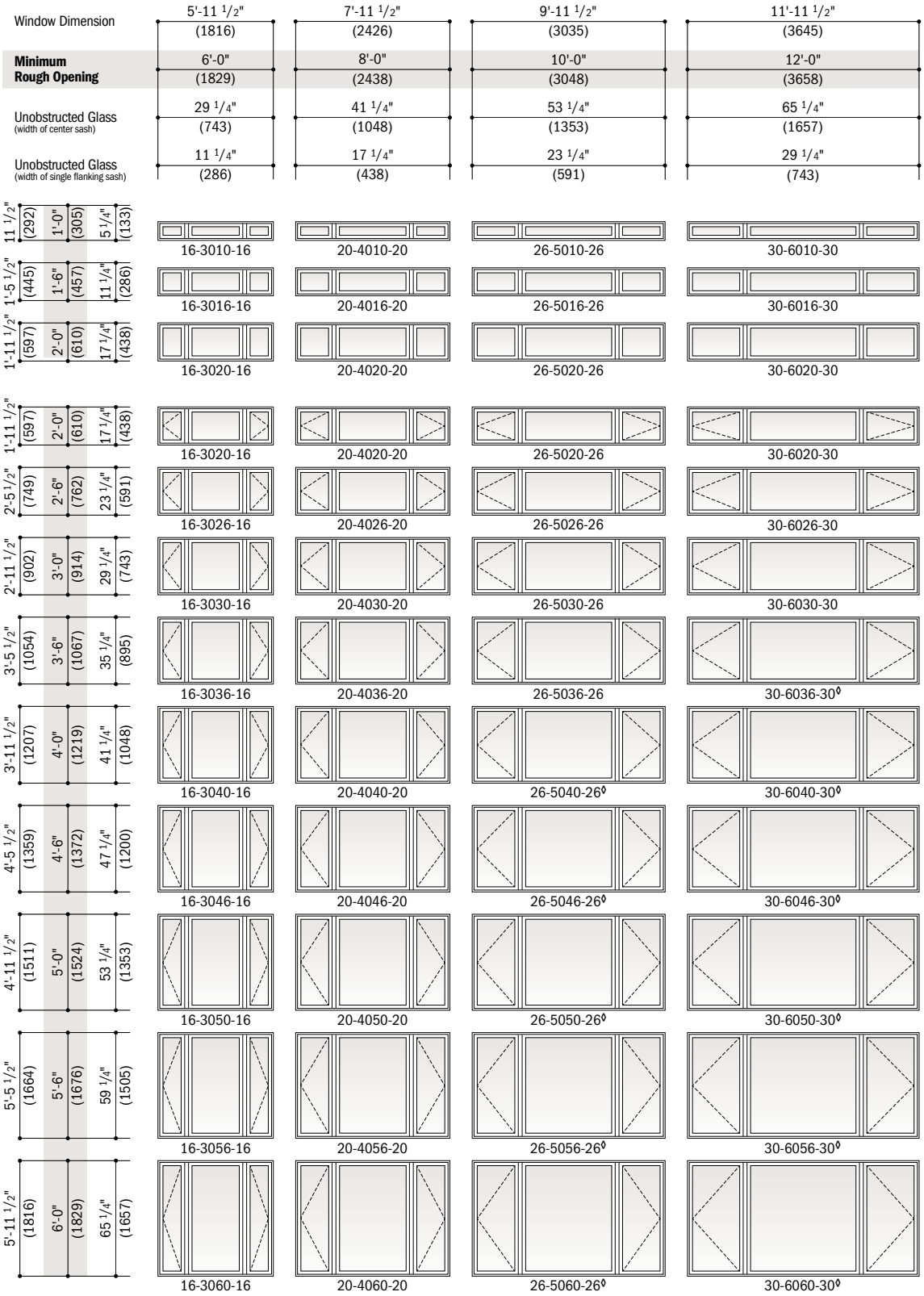
Details shown on pages 23-24. Grille patterns shown on page 22.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- **"Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

◊Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See table on pages 21-22.

Table of Sizes – Picture Window With Flanking Casements

Scale ⅛" (3) = 1'-0" (305) – 1:96



Choose left, right or stationary as viewed from the exterior. In addition to venting shown, other standard configurations are available. Windows have one continuous outer frame.

Transoms are also shown. See pages 70-71 for more information.

Details shown on pages 23-24. Grille patterns shown on page 22.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

◊ Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Casement Window Opening and Area Specifications

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position: Width Inches/(mm)	Clear Opening in Full Open Position: Height Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)	Hinge Type
1620	0.67 (0.06)	5 3/8" (137)	17 13/16" (452)	1.35 (0.13)	1.46 (0.14)	61 9/16" (1564)	2.86 (0.27)	wash mode
1626	0.89 (0.08)	5 3/8" (137)	23 13/16" (605)	1.82 (0.17)	1.95 (0.18)	55 9/16" (1411)	3.59 (0.33)	wash mode
1630	1.12 (0.10)	5 3/8" (137)	29 13/16" (757)	2.29 (0.21)	2.44 (0.23)	49 9/16" (1259)	4.31 (0.40)	wash mode
1636	1.34 (0.12)	5 3/8" (137)	35 13/16" (909)	2.75 (0.26)	2.94 (0.27)	43 9/16" (1106)	5.04 (0.47)	wash mode
1640	1.57 (0.15)	5 3/8" (137)	41 13/16" (1062)	3.22 (0.30)	3.43 (0.32)	37 9/16" (954)	5.77 (0.54)	wash mode
1646	1.79 (0.17)	5 3/8" (137)	47 13/16" (1214)	3.69 (0.34)	3.92 (0.36)	31 9/16" (802)	6.50 (0.60)	wash mode
1650	2.02 (0.19)	5 3/8" (137)	53 13/16" (1367)	4.16 (0.39)	4.41 (0.41)	25 9/16" (649)	7.23 (0.67)	wash mode
1656	2.24 (0.21)	5 3/8" (137)	59 13/16" (1519)	4.63 (0.43)	4.90 (0.46)	19 9/16" (497)	7.96 (0.74)	wash mode
1660	2.47 (0.23)	5 3/8" (137)	65 13/16" (1671)	5.10 (0.47)	5.40 (0.50)	13 9/16" (344)	8.69 (0.81)	wash mode
2020	1.41 (0.13)	11 3/8" (289)	17 13/16" (452)	2.07 (0.19)	2.20 (0.20)	61 9/16" (1564)	3.84 (0.36)	wash mode
2026	1.88 (0.18)	11 3/8" (289)	23 13/16" (605)	2.79 (0.26)	2.94 (0.27)	55 9/16" (1411)	4.81 (0.45)	wash mode
2030	2.36 (0.22)	11 3/8" (289)	29 13/16" (757)	3.50 (0.33)	3.69 (0.34)	49 9/16" (1259)	5.79 (0.54)	wash mode
2036	2.83 (0.26)	11 3/8" (289)	35 13/16" (909)	4.22 (0.39)	4.43 (0.41)	43 9/16" (1106)	6.77 (0.63)	wash mode
2040	3.31 (0.31)	11 3/8" (289)	41 13/16" (1062)	4.94 (0.46)	5.17 (0.48)	37 9/16" (954)	7.75 (0.72)	wash mode
2046	3.78 (0.35)	11 3/8" (289)	47 13/16" (1214)	5.66 (0.53)	5.91 (0.55)	31 9/16" (802)	8.73 (0.81)	wash mode
2050	4.26 (0.40)	11 3/8" (289)	53 13/16" (1367)	6.38 (0.59)	6.65 (0.62)	25 9/16" (649)	9.71 (0.90)	wash mode
2056	4.73 (0.44)	11 3/8" (289)	59 13/16" (1519)	7.10 (0.66)	7.40 (0.69)	19 9/16" (497)	10.69 (0.99)	wash mode
2060	5.21 (0.48)	11 3/8" (289)	65 13/16" (1671)	7.82 (0.73)	8.14 (0.76)	13 9/16" (344)	11.67 (1.08)	wash mode
2620	2.15 (0.20)	17 3/8" (442)	17 13/16" (452)	2.79 (0.26)	2.94 (0.27)	61 9/16" (1564)	4.81 (0.45)	wash mode
2626	2.88 (0.27)	17 3/8" (442)	23 13/16" (605)	3.75 (0.35)	3.94 (0.37)	55 9/16" (1411)	6.04 (0.56)	wash mode
2630	3.60 (0.33)	17 3/8" (442)	29 13/16" (757)	4.72 (0.44)	4.93 (0.46)	49 9/16" (1259)	7.27 (0.68)	wash mode
2636	4.33 (0.40)	17 3/8" (442)	35 13/16" (909)	5.69 (0.53)	5.92 (0.55)	43 9/16" (1106)	8.50 (0.79)	wash mode
2640 ◊	6.30 (0.59)	21 11/16" (551)	41 13/16" (1062)	6.66 (0.62)	6.91 (0.64)	37 9/16" (954)	9.73 (0.90)	widest clear opening
2646 ◊	7.21 (0.67)	21 11/16" (551)	47 13/16" (1214)	7.63 (0.71)	7.90 (0.73)	31 9/16" (802)	10.96 (1.02)	widest clear opening
2650 ◊	8.11 (0.75)	21 11/16" (551)	53 13/16" (1367)	8.60 (0.80)	8.90 (0.83)	25 9/16" (649)	12.19 (1.13)	widest clear opening
2656 ◊	9.02 (0.84)	21 11/16" (551)	59 13/16" (1519)	9.57 (0.89)	9.89 (0.92)	19 9/16" (497)	13.42 (1.25)	widest clear opening
2660 ◊	9.92 (0.92)	21 11/16" (551)	65 13/16" (1671)	10.54 (0.98)	10.88 (1.01)	13 9/16" (344)	14.65 (1.36)	widest clear opening
3020	2.89 (0.27)	23 3/8" (594)	17 13/16" (452)	3.50 (0.33)	3.69 (0.34)	61 9/16" (1564)	5.79 (0.54)	wash mode
3026	3.87 (0.36)	23 3/8" (594)	23 13/16" (605)	4.72 (0.44)	4.93 (0.46)	55 9/16" (1411)	7.27 (0.68)	wash mode
3030	4.84 (0.45)	23 3/8" (594)	29 13/16" (757)	5.94 (0.55)	6.17 (0.57)	49 9/16" (1259)	8.75 (0.81)	wash mode
3036 ◊	5.82 (0.54)	23 3/8" (594)	35 13/16" (909)	7.16 (0.67)	7.41 (0.69)	43 9/16" (1106)	10.23 (0.95)	wash mode
3040 ◊	6.79 (0.63)	23 3/8" (594)	41 13/16" (1062)	8.38 (0.78)	8.65 (0.80)	37 9/16" (954)	11.71 (1.09)	wash mode
3046 ◊	7.77 (0.72)	23 3/8" (594)	47 13/16" (1214)	9.60 (0.89)	9.90 (0.92)	31 9/16" (802)	13.19 (1.23)	wash mode
3050 ◊	8.74 (0.81)	23 3/8" (594)	53 13/16" (1367)	10.82 (1.00)	11.14 (1.03)	25 9/16" (649)	14.67 (1.36)	wash mode
3056 ◊	9.72 (0.90)	23 3/8" (594)	59 13/16" (1519)	12.04 (1.12)	12.38 (1.15)	19 9/16" (497)	16.15 (1.50)	wash mode
3060 ◊	10.69 (0.99)	23 3/8" (594)	65 13/16" (1671)	13.25 (1.23)	13.62 (1.27)	13 9/16" (344)	17.63 (1.64)	wash mode

- "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).
- Dimensions in parentheses are in millimeters or square meters.

◊ Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Twin Casement Window Opening and Area Specifications

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position: Width Inches/(mm)	Clear Opening in Full Open Position: Height Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)	Hinge Type
1620-2	0.67 (0.06)	5 3/8" (137)	17 13/16" (452)	2.70 (0.25)	2.92 (0.27)	61 9/16" (1564)	5.79 (0.54)	wash mode
1626-2	0.89 (0.08)	5 3/8" (137)	23 13/16" (605)	3.63 (0.34)	3.90 (0.36)	55 9/16" (1411)	7.27 (0.68)	wash mode
1630-2	1.12 (0.10)	5 3/8" (137)	29 13/16" (757)	4.57 (0.42)	4.89 (0.45)	49 9/16" (1259)	8.75 (0.81)	wash mode
1636-2	1.34 (0.12)	5 3/8" (137)	35 13/16" (909)	5.51 (0.51)	5.87 (0.55)	43 9/16" (1106)	10.23 (0.95)	wash mode
1640-2	1.57 (0.15)	5 3/8" (137)	41 13/16" (1062)	6.45 (0.60)	6.86 (0.64)	37 9/16" (954)	11.71 (1.09)	wash mode
1646-2	1.79 (0.17)	5 3/8" (137)	47 13/16" (1214)	7.38 (0.69)	7.84 (0.73)	31 9/16" (802)	13.19 (1.23)	wash mode
1650-2	2.02 (0.19)	5 3/8" (137)	53 13/16" (1367)	8.32 (0.77)	8.82 (0.82)	25 9/16" (649)	14.67 (1.36)	wash mode
1656-2	2.24 (0.21)	5 3/8" (137)	59 13/16" (1519)	9.26 (0.86)	9.81 (0.91)	19 9/16" (497)	16.15 (1.50)	wash mode
1660-2	2.47 (0.23)	5 3/8" (137)	65 13/16" (1671)	10.20 (0.95)	10.79 (1.00)	13 9/16" (344)	17.63 (1.64)	wash mode
1920-2	1.04 (0.10)	8 3/8" (213)	17 13/16" (452)	3.41 (0.32)	3.66 (0.34)	61 9/16" (1564)	6.77 (0.63)	wash mode
1926-2	1.39 (0.13)	8 3/8" (213)	23 13/16" (605)	4.60 (0.43)	4.90 (0.45)	55 9/16" (1411)	8.50 (0.79)	wash mode
1930-2	1.74 (0.16)	8 3/8" (213)	29 13/16" (757)	5.79 (0.54)	6.13 (0.57)	49 9/16" (1259)	10.23 (0.95)	wash mode
1936-2	2.09 (0.19)	8 3/8" (213)	35 13/16" (909)	6.98 (0.65)	7.36 (0.68)	43 9/16" (1106)	11.96 (1.11)	wash mode
1940-2	2.44 (0.23)	8 3/8" (213)	41 13/16" (1062)	8.16 (0.76)	8.60 (0.80)	37 9/16" (954)	13.69 (1.27)	wash mode
1946-2	2.79 (0.26)	8 3/8" (213)	47 13/16" (1214)	9.35 (0.87)	9.83 (0.91)	31 9/16" (802)	15.42 (1.43)	wash mode
1950-2	3.14 (0.29)	8 3/8" (213)	53 13/16" (1367)	10.54 (0.98)	11.06 (1.03)	25 9/16" (649)	17.15 (1.59)	wash mode
1956-2	3.49 (0.32)	8 3/8" (213)	59 13/16" (1519)	11.73 (1.09)	12.30 (1.14)	19 9/16" (497)	18.88 (1.75)	wash mode
1960-2	3.84 (0.36)	8 3/8" (213)	65 13/16" (1671)	12.91 (1.20)	13.53 (1.26)	13 9/16" (344)	20.61 (1.91)	wash mode
2020-2	1.41 (0.13)	11 3/8" (289)	17 13/16" (452)	4.13 (0.38)	4.40 (0.41)	61 9/16" (1564)	7.75 (0.72)	wash mode

- "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).
- Dimensions in parentheses are in millimeters or square meters.

◊ Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

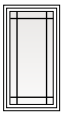
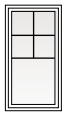
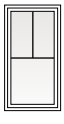
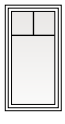
continued on next page

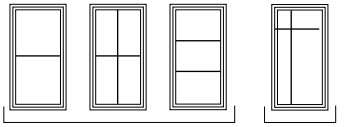
Twin Casement Window Opening and Area Specifications *(continued)*

Window Number	Clear Opening Area Sq. Ft./(m^2)	Clear Opening in Full Open Position: Width Inches/(mm)	Clear Opening in Full Open Position: Height Inches/(mm)	Glass Area Sq. Ft./(m^2)	Vent Area Sq. Ft./(m^2)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m^2)	Hinge Type
2026-2	1.88 (0.18)	11 3/8" (289)	23 13/16" (605)	5.57 (0.52)	5.89 (0.55)	55 9/16" (1411)	9.73 (0.90)	wash mode
2030-2	2.36 (0.22)	11 3/8" (289)	29 13/16" (757)	7.01 (0.65)	7.37 (0.68)	49 9/16" (1259)	11.71 (1.09)	wash mode
2036-2	2.83 (0.26)	11 3/8" (289)	35 13/16" (909)	8.45 (0.78)	8.86 (0.82)	43 9/16" (1106)	13.69 (1.27)	wash mode
2040-2	3.31 (0.31)	11 3/8" (289)	41 13/16" (1062)	9.88 (0.92)	10.34 (0.96)	37 9/16" (954)	15.67 (1.46)	wash mode
2046-2	3.78 (0.35)	11 3/8" (289)	47 13/16" (1214)	11.32 (1.05)	11.82 (1.10)	31 9/16" (802)	17.65 (1.64)	wash mode
2050-2	4.26 (0.40)	11 3/8" (289)	53 13/16" (1367)	12.76 (1.19)	13.31 (1.24)	25 9/16" (649)	19.63 (1.82)	wash mode
2056-2	4.73 (0.44)	11 3/8" (289)	59 13/16" (1519)	14.20 (1.32)	14.79 (1.37)	19 9/16" (497)	21.61 (2.01)	wash mode
2060-2	5.21 (0.48)	11 3/8" (289)	65 13/16" (1671)	15.63 (1.45)	16.27 (1.51)	13 9/16" (344)	23.59 (2.19)	wash mode
2320-2	1.78 (0.17)	14 3/8" (366)	17 13/16" (452)	4.85 (0.45)	5.15 (0.48)	61 9/16" (1564)	8.73 (0.81)	wash mode
2326-2	2.38 (0.22)	14 3/8" (366)	23 13/16" (605)	6.54 (0.61)	6.88 (0.64)	55 9/16" (1411)	10.96 (1.02)	wash mode
2330-2	2.98 (0.28)	14 3/8" (366)	29 13/16" (757)	8.23 (0.76)	8.61 (0.80)	49 9/16" (1259)	13.19 (1.23)	wash mode
2336-2	3.58 (0.33)	14 3/8" (366)	35 13/16" (909)	9.91 (0.92)	10.35 (0.96)	43 9/16" (1106)	15.42 (1.43)	wash mode
2340-2	4.18 (0.39)	14 3/8" (366)	41 13/16" (1062)	11.60 (1.08)	12.08 (1.12)	37 9/16" (954)	17.65 (1.64)	wash mode
2346-2	4.78 (0.44)	14 3/8" (366)	47 13/16" (1214)	13.29 (1.23)	13.81 (1.28)	31 9/16" (802)	19.88 (1.85)	wash mode
2350-2	5.38 (0.50)	14 3/8" (366)	53 13/16" (1367)	14.98 (1.39)	15.55 (1.44)	25 9/16" (649)	22.11 (2.05)	wash mode
2356-2	5.98 (0.56)	14 3/8" (366)	59 13/16" (1519)	16.66 (1.55)	17.28 (1.61)	19 9/16" (497)	24.34 (2.26)	wash mode
2360-2	6.58 (0.61)	14 3/8" (366)	65 13/16" (1671)	18.35 (1.70)	19.02 (1.77)	13 9/16" (344)	26.56 (2.47)	wash mode
2620-2	2.15 (0.20)	17 3/8" (442)	17 13/16" (452)	5.57 (0.52)	5.89 (0.55)	61 9/16" (1564)	9.71 (0.90)	wash mode
2626-2	2.88 (0.27)	17 3/8" (442)	23 13/16" (605)	7.51 (0.70)	7.87 (0.73)	55 9/16" (1411)	12.19 (1.13)	wash mode
2630-2	3.60 (0.33)	17 3/8" (442)	29 13/16" (757)	9.45 (0.88)	9.86 (0.92)	49 9/16" (1259)	14.67 (1.36)	wash mode
2636-2	4.33 (0.40)	17 3/8" (442)	35 13/16" (909)	11.38 (1.06)	11.84 (1.10)	43 9/16" (1106)	17.15 (1.59)	wash mode
2640-2 ◊	6.30 (0.59)	21 11/16" (551)	41 13/16" (1062)	13.32 (1.24)	13.82 (1.28)	37 9/16" (954)	19.63 (1.82)	widest clear opening
2646-2 ◊	7.21 (0.67)	21 11/16" (551)	47 13/16" (1214)	15.26 (1.42)	15.81 (1.47)	31 9/16" (802)	22.11 (2.05)	widest clear opening
2650-2 ◊	8.11 (0.75)	21 11/16" (551)	53 13/16" (1367)	17.20 (1.60)	17.79 (1.65)	25 9/16" (649)	24.59 (2.28)	widest clear opening
2656-2 ◊	9.02 (0.84)	21 11/16" (551)	59 13/16" (1519)	19.13 (1.78)	19.77 (1.84)	19 9/16" (497)	27.06 (2.51)	widest clear opening
2660-2 ◊	9.92 (0.92)	21 11/16" (551)	65 13/16" (1671)	21.07 (1.96)	21.76 (2.02)	13 9/16" (344)	29.54 (2.74)	widest clear opening
2920-2	2.52 (0.23)	20 3/8" (518)	17 13/16" (452)	6.29 (0.58)	6.63 (0.62)	61 9/16" (1564)	10.69 (0.99)	wash mode
2926-2	3.37 (0.31)	20 3/8" (518)	23 13/16" (605)	8.48 (0.79)	8.86 (0.82)	55 9/16" (1411)	13.42 (1.25)	wash mode
2930-2	4.22 (0.39)	20 3/8" (518)	29 13/16" (757)	10.66 (0.99)	11.10 (1.03)	49 9/16" (1259)	16.15 (1.50)	wash mode
2936-2 ◊	6.08 (0.57)	24 1/2" (621)	35 13/16" (909)	12.85 (1.19)	13.33 (1.24)	43 9/16" (1106)	18.88 (1.75)	widest clear opening
2940-2 ◊	5.92 (0.55)	20 3/8" (518)	41 13/16" (1062)	15.04 (1.40)	15.56 (1.45)	37 9/16" (954)	21.61 (2.01)	wash mode
2946-2 ◊	6.77 (0.63)	20 3/8" (518)	47 13/16" (1214)	17.23 (1.60)	17.80 (1.65)	31 9/16" (802)	24.34 (2.26)	wash mode
2950-2 ◊	7.62 (0.71)	20 3/8" (518)	53 13/16" (1367)	19.41 (1.80)	20.03 (1.86)	25 9/16" (649)	27.06 (2.51)	wash mode
2956-2 ◊	8.47 (0.79)	20 3/8" (518)	59 13/16" (1519)	21.60 (2.01)	22.27 (2.07)	19 9/16" (497)	29.79 (2.77)	wash mode
2960-2 ◊	9.32 (0.87)	20 3/8" (518)	65 13/16" (1671)	23.79 (2.21)	24.50 (2.28)	13 9/16" (344)	32.52 (3.02)	wash mode
3020-2	2.89 (0.27)	23 3/8" (594)	17 13/16" (452)	7.01 (0.65)	7.37 (0.68)	61 9/16" (1564)	11.67 (1.08)	wash mode
3026-2	3.87 (0.36)	23 3/8" (594)	23 13/16" (605)	9.45 (0.88)	9.86 (0.92)	55 9/16" (1411)	14.65 (1.36)	wash mode
3030-2	4.84 (0.45)	23 3/8" (594)	29 13/16" (757)	11.88 (1.10)	12.34 (1.15)	49 9/16" (1259)	17.63 (1.64)	wash mode
3036-2 ◊	5.82 (0.54)	23 3/8" (594)	35 13/16" (909)	14.32 (1.33)	14.82 (1.38)	43 9/16" (1106)	20.61 (1.91)	wash mode
3040-2 ◊	6.79 (0.63)	23 3/8" (594)	41 13/16" (1062)	16.76 (1.56)	17.31 (1.61)	37 9/16" (954)	23.59 (2.19)	wash mode
3046-2 ◊	7.77 (0.72)	23 3/8" (594)	47 13/16" (1214)	19.20 (1.78)	19.79 (1.84)	31 9/16" (802)	26.56 (2.47)	wash mode
3050-2 ◊	8.74 (0.81)	23 3/8" (594)	53 13/16" (1367)	21.63 (2.01)	22.27 (2.07)	25 9/16" (649)	29.54 (2.74)	wash mode
3056-2 ◊	9.72 (0.90)	23 3/8" (594)	59 13/16" (1519)	24.07 (2.24)	24.76 (2.30)	19 9/16" (497)	32.52 (3.02)	wash mode
3060-2 ◊	10.69 (0.99)	23 3/8" (594)	65 13/16" (1671)	26.51 (2.46)	27.24 (2.53)	13 9/16" (344)	35.50 (3.30)	wash mode

• "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).
• Dimensions in parentheses are in millimeters or square meters.
◊ Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m^2, clear opening width of 20" (508) and clear opening height of 24" (610).

Grille Patterns

	Prairie A	Colonial	Simulated Meeting Rail	Modified Colonial	Tall Fractional	Short Fractional
Casement						



Specified Equal Light Examples

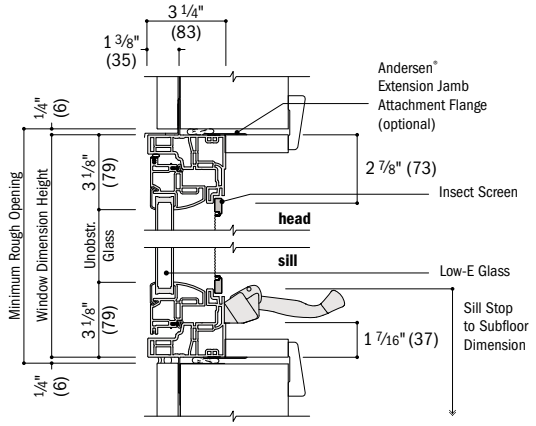
Custom Example

Number of lights and overall pattern varies with window size. Patterns shown may not be available for all sizes. Specified equal light and custom patterns are also available. For specified equal light, specify number of same-size rectangles across or down. For more information on divided light, see page 13 or visit **andersenwindows.com/grilles**.

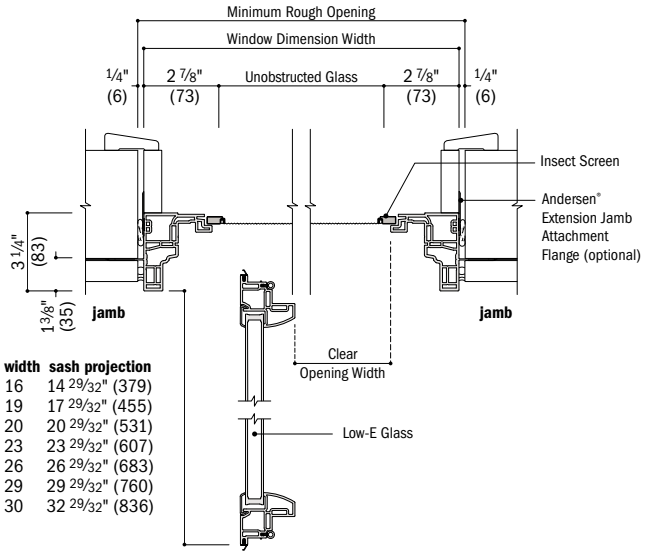
Casement Window Details – New Construction

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

1 3/8" flange setback

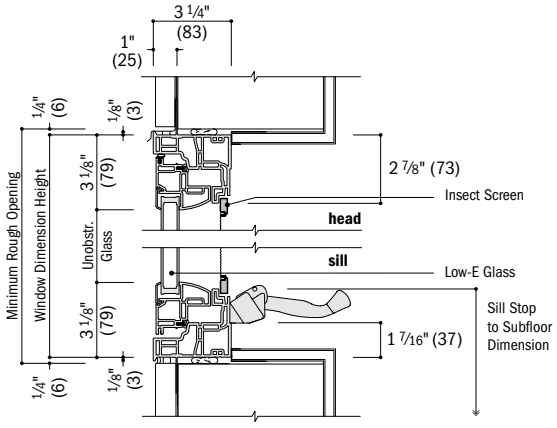


Vertical Section

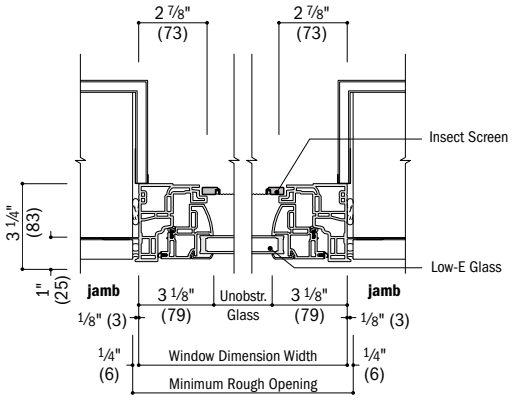


Horizontal Section

1" flange setback with stucco key

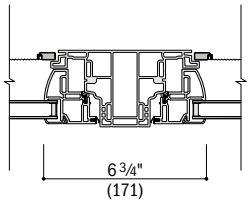


Vertical Section
Stucco Exterior

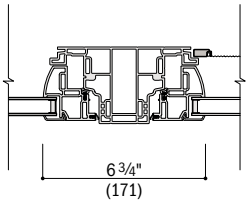


Horizontal Section
Stucco Exterior

integrals



Horizontal Section
Twin Casement



Horizontal Section
Picture With Flanking Casement

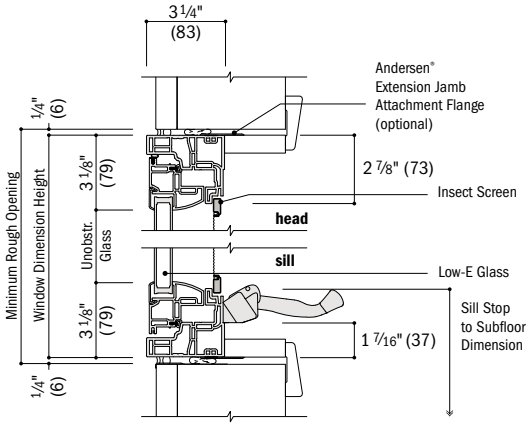
See pages 85-87 for joining details.

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

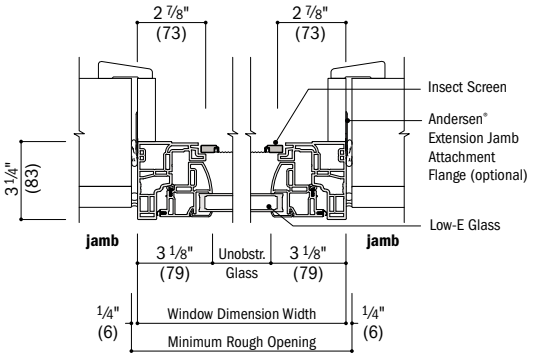
Casement Window Details – Replacement

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

no flange

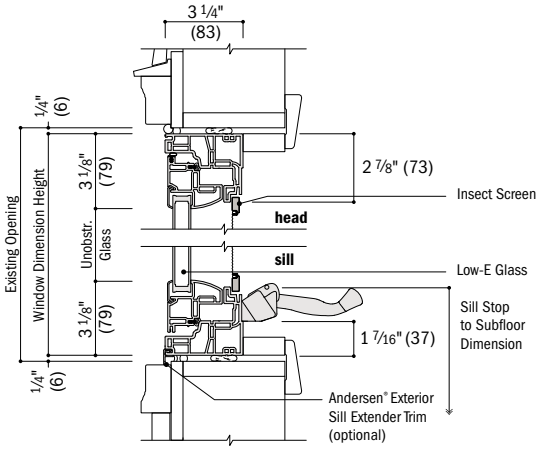


Vertical Section
Existing Framed Opening

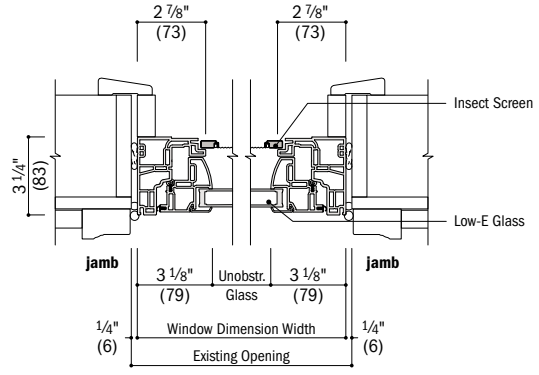


Horizontal Section
Existing Framed Opening

insert

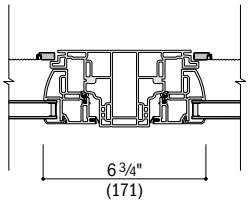


Vertical Section
Existing Window Opening

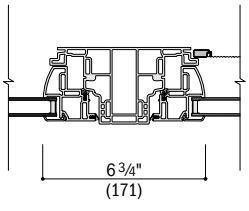


Horizontal Section
Existing Window Opening

integrals



Horizontal Section
Twin Casement



Horizontal Section
Picture With Flanking Casement

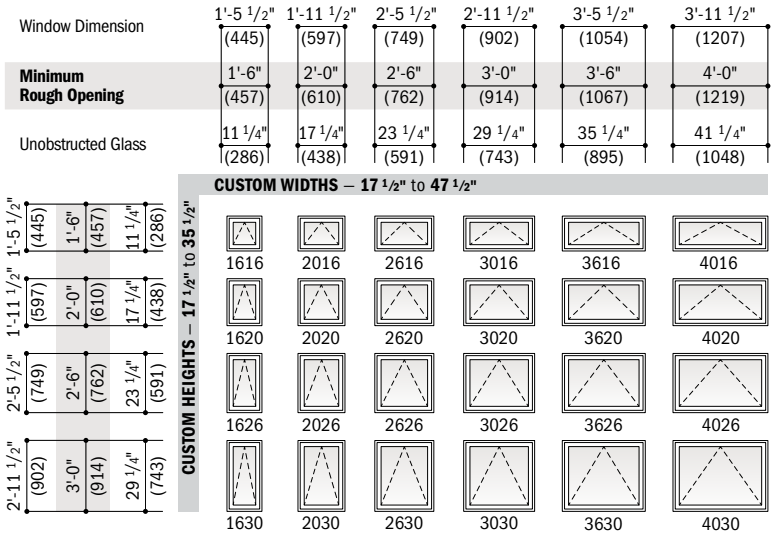
Installation accessories for insert frame shown on page 109.

See pages 84-87 for joining details.

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

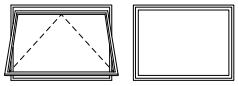
Table of Awning Window Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96



Custom-size windows are available in 1/8" (3) increments.

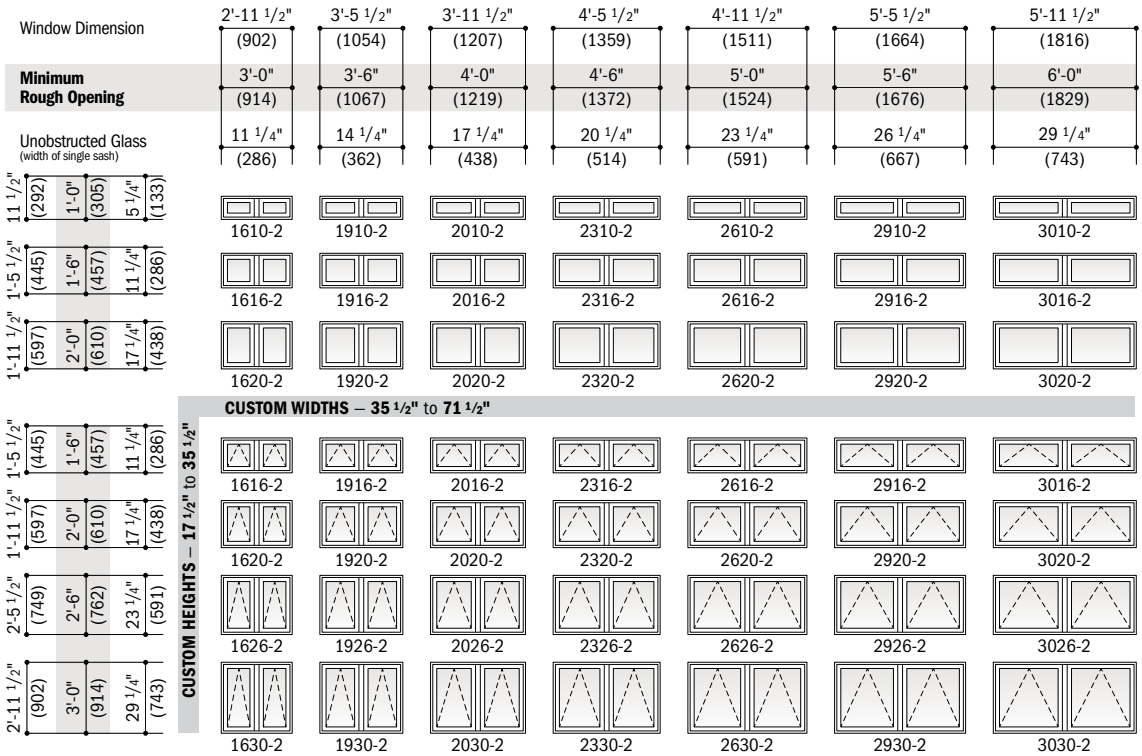
See page 88 for custom sizes and specifications.



Choose venting or stationary. **Awning windows must be installed to vent as shown and should not be rotated and used as a hopper.** Details shown on pages 28-29. Grille patterns shown on page 26.

Table of Twin Awning Window Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96



Custom-size windows are available in 1/8" (3) increments. See page 88 for custom sizes and specifications.

Windows have one continuous outer frame.

Twin transoms are also shown. See pages 70-71 for more information.

Details shown on pages 28-29. Grille patterns shown on page 26.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Table of Sizes – Picture Window Over Awning

Scale 1/8" (3) = 1'-0" (305) – 1:96

Window Dimension	1'-11 1/2" (597)	2'-5 1/2" (749)	2'-11 1/2" (902)	3'-5 1/2" (1054)	3'-11 1/2" (1207)
Minimum Rough Opening	2'-0" (610)	2'-6" (762)	3'-0" (914)	3'-6" (1067)	4'-0" (1219)
Unobstructed Glass (height of upper sash)	17 1/4" (438)	23 1/4" (591)	29 1/4" (743)	35 1/4" (895)	41 1/4" (1048)

CUSTOM WIDTHS – 17 1/2" to 47 1/2"

CUSTOM HEIGHTS – 47 1/2" to 95 1/2"

3'-11 1/2" (1207) 4'-0" (1219) 17 1/4" (610)	2020 2020	2620 2620	3020 3020	3620 3620	4020 4020
4'-11 1/2" (1511) 5'-0" (1524) 23 1/4" (591)	2026 2026	2626 2626	3026 3026	3626 3626	4026 4026
5'-11 1/2" (1816) 6'-0" (1829) 29 1/4" (743)	2030 2030	2630 2630	3030 3030	3630 3630	4030 4030
5'-11 1/2" (1816) 6'-0" (1829) 35 1/4" (895)	2040 2020	2640 2620	3040 3020	3640 3620	4040 4020
6'-11 1/2" (2121) 7'-0" (2134) 35 1/4" (895)	2040 2030	2640 2630	3040 3030	3640 3630	4040 4030
6'-11 1/2" (2121) 7'-0" (2134) 53 1/4" (1353)	2050 2020	2650 2620	3050 3020	3650 3620	4050 4020
7'-11 1/2" (2426) 8'-0" (2438) 53 1/4" (1353)	2050 2030	2650 2630	3050 3030	3650 3630	4050 4030

Custom-size windows are available in 1/8" (3) increments.

See page 89 for custom sizes and specifications.

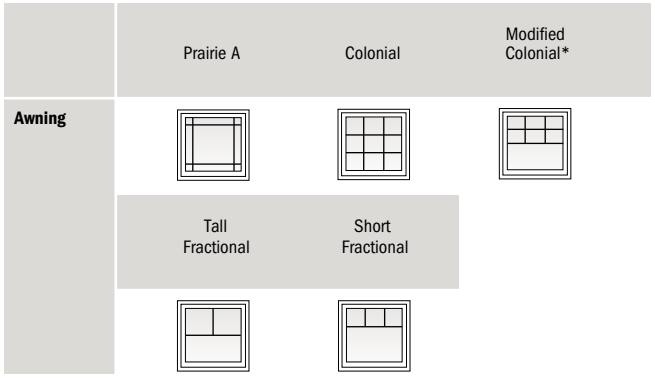
Windows have one continuous outer frame.

For unobstructed glass height dimensions of lower sash, see page 25.

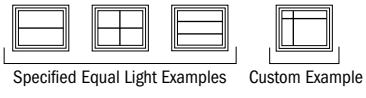
Details shown on pages 28-29.

Grille patterns shown below.

Grille Patterns



*Modified colonial pattern is available only for the upper sash of a picture window over awning configuration.



Number of lights and overall pattern varies with window size. Patterns shown may not be available for all sizes. Specified equal light and custom patterns are also available. For specified equal light, specify number of same-size rectangles across or down. For more information on divided light, see page 13 or visit **andersenwindows.com/grilles**.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Awning Window Opening and Area Specifications

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Depth Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
1616	0.66 (0.06)	11 13/16" (300)	8" (203)	0.88 (0.08)	0.66 (0.06)	67 9/16" (1716)	2.13 (0.20)
1620	0.66 (0.06)	11 13/16" (300)	8" (203)	1.35 (0.13)	0.66 (0.06)	61 9/16" (1564)	2.86 (0.27)
1626	0.66 (0.06)	11 13/16" (300)	8" (203)	1.82 (0.17)	0.66 (0.06)	55 9/16" (1411)	3.59 (0.33)
1630	0.66 (0.06)	11 13/16" (300)	8" (203)	2.29 (0.21)	0.66 (0.06)	49 9/16" (1259)	4.31 (0.40)
2016	0.99 (0.09)	17 13/16" (452)	8" (203)	1.35 (0.13)	0.99 (0.09)	67 9/16" (1716)	2.86 (0.27)
2020	0.99 (0.09)	17 13/16" (452)	8" (203)	2.07 (0.19)	0.99 (0.09)	61 9/16" (1564)	3.84 (0.36)
2026	0.99 (0.09)	17 13/16" (452)	8" (203)	2.79 (0.26)	0.99 (0.09)	55 9/16" (1411)	4.81 (0.45)
2030	0.99 (0.09)	17 13/16" (452)	8" (203)	3.50 (0.33)	0.99 (0.09)	49 9/16" (1259)	5.79 (0.54)
2616	1.32 (0.12)	23 13/16" (605)	8" (203)	1.82 (0.17)	1.32 (0.12)	67 9/16" (1716)	3.59 (0.33)
2620	1.32 (0.12)	23 13/16" (605)	8" (203)	2.79 (0.26)	1.32 (0.12)	61 9/16" (1564)	4.81 (0.45)
2626	1.32 (0.12)	23 13/16" (605)	8" (203)	3.75 (0.35)	1.32 (0.12)	55 9/16" (1411)	6.04 (0.56)
2630	1.32 (0.12)	23 13/16" (605)	8" (203)	4.72 (0.44)	1.32 (0.12)	49 9/16" (1259)	7.27 (0.68)
3016	1.66 (0.15)	29 13/16" (757)	8" (203)	2.29 (0.21)	1.66 (0.15)	67 9/16" (1716)	4.31 (0.40)
3020	1.66 (0.15)	29 13/16" (757)	8" (203)	3.50 (0.33)	1.66 (0.15)	61 9/16" (1564)	5.79 (0.54)
3026	1.66 (0.15)	29 13/16" (757)	8" (203)	4.72 (0.44)	1.66 (0.15)	55 9/16" (1411)	7.27 (0.68)
3030	1.66 (0.15)	29 13/16" (757)	8" (203)	5.94 (0.55)	1.66 (0.15)	49 9/16" (1259)	8.75 (0.81)
3616	1.99 (0.18)	35 13/16" (909)	8" (203)	2.75 (0.26)	1.99 (0.18)	67 9/16" (1716)	5.04 (0.47)
3620	1.99 (0.18)	35 13/16" (909)	8" (203)	4.22 (0.39)	1.99 (0.18)	61 9/16" (1564)	6.77 (0.63)
3626	1.99 (0.18)	35 13/16" (909)	8" (203)	5.69 (0.53)	1.99 (0.18)	55 9/16" (1411)	8.50 (0.79)
3630	1.99 (0.18)	35 13/16" (909)	8" (203)	7.16 (0.67)	1.99 (0.18)	49 9/16" (1259)	10.23 (0.95)
4016	2.32 (0.22)	41 13/16" (1062)	8" (203)	3.22 (0.30)	2.32 (0.22)	67 9/16" (1716)	5.77 (0.54)
4020	2.32 (0.22)	41 13/16" (1062)	8" (203)	4.94 (0.46)	2.32 (0.22)	61 9/16" (1564)	7.75 (0.72)
4026	2.32 (0.22)	41 13/16" (1062)	8" (203)	6.66 (0.62)	2.32 (0.22)	55 9/16" (1411)	9.73 (0.90)
4030	2.32 (0.22)	41 13/16" (1062)	8" (203)	8.38 (0.78)	2.32 (0.22)	49 9/16" (1259)	11.71 (1.09)

- "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).
- Dimensions in parentheses are in millimeters or square meters.

Twin Awning Window Opening and Area Specifications

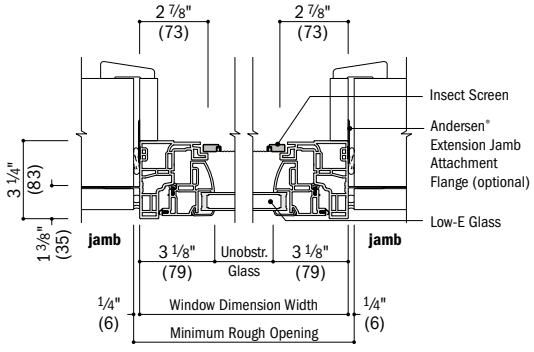
Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Depth Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
1616-2	0.66 (0.06)	11 13/16" (300)	8" (203)	1.76 (0.16)	1.31 (0.12)	67 9/16" (1716)	4.31 (0.40)
1620-2	0.66 (0.06)	11 13/16" (300)	8" (203)	2.70 (0.25)	1.31 (0.12)	61 9/16" (1564)	5.79 (0.54)
1626-2	0.66 (0.06)	11 13/16" (300)	8" (203)	3.63 (0.34)	1.31 (0.12)	55 9/16" (1411)	7.27 (0.68)
1630-2	0.66 (0.06)	11 13/16" (300)	8" (203)	4.57 (0.42)	1.31 (0.12)	49 9/16" (1259)	8.75 (0.81)
1916-2	0.82 (0.08)	14 13/16" (376)	8" (203)	2.23 (0.21)	1.65 (0.15)	67 9/16" (1716)	5.04 (0.47)
1920-2	0.82 (0.08)	14 13/16" (376)	8" (203)	3.41 (0.32)	1.65 (0.15)	61 9/16" (1564)	6.77 (0.63)
1926-2	0.82 (0.08)	14 13/16" (376)	8" (203)	4.60 (0.43)	1.65 (0.15)	55 9/16" (1411)	8.50 (0.79)
1930-2	0.82 (0.08)	14 13/16" (376)	8" (203)	5.79 (0.54)	1.65 (0.15)	49 9/16" (1259)	10.23 (0.95)
2016-2	0.99 (0.09)	17 13/16" (452)	8" (203)	2.70 (0.25)	1.98 (0.18)	67 9/16" (1716)	5.77 (0.54)
2020-2	0.99 (0.09)	17 13/16" (452)	8" (203)	4.13 (0.38)	1.98 (0.18)	61 9/16" (1564)	7.75 (0.72)
2026-2	0.99 (0.09)	17 13/16" (452)	8" (203)	5.57 (0.52)	1.98 (0.18)	55 9/16" (1411)	9.73 (0.90)
2030-2	0.99 (0.09)	17 13/16" (452)	8" (203)	7.01 (0.65)	1.98 (0.18)	49 9/16" (1259)	11.71 (1.09)
2316-2	1.16 (0.11)	20 13/16" (528)	8" (203)	3.16 (0.29)	2.31 (0.21)	67 9/16" (1716)	6.50 (0.60)
2320-2	1.16 (0.11)	20 13/16" (528)	8" (203)	4.85 (0.45)	2.31 (0.21)	61 9/16" (1564)	8.73 (0.81)
2326-2	1.16 (0.11)	20 13/16" (528)	8" (203)	6.54 (0.61)	2.31 (0.21)	55 9/16" (1411)	10.96 (1.02)
2330-2	1.16 (0.11)	20 13/16" (528)	8" (203)	8.23 (0.76)	2.31 (0.21)	49 9/16" (1259)	13.19 (1.23)
2616-2	1.32 (0.12)	23 13/16" (605)	8" (203)	3.63 (0.34)	2.65 (0.25)	67 9/16" (1716)	7.23 (0.67)
2620-2	1.32 (0.12)	23 13/16" (605)	8" (203)	5.57 (0.52)	2.65 (0.25)	61 9/16" (1564)	9.71 (0.90)
2626-2	1.32 (0.12)	23 13/16" (605)	8" (203)	7.51 (0.70)	2.65 (0.25)	55 9/16" (1411)	12.19 (1.13)
2630-2	1.32 (0.12)	23 13/16" (605)	8" (203)	9.45 (0.88)	2.65 (0.25)	49 9/16" (1259)	14.67 (1.36)
2916-2	1.49 (0.14)	26 13/16" (681)	8" (203)	4.10 (0.38)	2.98 (0.28)	67 9/16" (1716)	7.96 (0.74)
2920-2	1.49 (0.14)	26 13/16" (681)	8" (203)	6.29 (0.58)	2.98 (0.28)	61 9/16" (1564)	10.69 (0.99)
2926-2	1.49 (0.14)	26 13/16" (681)	8" (203)	8.48 (0.79)	2.98 (0.28)	55 9/16" (1411)	13.42 (1.25)
2930-2	1.49 (0.14)	26 13/16" (681)	8" (203)	10.66 (0.99)	2.98 (0.28)	49 9/16" (1259)	16.15 (1.50)
3016-2	1.66 (0.15)	29 13/16" (757)	8" (203)	4.57 (0.42)	3.31 (0.31)	67 9/16" (1716)	8.69 (0.81)
3020-2	1.66 (0.15)	29 13/16" (757)	8" (203)	7.01 (0.65)	3.31 (0.31)	61 9/16" (1564)	11.67 (1.08)
3026-2	1.66 (0.15)	29 13/16" (757)	8" (203)	9.45 (0.88)	3.31 (0.31)	55 9/16" (1411)	14.65 (1.36)
3030-2	1.66 (0.15)	29 13/16" (757)	8" (203)	11.88 (1.10)	3.31 (0.31)	49 9/16" (1259)	17.63 (1.64)

- "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).
- Dimensions in parentheses are in millimeters or square meters.

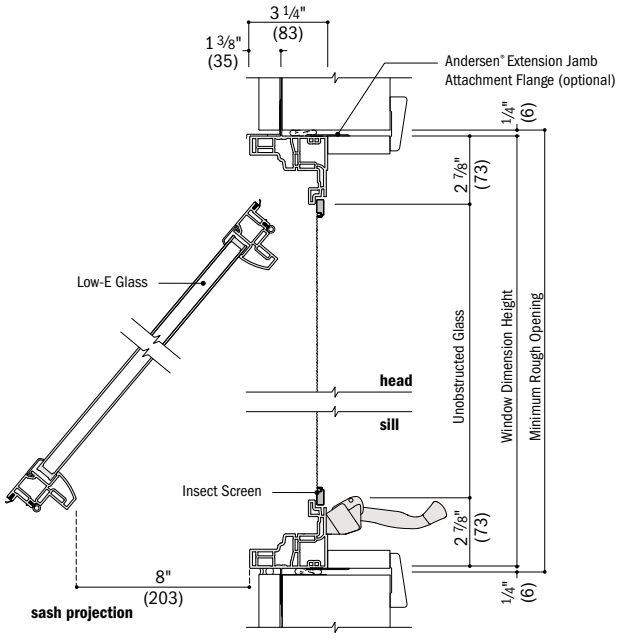
Awning Window Details – New Construction

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

1 3/8" flange setback

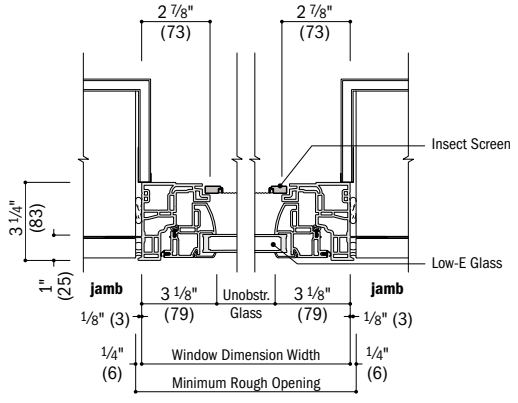


Horizontal Section

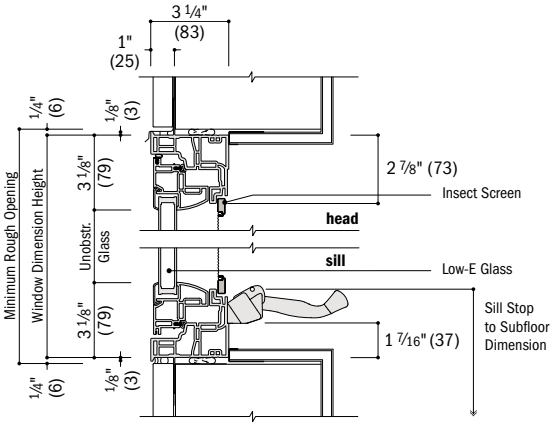


Vertical Section

1" flange setback with stucco key

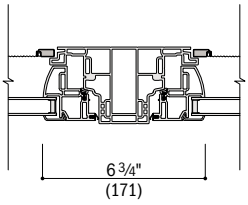


Horizontal Section
Stucco Exterior

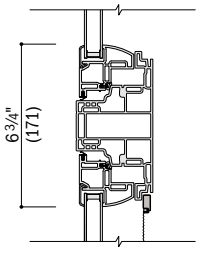


Vertical Section
Stucco Exterior

integrals



Horizontal Section
Twin Casement



Vertical Section
Picture Over Awning

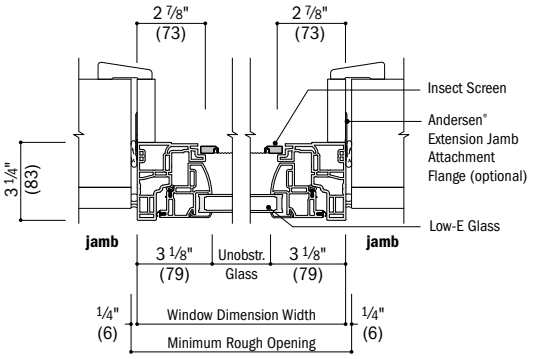
See pages 84-87 for joining details.

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

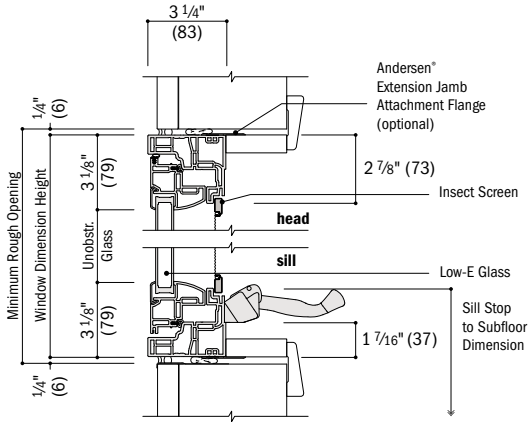
Awning Window Details – Replacement

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

no flange

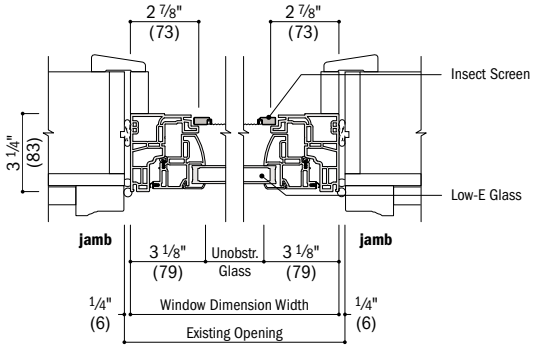


Horizontal Section
Existing Framed Opening

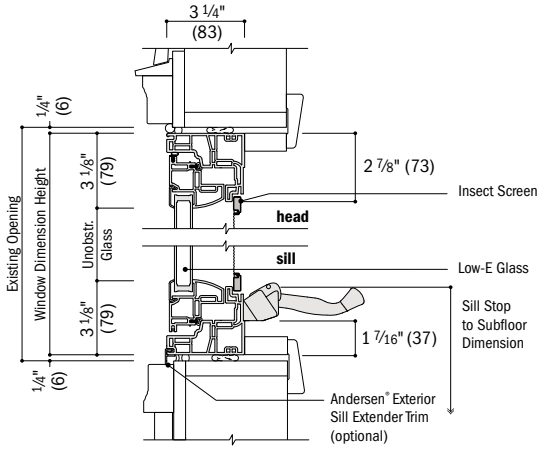


Vertical Section
Existing Framed Opening

insert

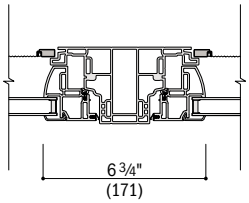


Horizontal Section
Existing Window Opening

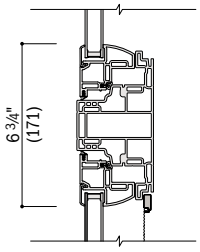


Vertical Section
Existing Window Opening

integrals



Horizontal Section
Twin Casement



Vertical Section
Picture Over Awning

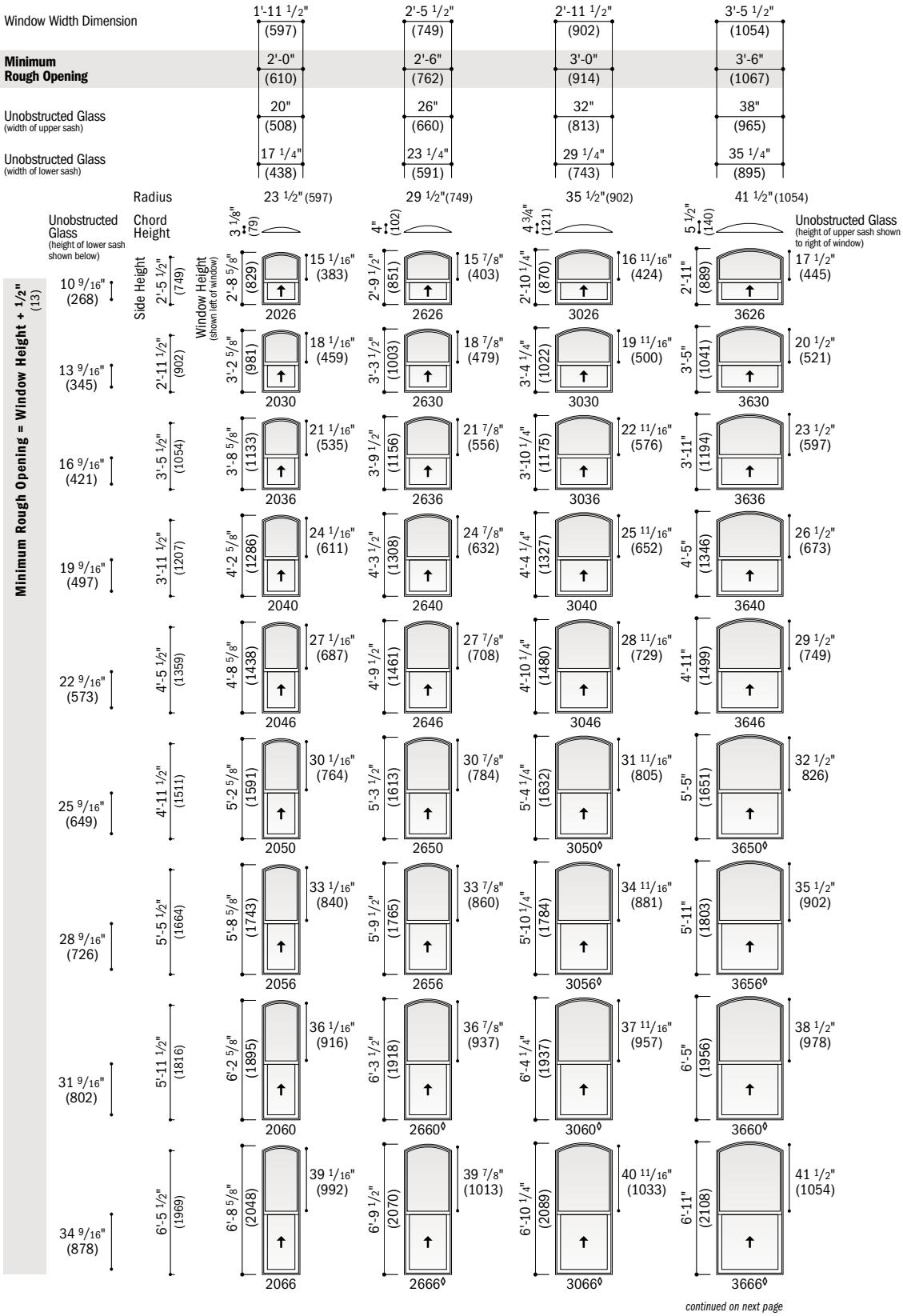
Installation accessories for insert frame shown on page 109.

See pages 84-87 for joining details.

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

Table of Arch Single-Hung Window Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96

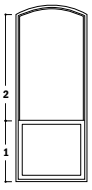


continued on next page

Custom-size windows are available in 1/8" (3) increments. Contact your Andersen supplier for more information.

For arch single-hung windows, the size designation does not reflect the overall window height (e.g., a 20<u>2</u>6 window size has a side height of 2'-5 1/2" and an overall window height of 2'-8 5/8").

Height dimensions for upper sash are to the right of each window size and lower sash are to the far left.



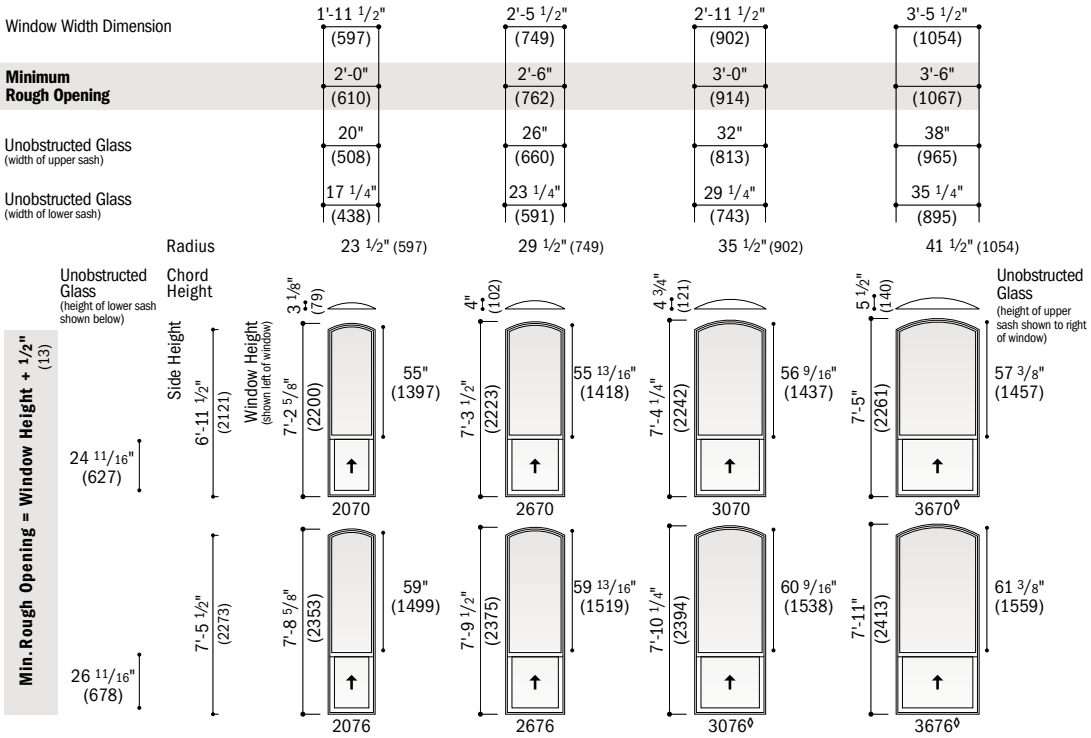
Windows with a side height greater than 6'-5 1/2" (1969) are only available with a 2:1 reverse cottage sash ratio.*

Details are shown on pages 48-49. Grille patterns shown on page 47.

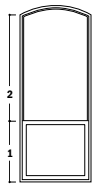
• "Window Dimension" always refers to outside frame-to-frame dimension.
• "**Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
• Dimensions in parentheses are in millimeters.
◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See table on pages 31 and 33.
*For side heights greater than 6'-5 1/2" (1969), meeting rail location = (side height in inches x 0.33) + 1.96".

Table of Arch Single-Hung Window Sizes *(continued)*

Scale 1/8" (3) = 1'-0" (305) – 1:96



Notes on previous page also apply to this page.



Windows with a side height greater than 6'-5 1/2" (1969) are only available with a 2:1 reverse cottage sash ratio.*

- "Window Dimension" always refers to outside frame-to-frame dimension.
- **"Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See table on pages 31 and 33.

*For side heights greater than 6'-5 1/2" (1969), meeting rail location = (side height in inches x 0.33) + 1.96".

Arch Single-Hung Window Opening and Area Specifications

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position: Width Inches/(mm)	Clear Opening in Full Open Position: Height Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
2026	1.53 (0.14)	20" (508)	11 1/16" (280)	3.25 (0.30)	1.53 (0.14)	51 3/8" (1304)	5.16 (0.48)
2030	1.95 (0.18)	20" (508)	14 1/16" (357)	4.03 (0.37)	1.95 (0.18)	45 3/8" (1152)	6.14 (0.57)
2036	2.37 (0.22)	20" (508)	17 1/16" (433)	4.80 (0.45)	2.37 (0.22)	39 3/8" (1000)	7.12 (0.66)
2040	2.78 (0.26)	20" (508)	20 1/16" (509)	5.58 (0.52)	2.78 (0.26)	33 3/8" (847)	8.10 (0.75)
2046	3.20 (0.30)	20" (508)	23 1/16" (585)	6.36 (0.59)	3.20 (0.30)	27 3/8" (695)	9.08 (0.84)
2050	3.62 (0.34)	20" (508)	26 1/16" (661)	7.13 (0.66)	3.62 (0.34)	21 3/8" (542)	10.06 (0.93)
2056	4.03 (0.37)	20" (508)	29 1/16" (738)	7.91 (0.73)	4.03 (0.37)	15 3/8" (390)	11.04 (1.03)
2060	4.45 (0.41)	20" (508)	32 1/16" (814)	8.68 (0.81)	4.45 (0.41)	9 3/8" (238)	12.02 (1.12)
2066	4.87 (0.45)	20" (508)	35 1/16" (890)	9.46 (0.88)	4.87 (0.45)	16 7/8"** (429)**	12.99 (1.21)
2070*	3.48 (0.32)	20" (508)	25 1/16" (636)	10.48 (0.97)	3.48 (0.32)	10 7/8"** (276)**	13.97 (1.30)
2076*	3.76 (0.35)	20" (508)	27 1/16" (687)	11.28 (1.05)	3.76 (0.35)	4 7/8"** (124)**	14.95 (1.39)
2626	1.99 (0.19)	26" (660)	11 1/16" (280)	4.39 (0.41)	1.99 (0.19)	50 9/16" (1284)	6.59 (0.61)
2630	2.53 (0.24)	26" (660)	14 1/16" (357)	5.41 (0.50)	2.53 (0.24)	44 9/16" (1132)	7.82 (0.73)
2636	3.08 (0.29)	26" (660)	17 1/16" (433)	6.44 (0.60)	3.08 (0.29)	38 9/16" (979)	9.05 (0.84)
2640	3.62 (0.34)	26" (660)	20 1/16" (509)	7.46 (0.69)	3.62 (0.34)	32 9/16" (827)	10.28 (0.95)
2646	4.16 (0.39)	26" (660)	23 1/16" (585)	8.49 (0.79)	4.16 (0.39)	26 9/16" (674)	11.51 (1.07)
2650	4.70 (0.44)	26" (660)	26 1/16" (661)	9.52 (0.88)	4.70 (0.44)	20 9/16" (522)	12.74 (1.18)
2656	5.24 (0.49)	26" (660)	29 1/16" (738)	10.54 (0.98)	5.24 (0.49)	14 9/16" (370)	13.97 (1.30)
2660◊	5.78 (0.54)	26" (660)	32 1/16" (814)	11.57 (1.07)	5.78 (0.54)	8 9/16" (217)	15.20 (1.41)
2666◊	6.33 (0.59)	26" (660)	35 1/16" (890)	12.59 (1.17)	6.33 (0.59)	16 1/16"** (429)**	16.42 (1.53)
2670*	4.52 (0.42)	26" (660)	25 1/16" (636)	13.87 (1.29)	4.52 (0.42)	10 1/16"** (256)**	17.65 (1.64)
2676*	4.88 (0.45)	26" (660)	27 1/16" (687)	14.91 (1.39)	4.88 (0.45)	4 1/16"** (103)**	18.88 (1.75)
3026	2.45 (0.23)	32" (813)	11 1/16" (280)	5.57 (0.52)	2.45 (0.23)	49 3/4" (1263)	8.07 (0.75)
3030	3.12 (0.29)	32" (813)	14 1/16" (357)	6.84 (0.64)	3.12 (0.29)	43 3/4" (1111)	9.54 (0.89)

continued on page 33

- "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096) except for XX66, XX70 and XX76 heights, which are calculated using a header height of 8' (2438).
- Dimensions in parentheses are in millimeters or square meters.

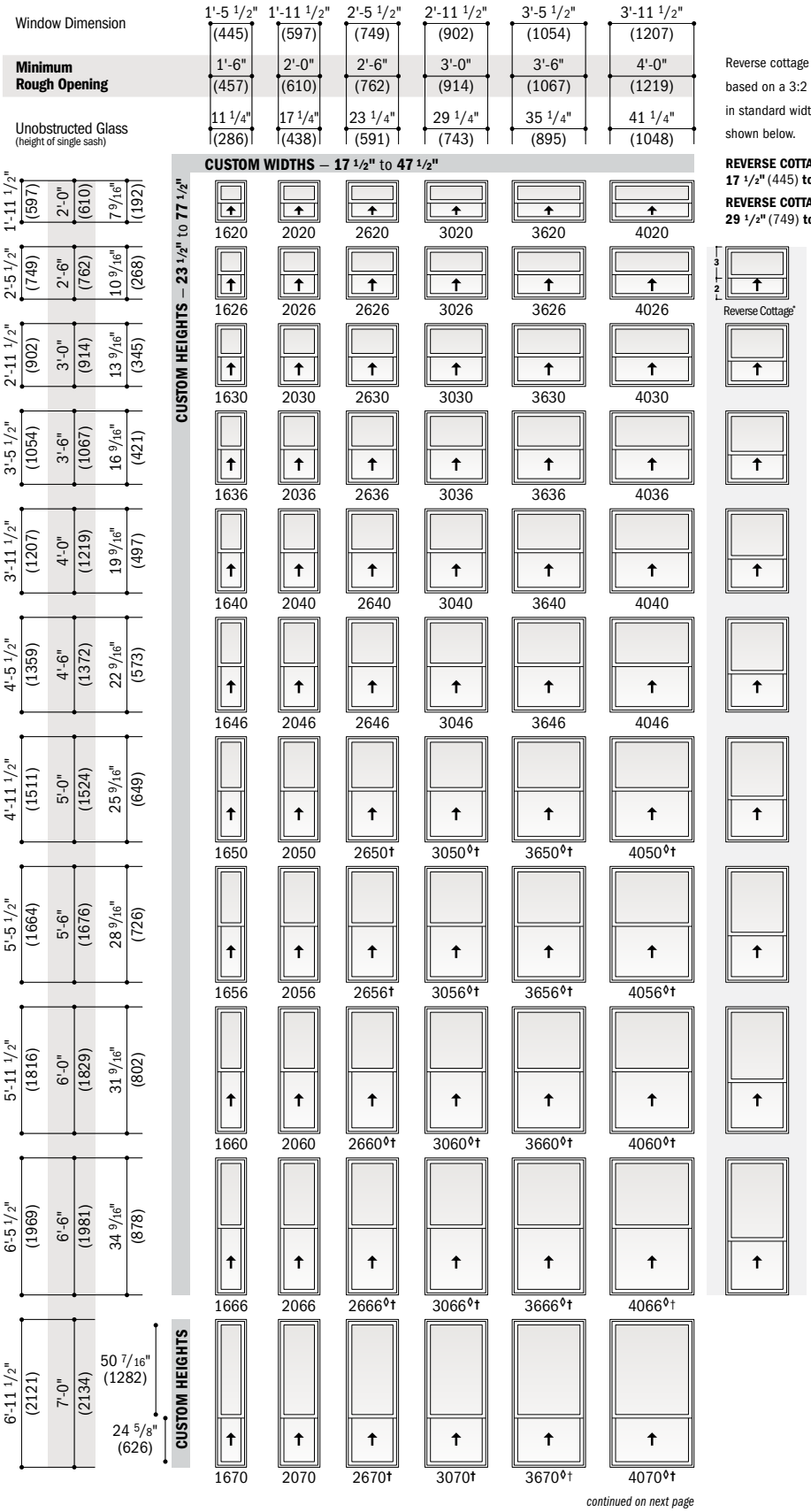
◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

*Available only with a 2:1 reverse cottage sash ratio.

**Calculated based upon a structural header height of 8' (2438).

Table of Single-Hung Window Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96



continued on next page

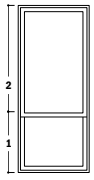
Reverse cottage sash is available based on a 3:2 ratio. Available in standard widths for the heights shown below.

REVERSE COTTAGE CUSTOM WIDTHS – 17 1/2" (445) **to 47 1/2"** (1207)

REVERSE COTTAGE CUSTOM HEIGHTS – 29 1/2" (749) **to 77 1/2"** (1969)

Custom-size windows are available in 1/8" (3) increments. See page 89 for custom sizes and specifications.

For construction site convenience, an optional drywall pass-through window is available for removal and reinstallation of the upper and lower sash.



Windows with a height greater than 6'-5 1/2" (1969) are only available with a 2:1 reverse cottage sash ratio.** Size tables for all windows with reverse cottage sash are available on **andersenwindows.com**.

Details shown on pages 50-51.

Grille patterns shown on page 47.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See table on page 39.

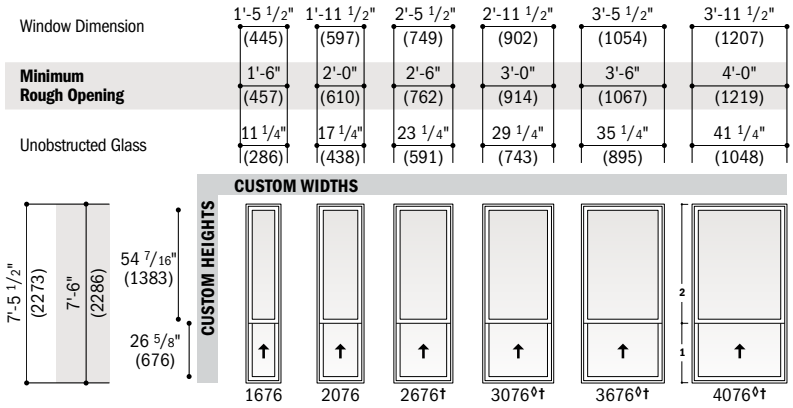
†Drywall pass-through window available for these standard and reverse cottage sizes and for custom-size windows wider than 1'-11 1/2" (597) and taller than 4'-5 1/2" (1359).

*For reverse cottage sash windows, meeting rail location = (window height in inches x 0.40) + 1.96".

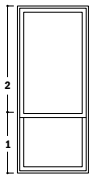
**For heights greater than 6'-5 1/2" (1969), meeting rail location = (window height in inches x 0.33) + 1.96".

Table of Single-Hung Window Sizes *(continued)*

Scale 1/8" (3) = 1'-0" (305) – 1:96



Notes on previous page also apply to this page.



Windows with a height greater than 6'-5 1/2" (1969) are only available with a 2:1 reverse cottage sash ratio.* Size tables for all windows with reverse cottage sash are available on **andersenwindows.com**.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- **"Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See table on bottom of this page≠≠.
†Drywall pass-through window available for these standard and reverse cottage sizes and for custom-size windows wider than 1'-11 1/2" (597) and taller than 4'-5 1/2" (1359).
*For heights greater than 6'-5 1/2" (1969), meeting rail location = (window height in inches x 0.33) + 1.96".

Arch Single-Hung Window Opening and Area Specifications *(continued from page 31)*

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Height Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
3036	3.79 (0.35)	32" (813)	17 1/16" (433)	8.12 (0.75)	3.79 (0.35)	37 3/4" (959)	11.02 (1.02)
3040	4.45 (0.41)	32" (813)	20 1/16" (509)	9.39 (0.87)	4.45 (0.41)	31 3/4" (806)	12.50 (1.16)
3046	5.12 (0.48)	32" (813)	23 1/16" (585)	10.67 (0.99)	5.12 (0.48)	25 3/4" (654)	13.98 (1.30)
3050 ◊	5.79 (0.54)	32" (813)	26 1/16" (661)	11.95 (1.11)	5.79 (0.54)	19 3/4" (501)	15.46 (1.44)
3056 ◊	6.45 (0.60)	32" (813)	29 1/16" (738)	13.22 (1.23)	6.45 (0.60)	13 3/4" (349)	16.94 (1.57)
3060 ◊	7.12 (0.66)	32" (813)	32 1/16" (814)	14.50 (1.35)	7.12 (0.66)	7 3/4" (197)	18.42 (1.71)
3066 ◊	7.79 (0.72)	32" (813)	35 1/16" (890)	15.77 (1.47)	7.79 (0.72)	15 1/4"** (387)**	19.90 (1.85)
3070*	5.56 (0.52)	32" (813)	25 1/16" (636)	17.30 (1.61)	5.56 (0.52)	9 1/4"** (235)**	21.38 (1.99)
3076 ◊*	6.01 (0.56)	32" (813)	27 1/16" (687)	18.59 (1.73)	6.01 (0.56)	3 1/4"** (83)**	22.86 (2.12)
3626	2.91 (0.27)	38" (965)	11 1/16" (280)	6.79 (0.63)	2.91 (0.27)	48 15/16" (1243)	9.59 (0.89)
3630	3.70 (0.34)	38" (965)	14 1/16" (357)	8.32 (0.77)	3.70 (0.34)	42 15/16" (1091)	11.31 (1.05)
3636	4.50 (0.42)	38" (965)	17 1/16" (433)	9.84 (0.91)	4.50 (0.42)	36 15/16" (938)	13.04 (1.21)
3640	5.29 (0.49)	38" (965)	20 1/16" (509)	11.37 (1.06)	5.29 (0.49)	30 15/16" (786)	14.77 (1.37)
3646	6.08 (0.56)	38" (965)	23 1/16" (585)	12.89 (1.20)	6.08 (0.56)	24 15/16" (633)	16.50 (1.53)
3650 ◊	6.87 (0.64)	38" (965)	26 1/16" (661)	14.42 (1.34)	6.87 (0.64)	18 15/16" (481)	18.23 (1.69)
3656 ◊	7.66 (0.71)	38" (965)	29 1/16" (738)	15.95 (1.48)	7.66 (0.71)	12 15/16" (329)	19.96 (1.85)
3660 ◊	8.45 (0.79)	38" (965)	32 1/16" (814)	17.47 (1.62)	8.45 (0.79)	6 15/16" (176)	21.69 (2.02)
3666 ◊	9.25 (0.86)	38" (965)	35 1/16" (890)	19.00 (1.77)	9.25 (0.86)	14 7/16"** (367)**	23.42 (2.18)
3670 ◊*	6.61 (0.61)	38" (965)	25 1/16" (636)	20.77 (1.93)	6.61 (0.61)	8 7/16"** (214)**	25.15 (2.34)
3676 ◊*	7.14 (0.66)	38" (965)	27 1/16" (687)	22.32 (2.07)	7.14 (0.66)	2 7/16"** (62)**	26.88 (2.50)

- "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096) except for XX66, XX70 and XX76 heights, which are calculated using a header height of 8' (2438).
- Dimensions in parentheses are in millimeters or square meters.

◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).
*Available only with a 2:1 reverse cottage sash ratio.
**Calculated based upon a structural header height of 8' (2438).

Single-Hung Window Opening and Area Specifications

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Height Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
1620	0.78 (0.07)	14" (356)	8 1/16" (204)	1.18 (0.11)	0.78 (0.07)	60 1/2" (1537)	2.86 (0.27)
1626	1.07 (0.10)	14" (356)	11 1/16" (280)	1.65 (0.15)	1.07 (0.10)	54 1/2" (1384)	3.59 (0.33)
1630	1.37 (0.13)	14" (356)	14 1/16" (357)	2.12 (0.20)	1.37 (0.13)	48 1/2" (1232)	4.31 (0.40)
1636	1.66 (0.15)	14" (356)	17 1/16" (433)	2.59 (0.24)	1.66 (0.15)	42 1/2" (1080)	5.04 (0.47)
1640	1.95 (0.18)	14" (356)	20 1/16" (509)	3.05 (0.28)	1.95 (0.18)	36 1/2" (927)	5.77 (0.54)
1646	2.24 (0.21)	14" (356)	23 1/16" (585)	3.52 (0.33)	2.24 (0.21)	30 1/2" (775)	6.50 (0.60)
1650	2.53 (0.24)	14" (356)	26 1/16" (661)	3.99 (0.37)	2.53 (0.24)	24 1/2" (622)	7.23 (0.67)
1656	2.82 (0.26)	14" (356)	29 1/16" (738)	4.46 (0.41)	2.82 (0.26)	18 1/2" (470)	7.96 (0.74)
1660	3.12 (0.29)	14" (356)	32 1/16" (814)	4.93 (0.46)	3.12 (0.29)	12 1/2" (318)	8.69 (0.81)
1666	3.41 (0.32)	14" (356)	35 1/16" (890)	5.40 (0.50)	3.41 (0.32)	6 1/2" (165)	9.42 (0.88)
1670*	2.43 (0.23)	14" (356)	25 1/16" (636)	5.87 (0.55)	2.43 (0.23)	14"** (356)**	10.15 (0.94)

continued on page 39

For reverse cottage, twin and triple single-hung window specifications, see pages 41, 43 and 45.

- "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096) except for XX70 and XX76 heights, which are calculated using a header height of 8' (2438).
- Dimensions in parentheses are in millimeters or square meters.

◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).
*Available only with a 2:1 reverse cottage sash ratio.
**Calculated based upon a structural header height of 8' (2438).

SINGLE-HUNG WINDOWS

Table of Twin and Triple Single-Hung Window Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96

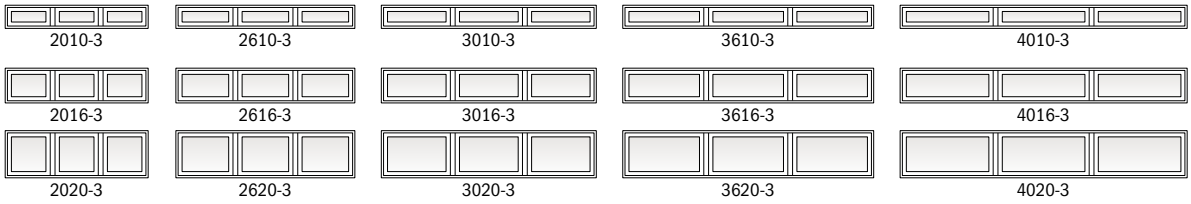
Notes on next page also apply to this page.

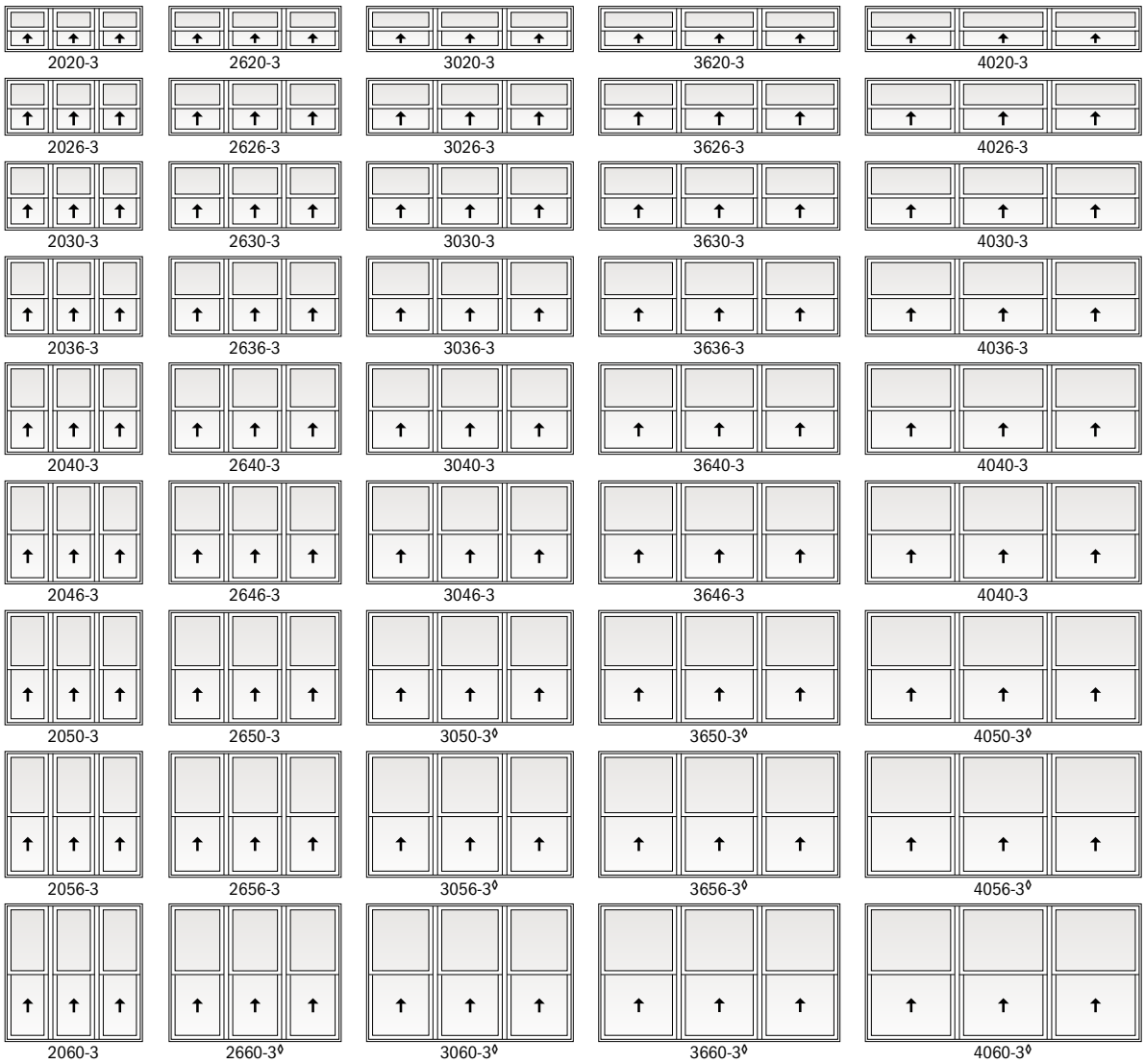
- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

◊Meets or exceed clear opening area of 5.7 sq. ft. 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See tables on pages 43 and 45.

5'-11 1/2" (1816)	7'-5 1/2" (2273)	8'-11 1/2" (2731)	10'-5 1/2" (3188)	11'-11 1/2" (3645)
6'-0" (1829)	7'-6" (2286)	9'-0" (2743)	10'-6" (3200)	12'-0" (3658)
17 1/4" (438)	23 1/4" (591)	29 1/4" (743)	35 1/4" (895)	41 1/4" (1048)

CUSTOM WIDTHS TRIPLE – 53 1/2" to 143 1/2"





Custom-size windows are available in 1/8" (3) increments. See page 89 for custom sizes and specifications.

Windows have one continuous outer frame.

Twin and triple transoms are also shown. See pages 70-71 for more information.

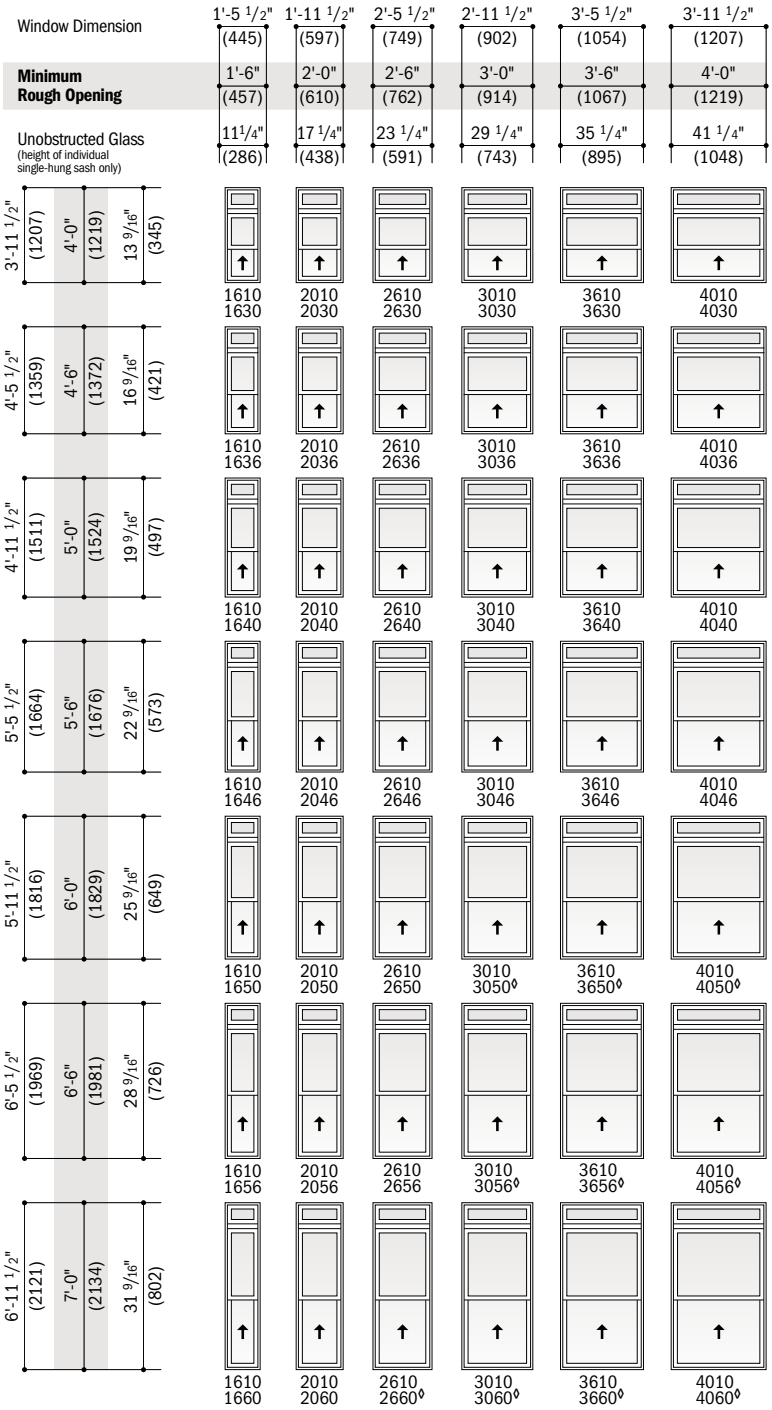
Details shown on pages 50-51. Grille patterns shown on page 47.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See tables on pages 43 and 45.

Table of Sizes – 10-High Transom Window Over Single-Hung

Scale ⅛" (3) = 1'-0" (305) – 1:96



Windows have one continuous outer frame.

Unobstructed glass height dimension of upper transom sash is 5 1/4" (133).

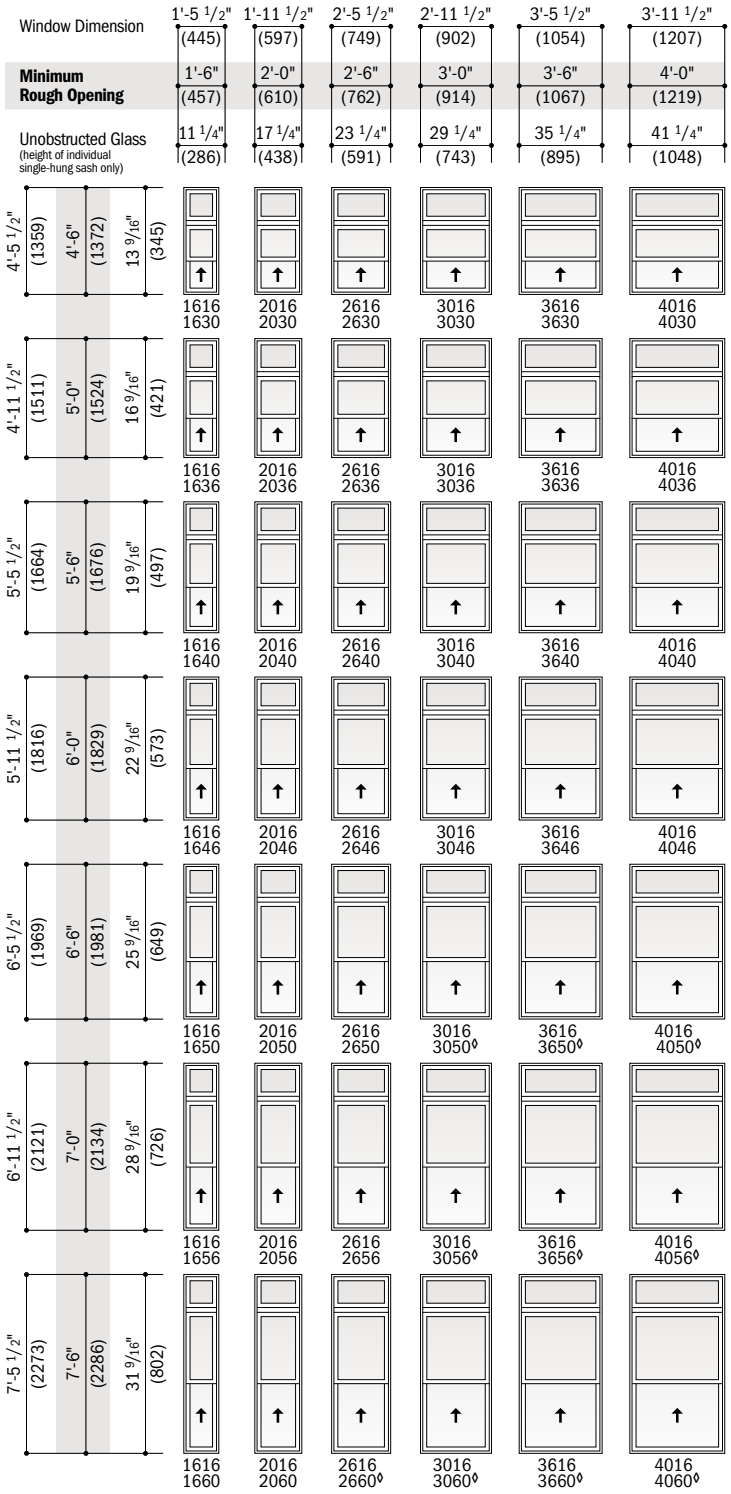
Details shown on pages 50-51.

Grille patterns shown on page 47.

• "Window Dimension" always refers to outside frame-to-frame dimension.
• "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
• Dimensions in parentheses are in millimeters.
◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Table of Sizes – 16-High Transom Window Over Single-Hung

Scale 1/8" (3) = 1'-0" (305) – 1:96



Windows have one continuous outer frame.

Unobstructed glass height dimension of upper transom sash is 11 1/4" (286).

Details shown on pages 50-51.

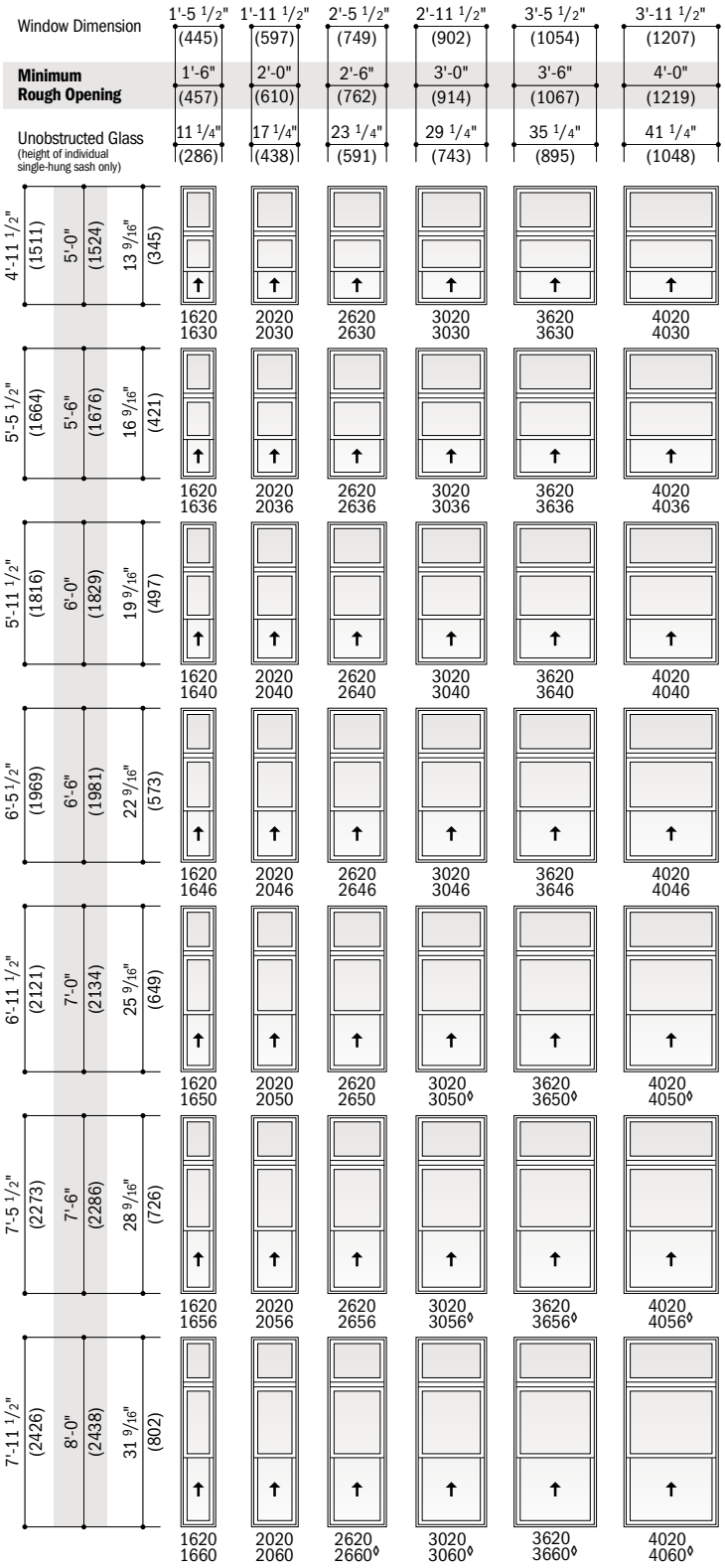
Grille patterns shown on page 47.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Table of Sizes – 20-High Transom Window Over Single-Hung

Scale 1/8" (3) = 1'-0" (305) – 1:96



Windows have one continuous outer frame.

Unobstructed glass height dimension of upper transom sash is 17 1/4" (438).

Details shown on pages 50-51.

Grille patterns shown on page 47.

• "Window Dimension" always refers to outside frame-to-frame dimension.
• "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
• Dimensions in parentheses are in millimeters.
◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Single-Hung Window Opening and Area Specifications *(continued from page 33)*

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Height Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
1676*	2.63 (0.24)	14" (356)	27 1/16" (687)	6.34 (0.59)	2.63 (0.24)	8"** (203)**	10.88 (1.01)
2020	1.12 (0.10)	20" (508)	8 1/16" (204)	1.81 (0.17)	1.12 (0.10)	60 1/2" (1537)	3.84 (0.36)
2026	1.53 (0.14)	20" (508)	11 1/16" (280)	2.53 (0.24)	1.53 (0.14)	54 1/2" (1384)	4.81 (0.45)
2030	1.95 (0.18)	20" (508)	14 1/16" (357)	3.25 (0.30)	1.95 (0.18)	48 1/2" (1232)	5.79 (0.54)
2036	2.37 (0.22)	20" (508)	17 1/16" (433)	3.96 (0.37)	2.37 (0.22)	42 1/2" (1080)	6.77 (0.63)
2040	2.78 (0.26)	20" (508)	20 1/16" (509)	4.68 (0.44)	2.78 (0.26)	36 1/2" (927)	7.75 (0.72)
2046	3.20 (0.30)	20" (508)	23 1/16" (585)	5.40 (0.50)	3.20 (0.30)	30 1/2" (775)	8.73 (0.81)
2050	3.62 (0.34)	20" (508)	26 1/16" (661)	6.12 (0.57)	3.62 (0.34)	24 1/2" (622)	9.71 (0.90)
2056	4.03 (0.38)	20" (508)	29 1/16" (738)	6.84 (0.64)	4.03 (0.38)	18 1/2" (470)	10.69 (0.99)
2060	4.45 (0.41)	20" (508)	32 1/16" (814)	7.56 (0.70)	4.45 (0.41)	12 1/2" (318)	11.67 (1.08)
2066	4.87 (0.45)	20" (508)	35 1/16" (890)	8.28 (0.77)	4.87 (0.45)	6 1/2" (165)	12.65 (1.18)
2070*	3.48 (0.32)	20" (508)	25 1/16" (636)	9.00 (0.84)	3.48 (0.32)	14"** (356)**	13.63 (1.27)
2076*	3.76 (0.35)	20" (508)	27 1/16" (687)	9.71 (0.90)	3.76 (0.35)	8"** (203)**	14.61 (1.36)
2620	1.45 (0.14)	26" (660)	8 1/16" (204)	2.44 (0.23)	1.45 (0.14)	60 1/2" (1537)	4.81 (0.45)
2626	1.99 (0.19)	26" (660)	11 1/16" (280)	3.41 (0.32)	1.99 (0.19)	54 1/2" (1384)	6.04 (0.56)
2630	2.54 (0.24)	26" (660)	14 1/16" (357)	4.37 (0.41)	2.54 (0.24)	48 1/2" (1232)	7.27 (0.68)
2636	3.08 (0.29)	26" (660)	17 1/16" (433)	5.34 (0.50)	3.08 (0.29)	42 1/2" (1080)	8.50 (0.79)
2640	3.62 (0.34)	26" (660)	20 1/16" (509)	6.31 (0.59)	3.62 (0.34)	36 1/2" (927)	9.73 (0.90)
2646	4.16 (0.39)	26" (660)	23 1/16" (585)	7.28 (0.68)	4.16 (0.39)	30 1/2" (775)	10.96 (1.02)
2650	4.70 (0.44)	26" (660)	26 1/16" (661)	8.25 (0.77)	4.70 (0.44)	24 1/2" (622)	12.19 (1.13)
2656	5.24 (0.49)	26" (660)	29 1/16" (738)	9.22 (0.86)	5.24 (0.49)	18 1/2" (470)	13.42 (1.25)
2660 ◊	5.79 (0.54)	26" (660)	32 1/16" (814)	10.19 (0.95)	5.79 (0.54)	12 1/2" (318)	14.65 (1.36)
2666 ◊	6.33 (0.59)	26" (660)	35 1/16" (890)	11.16 (1.04)	6.33 (0.45)	6 1/2" (165)	15.88 (1.48)
2670*	4.52 (0.42)	26" (660)	25 1/16" (636)	12.12 (1.13)	4.52 (0.42)	14"** (356)**	17.11 (1.59)
2676*	4.88 (0.45)	26" (660)	27 1/16" (687)	13.09 (1.22)	4.88 (0.45)	8"** (203)**	18.34 (1.70)
3020	1.79 (0.17)	32" (813)	8 1/16" (204)	3.07 (0.29)	1.79 (0.17)	60 1/2" (1537)	5.79 (0.54)
3026	2.45 (0.23)	32" (813)	11 1/16" (280)	4.28 (0.40)	2.45 (0.23)	54 1/2" (1384)	7.27 (0.68)
3030	3.12 (0.29)	32" (813)	14 1/16" (357)	5.50 (0.51)	3.12 (0.29)	48 1/2" (1232)	8.75 (0.81)
3036	3.79 (0.35)	32" (813)	17 1/16" (433)	6.72 (0.62)	3.79 (0.35)	42 1/2" (1080)	10.23 (0.95)
3040	4.45 (0.41)	32" (813)	20 1/16" (509)	7.94 (0.74)	4.45 (0.41)	36 1/2" (927)	11.71 (1.09)
3046	5.12 (0.48)	32" (813)	23 1/16" (585)	9.16 (0.85)	5.12 (0.48)	30 1/2" (775)	13.19 (1.23)
3050 ◊	5.79 (0.54)	32" (813)	26 1/16" (661)	10.38 (0.96)	5.79 (0.54)	24 1/2" (622)	14.67 (1.36)
3056 ◊	6.45 (0.60)	32" (813)	29 1/16" (738)	11.60 (1.08)	6.45 (0.60)	18 1/2" (470)	16.15 (1.50)
3060 ◊	7.12 (0.66)	32" (813)	32 1/16" (814)	12.82 (1.19)	7.12 (0.66)	12 1/2" (318)	17.63 (1.64)
3066 ◊	7.79 (0.72)	32" (813)	35 1/16" (890)	14.03 (1.30)	7.79 (0.72)	6 1/2" (165)	19.11 (1.78)
3070*	5.56 (0.52)	32" (813)	25 1/16" (636)	15.25 (1.42)	5.56 (0.52)	14"** (356)**	20.59 (1.91)
3076 ◊*	6.01 (0.56)	32" (813)	27 1/16" (687)	16.47 (1.53)	6.01 (0.56)	8"** (203)**	22.06 (2.05)
3620	2.12 (0.20)	38" (965)	8 1/16" (204)	3.69 (0.34)	2.12 (0.20)	60 1/2" (1537)	6.77 (0.63)
3626	2.91 (0.27)	38" (965)	11 1/16" (280)	5.16 (0.48)	2.91 (0.27)	54 1/2" (1384)	8.50 (0.79)
3630	3.71 (0.34)	38" (965)	14 1/16" (357)	6.63 (0.62)	3.71 (0.34)	48 1/2" (1232)	10.23 (0.95)
3636	4.50 (0.42)	38" (965)	17 1/16" (433)	8.10 (0.75)	4.50 (0.42)	42 1/2" (1080)	11.96 (1.11)
3640	5.29 (0.49)	38" (965)	20 1/16" (509)	9.57 (0.89)	5.29 (0.49)	36 1/2" (927)	13.69 (1.27)
3646	6.08 (0.57)	38" (965)	23 1/16" (585)	11.04 (1.03)	6.08 (0.57)	30 1/2" (775)	15.42 (1.43)
3650 ◊	6.87 (0.64)	38" (965)	26 1/16" (661)	12.51 (1.16)	6.87 (0.64)	24 1/2" (622)	17.15 (1.59)
3656 ◊	7.66 (0.71)	38" (965)	29 1/16" (738)	13.98 (1.30)	7.66 (0.71)	18 1/2" (470)	18.88 (1.75)
3660 ◊	8.46 (0.79)	38" (965)	32 1/16" (814)	15.44 (1.44)	8.46 (0.79)	12 1/2" (318)	20.61 (1.91)
3666 ◊	9.25 (0.86)	38" (965)	35 1/16" (890)	16.91 (1.57)	9.25 (0.86)	6 1/2" (165)	22.34 (2.08)
3670 ◊*	6.61 (0.61)	38" (965)	25 1/16" (636)	18.38 (1.71)	6.61 (0.61)	14"** (356)**	24.06 (2.24)
3676 ◊*	7.14 (0.66)	38" (965)	27 1/16" (687)	19.85 (1.84)	7.14 (0.66)	8"** (203)**	25.79 (2.40)
4020	2.46 (0.23)	44" (1118)	8 1/16" (204)	4.32 (0.40)	2.46 (0.23)	60 1/2" (1537)	7.75 (0.72)
4026	3.37 (0.31)	44" (1118)	11 1/16" (280)	6.04 (0.56)	3.37 (0.31)	54 1/2" (1384)	9.73 (0.90)
4030	4.29 (0.40)	44" (1118)	14 1/16" (357)	7.76 (0.72)	4.29 (0.40)	48 1/2" (1232)	11.71 (1.09)
4036	5.21 (0.48)	44" (1118)	17 1/16" (433)	9.48 (0.88)	5.21 (0.48)	42 1/2" (1080)	13.69 (1.27)
4040	6.12 (0.57)	44" (1118)	20 1/16" (509)	11.20 (1.04)	6.12 (0.57)	36 1/2" (927)	15.67 (1.46)
4046	7.04 (0.65)	44" (1118)	23 1/16" (585)	12.92 (1.20)	7.04 (0.65)	30 1/2" (775)	17.65 (1.64)
4050 ◊	7.96 (0.74)	44" (1118)	26 1/16" (661)	14.64 (1.36)	7.96 (0.74)	24 1/2" (622)	19.63 (1.82)
4056 ◊	8.87 (0.82)	44" (1118)	29 1/16" (738)	16.35 (1.52)	8.87 (0.82)	18 1/2" (470)	21.61 (2.01)
4060 ◊	9.79 (0.91)	44" (1118)	32 1/16" (814)	18.07 (1.68)	9.79 (0.91)	12 1/2" (318)	23.59 (2.19)
4066 ◊	10.71 (1.00)	44" (1118)	35 1/16" (890)	19.79 (1.84)	10.70 (1.00)	6 1/2" (165)	25.56 (2.38)
4070 ◊*	7.65 (0.71)	44" (1118)	25 1/16" (636)	21.51 (2.00)	7.65 (0.71)	14"** (356)**	27.54 (2.56)
4076 ◊*	8.26 (0.77)	44" (1118)	27 1/16" (687)	23.23 (2.16)	8.26 (0.77)	8"** (203)**	29.52 (2.74)

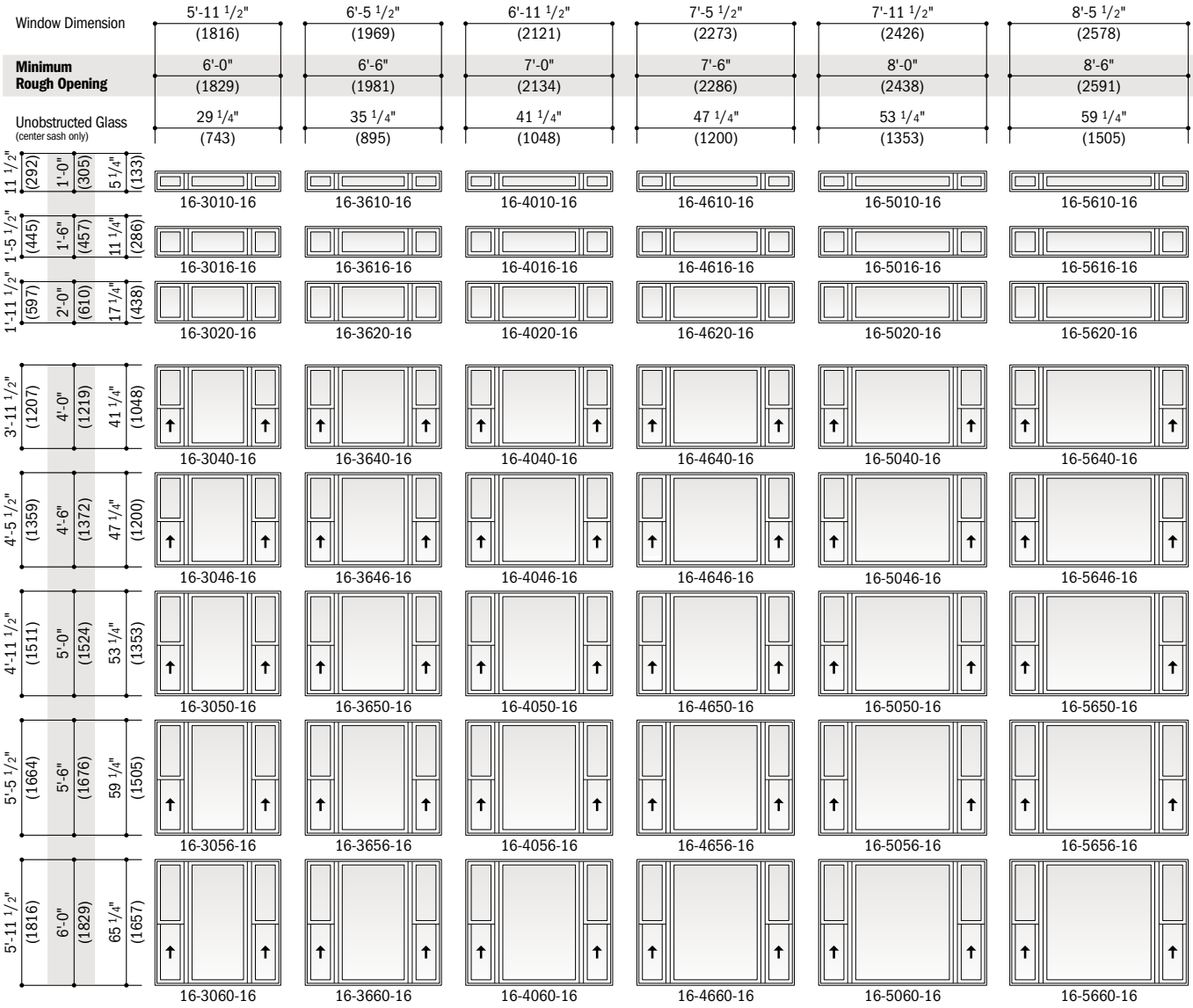
For arch single-hung window specifications, see pages 31 and 33.

For reverse cottage, twin and triple single-hung window specifications, see pages 41, 43 and 45.

• "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096) except for XX70 and XX76 heights, which are calculated using a header height of 8' (2438).
• Dimensions in parentheses are in millimeters or square meters.
◊ Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).
*Available only with a 2:1 reverse cottage sash ratio.
**Calculated based upon a structural header height of 8' (2438).

Table of Sizes – Picture Window With Flanking 16-Wide Single-Hungs

Scale 1/8" (3) = 1'-0" (305) – 1:96



Windows have one continuous outer frame.

Unobstructed glass width dimension of flanking sash is 11 1/4" (286). For unobstructed glass height dimensions of flanking single-hungs, see page 32.

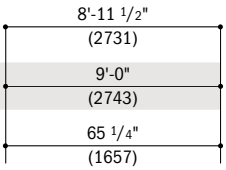
Matching transoms are also shown.

Details shown on pages 50-51.

Grille patterns shown on page 47.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

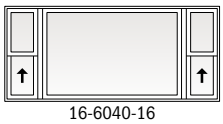
See notes on previous page.

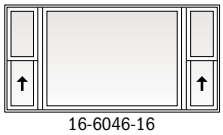


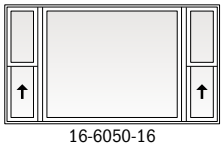

16-6010-16

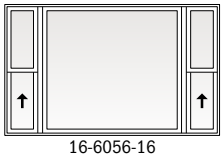

16-6016-16

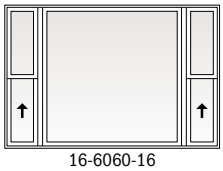

16-6020-16


16-6040-16


16-6046-16


16-6050-16


16-6056-16


16-6060-16

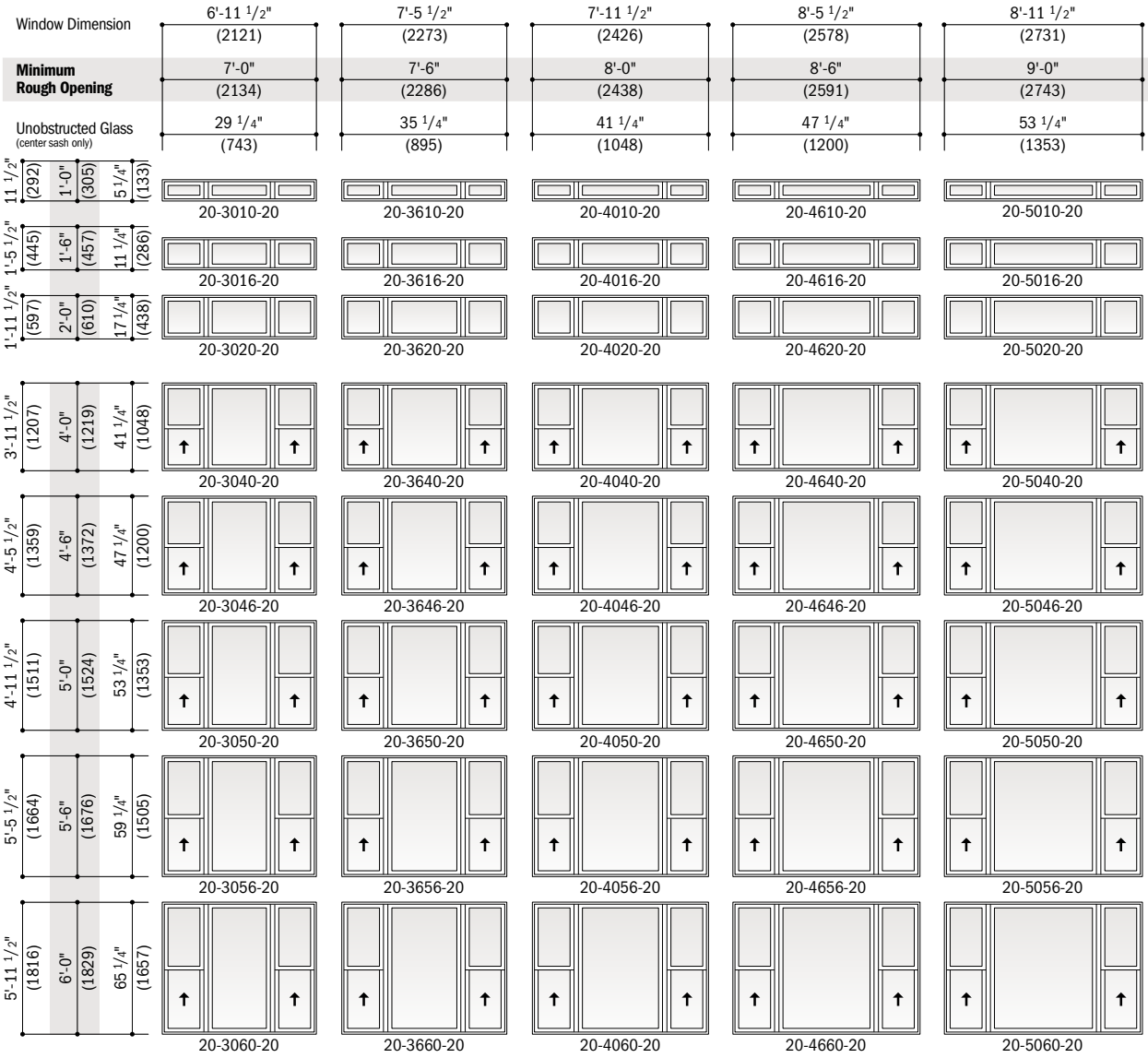
Single-Hung Window Opening and Area Specifications – 3:2 Reverse Cottage Sash Ratio

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position: Width Inches/(mm)	Clear Opening in Full Open Position: Height Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
1626	0.88 (0.08)	14" (356)	9 1/16" (230)	1.65 (0.15)	0.88 (0.08)	54 1/2" (1384)	3.59 (0.33)
1630	1.07 (0.10)	14" (356)	11 1/16" (280)	2.12 (0.20)	1.07 (0.10)	48 1/2" (1232)	4.31 (0.40)
1636	1.37 (0.13)	14" (356)	14 1/16" (357)	2.59 (0.24)	1.37 (0.13)	42 1/2" (1080)	5.04 (0.47)
1640	1.56 (0.15)	14" (356)	16 1/16" (407)	3.05 (0.28)	1.56 (0.15)	36 1/2" (927)	5.77 (0.54)
1646	1.85 (0.17)	14" (356)	19 1/16" (484)	3.52 (0.33)	1.85 (0.17)	30 1/2" (775)	6.50 (0.60)
1650	2.05 (0.19)	14" (356)	21 1/16" (534)	3.99 (0.37)	2.05 (0.19)	24 1/2" (622)	7.23 (0.67)
1656	2.24 (0.21)	14" (356)	23 1/16" (585)	4.46 (0.41)	2.24 (0.21)	18 1/2" (470)	7.96 (0.74)
1660	2.53 (0.24)	14" (356)	26 1/16" (661)	4.93 (0.46)	2.53 (0.24)	12 1/2" (318)	8.69 (0.81)
1666	2.73 (0.25)	14" (356)	28 1/16" (712)	5.40 (0.50)	2.73 (0.25)	6 1/2" (165)	9.42 (0.88)
2026	1.26 (0.12)	20" (508)	9 1/16" (230)	2.53 (0.24)	1.26 (0.12)	54 1/2" (1384)	4.81 (0.45)
2030	1.53 (0.14)	20" (508)	11 1/16" (280)	3.25 (0.30)	1.53 (0.14)	48 1/2" (1232)	5.79 (0.54)
2036	1.95 (0.18)	20" (508)	14 1/16" (357)	3.96 (0.37)	1.95 (0.18)	42 1/2" (1080)	6.77 (0.63)
2040	2.23 (0.21)	20" (508)	16 1/16" (407)	4.68 (0.44)	2.23 (0.21)	36 1/2" (927)	7.75 (0.72)
2046	2.64 (0.25)	20" (508)	19 1/16" (484)	5.40 (0.50)	2.64 (0.25)	30 1/2" (775)	8.73 (0.81)
2050	2.92 (0.27)	20" (508)	21 1/16" (534)	6.12 (0.57)	2.92 (0.27)	24 1/2" (622)	9.71 (0.90)
2056	3.20 (0.30)	20" (508)	23 1/16" (585)	6.84 (0.64)	3.20 (0.30)	18 1/2" (470)	10.69 (0.99)
2060	3.62 (0.34)	20" (508)	26 1/16" (661)	7.56 (0.70)	3.62 (0.34)	12 1/2" (318)	11.67 (1.08)
2066	3.89 (0.36)	20" (508)	28 1/16" (712)	8.28 (0.77)	3.89 (0.36)	6 1/2" (165)	12.65 (1.18)
2626	1.63 (0.15)	26" (660)	9 1/16" (230)	3.41 (0.32)	1.63 (0.15)	54 1/2" (1384)	6.04 (0.56)
2630	1.99 (0.19)	26" (660)	11 1/16" (280)	4.37 (0.41)	1.99 (0.19)	48 1/2" (1232)	7.27 (0.68)
2636	2.54 (0.24)	26" (660)	14 1/16" (357)	5.34 (0.50)	2.54 (0.24)	42 1/2" (1080)	8.50 (0.79)
2640	2.90 (0.27)	26" (660)	16 1/16" (407)	6.31 (0.59)	2.90 (0.27)	36 1/2" (927)	9.73 (0.90)
2646	3.44 (0.32)	26" (660)	19 1/16" (484)	7.28 (0.68)	3.44 (0.32)	30 1/2" (775)	10.96 (1.02)
2650	3.80 (0.35)	26" (660)	21 1/16" (534)	8.25 (0.77)	3.80 (0.35)	24 1/2" (622)	12.19 (1.13)
2656	4.16 (0.39)	26" (660)	23 1/16" (585)	9.22 (0.86)	4.16 (0.39)	18 1/2" (470)	13.42 (1.25)
2660	4.70 (0.44)	26" (660)	26 1/16" (661)	10.19 (0.95)	4.70 (0.44)	12 1/2" (318)	14.65 (1.36)
2666	5.06 (0.47)	26" (660)	28 1/16" (712)	11.16 (1.04)	5.06 (0.47)	6 1/2" (165)	15.88 (1.48)
3026	2.01 (0.19)	32" (813)	9 1/16" (230)	4.28 (0.40)	2.01 (0.19)	54 1/2" (1384)	7.27 (0.68)
3030	2.45 (0.23)	32" (813)	11 1/16" (280)	5.50 (0.51)	2.45 (0.23)	48 1/2" (1232)	8.75 (0.81)
3036	3.12 (0.29)	32" (813)	14 1/16" (357)	6.72 (0.62)	3.12 (0.29)	42 1/2" (1080)	10.23 (0.95)
3040	3.56 (0.33)	32" (813)	16 1/16" (407)	7.94 (0.74)	3.56 (0.33)	36 1/2" (927)	11.71 (1.09)
3046	4.23 (0.39)	32" (813)	19 1/16" (484)	9.16 (0.85)	4.23 (0.39)	30 1/2" (775)	13.19 (1.23)
3050	4.68 (0.43)	32" (813)	21 1/16" (534)	10.38 (0.96)	4.68 (0.43)	24 1/2" (622)	14.67 (1.36)
3056	5.12 (0.48)	32" (813)	23 1/16" (585)	11.60 (1.08)	5.12 (0.48)	18 1/2" (470)	16.15 (1.50)
3060 ◊	5.79 (0.54)	32" (813)	26 1/16" (661)	12.82 (1.19)	5.79 (0.54)	12 1/2" (318)	17.63 (1.64)
3066 ◊	6.23 (0.58)	32" (813)	28 1/16" (712)	14.03 (1.30)	6.23 (0.58)	6 1/2" (165)	19.11 (1.78)
3626	2.39 (0.22)	38" (965)	9 1/16" (230)	5.16 (0.48)	2.39 (0.22)	54 1/2" (1384)	8.50 (0.79)
3630	2.91 (0.27)	38" (965)	11 1/16" (280)	6.63 (0.62)	2.91 (0.27)	48 1/2" (1232)	10.23 (0.95)
3636	3.71 (0.34)	38" (965)	14 1/16" (357)	8.10 (0.75)	3.71 (0.34)	42 1/2" (1080)	11.96 (1.11)
3640	4.23 (0.39)	38" (965)	16 1/16" (407)	9.57 (0.89)	4.23 (0.39)	36 1/2" (927)	13.69 (1.27)
3646	5.02 (0.47)	38" (965)	19 1/16" (484)	11.04 (1.03)	5.02 (0.47)	30 1/2" (775)	15.42 (1.43)
3650	5.55 (0.52)	38" (965)	21 1/16" (534)	12.51 (1.16)	5.55 (0.52)	24 1/2" (622)	17.15 (1.59)
3656	6.08 (0.57)	38" (965)	23 1/16" (585)	13.98 (1.30)	6.08 (0.57)	18 1/2" (470)	18.88 (1.75)
3660 ◊	6.87 (0.64)	38" (965)	26 1/16" (661)	15.44 (1.44)	6.87 (0.64)	12 1/2" (318)	20.61 (1.91)
3666 ◊	7.40 (0.69)	38" (965)	28 1/16" (712)	16.91 (1.57)	7.40 (0.69)	6 1/2" (165)	22.34 (2.08)
4026	2.76 (0.26)	44" (1118)	9 1/16" (230)	6.04 (0.56)	2.76 (0.26)	54 1/2" (1384)	9.73 (0.90)
4030	3.37 (0.31)	44" (1118)	11 1/16" (280)	7.76 (0.72)	3.37 (0.31)	48 1/2" (1232)	11.71 (1.09)
4036	4.29 (0.40)	44" (1118)	14 1/16" (357)	9.48 (0.88)	4.29 (0.40)	42 1/2" (1080)	13.69 (1.27)
4040	4.90 (0.46)	44" (1118)	16 1/16" (407)	11.20 (1.04)	4.90 (0.46)	36 1/2" (927)	15.67 (1.46)
4046	5.82 (0.54)	44" (1118)	19 1/16" (484)	12.92 (1.20)	5.82 (0.54)	30 1/2" (775)	17.65 (1.64)
4050	6.43 (0.60)	44" (1118)	21 1/16" (534)	14.64 (1.36)	6.43 (0.60)	24 1/2" (622)	19.63 (1.82)
4056	7.04 (0.65)	44" (1118)	23 1/16" (585)	16.35 (1.52)	7.04 (0.65)	18 1/2" (470)	21.61 (2.01)
4060 ◊	7.96 (0.74)	44" (1118)	26 1/16" (661)	18.07 (1.68)	7.96 (0.74)	12 1/2" (318)	23.59 (2.19)
4066 ◊	8.57 (0.80)	44" (1118)	28 1/16" (712)	19.79 (1.84)	8.57 (0.80)	6 1/2" (165)	25.56 (2.38)

• "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).
• Dimensions in parentheses are in millimeters or square meters.
◊ Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Table of Sizes – Picture Window With Flanking 20-Wide Single-Hungs

Scale 1/8" (3) = 1'-0" (305) – 1:96



Windows have one continuous outer frame.

Unobstructed glass width dimension of flanking sash is 17 1/4" (438). For unobstructed glass height dimensions of flanking single-hungs, see page 32.

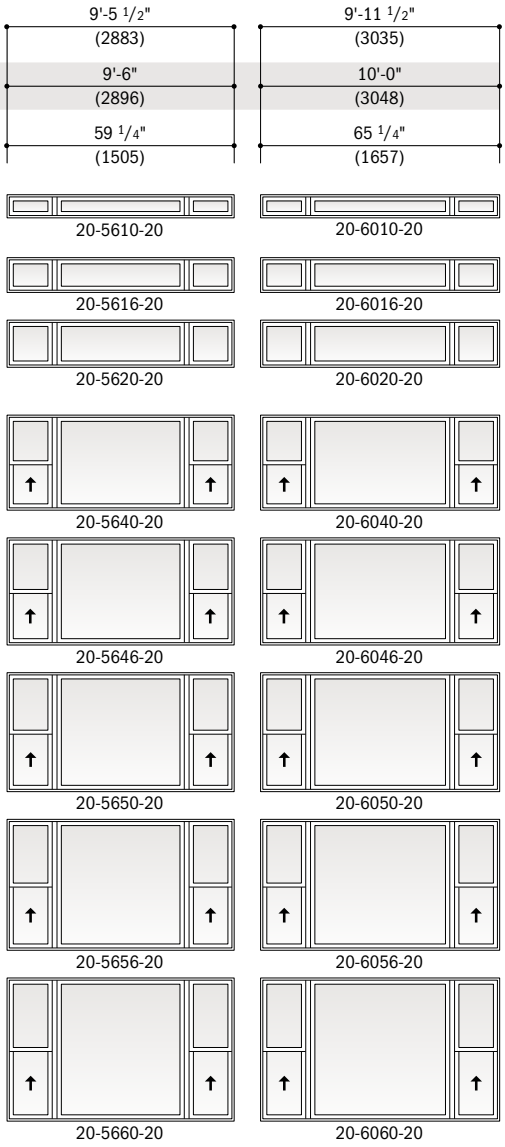
Matching transoms are also shown.

Details shown on pages 50-51.

Grille patterns shown on page 47.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Notes on previous page also apply to this page.



Twin Single-Hung Window Opening and Area Specifications

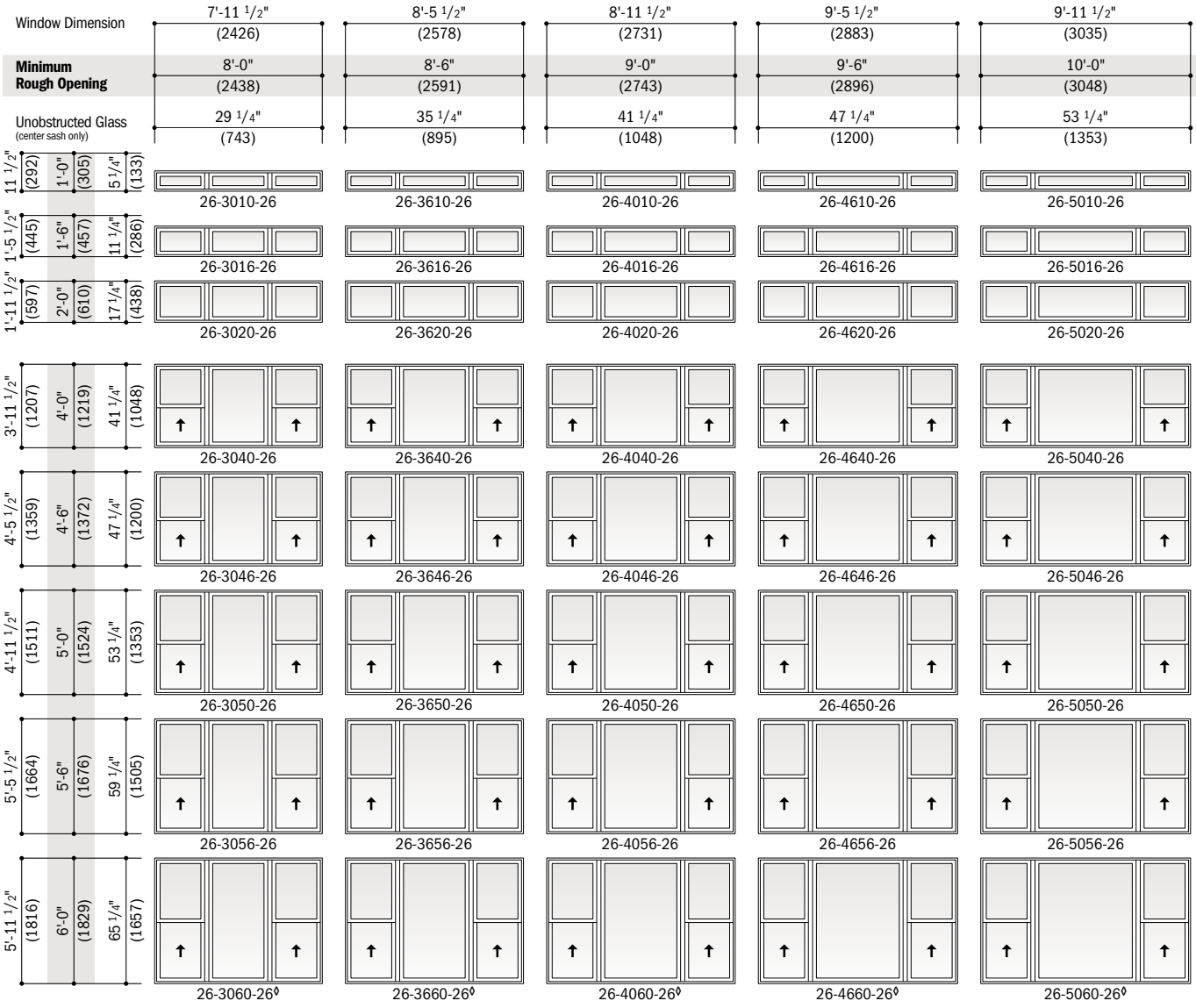
Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Height Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
1620-2	0.78 (0.07)	14" (356)	8 1/16" (204)	2.36 (0.22)	1.56 (0.15)	60 1/2" (1537)	5.79 (0.54)
1626-2	1.07 (0.10)	14" (356)	11 1/16" (280)	3.30 (0.31)	2.15 (0.20)	54 1/2" (1384)	7.27 (0.68)
1630-2	1.37 (0.13)	14" (356)	14 1/16" (357)	4.23 (0.39)	2.73 (0.25)	48 1/2" (1232)	8.75 (0.81)
1636-2	1.66 (0.15)	14" (356)	17 1/16" (433)	5.17 (0.48)	3.31 (0.31)	42 1/2" (1080)	10.23 (0.95)
1640-2	1.95 (0.18)	14" (356)	20 1/16" (509)	6.11 (0.57)	3.90 (0.36)	36 1/2" (927)	11.71 (1.09)
1646-2	2.24 (0.21)	14" (356)	23 1/16" (585)	7.05 (0.66)	4.48 (0.42)	30 1/2" (775)	13.19 (1.23)
1650-2	2.53 (0.24)	14" (356)	26 1/16" (661)	7.98 (0.74)	5.06 (0.47)	24 1/2" (622)	14.67 (1.36)
1656-2	2.82 (0.26)	14" (356)	29 1/16" (738)	8.92 (0.83)	5.65 (0.53)	18 1/2" (470)	16.15 (1.50)
1660-2	3.12 (0.29)	14" (356)	32 1/16" (814)	9.86 (0.92)	6.23 (0.58)	12 1/2" (318)	17.63 (1.64)
2020-2	1.12 (0.10)	20" (508)	8 1/16" (204)	3.62 (0.34)	2.23 (0.21)	60 1/2" (1537)	7.75 (0.72)
2026-2	1.53 (0.14)	20" (508)	11 1/16" (280)	5.05 (0.47)	3.07 (0.29)	54 1/2" (1384)	9.73 (0.90)
2030-2	1.95 (0.18)	20" (508)	14 1/16" (357)	6.49 (0.60)	3.90 (0.36)	48 1/2" (1232)	11.71 (1.09)
2036-2	2.37 (0.22)	20" (508)	17 1/16" (433)	7.93 (0.74)	4.73 (0.44)	42 1/2" (1080)	13.69 (1.27)
2040-2	2.78 (0.26)	20" (508)	20 1/16" (509)	9.37 (0.87)	5.57 (0.52)	36 1/2" (927)	15.67 (1.46)
2046-2	3.20 (0.30)	20" (508)	23 1/16" (585)	10.80 (1.00)	6.40 (0.60)	30 1/2" (775)	17.65 (1.64)
2050-2	3.62 (0.34)	20" (508)	26 1/16" (661)	12.24 (1.14)	7.23 (0.67)	24 1/2" (622)	19.63 (1.82)
2056-2	4.03 (0.38)	20" (508)	29 1/16" (738)	13.68 (1.27)	8.07 (0.75)	18 1/2" (470)	21.61 (2.01)
2060-2	4.45 (0.41)	20" (508)	32 1/16" (814)	15.12 (1.40)	8.90 (0.83)	12 1/2" (318)	23.59 (2.19)
2620-2	1.45 (0.14)	26" (660)	8 1/16" (204)	4.87 (0.45)	2.90 (0.27)	60 1/2" (1537)	9.71 (0.90)
2626-2	1.99 (0.19)	26" (660)	11 1/16" (280)	6.81 (0.63)	3.99 (0.37)	54 1/2" (1384)	12.19 (1.13)
2630-2	2.54 (0.24)	26" (660)	14 1/16" (357)	8.75 (0.81)	5.07 (0.47)	48 1/2" (1232)	14.67 (1.36)
2636-2	3.08 (0.29)	26" (660)	17 1/16" (433)	10.69 (0.99)	6.15 (0.57)	42 1/2" (1080)	17.15 (1.59)
2640-2	3.62 (0.34)	26" (660)	20 1/16" (509)	12.62 (1.17)	7.24 (0.67)	36 1/2" (927)	19.63 (1.82)
2646-2	4.16 (0.39)	26" (660)	23 1/16" (585)	14.56 (1.35)	8.32 (0.77)	30 1/2" (775)	22.11 (2.05)
2650-2	4.70 (0.44)	26" (660)	26 1/16" (661)	16.50 (1.53)	9.40 (0.87)	24 1/2" (622)	24.59 (2.28)
2656-2	5.24 (0.49)	26" (660)	29 1/16" (738)	18.44 (1.71)	10.49 (0.97)	18 1/2" (470)	27.06 (2.51)
2660-2 ◊	5.79 (0.54)	26" (660)	32 1/16" (814)	20.37 (1.89)	11.57 (1.08)	12 1/2" (318)	29.54 (2.75)
3020-2	1.79 (0.17)	32" (813)	8 1/16" (204)	6.13 (0.57)	3.57 (0.33)	60 1/2" (1537)	11.67 (1.08)
3026-2	2.45 (0.23)	32" (813)	11 1/16" (280)	8.57 (0.80)	4.91 (0.46)	54 1/2" (1384)	14.65 (1.36)
3030-2	3.12 (0.29)	32" (813)	14 1/16" (357)	11.01 (1.02)	6.24 (0.58)	48 1/2" (1232)	17.63 (1.64)
3036-2	3.79 (0.35)	32" (813)	17 1/16" (433)	13.44 (1.25)	7.57 (0.70)	42 1/2" (1080)	20.61 (1.91)
3040-2	4.45 (0.41)	32" (813)	20 1/16" (509)	15.88 (1.48)	8.91 (0.83)	36 1/2" (927)	23.59 (2.19)
3046-2	5.12 (0.48)	32" (813)	23 1/16" (585)	18.32 (1.70)	10.24 (0.95)	30 1/2" (775)	26.56 (2.47)
3050-2 ◊	5.79 (0.54)	32" (813)	26 1/16" (661)	20.76 (1.93)	11.57 (1.08)	24 1/2" (622)	29.54 (2.75)
3056-2 ◊	6.45 (0.60)	32" (813)	29 1/16" (738)	23.19 (2.16)	12.91 (1.20)	18 1/2" (470)	32.52 (3.02)
3060-2 ◊	7.12 (0.66)	32" (813)	32 1/16" (814)	25.63 (2.38)	14.24 (1.32)	12 1/2" (318)	35.50 (3.30)
3620-2	2.12 (0.20)	38" (965)	8 1/16" (204)	7.39 (0.69)	4.24 (0.39)	60 1/2" (1537)	13.63 (1.27)
3626-2	2.91 (0.27)	38" (965)	11 1/16" (280)	10.33 (0.96)	5.83 (0.54)	54 1/2" (1384)	17.11 (1.59)
3630-2	3.71 (0.34)	38" (965)	14 1/16" (357)	13.26 (1.23)	7.41 (0.69)	48 1/2" (1232)	20.59 (1.91)
3636-2	4.50 (0.42)	38" (965)	17 1/16" (433)	16.20 (1.51)	8.99 (0.84)	42 1/2" (1080)	24.06 (2.24)
3640-2	5.29 (0.49)	38" (965)	20 1/16" (509)	19.14 (1.78)	10.58 (0.98)	36 1/2" (927)	27.54 (2.56)
3646-2	6.08 (0.57)	38" (965)	23 1/16" (585)	22.08 (2.05)	12.16 (1.13)	30 1/2" (775)	31.02 (2.88)
3650-2 ◊	6.87 (0.64)	38" (965)	26 1/16" (661)	25.01 (2.32)	13.74 (1.28)	24 1/2" (622)	34.50 (3.21)
3656-2 ◊	7.66 (0.71)	38" (965)	29 1/16" (738)	27.95 (2.60)	15.33 (1.42)	18 1/2" (470)	37.98 (3.53)
3660-2 ◊	8.46 (0.79)	38" (965)	32 1/16" (814)	30.89 (2.87)	16.91 (1.57)	12 1/2" (318)	41.46 (3.85)
4020-2	2.46 (0.23)	44" (1118)	8 1/16" (204)	8.65 (0.80)	4.91 (0.46)	60 1/2" (1537)	15.59 (1.45)
4026-2	3.37 (0.31)	44" (1118)	11 1/16" (280)	12.08 (1.12)	6.75 (0.63)	54 1/2" (1384)	19.56 (1.82)
4030-2	4.29 (0.40)	44" (1118)	14 1/16" (357)	15.52 (1.44)	8.58 (0.80)	48 1/2" (1232)	23.54 (2.19)
4036-2	5.21 (0.48)	44" (1118)	17 1/16" (433)	18.96 (1.76)	10.41 (0.97)	42 1/2" (1080)	27.52 (2.56)
4040-2	6.12 (0.57)	44" (1118)	20 1/16" (509)	22.40 (2.08)	12.25 (1.14)	36 1/2" (927)	31.50 (2.93)
4046-2	7.04 (0.65)	44" (1118)	23 1/16" (585)	25.83 (2.40)	14.08 (1.31)	30 1/2" (775)	35.48 (3.30)
4050-2 ◊	7.96 (0.74)	44" (1118)	26 1/16" (661)	29.27 (2.72)	15.91 (1.48)	24 1/2" (622)	39.46 (3.67)
4056-2 ◊	8.87 (0.82)	44" (1118)	29 1/16" (738)	32.71 (3.04)	17.75 (1.65)	18 1/2" (470)	43.44 (4.04)
4060-2 ◊	9.79 (0.91)	44" (1118)	32 1/16" (814)	36.15 (3.36)	19.58 (1.82)	12 1/2" (318)	47.42 (4.41)

• "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).
• Dimensions in parentheses are in millimeters or square meters.
◊ Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

SINGLE-HUNG WINDOWS

Table of Sizes – Picture Window With Flanking 26-Wide Single-Hungs

Scale 1/8" (3) = 1'-0" (305) – 1:96



Windows have one continuous outer frame.

Unobstructed glass width dimension of flanking sash is 23 1/4" (591). For unobstructed glass height dimensions of flanking single-hungs, see page 32.

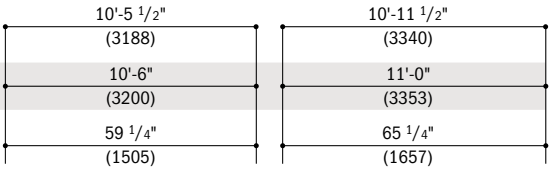
Matching transoms are also shown.

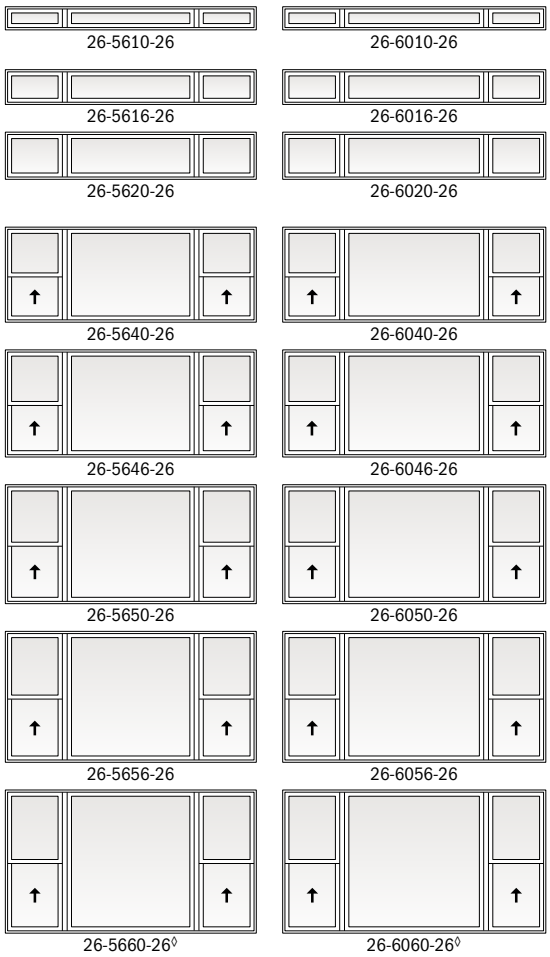
Details shown on pages 50-51.

Grille patterns shown on page 47.

• "Window Dimension" always refers to outside frame-to-frame dimension.
• "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
• Dimensions in parentheses are in millimeters.
◊ Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Notes on previous page also apply to this page.





Triple Single-Hung Window Opening and Area Specifications

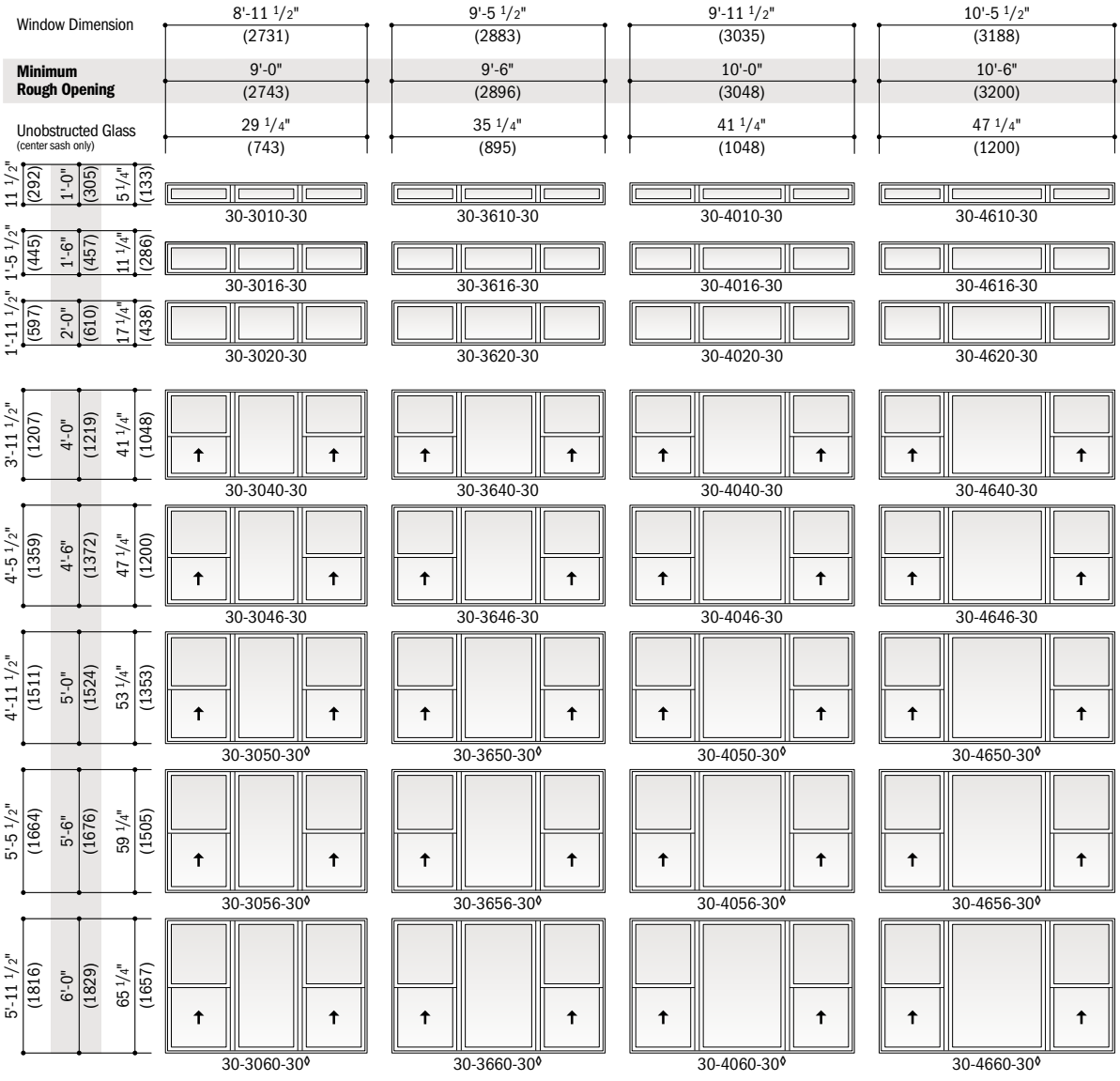
Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Height Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
1620-3	0.78 (0.07)	14" (356)	8 1/16" (204)	3.54 (0.33)	2.35 (0.22)	60 1/2" (1537)	8.73 (0.81)
1626-3	1.07 (0.10)	14" (356)	11 1/16" (280)	4.94 (0.46)	3.22 (0.30)	54 1/2" (1384)	10.96 (1.02)
1630-3	1.37 (0.13)	14" (356)	14 1/16" (357)	6.35 (0.59)	4.10 (0.38)	48 1/2" (1232)	13.19 (1.23)
1636-3	1.66 (0.15)	14" (356)	17 1/16" (433)	7.76 (0.72)	4.97 (0.46)	42 1/2" (1080)	15.42 (1.43)
1640-3	1.95 (0.18)	14" (356)	20 1/16" (509)	9.16 (0.85)	5.85 (0.54)	36 1/2" (927)	17.65 (1.64)
1646-3	2.24 (0.21)	14" (356)	23 1/16" (585)	10.57 (0.98)	6.72 (0.62)	30 1/2" (775)	19.88 (1.85)
1650-3	2.53 (0.24)	14" (356)	26 1/16" (661)	11.97 (1.11)	7.60 (0.71)	24 1/2" (622)	22.11 (2.05)
1656-3	2.82 (0.26)	14" (356)	29 1/16" (738)	13.38 (1.24)	8.47 (0.79)	18 1/2" (470)	24.34 (2.26)
1660-3	3.12 (0.29)	14" (356)	32 1/16" (814)	14.79 (1.37)	9.35 (0.87)	12 1/2" (318)	26.56 (2.47)
2020-3	1.12 (0.10)	20" (508)	8 1/16" (204)	5.42 (0.50)	3.35 (0.31)	60 1/2" (1537)	11.67 (1.08)
2026-3	1.53 (0.14)	20" (508)	11 1/16" (280)	7.58 (0.70)	4.60 (0.43)	54 1/2" (1384)	14.65 (1.36)
2030-3	1.95 (0.18)	20" (508)	14 1/16" (357)	9.74 (0.90)	5.85 (0.54)	48 1/2" (1232)	17.63 (1.64)
2036-3	2.37 (0.22)	20" (508)	17 1/16" (433)	11.89 (1.11)	7.10 (0.66)	42 1/2" (1080)	20.61 (1.91)
2040-3	2.78 (0.26)	20" (508)	20 1/16" (509)	14.05 (1.31)	8.35 (0.78)	36 1/2" (927)	23.59 (2.19)
2046-3	3.20 (0.30)	20" (508)	23 1/16" (585)	16.20 (1.51)	9.60 (0.89)	30 1/2" (775)	26.56 (2.47)
2050-3	3.62 (0.34)	20" (508)	26 1/16" (661)	18.36 (1.71)	10.85 (1.01)	24 1/2" (622)	29.54 (2.75)
2056-3	4.03 (0.38)	20" (508)	29 1/16" (738)	20.52 (1.91)	12.10 (1.12)	18 1/2" (470)	32.52 (3.02)
2060-3	4.45 (0.41)	20" (508)	32 1/16" (814)	22.67 (2.11)	13.35 (1.24)	12 1/2" (318)	35.50 (3.30)
2620-3	1.45 (0.14)	26" (660)	8 1/16" (204)	7.31 (0.68)	4.35 (0.41)	60 1/2" (1537)	14.61 (1.36)
2626-3	1.99 (0.19)	26" (660)	11 1/16" (280)	10.22 (0.95)	5.98 (0.56)	54 1/2" (1384)	18.34 (1.70)
2630-3	2.54 (0.24)	26" (660)	14 1/16" (357)	13.12 (1.22)	7.60 (0.71)	48 1/2" (1232)	22.06 (2.05)
2636-3	3.08 (0.29)	26" (660)	17 1/16" (433)	16.03 (1.49)	9.23 (0.86)	42 1/2" (1080)	25.79 (2.40)
2640-3	3.62 (0.34)	26" (660)	20 1/16" (509)	18.93 (1.76)	10.85 (1.01)	36 1/2" (927)	29.52 (2.74)
2646-3	4.16 (0.39)	26" (660)	23 1/16" (585)	21.84 (2.03)	12.48 (1.16)	30 1/2" (775)	33.25 (3.09)
2650-3	4.70 (0.44)	26" (660)	26 1/16" (661)	24.75 (2.30)	14.10 (1.31)	24 1/2" (622)	36.98 (3.44)
2656-3	5.24 (0.49)	26" (660)	29 1/16" (738)	27.65 (2.57)	15.73 (1.46)	18 1/2" (470)	40.71 (3.78)
2660-3◊	5.79 (0.54)	26" (660)	32 1/16" (814)	30.56 (2.84)	17.35 (1.61)	12 1/2" (318)	44.44 (4.13)
3020-3	1.79 (0.17)	32" (813)	8 1/16" (204)	9.20 (0.85)	5.36 (0.50)	60 1/2" (1537)	17.54 (1.63)
3026-3	2.45 (0.23)	32" (813)	11 1/16" (280)	12.85 (1.19)	7.36 (0.68)	54 1/2" (1384)	22.02 (2.05)
3030-3	3.12 (0.29)	32" (813)	14 1/16" (357)	16.51 (1.53)	9.36 (0.87)	48 1/2" (1232)	26.50 (2.46)
3036-3	3.79 (0.35)	32" (813)	17 1/16" (433)	20.16 (1.87)	11.36 (1.06)	42 1/2" (1080)	30.98 (2.88)
3040-3	4.45 (0.41)	32" (813)	20 1/16" (509)	23.82 (2.21)	13.36 (1.24)	36 1/2" (927)	35.46 (3.29)
3046-3	5.12 (0.48)	32" (813)	23 1/16" (585)	27.48 (2.55)	15.36 (1.43)	30 1/2" (775)	39.94 (3.71)
3050-3◊	5.79 (0.54)	32" (813)	26 1/16" (661)	31.13 (2.89)	17.36 (1.61)	24 1/2" (622)	44.42 (4.13)
3056-3◊	6.45 (0.60)	32" (813)	29 1/16" (738)	34.79 (3.23)	19.36 (1.80)	18 1/2" (470)	48.90 (4.54)
3060-3◊	7.12 (0.66)	32" (813)	32 1/2" (814)	38.45 (3.57)	21.36 (1.98)	12 1/2" (318)	53.38 (4.96)
3620-3	2.12 (0.20)	38" (965)	8 1/16" (204)	11.08 (1.03)	6.36 (0.59)	60 1/2" (1537)	20.48 (1.90)
3626-3	2.91 (0.27)	38" (965)	11 1/16" (280)	15.49 (1.44)	8.74 (0.81)	54 1/2" (1384)	25.71 (2.39)
3630-3	3.71 (0.34)	38" (965)	14 1/16" (357)	19.89 (1.85)	11.11 (1.03)	48 1/2" (1232)	30.94 (2.87)
3636-3	4.50 (0.42)	38" (965)	17 1/16" (433)	24.30 (2.26)	13.49 (1.25)	42 1/2" (1080)	36.17 (3.36)
3640-3	5.29 (0.49)	38" (965)	20 1/16" (509)	28.71 (2.67)	15.86 (1.47)	36 1/2" (927)	41.40 (3.85)
3646-3	6.08 (0.57)	38" (965)	23 1/16" (585)	33.11 (3.08)	18.24 (1.69)	30 1/2" (775)	46.63 (4.33)
3650-3◊	6.87 (0.64)	38" (965)	26 1/16" (661)	37.52 (3.49)	20.61 (1.92)	24 1/2" (622)	51.86 (4.82)
3656-3◊	7.66 (0.71)	38" (965)	29 1/16" (738)	41.93 (3.90)	22.99 (2.14)	18 1/2" (470)	57.09 (5.30)
3660-3◊	8.46 (0.79)	38" (965)	32 1/16" (814)	46.33 (4.30)	25.36 (2.36)	12 1/2" (318)	62.31 (5.79)
4020-3	2.46 (0.23)	44" (1118)	8 1/16" (204)	12.97 (1.21)	7.37 (0.69)	60 1/2" (1537)	23.42 (2.18)
4026-3	3.37 (0.31)	44" (1118)	11 1/16" (280)	18.12 (1.68)	10.12 (0.94)	54 1/2" (1384)	29.40 (2.73)
4030-3	4.29 (0.40)	44" (1118)	14 1/16" (357)	23.28 (2.16)	12.87 (1.20)	48 1/2" (1232)	35.38 (3.29)
4036-3	5.21 (0.48)	44" (1118)	17 1/16" (433)	28.44 (2.64)	15.62 (1.45)	42 1/2" (1080)	41.36 (3.84)
4040-3	6.12 (0.57)	44" (1118)	20 1/16" (509)	33.59 (3.12)	18.37 (1.71)	36 1/2" (927)	47.34 (4.40)
4046-3	7.04 (0.65)	44" (1118)	23 1/16" (585)	38.75 (3.60)	21.12 (1.96)	30 1/2" (775)	53.31 (4.95)
4050-3◊	7.96 (0.74)	44" (1118)	26 1/16" (661)	43.91 (4.08)	23.87 (2.22)	24 1/2" (622)	59.29 (5.51)
4056-3◊	8.87 (0.82)	44" (1118)	29 1/16" (738)	49.06 (4.56)	26.62 (2.47)	18 1/2" (470)	65.27 (6.06)
4060-3◊	9.79 (0.91)	44" (1118)	32 1/16" (814)	54.22 (5.04)	29.37 (2.73)	12 1/2" (318)	71.25 (6.62)

• "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).
• Dimensions in parentheses are in millimeters or square meters.
◊ Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Table of Sizes – Picture Window With Flanking 30-Wide Single-Hungs

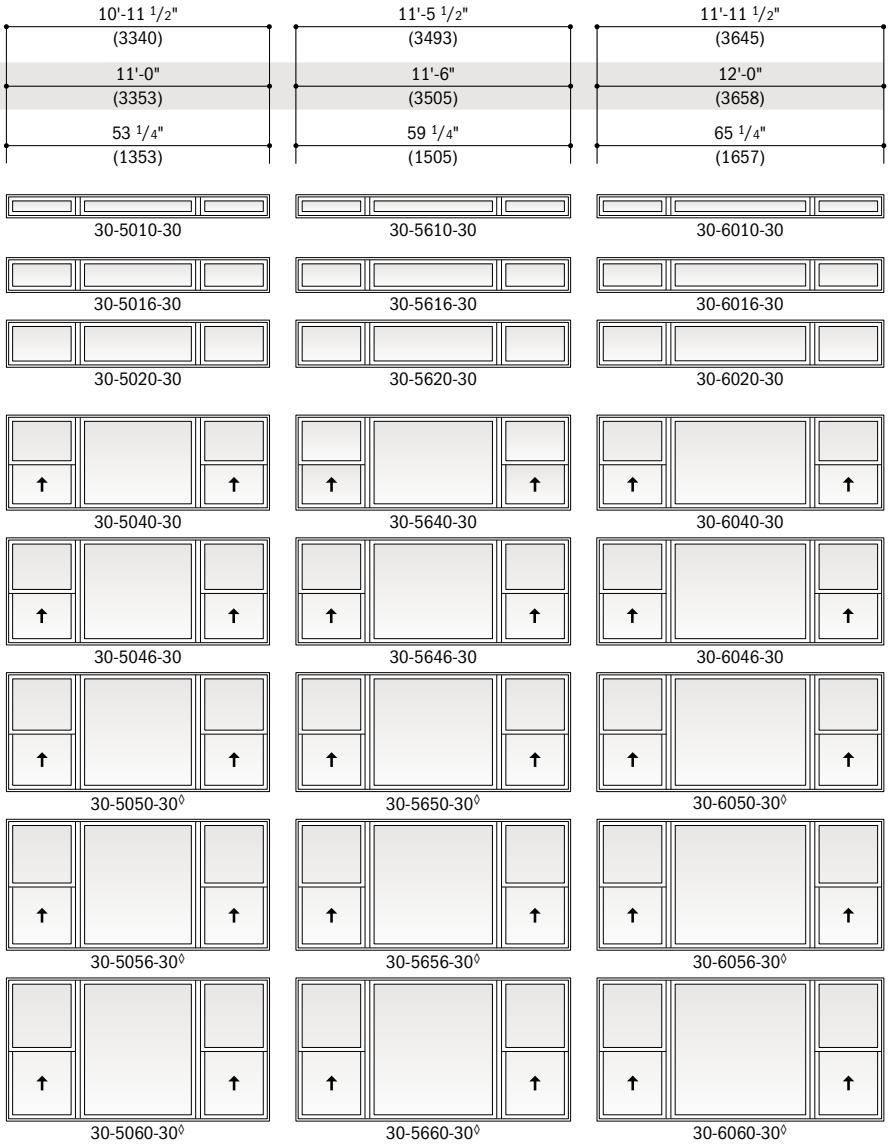
Notes on next page also apply to this page.

Scale 1/8" (3) = 1'-0" (305) – 1:96



- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

◊ Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).



Windows have one continuous outer frame.

Unobstructed glass width dimension of flanking sash is 29 1/4" (743). For unobstructed glass height dimensions of flanking single-hungs, see page 32.

Matching transoms are also shown.

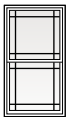
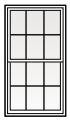
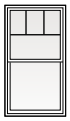
Details shown on pages 50-51.

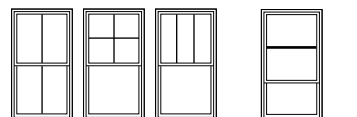
Grille patterns shown below.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- **"Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Grille Patterns

	Prairie A	Colonial	Short Fractional
Single-Hung			



Specified Equal Light Examples Custom Example*

Single-hung window patterns are also available in Upper Sash Only (USO) configurations. For picture window patterns that require alignment with single-hung patterns, identify the single-hung sash style (equal or reverse cottage) when ordering.

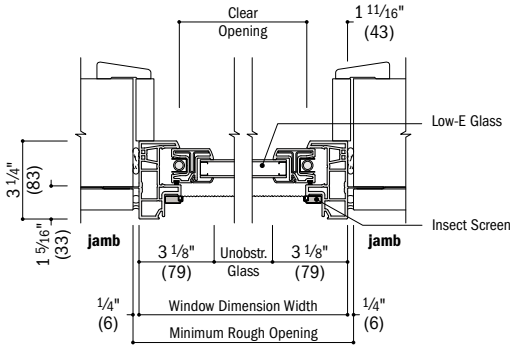
Number of lights and overall pattern varies with window size. Patterns shown may not be available for all sizes. Specified equal light and custom grille patterns are also available. For specified equal light, specify number of same-size rectangles across or down. For more information on divided light, see page 13 or visit **andersenwindows.com/grilles**.

*Grille illustration reflects a window taller than 6'-5 1/2" (1969) with a 2:1 sash ratio.
- Dimensions in parentheses are in millimeters.

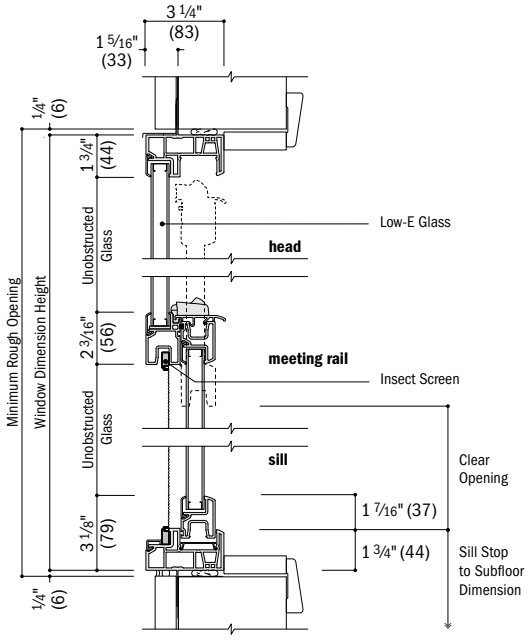
Arch Single-Hung Window Details – New Construction

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

1 3/8" flange setback

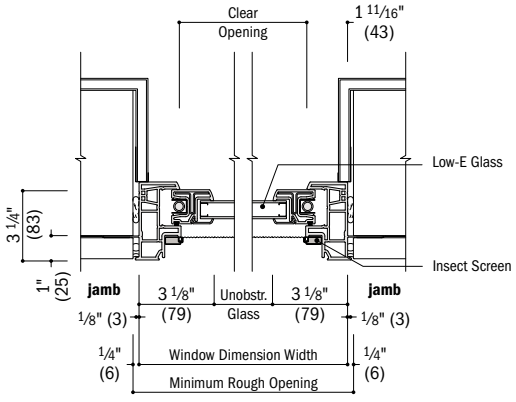


Horizontal Section
Arch Single-Hung

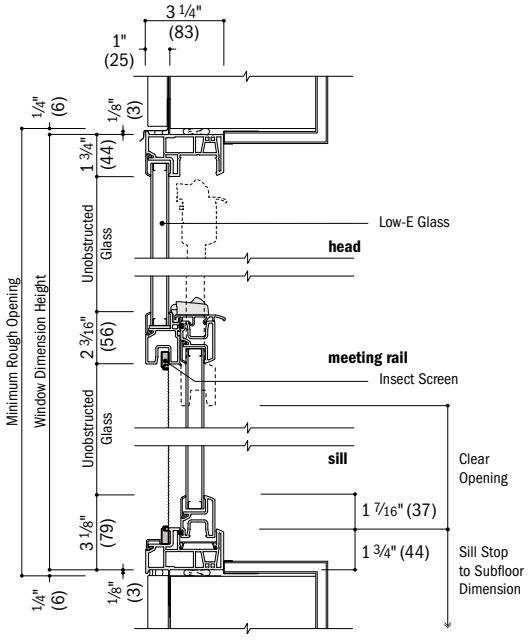


Vertical Section
Arch Single-Hung

1" flange setback with stucco key



Horizontal Section
Arch Single-Hung - Stucco Exterior



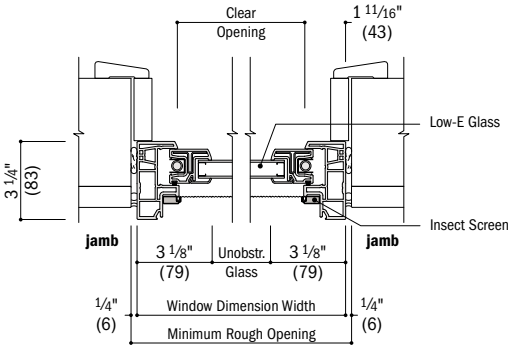
Vertical Section
Arch Single-Hung - Stucco Exterior

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

Arch Single-Hung Window Details – Replacement

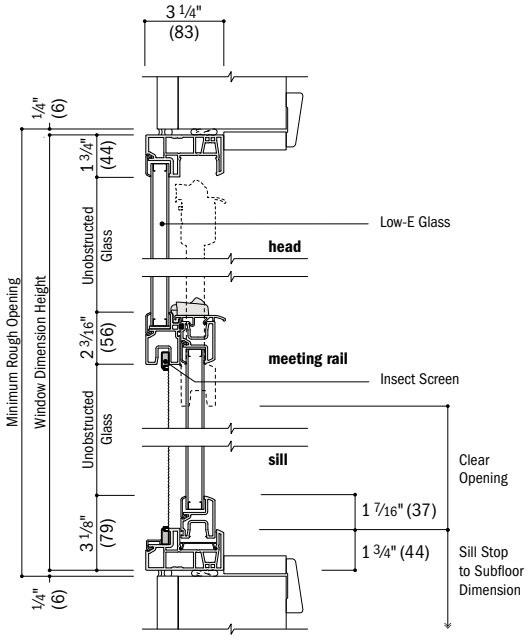
Scale 1 1/2" (38) = 1'-0" (305) – 1:8

no flange



Horizontal Section

Arch Single-Hung - Existing Framed Opening



Vertical Section

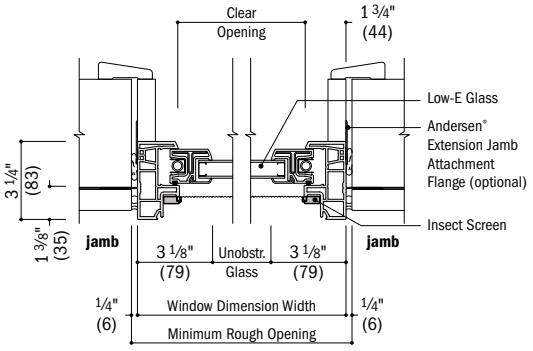
Arch Single-Hung - Existing Framed Opening

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

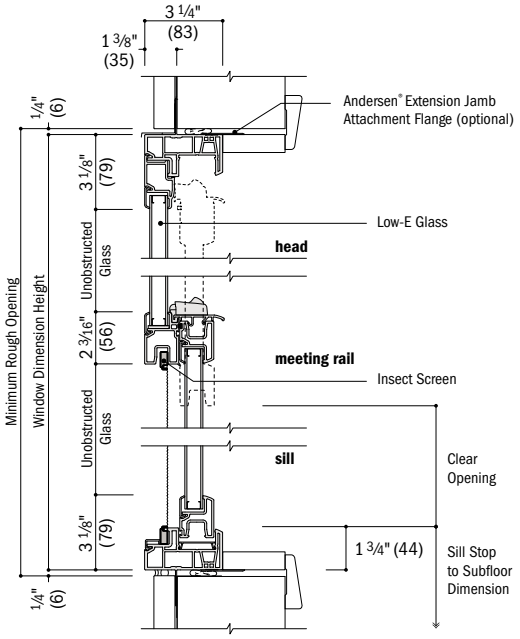
Single-Hung Window Details – New Construction

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

1 3/8" flange setback

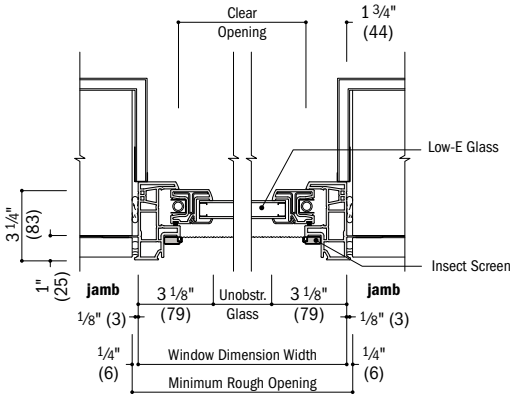


Horizontal Section

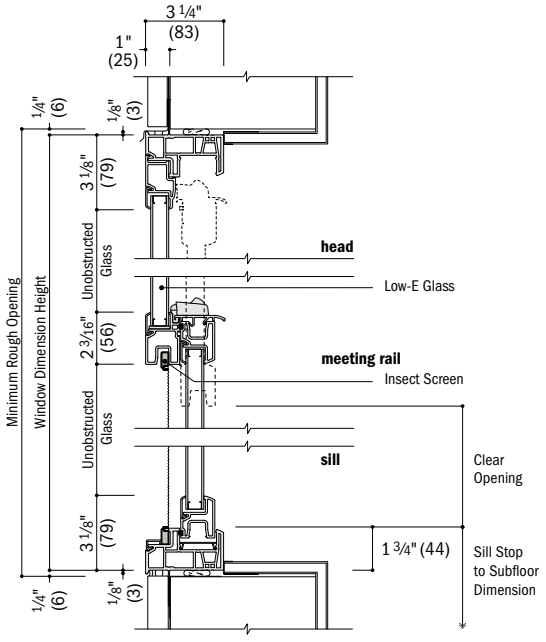


Vertical Section

1" flange setback with stucco key

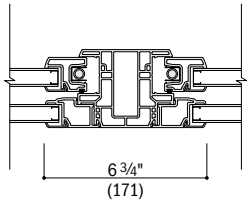


Horizontal Section
Stucco Exterior

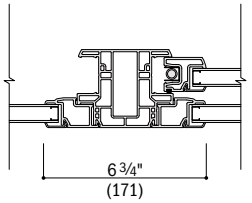


Vertical Section
Stucco Exterior

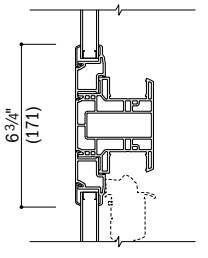
integrals



Horizontal Section
Twin or Triple Single-Hung



Horizontal Section
Picture With Flanking Single-Hung



Vertical Section
Transom Over Single-Hung

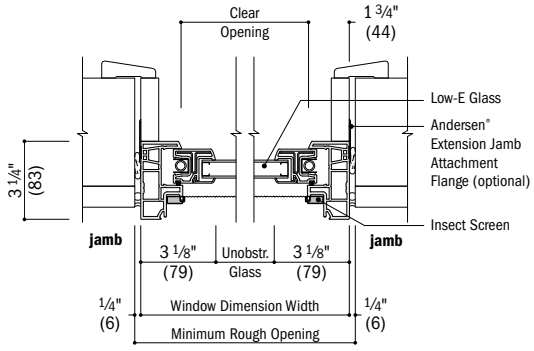
See pages 84-87 for joining details.

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

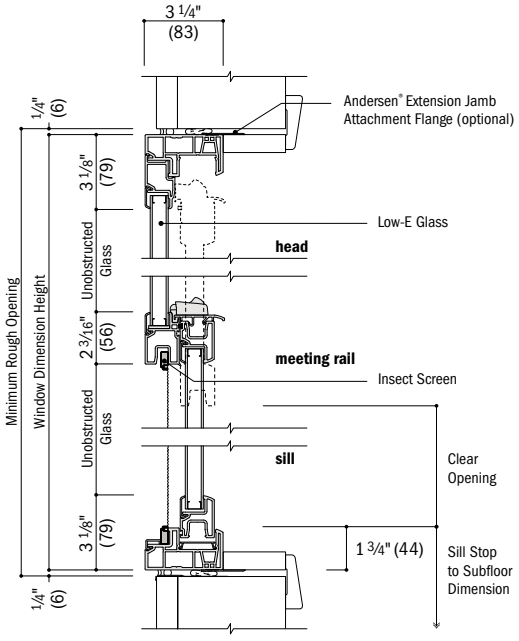
Single-Hung Window Details – Replacement

Scale 1 ½" (38) = 1'-0" (305) – 1:8

no flange

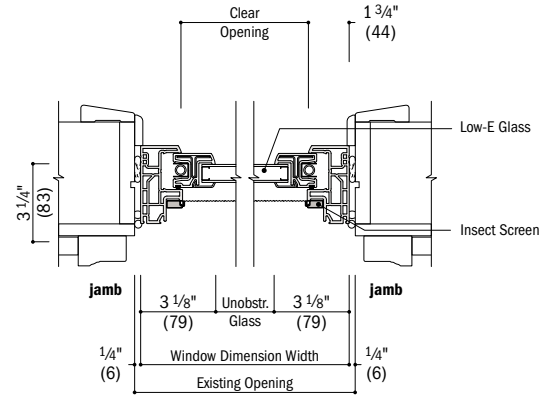


Horizontal Section
Existing Framed Opening

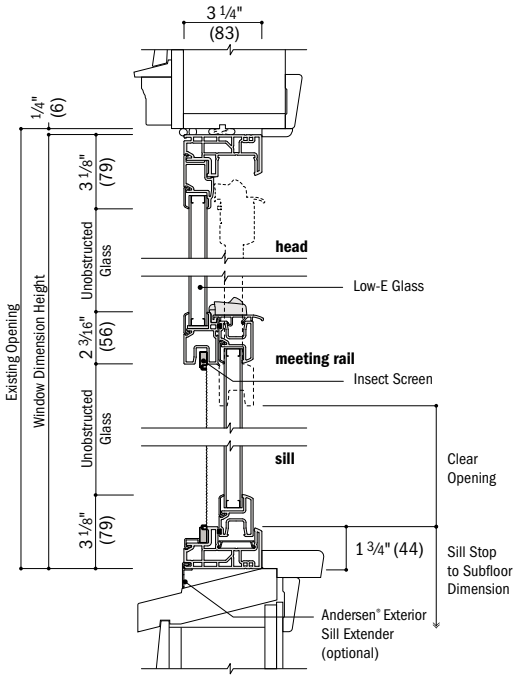


Vertical Section
Existing Framed Opening

insert

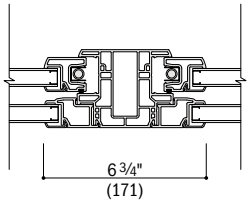


Horizontal Section
Existing Window Opening

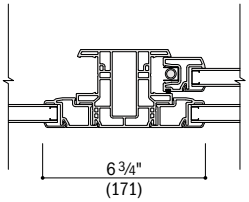


Vertical Section
Existing Window Opening

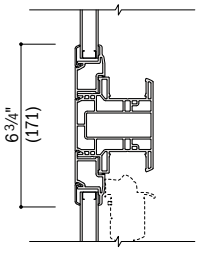
integrals



Horizontal Section
Twin or Triple Single-Hung



Horizontal Section
Picture With Flanking Single-Hung



Vertical Section
Transom Over Single-Hung

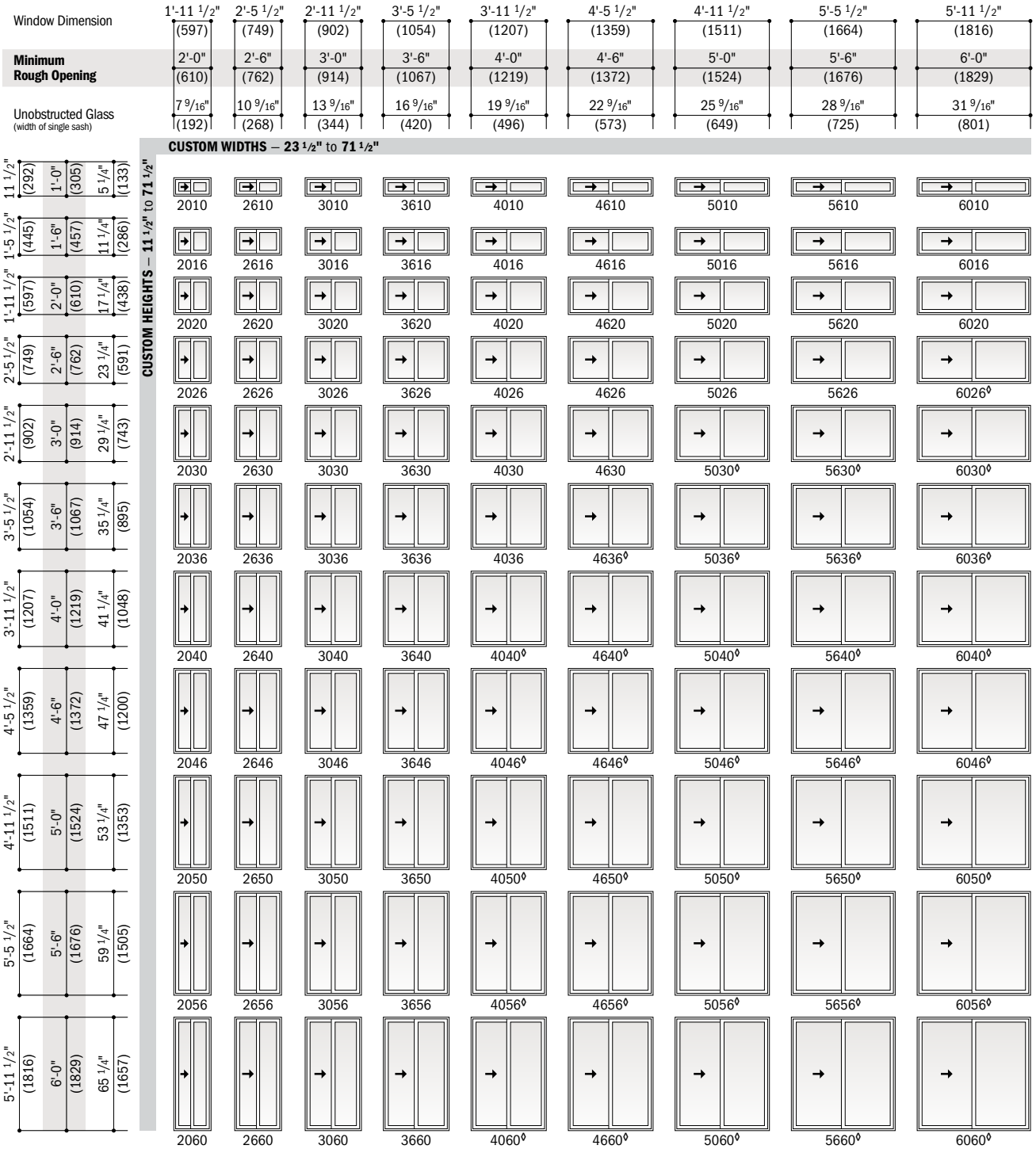
Installation accessories for insert frame shown on page 109.

See pages 84-87 for joining details.

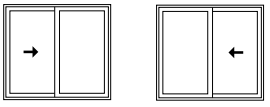
- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

Table of Gliding Window Sizes – Active-Stationary or Stationary-Active (XO/OX) Sash

Scale 1/8" (3) = 1'-0" (305) – 1:96



Custom-size windows are available in 1/8" (3) increments. See page 90 for custom sizes and specifications.



Active-Stationary Stationary-Active

Choose active-stationary (**XO**) or stationary-active (**OX**) as viewed from the exterior. Two locks are standard on all heights greater than 4'-2" (1270). Details shown on pages 64-65. Grille patterns shown on page 63.

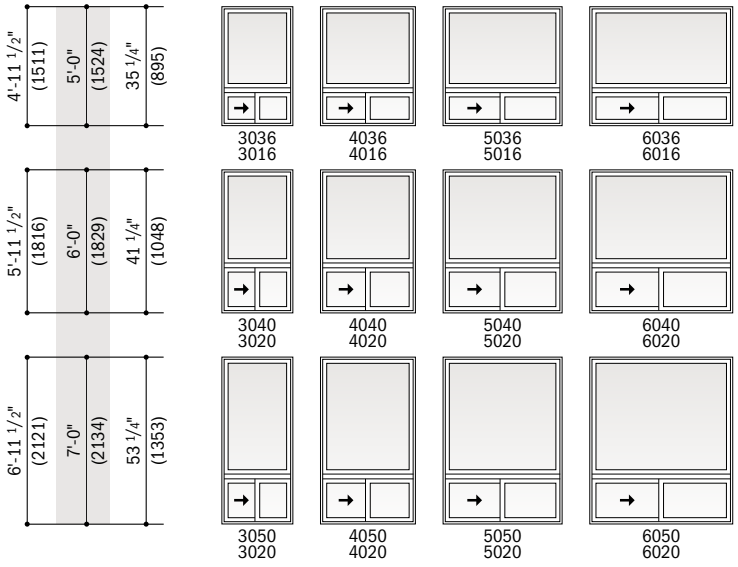
- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

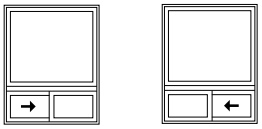
◊Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See table on pages 58-59.

Table of Sizes – Picture Over Gliding Window With Active-Stationary or Stationary-Active (XO/OX) Sash

Scale ⅛" (3) = 1'-0" (305) – 1:96

Window Dimension	2'-11 ½" (902)	3'-11 ½" (1207)	4'-11 ½" (1511)	5'-11 ½" (1816)
Minimum Rough Opening	3'-0" (914)	4'-0" (1219)	5'-0" (1524)	6'-0" (1829)
Unobstructed Glass (upper sash only)	29 ¼" (743)	41 ¼" (1048)	53 ¼" (1353)	65 ¼" (1657)





Active-Stationary

Stationary-Active

Choose active-stationary (**XO**) or stationary-active (**OX**) as viewed from the exterior. Windows have one continuous outer frame.

For unobstructed glass dimensions of lower sash, see page 52.

Details shown on pages 64-65.

Grille patterns shown on page 63.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Table Gliding Window Sizes – Active-Stationary-Active (XOX) 1:2:1 Sash Ratio

Notes on next page also apply to this page.

Scale 1/8" (3) = 1'-0" (305) – 1:96

Window Dimension	4'-11 1/2" (1511)	5'-11 1/2" (1816)	6'-11 1/2" (2121)	7'-5 1/2" (2273)	7'-11 1/2" (2426)	8'-5 1/2" (2578)
Minimum Rough Opening	5'-0" (1524)	6'-0" (1829)	7'-0" (2134)	7'-6" (2286)	8'-0" (2438)	8'-6" (2591)
Unobstructed Glass (width of center sash)	27 7/8" (708)	33 7/8" (861)	39 7/8" (1013)	42 7/8" (1089)	45 7/8" (1165)	48 7/8" (1242)
Unobstructed Glass (width of single venting sash)	10 17/32" (267)	13 17/32" (344)	16 17/32" (420)	18 1/32" (458)	19 17/32" (496)	21 1/32" (534)

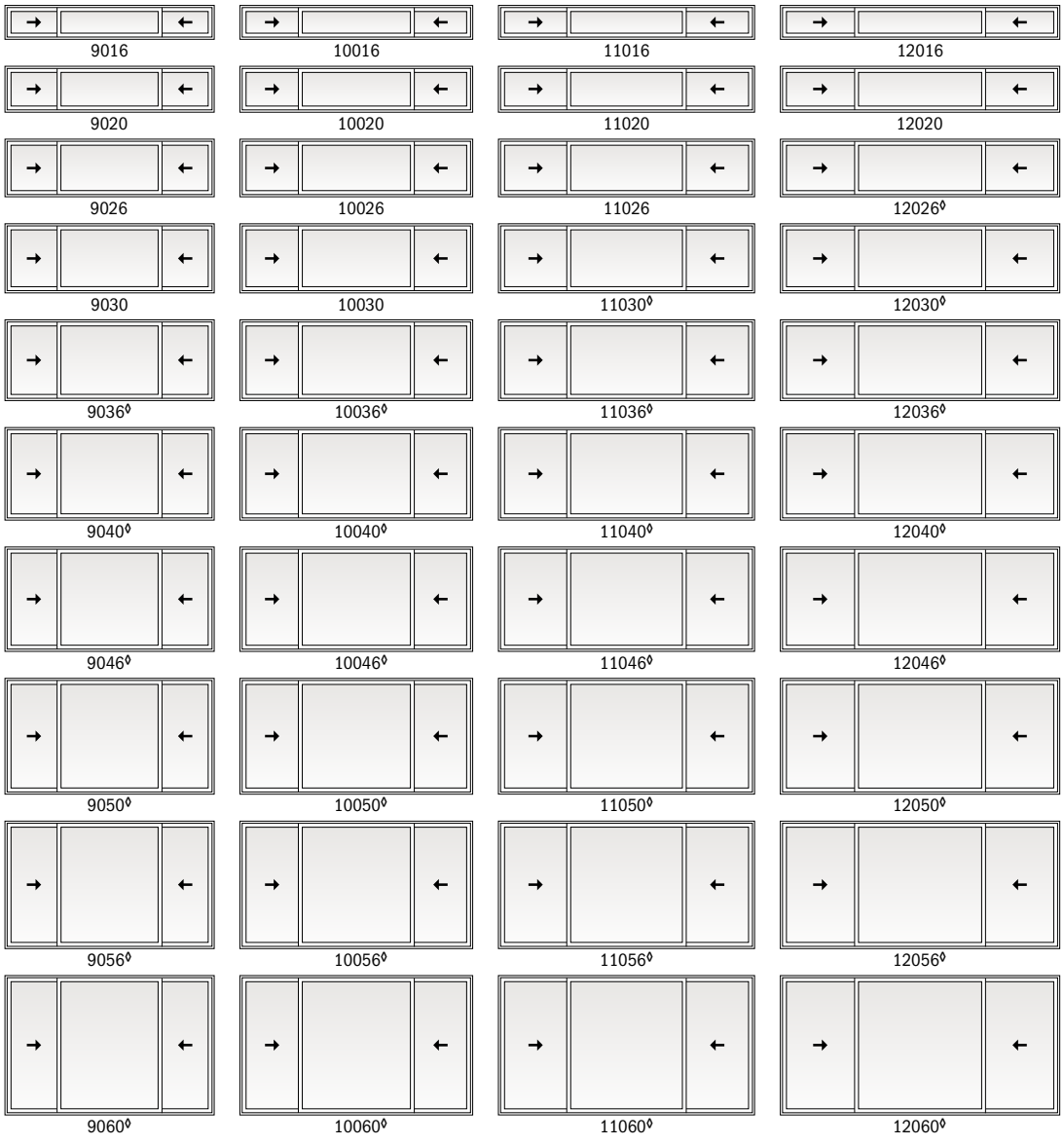
CUSTOM WIDTHS – 59 1/2" to 143 1/2"

CUSTOM HEIGHTS – 17 1/2" to 71 1/2"

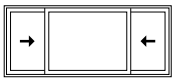
1'-5 1/2" (445)	5016	6016	7016	7616	8016	8616
1'-11 1/2" (597) 2'-0" (610) 17 1/4" (438)	5020	6020	7020	7620	8020	8620
2'-5 1/2" (749) 2'-6" (762) 23 1/4" (591)	5026	6026	7026	7626	8026	8626
2'-11 1/2" (902) 3'-0" (914) 29 1/4" (743)	5030	6030	7030	7630	8030	8630
3'-5 1/2" (1054) 3'-6" (1067) 35 1/4" (895)	5036	6036	7036	7636	8036	8636◊
3'-11 1/2" (1207) 4'-0" (1219) 41 1/4" (1048)	5040	6040	7040	7640	8040◊	8640◊
4'-5 1/2" (1359) 4'-6" (1372) 47 1/4" (1200)	5046	6046	7046	7646	8046◊	8646◊
4'-11 1/2" (1511) 5'-0" (1524) 53 1/4" (1353)	5050	6050	7050	7650	8050◊	8650◊
5'-5 1/2" (1664) 5'-6" (1676) 59 1/4" (1505)	5056	6056	7056	7656	8056◊	8656◊
5'-11 1/2" (1816) 6'-0" (1829) 65 1/4" (1657)	5060	6060	7060	7660	8060◊	8660◊

• "Window Dimension" always refers to outside frame-to-frame dimension.
• "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
• Dimensions in parentheses are in millimeters.
◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See table on pages 60-61.

8'-11 1/2" (2731)	9'-11 1/2" (3035)	10'-11 1/2" (3340)	11'-11 1/2" (3645)
9'-0" (2743)	10'-0" (3048)	11'-0" (3353)	12'-0" (3658)
51 7/8" (1318)	57 7/8" (1470)	63 7/8" (1623)	69 7/8" (1775)
22 17/32" (572)	25 17/32" (648)	28 17/32" (725)	31 17/32" (801)



Custom-size windows are available in 1/8" (3) increments. See page 90 for custom sizes and specifications.



Active-Stationary-Active

Exterior view shown. Sash configuration is active-stationary-active (**XOX**) with a 1:2:1 sash ratio. Two locks for each sash are standard on all heights greater than 4'-2" (1270).

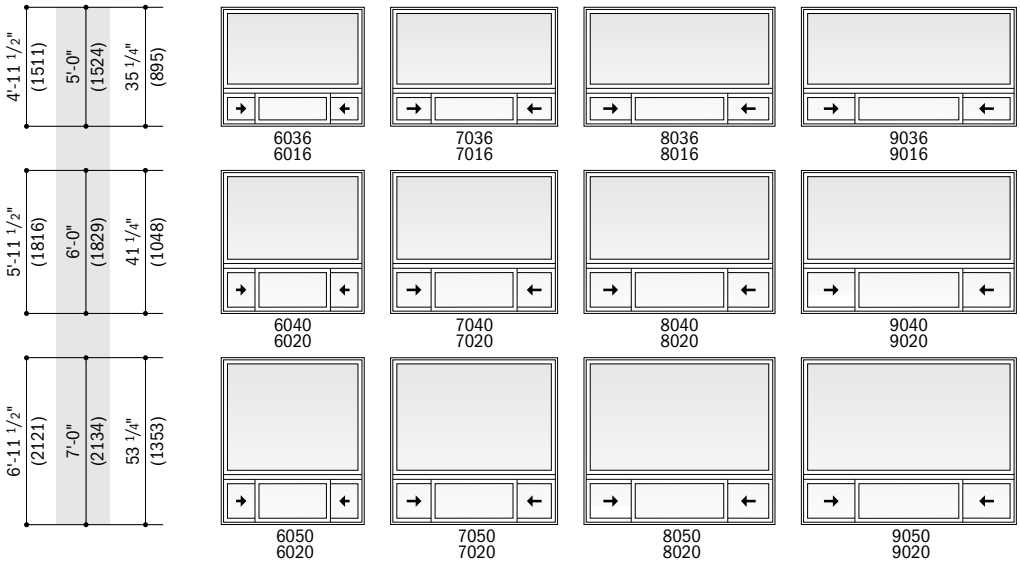
Details shown on pages 64-65. Grille patterns shown on page 63.

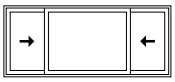
• "Window Dimension" always refers to outside frame-to-frame dimension.
• "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
• Dimensions in parentheses are in millimeters.
◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See table on pages 60-61.

Table of Sizes – Picture Window Over Gliding With Active-Stationary-Active (XOX) 1:2:1 Sash Ratio

Scale 1/8" (3) = 1'-0" (305) – 1:96

Window Dimension	5'-11 1/2" (1816)	6'-11 1/2" (2121)	7'-11 1/2" (2426)	8'-11 1/2" (2731)
Minimum Rough Opening	6'-0" (1829)	7'-0" (2134)	8'-0" (2438)	9'-0" (2743)
Unobstructed Glass (upper sash only)	65 1/4" (1657)	77 1/4" (1962)	89 1/4" (2267)	101 1/4" (2572)





Active-Stationary-Active

Exterior view shown. Lower sash configuration is active-stationary-active (**XOX**) with a 1:2:1 sash ratio. Windows have one continuous outer frame.

For unobstructed glass dimensions of lower sash, see pages 54-55.

Details shown on pages 64-65.
Grille patterns shown on page 63.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Table of Gliding Window Sizes – Active-Stationary-Active (XOX) 1:1:1 Equal Sash Ratio

Scale 1/8" (3) = 1'-0" (305) – 1:96

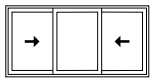
Window Dimension	3'-11 1/2" (1207)	4'-11 1/2" (1511)	5'-11 1/2" (1816)	6'-11 1/2" (2121)	7'-5 1/2" (2273)	7'-11 1/2" (2426)	8'-5 1/2" (2578)
Minimum Rough Opening	4'-0" (1219)	5'-0" (1524)	6'-0" (1829)	7'-0" (2134)	7'-6" (2286)	8'-0" (2438)	8'-6" (2591)
Unobstructed Glass (width of center sash)	12 11/32" (313)	16 11/32" (415)	20 11/32" (517)	24 11/32" (618)	26 11/32" (669)	28 11/32" (720)	30 11/32" (771)
Unobstructed Glass (width of single venting sash)	12 9/32" (312)	16 9/32" (414)	20 9/32" (516)	24 9/32" (617)	26 9/32" (668)	28 9/32" (719)	30 9/32" (770)

CUSTOM WIDTHS – 47 1/2" to 101 1/2"

CUSTOM HEIGHTS – 17 1/2" to 71 1/2"

1'-5 1/2" (445)	4016	5016	6016	7016	7616	8016	8616
1'-6" (457)							
11 1/4" (286)							
1'-11 1/2" (597)	4020	5020	6020	7020	7620	8020	8620
2'-0" (610)							
17 1/4" (438)							
2'-5 1/2" (749)	4026	5026	6026	7026	7626	8026	8626
2'-6" (762)							
23 1/4" (591)							
2'-11 1/2" (902)	4030	5030	6030	7030	7630	8030◊	8630◊
3'-0" (914)							
29 1/4" (743)							
3'-5 1/2" (1054)	4036	5036	6036	7036◊	7636◊	8036◊	8636◊
3'-6" (1067)							
35 1/4" (895)							
3'-11 1/2" (1207)	4040	5040	6040	7040◊	7640◊	8040◊	8640◊
4'-0" (1219)							
41 1/4" (1048)							
4'-5 1/2" (1359)	4046	5046	6046	7046◊	7646◊	8046◊	8646◊
4'-6" (1372)							
47 1/4" (1200)							
4'-11 1/2" (1511)	4050	5050	6050	7050◊	7650◊	8050◊	8650◊
5'-0" (1524)							
53 1/4" (1353)							
5'-5 1/2" (1664)	4056	5056	6056	7056◊	7656◊	8056◊	8656◊
5'-6" (1676)							
59 1/4" (1505)							
5'-11 1/2" (1816)	4060	5060	6060	7060◊	7660◊	8060◊	8660◊
6'-0" (1829)							
65 1/4" (1657)							

Custom-size windows are available in 1/8" (3) increments. See page 90 for custom sizes and specifications.



Active-Stationary-Active

Exterior view shown. Sash configuration is active-stationary-active (**XOX**) with a 1:1:1 equal sash ratio. Two locks are standard on all heights greater than 4'-2" (1270). Grille patterns shown on page 63.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- **"Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

◊Meets or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). See table on pages 62-63.

Gliding Window Opening and Area Specifications – Active-Stationary or Stationary-Active (XO/OX) Sash

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Height Inches/(mm)	Total Glass Area Sq. Ft./(m²)	Fixed Sash Glass Area Sq. Ft./(m²)	Active Sash Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
2010	0.45 (0.04)	8 1/16" (204)	8" (203)	0.55 (0.05)	0.28 (0.03)	0.27 (0.03)	0.45 (0.04)	72 1/2" (1842)	1.88 (0.17)
2016	0.78 (0.07)	8 1/16" (204)	14" (356)	1.18 (0.11)	0.59 (0.05)	0.59 (0.05)	0.78 (0.07)	66 1/2" (1689)	2.86 (0.27)
2020	1.12 (0.10)	8 1/16" (204)	20" (508)	1.81 (0.17)	0.91 (0.08)	0.90 (0.08)	1.12 (0.10)	60 1/2" (1537)	3.84 (0.36)
2026	1.45 (0.13)	8 1/16" (204)	26" (660)	2.44 (0.23)	1.22 (0.11)	1.21 (0.11)	1.45 (0.13)	54 1/2" (1384)	4.81 (0.45)
2030	1.79 (0.17)	8 1/16" (204)	32" (813)	3.07 (0.28)	1.54 (0.14)	1.53 (0.14)	1.79 (0.17)	48 1/2" (1232)	5.79 (0.54)
2036	2.12 (0.20)	8 1/16" (204)	38" (965)	3.69 (0.34)	1.85 (0.17)	1.84 (0.17)	2.12 (0.20)	42 1/2" (1080)	6.77 (0.63)
2040	2.46 (0.23)	8 1/16" (204)	44" (1118)	4.32 (0.40)	2.17 (0.20)	2.16 (0.20)	2.46 (0.23)	36 1/2" (927)	7.75 (0.72)
2046	2.79 (0.26)	8 1/16" (204)	50" (1270)	4.95 (0.46)	2.48 (0.23)	2.47 (0.23)	2.79 (0.26)	30 1/2" (775)	8.73 (0.81)
2050	3.13 (0.29)	8 1/16" (204)	56" (1422)	5.58 (0.52)	2.80 (0.26)	2.78 (0.26)	3.13 (0.29)	24 1/2" (622)	9.71 (0.90)
2056	3.46 (0.32)	8 1/16" (204)	62" (1575)	6.21 (0.58)	3.11 (0.29)	3.10 (0.29)	3.46 (0.32)	18 1/2" (470)	10.69 (0.99)
2060	3.80 (0.35)	8 1/16" (204)	68" (1727)	6.84 (0.64)	3.43 (0.32)	3.41 (0.32)	3.80 (0.35)	12 1/2" (318)	11.67 (1.08)
2610	0.61 (0.06)	11 1/16" (280)	8" (203)	0.77 (0.07)	0.39 (0.04)	0.38 (0.04)	0.61 (0.06)	72 1/2" (1842)	2.36 (0.22)
2616	1.07 (0.10)	11 1/16" (280)	14" (356)	1.65 (0.15)	0.83 (0.08)	0.82 (0.08)	1.07 (0.10)	66 1/2" (1689)	3.59 (0.33)
2620	1.53 (0.14)	11 1/16" (280)	20" (508)	2.53 (0.23)	1.27 (0.12)	1.26 (0.12)	1.53 (0.14)	60 1/2" (1537)	4.81 (0.45)
2626	1.99 (0.19)	11 1/16" (280)	26" (660)	3.41 (0.32)	1.71 (0.16)	1.70 (0.16)	1.99 (0.19)	54 1/2" (1384)	6.04 (0.56)
2630	2.45 (0.23)	11 1/16" (280)	32" (813)	4.28 (0.40)	2.15 (0.20)	2.14 (0.20)	2.45 (0.23)	48 1/2" (1232)	7.27 (0.68)
2636	2.91 (0.27)	11 1/16" (280)	38" (965)	5.16 (0.48)	2.59 (0.24)	2.58 (0.24)	2.91 (0.27)	42 1/2" (1080)	8.50 (0.79)
2640	3.37 (0.31)	11 1/16" (280)	44" (1118)	6.04 (0.56)	3.03 (0.28)	3.01 (0.28)	3.37 (0.31)	36 1/2" (927)	9.73 (0.90)
2646	3.83 (0.36)	11 1/16" (280)	50" (1270)	6.92 (0.64)	3.47 (0.32)	3.45 (0.32)	3.83 (0.36)	30 1/2" (775)	10.96 (1.02)
2650	4.29 (0.40)	11 1/16" (280)	56" (1422)	7.80 (0.72)	3.91 (0.36)	3.89 (0.36)	4.29 (0.40)	24 1/2" (622)	12.19 (1.13)
2656	4.75 (0.44)	11 1/16" (280)	62" (1575)	8.68 (0.81)	4.35 (0.40)	4.33 (0.40)	4.75 (0.44)	18 1/2" (470)	13.42 (1.25)
2660	5.21 (0.48)	11 1/16" (280)	68" (1727)	9.56 (0.89)	4.79 (0.44)	4.77 (0.44)	5.21 (0.48)	12 1/2" (318)	14.65 (1.36)
3010	0.78 (0.07)	14 1/16" (357)	8" (203)	0.99 (0.09)	0.49 (0.05)	0.49 (0.05)	0.78 (0.07)	72 1/2" (1842)	2.84 (0.26)
3016	1.36 (0.13)	14 1/16" (357)	14" (356)	2.12 (0.20)	1.06 (0.10)	1.06 (0.10)	1.36 (0.13)	66 1/2" (1689)	4.31 (0.40)
3020	1.95 (0.18)	14 1/16" (357)	20" (508)	3.25 (0.30)	1.63 (0.15)	1.62 (0.15)	1.95 (0.18)	60 1/2" (1537)	5.79 (0.54)
3026	2.53 (0.24)	14 1/16" (357)	26" (660)	4.37 (0.41)	2.19 (0.20)	2.18 (0.20)	2.53 (0.24)	54 1/2" (1384)	7.27 (0.68)
3030	3.12 (0.29)	14 1/16" (357)	32" (813)	5.50 (0.51)	2.76 (0.26)	2.75 (0.26)	3.12 (0.29)	48 1/2" (1232)	8.75 (0.81)
3036	3.70 (0.34)	14 1/16" (357)	38" (965)	6.63 (0.62)	3.32 (0.31)	3.31 (0.31)	3.70 (0.34)	42 1/2" (1080)	10.23 (0.95)
3040	4.29 (0.40)	14 1/16" (357)	44" (1118)	7.76 (0.72)	3.89 (0.36)	3.87 (0.36)	4.29 (0.40)	36 1/2" (927)	11.71 (1.09)
3046	4.87 (0.45)	14 1/16" (357)	50" (1270)	8.89 (0.83)	4.45 (0.41)	4.44 (0.41)	4.87 (0.45)	30 1/2" (775)	13.19 (1.23)
3050	5.46 (0.51)	14 1/16" (357)	56" (1422)	10.02 (0.93)	5.02 (0.47)	5.00 (0.46)	5.46 (0.51)	24 1/2" (622)	14.67 (1.36)
3056	6.04 (0.56)	14 1/16" (357)	62" (1575)	11.15 (1.04)	5.58 (0.52)	5.56 (0.52)	6.04 (0.56)	18 1/2" (470)	16.15 (1.50)
3060	6.63 (0.62)	14 1/16" (357)	68" (1727)	12.28 (1.14)	6.15 (0.57)	6.13 (0.57)	6.63 (0.62)	12 1/2" (318)	17.63 (1.64)
3610	0.95 (0.09)	17 1/16" (433)	8" (203)	1.21 (0.11)	0.60 (0.06)	0.60 (0.06)	0.95 (0.09)	72 1/2" (1842)	3.31 (0.31)
3616	1.66 (0.15)	17 1/16" (433)	14" (356)	2.59 (0.24)	1.29 (0.12)	1.29 (0.12)	1.66 (0.15)	66 1/2" (1689)	5.04 (0.47)
3620	2.37 (0.22)	17 1/16" (433)	20" (508)	3.96 (0.37)	1.98 (0.18)	1.98 (0.18)	2.37 (0.22)	60 1/2" (1537)	6.77 (0.63)
3626	3.08 (0.29)	17 1/16" (433)	26" (660)	5.34 (0.50)	2.67 (0.25)	2.67 (0.25)	3.08 (0.29)	54 1/2" (1384)	8.50 (0.79)
3630	3.79 (0.35)	17 1/16" (433)	32" (813)	6.72 (0.62)	3.36 (0.31)	3.36 (0.31)	3.79 (0.35)	48 1/2" (1232)	10.23 (0.95)
3636	4.50 (0.42)	17 1/16" (433)	38" (965)	8.10 (0.75)	4.06 (0.38)	4.04 (0.38)	4.50 (0.42)	42 1/2" (1080)	11.96 (1.11)
3640	5.21 (0.48)	17 1/16" (433)	44" (1118)	9.48 (0.88)	4.75 (0.44)	4.73 (0.44)	5.21 (0.48)	36 1/2" (927)	13.69 (1.27)
3646	5.92 (0.55)	17 1/16" (433)	50" (1270)	10.86 (1.01)	5.44 (0.50)	5.42 (0.50)	5.92 (0.55)	30 1/2" (775)	15.42 (1.43)
3650	6.63 (0.62)	17 1/16" (433)	56" (1422)	12.24 (1.14)	6.13 (0.57)	6.11 (0.57)	6.63 (0.62)	24 1/2" (622)	17.15 (1.59)
3656	7.34 (0.68)	17 1/16" (433)	62" (1575)	13.62 (1.26)	6.82 (0.63)	6.80 (0.63)	7.34 (0.68)	18 1/2" (470)	18.88 (1.75)
3660	8.05 (0.75)	17 1/16" (433)	68" (1727)	14.99 (1.39)	7.51 (0.70)	7.49 (0.70)	8.05 (0.75)	12 1/2" (318)	20.61 (1.91)
4010	1.11 (0.10)	20 1/16" (509)	8" (203)	1.43 (0.13)	0.71 (0.07)	0.71 (0.07)	1.11 (0.10)	72 1/2" (1842)	3.79 (0.35)
4016	1.95 (0.18)	20 1/16" (509)	14" (356)	3.05 (0.28)	1.53 (0.14)	1.53 (0.14)	1.95 (0.18)	66 1/2" (1689)	5.77 (0.54)
4020	2.78 (0.26)	20 1/16" (509)	20" (508)	4.68 (0.44)	2.34 (0.22)	2.34 (0.22)	2.78 (0.26)	60 1/2" (1537)	7.75 (0.72)
4026	3.62 (0.34)	20 1/16" (509)	26" (660)	6.31 (0.59)	3.16 (0.29)	3.15 (0.29)	3.62 (0.34)	54 1/2" (1384)	9.73 (0.90)
4030	4.45 (0.41)	20 1/16" (509)	32" (813)	7.94 (0.74)	3.97 (0.37)	3.97 (0.37)	4.45 (0.41)	48 1/2" (1232)	11.71 (1.09)
4036	5.29 (0.49)	20 1/16" (509)	38" (965)	9.57 (0.89)	4.79 (0.44)	4.78 (0.44)	5.29 (0.49)	42 1/2" (1080)	13.69 (1.27)
4040 ◊	6.12 (0.57)	20 1/16" (509)	44" (1118)	11.20 (1.04)	5.60 (0.52)	5.59 (0.52)	6.12 (0.57)	36 1/2" (927)	15.67 (1.46)
4046 ◊	6.96 (0.65)	20 1/16" (509)	50" (1270)	12.83 (1.19)	6.42 (0.60)	6.41 (0.60)	6.96 (0.65)	30 1/2" (775)	17.65 (1.64)
4050 ◊	7.79 (0.72)	20 1/16" (509)	56" (1422)	14.46 (1.34)	7.24 (0.67)	7.22 (0.67)	7.79 (0.72)	24 1/2" (622)	19.63 (1.82)
4056 ◊	8.63 (0.80)	20 1/16" (509)	62" (1575)	16.08 (1.49)	8.05 (0.75)	8.03 (0.75)	8.63 (0.80)	18 1/2" (470)	21.61 (2.01)
4060 ◊	9.46 (0.88)	20 1/16" (509)	68" (1727)	17.71 (1.65)	8.87 (0.82)	8.85 (0.82)	9.46 (0.88)	12 1/2" (318)	23.59 (2.19)
4610	1.28 (0.12)	23 1/16" (585)	8" (203)	1.64 (0.15)	0.82 (0.08)	0.82 (0.08)	1.28 (0.12)	72 1/2" (1842)	4.27 (0.40)
4616	2.24 (0.21)	23 1/16" (585)	14" (356)	3.52 (0.33)	1.76 (0.16)	1.76 (0.16)	2.24 (0.21)	66 1/2" (1689)	6.50 (0.60)
4620	3.20 (0.30)	23 1/16" (585)	20" (508)	5.40 (0.50)	2.70 (0.25)	2.70 (0.25)	3.20 (0.30)	60 1/2" (1537)	8.73 (0.81)

• "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).

continued on next page

• Dimensions in parentheses are in millimeters or square meters.

◊Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Gliding Window Opening and Area Specifications – Active-Stationary or Stationary-Active (XO/OX) Sash *(continued)*

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Height Inches/(mm)	Total Glass Area Sq. Ft./(m²)	Fixed Sash Glass Area Sq. Ft./(m²)	Active Sash Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
4626	4.16 (0.39)	23 1/16" (585)	26" (660)	7.28 (0.68)	3.64 (0.34)	3.64 (0.34)	4.16 (0.39)	54 1/2" (1384)	10.96 (1.02)
4630	5.12 (0.48)	23 1/16" (585)	32" (813)	9.16 (0.85)	4.58 (0.43)	4.58 (0.43)	5.12 (0.48)	48 1/2" (1232)	13.19 (1.23)
4636 ◊	6.08 (0.56)	23 1/16" (585)	38" (965)	11.04 (1.03)	5.52 (0.51)	5.51 (0.51)	6.08 (0.56)	42 1/2" (1080)	15.42 (1.43)
4640 ◊	7.04 (0.65)	23 1/16" (585)	44" (1118)	12.92 (1.20)	6.46 (0.60)	6.45 (0.60)	7.04 (0.65)	36 1/2" (927)	17.65 (1.64)
4646 ◊	8.00 (0.74)	23 1/16" (585)	50" (1270)	14.80 (1.37)	7.40 (0.69)	7.39 (0.69)	8.00 (0.74)	30 1/2" (775)	19.88 (1.85)
4650 ◊	8.96 (0.83)	23 1/16" (585)	56" (1422)	16.67 (1.55)	8.34 (0.78)	8.33 (0.77)	8.96 (0.83)	24 1/2" (622)	22.11 (2.05)
4656 ◊	9.92 (0.92)	23 1/16" (585)	62" (1575)	18.55 (1.72)	9.28 (0.86)	9.27 (0.86)	9.92 (0.92)	18 1/2" (470)	24.34 (2.26)
4660 ◊	10.88 (1.01)	23 1/16" (585)	68" (1727)	20.43 (1.90)	10.23 (0.95)	10.21 (0.95)	10.88 (1.01)	12 1/2" (318)	26.56 (2.47)
5010	1.45 (0.13)	26 1/16" (661)	8" (203)	1.86 (0.17)	0.93 (0.09)	0.93 (0.09)	1.45 (0.13)	72 1/2" (1842)	4.75 (0.44)
5016	2.53 (0.24)	26 1/16" (661)	14" (356)	3.99 (0.37)	2.00 (0.19)	1.99 (0.19)	2.53 (0.24)	66 1/2" (1689)	7.23 (0.67)
5020	3.62 (0.34)	26 1/16" (661)	20" (508)	6.12 (0.57)	3.06 (0.28)	3.06 (0.28)	3.62 (0.34)	60 1/2" (1537)	9.71 (0.90)
5026	4.70 (0.44)	26 1/16" (661)	26" (660)	8.25 (0.77)	4.13 (0.38)	4.12 (0.38)	4.70 (0.44)	54 1/2" (1384)	12.19 (1.13)
5030 ◊	5.79 (0.54)	26 1/16" (661)	32" (813)	10.38 (0.96)	5.19 (0.48)	5.18 (0.48)	5.79 (0.54)	48 1/2" (1232)	14.67 (1.36)
5036 ◊	6.87 (0.64)	26 1/16" (661)	38" (965)	12.51 (1.16)	6.26 (0.58)	6.25 (0.58)	6.87 (0.64)	42 1/2" (1080)	17.15 (1.59)
5040 ◊	7.96 (0.74)	26 1/16" (661)	44" (1118)	14.64 (1.36)	7.32 (0.68)	7.31 (0.68)	7.96 (0.74)	36 1/2" (927)	19.63 (1.82)
5046 ◊	9.04 (0.84)	26 1/16" (661)	50" (1270)	16.76 (1.56)	8.39 (0.78)	8.38 (0.78)	9.04 (0.84)	30 1/2" (775)	22.11 (2.05)
5050 ◊	10.13 (0.94)	26 1/16" (661)	56" (1422)	18.89 (1.76)	9.45 (0.88)	9.44 (0.88)	10.13 (0.94)	24 1/2" (622)	24.59 (2.28)
5056 ◊	11.21 (1.04)	26 1/16" (661)	62" (1575)	21.02 (1.95)	10.52 (0.98)	10.50 (0.98)	11.21 (1.04)	18 1/2" (470)	27.06 (2.51)
5060 ◊	12.30 (1.14)	26 1/16" (661)	68" (1727)	23.15 (2.15)	11.58 (1.08)	11.57 (1.07)	12.30 (1.14)	12 1/2" (318)	29.54 (2.74)
5610	1.61 (0.15)	29 1/16" (738)	8" (203)	2.08 (0.19)	1.04 (0.10)	1.04 (0.10)	1.61 (0.15)	72 1/2" (1842)	5.23 (0.49)
5616	2.82 (0.26)	29 1/16" (738)	14" (356)	4.46 (0.41)	2.23 (0.21)	2.23 (0.21)	2.82 (0.26)	66 1/2" (1689)	7.96 (0.74)
5620	4.03 (0.37)	29 1/16" (738)	20" (508)	6.84 (0.64)	3.42 (0.32)	3.42 (0.32)	4.03 (0.37)	60 1/2" (1537)	10.69 (0.99)
5626	5.24 (0.49)	29 1/16" (738)	26" (660)	9.22 (0.86)	4.61 (0.43)	4.61 (0.43)	5.24 (0.49)	54 1/2" (1384)	13.42 (1.25)
5630 ◊	6.45 (0.60)	29 1/16" (738)	32" (813)	11.60 (1.08)	5.80 (0.54)	5.79 (0.54)	6.45 (0.60)	48 1/2" (1232)	16.15 (1.50)
5636 ◊	7.66 (0.71)	29 1/16" (738)	38" (965)	13.98 (1.30)	6.99 (0.65)	6.98 (0.65)	7.66 (0.71)	42 1/2" (1080)	18.88 (1.75)
5640 ◊	8.87 (0.82)	29 1/16" (738)	44" (1118)	16.35 (1.52)	8.18 (0.76)	8.17 (0.76)	8.87 (0.82)	36 1/2" (927)	21.61 (2.01)
5646 ◊	10.08 (0.94)	29 1/16" (738)	50" (1270)	18.73 (1.74)	9.37 (0.87)	9.36 (0.87)	10.08 (0.94)	30 1/2" (775)	24.34 (2.26)
5650 ◊	11.29 (1.05)	29 1/16" (738)	56" (1422)	21.11 (1.96)	10.56 (0.98)	10.55 (0.98)	11.29 (1.05)	24 1/2" (622)	27.06 (2.51)
5656 ◊	12.50 (1.16)	29 1/16" (738)	62" (1575)	23.49 (2.18)	11.75 (1.09)	11.74 (1.09)	12.50 (1.16)	18 1/2" (470)	29.79 (2.77)
5660 ◊	13.71 (1.27)	29 1/16" (738)	68" (1727)	25.87 (2.40)	12.94 (1.20)	12.92 (1.20)	13.71 (1.27)	12 1/2" (318)	32.52 (3.02)
6010	1.78 (0.17)	32 1/16" (814)	8" (203)	2.30 (0.21)	1.15 (0.11)	1.15 (0.11)	1.78 (0.17)	72 1/2" (1842)	5.71 (0.53)
6016	3.11 (0.29)	32 1/16" (814)	14" (356)	4.93 (0.46)	2.47 (0.23)	2.46 (0.23)	3.11 (0.29)	66 1/2" (1689)	8.69 (0.81)
6020	4.45 (0.41)	32 1/16" (814)	20" (508)	7.56 (0.70)	3.78 (0.35)	3.78 (0.35)	4.45 (0.41)	60 1/2" (1537)	11.67 (1.08)
6026 ◊	5.78 (0.54)	32 1/16" (814)	26" (660)	10.19 (0.95)	5.10 (0.47)	5.09 (0.47)	5.78 (0.54)	54 1/2" (1384)	14.65 (1.36)
6030 ◊	7.12 (0.66)	32 1/16" (814)	32" (813)	12.82 (1.19)	6.41 (0.60)	6.40 (0.59)	7.12 (0.66)	48 1/2" (1232)	17.63 (1.64)
6036 ◊	8.45 (0.79)	32 1/16" (814)	38" (965)	15.44 (1.43)	7.73 (0.72)	7.72 (0.72)	8.45 (0.79)	42 1/2" (1080)	20.61 (1.91)
6040 ◊	9.79 (0.91)	32 1/16" (814)	44" (1118)	18.07 (1.68)	9.04 (0.84)	9.03 (0.84)	9.79 (0.91)	36 1/2" (927)	23.59 (2.19)
6046 ◊	11.12 (1.03)	32 1/16" (814)	50" (1270)	20.70 (1.92)	10.36 (0.96)	10.34 (0.96)	11.12 (1.03)	30 1/2" (775)	26.56 (2.47)
6050 ◊	12.46 (1.16)	32 1/16" (814)	56" (1422)	23.33 (2.17)	11.67 (1.08)	11.66 (1.08)	12.46 (1.16)	24 1/2" (622)	29.54 (2.74)
6056 ◊	13.79 (1.28)	32 1/16" (814)	62" (1575)	25.96 (2.41)	12.99 (1.21)	12.97 (1.21)	13.79 (1.28)	18 1/2" (470)	32.52 (3.02)
6060 ◊	15.13 (1.41)	32 1/16" (814)	68" (1727)	28.59 (2.66)	14.30 (1.33)	14.28 (1.33)	15.13 (1.41)	12 1/2" (318)	35.50 (3.30)

• "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).
• Dimensions in parentheses are in millimeters or square meters.
◊Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Gliding Window Opening and Area Specifications – Active-Stationary-Active (XOX) 1:2:1 Sash Ratio

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Height Inches/(mm)	Total Glass Area Sq. Ft./(m²)	Fixed Sash Glass Area Sq. Ft./(m²)	Single Active Sash Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
5016	1.16 (0.11)	11 7/8" (302)	14" (356)	3.82 (0.36)	2.18 (0.20)	0.82 (0.08)	2.31 (0.21)	66 1/2" (1689)	7.23 (0.67)
5020	1.65 (0.15)	11 7/8" (302)	20" (508)	5.86 (0.54)	3.34 (0.31)	1.26 (0.12)	3.31 (0.31)	60 1/2" (1537)	9.71 (0.90)
5026	2.15 (0.20)	11 7/8" (302)	26" (660)	7.90 (0.73)	4.50 (0.42)	1.70 (0.16)	4.30 (0.40)	54 1/2" (1384)	12.19 (1.13)
5030	2.64 (0.25)	11 7/8" (302)	32" (813)	9.94 (0.92)	5.66 (0.53)	2.14 (0.20)	5.29 (0.49)	48 1/2" (1232)	14.67 (1.36)
5036	3.14 (0.29)	11 7/8" (302)	38" (965)	11.98 (1.11)	6.83 (0.63)	2.58 (0.24)	6.28 (0.58)	42 1/2" (1080)	17.15 (1.59)
5040	3.64 (0.34)	11 7/8" (302)	44" (1118)	14.02 (1.30)	7.99 (0.74)	3.01 (0.28)	7.27 (0.68)	36 1/2" (927)	19.63 (1.82)
5046	4.13 (0.38)	11 7/8" (302)	50" (1270)	16.06 (1.49)	9.15 (0.85)	3.45 (0.32)	8.26 (0.77)	30 1/2" (775)	22.11 (2.05)
5050	4.63 (0.43)	11 7/8" (302)	56" (1422)	18.09 (1.68)	10.31 (0.96)	3.89 (0.36)	9.25 (0.86)	24 1/2" (622)	24.59 (2.28)
5056	5.12 (0.48)	11 7/8" (302)	62" (1575)	20.13 (1.87)	11.47 (1.07)	4.33 (0.40)	10.25 (0.95)	18 1/2" (470)	27.06 (2.51)
5060	5.62 (0.52)	11 7/8" (302)	68" (1727)	22.17 (2.06)	12.63 (1.17)	4.77 (0.44)	11.24 (1.04)	12 1/2" (318)	29.54 (2.74)
6016	1.45 (0.13)	14 7/8" (378)	14" (356)	4.76 (0.44)	2.65 (0.25)	1.06 (0.10)	2.90 (0.27)	66 1/2" (1689)	8.69 (0.81)
6020	2.07 (0.19)	14 7/8" (378)	20" (508)	7.30 (0.68)	4.06 (0.38)	1.62 (0.15)	4.14 (0.38)	60 1/2" (1537)	11.67 (1.08)
6026	2.69 (0.25)	14 7/8" (378)	26" (660)	9.84 (0.91)	5.47 (0.51)	2.18 (0.20)	5.38 (0.50)	54 1/2" (1384)	14.65 (1.36)
6030	3.31 (0.31)	14 7/8" (378)	32" (813)	12.38 (1.15)	6.88 (0.64)	2.75 (0.26)	6.62 (0.62)	48 1/2" (1232)	17.63 (1.64)
6036	3.93 (0.37)	14 7/8" (378)	38" (965)	14.92 (1.39)	8.29 (0.77)	3.31 (0.31)	7.86 (0.73)	42 1/2" (1080)	20.61 (1.91)
6040	4.55 (0.42)	14 7/8" (378)	44" (1118)	17.45 (1.62)	9.71 (0.90)	3.87 (0.36)	9.10 (0.85)	36 1/2" (927)	23.59 (2.19)
6046	5.17 (0.48)	14 7/8" (378)	50" (1270)	19.99 (1.86)	11.12 (1.03)	4.44 (0.41)	10.35 (0.96)	30 1/2" (775)	26.56 (2.47)
6050	5.79 (0.54)	14 7/8" (378)	56" (1422)	22.53 (2.09)	12.53 (1.16)	5.00 (0.46)	11.59 (1.08)	24 1/2" (622)	29.54 (2.74)
6056	6.41 (0.60)	14 7/8" (378)	62" (1575)	25.07 (2.33)	13.94 (1.30)	5.56 (0.52)	12.83 (1.19)	18 1/2" (470)	32.52 (3.02)
6060	7.04 (0.65)	14 7/8" (378)	68" (1727)	27.61 (2.56)	15.35 (1.43)	6.13 (0.57)	14.07 (1.31)	12 1/2" (318)	35.50 (3.30)
7016	1.74 (0.16)	17 7/8" (455)	14" (356)	5.70 (0.53)	3.12 (0.29)	1.29 (0.12)	3.48 (0.32)	66 1/2" (1689)	10.15 (0.94)
7020	2.49 (0.23)	17 7/8" (455)	20" (508)	8.74 (0.81)	4.78 (0.44)	1.98 (0.18)	4.97 (0.46)	60 1/2" (1537)	13.63 (1.27)
7026	3.23 (0.30)	17 7/8" (455)	26" (660)	11.78 (1.09)	6.44 (0.60)	2.67 (0.25)	6.46 (0.60)	54 1/2" (1384)	17.11 (1.59)
7030	3.98 (0.37)	17 7/8" (455)	32" (813)	14.81 (1.38)	8.10 (0.75)	3.36 (0.31)	7.96 (0.74)	48 1/2" (1232)	20.59 (1.91)
7036	4.72 (0.44)	17 7/8" (455)	38" (965)	17.85 (1.66)	9.76 (0.91)	4.04 (0.38)	9.45 (0.88)	42 1/2" (1080)	24.06 (2.24)
7040	5.47 (0.51)	17 7/8" (455)	44" (1118)	20.89 (1.94)	11.42 (1.06)	4.73 (0.44)	10.94 (1.02)	36 1/2" (927)	27.54 (2.56)
7046	6.21 (0.58)	17 7/8" (455)	50" (1270)	23.93 (2.22)	13.09 (1.22)	5.42 (0.50)	12.43 (1.15)	30 1/2" (775)	31.02 (2.88)
7050	6.96 (0.65)	17 7/8" (455)	56" (1422)	26.97 (2.51)	14.75 (1.37)	6.11 (0.57)	13.92 (1.29)	24 1/2" (622)	34.50 (3.21)
7056	7.71 (0.72)	17 7/8" (455)	62" (1575)	30.01 (2.79)	16.41 (1.52)	6.80 (0.63)	15.41 (1.43)	18 1/2" (470)	37.98 (3.53)
7060	8.45 (0.79)	17 7/8" (455)	68" (1727)	33.05 (3.07)	18.07 (1.68)	7.49 (0.70)	16.90 (1.57)	12 1/2" (318)	41.46 (3.85)
7616	1.89 (0.18)	19 3/8" (493)	14" (356)	6.17 (0.57)	3.35 (0.31)	1.41 (0.13)	3.77 (0.35)	66 1/2" (1689)	10.88 (1.01)
7620	2.69 (0.25)	19 3/8" (493)	20" (508)	9.46 (0.88)	5.14 (0.48)	2.16 (0.20)	5.39 (0.50)	60 1/2" (1537)	14.61 (1.36)
7626	3.50 (0.33)	19 3/8" (493)	26" (660)	12.74 (1.18)	6.92 (0.64)	2.91 (0.27)	7.01 (0.65)	54 1/2" (1384)	18.34 (1.70)
7630	4.31 (0.40)	19 3/8" (493)	32" (813)	16.03 (1.49)	8.71 (0.81)	3.66 (0.34)	8.62 (0.80)	48 1/2" (1232)	22.06 (2.05)
7636	5.12 (0.48)	19 3/8" (493)	38" (965)	19.32 (1.80)	10.50 (0.98)	4.41 (0.41)	10.24 (0.95)	42 1/2" (1080)	25.79 (2.40)
7640	5.93 (0.55)	19 3/8" (493)	44" (1118)	22.61 (2.10)	12.28 (1.14)	5.16 (0.48)	11.85 (1.10)	36 1/2" (927)	29.52 (2.74)
7646	6.74 (0.63)	19 3/8" (493)	50" (1270)	25.90 (2.41)	14.07 (1.31)	5.91 (0.55)	13.47 (1.25)	30 1/2" (775)	33.25 (3.09)
7650	7.54 (0.70)	19 3/8" (493)	56" (1422)	29.19 (2.71)	15.86 (1.47)	6.67 (0.62)	15.09 (1.40)	24 1/2" (622)	36.98 (3.44)
7656	8.35 (0.78)	19 3/8" (493)	62" (1575)	32.48 (3.02)	17.64 (1.64)	7.42 (0.69)	16.70 (1.55)	18 1/2" (470)	40.71 (3.78)
7660	9.16 (0.85)	19 3/8" (493)	68" (1727)	35.77 (3.32)	19.43 (1.81)	8.17 (0.76)	18.32 (1.70)	12 1/2" (318)	44.44 (4.13)
8016	2.03 (0.19)	20 7/8" (531)	14" (356)	6.64 (0.62)	3.58 (0.33)	1.53 (0.14)	4.06 (0.38)	66 1/2" (1689)	11.61 (1.08)
8020	2.90 (0.27)	20 7/8" (531)	20" (508)	10.17 (0.95)	5.50 (0.51)	2.34 (0.22)	5.81 (0.54)	60 1/2" (1537)	15.59 (1.45)
8026	3.77 (0.35)	20 7/8" (531)	26" (660)	13.71 (1.27)	7.41 (0.69)	3.15 (0.29)	7.55 (0.70)	54 1/2" (1384)	19.56 (1.82)
8030	4.64 (0.43)	20 7/8" (531)	32" (813)	17.25 (1.60)	9.32 (0.87)	3.97 (0.37)	9.29 (0.86)	48 1/2" (1232)	23.54 (2.19)
8036	5.52 (0.51)	20 7/8" (531)	38" (965)	20.79 (1.93)	11.23 (1.04)	4.78 (0.44)	11.03 (1.02)	42 1/2" (1080)	27.52 (2.56)
8040 ◊	6.39 (0.59)	20 7/8" (531)	44" (1118)	24.33 (2.26)	13.14 (1.22)	5.59 (0.52)	12.77 (1.19)	36 1/2" (927)	31.50 (2.93)
8046 ◊	7.26 (0.67)	20 7/8" (531)	50" (1270)	27.87 (2.59)	15.06 (1.40)	6.41 (0.60)	14.51 (1.35)	30 1/2" (775)	35.48 (3.30)
8050 ◊	8.13 (0.76)	20 7/8" (531)	56" (1422)	31.41 (2.92)	16.97 (1.58)	7.22 (0.67)	16.25 (1.51)	24 1/2" (622)	39.46 (3.67)
8056 ◊	9.00 (0.84)	20 7/8" (531)	62" (1575)	34.95 (3.25)	18.88 (1.75)	8.03 (0.75)	18.00 (1.67)	18 1/2" (470)	43.44 (4.04)
8060 ◊	9.87 (0.92)	20 7/8" (531)	68" (1727)	38.48 (3.58)	20.79 (1.93)	8.85 (0.82)	19.74 (1.83)	12 1/2" (318)	47.42 (4.41)
8616	2.18 (0.20)	22 3/8" (569)	14" (356)	7.10 (0.66)	3.82 (0.35)	1.64 (0.15)	4.36 (0.40)	66 1/2" (1689)	12.34 (1.15)
8620	3.11 (0.29)	22 3/8" (569)	20" (508)	10.89 (1.01)	5.86 (0.54)	2.52 (0.23)	6.22 (0.58)	60 1/2" (1537)	16.56 (1.54)
8626	4.04 (0.38)	22 3/8" (569)	26" (660)	14.68 (1.36)	7.89 (0.73)	3.39 (0.32)	8.09 (0.75)	54 1/2" (1384)	20.79 (1.93)
8630	4.98 (0.46)	22 3/8" (569)	32" (813)	18.47 (1.72)	9.93 (0.92)	4.27 (0.40)	9.96 (0.92)	48 1/2" (1232)	25.02 (2.32)
8636 ◊	5.91 (0.55)	22 3/8" (569)	38" (965)	22.26 (2.07)	11.97 (1.11)	5.15 (0.48)	11.82 (1.10)	42 1/2" (1080)	29.25 (2.72)
8640 ◊	6.84 (0.64)	22 3/8" (569)	44" (1118)	26.05 (2.42)	14.00 (1.30)	6.02 (0.56)	13.69 (1.27)	36 1/2" (927)	33.48 (3.11)
8646 ◊	7.78 (0.72)	22 3/8" (569)	50" (1270)	29.84 (2.77)	16.04 (1.49)	6.90 (0.64)	15.55 (1.45)	30 1/2" (775)	37.71 (3.50)
8650 ◊	8.71 (0.81)	22 3/8" (569)	56" (1422)	33.63 (3.12)	18.08 (1.68)	7.77 (0.72)	17.42 (1.62)	24 1/2" (622)	41.94 (3.90)

• "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).

continued on next page

• Dimensions in parentheses are in millimeters or square meters.

◊Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Gliding Window Opening and Area Specifications – Active-Stationary-Active (XOX) 1:2:1 Sash Ratio *(continued)*

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Height Inches/(mm)	Total Glass Area Sq. Ft./(m²)	Fixed Sash Glass Area Sq. Ft./(m²)	Single Active Sash Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
8656◊	9.64 (0.90)	22 3/8" (569)	62" (1575)	37.41 (3.48)	20.11 (1.87)	8.65 (0.80)	19.29 (1.79)	18 1/2" (470)	46.17 (4.29)
8660◊	10.58 (0.98)	22 3/8" (569)	68" (1727)	41.20 (3.83)	22.15 (2.06)	9.53 (0.89)	21.15 (1.97)	12 1/2" (318)	50.40 (4.68)
9016	2.32 (0.22)	23 7/8" (607)	14" (356)	7.57 (0.70)	4.05 (0.38)	1.76 (0.16)	4.65 (0.43)	66 1/2" (1689)	13.06 (1.21)
9020	3.32 (0.31)	23 7/8" (607)	20" (508)	11.61 (1.08)	6.22 (0.58)	2.70 (0.25)	6.64 (0.62)	60 1/2" (1537)	17.54 (1.63)
9026	4.32 (0.40)	23 7/8" (607)	26" (660)	15.65 (1.45)	8.38 (0.78)	3.64 (0.34)	8.63 (0.80)	54 1/2" (1384)	22.02 (2.05)
9030	5.31 (0.49)	23 7/8" (607)	32" (813)	19.69 (1.83)	10.54 (0.98)	4.58 (0.43)	10.62 (0.99)	48 1/2" (1232)	26.50 (2.46)
9036◊	6.31 (0.59)	23 7/8" (607)	38" (965)	23.73 (2.20)	12.70 (1.18)	5.51 (0.51)	12.61 (1.17)	42 1/2" (1080)	30.98 (2.88)
9040◊	7.30 (0.68)	23 7/8" (607)	44" (1118)	27.77 (2.58)	14.86 (1.38)	6.45 (0.60)	14.60 (1.36)	36 1/2" (927)	35.46 (3.29)
9046◊	8.30 (0.77)	23 7/8" (607)	50" (1270)	31.81 (2.95)	17.02 (1.58)	7.39 (0.69)	16.60 (1.54)	30 1/2" (775)	39.94 (3.71)
9050◊	9.29 (0.86)	23 7/8" (607)	56" (1422)	35.84 (3.33)	19.19 (1.78)	8.33 (0.77)	18.59 (1.73)	24 1/2" (622)	44.42 (4.13)
9056◊	10.29 (0.96)	23 7/8" (607)	62" (1575)	39.88 (3.71)	21.35 (1.98)	9.27 (0.86)	20.58 (1.91)	18 1/2" (470)	48.90 (4.54)
9060◊	11.29 (1.05)	23 7/8" (607)	68" (1727)	43.92 (4.08)	23.51 (2.18)	10.21 (0.95)	22.57 (2.10)	12 1/2" (318)	53.38 (4.96)
10016	2.62 (0.24)	26 7/8" (683)	14" (356)	8.51 (0.79)	4.52 (0.42)	1.99 (0.19)	5.23 (0.49)	66 1/2" (1689)	14.52 (1.35)
10020	3.74 (0.35)	26 7/8" (683)	20" (508)	13.05 (1.21)	6.93 (0.64)	3.06 (0.28)	7.47 (0.69)	60 1/2" (1537)	19.50 (1.81)
10026	4.86 (0.45)	26 7/8" (683)	26" (660)	17.59 (1.63)	9.35 (0.87)	4.12 (0.38)	9.71 (0.90)	54 1/2" (1384)	24.48 (2.27)
10030	5.98 (0.56)	26 7/8" (683)	32" (813)	22.13 (2.06)	11.76 (1.09)	5.18 (0.48)	11.96 (1.11)	48 1/2" (1232)	29.46 (2.74)
10036◊	7.10 (0.66)	26 7/8" (683)	38" (965)	26.67 (2.48)	14.17 (1.32)	6.25 (0.58)	14.20 (1.32)	42 1/2" (1080)	34.44 (3.20)
10040◊	8.22 (0.76)	26 7/8" (683)	44" (1118)	31.20 (2.90)	16.58 (1.54)	7.31 (0.68)	16.44 (1.53)	36 1/2" (927)	39.42 (3.66)
10046◊	9.34 (0.87)	26 7/8" (683)	50" (1270)	35.74 (3.32)	18.99 (1.76)	8.38 (0.78)	18.68 (1.74)	30 1/2" (775)	44.40 (4.12)
10050◊	10.46 (0.97)	26 7/8" (683)	56" (1422)	40.28 (3.74)	21.40 (1.99)	9.44 (0.88)	20.92 (1.94)	24 1/2" (622)	49.38 (4.59)
10056◊	11.58 (1.08)	26 7/8" (683)	62" (1575)	44.82 (4.16)	23.82 (2.21)	10.50 (0.98)	23.16 (2.15)	18 1/2" (470)	54.36 (5.05)
10060◊	12.70 (1.18)	26 7/8" (683)	68" (1727)	49.36 (4.59)	26.23 (2.44)	11.57 (1.07)	25.40 (2.36)	12 1/2" (318)	59.34 (5.51)
11016	2.91 (0.27)	29 7/8" (759)	14" (356)	9.45 (0.88)	4.99 (0.46)	2.23 (0.21)	5.81 (0.54)	66 1/2" (1689)	15.98 (1.48)
11020	4.15 (0.39)	29 7/8" (759)	20" (508)	14.49 (1.35)	7.65 (0.71)	3.42 (0.32)	8.31 (0.77)	60 1/2" (1537)	21.46 (1.99)
11026	5.40 (0.50)	29 7/8" (759)	26" (660)	19.53 (1.81)	10.31 (0.96)	4.61 (0.43)	10.80 (1.00)	54 1/2" (1384)	26.94 (2.50)
11030◊	6.64 (0.62)	29 7/8" (759)	32" (813)	24.56 (2.28)	12.98 (1.21)	5.79 (0.54)	13.29 (1.23)	48 1/2" (1232)	32.42 (3.01)
11036◊	7.89 (0.73)	29 7/8" (759)	38" (965)	29.60 (2.75)	15.64 (1.45)	6.98 (0.65)	15.78 (1.47)	42 1/2" (1080)	37.90 (3.52)
11040◊	9.14 (0.85)	29 7/8" (759)	44" (1118)	34.64 (3.22)	18.30 (1.70)	8.17 (0.76)	18.27 (1.70)	36 1/2" (927)	43.38 (4.03)
11046◊	10.38 (0.96)	29 7/8" (759)	50" (1270)	39.68 (3.69)	20.96 (1.95)	9.36 (0.87)	20.76 (1.93)	30 1/2" (775)	48.86 (4.54)
11050◊	11.63 (1.08)	29 7/8" (759)	56" (1422)	44.72 (4.15)	23.62 (2.19)	10.55 (0.98)	23.25 (2.16)	24 1/2" (622)	54.34 (5.05)
11056◊	12.87 (1.20)	29 7/8" (759)	62" (1575)	49.76 (4.62)	26.28 (2.44)	11.74 (1.09)	25.75 (2.39)	18 1/2" (470)	59.81 (5.56)
11060◊	14.12 (1.31)	29 7/8" (759)	68" (1727)	54.80 (5.09)	28.95 (2.69)	12.92 (1.20)	28.24 (2.62)	12 1/2" (318)	65.29 (6.07)
12016	3.20 (0.30)	32 7/8" (836)	14" (356)	10.39 (0.96)	5.46 (0.51)	2.46 (0.23)	6.40 (0.59)	66 1/2" (1689)	17.44 (1.62)
12020	4.57 (0.42)	32 7/8" (836)	20" (508)	15.92 (1.48)	8.37 (0.78)	3.78 (0.35)	9.14 (0.85)	60 1/2" (1537)	23.42 (2.18)
12026◊	5.94 (0.55)	32 7/8" (836)	26" (660)	21.46 (1.99)	11.28 (1.05)	5.09 (0.47)	11.88 (1.10)	54 1/2" (1384)	29.40 (2.73)
12030◊	7.31 (0.68)	32 7/8" (836)	32" (813)	27.00 (2.51)	14.19 (1.32)	6.40 (0.59)	14.62 (1.36)	48 1/2" (1232)	35.38 (3.29)
12036◊	8.68 (0.81)	32 7/8" (836)	38" (965)	32.54 (3.02)	17.11 (1.59)	7.72 (0.72)	17.36 (1.61)	42 1/2" (1080)	41.36 (3.84)
12040◊	10.05 (0.93)	32 7/8" (836)	44" (1118)	38.08 (3.54)	20.02 (1.86)	9.03 (0.84)	20.10 (1.87)	36 1/2" (927)	47.34 (4.40)
12046◊	11.42 (1.06)	32 7/8" (836)	50" (1270)	43.62 (4.05)	22.93 (2.13)	10.34 (0.96)	22.85 (2.12)	30 1/2" (775)	53.31 (4.95)
12050◊	12.79 (1.19)	32 7/8" (836)	56" (1422)	49.16 (4.57)	25.84 (2.40)	11.66 (1.08)	25.59 (2.38)	24 1/2" (622)	59.29 (5.51)
12056◊	14.16 (1.32)	32 7/8" (836)	62" (1575)	54.70 (5.08)	28.75 (2.67)	12.97 (1.21)	28.33 (2.63)	18 1/2" (470)	65.27 (6.06)
12060◊	15.54 (1.44)	32 7/8" (836)	68" (1727)	60.23 (5.60)	31.67 (2.94)	14.28 (1.33)	31.07 (2.89)	12 1/2" (318)	71.25 (6.62)

• "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).
• Dimensions in parentheses are in millimeters or square meters.
◊Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Gliding Window Opening and Area Specifications – Active-Stationary-Active (XOX) 1:1:1 Equal Sash Ratio

Window Number	Clear Opening Area Sq. Ft./(m^2)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Height Inches/(mm)	Total Glass Area Sq. Ft./(m^2)	Fixed Sash Glass Area Sq. Ft./(m^2)	Single Active Sash Glass Area Sq. Ft./(m^2)	Vent Area Sq. Ft./(m^2)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m^2)
4016	1.04 (0.10)	10 5/8" (271)	14" (356)	2.89 (0.27)	0.96 (0.09)	0.96 (0.09)	2.07 (0.19)	66 1/2" (1689)	5.77 (0.54)
4020	1.48 (0.14)	10 5/8" (271)	20" (508)	4.42 (0.41)	1.48 (0.14)	1.47 (0.14)	2.96 (0.28)	60 1/2" (1537)	7.75 (0.72)
4026	1.93 (0.18)	10 5/8" (271)	26" (660)	5.96 (0.55)	1.99 (0.19)	1.99 (0.18)	3.85 (0.36)	54 1/2" (1384)	9.73 (0.90)
4030	2.37 (0.22)	10 5/8" (271)	32" (813)	7.50 (0.70)	2.51 (0.23)	2.50 (0.23)	4.74 (0.44)	48 1/2" (1232)	11.71 (1.09)
4036	2.82 (0.26)	10 5/8" (271)	38" (965)	9.04 (0.84)	3.02 (0.28)	3.01 (0.28)	5.63 (0.52)	42 1/2" (1080)	13.69 (1.27)
4040	3.26 (0.30)	10 5/8" (271)	44" (1118)	10.58 (0.98)	3.53 (0.33)	3.52 (0.33)	6.52 (0.61)	36 1/2" (927)	15.67 (1.46)
4046	3.70 (0.34)	10 5/8" (271)	50" (1270)	12.12 (1.13)	4.05 (0.38)	4.03 (0.37)	7.41 (0.69)	30 1/2" (775)	17.65 (1.64)
4050	4.15 (0.39)	10 5/8" (271)	56" (1422)	13.66 (1.27)	4.56 (0.42)	4.55 (0.42)	8.30 (0.77)	24 1/2" (622)	19.63 (1.82)
4056	4.59 (0.43)	10 5/8" (271)	62" (1575)	15.20 (1.41)	5.08 (0.47)	5.06 (0.47)	9.19 (0.85)	18 1/2" (470)	21.61 (2.01)
4060	5.04 (0.47)	10 5/8" (271)	68" (1727)	16.73 (1.55)	5.59 (0.52)	5.57 (0.52)	10.08 (0.94)	12 1/2" (318)	23.59 (2.19)
5016	1.43 (0.13)	14 5/8" (373)	14" (356)	3.82 (0.36)	1.28 (0.12)	1.27 (0.12)	2.85 (0.26)	66 1/2" (1689)	7.23 (0.67)
5020	2.04 (0.19)	14 5/8" (373)	20" (508)	5.86 (0.54)	1.96 (0.18)	1.95 (0.18)	4.07 (0.38)	60 1/2" (1537)	9.71 (0.90)
5026	2.65 (0.25)	14 5/8" (373)	26" (660)	7.90 (0.73)	2.64 (0.25)	2.63 (0.24)	5.30 (0.49)	54 1/2" (1384)	12.19 (1.13)
5030	3.26 (0.30)	14 5/8" (373)	32" (813)	9.94 (0.92)	3.32 (0.31)	3.31 (0.31)	6.52 (0.61)	48 1/2" (1232)	14.67 (1.36)
5036	3.87 (0.36)	14 5/8" (373)	38" (965)	11.98 (1.11)	4.00 (0.37)	3.99 (0.37)	7.74 (0.72)	42 1/2" (1080)	17.15 (1.59)
5040	4.48 (0.42)	14 5/8" (373)	44" (1118)	14.02 (1.30)	4.68 (0.43)	4.67 (0.43)	8.96 (0.83)	36 1/2" (927)	19.63 (1.82)
5046	5.09 (0.47)	14 5/8" (373)	50" (1270)	16.06 (1.49)	5.36 (0.50)	5.35 (0.50)	10.19 (0.95)	30 1/2" (775)	22.11 (2.05)
5050	5.70 (0.53)	14 5/8" (373)	56" (1422)	18.09 (1.68)	6.04 (0.56)	6.03 (0.56)	11.41 (1.06)	24 1/2" (622)	24.59 (2.28)
5056	6.32 (0.59)	14 5/8" (373)	62" (1575)	20.13 (1.87)	6.72 (0.62)	6.71 (0.62)	12.63 (1.17)	18 1/2" (470)	27.06 (2.51)
5060	6.93 (0.64)	14 5/8" (373)	68" (1727)	22.17 (2.06)	7.40 (0.69)	7.38 (0.69)	13.85 (1.29)	12 1/2" (318)	29.54 (2.74)
6016	1.82 (0.17)	18 5/8" (474)	14" (356)	4.76 (0.44)	1.59 (0.15)	1.59 (0.15)	3.63 (0.34)	66 1/2" (1689)	8.69 (0.81)
6020	2.59 (0.24)	18 5/8" (474)	20" (508)	7.30 (0.68)	2.44 (0.23)	2.43 (0.23)	5.19 (0.48)	60 1/2" (1537)	11.67 (1.08)
6026	3.37 (0.31)	18 5/8" (474)	26" (660)	9.84 (0.91)	3.28 (0.31)	3.28 (0.30)	6.74 (0.63)	54 1/2" (1384)	14.65 (1.36)
6030	4.15 (0.39)	18 5/8" (474)	32" (813)	12.38 (1.15)	4.13 (0.38)	4.12 (0.38)	8.30 (0.77)	48 1/2" (1232)	17.63 (1.64)
6036	4.93 (0.46)	18 5/8" (474)	38" (965)	14.92 (1.39)	4.98 (0.46)	4.97 (0.46)	9.85 (0.92)	42 1/2" (1080)	20.61 (1.91)
6040	5.70 (0.53)	18 5/8" (474)	44" (1118)	17.45 (1.62)	5.83 (0.54)	5.81 (0.54)	11.41 (1.06)	36 1/2" (927)	23.59 (2.19)
6046	6.48 (0.60)	18 5/8" (474)	50" (1270)	19.99 (1.86)	6.67 (0.62)	6.66 (0.62)	12.96 (1.20)	30 1/2" (775)	26.56 (2.47)
6050	7.26 (0.67)	18 5/8" (474)	56" (1422)	22.53 (2.09)	7.52 (0.70)	7.51 (0.70)	14.52 (1.35)	24 1/2" (622)	29.54 (2.74)
6056	8.04 (0.75)	18 5/8" (474)	62" (1575)	25.07 (2.33)	8.37 (0.78)	8.35 (0.78)	16.08 (1.49)	18 1/2" (470)	32.52 (3.02)
6060	8.82 (0.82)	18 5/8" (474)	68" (1727)	27.61 (2.56)	9.22 (0.86)	9.20 (0.85)	17.63 (1.64)	12 1/2" (318)	35.50 (3.30)
7016	2.20 (0.20)	22 5/8" (576)	14" (356)	5.70 (0.53)	1.90 (0.18)	1.90 (0.18)	4.41 (0.41)	66 1/2" (1689)	10.15 (0.94)
7020	3.15 (0.29)	22 5/8" (576)	20" (508)	8.74 (0.81)	2.92 (0.27)	2.91 (0.27)	6.30 (0.59)	60 1/2" (1537)	13.63 (1.27)
7026	4.09 (0.38)	22 5/8" (576)	26" (660)	11.78 (1.09)	3.93 (0.37)	3.92 (0.36)	8.19 (0.76)	54 1/2" (1384)	17.11 (1.59)
7030	5.04 (0.47)	22 5/8" (576)	32" (813)	14.81 (1.38)	4.94 (0.46)	4.94 (0.46)	10.08 (0.94)	48 1/2" (1232)	20.59 (1.91)
7036 ◊	5.98 (0.56)	22 5/8" (576)	38" (965)	17.85 (1.66)	5.96 (0.55)	5.95 (0.55)	11.96 (1.11)	42 1/2" (1080)	24.06 (2.24)
7040 ◊	6.93 (0.64)	22 5/8" (576)	44" (1118)	20.89 (1.94)	6.97 (0.65)	6.96 (0.65)	13.85 (1.29)	36 1/2" (927)	27.54 (2.56)
7046 ◊	7.87 (0.73)	22 5/8" (576)	50" (1270)	23.93 (2.22)	7.99 (0.74)	7.97 (0.74)	15.74 (1.46)	30 1/2" (775)	31.02 (2.88)
7050 ◊	8.82 (0.82)	22 5/8" (576)	56" (1422)	26.97 (2.51)	9.00 (0.84)	8.98 (0.83)	17.63 (1.64)	24 1/2" (622)	34.50 (3.21)
7056 ◊	9.76 (0.91)	22 5/8" (576)	62" (1575)	30.01 (2.79)	10.01 (0.93)	10.00 (0.93)	19.52 (1.81)	18 1/2" (470)	37.98 (3.53)
7060 ◊	10.70 (0.99)	22 5/8" (576)	68" (1727)	33.05 (3.07)	11.03 (1.02)	11.01 (1.02)	21.41 (1.99)	12 1/2" (318)	41.46 (3.85)
7616	2.40 (0.22)	24 5/8" (627)	14" (356)	6.17 (0.57)	2.06 (0.19)	2.05 (0.19)	4.80 (0.45)	66 1/2" (1689)	10.88 (1.01)
7620	3.43 (0.32)	24 5/8" (627)	20" (508)	9.46 (0.88)	3.15 (0.29)	3.15 (0.29)	6.85 (0.64)	60 1/2" (1537)	14.61 (1.36)
7626	4.45 (0.41)	24 5/8" (627)	26" (660)	12.74 (1.18)	4.25 (0.40)	4.25 (0.39)	8.91 (0.83)	54 1/2" (1384)	18.34 (1.70)
7630	5.48 (0.51)	24 5/8" (627)	32" (813)	16.03 (1.49)	5.35 (0.50)	5.34 (0.50)	10.96 (1.02)	48 1/2" (1232)	22.06 (2.05)
7636 ◊	6.51 (0.60)	24 5/8" (627)	38" (965)	19.32 (1.80)	6.45 (0.60)	6.44 (0.60)	13.02 (1.21)	42 1/2" (1080)	25.79 (2.40)
7640 ◊	7.54 (0.70)	24 5/8" (627)	44" (1118)	22.61 (2.10)	7.54 (0.70)	7.53 (0.70)	15.08 (1.40)	36 1/2" (927)	29.52 (2.74)
7646 ◊	8.57 (0.80)	24 5/8" (627)	50" (1270)	25.90 (2.41)	8.64 (0.80)	8.63 (0.80)	17.13 (1.59)	30 1/2" (775)	33.25 (3.09)
7650 ◊	9.59 (0.89)	24 5/8" (627)	56" (1422)	29.19 (2.71)	9.74 (0.90)	9.72 (0.90)	19.19 (1.78)	24 1/2" (622)	36.98 (3.44)
7656 ◊	10.62 (0.99)	24 5/8" (627)	62" (1575)	32.48 (3.02)	10.84 (1.01)	10.82 (1.01)	21.24 (1.97)	18 1/2" (470)	40.71 (3.78)
7660 ◊	11.65 (1.08)	24 5/8" (627)	68" (1727)	35.77 (3.32)	11.93 (1.11)	11.92 (1.11)	23.30 (2.16)	12 1/2" (318)	44.44 (4.13)
8016	2.59 (0.24)	26 5/8" (677)	14" (356)	6.64 (0.62)	2.21 (0.21)	2.21 (0.21)	5.19 (0.48)	66 1/2" (1689)	11.61 (1.08)
8020	3.70 (0.34)	26 5/8" (677)	20" (508)	10.17 (0.95)	3.39 (0.32)	3.39 (0.31)	7.41 (0.69)	60 1/2" (1537)	15.59 (1.45)
8026	4.82 (0.45)	26 5/8" (677)	26" (660)	13.71 (1.27)	4.58 (0.43)	4.57 (0.42)	9.63 (0.89)	54 1/2" (1384)	19.56 (1.82)
8030 ◊	5.93 (0.55)	26 5/8" (677)	32" (813)	17.25 (1.60)	5.76 (0.53)	5.75 (0.53)	11.85 (1.10)	48 1/2" (1232)	23.54 (2.19)
8036 ◊	7.04 (0.65)	26 5/8" (677)	38" (965)	20.79 (1.93)	6.94 (0.64)	6.93 (0.64)	14.08 (1.31)	42 1/2" (1080)	27.52 (2.56)
8040 ◊	8.15 (0.76)	26 5/8" (677)	44" (1118)	24.33 (2.26)	8.12 (0.75)	8.11 (0.75)	16.30 (1.51)	36 1/2" (927)	31.50 (2.93)
8046 ◊	9.26 (0.86)	26 5/8" (677)	50" (1270)	27.87 (2.59)	9.30 (0.86)	9.28 (0.86)	18.52 (1.72)	30 1/2" (775)	35.48 (3.30)
8050 ◊	10.37 (0.96)	26 5/8" (677)	56" (1422)	31.41 (2.92)	10.48 (0.97)	10.46 (0.97)	20.74 (1.93)	24 1/2" (622)	39.46 (3.67)

• "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).

continued on next page

• Dimensions in parentheses are in millimeters or square meters.

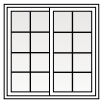
◊Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m^2, clear opening width of 20" (508) and clear opening height of 24" (610).

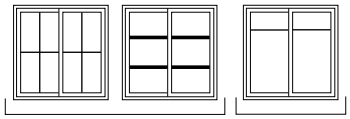
Gliding Window Opening and Area Specifications – Active-Stationary-Active (XOX) 1:1:1 Equal Sash Ratio *(continued)*

Window Number	Clear Opening Area Sq. Ft./(m²)	Clear Opening in Full Open Position Width Inches/(mm)	Clear Opening in Full Open Position Height Inches/(mm)	Total Glass Area Sq. Ft./(m²)	Fixed Sash Glass Area Sq. Ft./(m²)	Single Active Sash Glass Area Sq. Ft./(m²)	Vent Area Sq. Ft./(m²)	Top of Subfloor to Top of Inside Sill Stop Inches/(mm)	Overall Window Area Sq. Ft./(m²)
8056 ◊	11.48 (1.07)	26 5/8" (677)	62" (1575)	34.95 (3.25)	11.66 (1.08)	11.64 (1.08)	22.97 (2.13)	18 1/2" (470)	43.44 (4.04)
8060 ◊	12.59 (1.17)	26 5/8" (677)	68" (1727)	38.48 (3.58)	12.84 (1.19)	12.82 (1.19)	25.19 (2.34)	12 1/2" (318)	47.42 (4.41)
8616	2.79 (0.26)	28 5/8" (728)	14" (356)	7.10 (0.66)	2.37 (0.22)	2.37 (0.22)	5.57 (0.52)	66 1/2" (1689)	12.34 (1.15)
8620	3.98 (0.37)	28 5/8" (728)	20" (508)	10.89 (1.01)	3.63 (0.34)	3.63 (0.34)	7.96 (0.74)	60 1/2" (1537)	16.56 (1.54)
8626	5.18 (0.48)	28 5/8" (728)	26" (660)	14.68 (1.36)	4.90 (0.46)	4.89 (0.45)	10.35 (0.96)	54 1/2" (1384)	20.79 (1.93)
8630 ◊	6.37 (0.59)	28 5/8" (728)	32" (813)	18.47 (1.72)	6.16 (0.57)	6.15 (0.57)	12.74 (1.18)	48 1/2" (1232)	25.02 (2.32)
8636 ◊	7.57 (0.70)	28 5/8" (728)	38" (965)	22.26 (2.07)	7.43 (0.69)	7.42 (0.69)	15.13 (1.41)	42 1/2" (1080)	29.25 (2.72)
8640 ◊	8.76 (0.81)	28 5/8" (728)	44" (1118)	26.05 (2.42)	8.69 (0.81)	8.68 (0.81)	17.52 (1.63)	36 1/2" (927)	33.48 (3.11)
8646 ◊	9.95 (0.92)	28 5/8" (728)	50" (1270)	29.84 (2.77)	9.95 (0.92)	9.94 (0.92)	19.91 (1.85)	30 1/2" (775)	37.71 (3.50)
8650 ◊	11.15 (1.04)	28 5/8" (728)	56" (1422)	33.63 (3.12)	11.22 (1.04)	11.20 (1.04)	22.30 (2.07)	24 1/2" (622)	41.94 (3.90)
8656 ◊	12.34 (1.15)	28 5/8" (728)	62" (1575)	37.41 (3.48)	12.48 (1.16)	12.47 (1.16)	24.69 (2.29)	18 1/2" (470)	46.17 (4.29)
8660 ◊	13.54 (1.26)	28 5/8" (728)	68" (1727)	41.20 (3.83)	13.75 (1.28)	13.73 (1.28)	27.08 (2.52)	12 1/2" (318)	50.40 (4.68)

• "Top of Subfloor to Top of Inside Sill Stop" is calculated based upon a structural header height of 6'-10 1/2" (2096).
• Dimensions in parentheses are in millimeters or square meters.
◊Meets or exceed clear opening area of 5.7 sq. ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Grille Patterns

	Prairie A	Colonial	Modified Colonial	Tall Fractional	Short Fractional
Gliding					



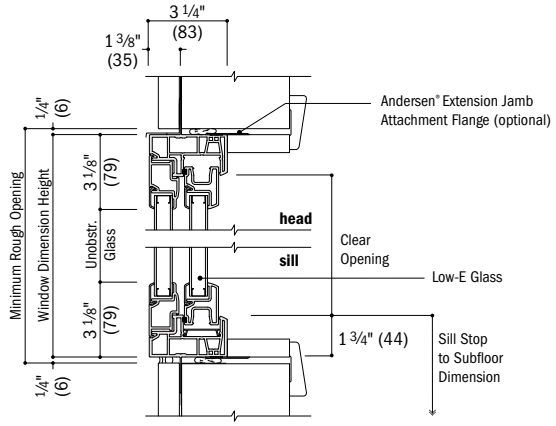
Specified Equal Light Examples | Custom Example

Number of lights and overall pattern varies with window size. Patterns shown may not be available for all sizes. Specified equal light and custom patterns are also available. For specified equal light, specify number of same-size rectangles across or down. For more information on divided light, see page 13 or visit **andersenwindows.com/grilles**.

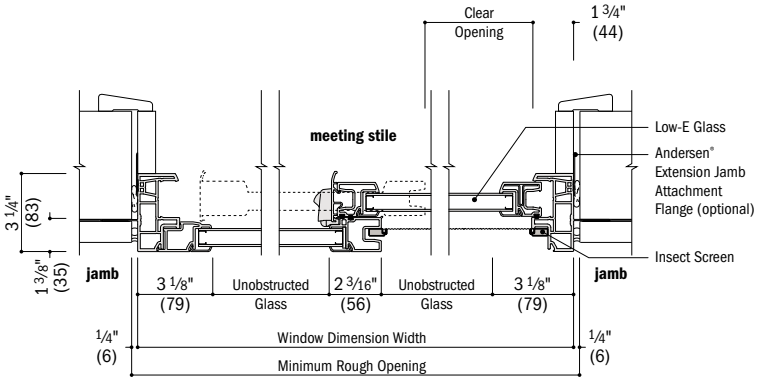
Gliding Window Details – New Construction

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

1 3/8" flange setback

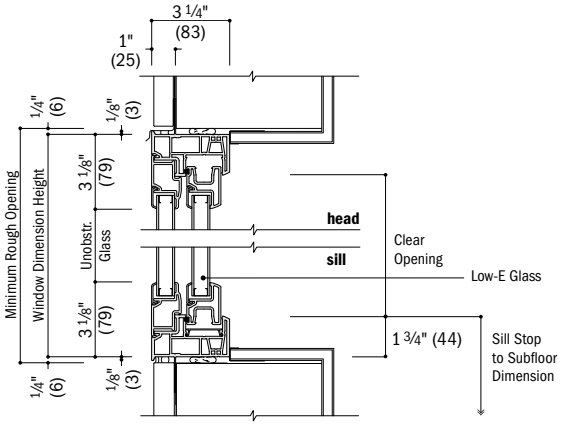


Vertical Section

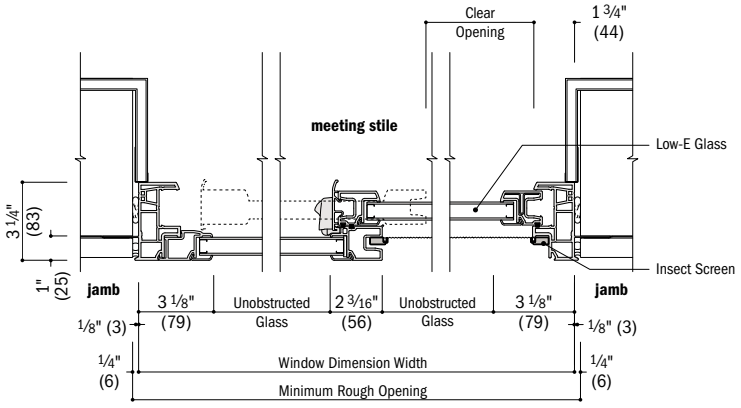


Horizontal Section

1" flange setback with stucco key

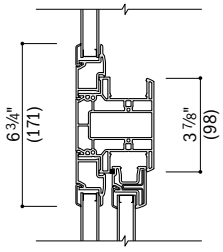


Vertical Section
Stucco Exterior



Horizontal Section
Stucco Exterior

integral



Vertical Section
Picture Over Gliding

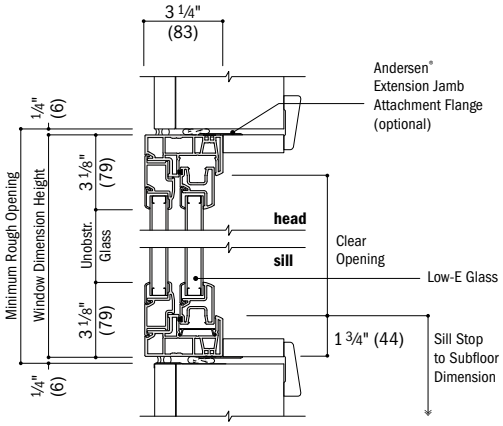
See pages 84-87 for joining details.

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

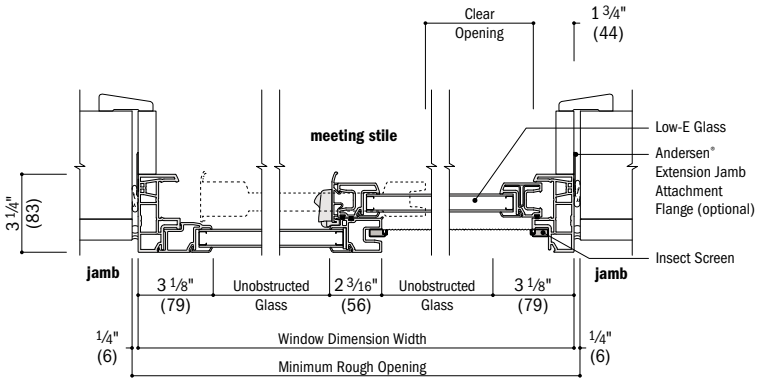
Gliding Window Details – Replacement

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

no flange

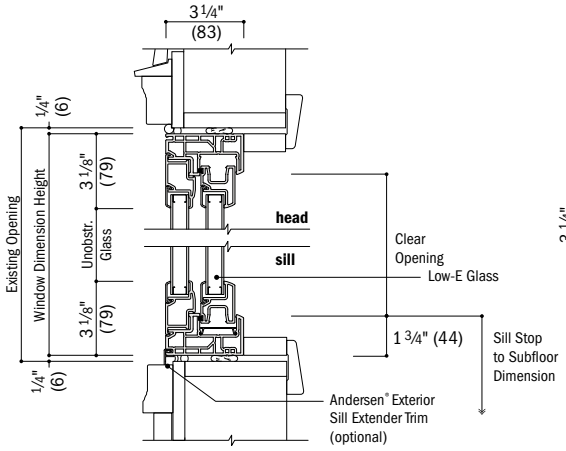


Vertical Section
Existing Framed Opening

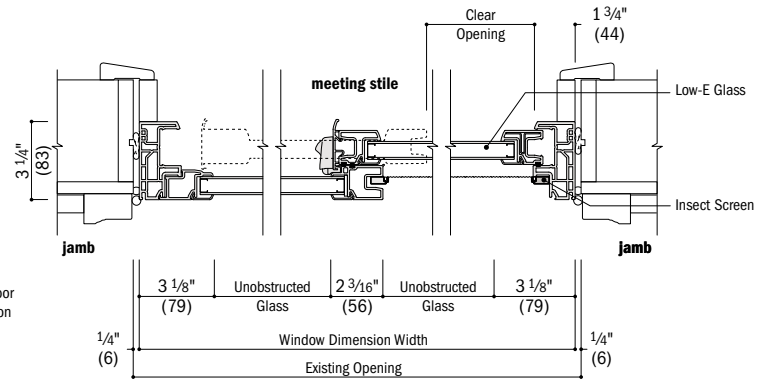


Horizontal Section
Existing Framed Opening

insert

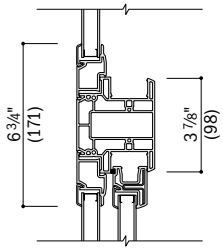


Vertical Section
Existing Window Opening



Horizontal Section
Existing Window Opening

integral



Vertical Section
Picture Over Gliding

Installation accessories for insert frame shown on page 109.

See pages 84-87 for joining details.

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

Table of Picture and Single Transom Window Sizes

Notes on next page also apply to this page.

Scale ⅛" (3) = 1'-0" (305) – 1:96

Window Dimension	11 ½" (292)	1'-5 ½" (445)	1'-11 ½" (597)	2'-5 ½" (749)	2'-11 ½" (902)	3'-5 ½" (1054)	3'-11 ½" (1207)	4'-5 ½" (1359)	4'-11 ½" (1511)	5'-5 ½" (1664)
Minimum Rough Opening	1'-0" (305)	1'-6" (457)	2'-0" (610)	2'-6" (762)	3'-0" (914)	3'-6" (1067)	4'-0" (1219)	4'-6" (1372)	5'-0" (1524)	5'-6" (1676)
Unobstructed Glass	5 ¼" (133)	11 ¼" (286)	17 ¼" (438)	23 ¼" (591)	29 ¼" (743)	35 ¼" (895)	41 ¼" (1048)	47 ¼" (1200)	53 ¼" (1353)	59 ¼" (1505)

CUSTOM WIDTHS – 11 ½" to 95 ½"

CUSTOM HEIGHTS – 11 ½" to 95 ½"

11 ½" (292)	1010	1610	2010	2610	3010	3610	4010	4610	5010	5610
1'-5 ½" (445)	1016	1616	2016	2616	3016	3616	4016	4616	5016	5616
1'-11 ½" (597)	1020	1620	2020	2620	3020	3620	4020	4620	5020	5620
2'-5 ½" (749)	1026	1626	2026	2626	3026	3626	4026	4626	5026	5626
2'-11 ½" (902)	1030	1630	2030	2630	3030	3630	4030	4630	5030	5630
3'-5 ½" (1054)	1036	1636	2036	2636	3036	3636	4036	4636	5036	5636
3'-11 ½" (1207)	1040	1640	2040	2640	3040	3640	4040	4640	5040	5640
4'-5 ½" (1359)	1046	1646	2046	2646	3046	3646	4046	4646	5046	5646
4'-11 ½" (1511)	1050	1650	2050	2650	3050	3650	4050	4650	5050	5650
5'-5 ½" (1664)	1056	1656	2056	2656	3056	3656	4056	4656	5056	5656
5'-11 ½" (1816)	1060	1660	2060	2660	3060	3660	4060	4660	5060	5660
6'-5 ½" (1969)	1066	1666	2066	2666	3066	3666	4066	4666	5066	5666

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Picture and transom sizes on pages 66-71.

5'-11 1/2" (1816)	6'-5 1/2" (1969)	6'-11 1/2" (2121)	7'-5 1/2" (2273)	7'-11 1/2" (2426)
6'-0" (1829)	6'-6" (1981)	7'-0" (2134)	7'-6" (2286)	8'-0" (2438)
65 1/4" (1657)	71 1/4" (1810)	77 1/4" (1962)	83 1/4" (2115)	89 1/4" (2267)

continued on next page

Custom-size windows are available in 1/8" (3) increments. See page 90 for custom sizes and specifications.

Details shown on pages 81-82.

Grille patterns shown on page 77.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- **"Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Table of Picture and Single Transom Window Sizes *(continued)*

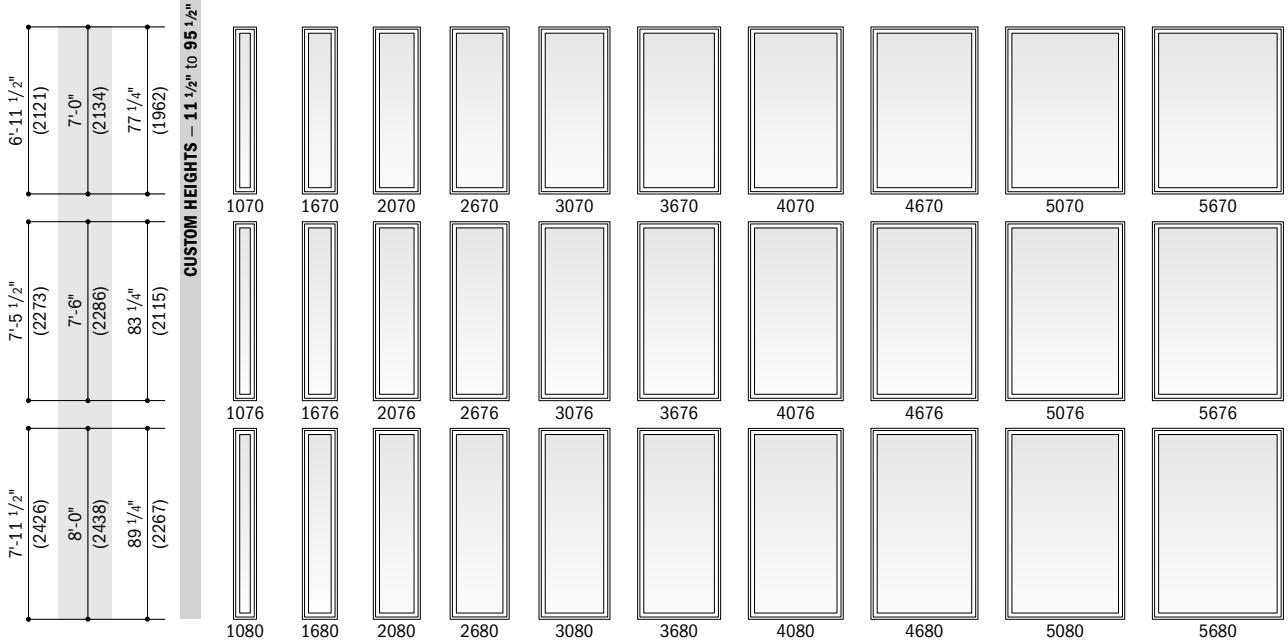
Notes on next page also apply to this page.

Scale ⅛" (3) = 1'-0" (305) – 1:96

Window Dimension	11 1/2" (292)	1'-5 1/2" (445)	1'-11 1/2" (597)	2'-5 1/2" (749)	2'-11 1/2" (902)	3'-5 1/2" (1054)	3'-11 1/2" (1207)	4'-5 1/2" (1359)	4'-11 1/2" (1511)	5'-5 1/2" (1664)
Minimum Rough Opening	1'-0" (305)	1'-6" (457)	2'-0" (610)	2'-6" (762)	3'-0" (914)	3'-6" (1067)	4'-0" (1219)	4'-6" (1372)	5'-0" (1524)	5'-6" (1676)
Unobstructed Glass	5 1/4" (133)	11 1/4" (286)	17 1/4" (438)	23 1/4" (591)	29 1/4" (743)	35 1/4" (895)	41 1/4" (1048)	47 1/4" (1200)	53 1/4" (1353)	59 1/4" (1505)

CUSTOM WIDTHS – 11 1/2" to 95 1/2"

CUSTOM HEIGHTS – 11 1/2" to 95 1/2"



- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Picture and Single Transom Window Area Specifications

Window Number	Glass Area Sq. Ft./(m²)	Overall Window Area Sq. Ft./(m²)
1010	0.19 (0.02)	0.92 (0.09)
1016	0.41 (0.04)	1.40 (0.13)
1020	0.63 (0.06)	1.88 (0.17)
1026	0.85 (0.08)	2.36 (0.22)
1030	1.07 (0.10)	2.84 (0.26)
1036	1.29 (0.12)	3.31 (0.31)
1040	1.50 (0.14)	3.79 (0.35)
1046	1.72 (0.16)	4.27 (0.40)
1050	1.94 (0.18)	4.75 (0.44)
1056	2.16 (0.20)	5.23 (0.49)
1060	2.38 (0.22)	5.71 (0.53)
1066	2.60 (0.24)	6.19 (0.57)
1070	2.82 (0.26)	6.67 (0.62)
1076	3.04 (0.28)	7.15 (0.66)
1080	3.25 (0.30)	7.63 (0.71)
1610	0.41 (0.04)	1.40 (0.13)
1616	0.88 (0.08)	2.13 (0.20)
1620	1.35 (0.13)	2.86 (0.27)
1626	1.82 (0.17)	3.59 (0.33)
1630	2.29 (0.21)	4.31 (0.40)
1636	2.75 (0.26)	5.04 (0.47)
1640	3.22 (0.30)	5.77 (0.54)
1646	3.69 (0.34)	6.50 (0.60)

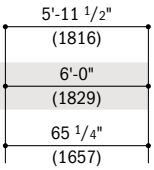
Window Number	Glass Area Sq. Ft./(m²)	Overall Window Area Sq. Ft./(m²)
1650	4.16 (0.39)	7.23 (0.67)
1656	4.63 (0.43)	7.96 (0.74)
1660	5.10 (0.47)	8.69 (0.81)
1666	5.57 (0.52)	9.42 (0.87)
1670	6.04 (0.56)	10.15 (0.94)
1676	6.50 (0.60)	10.88 (1.01)
1680	6.97 (0.65)	11.61 (1.08)
2010	0.63 (0.06)	1.88 (0.17)
2016	1.35 (0.13)	2.86 (0.27)
2020	2.07 (0.19)	3.84 (0.36)
2026	2.79 (0.26)	4.81 (0.45)
2030	3.50 (0.33)	5.79 (0.54)
2036	4.22 (0.39)	6.77 (0.63)
2040	4.94 (0.46)	7.75 (0.72)
2046	5.66 (0.53)	8.73 (0.81)
2050	6.38 (0.59)	9.71 (0.90)
2056	7.10 (0.66)	10.69 (0.99)
2060	7.82 (0.73)	11.67 (1.08)
2066	8.54 (0.79)	12.65 (1.17)
2070	9.25 (0.86)	13.63 (1.27)
2076	9.97 (0.93)	14.61 (1.36)
2080	10.69 (0.99)	15.59 (1.45)
2610	0.85 (0.08)	2.36 (0.22)

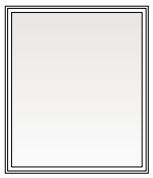
Window Number	Glass Area Sq. Ft./(m²)	Overall Window Area Sq. Ft./(m²)
2616	1.82 (0.17)	3.59 (0.33)
2620	2.79 (0.26)	4.81 (0.45)
2626	3.75 (0.35)	6.04 (0.56)
2630	4.72 (0.44)	7.27 (0.68)
2636	5.69 (0.53)	8.50 (0.79)
2640	6.66 (0.62)	9.73 (0.90)
2646	7.63 (0.71)	10.96 (1.02)
2650	8.60 (0.80)	12.19 (1.13)
2656	9.57 (0.89)	13.42 (1.25)
2660	10.54 (0.98)	14.65 (1.36)
2666	11.50 (1.07)	15.88 (1.47)
2670	12.47 (1.16)	17.11 (1.59)
2676	13.44 (1.25)	18.34 (1.70)
2680	14.41 (1.34)	19.56 (1.82)
3010	1.07 (0.10)	2.84 (0.26)
3016	2.29 (0.21)	4.31 (0.40)
3020	3.50 (0.33)	5.79 (0.54)
3026	4.72 (0.44)	7.27 (0.68)
3030	5.94 (0.55)	8.75 (0.81)
3036	7.16 (0.67)	10.23 (0.95)
3040	8.38 (0.78)	11.71 (1.09)

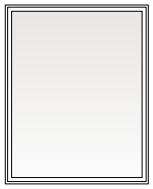
- Dimensions in parentheses are in square meters.

continued on next page

Picture and transom sizes on pages 66-71.




6070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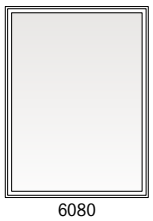

6080

Custom-size windows are available in 1/8" (3) increments. See page 90 for custom sizes and specifications.

Details shown on pages 81-82. Grille patterns shown on page 77.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- **"Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Picture and Single Transom Window Area Specifications *(continued)*

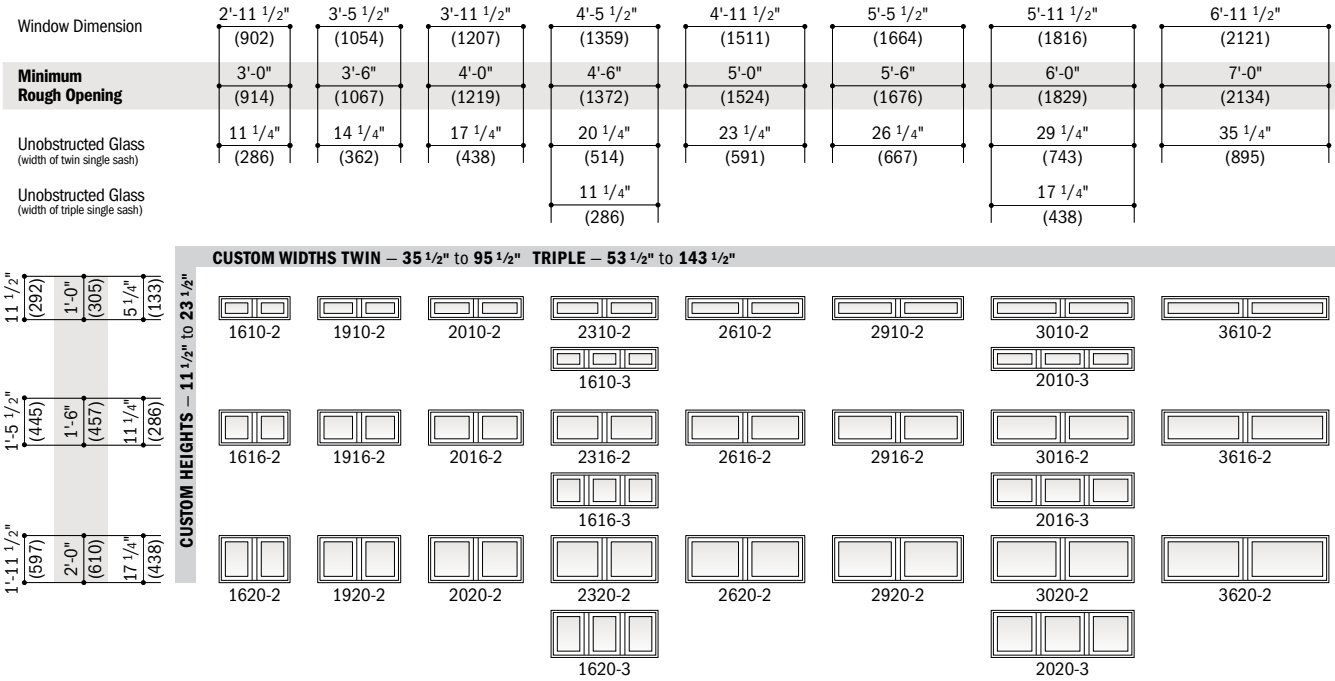
Window Number	Glass Area Sq. Ft./(m^2)		Overall Window Area Sq. Ft./(m^2)	
3046	9.60	(0.89)	13.19	(1.23)
3050	10.82	(1.00)	14.67	(1.36)
3056	12.04	(1.12)	16.15	(1.50)
3060	13.25	(1.23)	17.63	(1.64)
3066	14.47	(1.34)	19.11	(1.77)
3070	15.69	(1.46)	20.59	(1.91)
3076	16.91	(1.57)	22.06	(2.05)
3080	18.13	(1.68)	23.54	(2.19)
3610	1.29	(0.12)	3.31	(0.31)
3616	2.75	(0.26)	5.04	(0.47)
3620	4.22	(0.39)	6.77	(0.63)
3626	5.69	(0.53)	8.50	(0.79)
3630	7.16	(0.67)	10.23	(0.95)
3636	8.63	(0.80)	11.96	(1.11)
3640	10.10	(0.94)	13.69	(1.27)
3646	11.57	(1.07)	15.42	(1.43)
3650	13.04	(1.21)	17.15	(1.59)
3656	14.50	(1.35)	18.88	(1.75)
3660	15.97	(1.48)	20.61	(1.91)
3666	17.44	(1.62)	22.34	(2.07)
3670	18.91	(1.76)	24.06	(2.24)
3676	20.38	(1.89)	25.79	(2.40)
3680	21.85	(2.03)	27.52	(2.56)
4010	1.50	(0.14)	3.79	(0.35)
4016	3.22	(0.30)	5.77	(0.54)
4020	4.94	(0.46)	7.75	(0.72)
4026	6.66	(0.62)	9.73	(0.90)
4030	8.38	(0.78)	11.71	(1.09)
4036	10.10	(0.94)	13.69	(1.27)
4040	11.82	(1.10)	15.67	(1.46)
4046	13.54	(1.26)	17.65	(1.64)
4050	15.25	(1.42)	19.63	(1.82)
4056	16.97	(1.58)	21.61	(2.01)
4060	18.69	(1.74)	23.59	(2.19)
4066	20.41	(1.90)	25.56	(2.37)
4070	22.13	(2.06)	27.54	(2.56)
4076	23.85	(2.22)	29.52	(2.74)
4080	25.57	(2.38)	31.50	(2.93)
4610	1.72	(0.16)	4.27	(0.40)
4616	3.69	(0.34)	6.50	(0.60)
4620	5.66	(0.53)	8.73	(0.81)
4626	7.63	(0.71)	10.96	(1.02)
4630	9.60	(0.89)	13.19	(1.23)
4636	11.57	(1.07)	15.42	(1.43)
4640	13.54	(1.26)	17.65	(1.64)
4646	15.50	(1.44)	19.88	(1.85)
4650	17.47	(1.62)	22.11	(2.05)
4656	19.44	(1.81)	24.34	(2.26)
4660	21.41	(1.99)	26.56	(2.47)
4666	23.38	(2.17)	28.79	(2.67)
4670	25.35	(2.35)	31.02	(2.88)
4676	27.32	(2.54)	33.25	(3.09)
4680	29.29	(2.72)	35.48	(3.30)
5010	1.94	(0.18)	4.75	(0.44)
5016	4.16	(0.39)	7.23	(0.67)
5020	6.38	(0.59)	9.71	(0.90)
5026	8.60	(0.80)	12.19	(1.13)
5030	10.82	(1.00)	14.67	(1.36)
5036	13.04	(1.21)	17.15	(1.59)
5040	15.25	(1.42)	19.63	(1.82)
5046	17.47	(1.62)	22.11	(2.05)
5050	19.69	(1.83)	24.59	(2.28)
5056	21.91	(2.04)	27.06	(2.51)
5060	24.13	(2.24)	29.54	(2.74)
5066	26.35	(2.45)	32.02	(2.97)
5070	28.57	(2.65)	34.50	(3.21)
5076	30.79	(2.86)	36.98	(3.44)
5080	33.00	(3.07)	39.46	(3.67)
5610	2.16	(0.20)	5.23	(0.49)
5616	4.63	(0.43)	7.96	(0.74)
5620	7.10	(0.66)	10.69	(0.99)
5626	9.57	(0.89)	13.42	(1.25)
5630	12.04	(1.12)	16.15	(1.50)
5636	14.50	(1.35)	18.88	(1.75)
5640	16.97	(1.58)	21.61	(2.01)
5646	19.44	(1.81)	24.34	(2.26)
5650	21.91	(2.04)	27.06	(2.51)
5656	24.38	(2.26)	29.79	(2.77)
5660	26.85	(2.49)	32.52	(3.02)
5666	29.32	(2.72)	35.25	(3.27)
5670	31.79	(2.95)	37.98	(3.53)
5676	34.25	(3.18)	40.71	(3.78)
5680	36.72	(3.41)	43.44	(4.04)
6010	2.38	(0.22)	5.71	(0.53)
6016	5.10	(0.47)	8.69	(0.81)
6020	7.82	(0.73)	11.67	(1.08)
6026	10.54	(0.98)	14.65	(1.36)
6030	13.25	(1.23)	17.63	(1.64)
6036	15.97	(1.48)	20.61	(1.91)
6040	18.69	(1.74)	23.59	(2.19)
6046	21.41	(1.99)	26.56	(2.47)
6050	24.13	(2.24)	29.54	(2.74)
6056	26.85	(2.49)	32.52	(3.02)
6060	29.57	(2.75)	35.50	(3.30)
6066	32.29	(3.00)	38.48	(3.57)
6070	35.00	(3.25)	41.46	(3.85)
6076	37.72	(3.50)	44.44	(4.13)
6080	40.44	(3.76)	47.42	(4.41)
6610	2.60	(0.24)	6.19	(0.57)
6616	5.57	(0.52)	9.42	(0.87)
6620	8.54	(0.79)	12.65	(1.17)
6626	11.50	(1.07)	15.88	(1.47)
6630	14.47	(1.34)	19.11	(1.77)
6636	17.44	(1.62)	22.34	(2.07)
6640	20.41	(1.90)	25.56	(2.37)
6646	23.38	(2.17)	28.79	(2.67)
6650	26.35	(2.45)	32.02	(2.97)
6656	29.32	(2.72)	35.25	(3.27)
6660	32.29	(3.00)	38.48	(3.57)
7010	2.82	(0.26)	6.67	(0.62)
7016	6.04	(0.56)	10.15	(0.94)
7020	9.25	(0.86)	13.63	(1.27)
7026	12.47	(1.16)	17.11	(1.59)
7030	15.69	(1.46)	20.59	(1.91)
7036	18.91	(1.76)	24.06	(2.24)
7040	22.13	(2.06)	27.54	(2.56)
7046	25.35	(2.35)	31.02	(2.88)
7050	28.57	(2.65)	34.50	(3.21)
7056	31.79	(2.95)	37.98	(3.53)
7060	35.00	(3.25)	41.46	(3.85)
7610	3.04	(0.28)	7.15	(0.66)
7616	6.50	(0.60)	10.88	(1.01)
7620	9.97	(0.93)	14.61	(1.36)
7626	13.44	(1.25)	18.34	(1.70)
7630	16.91	(1.57)	22.06	(2.05)
7636	20.38	(1.89)	25.79	(2.40)
7640	23.85	(2.22)	29.52	(2.74)
7646	27.32	(2.54)	33.25	(3.09)
7650	30.79	(2.86)	36.98	(3.44)
7656	34.25	(3.18)	40.71	(3.78)
7660	37.72	(3.50)	44.44	(4.13)
8010	3.25	(0.30)	7.63	(0.71)
8016	6.97	(0.65)	11.61	(1.08)
8020	10.69	(0.99)	15.59	(1.45)
8026	14.41	(1.34)	19.56	(1.82)
8030	18.13	(1.68)	23.54	(2.19)
8036	21.85	(2.03)	27.52	(2.56)
8040	25.57	(2.38)	31.50	(2.93)
8046	29.29	(2.72)	35.48	(3.30)
8050	33.00	(3.07)	39.46	(3.67)
8056	36.72	(3.41)	43.44	(4.04)
8060	40.44	(3.76)	47.42	(4.41)

- Dimensions in parentheses are in square meters.

Table of Twin and Triple Transom Window Sizes

Scale ⅛" (3) = 1'-0" (305) – 1:96

Notes on next page also apply to this page.



- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Twin Transom Window Area Specifications

Window Number	Glass Area Sq. Ft./(m²)		Overall Window Area Sq. Ft./(m²)	
1610-2	0.82	(0.08)	2.84	(0.26)
1910-2	1.04	(0.10)	3.31	(0.31)
2010-2	1.26	(0.12)	3.79	(0.35)
2310-2	1.48	(0.14)	4.27	(0.40)
2610-2	1.70	(0.16)	4.75	(0.44)
2910-2	1.91	(0.18)	5.23	(0.49)
3010-2	2.13	(0.20)	5.71	(0.53)
3610-2	2.57	(0.24)	6.67	(0.62)
4010-2	3.01	(0.28)	7.63	(0.71)
1616-2	1.76	(0.16)	4.31	(0.40)
1916-2	2.23	(0.21)	5.04	(0.47)
2016-2	2.70	(0.25)	5.77	(0.54)
2316-2	3.16	(0.29)	6.50	(0.60)
2616-2	3.63	(0.34)	7.23	(0.67)
2916-2	4.10	(0.38)	7.96	(0.74)
3016-2	4.57	(0.42)	8.69	(0.81)
3616-2	5.51	(0.51)	10.15	(0.94)
4016-2	6.45	(0.60)	11.61	(1.08)
1620-2	2.70	(0.25)	5.79	(0.54)
1920-2	3.41	(0.32)	6.77	(0.63)
2020-2	4.13	(0.38)	7.75	(0.72)
2320-2	4.85	(0.45)	8.73	(0.81)
2620-2	5.57	(0.52)	9.71	(0.90)
2920-2	6.29	(0.58)	10.69	(0.99)
3020-2	7.01	(0.65)	11.67	(1.08)
3620-2	8.45	(0.78)	13.63	(1.27)
4020-2	9.88	(0.92)	15.59	(1.45)

- Dimensions in parentheses are in square meters.

Triple Transom Window Area Specifications

Window Number	Glass Area Sq. Ft./(m²)		Overall Window Area Sq. Ft./(m²)	
1610-3	1.23	(0.11)	4.27	(0.40)
2010-3	1.89	(0.18)	5.71	(0.53)
2610-3	2.54	(0.24)	7.15	(0.66)
3010-3	3.20	(0.30)	8.59	(0.80)
3610-3	3.86	(0.36)	10.02	(0.93)
4010-3	4.51	(0.42)	11.46	(1.06)
1616-3	2.64	(0.24)	6.50	(0.60)
2016-3	4.04	(0.38)	8.69	(0.81)
2616-3	5.45	(0.51)	10.88	(1.01)
3016-3	6.86	(0.64)	13.06	(1.21)
3616-3	8.26	(0.77)	15.25	(1.42)
4016-3	9.67	(0.90)	17.44	(1.62)
1620-3	4.04	(0.38)	8.73	(0.81)
2020-3	6.20	(0.58)	11.67	(1.08)
2620-3	8.36	(0.78)	14.61	(1.36)
3020-3	10.51	(0.98)	17.54	(1.63)
3620-3	12.67	(1.18)	20.48	(1.90)
4020-3	14.82	(1.38)	23.42	(2.18)

- Dimensions in parentheses are in square meters.

Half Circle Window Area Specifications

Window Number	Glass Area Sq. Ft./(m²)		Overall Window Area Sq. Ft./(m²)	
20	0.80	(0.07)	2.02	(0.19)
26	1.46	(0.14)	3.01	(0.28)
30	2.32	(0.22)	4.21	(0.39)
36	3.37	(0.31)	5.60	(0.52)
40	4.62	(0.43)	7.18	(0.67)
46	6.06	(0.56)	8.97	(0.83)
50	7.70	(0.72)	10.95	(1.02)
56	9.54	(0.89)	13.12	(1.22)
60	11.58	(1.08)	15.49	(1.44)
66	13.81	(1.28)	18.06	(1.68)
70	16.23	(1.51)	20.83	(1.93)
76	18.85	(1.75)	23.79	(2.21)
80	21.67	(2.01)	26.94	(2.50)

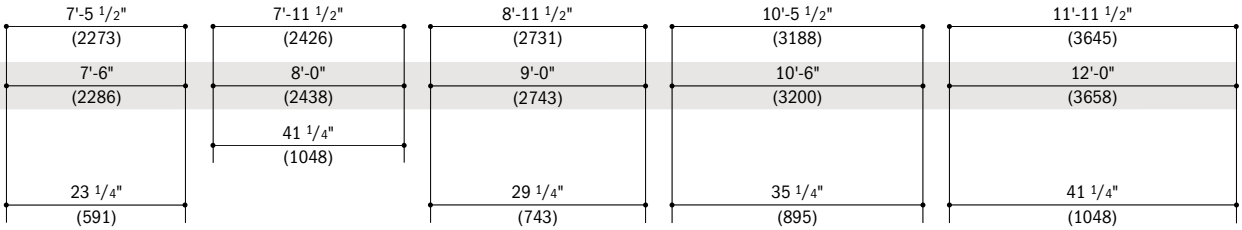
- Dimensions in parentheses are in square meters.

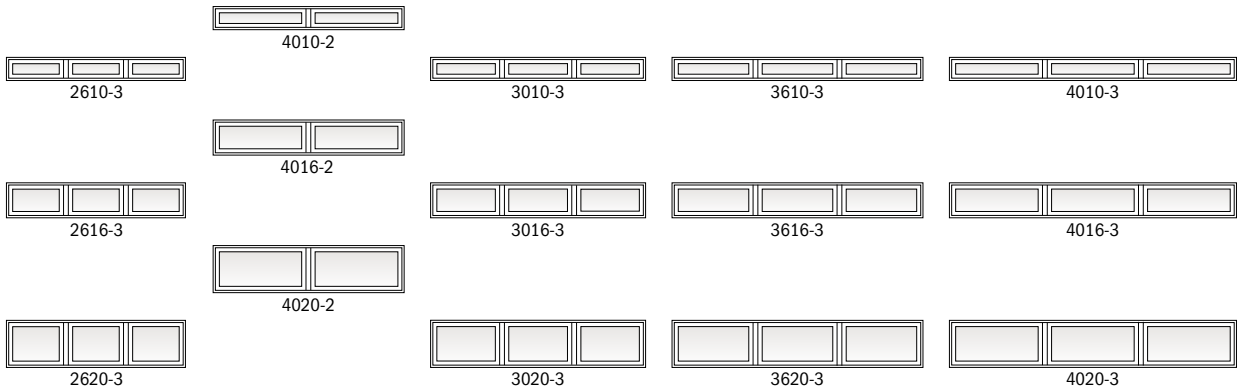
Circle Window Area Specifications

Window Number	Glass Area Sq. Ft./(m²)		Overall Window Area Sq. Ft./(m²)	
2020	1.61	(0.15)	3.01	(0.28)
2626	2.93	(0.27)	4.75	(0.44)
3030	4.65	(0.43)	6.87	(0.64)
3636	6.75	(0.63)	9.39	(0.87)
4040	9.25	(0.86)	12.31	(1.14)

- Dimensions in parentheses are in square meters.

Picture and transom sizes on pages 66-71.





- "Window Dimension" always refers to outside frame-to-frame dimension.
- **"Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Custom-size windows are available in 1/8" (3) increments. See page 90 for custom sizes and specifications.

Windows have one continuous outer frame. Details shown on pages 82-83.

Quarter Circle Window Area Specifications

Window Number	Glass Area Sq. Ft./(m²)		Overall Window Area Sq. Ft./(m²)	
1616	0.69	(0.06)	1.82	(0.17)
2020	1.62	(0.15)	3.22	(0.30)
2626	2.95	(0.27)	5.01	(0.47)
3030	4.67	(0.43)	7.19	(0.67)
3636	6.78	(0.63)	9.77	(0.91)
4040	9.28	(0.86)	12.73	(1.18)
4646	12.18	(1.13)	16.09	(1.50)
5050	15.47	(1.44)	19.85	(1.84)

- Dimensions in parentheses are in square meters.

Springline™ Window Area Specifications

Window Number	Glass Area Sq. Ft./(m²)		Overall Window Area Sq. Ft./(m²)	
2020	3.23	(0.30)	5.34	(0.50)
2026	3.95	(0.37)	6.32	(0.59)
2030	4.67	(0.43)	7.30	(0.68)
2036	5.38	(0.50)	8.28	(0.77)
2040	6.10	(0.57)	9.26	(0.86)
2046	6.81	(0.63)	10.24	(0.95)
2050	7.53	(0.70)	11.22	(1.04)
2620	4.74	(0.44)	7.19	(0.67)
2626	5.71	(0.53)	8.42	(0.78)
2630	6.67	(0.62)	9.65	(0.90)
2636	7.64	(0.71)	10.87	(1.01)
2640	8.61	(0.80)	12.10	(1.12)
2646	9.57	(0.89)	13.33	(1.24)

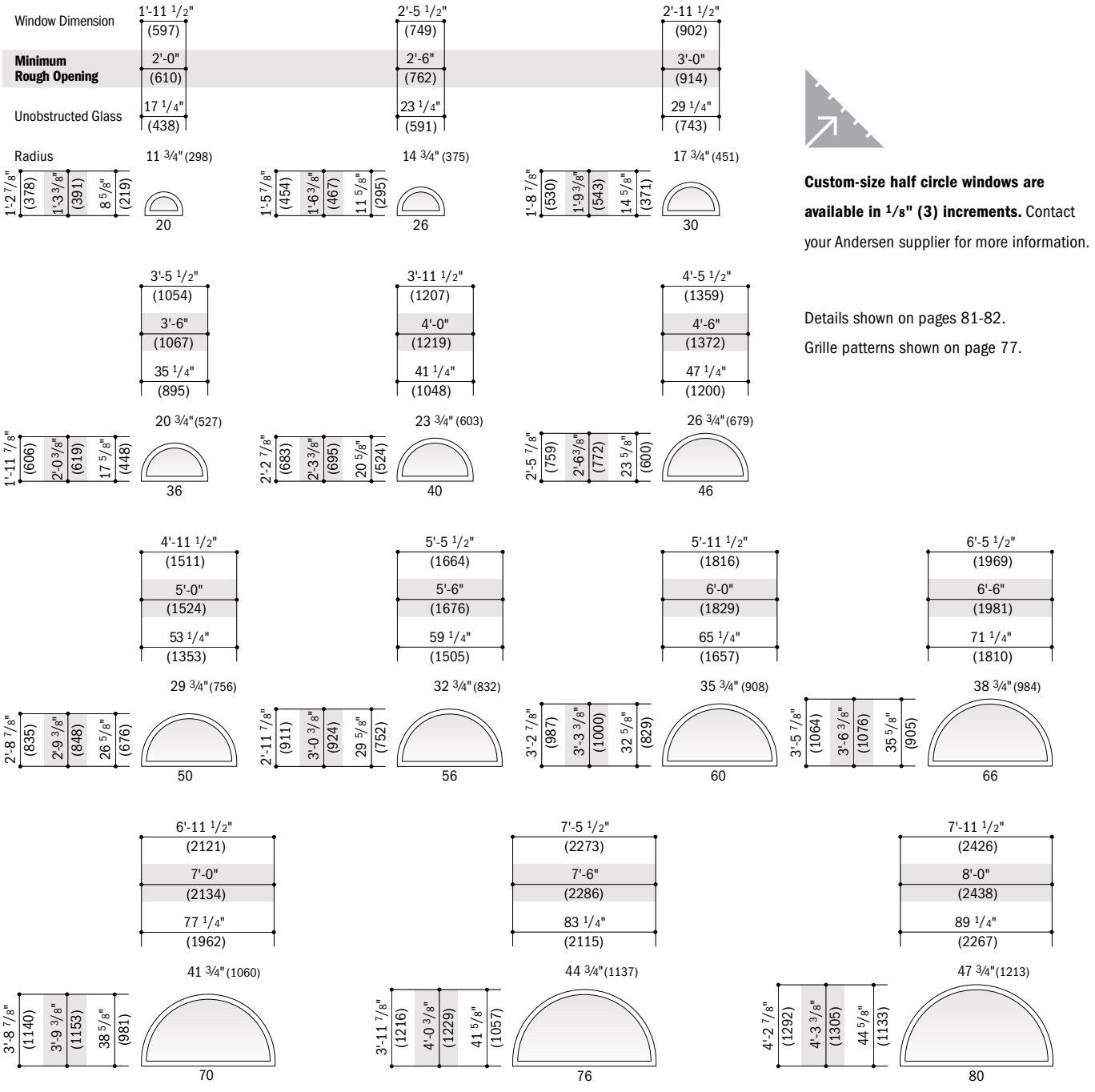
Window Number	Glass Area Sq. Ft./(m²)		Overall Window Area Sq. Ft./(m²)	
2650	10.54	(0.98)	14.56	(1.35)
3020	6.45	(0.60)	9.23	(0.86)
3026	7.66	(0.71)	10.71	(0.99)
3030	8.88	(0.82)	12.19	(1.13)
3036	10.10	(0.94)	13.67	(1.27)
3040	11.31	(1.05)	15.15	(1.41)
3046	12.53	(1.16)	16.63	(1.54)
3050	13.74	(1.28)	18.11	(1.68)
3620	8.35	(0.78)	11.47	(1.07)
3626	9.81	(0.91)	13.20	(1.23)
3630	11.28	(1.05)	14.93	(1.39)
3636	12.75	(1.18)	16.66	(1.55)
3640	14.21	(1.32)	18.39	(1.71)
3646	15.68	(1.46)	20.12	(1.87)
3650	17.14	(1.59)	21.84	(2.03)
4020	10.45	(0.97)	13.90	(1.29)
4026	12.16	(1.13)	15.88	(1.48)
4030	13.88	(1.29)	17.86	(1.66)
4036	15.59	(1.45)	19.84	(1.84)
4040	17.31	(1.61)	21.82	(2.03)
4046	19.03	(1.77)	23.80	(2.21)
4050	20.74	(1.93)	25.78	(2.40)
4620	12.74	(1.18)	16.54	(1.54)
4626	14.71	(1.37)	18.77	(1.74)
4630	16.67	(1.55)	20.99	(1.95)
4636	18.64	(1.73)	23.22	(2.16)
4640	20.60	(1.91)	25.45	(2.36)
4646	22.57	(2.10)	27.68	(2.57)

Window Number	Glass Area Sq. Ft./(m²)		Overall Window Area Sq. Ft./(m²)	
4650	24.54	(2.28)	29.91	(2.78)
5020	15.23	(1.41)	19.36	(1.80)
5026	17.45	(1.62)	21.84	(2.03)
5030	19.66	(1.83)	24.32	(2.26)
5036	21.88	(2.03)	26.80	(2.49)
5040	24.09	(2.24)	29.28	(2.72)
5046	26.31	(2.44)	31.76	(2.95)
5050	28.53	(2.65)	34.24	(3.18)
5620	17.92	(1.66)	22.39	(2.08)
5626	20.38	(1.89)	25.12	(2.33)
5630	22.85	(2.12)	27.85	(2.59)
5636	25.31	(2.35)	30.58	(2.84)
5640	27.78	(2.58)	33.31	(3.09)
5646	30.25	(2.81)	36.03	(3.35)
5650	32.71	(3.04)	38.76	(3.60)
6020	20.80	(1.93)	25.61	(2.38)
6026	23.51	(2.18)	28.59	(2.66)
6030	26.23	(2.44)	31.57	(2.93)
6036	28.95	(2.69)	34.55	(3.21)
6040	31.66	(2.94)	37.53	(3.49)
6046	34.38	(3.19)	40.51	(3.76)
6050	37.10	(3.45)	43.48	(4.04)

- Dimensions in parentheses are in square meters.

Table of Half Circle Window Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96



Custom-size half circle windows are available in 1/8" (3) increments. Contact your Andersen supplier for more information.

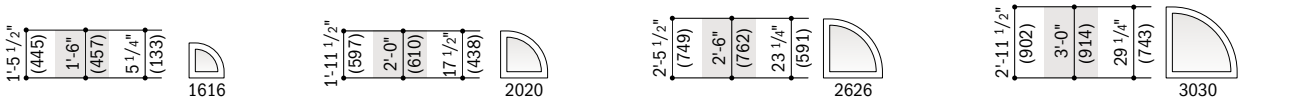
Details shown on pages 81-82.
Grille patterns shown on page 77.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Table of Quarter Circle Window Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96

Window Dimension	1'-5 1/2" (445)	1'-11 1/2" (597)	2'-5 1/2" (749)	2'-11 1/2" (902)
Minimum Rough Opening	1'-6" (457)	2'-0" (610)	2'-6" (762)	3'-0" (914)
Unobstructed Glass	5 1/4" (133)	17 1/2" (438)	23 1/4" (591)	29 1/4" (743)
Radius	14 3/8" (365)	20 3/8" (518)	26 3/8" (670)	32 3/8" (822)



Window Dimension	3'-5 1/2" (1054)	3'-11 1/2" (1207)	4'-5 1/2" (1359)	4'-11 1/2" (1511)
Minimum Rough Opening	3'-6" (1067)	4'-0" (1219)	4'-6" (1372)	5'-0" (1524)
Unobstructed Glass	35 1/4" (895)	41 1/4" (1048)	47 1/4" (1200)	53 1/4" (1353)
Radius	38 3/8" (975)	44 3/8" (1127)	50 3/8" (1280)	56 3/8" (1432)

Custom-size quarter circle windows are available in 1/8" (3) increments.

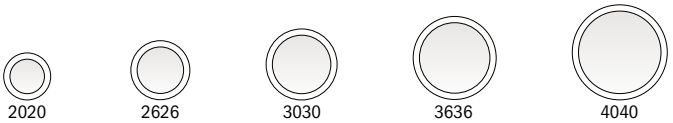
Contact your Andersen supplier for more information.

Details shown on pages 81-82. Grille patterns shown on page 77.

Table of Circle Window Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96

Window Dimension	1'-11 1/2" (597)	2'-5 1/2" (749)	2'-11 1/2" (902)	3'-5 1/2" (1054)	3'-11 1/2" (1207)
Minimum Rough Opening	2'-0" (610)	2'-6" (762)	3'-0" (914)	3'-6" (1067)	4'-0" (1219)
Unobstructed Glass	17 1/4" (438)	23 1/4" (591)	29 1/4" (743)	35 1/4" (895)	41 1/4" (1048)



Custom-size circle windows are available in 1/8" (3) increments. Contact your Andersen supplier for more information.

Details shown on pages 81-82.
Grille patterns shown on page 77.

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

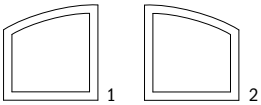
PICTURE, TRANSOM & SPECIALTY WINDOWS

These custom shapes are available in 1/8" (3) increments.

Design Criteria
Listed for each custom shape are factors that must be considered when deciding on a custom-shaped specialty window.

Details shown on pages 81-82. Grilles are available for most shapes and sizes in colonial and specified equal divided light patterns. For more information on divided light, see page 13 or contact your Andersen supplier.

Custom Unequal Leg Arch



Choose left facing (1) or right facing (2) as viewed from the exterior. Contains unequal legs, two right angles at the sill and an arch at the top.

Custom-size design limitations:

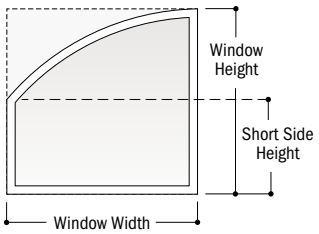
Min./Max. Window Width
17 1/2" (445) to 95 1/2" (2426)

Min./Max. Window Height
11 3/8" (289) to 95 1/2" (2426)

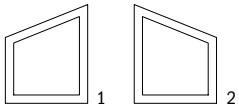
Min./Max. Short Side Height
9 3/4" (248) to 93 7/8" (2384)

Max. Frame Area: 40 sq. ft. or 3.7 m²
Based on the smallest square or rectangular shape that covers the entire window.

Additional limitations may apply. Contact your Andersen supplier for more information.



Custom Trapezoid



Choose left facing (1) or right facing (2) as viewed from the exterior. Contains a slope to the left or right. Slope is often designed to match a roof's pitch.

Custom-size design limitations:

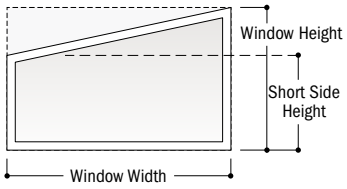
Min./Max. Window Width
17 1/2" (445) to 107 1/2" (2731)

Min./Max. Window Height
9 7/8" (251) to 95 1/2" (2426)

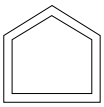
Min./Max. Short Side Height
9 3/4" (248) to 95 3/8" (2423)

Max. Frame Area: 40 sq. ft. or 3.7 m²
Based on the smallest square or rectangular shape that covers the entire window.

Additional limitations may apply. Contact your Andersen supplier for more information.



Custom Peak Pentagon



Contains sides of equal length, extending at right angles from the sill and two angled sides of equal length that peak above the center of the sill.

Custom-size design limitations:

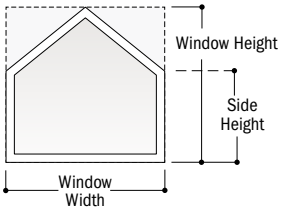
Min./Max. Window Width
17 1/2" (445) to 107 1/2" (2731)

Min./Max. Window Height
14 1/8" (359) to 107 1/2" (2731)

Min./Max. Side Height
9 3/4" (248) to 94 1/8" (2391)

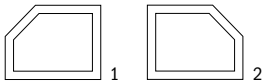
Max. Frame Area: 40 sq. ft. or 3.7 m²
Based on the smallest square or rectangular shape that covers the entire window.

Additional limitations may apply. Contact your Andersen supplier for more information.



• Dimensions in parentheses are in millimeters.

Custom Angled Pentagon



Choose left facing (1) or right facing (2) as viewed from the exterior. Contains an angle cut, or a "clipped corner," sloping to the left or right.

Custom-size design limitations:

Min./Max. Window Width
17 1/2" (445) to 107 1/2" (2731)

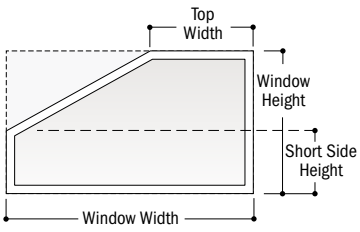
Min./Max. Top Width
9 3/4" (248) to 107 3/8" (2727)

Min./Max. Window Height
14 3/8" (365) to 107 1/2" (2731)

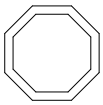
Min./Max. Short Side Height
9 3/4" (248) to 94 1/8" (226)

Max. Frame Area: 40 sq. ft. or 3.7 m²
Based on the smallest square or rectangular shape that covers the entire window.

Additional limitations may apply. Contact your Andersen supplier for more information.



Custom Octagon



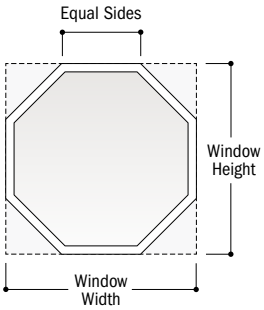
Contains eight equal angles and sides.

Custom-size design limitations:

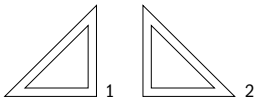
Min./Max. Window Width
23 1/2" (597) to 71 1/2" (1816)

Min./Max. Window Height
23 1/2" (597) to 71 1/2" (1816)

Additional limitations may apply. Contact your Andersen supplier for more information.



Custom Right Triangle



Choose left facing (1) or right facing (2) as viewed from the exterior. Contains one 90-degree angle.

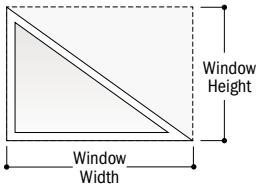
Custom-size design limitations:

Min./Max. Window Width
17 1/2" (445) to 95 1/2" (2426)

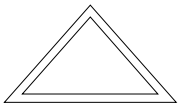
Min./Max. Window Height
17 1/2" (445) to 95 1/2" (2426)

Max. Frame Area: 40 sq. ft. or 3.7 m²
Based on the smallest square or rectangular shape that covers the entire window.

Additional limitations may apply. Contact your Andersen supplier for more information.



Custom Isosceles Triangle



Contains two sides of equal length and two equal angles.

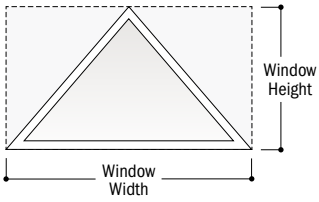
Custom-size design limitations:

Min./Max. Window Width
17 1/2" (445) to 107 1/2" (2731)

Min./Max. Window Height
17 1/2" (445) to 75 7/8" (1927)

Max. Frame Area: 40 sq. ft. or 3.7 m²
Based on the smallest square or rectangular shape that covers the entire window.

Additional limitations may apply. Contact your Andersen supplier for more information.



• Dimensions in parentheses are in millimeters.

Table of Springline™ Window Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96

Notes on next page also apply to this page.

Window Width Dimension	1'-11 1/2" (597)	2'-5 1/2" (749)	2'-11 1/2" (902)	3'-5 1/2" (1054)	3'-11 1/2" (1207)	4'-5 1/2" (1359)	4'-11 1/2" (1511)
Minimum Rough Opening	2'-0" (610)	2'-6" (762)	3'-0" (914)	3'-6" (1067)	4'-0" (1219)	4'-6" (1372)	5'-0" (1524)
Unobstructed Glass	17 1/4" (438)	23 1/4" (591)	29 1/4" (743)	35 1/4" (895)	41 1/4" (1048)	47 1/4" (1200)	53 1/4" (1353)

Window Height Shown in Table

CUSTOM SIZES AVAILABLE

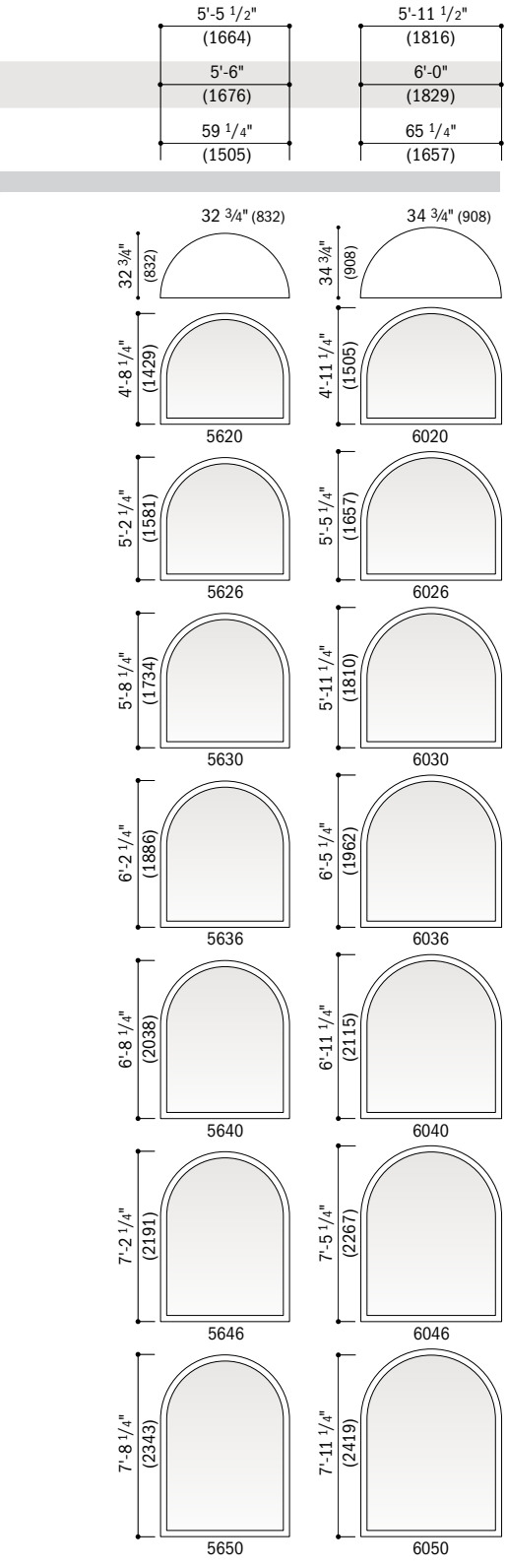
Minimum Rough Opening = Window Height + 1/2" (13)

Unobstructed Glass = Window Height – 6.25" (159)

CUSTOM SIZES AVAILABLE

Radius	11 3/4" (298)	14 3/4" (375)	17 3/4" (451)	20 3/4" (527)	23 3/4" (603)	26 3/4" (679)	29 3/4" (756)
Chord Height	11 3/4" (298)	14 3/4" (375)	17 3/4" (451)	20 3/4" (527)	23 3/4" (603)	26 3/4" (679)	29 3/4" (756)
Side Height 1'-11 1/2" (597)	2'-11 1/4" (895) 2020	3'-2 1/4" (972) 2620	3'-5 1/4" (1048) 3020	3'-8 1/4" (1124) 3620	3'-11 1/4" (1200) 4020	4'-2 1/4" (1276) 4620	4'-5 1/4" (1353) 5020
2'-5 1/2" (749)	3'-5 1/4" (1048) 2026	3'-8 1/4" (1124) 2626	3'-11 1/4" (1200) 3026	4'-2 1/4" (1276) 3626	4'-5 1/4" (1353) 4026	4'-8 1/4" (1429) 4626	4'-11 1/4" (1505) 5026
2'-11 1/2" (902)	3'-11 1/4" (1200) 2030	4'-2 1/4" (1276) 2630	4'-5 1/4" (1353) 3030	4'-8 1/4" (1429) 3630	4'-11 1/4" (1505) 4030	5'-2 1/4" (1581) 4630	5'-5 1/4" (1657) 5030
3'-5 1/2" (1054)	4'-5 1/4" (1353) 2036	4'-8 1/4" (1429) 2636	4'-11 1/4" (1505) 3036	5'-2 1/4" (1581) 3636	5'-5 1/4" (1657) 4036	5'-8 1/4" (1734) 4636	5'-11 1/4" (1810) 5036
3'-11 1/2" (1207)	4'-11 1/4" (1505) 2040	5'-2 1/4" (1581) 2640	5'-5 1/4" (1657) 3040	5'-8 1/4" (1734) 3640	5'-11 1/4" (1810) 4040	6'-2 1/4" (1886) 4640	6'-5 1/4" (1962) 5040
4'-5 1/2" (1359)	5'-5 1/4" (1657) 2046	5'-8 1/4" (1734) 2646	5'-11 1/4" (1810) 3046	6'-2 1/4" (1886) 3646	6'-5 1/4" (1962) 4046	6'-8 1/4" (2038) 4646	6'-11 1/4" (2115) 5046
4'-11 1/2" (1511)	5'-11 1/4" (1810) 2050	6'-2 1/4" (1886) 2650	6'-5 1/4" (1962) 3050	6'-8 1/4" (2038) 3650	6'-11 1/4" (2115) 4050	7'-2 1/4" (2191) 4650	7'-5 1/4" (2267) 5050

- "Window Dimension" always refers to outside frame-to-frame dimension.
- "**Minimum Rough Opening**" **dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.



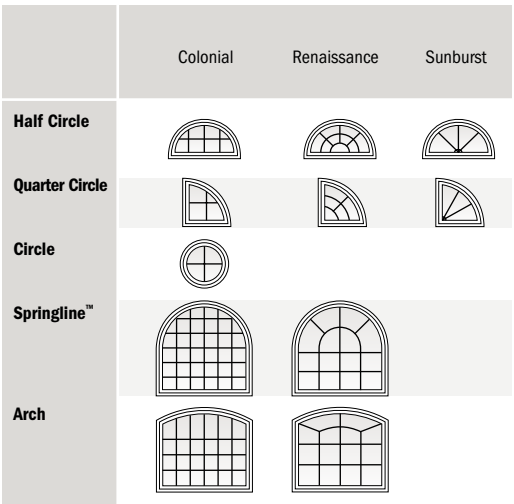
• "Window Dimension" always refers to outside frame-to-frame dimension.
• **"Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
• Dimensions in parentheses are in millimeters.

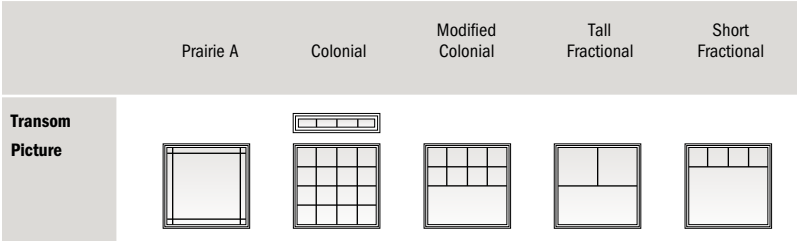
Custom-size windows are available in 1/8" (3) increments. Contact your Andersen supplier for more information.

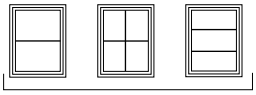
For Springline™ and arch windows, the size designation does not reflect overall window height. (e.g., a 2020 Springline window size has a side height of 1'-11 1/2" and an overall window height of 2'-11 1/4".)

Details shown on pages 81-82.
Grille patterns shown below.

Grille Patterns






Specified Equal Light Examples

Number of lights and overall pattern varies with window size. Patterns are not available in all configurations. Specialty window patterns may not align with picture window patterns when joined. Specified equal light pattern is available for all shapes except quarter circle. For specified equal light, specify number of same-size rectangles across or down. Custom grille patterns are available for picture and transom windows. For more information on divided light, see page 13 or visit **andersenwindows.com/grilles**.

Table of Arch Window Sizes

Notes on page 77 also apply to this pages.

Scale 1/8" (3) = 1'-0" (305) – 1:96

Window Width Dimension	1'-11 1/2" (597)	2'-5 1/2" (749)	2'-11 1/2" (902)	3'-5 1/2" (1054)	3'-11 1/2" (1207)	4'-5 1/2" (1359)	4'-11 1/2" (1511)
Minimum Rough Opening	2'-0" (610)	2'-6" (762)	3'-0" (914)	3'-6" (1067)	4'-0" (1219)	4'-6" (1372)	5'-0" (1524)
Unobstructed Glass	17 1/4" (438)	23 1/4" (591)	29 1/4" (743)	35 1/4" (895)	41 1/4" (1048)	47 1/4" (1200)	53 1/4" (1353)

CUSTOM SIZES AVAILABLE

Window Height Shown in Table

Minimum Rough Opening = Window Height + 1/2" (13)

Unobstructed Glass = Window Height – 6.25" (159)

CUSTOM SIZES AVAILABLE

Radius	23 1/2" (597)	29 1/2" (749)	35 1/2" (902)	41 1/2" (1054)	47 1/2" (1207)	53 1/2" (1359)	59 1/2" (1511)
Chord Height	3 5/32" (80)	3 15/16" (100)	4 3/4" (121)	5 9/16" (141)	6 3/8" (162)	7 5/32" (182)	7 31/32" (202)
Side Height 11 1/2" (292)	1'-2 21/32" (372) 2010	1'-3 7/16" (392) 2610	1'-4 1/4" (413) 3010	1'-5 1/16" (433) 3610	1'-5 7/8" (454) 4010	1'-6 21/32" (474) 4610	1'-7 15/32" (495) 5010
1'-5 1/2" (445)	1'-8 21/32" (524) 2016	1'-9 7/16" (545) 2616	1'-10 1/4" (565) 3016	1'-11 1/16" (586) 3616	1'-11 7/8" (606) 4016	2'-0 21/32" (627) 4616	2'-1 15/32" (647) 5016
1'-11 1/2" (597)	2'-2 21/32" (677) 2020	2'-3 7/16" (697) 2620	2'-4 1/4" (718) 3020	2'-5 1/16" (738) 3620	2'-5 7/8" (759) 4020	2'-6 21/32" (779) 4620	2'-7 15/32" (799) 5020
2'-5 1/2" (749)	2'-8 21/32" (829) 2026	2'-9 7/16" (850) 2626	2'-10 1/4" (870) 3026	2'-11 1/16" (891) 3626	2'-11 7/8" (911) 4026	3'-0 21/32" (931) 4626	3'-1 15/32" (952) 5026
2'-11 1/2" (902)	3'-2 21/32" (982) 2030	3'-3 7/16" (1002) 2630	3'-4 1/4" (1023) 3030	3'-5 1/16" (1043) 3630	3'-5 7/8" (1063) 4030	3'-6 21/32" (1084) 4630	3'-7 15/32" (1104) 5030
3'-5 1/2" (1054)	3'-8 21/32" (1134) 2036	3'-9 7/16" (1154) 2636	3'-10 1/4" (1175) 3036	3'-11 1/16" (1195) 3636	3'-11 7/8" (1216) 4036	4'-0 21/32" (1236) 4636	4'-1 15/32" (1257) 5036
3'-11 1/2" (1207)	4'-2 21/32" (1286) 2040	4'-3 7/16" (1307) 2640	4'-4 1/4" (1327) 3040	4'-5 1/16" (1348) 3640	4'-5 7/8" (1368) 4040	4'-6 21/32" (1389) 4640	4'-7 15/32" (1409) 5040
4'-5 1/2" (1359)	4'-8 21/32" (1439) 2046	4'-9 7/16" (1459) 2646	4'-10 1/4" (1480) 3046	4'-11 1/16" (1500) 3646	4'-11 7/8" (1521) 4046	5'-0 21/32" (1541) 4646	5'-1 15/32" (1561) 5046
4'-11 1/2" (1511)	5'-2 21/32" (1591) 2050	5'-3 7/16" (1612) 2650	5'-4 1/4" (1632) 3050	5'-5 1/16" (1653) 3650	5'-5 7/8" (1673) 4050	5'-6 21/32" (1693) 4650	5'-7 15/32" (1714) 5050
5'-5 1/2" (1664)	5'-8 21/32" (1744) 2056	5'-9 7/16" (1764) 2656	5'-10 1/4" (1785) 3056	5'-11 1/16" (1805) 3656	5'-11 7/8" (1825) 4056	6'-0 21/32" (1846) 4656	6'-1 15/32" (1866) 5056
5'-11 1/2" (1816)	6'-2 21/32" (1896) 2060	6'-3 7/16" (1916) 2660	6'-4 1/4" (1937) 3060	6'-5 1/16" (1957) 3660	6'-5 7/8" (1978) 4060	6'-6 21/32" (1998) 4660	6'-7 15/32" (2019) 5060

Notes on page 77 also apply to this pages.

5'-5 1/2" (1664)	5'-11 1/2" (1816)	6'-5 1/2" (1969)	6'-11 1/2" (2121)	7'-5 1/2" (2273)	7'-11 1/2" (2426)
5'-6" (1676)	6'-0" (1829)	6'-6" (1981)	7'-0" (2134)	7'-6" (2286)	8'-0" (2438)
59 1/4" (1505)	65 1/4" (1657)	71 1/4" (1810)	77 1/4" (1962)	83 1/4" (2115)	89 1/4" (2267)

65 1/2" (1664)	71 1/2" (1816)	77 1/2" (1969)	83 1/2" (2121)	89 1/2" (2273)	95 1/2" (2426)
8 25/32" (223)	9 19/32" (243)	10 3/8" (264)	11 3/16" (284)	12" (305)	12 25/32" (325)
1'-8 9/32" (515) 5610	1'-9 3/32" (535) 6010	1'-9 7/8" (556) 6610	1'-10 11/16" (576) 7010	1'-11 1/2" (597) 7610	2'-0 9/32" (617) 8010
2'-2 9/32" (667) 5616	2'-3 3/32" (688) 6016	2'-3 7/8" (708) 6616	2'-4 11/16" (729) 7016	2'-5 1/2" (749) 7616	2'-6 9/32" (769) 8016
2'-8 9/32" (820) 5620	2'-9 3/32" (840) 6020	2'-9 7/8" (861) 6620	2'-10 11/16" (881) 7020	2'-11 1/2" (901) 7620	3'-0 9/32" (922) 8020
3'-2 9/32" (972) 5626	3'-3 3/32" (993) 6026	3'-3 7/8" (1013) 6626	3'-4 11/16" (1033) 7026	3'-5 1/2" (1054) 7626	3'-6 9/32" (1074) 8026
3'-8 9/32" (1125) 5630	3'-9 3/32" (1145) 6030	3'-9 7/8" (1165) 6630	3'-10 11/16" (1186) 7030	3'-11 1/2" (1206) 7630	4'-0 9/32" (1227) 8030
4'-2 9/32" (1277) 5636	4'-3 3/32" (1297) 6036	4'-3 7/8" (1318) 6636	4'-4 11/16" (1338) 7036	4'-5 1/2" (1359) 7636	4'-6 9/32" (1379) 8036
4'-8 9/32" (1429) 5640	4'-9 3/32" (1450) 6040	4'-9 7/8" (1470) 6640	4'-10 11/16" (1491) 7040	4'-11 1/2" (1511) 7640	5'-0 9/32" (1531) 8040
5'-2 9/32" (1582) 5646	5'-3 3/32" (1602) 6046	5'-3 7/8" (1623) 6646	5'-4 11/16" (1643) 7046	5'-5 1/2" (1663) 7646	5'-6 9/32" (1684) 8046
5'-8 9/32" (1734) 5650	5'-9 3/32" (1755) 6050	5'-9 7/8" (1775) 6650	5'-10 11/16" (1795) 7050	5'-11 1/2" (1816) 7650	6'-0 9/32" (1836) 8050
6'-2 9/32" (1887) 5656	6'-3 3/32" (1907) 6056	6'-3 7/8" (1927) 6656	6'-4 11/16" (1948) 7056	6'-5 1/2" (1968) 7656	6'-6 9/32" (1989) 8056
6'-8 9/32" (2039) 5660	6'-9 3/32" (2059) 6060	6'-9 7/8" (2080) 6660	6'-10 11/16" (2100) 7060	6'-11 1/2" (2121) 7660	7'-0 9/32" (2141) 8060

Arch Window Area Specifications

Window Number	Glass Area Sq. Ft./(m²)		Overall Window Area Sq. Ft./(m²)	
2010	0.93	(0.09)	2.22	(0.21)
2016	1.65	(0.15)	3.20	(0.30)
2020	2.37	(0.22)	4.18	(0.39)
2026	3.09	(0.29)	5.16	(0.48)
2030	3.81	(0.35)	6.14	(0.57)
2036	4.52	(0.42)	7.12	(0.66)
2040	5.24	(0.49)	8.10	(0.75)
2046	5.96	(0.55)	9.08	(0.84)
2050	6.68	(0.62)	10.06	(0.93)
2056	7.40	(0.69)	11.04	(1.03)
2060	8.12	(0.75)	12.02	(1.12)
2610	1.34	(0.12)	2.90	(0.27)
2616	2.31	(0.21)	4.13	(0.38)
2620	3.28	(0.30)	5.36	(0.50)
2626	4.25	(0.39)	6.59	(0.61)
2630	5.22	(0.48)	7.82	(0.73)
2636	6.19	(0.57)	9.05	(0.84)
2640	7.16	(0.66)	10.28	(0.95)
2646	8.12	(0.75)	11.51	(1.07)
2650	9.09	(0.84)	12.74	(1.18)
2656	10.06	(0.93)	13.97	(1.30)
2660	11.03	(1.02)	15.20	(1.41)
3010	1.80	(0.17)	3.63	(0.34)
3016	3.02	(0.28)	5.11	(0.47)
3020	4.24	(0.39)	6.59	(0.61)
3026	5.46	(0.51)	8.07	(0.75)
3030	6.68	(0.62)	9.54	(0.89)
3036	7.90	(0.73)	11.02	(1.02)
3040	9.11	(0.85)	12.50	(1.16)
3046	10.33	(0.96)	13.98	(1.30)
3050	11.55	(1.07)	15.46	(1.44)
3056	12.77	(1.19)	16.94	(1.57)
3060	13.99	(1.30)	18.42	(1.71)
3610	2.30	(0.21)	4.40	(0.41)
3616	3.77	(0.35)	6.13	(0.57)
3620	5.24	(0.49)	7.86	(0.73)
3626	6.71	(0.62)	9.59	(0.89)
3630	8.18	(0.76)	11.31	(1.05)
3636	9.65	(0.90)	13.04	(1.21)
3640	11.12	(1.03)	14.77	(1.37)
3646	12.59	(1.17)	16.50	(1.53)
3650	14.05	(1.31)	18.23	(1.69)
3656	15.52	(1.44)	19.96	(1.85)
3660	16.99	(1.58)	21.69	(2.02)
4010	2.85	(0.27)	5.21	(0.48)
4016	4.57	(0.42)	7.19	(0.67)
4020	6.29	(0.58)	9.17	(0.85)
4026	8.01	(0.74)	11.15	(1.04)
4030	9.73	(0.90)	13.13	(1.22)
4036	11.45	(1.06)	15.11	(1.40)
4040	13.17	(1.22)	17.09	(1.59)
4046	14.88	(1.38)	19.07	(1.77)
4050	16.60	(1.54)	21.05	(1.96)
4056	18.32	(1.70)	23.03	(2.14)
4060	20.04	(1.86)	25.00	(2.32)
4610	3.45	(0.32)	6.07	(0.56)
4616	5.42	(0.50)	8.30	(0.77)
4620	7.38	(0.69)	10.53	(0.98)
4626	9.35	(0.87)	12.76	(1.19)
4630	11.32	(1.05)	14.99	(1.39)
4636	13.29	(1.23)	17.22	(1.60)
4640	15.26	(1.42)	19.45	(1.81)
4646	17.23	(1.60)	21.68	(2.01)
4650	19.20	(1.78)	23.91	(2.22)
4656	21.17	(1.97)	26.14	(2.43)
4660	23.13	(2.15)	28.36	(2.64)
5010	4.09	(0.38)	6.98	(0.65)
5016	6.30	(0.59)	9.46	(0.88)
5020	8.52	(0.79)	11.94	(1.11)
5026	10.74	(1.00)	14.42	(1.34)
5030	12.96	(1.20)	16.90	(1.57)
5036	15.18	(1.41)	19.37	(1.80)
5040	17.40	(1.62)	21.85	(2.03)
5046	19.62	(1.82)	24.33	(2.26)
5050	21.84	(2.03)	26.81	(2.49)
5056	24.05	(2.23)	29.29	(2.72)
5060	26.27	(2.44)	31.77	(2.95)
5610	4.77	(0.44)	7.93	(0.74)
5616	7.24	(0.67)	10.66	(0.99)
5620	9.71	(0.90)	13.39	(1.24)
5626	12.18	(1.13)	16.12	(1.50)
5630	14.65	(1.36)	18.85	(1.75)
5636	17.11	(1.59)	21.58	(2.00)
5640	19.58	(1.82)	24.30	(2.26)
5646	22.05	(2.05)	27.03	(2.51)
5650	24.52	(2.28)	29.76	(2.77)
5656	26.99	(2.51)	32.49	(3.02)
5660	29.46	(2.74)	35.22	(3.27)
6010	5.50	(0.51)	8.93	(0.83)
6016	8.22	(0.76)	11.91	(1.11)
6020	10.94	(1.02)	14.88	(1.38)
6026	13.66	(1.27)	17.86	(1.66)
6030	16.38	(1.52)	20.84	(1.94)
6036	19.09	(1.77)	23.82	(2.21)
6040	21.81	(2.03)	26.80	(2.49)
6046	24.53	(2.28)	29.78	(2.77)
6050	27.25	(2.53)	32.76	(3.04)
6056	29.97	(2.78)	35.74	(3.32)
6060	32.69	(3.04)	38.72	(3.60)
6610	6.27	(0.58)	9.97	(0.93)
6616	9.24	(0.86)	13.20	(1.23)
6620	12.21	(1.13)	16.43	(1.53)
6626	15.18	(1.41)	19.66	(1.83)
6630	18.15	(1.69)	22.88	(2.13)
6636	21.12	(1.96)	26.11	(2.43)
6640	24.09	(2.24)	29.34	(2.73)
6646	27.06	(2.51)	32.57	(3.03)
6650	30.02	(2.79)	35.80	(3.33)
6656	32.99	(3.07)	39.03	(3.63)
6660	35.96	(3.34)	42.26	(3.93)
7010	7.10	(0.66)	11.05	(1.03)
7016	10.31	(0.96)	14.53	(1.35)
7020	13.53	(1.26)	18.01	(1.67)
7026	16.75	(1.56)	21.49	(2.00)
7030	19.97	(1.86)	24.97	(2.32)
7036	23.19	(2.15)	28.45	(2.64)
7040	26.41	(2.45)	31.93	(2.97)
7046	29.63	(2.75)	35.41	(3.29)
7050	32.85	(3.05)	38.89	(3.61)
7056	36.06	(3.35)	42.37	(3.94)
7060	39.28	(3.65)	45.85	(4.26)
7610	7.96	(0.74)	12.19	(1.13)
7616	11.43	(1.06)	15.92	(1.48)
7620	14.90	(1.38)	19.64	(1.83)
7626	18.37	(1.71)	23.37	(2.17)
7630	21.84	(2.03)	27.10	(2.52)
7636	25.30	(2.35)	30.83	(2.86)
7640	28.77	(2.67)	34.56	(3.21)
7646	32.24	(3.00)	38.29	(3.56)
7650	35.71	(3.32)	42.02	(3.90)
7656	39.18	(3.64)	45.75	(4.25)
7660	42.65	(3.96)	49.48	(4.60)
8010	8.87	(0.82)	13.36	(1.24)
8016	12.59	(1.17)	17.34	(1.61)
8020	16.31	(1.52)	21.32	(1.98)
8026	20.03	(1.86)	25.30	(2.35)
8030	23.75	(2.21)	29.28	(2.72)
8036	27.47	(2.55)	33.26	(3.09)
8040	31.18	(2.90)	37.24	(3.46)
8046	34.90	(3.24)	41.22	(3.83)
8050	38.62	(3.59)	45.20	(4.20)
8056	42.34	(3.93)	49.18	(4.57)
8060	46.06	(4.28)	53.16	(4.94)

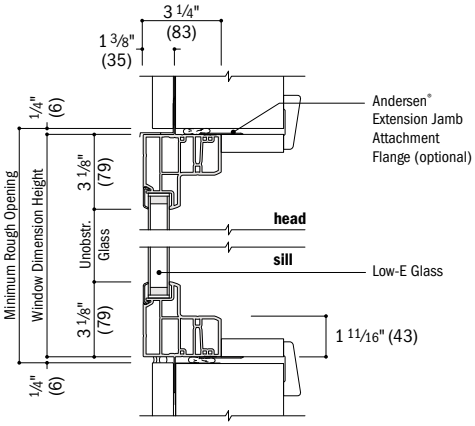
• Dimensions in parentheses are in square meters.

For picture, transom, half circle, quarter circle, circle and Springline™ window specifications, see pages 68-71.

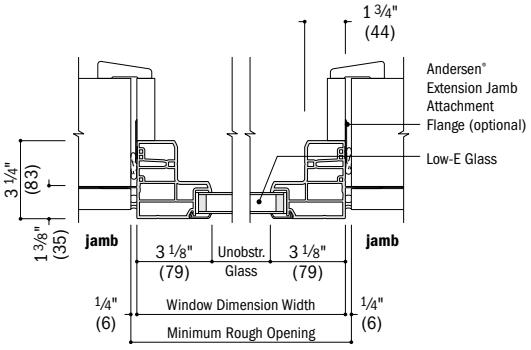
Picture, Single Transom and Specialty Window Details – New Construction

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

1 3/8" flange setback

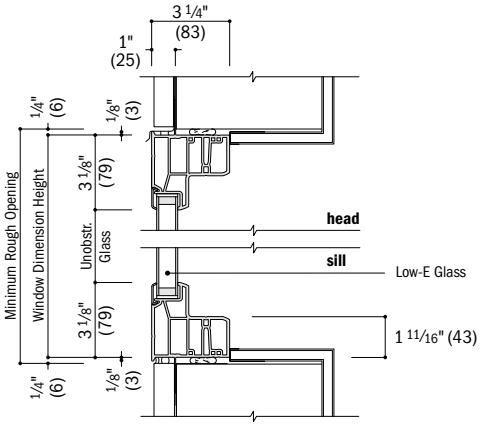


Vertical Section

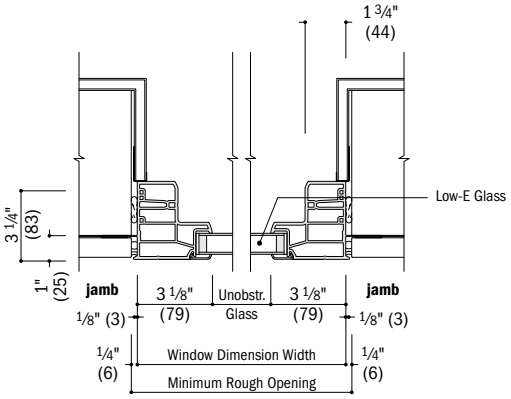


Horizontal Section

1" flange setback with stucco key



Vertical Section
Stucco Exterior

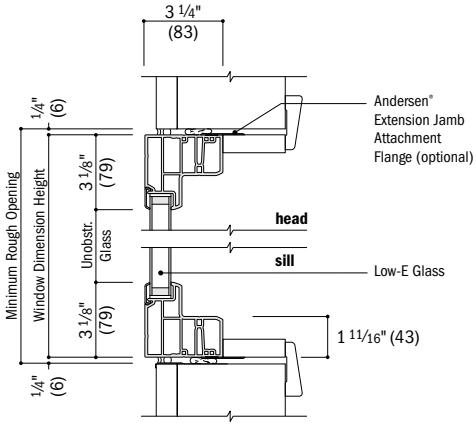


Horizontal Section
Stucco Exterior

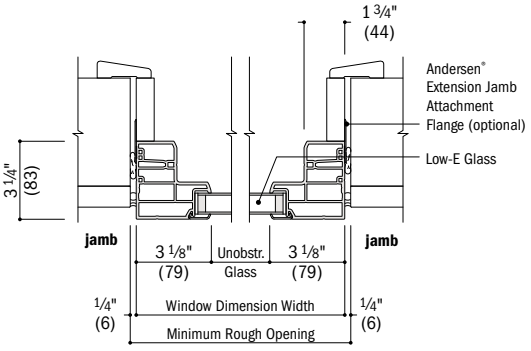
Picture, Single Transom and Specialty Window Details – Replacement

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

no flange



Vertical Section
Existing Framed Opening



Horizontal Section
Existing Framed Opening

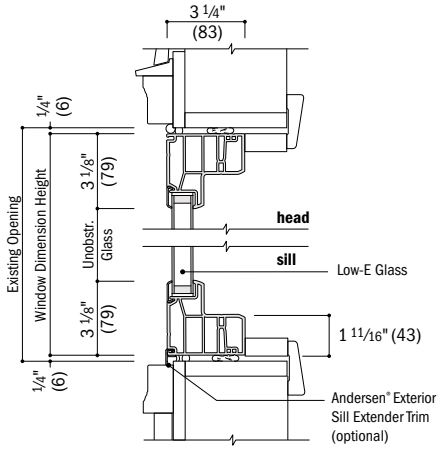
continued on next page

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

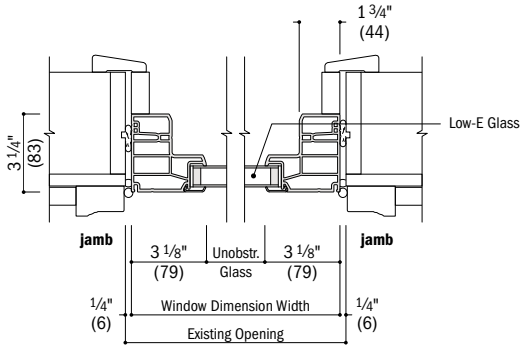
Picture, Single Transom and Specialty Window Details – Replacement *(continued)*

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

insert



Vertical Section
Existing Window Opening

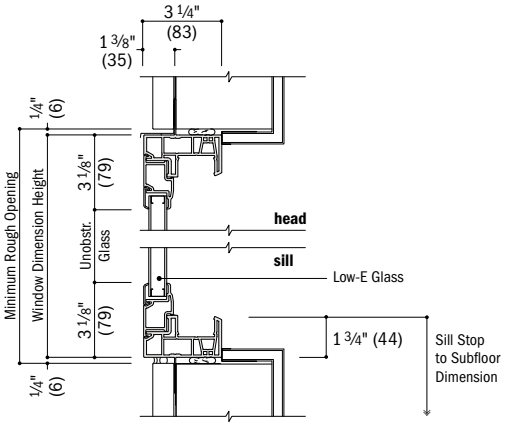


Horizontal Section
Existing Window Opening

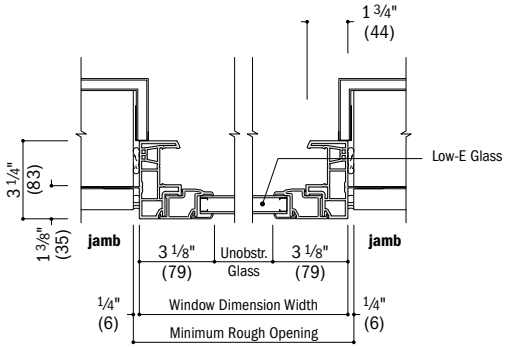
Twin and Triple Transom Window Details – New Construction

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

1 3/8" flange setback

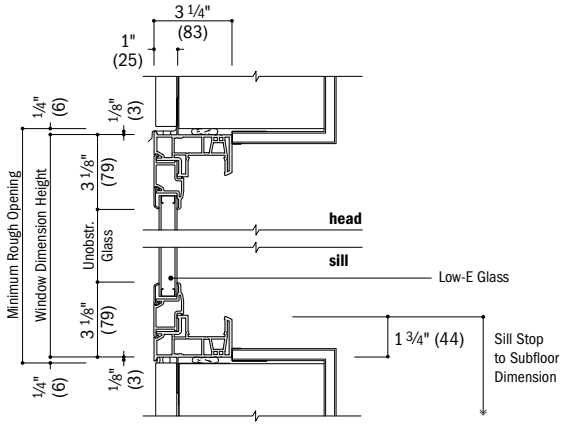


Vertical Section

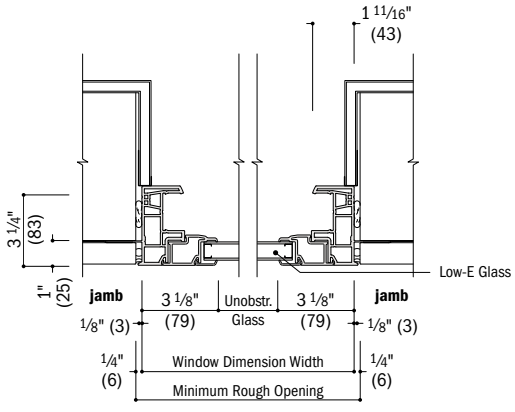


Horizontal Section

1" flange setback with stucco key



Vertical Section



Horizontal Section

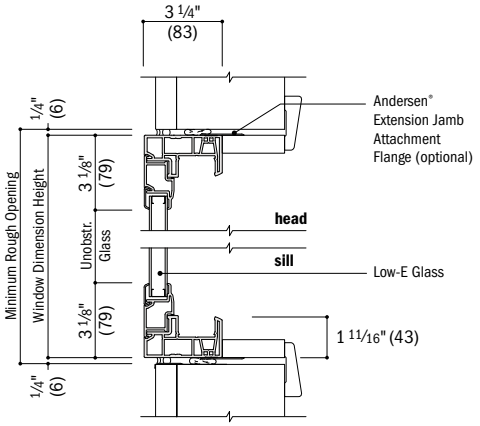
continued on next page

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

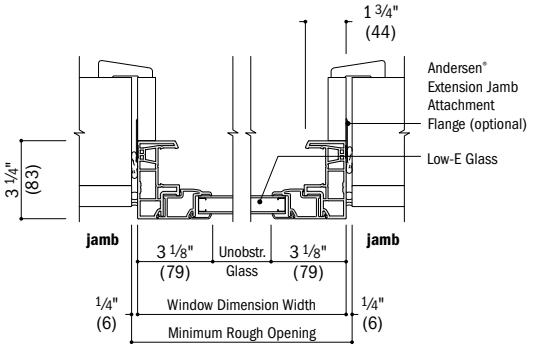
Twin and Triple Transom Window Details – Replacement *(continued)*

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

no flange

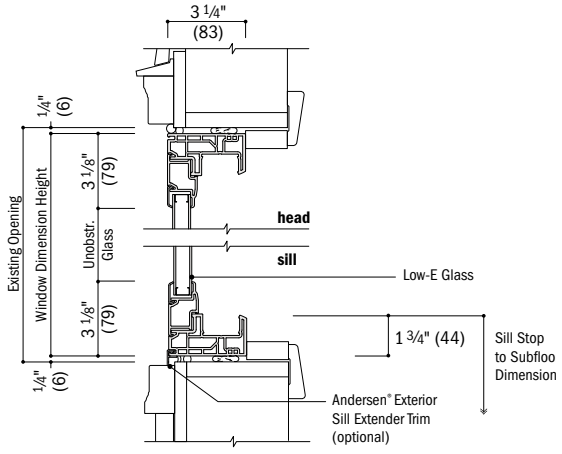


Vertical Section
Existing Framed Opening

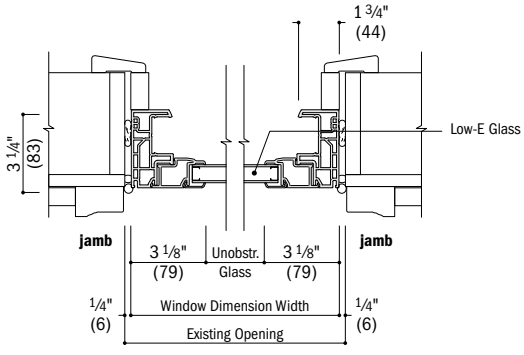


Horizontal Section
Existing Framed Opening

insert

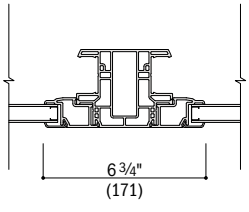


Vertical Section
Existing Window Opening



Horizontal Section
Existing Window Opening

integral



Horizontal Section
Twin or Triple Transom

Installation accessories for insert frame shown on page 109.

See pages 84-87 for joining details.

- Drip cap is required to complete window installation as shown but may not be included with the window. Use of drip cap is recommended for proper installation.
- Light-colored areas are parts included with window. Dark-colored areas are additional Andersen® parts required to complete window assembly as shown.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

WINDOW JOINING DETAILS

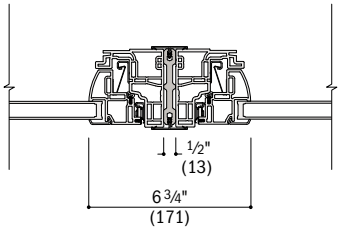
Vertical (ribbon) Fiberglass Joining Details – Non-Reinforced

Scale 1½" (38) = 1'-0" (305) — 1:8

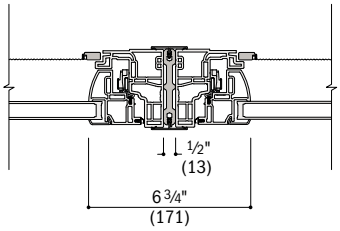
Overall Window Dimension Width – Sum of individual window widths plus ½" (13) per join.

Overall Minimum Rough Opening Width – Overall window dimension width plus ¾" (19).

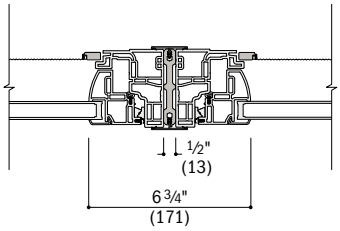
The addition of joining materials will affect the overall rough opening dimension. See page 110.



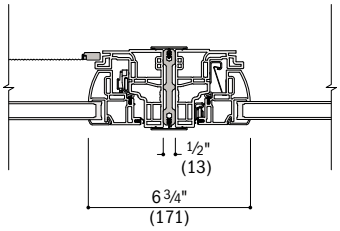
Casement to Casement
(Stationary Jamb to Stationary Jamb)



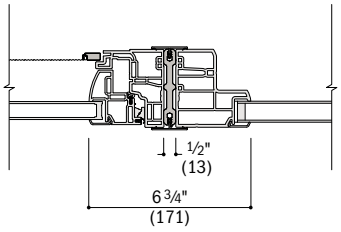
Casement to Casement
(Lock Jamb to Lock Jamb)



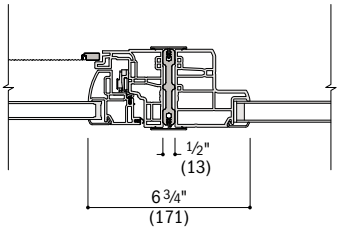
Casement to Casement
(Hinge Jamb to Hinge Jamb)



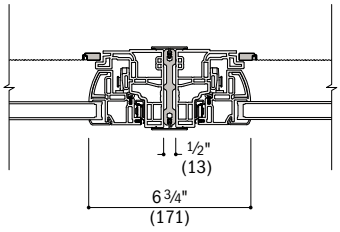
Casement to Casement
(Lock Jamb to Stationary Jamb)



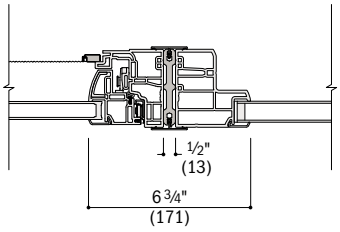
Casement to Picture/Single Transom
(Casement Hinge Jamb)



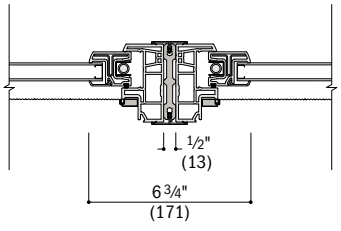
Casement to Picture/Single Transom
(Casement Lock Jamb)



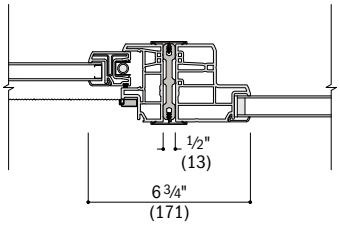
Awning to Awning



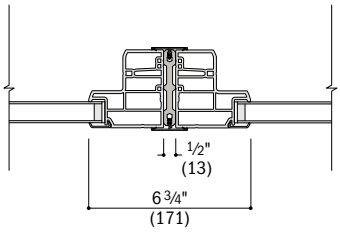
Awning to Picture/Single Transom



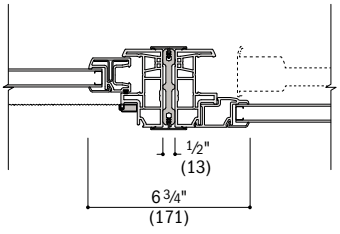
Single-Hung to Single-Hung



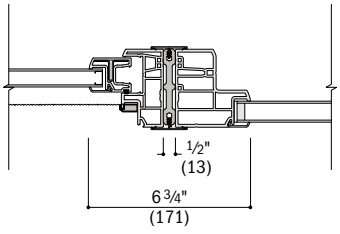
Single-Hung to Picture/Single Transom



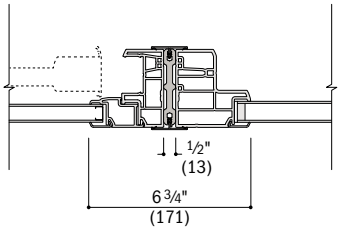
Picture/Single Transom to Picture/Single Transom



Gliding to Gliding
(Active Jamb to Stationary Jamb)



Gliding to Picture/Single Transom
(Gliding Active Jamb)



Gliding to Picture/Single Transom
(Gliding Stationary Jamb)

- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Structural performance of any combination is only as high as the lowest structural performance of any individual unit or join in the combination.
- Dimensions in parentheses are in millimeters.

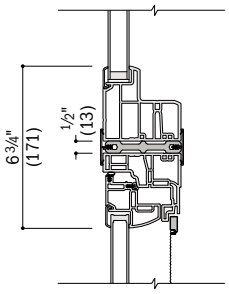
Horizontal (stack) Fiberglass Joining Details – Non-Reinforced

Scale 1½" (38) = 1'-0" (305) – 1:8

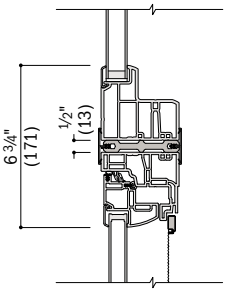
Overall Window Dimension Width – Sum of individual window widths plus ½" (13) per join.

Overall Minimum Rough Opening Width – Overall window dimension width plus ¾" (19).

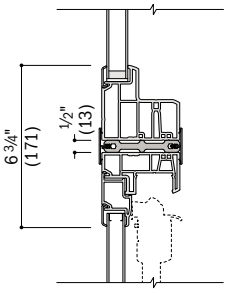
The addition of joining materials will affect the overall rough opening dimension. See page 110.



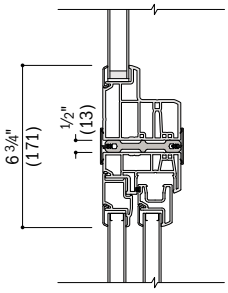
Picture/Single Transom/Specialty Over Casement



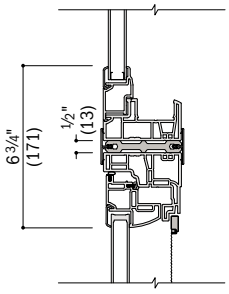
Picture/Single Transom/Specialty Over Awning



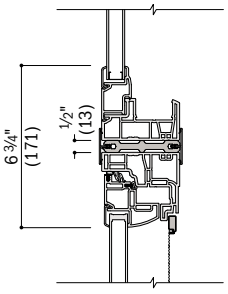
Picture/Single Transom/Specialty Over Single-Hung



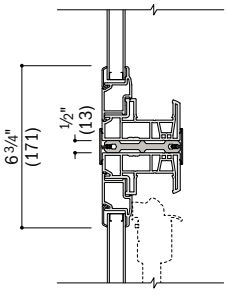
Picture/Single Transom/Specialty Over Gliding



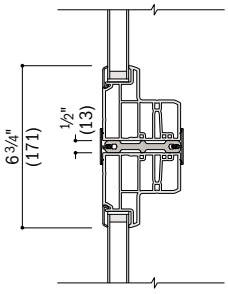
Twin Transom Over Twin Casement



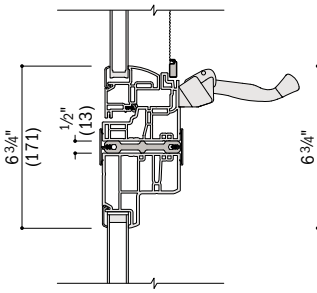
Twin Transom Over Twin Awning



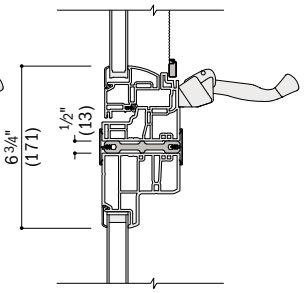
Twin Transom Over Twin Single-Hung



Picture/Single Transom/Specialty Over Picture/Single Transom



Casement Over Picture/Single Transom



Awning Over Picture/Single Transom

For more information on joining, refer to the combination designs section starting on page 99.

- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Structural performance of any combination is only as high as the lowest structural performance of any individual unit or join in the combination.
- Dimensions in parentheses are in millimeters.

WINDOW JOINING DETAILS

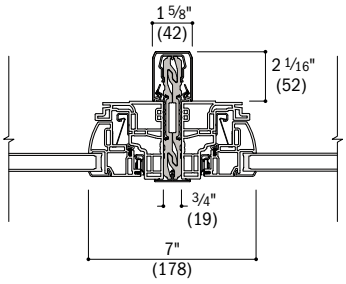
Vertical (ribbon) Fiberglass Joining Details – Reinforced

Scale 1½" (38) = 1'-0" (305) — 1:8

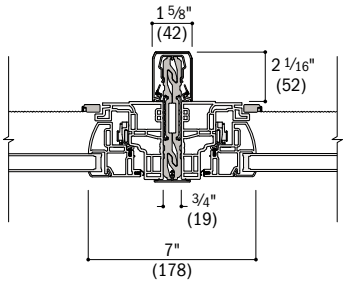
Overall Window Dimension Width – Sum of individual window widths plus ¾" (19) per join.

Overall Minimum Rough Opening Width – Overall window dimension width plus ¾" (19).

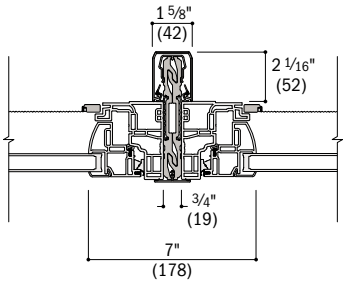
The addition of joining materials will affect the overall rough opening dimension. See page 110.



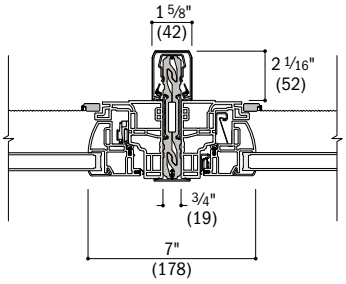
Casement to Casement
(Stationary Jamb to Stationary Jamb)



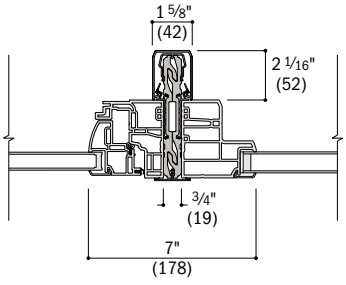
Casement to Casement
(Lock Jamb to Lock Jamb)



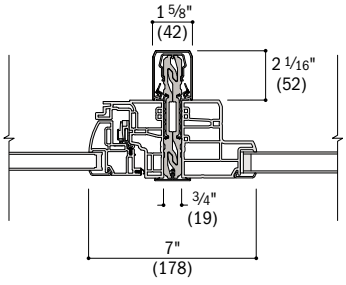
Casement to Casement
(Hinge Jamb to Hinge Jamb)



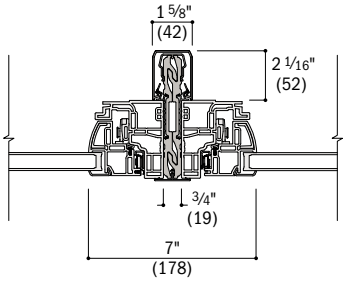
Casement to Casement
(Lock Jamb to Stationary Jamb)



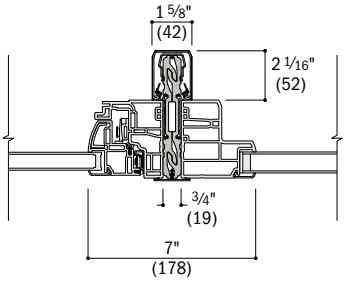
Casement to Picture/Single Transom
(Casement Hinge Jamb)



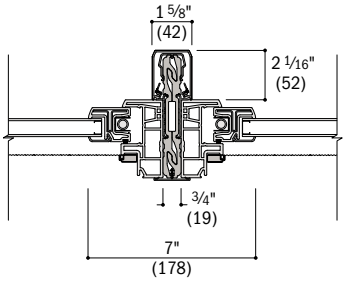
Casement to Picture/Single Transom
(Casement Lock Jamb)



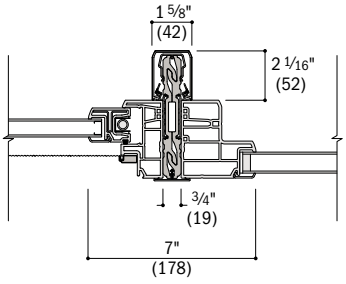
Awning to Awning



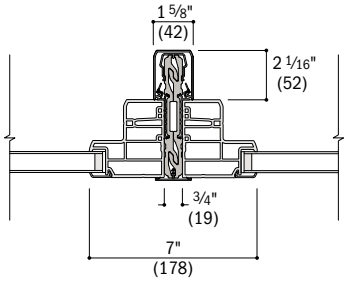
Awning to Picture/Single Transom



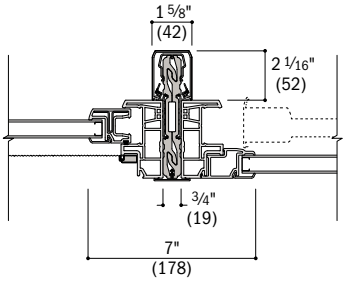
Single-Hung to Single-Hung



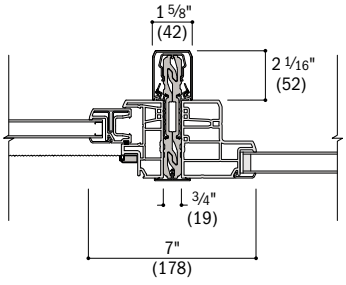
Single-Hung to Picture/Single Transom



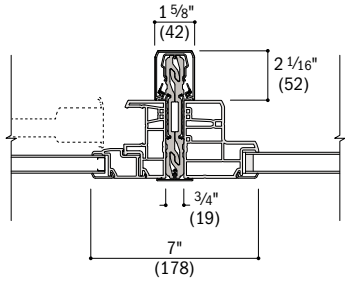
Picture/Single Transom to Picture/Single Transom



Gliding to Gliding
(Active Jamb to Stationary Jamb)



Gliding to Picture/Single Transom
(Gliding Active Jamb)



Gliding to Picture/Single Transom
(Gliding Stationary Jamb)

• Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.
• Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
• Structural performance of any combination is only as high as the lowest structural performance of any individual unit or join in the combination.
• Dimensions in parentheses are in millimeters.

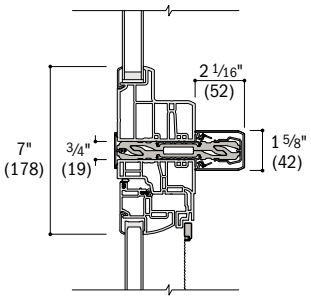
Horizontal (stack) Fiberglass Joining Details – Reinforced

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

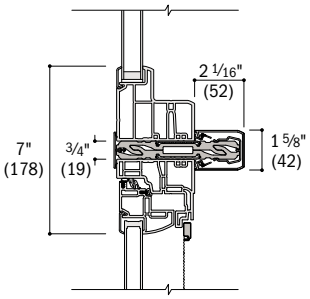
Overall Window Dimension Width – Sum of individual window widths plus 3/4" (19) per join.

Overall Minimum Rough Opening Width – Overall window dimension width plus 3/4" (19).

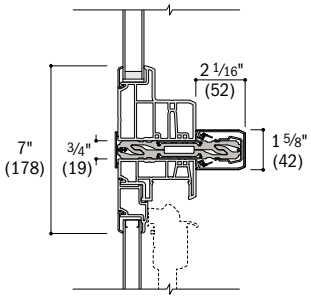
The addition of joining materials will affect the overall rough opening dimension. See page 110.



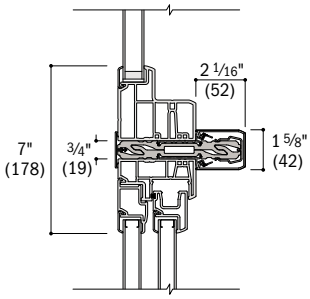
Picture/Single Transom/Specialty Over Casement



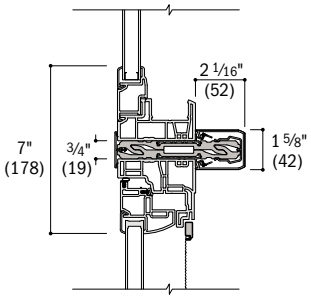
Picture/Single Transom/Specialty Over Awning



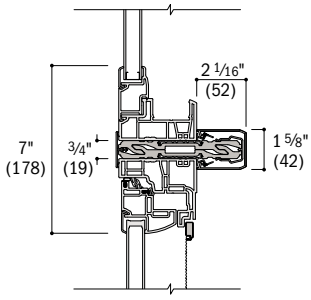
Picture/Single Transom/Specialty Over Single-Hung



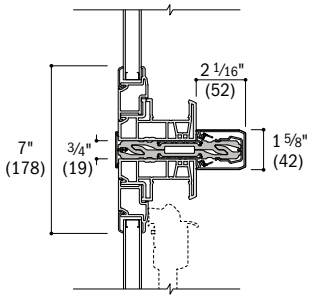
Picture/Single Transom/Specialty Over Gliding



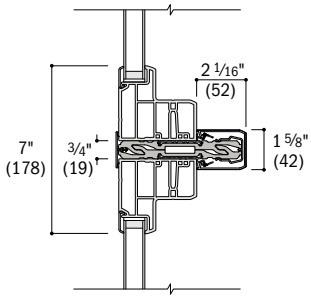
Twin Transom Over Twin Casement



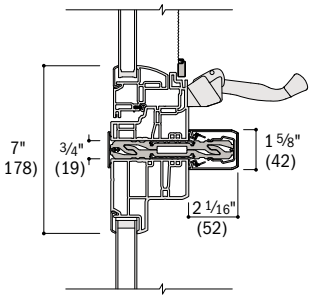
Twin Transom Over Twin Awning



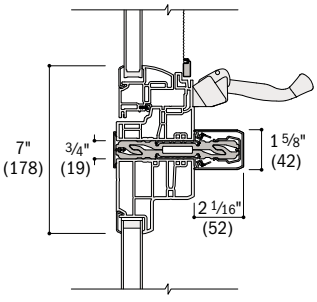
Twin Transom Over Twin Single-Hung



Picture/Single Transom/Specialty Over Picture/Single Transom



Casement Over Picture/Single Transom



Awning Over Picture/Single Transom

For more information on joining, refer to the combination designs section starting on page 99.

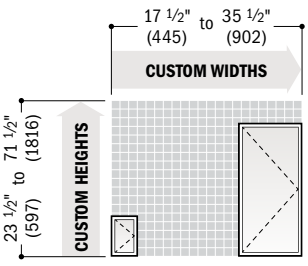
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Structural performance of any combination is only as high as the lowest structural performance of any individual unit or join in the combination.
- Dimensions in parentheses are in millimeters.

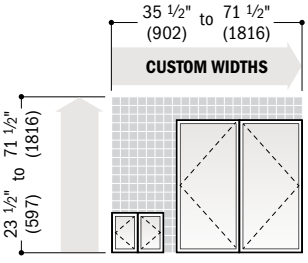
WINDOW CUSTOM SIZES

Custom Sizes and Specification Formulas

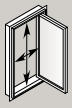
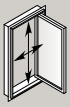
100 Series custom-size windows are available in 1/8" (3) increments between minimum and maximum widths and heights shown. Some restrictions apply.

Casement Windows

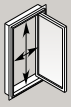
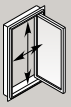




Single

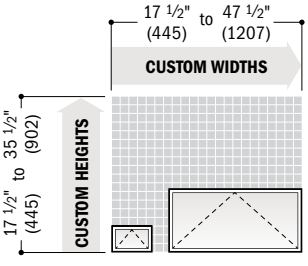
Clear Opening 	**Width** = window width − 12.103" (307) *wash mode** **Width** = window width − 7.790" (198) *widest clear opening** **Height** = window height − 5.694" (145)	**Minimum R.O.** 	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Vent Opening 	**Width** = window width − 7.964" (202) **Height** = window height − 5.694" (145)	**Unobst. Glass** 	**Width** = window width − 6.250" (159) **Height** = window height − 6.250" (159)

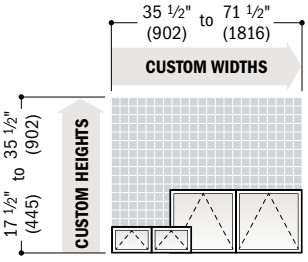
Twin

Clear Opening 	**Width** = (window width ÷ 2) − 12.353" (314) *wash mode** **Width** = (window width ÷ 2) − 8.040" (204) *widest clear opening** **Height** = window height − 5.694" (145)	**Minimum R.O.** 	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Vent Opening 	**Width** = window width − 16.428" (417) **Height** = window height − 5.694" (145)	**Unobst. Glass** 	**Single Sash Width** = (window width ÷ 2) − 6.50" (165) **Total Sash Width** = window width − 13.000" (330) **Height** = window height − 6.250" (159)

*Widest clear opening hinge will be applied, based on window size, if it allows the window to meet or exceed clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610). Hinge type cannot be specified.

Awning Windows



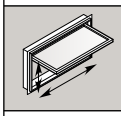
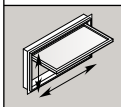


Single

Clear Opening 	**Width** = window width − 5.694" (145) **Depth** = 8.000" (203)	**Minimum R.O.** 	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Vent Opening 	**Width** = window width − 5.694" (145) **Depth** = 8.000" (203)	**Unobst. Glass** 	**Width** = window width − 6.250" (159) **Height** = window height − 6.250" (159)

• Awning windows do not meet clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

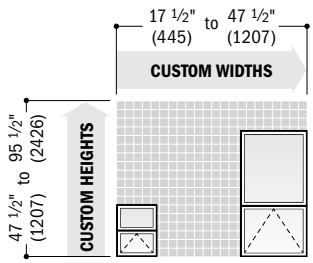
Twin

Clear Opening 	**Width** = (window width ÷ 2) − 5.944" (151) **Depth** = 8.000" (203)	**Minimum R.O.** 	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Vent Opening 	**Width** = (window width ÷ 2) − 5.944" (151) **Depth** = 8.000" (203)	**Unobst. Glass** 	**Single Sash Width** = (window width ÷ 2) − 6.50" (165) **Total Sash Width** = window width − 13.000" (330) **Height** = window height − 6.250" (159)

• Awning windows do not meet clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

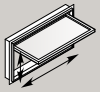
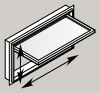
• **Clear Opening** formulas provide dimensions for determining area available for egress. **Vent Opening** formulas provide dimensions for determining area available for passage of air. **Minimum R.O.** (minimum rough opening) formulas provide minimum rough opening width and height dimensions. **Unobst. Glass** (unobstructed glass) formulas provide dimensions for determining area available for passage of light.
• Dimensions in parentheses are in millimeters.

Awning Windows *(continued)*



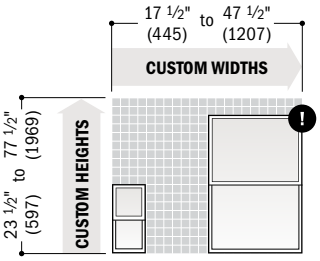
Contact your Andersen supplier for min./max. height dimensions for lower venting sash.

Picture Window Over Awning

Clear Opening 	**Width** = window width − 5.694" (145) **Depth** = 8.000" (203)	**Minimum R.O.** 	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Vent Opening 	**Width** = window width − 5.694" (145) **Depth** = 8.000" (203)	**Unobst. Glass** 	**Width** = window width − 6.250" (159) **Total Sash Height** = window height − 13.000" (330) *Contact your Andersen supplier for unobstructed glass height dimension of individual stationary sash or venting sash.*

• Awning windows do not meet clear opening area of 5.7 sq.ft. or 0.53 m², clear opening width of 20" (508) and clear opening height of 24" (610).

Single-Hung Windows

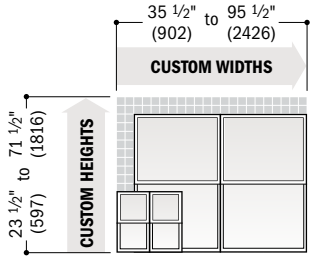


Windows with a height greater than 77 1/2" (1969) are only available with a 2:1 reverse cottage sash ratio.*

Equal Sash Ratio

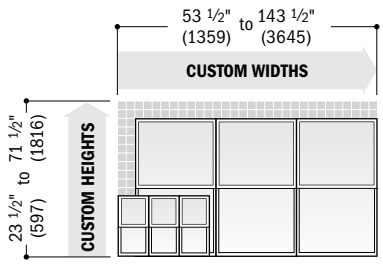
Clear Opening 	**Width** = window width − 3.500" (89) **Height** = (window height ÷ 2) − 3.711" (94)	**Minimum R.O.** 	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Vent Opening 	**Equal Sash Ratio** **Width** = window width − 3.500" (89) **Height** = (window height ÷ 2) − 3.711" (94)	**Unobst. Glass** 	**Equal Sash Ratio** **Width** = window width − 6.250" (159) **Fixed Sash Height** = (window height ÷ 2) − 4.184" (106) **Venting Sash Height** = (window height ÷ 2) − 4.226" (107) **Total Sash Height** = window height − 8.410" (214)

• Drywall pass-through window is available for custom-size windows wider than 23 1/2" (597) and taller than 53 1/2" (1359).
• Windows with a 3:2 reverse cottage sash ratio are available in custom sizes from 17 1/2" (445) to 47 1/2" (1207) in width to 29 1/2" (749) to 77 1/2" (1969) in height. For area and opening specification formulas, visit andersenwindows.com.
* Window heights that require a 2:1 reverse cottage sash ratio are available in custom sizes from 17 1/2" (445) to 47 1/2" (1207) in width to 77 5/8" (1972) to 89 1/2" (2273) in height. For area and opening specifications, contact your Andersen supplier.



Twin

Clear Opening 	**Width** = (window width ÷ 2) − 3.750" (95) **Height** = (window height ÷ 2) − 3.711" (94)	**Minimum R.O.** 	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Vent Opening 	**Equal Sash Ratio** **Width** = window width − 3.500" (89) **Height** = (window height ÷ 2) − 3.711" (94)	**Unobst. Glass** 	**Single Sash Width** = (window width ÷ 2) − 6.500" (165) **Total Sash Width** = window width − 13.000" (330) **Fixed Sash Height** = (window height ÷ 2) − 4.184" (106) **Venting Sash Height** = (window height ÷ 2) − 4.226" (107) **Total Sash Height** = window height − 8.410" (214)



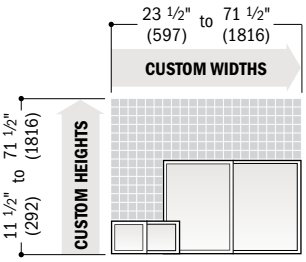
Triple

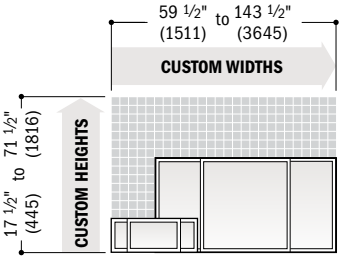
Clear Opening 	**Width** = (window width ÷ 3) − 3.833" (97) **Height** = (window height ÷ 2) − 3.711" (94)	**Minimum R.O.** 	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Vent Opening 	**Equal Sash Ratio** **Width** = window width − 11.500" (292) **Height** = (window height ÷ 2) − 3.711" (94)	**Unobst. Glass** 	**Single Sash Width** = (window width ÷ 3) − 6.583" (167) **Total Sash Width** = window width − 19.750" (502) **Fixed Sash Height** = (window height ÷ 2) − 4.184" (106) **Venting Sash Height** = (window height ÷ 2) − 4.226" (107) **Total Sash Height** = window height − 8.410" (214)

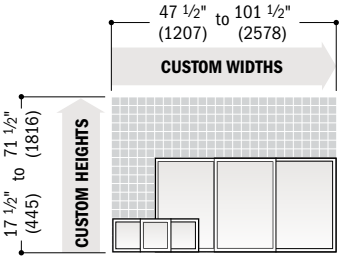
• **Clear Opening** formulas provide dimensions for determining area available for egress. **Vent Opening** formulas provide dimensions for determining area available for passage of air. **Minimum R.O.** (minimum rough opening) formulas provide minimum rough opening width and height dimensions. **Unobst. Glass** (unobstructed glass) formulas provide dimensions for determining area available for passage of light.
• Dimensions in parentheses are in millimeters.

WINDOW CUSTOM SIZES

Gliding Windows







Active-Stationary or Stationary-Active (XO/OX)

Clear Opening	**Width** = (window width ÷ 2) − 3.711" (94) **Height** = window height − 3.500" (89)	**Minimum R.O.**	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Vent Opening	**Width** = (window width ÷ 2) − 3.711" (94) **Height** = window height − 3.500" (89)	**Unobst. Glass**	**Fixed Sash Width** = (window width ÷ 2) − 4.184" (106) **Venting Sash Width** = (window width ÷ 2) − 4.226" (107) **Total Sash Width** = window width − 8.410" (214) **Height** = window height − 6.250" (159)

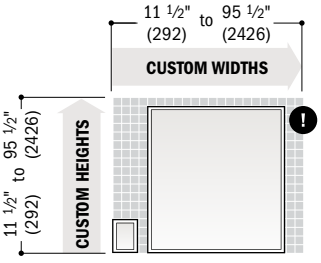
Active-Stationary-Active (XOX) 1:2:1 Sash Ratio

Clear Opening	**Width** = (window width ÷ 4) − 2.976" (76) **Height** = window height − 3.500" (89)	**Minimum R.O.**	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Vent Opening	**Width** = (window width ÷ 2) − 5.952" (151) **Height** = window height − 3.500" (89)	**Unobst. Glass**	**Fixed Sash Width** = (window width ÷ 2) − 1.868" (47) **Venting Sash Width** = (window width ÷ 4) − 4.351" (111) **Total Sash Width** = window width − 10.570" (268) **Height** = window height − 6.250" (159)

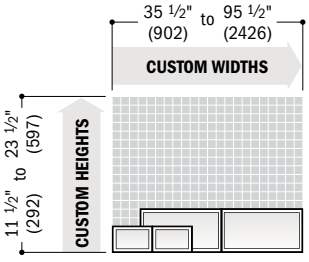
Active-Stationary-Active (XOX) 1:1:1 Equal Sash Ratio

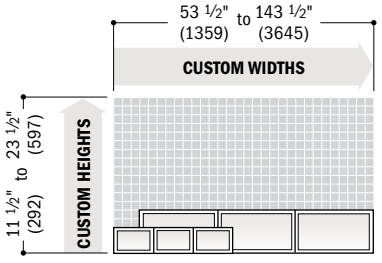
Clear Opening	**Width** = (window width ÷ 3) − 5.164" (131) **Height** = window height − 3.500" (89)	**Minimum R.O.**	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Vent Opening	**Width** = (window width ÷ 3) − 5.164" (131) **Height** = window height − 3.500" (89)	**Unobst. Glass**	**Fixed Sash Width** = (window width ÷ 3) − 3.496" (89) **Venting Sash Width** = (window width ÷ 3) − 3.537" (90) **Total Sash Width** = window width − 10.570" (268) **Height** = window height − 6.250" (159)

Picture and Transom Windows



! Either height or width must be 71 1/2" (1816) or less.





Triple transom windows with unequal sash are not available in custom sizes.

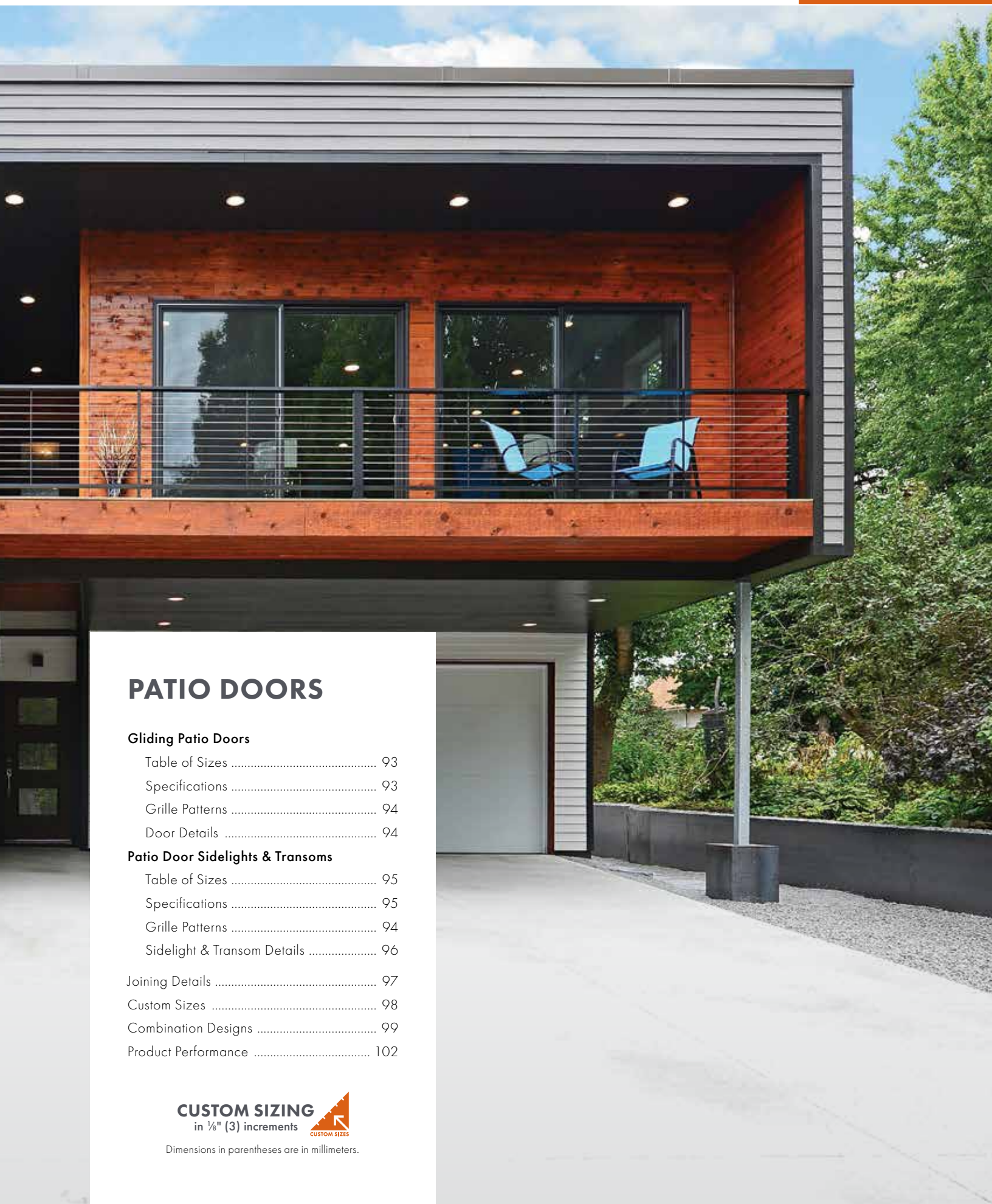
Picture and Single Transom

Minimum R.O.	**Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Unobst. Glass	**Width** = window width − 6.250" (159) **Height** = window height − 6.250" (159)

Twin and Triple Transom

Minimum R.O.	**Twin** **Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)	**Triple** **Width** = window width + 1/2" (13) **Height** = window height + 1/2" (13)
Unobst. Glass	**Twin** **Single Sash Width** = (window width ÷ 2) − 6.500" (165) **Total Sash Width** = window width − 13.000" (330) **Height** = window height − 6.250" (159)	**Triple** **Single Sash Width** = (window width ÷ 3) − 6.583" (167) **Total Sash Width** = window width − 19.750" (502) **Height** = window height − 6.250" (159)

• **Clear Opening** formulas provide dimensions for determining area available for egress. **Vent Opening** formulas provide dimensions for determining area available for passage of air. **Minimum R.O.** (minimum rough opening) formulas provide minimum rough opening width and height dimensions. **Unobst. Glass** (unobstructed glass) formulas provide dimensions for determining area available for passage of light.
• Dimensions in parentheses are in millimeters.



PATIO DOORS

CUSTOM SIZING
in ⅛" (3) increments

CUSTOM SIZES

Dimensions in parentheses are in millimeters.

FEATURES

GLIDING PATIO DOORS

FRAME

Ⓐ The frame is constructed with Fibrex® composite material. This construction produces a rigid frame.

Ⓑ Durable, low-maintenance finish won't fade, flake, blister or peel.*

Factory-assembled doors arrive at the job site ready to install.

Ⓒ Dual felt weatherstrip, applied on the inside pocket of both side jambs and the head jamb, creates a positive seal between the frame and panels. The result is a long-lasting,* energy-efficient barrier against wind, water and dust.

A full-length combination weatherstrip/interlock system provides a flexible seal at the meeting stile.

Three frame options include:

- 1 3/8" (35) flange setback for siding applications. An integral rigid vinyl flange helps seal the unit to the structure.
- 1" (25) flange setback with stucco key. An integral rigid vinyl flange helps seal the unit to the structure.
- No-flange option for door replacement in an existing framed opening.

PANEL

Ⓓ Fibrex material construction provides long-lasting performance.* The panel, finished with a durable capping, provides maximum protection and a matte, low-maintenance finish.

Ⓔ Dual corrosion-resistant* ball-bearing rollers on the operating door panel provide smooth operation with self-contained leveling adjusters. The rollers have deep grooves to increase engagement with the roller track and resist lateral movement. Metal reinforcement inserted into the panel stiles provides additional stability.

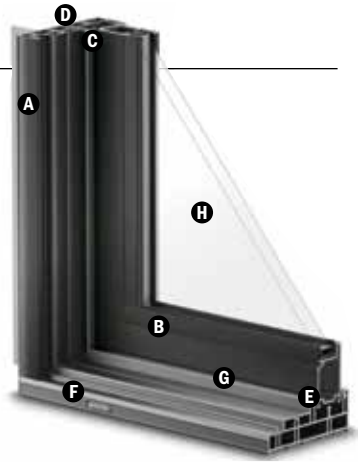
SILL

Ⓕ The one-piece sill design with weep holes located on the sill exterior provides superior water management. The heavy-gauge PVC construction is wear resistant and neutral gray in color.

Ⓖ The roller track has a stainless steel cap that resists denting for smooth, reliable operation.

GLASS

A glazing bead and silicone provide superior weathertightness and durability.



Ⓗ High-Performance options include:

- Low-E SmartSun™ tempered glass
- Low-E SmartSun HeatLock® tempered glass
- Low-E tempered glass
- Low-E HeatLock tempered glass
- Low-E Sun tempered glass
- Low-E PassiveSun® tempered glass
- Low-E PassiveSun HeatLock tempered glass
- Clear Dual-Pane tempered glass

Additional glass options are available. Contact your Andersen supplier.

A removable translucent film helps shield the glass from damage during delivery and construction, and simplifies finishing at the job site.

Patterned Glass

Patterned glass options are available. See page 12 for more details.

Glass Spacers

Glass spacers are now available in black, in addition to stainless steel, to provide more ways to customize project designs and achieve a contemporary look. (E-Series window is shown above.)

HARDWARE

Locking System

A two-point locking system engages a steel receiver plate that's secured into the side jamb. This provides enhanced security and a weathertight seal, with the operating panel pulled tightly into the jamb.

COLOR OPTIONS

EXTERIOR COLORS

White | Sandtone | Terratone | Dark Bronze | Black

INTERIOR COLORS

White | Sandtone** | Dark Bronze** | Black**

HARDWARE

Standard Handle

TULSA

Exterior handle matches the door's exterior color. Interior handle matches the door's interior color. Dark bronze exterior and white interior shown.

Optional Handle

AFTON

Antique Brass | Black
Bright Brass | **Satin Nickel**

Bold name denotes finish shown.

AFTON HARDWARE FINISHES

Antique Brass | Black | Bright Brass | Satin Nickel

Finishes shown are for Afton hardware only.

ACCESSORIES Sold Separately

HARDWARE

Auxiliary Foot Lock

Provides an extra measure of security when the door is in a locked position. Available in colors that coordinate with the interior.

GRILLES

Grilles are available in a variety of configurations. See page 13 for details.

INSECT SCREENS

Insect screens have charcoal gray fiberglass screen mesh. The latch mechanism is contained within the insect screen handle for easy operation. Frames are available in colors to match the door exterior.

SIDELIGHTS & TRANSOMS

Patio door sidelights and transoms are available. See pages 95-96.

*Visit andersenwindows.com/warranty for details.
**Products with Sandtone, dark bronze and black interiors have matching exteriors.
Dimensions in parentheses are in millimeters.
Printing limitations prevent exact replication of colors and finishes.
See your Andersen supplier for actual color and finish samples.

Patio Door Heights

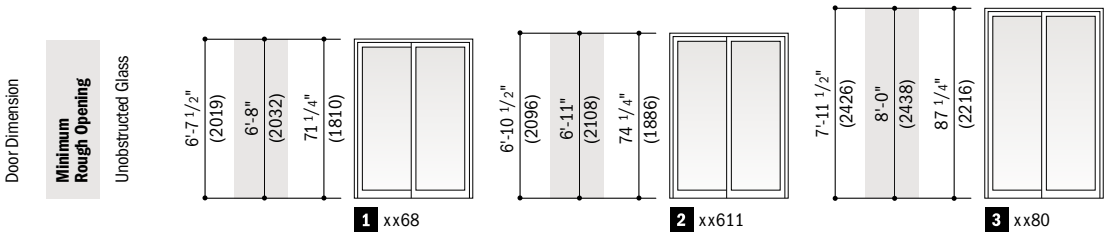
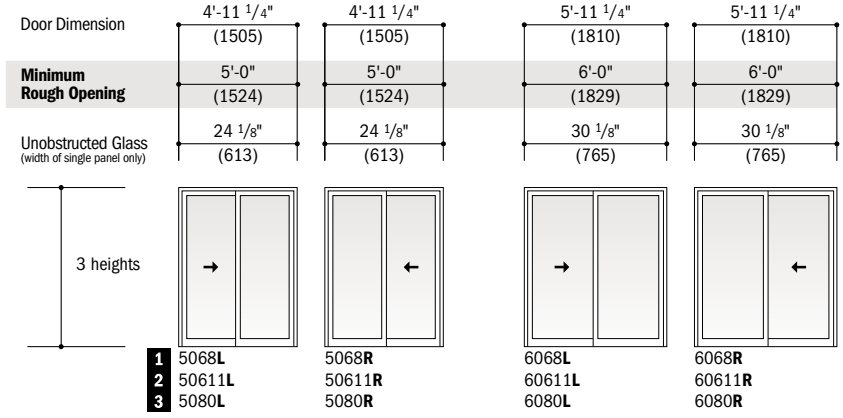
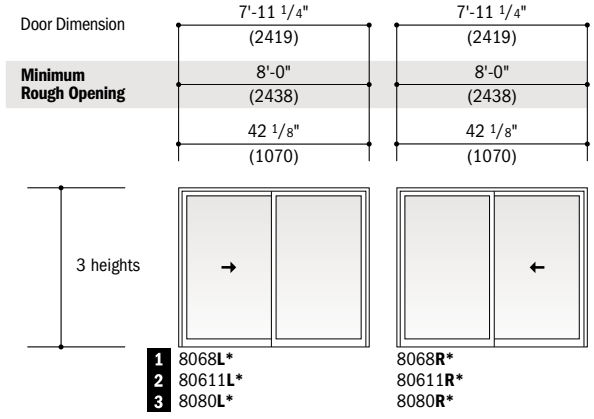


Table of Gliding Patio Doors Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96





- "Door Dimension" always refers to outside frame-to-frame dimension.
- **"Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

*Meets or exceed a 32" (813) clear opening width.

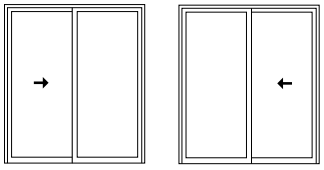
Custom-size patio doors are available in 1/8" (3) increments. See page 98 for custom sizes and specifications.

Arrow indicates direction of panel operation as viewed from the exterior. Details and grille patterns shown on page 94.

To meet or exceed a clear opening width of 32" (813), select a door width that requires a rough opening width of 6'-6" (1981) or greater.

Order Designation Description

Viewed from the exterior.



Gliding Patio Door Opening and Area Specifications

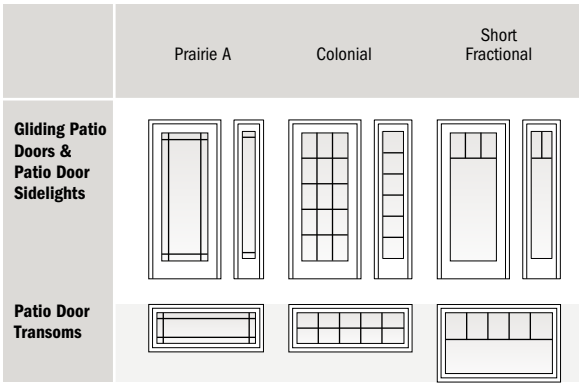
Door Number	Clear Opening Area* Sq. Ft./(m²)	Clear Opening in Full Open Position: Width* Inches/(mm)	Clear Opening in Full Open Position: Height Inches/(mm)	Glass Area Sq. Ft./(m²)	Vent Area* Sq. Ft./(m²)	Overall Door Area Sq. Ft./(m²)
5068	12.38 (1.15)	23 1/2" (597)	75 7/8" (1927)	23.87 (2.22)	12.38 (1.15)	32.71 (3.04)
6068	15.54 (1.44)	29 1/2" (749)	75 7/8" (1927)	31.27 (2.91)	15.54 (1.44)	39.34 (3.65)
8068	21.87 (2.03)	41 1/2" (1054)	75 7/8" (1927)	43.14 (4.01)	21.87 (2.03)	52.59 (4.89)
50611	12.87 (1.20)	23 1/2" (597)	78 7/8" (2003)	52.79 (4.90)	12.87 (1.20)	33.95 (3.15)
60611	16.16 (1.50)	29 1/2" (749)	78 7/8" (2003)	32.58 (3.03)	16.16 (1.50)	40.82 (3.79)
80611	22.73 (2.11)	41 1/2" (1054)	78 7/8" (2003)	44.96 (4.18)	22.73 (2.11)	54.57 (5.07)
5080	14.99 (1.39)	23 1/2" (597)	91 7/8" (2334)	31.02 (2.88)	14.99 (1.39)	39.29 (3.65)
6080	18.82 (1.75)	29 1/2" (749)	91 7/8" (2334)	38.29 (3.56)	18.82 (1.75)	47.25 (4.39)
8080	26.48 (2.46)	41 1/2" (1054)	91 7/8" (2334)	52.83 (4.91)	26.48 (2.46)	63.17 (5.87)

- Dimensions in parentheses are in millimeters or square meters.

*For doors with Tulsa hardware only. Contact your Andersen supplier for doors with Afton hardware.

GLIDING PATIO DOORS

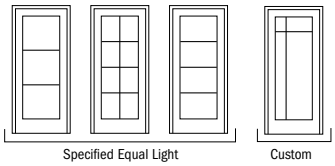
Grille Patterns



Number of lights and overall pattern varies with door size. Patterns shown may not be available for all sizes. Specified equal light and custom patterns are also available.

For specified equal light, specify number of same-size rectangles across or down.

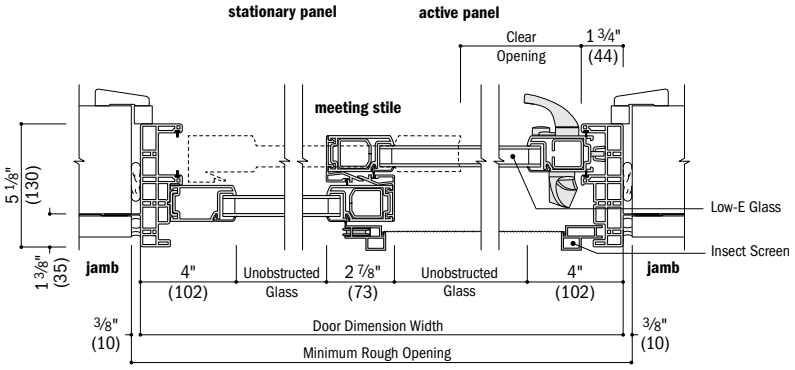
For more information on divided light, see page 13 or visit **andersenwindows.com/grilles**.



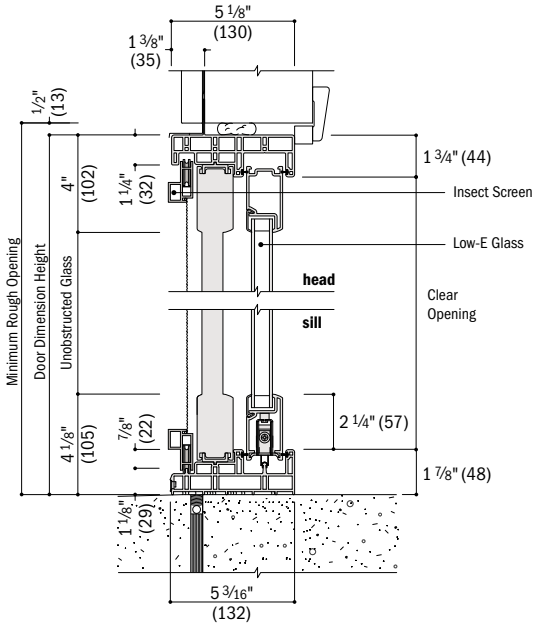
Gliding Patio Door Details

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

1 3/8" flange setback

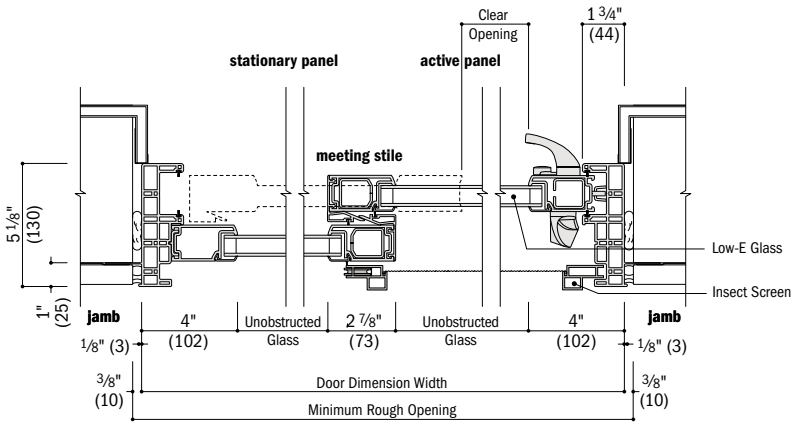


Horizontal Section

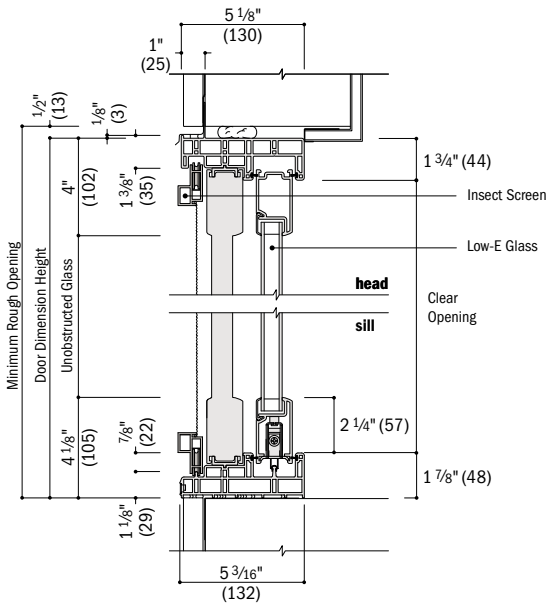


Vertical Section

1" flange setback with stucco key



Horizontal Section
Stucco Exterior



Vertical Section
Stucco Exterior

See page 97 for joining details.

- Drip cap is required to complete door installation as shown but may not be included with the door. Use of drip cap is recommended for proper installation.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

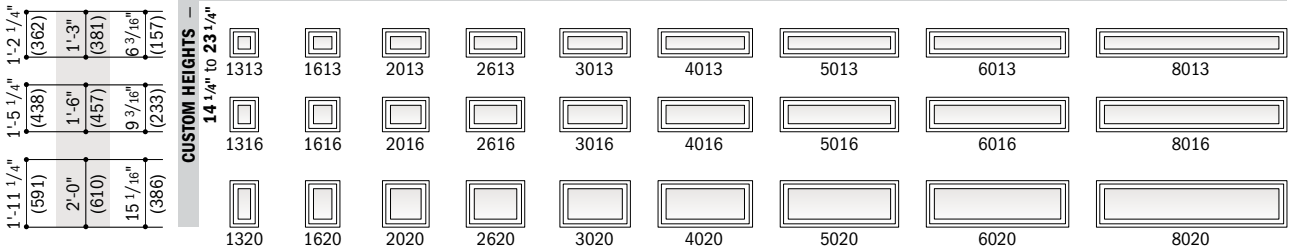
Table of Patio Door Transom and Sidelight Sizes

Scale 1/8" (3) = 1'-0" (305) – 1:96

Transom/Sidelight Dimension	1'-2 1/4" (362)	1'-5 1/4" (438)	1'-11 1/4" (591)	2'-5 1/4" (743)	2'-11 1/4" (895)	3'-11 1/4" (1200)	4'-11 1/4" (1505)	5'-11 1/4" (1810)	7'-11 1/4" (2419)
Minimum Rough Opening	1'-3" (381)	1'-6" (457)	2'-0" (610)	2'-6" (762)	3'-0" (914)	4'-0" (1219)	5'-0" (1524)	6'-0" (1829)	8'-0" (2438)
Unobstructed Glass	6 3/16" (157)	9 3/16" (233)	15 3/16" (386)	21 3/16" (538)	27 3/16" (691)	39 3/16" (995)	51 3/16" (1300)	63 3/16" (1605)	87 3/16" (2215)

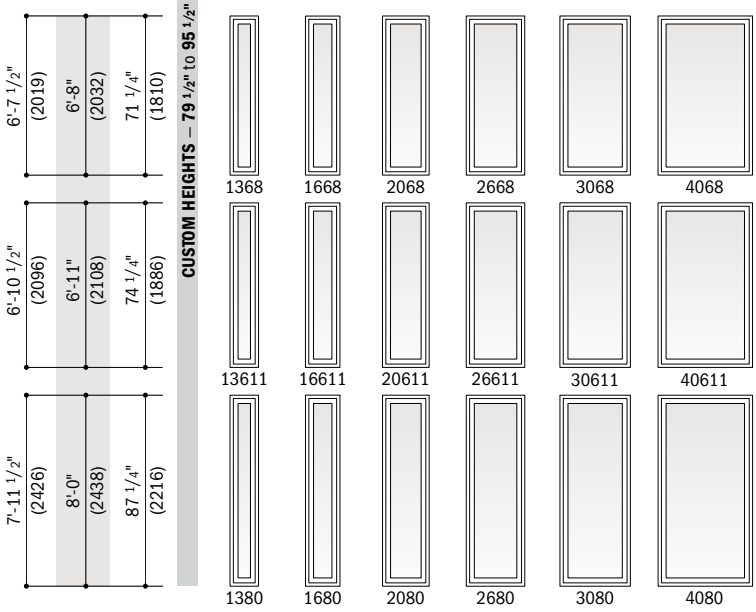
CUSTOM WIDTHS – 14 1/4" to 95 1/4"

CUSTOM HEIGHTS – 14 1/4" to 23 1/4"



CUSTOM WIDTHS – 14 1/4" to 47 1/4"

CUSTOM HEIGHTS – 79 1/2" to 95 1/2"



Custom-size doors are available in 1/8" (3) increments.

See page 98 for custom sizes and specifications.

Details shown on page 96.

Grille patterns shown on page 94.

- "Transom/Sidelight Dimension" always refers to outside frame-to-frame dimension.
- **"Minimum Rough Opening" dimensions may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See page 110 for more details.**
- Dimensions in parentheses are in millimeters.

Patio Door Sidelight Area Specifications

Sidelight Number	Glass Area Sq. Ft./(m²)	Overall Window Area Sq. Ft./(m²)
1368	3.06 (0.28)	7.87 (0.73)
13611	3.19 (0.30)	8.16 (0.76)
1380	3.75 (0.35)	9.45 (0.88)
1668	4.55 (0.42)	9.52 (0.88)
16611	4.74 (0.44)	9.88 (0.92)
1680	5.57 (0.52)	11.44 (1.06)
2068	7.51 (0.70)	12.84 (1.19)
20611	7.83 (0.73)	13.32 (1.24)
2080	9.20 (0.85)	15.42 (1.43)
2668	10.48 (0.97)	16.15 (1.50)
26611	10.92 (1.01)	16.76 (1.56)
2680	12.84 (1.19)	19.40 (1.80)
3068	13.45 (1.25)	19.46 (1.81)
30611	14.02 (1.30)	20.20 (1.88)
3080	16.47 (1.53)	23.38 (2.17)
4068	19.39 (1.80)	26.09 (2.42)
40611	20.21 (1.88)	27.07 (2.51)
4080	23.74 (2.21)	31.34 (2.91)

- Dimensions in parentheses are in square meters.

Patio Door Transom Area Specifications

Transom Number	Glass Area Sq. Ft./(m²)	Overall Window Area Sq. Ft./(m²)
1313	0.27 (0.03)	1.41 (0.13)
1316	0.40 (0.04)	1.71 (0.16)
1320	0.65 (0.06)	2.30 (0.21)
1613	0.40 (0.04)	1.71 (0.16)
1616	0.59 (0.05)	2.07 (0.19)
1620	0.97 (0.09)	2.79 (0.26)
2013	0.65 (0.06)	2.30 (0.21)
2016	0.97 (0.09)	2.79 (0.26)
2020	1.61 (0.15)	3.75 (0.35)
2613	0.91 (0.09)	2.90 (0.27)
2616	1.35 (0.13)	3.50 (0.33)
2620	2.24 (0.21)	4.72 (0.44)
3013	1.17 (0.11)	3.49 (0.32)
3016	1.74 (0.16)	4.22 (0.39)
3020	2.87 (0.27)	5.69 (0.53)
4013	1.69 (0.16)	4.68 (0.43)
4016	2.50 (0.23)	5.66 (0.53)
4020	4.13 (0.39)	7.63 (0.71)

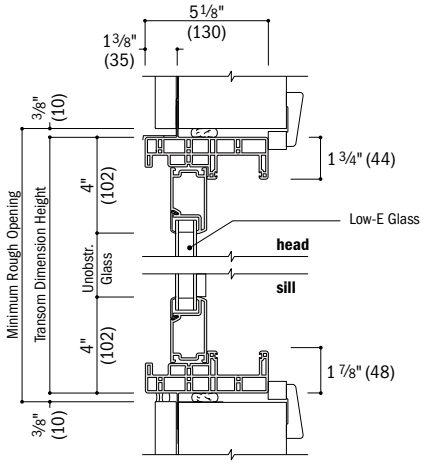
Transom Number	Glass Area Sq. Ft./(m²)	Overall Window Area Sq. Ft./(m²)
5013	2.20 (0.20)	5.86 (0.55)
5016	3.27 (0.30)	7.10 (0.66)
5020	5.40 (0.50)	9.57 (0.89)
6013	2.72 (0.25)	7.05 (0.66)
6016	4.03 (0.38)	8.54 (0.79)
6020	6.67 (0.62)	11.50 (1.07)
8013	3.75 (0.35)	9.43 (0.88)
8016	5.56 (0.52)	11.41 (1.06)
8020	9.20 (0.85)	15.38 (1.43)

- Dimensions in parentheses are in square meters.

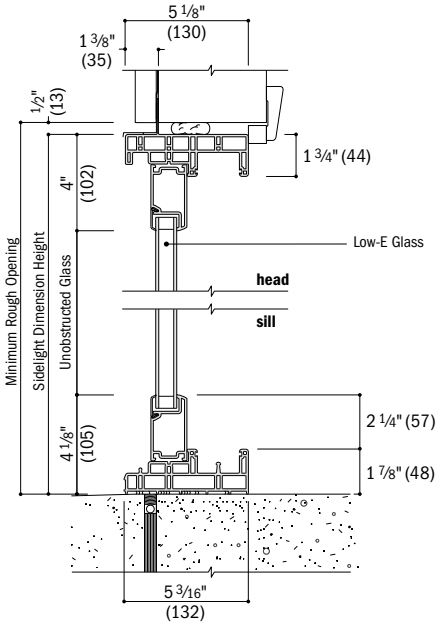
Patio Door Sidelight and Transom Details

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

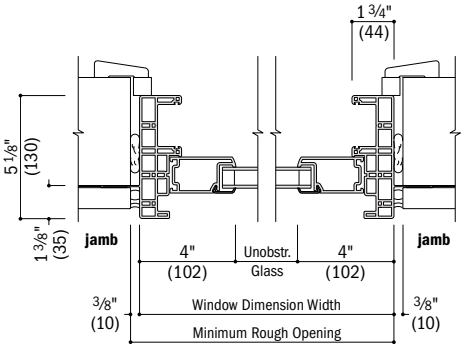
1 3/8" flange setback



Vertical Section
Patio Door Transom

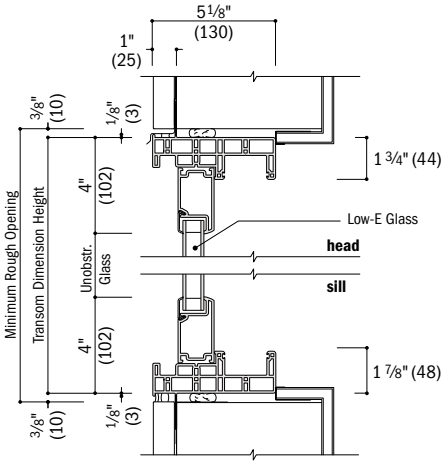


Vertical Section
Patio Door Sidelight

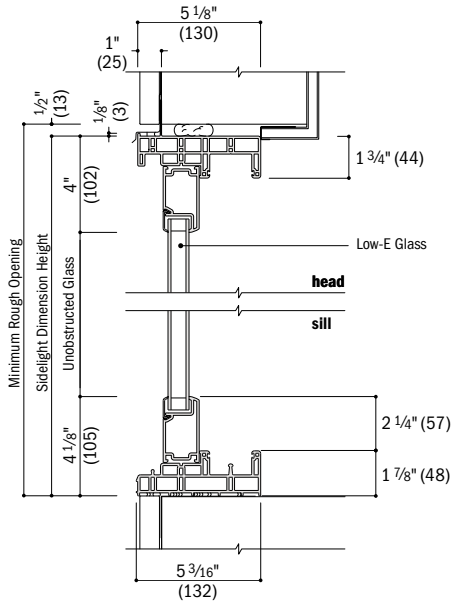


Horizontal Section
Patio Door Sidelight/Transom

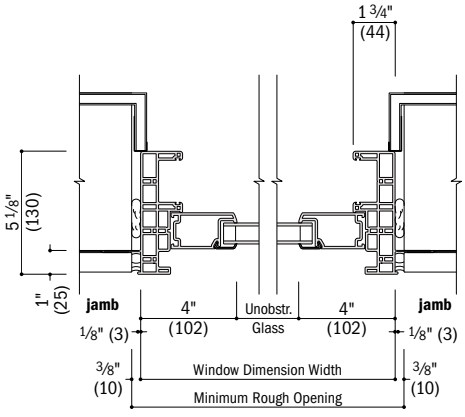
1" flange setback with stucco key



Vertical Section
Patio Door Transom – Stucco Exterior



Vertical Section
Patio Door Sidelight – Stucco Exterior



Horizontal Section
Patio Door Sidelight/Transom – Stucco Exterior

See page 97 for joining details.

- Drip cap is required to complete sidelight and transom installation as shown, but may not be included with the sidelight and transom. Use of drip cap is recommended for proper installation.
- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Dimensions in parentheses are in millimeters.

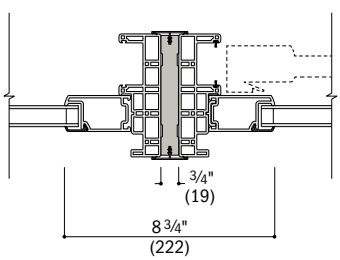
Vertical (ribbon) Joining Details

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

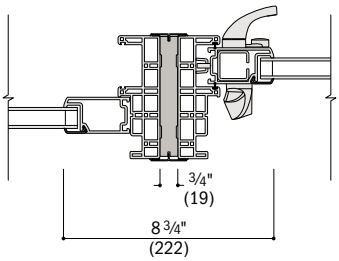
Overall Door-Sidelight or Sidelight-Sidelight Dimension Width – Sum of individual door-sidelight or sidelight-sidelight widths plus 3/4" (19).

Overall Minimum Rough Opening Width – Overall dimension width plus 3/4" (19).

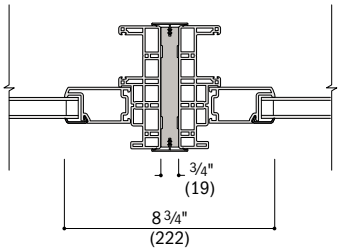
The addition of joining materials will affect the overall rough opening dimension. See page 110.



Patio Door Sidelight to Gliding Patio Door
(Patio Door Stationary Jamb)



Patio Door Sidelight to Gliding Patio Door
(Patio Door Operating Jamb)

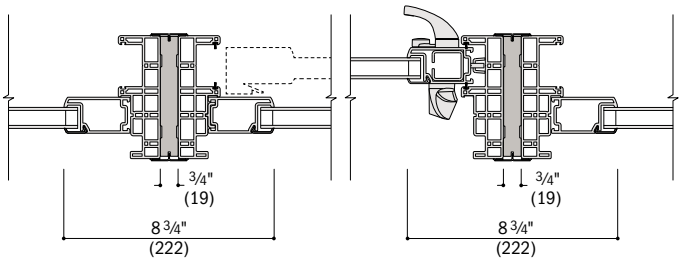


Patio Door Sidelight to Patio Door Sidelight

Overall Sidelight-Door-Sidelight Dimension Width – Sum of individual sidelight-door-sidelight widths plus 1 1/2" (38).

Overall Minimum Rough Opening Width – Overall dimension width plus 3/4" (19).

The addition of joining materials will affect the overall rough opening dimension. See page 110.



Patio Door Sidelight to Gliding Patio Door to Patio Door Sidelight
(Patio Door Stationary Jamb – Patio Door Operating Jamb)

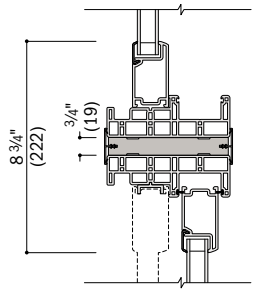
Horizontal (stack) Joining Details

Scale 1 1/2" (38) = 1'-0" (305) – 1:8

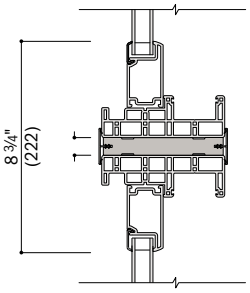
Overall Transom/Door or Transom/Sidelight Dimension Height – Sum of individual transom/door or transom/sidelight heights plus 3/4" (19).

Overall Minimum Rough Opening Height – Overall dimension height plus 1/2" (13).

The addition of joining materials will affect the overall rough opening dimension. See page 110.



Patio Door Transom Over Gliding Patio Door



Patio Door Transom Over Patio Door Sidelight

For more information on joining, refer to the combination designs section starting on page 99.

- **Minimum rough openings may need to be increased to allow for use of building wraps, flashing, sill panning, brackets, fasteners or other items. See installation information on page 110.**
- Details are for illustration only and are not intended to represent product installation methods or materials. Refer to product installation instructions at andersenwindows.com.
- Structural performance of any combination is only as high as the lowest structural performance of any individual unit or join in the combination.
- Contact your Andersen supplier for information on meeting wind load requirements for patio door joined combinations.

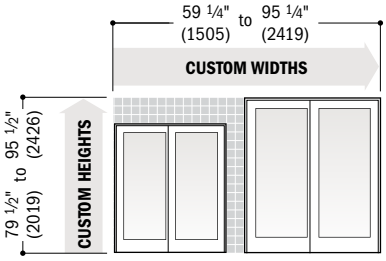
PATIO DOOR CUSTOM SIZES

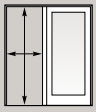
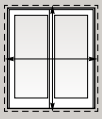
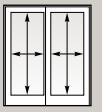
Custom Sizes and Specification Formulas

100 Series custom-size patio doors and patio door sidelights and transoms are available in 1/8" (3) increments between minimum and maximum widths and heights shown. Some restrictions apply.

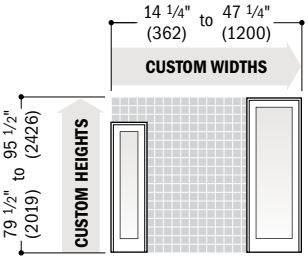
To meet or exceed a clear opening width of 32" (813), select a custom-size door width that requires a rough opening width of 6'-6" (1981) or greater.

Gliding Patio Doors



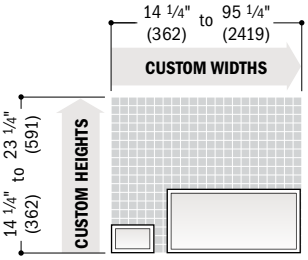
Clear Opening 	**Width** = (door width ÷ 2) − 6.125" (156) **Height** = door height − 3.625" (92)	**Minimum R.O.** 	**Width** = door width + 3/4" (19) **Height** = door height + 1/2" (13)	**Unobst. Glass** 	**Single-Panel** **Width** = (door width ÷ 2) − 5.500" (140) **Two-Panel** **Width** = door width − 11.000" (279) **Height** = door height − 8.250" (210)

Patio Door Sidelights



Minimum R.O. 	**Width** = sidelight width + 3/4" (19) **Height** = sidelight height + 1/2" (13)	**Unobst. Glass** 	**Width** = sidelight width − 8.048" (204) **Height** = sidelight height − 8.048" (204)

Patio Door Transoms



Minimum R.O. 	**Width** = transom width + 3/4" (19) **Height** = transom height + 3/4" (19)	**Unobst. Glass** 	**Width** = transom width − 8.048" (204) **Height** = transom height − 8.048" (204)

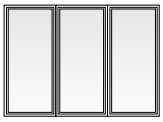
• **Clear Opening** formulas provide dimensions for determining area available for egress. Vent opening, or area available for passage of air, is equal to clear opening. **Minimum R.O.** (minimum rough opening) formulas provide minimum rough opening width and height dimensions. **Unobst. Glass** (unobstructed glass) formulas provide dimensions for determining area available for passage of light.
• Dimensions in parentheses are in millimeters.

Andersen® window and patio doors make it easy to create a wide variety of combination designs

Combination Types

Ribbons are horizontal window combinations (vertical joins) where opposite ends (head and sill) of individual windows are fastened to the building structure. Stacks are vertical window combinations (horizontal joins) where opposite sides (both side jambs) of individual windows are fastened to the building structure. One-way configurations or two-way configurations are used in combination designs.

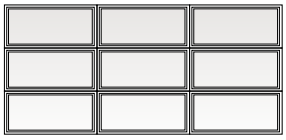
One-Way



Ribbon Combination

Stack Combination

Two-Way



Multiple Ribbon/Stack Combination

Two-way combinations exist when multiple vertical stacks and horizontal ribbons are joined together. Unlike one-way combinations, the adjacent sides (head and sill, or both side jambs) of individual units are not necessarily fastened directly to the building structure. Two-way combinations are joined with both vertical and horizontal joining material, and may require reinforced joining materials and brackets depending on the local building code requirement for design wind load (measured in pounds per square foot, psf).

Determining Design Wind Load Performance

Proper combination design in conformance with local wind load requirements is vital to the success of your project. To make sure a combination is safe and that it complies with local building codes, the combination design wind load performance capacity must be determined. Correctly determining this performance capacity involves the following three steps:

STEP 1: Determine Building Code Requirement

Make sure you have the proper local codes and have identified specified compliance values. This calculated value (psf) will be used to determine if the combination will be acceptable (STEP 3).

STEP 2: Determine Product Performance

Compare product Design Pressure Rating data to the local building code (psf) requirement. This will show whether the individual units in a combination design are acceptable.

STEP 3: Determine Combination Performance

This step helps determine whether a given product, size, configuration and joining material type will meet the local building code design wind load requirement. To determine what joining material type to use (non-reinforced or reinforced), compare the local building code design wind load requirement to the design wind load table value for a particular joining material on the following pages.

For a successful installation, designed to provide the required design pressure, it is important that Andersen joining materials and installation accessories be specified by a project architect or contractor. Andersen joining materials create a joining system that maintains the look of Andersen® products without sacrificing performance. Check with your Andersen supplier for more information.

The addition of joining materials will affect the overall rough opening dimension. See page 110. **Instruction guides are available at andersenwindows.com. Read and follow instruction guides in their entirety.**

Andersen Trim and End Caps – Interior trim is included with each joining kit for finishing the join on the interior. Exterior trim strip and trim strip end caps are included with each kit for finishing the exterior join.

Materials vary depending on type of units being joined and wind load requirements. Non-reinforced joining materials are used to create alignment and positive joining between windows. Joining materials are not connected to the rough opening structure.

Reinforced joining materials are used to create product alignment, positive joining and load transfer between the Andersen windows and doors and the rough opening. They provide added strength capable of withstanding a variety of wind load pressures. The structural performance of any combination is only as high as the lowest structural performance rating of any individual window or joining material in the combination.

Please contact your Andersen supplier for specific performance and product recommendations.

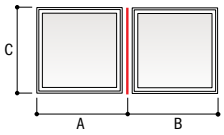
COMBINATION DESIGNS

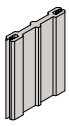
1-Way Non-Reinforced Fiberglass Joining

100 Series Windows: Picture to Picture, Casement to Casement, Awning to Awning, Casement to Picture, Awning to Picture

Applicable for flanged or flangeless installations into wood, metal, concrete or masonry.

Average Adjacent Window Dimension								
	(A + B) ÷ 2 = **6'-0"** (1829)	50	50	43	37	32	29	26
	(A + B) ÷ 2 = **5'-6"** (1676)	50	50	44	38	33	30	27
	(A + B) ÷ 2 = **5'-0"** (1524)	50	50	45	39	35	31	28
	(A + B) ÷ 2 = **4'-6"** (1372)	50	50	46	41	36	33	30
	(A + B) ÷ 2 = **4'-0"** (1219)	50	50	49	43	39	35	32
	(A + B) ÷ 2 = **3'-6"** (1067)	50	50	50	47	42	39	36
	(A + B) ÷ 2 = **3'-0"** (914)	50	50	50	50	47	43	40
	(A + B) ÷ 2 = **2'-6"** (762)	50	50	50	50	50	50	46
	(A + B) ÷ 2 = **2'-0"** (610)	50	50	50	50	50	50	50
	C = (length of join)	**5'-0"** (1524)	**5'-6"** (1676)	**6'-0"** (1829)	**6'-6"** (1981)	**7'-0"** (2134)	**7'-6"** (2286)	**8'-0"** (2438)





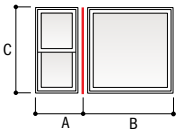
½" (13) x 3 ¼" (83)
Fiberglass Joining Material

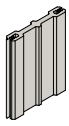
1-Way Non-Reinforced Fiberglass Joining

100 Series Windows: Single-Hung to Picture, Gliding to Picture

Applicable for flanged or flangeless installations into wood, metal, concrete or masonry.

Avg. Adjacent Window Dim.								
	(A + B) ÷ 2 = **5'-0"** (1524)	50	50	45	39	35	31	28
	(A + B) ÷ 2 = **4'-6"** (1372)	50	50	46	41	36	33	30
	(A + B) ÷ 2 = **4'-0"** (1219)	50	50	49	43	39	35	32
	(A + B) ÷ 2 = **3'-6"** (1067)	50	50	50	47	42	39	36
	(A + B) ÷ 2 = **3'-0"** (914)	50	50	50	50	47	43	40
	(A + B) ÷ 2 = **2'-6"** (762)	50	50	50	50	50	50	46
	(A + B) ÷ 2 = **2'-0"** (610)	50	50	50	50	50	50	50
	C = (length of join)	**5'-0"** (1524)	**5'-6"** (1676)	**6'-0"** (1829)	**6'-6"** (1981)	**7'-0"** (2134)	**7'-6"** (2286)	**8'-0"** (2438)





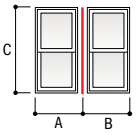
½" (13) x 3 ¼" (83)
Fiberglass Joining Material

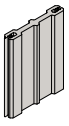
1-Way Non-Reinforced Fiberglass Joining

100 Series Windows: Single-Hung to Single-Hung, Gliding to Gliding, Single-Hung to Casement, Single-Hung to Awning

Applicable for flanged or flangeless installations into wood, metal, concrete or masonry.

Avg. Adj. Window Dim.								
	(A + B) ÷ 2 = **4'-0"** (1219)	50	50	49	43	39	34	30
	(A + B) ÷ 2 = **3'-6"** (1067)	50	50	50	47	42	38	33
	(A + B) ÷ 2 = **3'-0"** (914)	50	50	50	50	47	43	38
	(A + B) ÷ 2 = **2'-6"** (762)	50	50	50	50	50	50	45
	(A + B) ÷ 2 = **2'-0"** (610)	50	50	50	50	50	50	50
	C = (length of join)	**5'-0"** (1524)	**5'-6"** (1676)	**6'-0"** (1829)	**6'-6"** (1981)	**7'-0"** (2134)	**7'-6"** (2286)	**8'-0"** (2438)





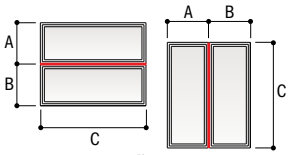
½" (13) x 3 ¼" (83)
Fiberglass Joining Material

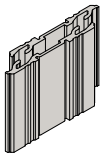
- Numerical values in charts represent structural pressure only.
- Structural performance of any combination is only as high as the lowest structural performance of any individual unit or joining material in the combination.
- Andersen® products must be installed and anchored properly according to joining and installation guides to meet rated structural performance. Refer to product joining and installation guides at andersenwindows.com.
- Single transom windows use "picture" frame type. Integral transom windows use "single-hung" frame type. Combination performance should be determined accordingly.
- Dimensions in parentheses are in millimeters.

1-Way Reinforced Fiberglass Joining

100 Series Windows: Casement, Awning, Picture, Single-Hung, Gliding

Applicable for flanged or flangeless installations into wood, metal, concrete or masonry.





¾" (19) x 5 ⅛" (130) Fiberglass Joining Material
For 4 9/16" (116) wall depths.

Average Adjacent Window Dimension	C = (length of join)	2'-0" (610)	2'-6" (762)	3'-0" (914)	3'-6" (1067)	4'-0" (1219)	4'-6" (1372)	5'-0" (1524)	5'-6" (1676)	6'-0" (1829)	6'-6" (1981)	7'-0" (2134)	7'-6" (2286)	8'-0" (2438)	8'-6" (2591)	9'-0" (2743)	9'-6" (2896)	10'-0" (3048)	10'-6" (3200)	11'-0" (3353)	11'-6" (3505)	12'-0" (3658)
(A + B) ÷ 2 = **8'-0"** (2438)		50	50	50	50	50	50	50	50	50	50	50										
(A + B) ÷ 2 = **7'-6"** (2286)		50	50	50	50	50	50	50	50	50	50	50										
(A + B) ÷ 2 = **7'-0"** (2134)		50	50	50	50	50	50	50	50	50	50	50										
(A + B) ÷ 2 = **6'-6"** (1981)		50	50	50	50	50	50	50	50	50	50	50										
(A + B) ÷ 2 = **6'-0"** (1829)		50	50	50	50	50	50	50	50	50	50	50	50	50								
(A + B) ÷ 2 = **5'-6"** (1676)		50	50	50	50	50	50	50	50	50	50	50	50	50								
(A + B) ÷ 2 = **5'-0"** (1524)		50	50	50	50	50	50	50	50	50	50	50	50	50								
(A + B) ÷ 2 = **4'-6"** (1372)		50	50	50	50	50	50	50	50	50	50	50	50	50								
(A + B) ÷ 2 = **4'-0"** (1219)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	37	35	28	27
(A + B) ÷ 2 = **3'-9"** (1372)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	42	40	30	28
(A + B) ÷ 2 = **3'-6"** (1067)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	44	42	32	30
(A + B) ÷ 2 = **3'-0"** (914)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	36	34
(A + B) ÷ 2 = **2'-6"** (762)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	42	40
(A + B) ÷ 2 = **2'-0"** (610)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(A + B) ÷ 2 = **1'-6"** (457)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50

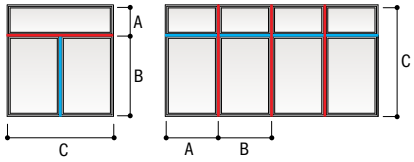
2-Way Reinforced Fiberglass Joining*

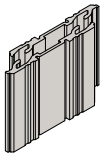
100 Series Windows: Casement, Awning, Picture, Single-Hung, Gliding

Applicable for flanged or flangeless installations into wood, metal, concrete or masonry.

Average Adjacent Window Dimension	C = (length of join)	2'-0" (610)	2'-6" (762)	3'-0" (914)	3'-6" (1067)	4'-0" (1219)	4'-6" (1372)	5'-0" (1524)	5'-6" (1676)	6'-0" (1829)	6'-6" (1981)	7'-0" (2134)	7'-6" (2286)	8'-0" (2438)	8'-6" (2591)	9'-0" (2743)	9'-6" (2896)	10'-0" (3048)	10'-6" (3200)	11'-0" (3353)	11'-6" (3505)	12'-0" (3658)
(A + B) ÷ 2 = **6'-0"** (1829)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	44	40	26	23	21	20
(A + B) ÷ 2 = **5'-6"** (1676)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	43	28	26	23	21
(A + B) ÷ 2 = **5'-0"** (1524)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	32	30	26	24
(A + B) ÷ 2 = **4'-6"** (1372)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	36	33	27	25
(A + B) ÷ 2 = **4'-0"** (1219)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	41	37	30	28
(A + B) ÷ 2 = **3'-9"** (1372)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	43	40	32	30
(A + B) ÷ 2 = **3'-6"** (1067)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	42	35	32
(A + B) ÷ 2 = **3'-0"** (914)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	40	37
(A + B) ÷ 2 = **2'-6"** (762)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	43	40
(A + B) ÷ 2 = **2'-0"** (610)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(A + B) ÷ 2 = **1'-6"** (457)		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50

Red lines represent reinforced joins.
Blue lines represent non-reinforced joins.

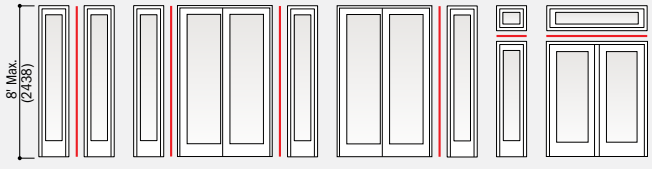




¾" (19) x 5 ⅛" (130) Fiberglass Joining Material
For 4 9/16" (116) wall depths.

1-Way LVL Joining

100 Series Patio Doors: Gliding Patio Doors, Patio Door Sidelights and Transoms



Maximum design pressure 30 psf

Field joining only.

- Numerical values in charts represent structural pressure only.
- Structural performance of any combination is only as high as the lowest structural performance of any individual unit or joining material in the combination.
- Andersen® products must be installed and anchored properly according to joining and installation guides to meet rated structural performance. Refer to product joining and installation guides at andersenwindows.com.
- Single transom windows use "picture" frame type. Integral transom windows use "single-hung" frame type. Combination performance should be determined accordingly.
- Performance of 2-way combinations may be limited by non-reinforced joins 6' (1829) or greater in length. Verify performance of non-reinforced joins within 2-way combinations using the appropriate non-reinforced joining table.

*All 2-way joining requires both non-reinforced and reinforced elements. Intersecting reinforced or non-reinforced joints are not available.

- Dimensions in parentheses are in millimeters.

Andersen® 100 Series Window and Patio Door Altitude Limits

The chart below gives the altitude limit in feet for 100 Series products in this catalog. If the installation of a given product is at an altitude greater than that shown in this chart, a capillary breather tube must be ordered. Be aware that the use of a capillary breather tube eliminates argon gas blend fill and will result in a slightly lower thermal performance (approximately 0.02 increase in window U-Factor). For NFRC certified total unit performance on units with capillary breather tubes for higher altitude applications, please visit **andersenwindows.com/nfrc**.

The use of dual-pane insulating glass without capillary breather tubes at altitudes higher than its rating will result in severe glass distortion, increased glass breakage potential and a risk for seal failure.

Smaller windows are most affected by altitude changes. An increase in altitude results in a decrease in atmospheric pressure. A sealed insulating glass unit attempts to combat this change by increasing its volume to reduce its pressure. One way to increase its volume is by glass deflection. A smaller window is stiffer and does not deflect as much as a larger window; therefore, it cannot relieve the pressure as readily. Thus, the load applied to the glass is greater, resulting in a greater risk for breakage. Another way the window tries to increase its volume is by increasing the edge area; i.e., the seal area. The increased pressure applied to the edge seal load for a smaller window is therefore greater, increasing the chance for seal failure.

Andersen® Product	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000
100 Series Casement Windows		1620 1650 1626 1656 1630 1660 1636 1640 1646	2020 2050 2026 2056 2030 2060 2036 2620 2040 3020 2046	2660	2626 2656 2630 3026 2636 2640 2646 2650	3056 3060	3030 3036 3040 3046 3050	
100 Series Awning Windows		1616 2016 4016 1620 2616 1626 3016 1630 3616	2020 3020 2026 3620 2030 4020 2620		2626 4026 2630 3026 3626		3030 3630 4030	
100 Series Single-Hung Windows	1620 2020 2620 3020 3620 4020	1626 1666 3030 1630 1670 3626 1636 1676 3630 1640 2026 4026 1646 2030 4030 1650 2626 1656 2630 1660 3026	2036 2076 2040 2636 2046 3036 2050 3636 2056 4036 2060 2066 2070	2640 3040 3640 4040	2646 3646 2650 4046 2656 2660 2666 2670 2676 3046	3050 3650 4050	3056 3060 3066 3070 3076 3656 4056	3660 3666 3670 3676 4060 4066 4070 4076
100 Series Gliding Windows – Active-Stationary or Stationary-Active	2010 2056 4016 2016 2060 4610 2020 2610 4616 2026 2616 5010 2030 3010 5016 2036 3016 5610 2040 3610 5616 2046 3616 6010 2050 4010 6016	2620 3020 3620 2626 3026 4020 2630 3030 4620 2636 3036 5020 2640 3040 5620 2646 3046 6020 2650 3050 2656 3056 2660 3060	3626 4626 3630 5026 3636 5626 3640 6026 3646 3650 3656 3660 4026	4030 4036 4040 4046 4050 4056 4060	4630 5630 4636 6030 4640 4646 4650 4656 4660 5030 5060	5036 5040 5046 5050 5056 5656 5660	5636 5640 5646 5650 6036 6050 6056 6060	6040 6046
100 Series Gliding Windows – Active-Stationary-Active		5016 6020 5020 6026 5026 6030 5030 7016 5036 7616 5040 8016 5046 8616 5050 9016 5056 10016 5060 11016 6016 12016	6036 8020 6040 8620 6046 9020 6050 10020 6056 11020 6060 12020 7020 7026 7030 7036 7620	7040 8040 7046 7050 7056 7060 7626 7630 7636 8026 8030 8036	7640 8636 7646 8640 7650 9026 7656 9030 7660 9036 8046 9040 8050 9046 8056 10026 8060 11026 8626 12026 8630	8646 8650 8656 8660 10030 10036 10040 10046 10050 11056	9050 12056 9056 12060 9060 10060 11030 11036 11040 11046 11050 12030 12050	10056 11060 12036 12040 12046
100 Series Picture, Transom and Specialty Windows	1010 5610 1016 6010 1020 6610 1026 7010 1030 7610 1036 8010 1040 1046 1050 1056 1060 1066 1070 1076 1080 1610 2010 2610 3010 3610 4010 4610 5010	1616 2060 7016 1620 2066 7020 1626 2070 7616 1630 2076 7620 1636 2080 8016 1640 2616 8020 1646 2620 1650 3016 1656 3020 1660 3616 1666 3620 1670 4016 1676 4020 1680 4616 2016 4620 2020 5016 2026 5020 2030 5616 2036 5620 2040 6016 2046 6020 2050 6616 2056 6620	2626 2630 2636 2640 2646 2650 2656 2660 2666 2670 2676 2680 3026 3626 4026 4626 5026 5626 6026 6626 7026 7626 8026		3030 3036 3040 3046 3050 3056 3060 3066 3070 3076 3080 3630 4030 4630 5030 5630 6030 6630 7030 7630 8030		3636 3640 3646 3650 3656 3660 3666 3670 3676 3680 4036 4636 5036 5636 6036 6636 7036 7636 8036	4040 5066 6646 4046 5070 6650 4050 5076 6656 4056 5080 6660 4060 5640 7040 4066 5646 7046 4070 5650 7050 4076 5656 7056 4080 5660 7060 4640 5666 7640 4646 5670 7646 4650 5676 7650 4656 5680 7656 4660 6040 7660 4666 6046 8040 4670 6050 8046 4676 6055 8050 4680 6060 8056 5040 6066 8060 5046 6070 5050 6076 5056 6080 5060 6640
100 Series Gliding Patio Doors								5068 6068 8068 50611 60611 80611 5080 6080 8080
100 Series Patio Door Sidelights	1368 13611 1380	1668 16611 1680				2068 20611 2080		2668 3068 4068 26611 30611 40611 2680 3080 4080
100 Series Patio Door Transoms	1313 2016 5013 1316 2613 5016 1320 2616 6013 1613 3013 6016 1616 3016 8013 1620 4013 8016 2013 4016	2020 2620 3020 4020 5020 6020 8020						

- Deflection of glass will occur on units with larger glass areas.
- Altitude limits for patio doors shown in two-panel configurations. These limits also qualify for same size panels used in single panel configurations.
- **Contact your Andersen supplier for altitude limits for custom-sized windows and doors.**
- For NFRC ratings of units with capillary breather tubes, visit andersenwindows.com.

PERFORMANCE STANDARDS

The Window and Door Manufacturers Association (WDMA), the American Architectural Manufacturers Association (AAMA) and the Canadian Standards Association (CSA) jointly release the North American Fenestration Standard/Specification for Windows, Doors and Skylights (NAFS-11) where "-11" refers to the most recent publication year of 2011. NAFS is also referred to as AAMA/WDMA/CSA 101/I.S.2/A440, which is how the International Code Council (ICC) lists this standard in the 2012, 2015 and 2018 International Residential Code (IRC) and International Building Code (IBC) as the means to indicate the window, door or skylights design pressure rating used to determine compliance to the job site design pressure requirements.

A product only achieves a "Performance Grade" or "PG" rating when it complies with all of the NAFS performance requirements such as ease of operation, air infiltration resistance, resistance to water penetration and resistance to forced entry, etc. A "Design Pressure Rating" or "DP" rating only depicts the design and structural load performance.

Performance Classes

The NAFS Standard/Specification defines requirements for four performance classes. Performance classes are designated R, LC, CW and AW. This classification system provides for several levels of performance. Product selection is always based on the performance and building code requirements of the particular project.

Elements of Performance Grade (PG) Designations

In order to qualify for a given performance grade (PG), test specimens need to pass all required performance tests for the following, in addition to all required auxiliary (durability) and applicable material/component tests (not shown here) for the applicable product type and desired performance class:

(a) Operating force (if applicable): Maximum operating force varies by product type and performance class.

(b) Air leakage resistance: Tested in accordance with ASTM E283 at a test pressure of 1.57 psf. Allowable air infiltration for R, LC and CW class designations is 0.3 cubic feet per minute per square foot of frame (cfm/ft^2).

(c) Water penetration resistance: Tested in accordance with ASTM E547 with the specified test pressure applied per NAFS-11. Test consists of four cycles. Each cycle consists of five minutes with pressure applied and one minute with the pressure released, during which the water spray is continuously applied. Water spray shall be uniformly applied at a constant rate of 5 U.S. gal/ft^2 · hr.

(d) Uniform load deflection test: Tested in accordance with ASTM E330 for both positive and negative pressure (pressure defined by NAFS-11) with the load maintained for a period of 10 seconds. The test specimen shall be evaluated for deflection during each load for permanent damage after each load and for any effects on the normal operation of the specimen. *Starting with the 2008 version of NAFS, design pressure (DP) will only represent the "uniform load deflection test."*

(e) Uniform load structural test: Tested in accordance with ASTM E330 for both positive and negative pressure (pressure defined by NAFS-11) with the load maintained for a period of 10 seconds. After loads are removed, there shall be no permanent deformation in excess of 0.4% of its span and no damage to the unit, which would make it inoperable.

(f) Forced-entry resistance (if applicable): Tested in accordance with ASTM F588 (windows), F476 (swinging doors) and F842 (sliding doors) at a performance level 10 rating.

Performance Grades (PG) and Corresponding Test Pressures (psf)

Performance Class/ Performance Grade		Air Infiltration Test Pressure		Maximum Allowable Air Infiltration/ Exfiltration Rate		Water Penetration Resistance Test Pressure		Design Pressure		Structural Test Pressure	
R	LC	Pa	psf	L/s·m^2	cfm/ft^2	Pa	psf	Pa	psf	Pa	psf
15	-	75	1.57	1.5	0.30	140	2.92	720	15.04	1080	22.56
20	-	75	1.57	1.5	0.30	150	3.13	960	20.05	1440	30.08
25	25	75	1.57	1.5	0.30	180	3.76	1200	25.06	1800	37.59
30	30	75	1.57	1.5	0.30	220	4.59	1440	30.08	2160	45.11
35	35	75	1.57	1.5	0.30	260	5.43	1680	35.09	2520	52.63
40	40	75	1.57	1.5	0.30	290	6.06	1920	40.10	2880	60.15
45	45	75	1.57	1.5	0.30	330	6.89	2160	45.11	3240	67.67
50	50	75	1.57	1.5	0.30	360	7.52	2400	50.13	3600	75.19
55	55	75	1.57	1.5	0.30	400	8.35	2640	55.14	3960	82.71
60	60	75	1.57	1.5	0.30	440	9.19	2880	60.15	4320	90.23
65	65	75	1.57	1.5	0.30	470	9.82	3120	65.16	4680	97.74
70	70	75	1.57	1.5	0.30	510	10.65	3360	70.18	5040	105.26
75	75	75	1.57	1.5	0.30	540	11.28	3600	75.19	5400	112.78
80	80	75	1.57	1.5	0.30	580	12.11	3840	80.20	5760	120.30
85	85	75	1.57	1.5	0.30	580	12.11	4080	85.21	6120	127.82
90	90	75	1.57	1.5	0.30	580	12.11	4320	90.23	6480	135.34
95	95	75	1.57	1.5	0.30	580	12.11	4560	95.24	6840	142.86
100	100	75	1.57	1.5	0.30	580	12.11	4800	100.25	7200	150.38

HALLMARK CERTIFICATION

The Window and Door Manufacturers Association (WDMA)-sponsored Hallmark Certification Program provides manufacturers with certification to the AAMA/WDMA/CSA 101/I.S.2/A440-11 Standard and is designed to provide builders, architects, specifiers and consumers with an easily recognizable means of identifying products that have been manufactured and tested in accordance with NAFS (AAMA/WDMA/CSA 101/I.S.2/A440) industry standards and other applicable performance standards. Conformance is determined by periodic in-plant inspections by a third-party administrator. Inspections include auditing licensee quality control procedures and processes, and a review to confirm products are manufactured in accordance with the appropriate performance standards. Periodic testing of representative product constructions and components by an independent testing laboratory is also required. When all of the program requirements are met, the licensee is authorized to use the WDMA Hallmark registered logo on their certification label as a means of identifying products and their performance ratings.

Products successfully obtaining Hallmark Certification will be labeled with a three-part code, which includes performance class, performance grade and size tested. In addition to this mandatory requirement, you are allowed to list the design pressure on a separate line.

WINDOW & DOOR MANUFACTURERS ASSOCIATION WDMA Hallmark Certified www.wdma.com	Andersen Corporation 100 SERIES CASEMENT WINDOW Manufacturer stipulates certification as indicated below.
STANDARD	RATING
AAMA/WDMA/CSA 101/I.S.2/A440-11	Class LC(1) – PG40(2) – Size Tested 71.5 x 71.5 in.(3) DP+40/-45(4)
AAMA/WDMA/CSA 101/I.S.2/A440-08	Class LC(1) – PG40(2) – Size Tested 71.5 x 71.5 in.(3) DP+40/-45(4)

(1) – Performance Class

(2) – Performance Grade

(3) – Size Tested

(4) – Design Pressure

In the example above, the performance class is LC, the performance grade (PG) is 40 pounds per square foot (psf) and the size tested is 71.5" x 71.5". What this means to the specifier is, based on the performance grade chart, the laboratory-tested air infiltration was less than 0.3 cfm/ft^2 (test pressure is always 1.57 psf and the allowable airflow is 0.3 cfm/ft^2), the product tested successfully resisted a laboratory water penetration test at a test pressure of 6.0 psf, the product tested successfully withstood a laboratory positive test pressure of 60 psf and a laboratory negative test pressure of 67 psf, and the product tested passed the laboratory requirements for operational force and forced-entry resistance. Based on this test, all products of the same design that are smaller than the tested size can be labeled with this product performance rating.

IMPORTANT

Building codes prescribe design pressure based on a variety of criteria (i.e., windspeed zone, building height, building type, job site exposure, etc.). Design pressures derived from Performance Grade (PG) test requirements should be used to determine compliance to building code required design pressures. Structural test pressures, which are tested at 1.5 times the design pressure, should **not** be used for determining design pressure code compliance. In the example above, a PG 40 performance grade rating, which passes a 40 psf design pressure, should be used for determining code compliance, not the structural test pressure of 60 psf.

If you need further details about how Andersen® products perform to this standard, contact your Andersen supplier.

If you need further information about the AAMA/WDMA/CSA 101/I.S.2/A440-11 standard or the Hallmark Certification Program, please contact: WDMA, 2001 K Street NW, 3rd Floor North, Washington, D.C. 20006. Phone: 202-367-1157 Website: **wdma.com**

Where designated, Andersen products are tested, certified and labeled to the requirements of the Hallmark Certification Program. Actual performance may vary based on variations in manufacturing, shipping, installation, environmental conditions and conditions of use.

Performance Grade, Sound Transmission and Air Infiltration Ratings — 100 Series Windows and Patio Doors

For current performance information, please visit **andersenwindows.com**.

Andersen® Product	AAMA/WDMA/CSA 101/I.S.2/A440 Performance Grade (PG)	+/- Corresponding Design Pressure (DP)	STANDARD GLASS		STC UPGRADE GLASS		Air Infiltration CFM/FT²
			Sound Transmission Class (STC)	Outdoor/Indoor Transmission Class (OITC)	Sound Transmission Class (STC)	Outdoor/Indoor Transmission Class (OITC)	
Casement Windows							
Single and Twin (venting/stationary)	Class LC-PG40 Size Tested 71.5" x 71.5"	40/45	30	25	33	28	< 0.2
Single and Twin, PG Upgrade (venting/stationary)	Class LC-PG50 Size Tested 71.5" x 71.5"	50/50*	30	25	33	28	< 0.2
Picture With Flanking Casements	Class LC-PG40 Size Tested 143.5" x 71.5"	40/40	-	-	-	-	< 0.2
Picture With Flanking Casements, PG Upgrade	Class LC-PG50 Size Tested 143.5" x 65.5"	50/50*	-	-	-	-	< 0.2
Awning Windows							
Single and Twin (venting/stationary)	Class LC-PG40 Size Tested 47.5" x 95.5"	40/45	30	25	33	28	< 0.2
Single and Twin, PG Upgrade (venting/stationary)	Class LC-PG50 Size Tested 47.5" x 95.5"	50/50*	30	25	33	28	< 0.2
Picture Over Awning	Class LC-PG40 Size Tested 47.5" x 95.5"	40/45	-	-	-	-	< 0.2
Picture Over Awning, PG Upgrade	Class LC-PG50 Size Tested 47.5" x 95.5"	50/50*	-	-	-	-	< 0.2
Single-Hung Windows							
Arch Single-Hung	Class LC-PG30 Size Tested 41.5" x 95.0"	30/30	-	-	-	-	< 0.2
Arch Single-Hung, PG Upgrade	Class LC-PG50 Size Tested 41.5" x 83.0"	50/50*	-	-	-	-	< 0.2
Single-Hung	Class LC-PG30 Size Tested 47.5" x 89.5"	30/30	28	23	32	26	< 0.2
Single-Hung, PG Upgrade	Class LC-PG50 Size Tested 47.5" x 77.5"	50/50*	28	23	32	26	< 0.2
Twin and Triple Single-Hung	Class LC-PG30 Size Tested 143.5" x 71.5"	30/30	-	-	-	-	< 0.2
Twin and Triple Single-Hung, PG Upgrade	Class LC-PG50 Size Tested 143.5" x 65.5"	50/50*	-	-	-	-	< 0.2
Transom Over Single-Hung	Class LC-PG30 Size Tested 47.5" x 95.5"	30/30	-	-	-	-	< 0.2
Transom Over Single-Hung, PG Upgrade	Class LC-PG50 Size Tested 47.5" x 95.5"	50/50*	-	-	-	-	< 0.2
Picture With Flanking Single-Hungs	Class LC-PG30 Size Tested 143.5" x 71.5"	30/30	-	-	-	-	< 0.2
Picture With Flanking Single-Hungs, PG Upgrade	Class LC-PG50 Size Tested 143.5" x 59.5"	50/50*	-	-	-	-	< 0.2
Gliding Windows							
Gliding - Active-Stationary or Stationary-Active	Class LC-PG30 Size Tested 71.5" x 71.5"	30/30	28	23	32	27	< 0.2
Gliding, PG Upgrade - Active-Stationary or Stationary-Active	Class LC-PG50 Size Tested 71.5" x 59.5"	50/50*	28	23	32	27	< 0.2
Picture over Gliding - Active-Stationary or Stationary-Active	Class LC-PG30 Size Tested 59.5" x 83.5"	30/30	-	-	-	-	< 0.2
Gliding - Active-Stationary-Active	Class LC-PG30 Size Tested 143.5" x 71.5"	30/30	-	-	-	-	< 0.2
Gliding, PG Upgrade - Active-Stationary-Active	Class LC-PG50 Size Tested 101.5" x 59.5"	50/50*	-	-	-	-	< 0.2
Picture over Gliding - Active-Stationary-Active	Class LC-PG30 Size Tested 107.5" x 83.5"	30/30	-	-	-	-	< 0.2
Picture, Transom & Specialty Windows							
Picture, Transom and Specialty Windows	Class LC-PG40 Size Tested 95.5" x 84.3"	40/40	29	24	32	27	< 0.2
Picture, Transom and Specialty Windows, PG Upgrade	Class LC-PG50 Size Tested 95.5" x 71.5"	50/50*	29	24	32	27	< 0.2
Gliding Patio Doors	Class LC-PG30 Size Tested 95.3" x 95.5"	30/30	28	23	29	26	< 0.2
Patio Door Sidelights	Class LC-PG30 Size Tested 47.3" x 95.3"	30/30	29	24	31	26	< 0.2
Patio Door Transoms	Class LC-PG30 Size Tested 95.3" x 23.3"	30/30	29	24	31	26	< 0.2

- "Performance Grade (PG)" ratings may vary from tested performance rating for larger or smaller units of a particular type.
- "Sound Transmission Class (STC)" and "Outdoor/Indoor Transmission Class (OITC)" ratings are for individual units with 3 mm glass based on independent tests and represent entire unit.
- This data is accurate as of January 2022. Due to ongoing product changes, updated test results, or new industry standards, this data may change over time.
- Where designated, Andersen products are certified and labeled to the requirements of the Hallmark Certification Program. Actual performance may vary based on variations in manufacturing, shipping, installation, environmental conditions and conditions of use.
- Contact your Andersen supplier for more information.

*Available for select sizes. Contact your Andersen supplier.

Andersen® Products Total Unit Recycled Content Percentages

For current performance information, please visit **andersenwindows.com**.

Andersen Product	% Pre-Consumer Recycled Content
100 Series Windows & Patio Doors	
Casement Window	23%
Awning Window	24%
Single-Hung Window	20%
Gliding Window	21%
Picture Window	18%
Gliding Patio Door	14%
Patio Door Sidelight	18%
Patio Door Transom	21%

- "% Pre-Consumer Recycled Content" is calculated to meet ISO 14021 standards based on NFRC sizing. Actual recycled content dependent on product size.

Center of Glass Performance Data — 100 Series Windows and Patio Doors

For current performance information, please visit **andersenwindows.com**.

Andersen® Product & Glass Type	VT[1]	SC[2]	SHGC[3]	RHG[4]	Fading Tuv[5]	Fading Tdw[6]	%RH @ center[7]	IGST[8]
Low-E Glass								
Casement, Awning, Single-Hung and Gliding Windows	72%	0.48	0.41	98.2	16%	33%	61%	55.7
Picture, Transom and Specialty Windows	72%	0.47	0.41	97.5	16%	33%	60%	55.3
Gliding Patio Doors	72%	0.47	0.41	97.5	16%	33%	60%	55.3
Patio Door Sidelights and Transoms	72%	0.47	0.41	97.5	16%	33%	60%	55.3
Low-E SmartSun™ Glass								
Casement, Awning, Single-Hung and Gliding Windows	65%	0.31	0.27	65.6	5%	21%	62%	56.1
Picture, Transom and Specialty Windows	65%	0.31	0.27	64.9	5%	21%	61%	55.7
Gliding Patio Doors	65%	0.31	0.27	64.9	5%	21%	61%	55.7
Patio Door Sidelights and Transoms	65%	0.31	0.27	64.9	5%	21%	61%	55.7
Low-E Sun Glass								
Casement, Awning, Single-Hung and Gliding Windows	40%	0.29	0.25	61.1	16%	24%	60%	55.4
Picture, Transom and Specialty Windows	40%	0.29	0.25	60.4	16%	24%	59%	55.0
Gliding Patio Doors	40%	0.29	0.25	60.4	16%	24%	59%	55.0
Patio Door Sidelights and Transoms	40%	0.29	0.25	60.4	16%	24%	59%	55.0
Low-E PassiveSun® Glass								
Casement, Awning, Single-Hung and Gliding Windows	79%	0.79	0.69	161.0	29%	42%	60%	55.1
Picture, Transom and Specialty Windows	79%	0.79	0.69	161.0	29%	42%	59%	54.7
Gliding Patio Doors	79%	0.79	0.69	161.0	29%	42%	59%	54.7
Patio Door Sidelights and Transoms	79%	0.79	0.69	161.0	29%	42%	59%	54.7
Clear Dual-Pane Glass								
Casement, Awning, Single-Hung and Gliding Windows	82%	0.89	0.78	186	58%	61%	39%	43.7
Picture, Transom and Specialty Windows	82%	0.89	0.78	186	58%	61%	39%	43.6
Gliding Patio Doors	82%	0.89	0.78	186	58%	61%	39%	43.6
Patio Door Sidelights and Transoms	82%	0.89	0.78	186	58%	61%	39%	43.6

• Based on NFRC testing/simulation conditions using Windows v7.4.6.0 and NFRC validated spectral data. 0°F outside temperature, 70°F inside temperature and a 15 mph wind. 1) Visible Transmittance (VT) measures how much light comes through the glass. The higher the value, from 0 to 1, the more daylight the glass lets in. Visible Transmittance is measured over the 380 to 760 nanometer portion of the solar spectrum. 2) Shading Coefficient (SC) defines the amount of heat gain through the glass compared to a single light of clear 1/8" (3) glass. 3) Solar Heat Gain Coefficient (SHGC) defines the fraction of solar radiation admitted through the glass directly transmitted, as well as absorbed and subsequently released inward. The lower the value, the less heat is transmitted through the product. 4) Relative Heat Gain (RHG) is the amount of heat gain through a glazing incorporating U-Factor and Solar Heat Gain Coefficient. 5) Transmission Ultra-Violet Energy (Tuv). The transmission of short-wave energy in the 300-380 nanometer portion of the solar spectrum. The energy can cause fabric fading. 6) Transmission Damage Function (Tdw). The transmission of UV and visible light energy in the 300-600 nanometer portion of the solar spectrum. The value includes both the UV and visible light energy that can cause fabric fading. This rating has also been referred to as the Krochmann Damage Function. This rating better predicts fading potential than UV transmission alone. The lower the Damage Function rating, the less transmission of short-wave energy through the glass that can potentially cause fabric fading. Fabric type is also a key component of fading potential. 7) Percent relative humidity before condensation occurs at the center of glass, taken using center of glass temperature. 8) Inside glass surface temperatures are taken at the center of glass.

• This data is accurate as of January 2022. Due to ongoing product changes, updated test results or new industry standards, this data may change over time. Contact your Andersen supplier for current performance information or upgrade options.

• Contact your Andersen supplier for center of glass performance data on windows with patterned glass, tempered glass and products ordered with capillary breather tubes.

Andersen® NFRC Certified Total Unit Performance

For current performance information, please visit **andersenwindows.com**.

Refer to notes on page 106 for important information on performance data.

Andersen Product	High-Performance Dual-Pane Glass Type		U-Factor[1]	SHGC[2]	VT[3]
100 Series Casement Windows AND-N-84 2.2 mm glass	Low-E	Without Grilles	0.28	0.28	0.48
		Simulated Divided Light Grilles	0.28	0.25	0.43
		Finelight™ Grilles	0.28	0.25	0.43
		Finelight With Exterior Applied Grilles	0.28	0.25	0.43
		Full Divided Light Grilles	0.29	0.25	0.43
	Low-E w/HeatLock™	Without Grilles	0.24	0.27	0.47
		Simulated Divided Light Grilles	0.24	0.25	0.42
		Finelight Grilles	0.24	0.25	0.42
		Finelight With Exterior Applied Grilles	0.24	0.25	0.42
		Full Divided Light Grilles	0.26	0.25	0.42
	Low-E SmartSun™	Without Grilles	0.27	0.18	0.43
		Simulated Divided Light Grilles	0.27	0.17	0.39
		Finelight Grilles	0.27	0.17	0.39
		Finelight With Exterior Applied Grilles	0.27	0.17	0.39
		Full Divided Light Grilles	0.28	0.17	0.39
	Low-E SmartSun w/HeatLock	Without Grilles	0.24	0.18	0.42
		Simulated Divided Light Grilles	0.24	0.16	0.38
		Finelight Grilles	0.24	0.16	0.38
		Finelight With Exterior Applied Grilles	0.24	0.16	0.38
		Full Divided Light Grilles	0.25	0.16	0.38
	Low-E Sun	Without Grilles	0.28	0.17	0.26
		Simulated Divided Light Grilles	0.28	0.16	0.24
		Finelight Grilles	0.28	0.16	0.24
		Finelight With Exterior Applied Grilles	0.28	0.16	0.24
		Full Divided Light Grilles	0.29	0.16	0.24
	Low-E PassiveSun®	Without Grilles	0.28	0.46	0.53
		Simulated Divided Light Grilles	0.28	0.42	0.47
		Finelight Grilles	0.28	0.42	0.47
		Finelight With Exterior Applied Grilles	0.28	0.42	0.47
		Full Divided Light Grilles	0.29	0.42	0.47
	Clear Dual-Pane	Without Grilles	0.41	0.52	0.55
		Simulated Divided Light Grilles	0.41	0.48	0.49
		Finelight Grilles	0.41	0.48	0.49
		Finelight With Exterior Applied Grilles	0.41	0.48	0.49
		Full Divided Light Grilles	0.42	0.48	0.49

Andersen Product	High-Performance Dual-Pane Glass Type		U-Factor[1]	SHGC[2]	VT[3]
100 Series Awning Windows AND-N-85 2.2 mm glass	Low-E	Without Grilles	0.28	0.28	0.48
		Simulated Divided Light Grilles	0.28	0.25	0.43
		Finelight™ Grilles	0.28	0.25	0.43
		Finelight With Exterior Applied Grilles	0.28	0.25	0.43
		Full Divided Light Grilles	0.29	0.25	0.43
	Low-E w/HeatLock™	Without Grilles	0.25	0.27	0.47
		Simulated Divided Light Grilles	0.25	0.25	0.42
		Finelight Grilles	0.25	0.25	0.42
		Finelight With Exterior Applied Grilles	0.25	0.25	0.42
		Full Divided Light Grilles	0.26	0.25	0.42
	Low-E SmartSun™	Without Grilles	0.27	0.18	0.43
		Simulated Divided Light Grilles	0.27	0.17	0.39
		Finelight Grilles	0.27	0.17	0.39
		Finelight With Exterior Applied Grilles	0.27	0.17	0.39
		Full Divided Light Grilles	0.28	0.17	0.39
	Low-E SmartSun w/HeatLock	Without Grilles	0.24	0.18	0.42
		Simulated Divided Light Grilles	0.24	0.16	0.38
		Finelight Grilles	0.24	0.16	0.38
		Finelight With Exterior Applied Grilles	0.24	0.16	0.38
		Full Divided Light Grilles	0.26	0.16	0.38
	Low-E Sun	Without Grilles	0.28	0.17	0.26
		Simulated Divided Light Grilles	0.28	0.16	0.24
		Finelight Grilles	0.28	0.16	0.24
		Finelight With Exterior Applied Grilles	0.28	0.16	0.24
		Full Divided Light Grilles	0.29	0.16	0.24
	Low-E PassiveSun®	Without Grilles	0.28	0.46	0.53
		Simulated Divided Light Grilles	0.28	0.42	0.47
		Finelight Grilles	0.28	0.42	0.47
		Finelight With Exterior Applied Grilles	0.28	0.42	0.47
		Full Divided Light Grilles	0.29	0.42	0.47
	Clear Dual-Pane	Without Grilles	0.42	0.52	0.55
		Simulated Divided Light Grilles	0.42	0.48	0.49
		Finelight Grilles	0.42	0.48	0.49
		Finelight With Exterior Applied Grilles	0.42	0.48	0.49
		Full Divided Light Grilles	0.42	0.48	0.49

• This data is accurate as of January 2022. Due to ongoing product changes, updated test results, or new industry standards or requirements, this data may change over time.
Ratings are for sizes specified by NFRC for testing and certification. Ratings may vary depending on use of tempered glass, different grille options, glass for high altitudes, etc.

continued on next page

Andersen® NFRC Certified Total Unit Performance *(continued)*

For current performance information, please visit **andersenwindows.com**.

Andersen Product	High-Performance Dual-Pane Glass Type		U-Factor[1]	SHGC[2]	VT[3]
100 Series Single-Hung Windows AND-N-80 2.2 mm glass	Low-E	Without Grilles	0.30	0.31	0.54
		Simulated Divided Light Grilles	0.30	0.28	0.48
		Finelight™ Grilles	0.30	0.28	0.48
		Finelight With Exterior Applied Grilles	0.30	0.28	0.48
		Full Divided Light Grilles	0.31	0.28	0.48
	Low-E w/HeatLock™	Without Grilles	0.26	0.31	0.53
		Simulated Divided Light Grilles	0.26	0.28	0.47
		Finelight Grilles	0.26	0.28	0.47
		Finelight With Exterior Applied Grilles	0.26	0.28	0.47
		Full Divided Light Grilles	0.28	0.28	0.47
	Low-E SmartSun™	Without Grilles	0.29	0.21	0.49
		Simulated Divided Light Grilles	0.29	0.19	0.43
		Finelight Grilles	0.29	0.19	0.43
		Finelight With Exterior Applied Grilles	0.29	0.19	0.43
		Full Divided Light Grilles	0.31	0.19	0.43
	Low-E SmartSun w/HeatLock	Without Grilles	0.25	0.20	0.48
		Simulated Divided Light Grilles	0.25	0.18	0.42
		Finelight Grilles	0.25	0.18	0.42
		Finelight With Exterior Applied Grilles	0.25	0.18	0.42
		Full Divided Light Grilles	0.28	0.18	0.42
	Low-E Sun	Without Grilles	0.30	0.19	0.30
		Simulated Divided Light Grilles	0.30	0.17	0.27
		Finelight Grilles	0.30	0.17	0.27
		Finelight With Exterior Applied Grilles	0.30	0.17	0.27
		Full Divided Light Grilles	0.32	0.17	0.27
	Low-E PassiveSun®	Without Grilles	0.31	0.52	0.60
		Simulated Divided Light Grilles	0.31	0.47	0.53
		Finelight Grilles	0.31	0.47	0.53
		Finelight With Exterior Applied Grilles	0.31	0.47	0.53
		Full Divided Light Grilles	0.32	0.47	0.53
	Clear Dual-Pane	Without Grilles	0.46	0.59	0.62
		Simulated Divided Light Grilles	0.46	0.53	0.55
		Finelight Grilles	0.46	0.53	0.55
		Finelight With Exterior Applied Grilles	0.46	0.53	0.55
		Full Divided Light Grilles	0.47	0.53	0.55
100 Series Gliding Windows AND-N-81 2.2 mm glass	Low-E	Without Grilles	0.30	0.31	0.54
		Simulated Divided Light Grilles	0.30	0.28	0.48
		Finelight™ Grilles	0.30	0.28	0.48
		Finelight With Exterior Applied Grilles	0.30	0.28	0.48
		Full Divided Light Grilles	0.31	0.28	0.48
	Low-E w/HeatLock™	Without Grilles	0.26	0.31	0.53
		Simulated Divided Light Grilles	0.26	0.28	0.47
		Finelight Grilles	0.26	0.28	0.47
		Finelight With Exterior Applied Grilles	0.26	0.28	0.47
		Full Divided Light Grilles	0.28	0.28	0.47
	Low-E SmartSun™	Without Grilles	0.29	0.21	0.49
		Simulated Divided Light Grilles	0.29	0.19	0.43
		Finelight Grilles	0.29	0.19	0.43
		Finelight With Exterior Applied Grilles	0.29	0.19	0.43
		Full Divided Light Grilles	0.31	0.19	0.43
	Low-E SmartSun w/HeatLock	Without Grilles	0.26	0.20	0.48
		Simulated Divided Light Grilles	0.26	0.18	0.42
		Finelight Grilles	0.26	0.18	0.42
		Finelight With Exterior Applied Grilles	0.26	0.18	0.42
		Full Divided Light Grilles	0.28	0.18	0.42
	Low-E Sun	Without Grilles	0.30	0.19	0.30
		Simulated Divided Light Grilles	0.30	0.17	0.27
		Finelight Grilles	0.30	0.17	0.27
		Finelight With Exterior Applied Grilles	0.30	0.17	0.27
		Full Divided Light Grilles	0.32	0.17	0.27
	Low-E PassiveSun®	Without Grilles	0.31	0.52	0.60
		Simulated Divided Light Grilles	0.31	0.47	0.53
		Finelight Grilles	0.31	0.47	0.53
		Finelight With Exterior Applied Grilles	0.31	0.47	0.53
		Full Divided Light Grilles	0.32	0.47	0.53
	Clear Dual-Pane	Without Grilles	0.46	0.59	0.62
		Simulated Divided Light Grilles	0.46	0.53	0.55
		Finelight Grilles	0.46	0.53	0.55
		Finelight With Exterior Applied Grilles	0.46	0.53	0.55
		Full Divided Light Grilles	0.47	0.53	0.55

Andersen Product	High-Performance Dual-Pane Glass Type		U-Factor[1]	SHGC[2]	VT[3]
100 Series Picture and Specialty Windows AND-N-82 3.0 mm glass	Low-E	Without Grilles	0.27	0.32	0.56
		Simulated Divided Light Grilles	0.27	0.29	0.50
		Finelight™ Grilles	0.27	0.29	0.50
		Finelight With Exterior Applied Grilles	0.27	0.29	0.50
		Full Divided Light Grilles	0.29	0.29	0.50
	Low-E w/HeatLock™	Without Grilles	0.23	0.32	0.55
		Simulated Divided Light Grilles	0.23	0.29	0.49
		Finelight Grilles	0.23	0.29	0.49
		Finelight With Exterior Applied Grilles	0.23	0.29	0.49
		Full Divided Light Grilles	0.26	0.29	0.49
	Low-E SmartSun™	Without Grilles	0.27	0.22	0.50
		Simulated Divided Light Grilles	0.27	0.20	0.45
		Finelight Grilles	0.27	0.20	0.45
		Finelight With Exterior Applied Grilles	0.27	0.20	0.45
		Full Divided Light Grilles	0.29	0.20	0.45
	Low-E SmartSun w/HeatLock	Without Grilles	0.23	0.21	0.49
		Simulated Divided Light Grilles	0.23	0.19	0.44
		Finelight Grilles	0.23	0.19	0.44
		Finelight With Exterior Applied Grilles	0.23	0.19	0.44
		Full Divided Light Grilles	0.25	0.19	0.44
	Low-E Sun	Without Grilles	0.28	0.20	0.31
		Simulated Divided Light Grilles	0.28	0.18	0.28
		Finelight Grilles	0.28	0.18	0.28
		Finelight With Exterior Applied Grilles	0.28	0.18	0.28
		Full Divided Light Grilles	0.30	0.18	0.28
	Low-E PassiveSun®	Without Grilles	0.28	0.54	0.61
		Simulated Divided Light Grilles	0.28	0.48	0.55
		Finelight Grilles	0.28	0.48	0.55
		Finelight With Exterior Applied Grilles	0.28	0.48	0.55
		Full Divided Light Grilles	0.30	0.48	0.55
	Clear Dual-Pane	Without Grilles	0.44	0.61	0.64
		Simulated Divided Light Grilles	0.44	0.55	0.57
		Finelight Grilles	0.44	0.55	0.57
		Finelight With Exterior Applied Grilles	0.44	0.55	0.57
		Full Divided Light Grilles	0.45	0.55	0.57
100 Series Transom Windows AND-N-83 3.0 mm glass	Low-E	Without Grilles	0.29	0.33	0.56
		Simulated Divided Light Grilles	0.29	0.30	0.50
		Finelight™ Grilles	0.29	0.30	0.50
		Finelight With Exterior Applied Grilles	0.29	0.30	0.50
		Full Divided Light Grilles	0.30	0.30	0.50
	Low-E w/HeatLock™	Without Grilles	0.25	0.32	0.55
		Simulated Divided Light Grilles	0.25	0.29	0.49
		Finelight Grilles	0.25	0.29	0.49
		Finelight With Exterior Applied Grilles	0.25	0.29	0.49
		Full Divided Light Grilles	0.27	0.29	0.49
	Low-E SmartSun™	Without Grilles	0.28	0.22	0.50
		Simulated Divided Light Grilles	0.28	0.20	0.45
		Finelight Grilles	0.28	0.20	0.45
		Finelight With Exterior Applied Grilles	0.28	0.20	0.45
		Full Divided Light Grilles	0.30	0.20	0.45
	Low-E SmartSun w/HeatLock	Without Grilles	0.24	0.21	0.49
		Simulated Divided Light Grilles	0.24	0.19	0.44
		Finelight Grilles	0.24	0.19	0.44
		Finelight With Exterior Applied Grilles	0.24	0.19	0.44
		Full Divided Light Grilles	0.27	0.19	0.44
	Low-E Sun	Without Grilles	0.30	0.20	0.31
		Simulated Divided Light Grilles	0.30	0.18	0.28
		Finelight Grilles	0.30	0.18	0.28
		Finelight With Exterior Applied Grilles	0.30	0.18	0.28
		Full Divided Light Grilles	0.31	0.18	0.28
	Low-E PassiveSun®	Without Grilles	0.30	0.54	0.61
		Simulated Divided Light Grilles	0.30	0.48	0.55
		Finelight Grilles	0.30	0.48	0.55
		Finelight With Exterior Applied Grilles	0.30	0.48	0.55
		Full Divided Light Grilles	0.31	0.48	0.55
	Clear Dual-Pane	Without Grilles	0.46	0.61	0.64
		Simulated Divided Light Grilles	0.46	0.55	0.57
		Finelight Grilles	0.46	0.55	0.57
		Finelight With Exterior Applied Grilles	0.46	0.55	0.57
		Full Divided Light Grilles	0.47	0.55	0.57

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1) U-Factor defines the amount of heat loss through the total unit in BTU/hr-ft²-°F. The lower the value, the less heat is lost through the entire product. Window values represent non-tempered glass. Use of tempered glass can increase U-Factor ratings. See andersenwindows.com/nfrc for specific performance values. Door values represent tempered glass. 2) Solar Heat Gain Coefficient (SHGC) defines the fraction of solar radiation admitted through the glass directly transmitted, as well as absorbed and subsequently released inward. The lower the value, the less heat is transmitted through the product. 3) Visible Transmittance (VT) measures how much light comes through a product (glass and frame). The higher the value, from 0 to 1, the more daylight the product lets in over the product's total unit area. Visible Light Transmittance is measured over the 380 to 760 nanometer portion of the solar spectrum.

- NFRC ratings are based on modeling by a third-party agency as validated by an independent test lab in compliance with NFRC program and procedural requirements.
- This data is accurate as of January 2022. Due to ongoing product changes, updated test results, or new industry standards or requirements, this data may change over time.

Ratings are for sizes specified by NFRC for testing and certification. Ratings may vary depending on unit size, use of tempered glass, different grille options, glass for high altitudes, etc.

- Values are for single units with given pane thickness and 3/4" (19 mm) grilles for windows and 1" (25 mm) grilles for door products.

Andersen® NFRC Certified Total Unit Performance *(continued)*

For current performance information, please visit **andersenwindows.com**.

Andersen Product	High-Performance Dual-Pane Glass Type		U-Factor[1]	SHGC[2]	VT[3]
100 Series Gliding Patio Doors AND-N-100 3.1 mm glass	Low-E	Without Grilles	0.30	0.32	0.55
		Simulated Divided Light Grilles	0.30	0.25	0.42
		Finelight™ Grilles	0.30	0.29	0.48
		Finelight With Exterior Applied Grilles	0.30	0.29	0.48
		Full Divided Light Grilles	0.34	0.25	0.42
	Low-E w/HeatLock™	Without Grilles	0.26	0.32	0.54
		Simulated Divided Light Grilles	0.26	0.25	0.41
		Finelight Grilles	0.26	0.28	0.47
		Finelight With Exterior Applied Grilles	0.26	0.28	0.47
		Full Divided Light Grilles	0.32	0.25	0.41
	Low-E SmartSun™	Without Grilles	0.29	0.21	0.50
		Simulated Divided Light Grilles	0.29	0.17	0.38
		Finelight Grilles	0.29	0.19	0.44
		Finelight With Exterior Applied Grilles	0.29	0.19	0.44
		Full Divided Light Grilles	0.34	0.17	0.38
	Low-E SmartSun w/HeatLock	Without Grilles	0.25	0.21	0.49
		Simulated Divided Light Grilles	0.25	0.17	0.37
		Finelight Grilles	0.25	0.19	0.43
		Finelight With Exterior Applied Grilles	0.25	0.19	0.43
		Full Divided Light Grilles	0.31	0.17	0.37
	Low-E Sun	Without Grilles	0.30	0.20	0.31
		Simulated Divided Light Grilles	0.30	0.16	0.23
		Finelight Grilles	0.30	0.16	0.23
		Finelight With Exterior Applied Grilles	0.30	0.16	0.23
		Full Divided Light Grilles	0.34	0.16	0.23
	Low-E PassiveSun®	Without Grilles	0.31	0.53	0.61
		Simulated Divided Light Grilles	0.31	0.41	0.46
		Finelight Grilles	0.31	0.41	0.46
		Finelight With Exterior Applied Grilles	0.31	0.41	0.46
		Full Divided Light Grilles	0.37	0.41	0.46
	Clear Dual-Pane	Without Grilles	0.46	0.60	0.63
		Simulated Divided Light Grilles	0.46	0.46	0.48
		Finelight Grilles	0.46	0.53	0.55
		Finelight With Exterior Applied Grilles	0.46	0.53	0.55
		Full Divided Light Grilles	0.48	0.46	0.48
100 Series Patio Door Transoms AND-N-98 3.0 mm glass	Low-E	Without Grilles	0.32	0.25	0.43
		Simulated Divided Light Grilles	0.32	0.20	0.34
		Finelight™ Grilles	0.32	0.23	0.38
		Finelight With Exterior Applied Grilles	0.32	0.23	0.38
		Full Divided Light Grilles	0.34	0.20	0.34
	Low-E w/HeatLock™	Without Grilles	0.29	0.25	0.42
		Simulated Divided Light Grilles	0.29	0.20	0.33
		Finelight Grilles	0.29	0.22	0.37
		Finelight With Exterior Applied Grilles	0.29	0.22	0.37
		Full Divided Light Grilles	0.32	0.20	0.33
	Low-E SmartSun™	Without Grilles	0.31	0.17	0.38
		Simulated Divided Light Grilles	0.31	0.14	0.30
		Finelight Grilles	0.31	0.15	0.34
		Finelight With Exterior Applied Grilles	0.31	0.15	0.34
		Full Divided Light Grilles	0.34	0.14	0.30
	Low-E SmartSun w/HeatLock	Without Grilles	0.28	0.17	0.37
		Simulated Divided Light Grilles	0.28	0.14	0.30
		Finelight Grilles	0.28	0.15	0.33
		Finelight With Exterior Applied Grilles	0.28	0.15	0.33
		Full Divided Light Grilles	0.32	0.14	0.30
	Low-E Sun	Without Grilles	0.32	0.16	0.24
		Simulated Divided Light Grilles	0.32	0.13	0.19
		Finelight Grilles	0.32	0.13	0.19
		Finelight With Exterior Applied Grilles	0.32	0.13	0.19
		Full Divided Light Grilles	0.34	0.13	0.19
	Low-E PassiveSun®	Without Grilles	0.32	0.41	0.47
		Simulated Divided Light Grilles	0.32	0.33	0.37
		Finelight Grilles	0.32	0.33	0.37
		Finelight With Exterior Applied Grilles	0.32	0.33	0.37
		Full Divided Light Grilles	0.36	0.33	0.37
	Clear Dual-Pane	Without Grilles	0.45	0.47	0.49
		Simulated Divided Light Grilles	0.45	0.38	0.38
		Finelight Grilles	0.45	0.42	0.43
		Finelight With Exterior Applied Grilles	0.45	0.42	0.43
		Full Divided Light Grilles	0.45	0.38	0.38

Andersen Product	High-Performance Dual-Pane Glass Type		U-Factor[1]	SHGC[2]	VT[3]
100 Series Patio Door Sidelights AND-N-97 3.0 mm glass	Low-E	Without Grilles	0.31	0.25	0.42
		Simulated Divided Light Grilles	0.31	0.20	0.33
		Finelight™ Grilles	0.31	0.23	0.38
		Finelight With Exterior Applied Grilles	0.31	0.23	0.38
		Full Divided Light Grilles	0.34	0.20	0.33
	Low-E w/HeatLock™	Without Grilles	0.28	0.25	0.41
		Simulated Divided Light Grilles	0.28	0.20	0.33
		Finelight Grilles	0.28	0.22	0.37
		Finelight With Exterior Applied Grilles	0.28	0.22	0.37
		Full Divided Light Grilles	0.32	0.20	0.33
	Low-E SmartSun™	Without Grilles	0.31	0.17	0.38
		Simulated Divided Light Grilles	0.31	0.14	0.30
		Finelight Grilles	0.31	0.15	0.34
		Finelight With Exterior Applied Grilles	0.31	0.15	0.34
		Full Divided Light Grilles	0.34	0.14	0.30
	Low-E SmartSun w/HeatLock	Without Grilles	0.28	0.16	0.37
		Simulated Divided Light Grilles	0.28	0.14	0.29
		Finelight Grilles	0.28	0.15	0.33
		Finelight With Exterior Applied Grilles	0.28	0.15	0.33
		Full Divided Light Grilles	0.32	0.14	0.29
	Low-E Sun	Without Grilles	0.32	0.16	0.24
		Simulated Divided Light Grilles	0.32	0.13	0.19
		Finelight Grilles	0.32	0.13	0.19
		Finelight With Exterior Applied Grilles	0.32	0.13	0.19
		Full Divided Light Grilles	0.34	0.13	0.19
	Low-E PassiveSun®	Without Grilles	0.32	0.41	0.47
		Simulated Divided Light Grilles	0.32	0.33	0.37
		Finelight Grilles	0.32	0.33	0.37
		Finelight With Exterior Applied Grilles	0.32	0.33	0.37
		Full Divided Light Grilles	0.36	0.33	0.37
	Clear Dual-Pane	Without Grilles	0.44	0.47	0.49
		Simulated Divided Light Grilles	0.44	0.37	0.38
		Finelight Grilles	0.44	0.42	0.43
		Finelight With Exterior Applied Grilles	0.44	0.42	0.43
		Full Divided Light Grilles	0.45	0.37	0.38

1) U-Factor defines the amount of heat loss through the total unit in BTU/hr-ft²-°F. The lower the value, the less heat is lost through the entire product. Window values represent non-tempered glass. Use of tempered glass can increase U-Factor ratings. See andersenwindows.com/nfrc for specific performance values. Door values represent tempered glass. 2) Solar Heat Gain Coefficient (SHGC) defines the fraction of solar radiation admitted through the glass directly transmitted, as well as absorbed and subsequently released inward. The lower the value, the less heat is transmitted through the product. 3) Visible Transmittance (VT) measures how much light comes through a product (glass and frame). The higher the value, from 0 to 1, the more daylight the product lets in over the product's total unit area. Visible Light Transmittance is measured over the 380 to 760 nanometer portion of the solar spectrum.

- NFRC ratings are based on modeling by a third-party agency as validated by an independent test lab in compliance with NFRC program and procedural requirements.
- This data is accurate as of January 2022. Due to ongoing product changes, updated test results, or new industry standards or requirements, this data may change over time. Ratings are for sizes specified by NFRC for testing and certification. Ratings may vary depending on unit size, use of tempered glass, different grille options, glass for high altitudes, etc.
- Values are for single units with given pane thickness and 3/4" (19 mm) grilles for windows and 1" (25 mm) grilles for door products.

About the NFRC

The National Fenestration Rating Council (NFRC) is a nonpartisan coalition of professionals whose purpose is to provide fair, accurate and credible energy performance ratings for fenestration products. NFRC's membership includes manufacturers, suppliers, designers, specifiers, utility companies, government agencies and other building industry representatives.

Andersen Corporation is a founding member of the NFRC and continues to support its work by providing fair, accurate and credible energy performance ratings to consumers and the building industry. If you have any questions about the NFRC, its program or energy performance ratings, write them at: NFRC, 6305 Ivy Lane, Suite 410, Greenbelt, MD 20770. Phone: 301-589-1776 Website: **nfrc.org**

About the Label

Look for this certification label on every window and patio door you buy. The NFRC section was designed by the National Fenestration Rating Council to provide accurate information that helps you promote the energy efficiency of the homes you build. These ratings allow you – and your customers – to measure and compare the energy performance of similar products. If the product does not have this label, the NFRC has not verified its claims.

Energy Rating (ER) represents "Energy Rating" and is a rating used in Canada for product comparison purposes (the higher the ER number, the more energy saved during the heating season).

ENERGY STAR® Climate Zone Map is based on U-Factor and solar heat gain coefficient criteria for specific ENERGY STAR climate zones within the United States and Canada. The shading of the map shows which climate zone(s) a particular product and glass type is ENERGY STAR certified in.

U-Factor indicates how well a product prevents heat from escaping (the lower the number, the better).

Solar Heat Gain Coefficient measures how well a product blocks heat caused by sunlight (the lower the number, the more it will help reduce the use of air conditioning and as a result, reduce electrical bills and energy use).

Visible Transmittance refers to how much visible light comes through a product (the closer to 1.0, the more light is transmitted).

WDMA Hallmark Certification verifies the performance ratings of this product were tested by an independent testing laboratory and verified by a third-party certification program.

Test Standards

Performance Grade (PG) and **Design Pressure (DP) Ratings**

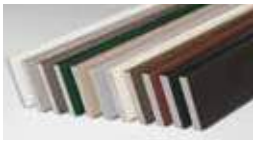
Glass Construction used with this product type.

• NFRC ratings are based on modeling by a third-party agency as validated by an independent test lab in compliance with NFRC program and procedural requirements.
• "ENERGY STAR" is a registered trademark of the U.S. Environmental Protection Agency.

INSTALLATION ACCESSORIES FOR WINDOWS & DOORS

Optional accessories are available for the installation of Andersen® windows and patio doors. Keep instruction guidelines and safety information in mind when considering the installation and use of any Andersen product. For questions, contact your local Andersen supplier.

FIBREX® TRIM BOARD



Available in white, canvas, prairie grass, Sandtone, Terratone, cocoa bean, dark bronze, red rock, forest green, dove gray and black, this solid cellular Fibrex trim board can be cut or ripped to size, and can be fastened using nails or screws. 3 ½" (89) x ¾" (19) thick in 10' (3048) lengths.

COLOR-MATCHED SEALANT

Color-matched sealant is available in Andersen exterior colors. This high-quality sealant can be used during the installation of all Andersen products.

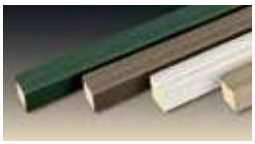
VINYL CHANNELS

Rigid vinyl "J" and "h" channels are available in white, Sandtone and Terratone. "J" and "h" channels are ½" (13) deep and come in 150" (3810) lengths. "J" channels are ¾" (19) wide and "h" channels are 1" (25) wide. "H" channels are ¾" (19) deep and come in 84" (2134) and 150" (3810) lengths. White "H" channels are ¾" (19) wide. Sandtone and Terratone "H" channels are 1" (25) wide.

DRIP CAP

Heavy 24-gauge corrosion-resistant aluminum construction in two profiles to match frames. Available in white, canvas, Sandtone, Terratone, dark bronze, forest green and black in 6' (1829), 10' (3048) and 12'-7 ½" (3848) lengths.

AUXILIARY CASING



Made of cellular Fibrex material. Available in white, canvas, Sandtone, Terratone, dark bronze, forest green and black. 1 3/16" (30) x 1 3/16" (30) thick in 150" (3810) lengths.

COIL STOCK

Andersen aluminum coil stock can be ordered in white, canvas, prairie grass, Sandtone, Terratone, cocoa bean, dark bronze, red rock, forest green, dove gray and black. Made from .018" thick aluminum, coil stock is available in 24" (610) x 50' (15240) rolls. Color-matched 1 ¼" (32)-long stainless steel trim nails are also available and can be ordered in 1 lb/454 kg boxes.

INSTALLATION ACCESSORIES FOR INSERT WINDOWS

EXTERIOR SILL EXTENDER

A sill extender fits into the exterior accessory kerf in the window frame to hide the gap between the new insert window and the existing window frame at the sill. Precut to fit a 14° sill slope, it can be cut to fit other slopes as needed. Available in all exterior colors. Shown in white.

HEAD EXPANDER

A head expander assists in filling the opening at the top of the window when doing an interior installation. Available in white.

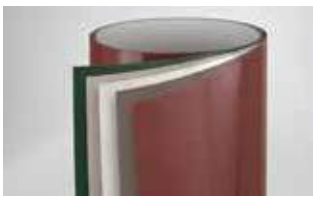
EXTERIOR FRAME EXTENDERS

Frame extenders fit into the exterior accessory kerf in the frame to hide the gap around the sides and/or head between the new insert window and the existing window frame. Extenders can be cut to length as needed. Available in all exterior colors. Shown in dark bronze.

Exterior frame and sill extenders are available in long lengths or can be ordered cut to approximate lengths for convenience at the job site.

Insert window shown with exterior frame extenders and sill extender in dark bronze.

COIL STOCK



Coil stock fits into the exterior accessory kerf in the window frame, then wraps the existing wood window trim. It can be cut and formed to profiles at the job site. Andersen aluminum coil stock can be ordered white, canvas, prairie grass, Sandtone, Terratone, cocoa bean, dark bronze, red rock, forest green, dove gray and black. Made from .018" thick aluminum, coil stock is available in 24" (610) x 50' (15240) rolls. Color-matched 1 ¼" (32) stainless steel trim nails are also available and can be ordered in 1 lb/.454 kg boxes.

COLOR-MATCHED SEALANT

Color-matched sealant is available in Andersen exterior colors and is specially formulated to adhere to Andersen products.

FOAM BACKER ROD

Available for installations, ⅜" (10) backer rod helps provide an air seal around the frame. Available in 100' (30480) rolls.

SHIMS

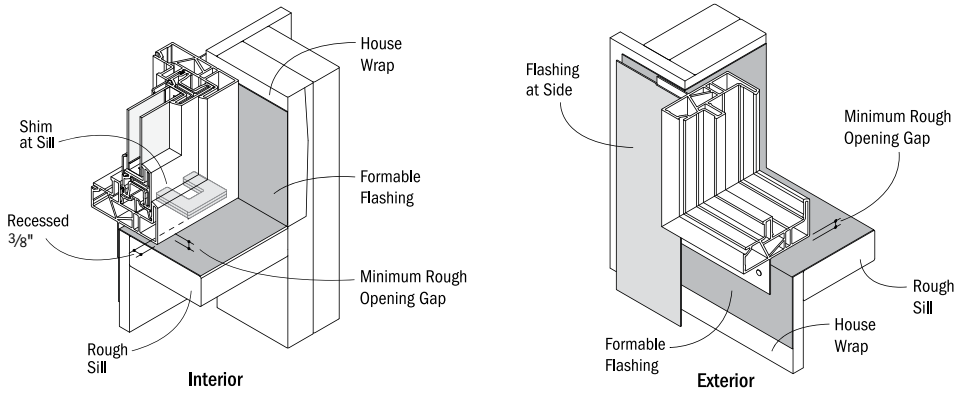
Flat self-hanging shims help with a secure installation. Available in boxes of 248 shims.

INSTALLATION INFORMATION

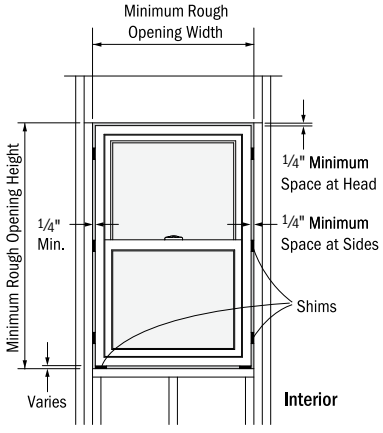
ROUGH OPENINGS

The purpose of a rough opening is to allow for proper spacing between the window or patio door unit and the building structure. The space is required for locating, leveling and squaring the unit during installation and to provide an area for insulation. A rough opening that is incorrectly sized may affect unit operation and may not allow for adequate fastening of the unit to the building structure. Andersen rough opening dimensions are provided as a guideline to help determine the minimum amount of space needed between the window or patio door and the building structure. See appropriate product sections for rough opening guidelines for each product.

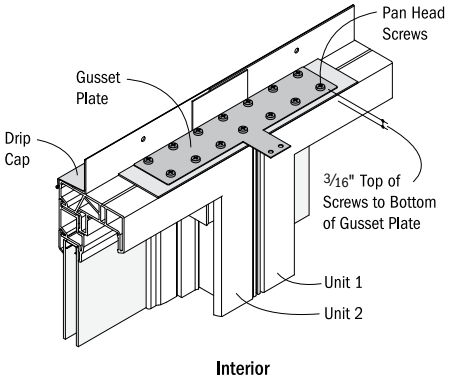
Keep in mind that rough opening dimensions may need to be altered from published guidelines, depending on installation methods, joining methods, replacement methods, etc. For example, flashing systems can reduce the amount of available rough opening space and should be factored in when calculating rough opening dimensions. The use of support or joining materials will encroach on the rough opening and may require additional rough opening space between the unit and the building structure, depending on the thickness of the flashing system and joining materials used. To facilitate drainage, the rough opening sill plate should never slope toward the interior. For challenging environments and other information, refer to EEBA's (Energy and Environmental Building Association) Water Management Guide (**eeba.org**).



Example of window sill flashing in a membrane drainage system.



Example of window unit installed using Andersen published minimum rough opening dimensions.



Example of two units joined together with the use of gusset plates and pan head screws that will require additional rough opening space.

IMPORTANCE OF PROPER INSTALLATION

Proper installation and maintenance of Andersen products is essential to attain optimum performance and operation. Installation instructions that provide guidelines for proper installation are typically provided with Andersen products. They are also available by visiting **andersenwindows.com**. Remember that every installation is different, and Andersen strongly recommends consultation with the local supplier or an experienced contractor, architect or structural engineer prior to the installation of any Andersen product. The method of attachment for Andersen products, fastener selection and code compliance is the responsibility of the architect, building owner, contractor, installer and/or consumer. For more complete installation details, visit **andersenwindows.com** or see your Andersen supplier.

GENERAL NOTES

When ordering, make certain you specify, then verify, the exact product, unit dimensions, configuration requirements, color and options you desire on each window or patio door. Before installing the product, we suggest you verify that it includes the features and options you ordered. Visit **andersenwindows.com** for product installation and joining guides. Printing limitations prohibit exact color replication of products. View actual samples for building specifications. Andersen Corporation reserves the right to change details, specifications or sizes without notice. The customer assumes all risk of alterations made to Andersen products.

CODES

Appropriate selection of Andersen® products that conform to all applicable laws, ordinances, building codes and safety requirements is the sole responsibility of the architect, designer, building owner and/or contractor. Check with your local building code officials for specific information. Unit wind load, performance grade and energy performance information is provided on pages 99-108. For up-to-date product performance information, visit **andersenwindows.com**. The performance of any building system depends on the design and construction of the building system in its entirety, which should meet building code requirements, as well as address product and material limitations, and local environment and climate.

DRIP CAPS

Drip caps are a specific type of flashing or trim used at the head of a window or door to direct water from the drainage plane out beyond the face of the unit.

FLASHING

Flashing is an important element in a building's water management system. It is used to shed and direct water to the building exterior or to the drainage plane. Flashing materials are typically applied starting from the bottom and working upward, with each successive layer overlapping the previous one in shingle fashion. Water infiltration problems in any type of building can be reduced by properly flashing and/or sealing around all building openings, including windows and doors.

USE OF SHIMS

Shims are used along the side jambs of windows and doors to center the unit in the rough opening and to position it plumb, level and square. In addition, shims are always required for windows under the sill at the side jambs to lift it off the rough opening sill plate. Shims also enable a straight frame for proper weatherstrip contact and unit operation. If not placed properly, unit performance and operation can be affected. Use waterproof shims capable of supporting the weight of the product. When using tapered shims, use them in pairs with the tapers opposing each other to avoid tilting the unit or twisting (rotating) of the jambs.

SEALANTS

Sealants are elastic materials used to block the passage of water and/or air while allowing movement between the two sides of the joint. A sealant should bond tightly, and be able to expand and contract to accommodate joint movement without cracking or tearing away from the substrate. Surfaces must be clean, dry and sound for adequate sealant adhesion. Choose a sealant that is compatible with, and that will adhere adequately to, all building materials used in the window and patio door area. Proper sealant joint design is based upon the expected movement of adjacent materials and the movement capability of the sealant. A general rule of thumb is that the depth of the sealant joint should be equal to half the width (D = W/2), but generally not less than ¼" (6) or more than ½" (13). Foam-plastic backer rod can be used to limit the depth of the sealant joint, to provide a backstop for tooling the sealant without damage to the bond. It also acts as a bond breaker to help minimize stress in the sealant. Sealants should be maintained seasonally, and repaired and/or replaced as needed.

GENERAL INSTALLATION GUIDELINES

1. Read and follow the installation guide in its entirety.
2. Decide whether you are integrating to a surface barrier or a membrane drainage system before installing the product. The appropriate method for your installation may vary based on building design, application and industry practices.
3. Make certain the drainage plane is continuous (proper overlaps to shed water, taped seams, etc.).
4. Andersen products should be installed only in the vertical position.
5. Check the rough opening to make sure it is sized properly, is square and is level.
6. Install the window or door plumb.
7. Install the window or door level.
8. Install the window or door square. Diagonal measurements should be within ⅛" (3).
9. Follow installation instructions to properly locate shims and to make sure that units are plumb, level and square. Shims are always required under the window jambs at the sill and along the jambs on the sides for windows and doors.
10. Check for squareness of unit before final anchoring of the product into the wall.
11. Anchor unit as directed with appropriate fasteners.
12. Integrate the window and door into the drainage plane of the wall using quality flashing and sealing materials. All flashing materials should be properly overlapped to shed water.
13. Allow ¼" (6) minimum space for a sealant joint around perimeter of unit between exterior finish materials and unit.
14. Insulate and seal the interior cavity between the window or door frame and the rough opening.
15. Check operation before application of interior trim.

EXTERIOR PAINTING/SEALING OF ANDERSEN® PRODUCTS

The exterior of some Andersen products may be painted or stained. However, improper painting and staining may cause damage to vinyl, aluminum and other exterior materials.

CAUTIONS

1. Do not apply any type of film to insulating glass. Thermal stress and glass damage can result. Andersen Corporation is not responsible for product performance when films are applied to Andersen products.
2. The use of removable insulating materials such as insulated window coverings, shutters and other shading devices may also cause thermal stress conditions and/or deformation of protective vinyl. In addition, excessive condensation may result, which can have a deteriorating effect on the window or door unit(s) involved. Andersen Corporation is not responsible for product performance when these kinds of materials or devices are applied to or used in conjunction with Andersen products.
3. In wall construction utilizing brick facades, leave adequate clearance between sill, jambs and brick for sealing and dimensional change of framework.
4. Acid solutions commonly used to wash brick and other masonry materials will damage glass, fasteners, hardware and metal flashing. Protect unit and follow cleaning product instructions carefully. Damage caused by acid solution is not covered under the Andersen limited warranty.
5. Andersen windows may be combined in almost unlimited ribbons or stacks if each unit is positively secured to structural elements on opposing sides and if the proper joining system is used. See page 99 for more information.

SAFETY GLASS

Unless specifically ordered, Andersen windows are not made with safety glass and, if broken, the glass could fragment, causing injury. Andersen windows may be ordered with tempered glass which may reduce the likelihood of injury when broken. All Andersen patio doors are made with tempered glass. Differences in appearance between tempered and non-tempered glass can be expected. Slight visual distortions may be noticeable and occur normally as a result of the tempering process. Building codes require safety glass in locations adjacent to or near doors and other locations.

WINDOW AND PATIO DOOR SAFETY

Windows may provide a secondary avenue of escape or rescue in an emergency, such as a fire. Every family should develop an escape plan and make sure family members know how to escape from the home in an emergency. In your plan, include two ways to escape from every room in case one way is blocked by fire or smoke, and make sure you have a designated meeting place outside. A window or a patio door is an alternate means of escape or rescue. Practice your plan until each member of the family understands it and is able to escape without assistance. Remember, you may not be able to reach children during a fire emergency. Teach children – even very young children – that they must escape from a fire in the home and never hide from the fire or from emergency personnel.

LOOKOUT FOR KIDS® PROGRAM

The Consumer Product Safety Commission has said: "Keep children away from open windows to prevent falls. Don't depend on insect screens to keep the child from falling out of the window. They are designed to keep insects out, not children in. Avoid placing furniture near windows to keep children from climbing to a window seat or sill." In an effort to educate consumers about the potential for child falls from windows, Andersen Corporation created the LookOut For Kids Program. It combines a window and door safety brochure and specific product instructions to help make window and door safety an important priority for consumers. For more information on child safety, write:

Andersen Corporation
LookOut For Kids Program
100 Fourth Avenue North
Bayport, MN 55003
Call **800-313-8889** or email
lofk@andersencorp.com

LOOK OUT! for kids®

Dimensions in parentheses are in millimeters.

Andersen® windows and patio doors can make significant contributions to the success of sustainable design strategies

As a charter member of the U.S. Green Building Council, we're active supporters of certified green buildings. Our products can help customers in pursuing green building programs, such as Leadership in Energy and Environmental Design (LEED®), the National Green Building Standard, Green Globes, GreenStar and more. Below is an overview of how our products may assist project teams with pursuing LEED v4 or the NAHB National Green Building Standard rating systems. More detailed credit summaries, as well as information about how Andersen products can support earlier versions of LEED certification (e.g., LEED v3 or LEED 2008), are available at **andersenwindows.com**.

LEED V4 FOR BUILDING DESIGN AND CONSTRUCTION: NEW CONSTRUCTION AND MAJOR RENOVATIONS

Integrative Process Credit:

Energy & Atmosphere

- Minimum energy performance prerequisite
- Optimize energy performance credit
- Renewable energy production credit
- Green power and carbon offsets credit

Materials & Resources

- Construction and demolition waste management planning credit
- Building product disclosure and optimization sourcing of raw materials credit
- Construction and demolition waste management credit

Indoor Environmental Quality

- Minimum indoor air quality performance prerequisite
- Minimum acoustic performance prerequisite – schools
- Enhanced indoor air quality strategies credit
- Low-emitting materials credit
- Thermal comfort credit
- Daylight credit
- Quality views credit
- Acoustic performance credit (option 2)

LEED V4 FOR BUILDING DESIGN AND CONSTRUCTION: HOMES AND MULTI-FAMILY MIDRISES

Energy & Atmosphere

- Minimum energy performance prerequisite
- Education of the homeowner, tenant or building prerequisite
- Annual energy use credit
- Building orientation for passive solar credit
- Air infiltration credit
- Windows credit

Materials & Resources

- Durability management prerequisite
- Environmentally preferable products credit
- Construction waste management credit

Indoor Environmental Quality

- Ventilation prerequisite
- Low-emitting products credit

ANSI ICC/ASHRAE 700-2015 NATIONAL GREEN BUILDING STANDARD

NGBS section numbers are referenced in parentheses.

Resource Efficiency

- Prefinished materials (601.7)
- Flashing (602.12)
- Exterior doors, including storm doors (602.1.10)
- Recycled construction materials (605.3)
- Bio-based products (606.1)
- Wood-based products (606.2)
- Manufacturer's environmental management system concepts (611.1)

Energy Efficiency

- Mandatory requirements (701.1)
- Building thermal envelope air sealing (701.4.3.1)
- Multi-family air leakage alternative (701.4.3.3)
- Fenestration air leakage (701.4.3.4)
- ICC IECC analysis (702.2.1)
- Energy performance analysis (702.2.2)
- UA improvement (703.2.1)
- Fenestration (703.2.5)
- Sun-tempered design (703.7.1)
- Passive cooling design (703.7.3)
- Passive solar heating design (703.7.4)

Indoor Environmental Quality

- Wood materials (901.4)
- Interior architectural coatings (901.9)
- Interior adhesives & sealants (901.9)
- Operable windows & sliding glass doors (902.1.5)

Energy Efficient

- Homeowner's manual (1001.1)
- Building construction manual (1002.1)

THE ENVIRONMENT HAS A BUSINESS PARTNER

Respect for the environment is nothing new at Andersen. For more than a century, it has been part of who we are. Our commitment to recycle and reclaim materials began simply because it was good business. Now it's part of our broader commitment to sustainability and responsible stewardship of all of our resources. Andersen is committed to providing you with long-lasting,* energy-efficient windows and patio doors. Visit **andersenwindows.com/sustainability** for more information.

Andersen® products are certified under the National Fenestration Rating Council (NFRC) voluntary third-party certification program designed to ensure accurate energy performance ratings and labeling.

The Window & Door Manufacturers Association (WDMA) Hallmark Certification program includes product testing and quality-control process audits to verify that Andersen windows and doors are produced in conformance with the industry standards for air, water resistance and structural performance.

Andersen Corporation is proud to be an ENERGY STAR® partner. For over 115 years, Andersen has built a reputation for environmental stewardship and energy-efficient products. In fact, Andersen has been part of the ENERGY STAR program since it started and was the first window manufacturer to be named an ENERGY STAR National Window Partner of the Year in 1999.

Andersen was the first window manufacturer to certify our products for indoor air quality, beginning in 2008. Our Indoor Advantage™ Gold certification by SCS Global Services (SCS) meets the rigorous high standards for healthier indoor air quality set by California Specification 01350.

Under U.S. Green Building Council (USGBC) guidelines, Andersen is able to claim a percentage of material in its Fibrex® product as pre-consumer recycled content. SCS Global Services (SCS) has certified this amount for Andersen.

*Visit andersenwindows.com/warranty for details.

ANDERSEN™
WINDOWS & DOORS

PDF NAVIGATION TIPS

Welcome to an overview of the enhanced navigation tools available in this PDF. Here are some simple tips on PDF navigation. Before you begin be sure you are using the latest version of **Adobe Acrobat Reader DC**, available at – **https://get.adobe.com/reader/**

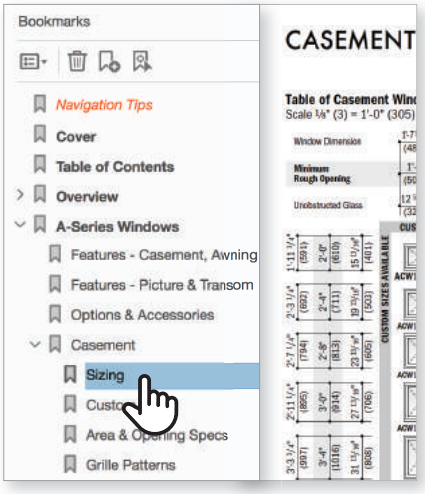
To watch a 3-minute tutorial on navigating catalog PDFs, go to: **https://youtu.be/sWWnYn60N3Y**

BOOKMARK NAVIGATION

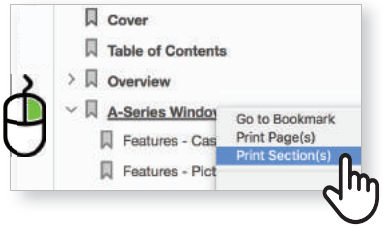
① Acrobat will display the bookmarks panel when you open the PDF.

Bookmarks are the easiest way to find specific product information.

Select a topic and that page will be displayed.



② If you need to print a specific section, **right click on that section** within in the bookmarks panel and choose **"Print Section"**.



LINKS AND URL NAVIGATION

① You can also use the **embedded links** to navigate between sections. All links are underlined in blue.

② Website links automatically open in your web browser.

PDF NAVIGATION TIPS Cont.

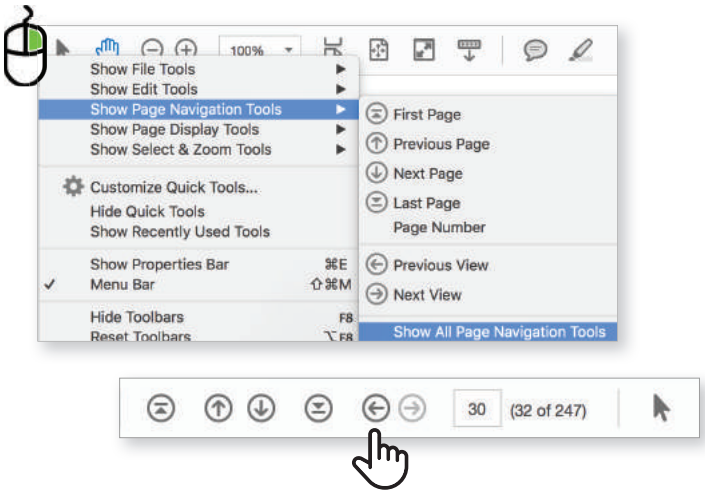
Add additional navigation tools by adjusting the default settings in Acrobat.

TOOL BAR NAVIGATION

1

To add a **"Jump Back" Button** to your tool bar. **Right click on tool bar**, select **Show Page Navigation Tools** and choose **Show All Page Navigation Tools**.

Right and left facing arrows are added to the tool bar allowing you to go back or forward to the last page you viewed.

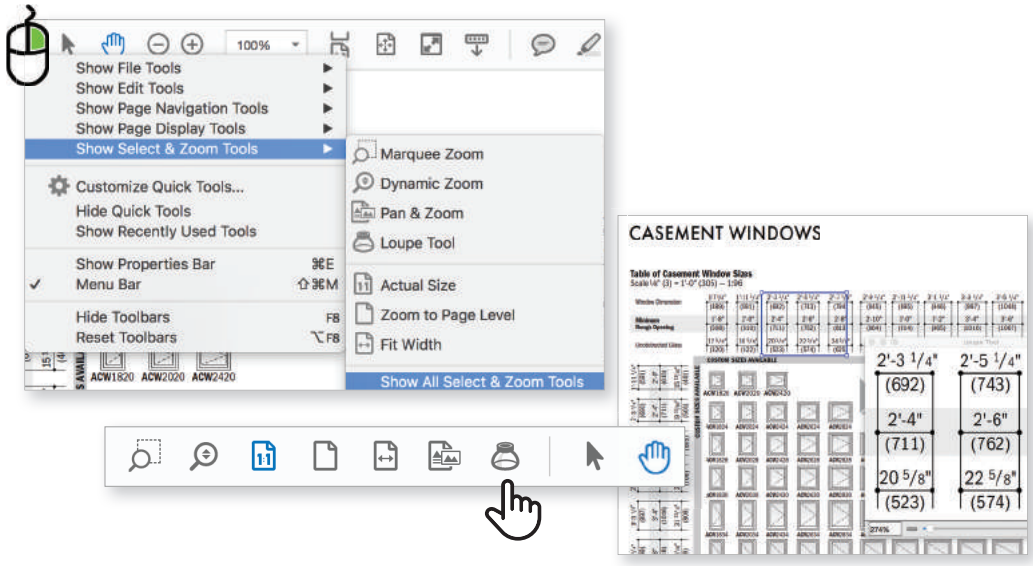


2

Another helpful tool is the **Loupe Tool**.

It allows you to zoom in on the page without having to increase the page size.

To add a **Loupe Tool** to your tool bar, **right click on tool bar**, select **Show Select & Zoom Tools** and then choose **Show All Select & Zoom Tools.**



3

You can also use the **commenting tools**. Add a post-it note with your comments or highlight important information.

Be sure to save the file.

To watch a 3-minute tutorial on navigating catalog PDFs, go to: **https://youtu.be/sWWnYn60N3Y**

We are always looking for ways to improve.

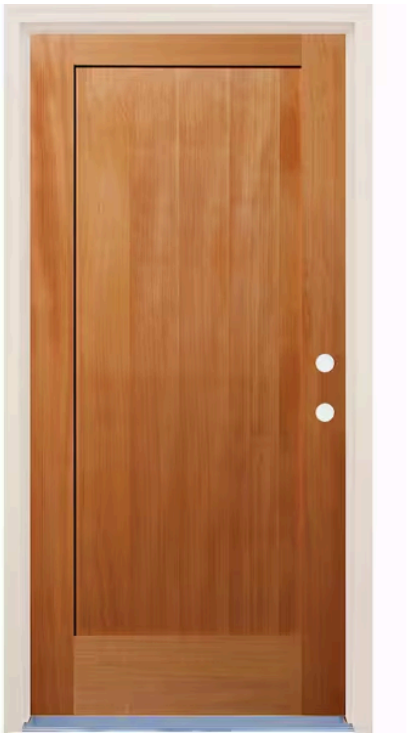
Please send feedback to **webmarketing@andersencorp.com**.

Internet # 314827230 Model # HDXD209523 Store SKU # 1005808874

Builders Choice (Brand Rating: 4.1/5)

32 in. x 80 in. 1 Panel Shaker Left-Hand/Inswing Unfinished Fir Wood Prehung Front Door

Questions & Answers



Hover Image to Zoom

Share Print

$2,258.00

$189.00/mo** suggested payments with 12 months** financing Apply Now

- Crafted with premium Douglas Fir for durability
- Classic single panel design complements any interior decor
- Engineered construction minimizes warping
- View More Details

Pickup at SW Albuquerque

Delivering to 87120

Ship to Store
Wed, Apr 9
9 available
FREE

Delivery
Apr 10 - Apr 17
9 available

Get Expert Door Installation

A local pro will take care of the job for you

Request door installation service

What to Expect

Have Questions? We're Here to Help.

Speak to a Virtual Associate about Doors or Windows today.
Monday - Friday from 9AM - 11PM ET &
Saturday - Sunday from 9AM - 9PM ET.

Request Appointment

What to Expect

Or call 1-833-HD-APRON(1-833-432-7766)

Feedback

1

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As low as $121.65/mo with PayPal. Learn more

Free & Easy Returns In Store or Online

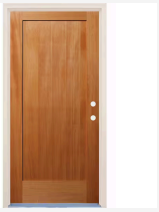
Return this item within **90 days** of purchase.

Read Return Policy

Frequently Bought Together

CURRENT ITEM

Select



Builders Choice
32 in. x 80 in. 1 Panel Shaker Left-Hand/Inswing Unfinished Fir Wood Prehung Front Door

$2,258.00

Select

Builders Choice
32 in. x 80 in. 1 Panel Shaker Right-Hand/Inswing Unfinished Fir Wood Prehung Front Door

$2,214.40

1/1

Subtotal: $4,472.40

Add 2 Items to Cart

Ask about this product

Get an immediate answer with AI

Type a question

Get an Answer

AI-generated from the text of manufacturer documentation. To verify or get additional information, please contact The Home Depot customer service.

Product Details

About This Product

Make a statement with the sleek and modern lines of Builders Choice exterior doors. Crafted from Premium Douglas Fir, their clean geometric design is perfect for contemporary home styles. These doors are pre-hung on a primed frame, making them easy to install and finish in the paint color of your choice. Regular maintenance will help improve the durability and longevity of these beautifully crafted doors.

Highlights

- Durable fir construction features vertical grain
- Classic single panel design complements any interior decor
- Brickmould provides a clean and complete installation
- Engineered construction is designed to minimized warping and extend the life of the door
- Solid core construction minimizes sound transmission
- Pre-hung single door available in 4-9/16 in. or 6-9/16 in. primed frame
- Double-bored for quick lockset installation
- Includes oil-rubbed bronze hinges
- Unfinished
- 1-year limited warranty
- Must have adequate overhang over door (see warranty for details)
- Door must be finished on all 6 sides
- Return Policy
- California residents see Prop 65 WARNINGS

Product Information

Internet # 314827230
Model # HDXD209523
Store SKU # 1005808874

Additional Resources

Shop All Builders Choice

From the Manufacturer

- Warranty
- Use and Care Manual
- Instructions / Assembly
- Return Policy

Specifications

Dimensions

Door Height (in.)	81.5 in
Door Thickness (in.)	1.75 in
Door Width (in.)	33.5 in
Jamb Size (in.)	6-9/16"
Nominal Door Height (in.)	80 in

Nominal Door Thickness (in.)	2 in
Nominal Door Width (in.)	32 in
Rough Opening Height (in.)	82 in
Rough Opening Width (in.)	34 in

Details

Bore Type	Double Bore
Color Family	Light Brown Wood
Color/Finish	Unfinished
Door Configuration	Single Door
Door Handing	Left-Hand/Inswing
Door Style	Craftsman, Modern
Door Type	Exterior Prehung
Features	Brickmold, Lockset Bore (Double Bore), Weatherstripping
Finish Type	Unfinished
Frame Material	Wood
Hinge Finish	Bronze
Hinge Type	Ball Bearing
Included	No Additional Items Included
Material	Wood
Number of Hinges	3
Panel Type	1 Panel
Product Weight (lb.)	90 lb
Returnable	90-Day
Suggested Application	Back, Basement Entry, Front, Garage Entry, Side

Warranty / Certifications

Energy Star Qualified	Not Qualified
Manufacturer Warranty	One Year Limited

How can we improve our product information? Provide feedback.

Questions & Answers

Customer Reviews

More from Builders Choice

All Items | Wood Doors Without Glass | Wood Doors With Glass


© Twin Creeks
Log Home Supply

Bundle #1 Grade 18" Kiln-Dried Alaskan Yellow Cedar Shingles

★★★★★ 1 Review

Bundle #1 Grade 18” Alaskan Yellow Cedar Shingles Is popular due to its unique properties and appearance. Graded to the same exacting quality control products written by the Cedar Shake and Shingle Bureau for Western Red Cedar. These products weather to a lighter, more silvery gray than Western Red Cedar.

Please call for a custom shipping quote if you need 10 or more bundles.

SKU: 1AYC18SH

$149.95

Quantity

— 1 +

ADD TO CART

Typically ships in 1 business day

Details

Bundle #1 Grade 18” Kiln-Dried Alaskan Yellow Cedar Shingles Is popular due to its unique properties and appearance. Graded to the same exacting quality control products written by the Cedar Shake and Shingle Bureau for Western Red Cedar. These products weather to a lighter, more silvery gray than Western Red Cedar.

Features & Benefits of Yellow Cedar Shingles:

• **Extreme Durability** – Cedar Shingles easily withstand harsh weather conditions including heavy wind, rain, and hail.

• **Longevity** – Alaskan Yellow Cedar is known as one of the most durable softwoods. With proper maintenance Cedar Shingles can beautify your home for decades. Lasting longer than other other wood

types.

• **Energy Efficiency** – Cedar offers excellent insulation for your home, keeping it warmer during cold months, while allowing your home to breathe and stay cooler during the warmer months.

• **Termite Resistance** – Alaskan Yellow Cedar wood is naturally resistant to termites.

• **Ease of Installation** – Great for Do-It-Yourself projects, Cedar Shingles are easy to install.

• **Versatility** – Alaskan Yellow Cedar Shingles can be used with many different architectural styles, affording you the option of a home covered in beautiful Cedar wood, or simply a small rustic accent area on an otherwise traditional home.

• **Quality Milling** – We sell only the highest quality Cedar products.

• **Adaptability** – Cedar Shingles are manufactured to be used on both interior and exterior wall surfaces.

Product Specifications:

• **Packaging:** Roofing-style bundle secured with a plastic strap. These bundles are packed 18/18. That is, 18 rows of shingles by 18 rows of shingles with the tapered tops interleaving in the middle of the pack and the butt ends facing out.

• **Shingle Length:** 18" (Perfection)

• **Grade:** Number 1 Grade. For exterior or interior walls where a superior quality product is desired. Clear heartwood: 100% edge grain; no defects.

• **Drying:** Kiln-Dried

• **Texture:** Natural Sawn

• **Thickness:** 5/2-1/4" (5 shingle "butts" stacked together should measure 2 ¼" thick)

• **Width:** Shingles can vary from 4"-8" wide.

• **Exposure Options:** These shingles can be installed with exposures from 4" to 14".

• **Typical Bundle Dimensions:** 24"x18"x8"

• **Shipping Options:** These bundles can be shipped via UPS or FedEx within a cardboard box or can be palletized if shipped by a trucking method.

Coverage Rate Information:

Approximate coverage of one bundle of 18", #1 Grade Western Red Cedar Shingles at indicated weather exposure: (eg: 1 Bundle 18" No.1 Shingles @ 10" Exposure = 45 sqft)											
Exposure	4"	4½"	5"	5 ½"	6"	6 ½"	7"	7½"	8"	8½"	9"
Coverage in SF	18 sf	21 sf	23 sf	25 sf	27 sf	30 sf	32 sf	34 sf	36 sf †	39 sf	41 sf
Exposure	9 ½"	10"	10½"	11"	11½"	12"	12½"	13"	13½"	14"	
Coverage in SF	43 sf	45 sf	48 sf	50 sf	52 sf	54 sf	57 sf	59 sf	61 sf	64 sf ‡	
†Maximum exposure recommended for double coursing 18" No. 1 grade shingles on sidewalls is 14". ‡Maximum exposure recommended for single coursing 18" No. 1 grade shingles on sidewalls is 8".											

• Each bundle is sized to cover 25 square feet of wall if applied at a 5-1/2" shingle exposure. The chart above provides a conversion for coverage at different exposures.

• When using double coursing, this product has a maximum recommended exposure of 14".

• When using single coursing, this product has a maximum recommended exposure of 8".

Single Coursing Vs. Double Coursing Application Methods:

• Using the single coursing application method, the shingles are installed with one layer of shingles per

run.

• Using the double coursing method, two shingles are installed on top of each other on every layer. This method allows more of the face of each shingle to be exposed, providing more square footage of coverage from each bundle of shingles. Double exposure application also saves money on material and produces a more noticeable shadow line.

Estimating Cedar Shingles:

1. Start by measuring the amount of square footage you have to cover.
2. Each bundle will vary in the amount of completed coverage it will yield based on the width of exposure you choose. Exposure is the height in inches of the shingle face not covered by the next shingle course. Generally, the wider the exposure, the more coverage you will get from the bundle.
3. Using the chart above, identify the amount of coverage per bundle at your desired exposure.
4. Divide the square footage of coverage needed by the square footage per bundle value that you just selected from the chart.

Example: 500 square feet of wall needs to be covered using #1 Grade 18" (Perfection) Cedar Sidewall Shingles. The highest level of exposure is desired; therefore, the shingles can be installed as a double course with a 14" exposure. At 14" exposure, each bundle of shingles should yield 64 square feet of coverage. So, divide the 500 square feet of wall coverage by the 64 square feet of coverage per bundle (500 / 64 = 7.8 bundles). Since the calculation indicates that a partial bundle is required, round up to 8 bundles to ensure that enough shingles will be available to complete the job.

Product Resources:

Alaskan Yellow Cedar Product Selection Guide
Cedar Shake and Shingle Specification Guide
CSSB Exterior and Interior Wall Manual
CSSB New Roof Construction Manual

Specifications

More Information

Reviews ★★★★★ 1 Review Write a Review

Product Questions 0 question

RECOMMENDED PRODUCTS

C) STAFF INFORMATION – PROJECT MEMO

PROJECT MEMORANDUM #2

March 20, 2025

TO: Richard Pham

FROM: Silvia Bolivar, PLA, ASLA/ *SB*
Senior Planner
City of Albuquerque Planning Department

RE: PROJECT #HCOA-2025-00009
Certificate of Appropriateness – Major for Alterations
305 13th Street NW

I am following up on our recent email exchanges over the past week regarding the project at 305 13th Street NW. As part of our discussions, on Wednesday, March 19th, I provided a link to the *New Town Neighborhoods Development Guidelines*, which outline regulations applicable to the Fourth Ward.

I want to take this opportunity to highlight the key guidelines that directly impact the proposal. Compliance with these guidelines must be demonstrated as part of your project review. In some cases, you will need to submit a justification letter explaining how the proposed project aligns with the applicable guidelines. If full compliance is not feasible, the justification should clearly articulate the reasons why and provide supporting details.

Applicable Guidelines:

- Page 46 Exterior Walls
- Page 55 Porches and Entrances
- Page 58 Windows and Doors
- Page 64 Details & Ornamentation

As noted on page 47 of the *New Town Development Guidelines*, *Preservation Brief #8* was previously recommended for further guidance. However, as of October 2023, this brief was rescinded because its recommendations no longer aligned with current best practices in historic preservation. In its place, *Preservation Brief #16*, titled *The Use of Substitute Materials on Historic Building Exteriors* (revised in 2023), now serves as a relevant resource. This brief provides updated guidance on selecting and using substitute materials when replacement is necessary. A link to the full document is available through *Technical Preservation Services (U.S. National Park Service)*, and I have also attached a PDF copy to this memorandum. For specific guidance on siding

and potential substitute materials, please refer to page 14. Additionally, page 46 of the *Fourth Ward Guidelines* states that synthetic siding may be appropriate if the substitute material closely resembles the original in design, dimension, detail, texture, and pattern.

Regarding your proposal for new horizontal wood siding, this material does not match the design, composition, or visual characteristics of the existing wood shaker shingles, which would result in a loss of historic integrity. Given the significant deterioration of the current shingles, I understand that replacement is unavoidable, as repair would be both impractical and cost-prohibitive, but the substitute material must replicate the existing siding. Substitute materials may be an appropriate alternative if they accurately replicate the visual and physical properties of the original shingles. This includes considerations such as texture, color variation, thickness, and installation pattern. The *Standards for Rehabilitation* emphasize that when replacing a distinctive historic feature, the new feature must:

- Match the original in composition, design, color, texture, and other visual characteristics.
- Maintain the historic character of the property by preserving as many original features as possible.

For the east elevation facing 13th Street NW, I recommend that the shingles begin at the base of the stairs rather than at the top in order to replicate the existing design. For the remaining elevations, the use of stucco would be appropriate.

Additionally, the proposed reframing of the windows on the west elevation is appropriate and aligns with the request.

Please let me know if you have any questions or need further clarification.

Thank you.

PROJECT MEMORANDUM

March 18, 2025

TO: Richard Pham

FROM: Silvia Bolivar, PLA, ASLA/ *SB*
Senior Planner
City of Albuquerque Planning Department

RE: PROJECT #HCOA-2025-00009
Certificate of Appropriateness – Major for Alterations
305 13th Street NW

I have completed the initial review of the application, including the justification letter for the proposed alterations at 305 13th Street NW.

The request is set for review at a public hearing before the Landmarks Commission (LC) on April 9, 2025, at 3:00 PM. Beginning April 1, 2025, the Landmarks Commission hearings will be conducted in person at Plaza Del Sol, Basement Hearing Room, 600 2nd Street NW, Albuquerque, NM 87102. The meeting will also be accessible via Zoom; however, this option is available exclusively for members of the public. During the hearing, the request will be evaluated based on its consistency with compliance with the design guidelines and standards for the Huning Highland historic district and the Integrated Development Ordinance (IDO).

1. Introduction:

   A. The legal ad will be posted as:

      Richard Pham, requests approval for a Certificate of Appropriateness – Major for alterations at 305 13th Street NW, described as Block 16, South half of Lots: 17, 23, 24, and 25, Perea Addition, between Marquette Avenue NW and Roma Avenue NW, zoned R-1A, 0.15 acres (J-13-Z).

   B. The property is within the boundaries of the Fourth Ward Historic Protection Overlay Zone (HPO-4). The property is considered a contributing building to the Fourth Ward Historic District.

   C. As per my email earlier this morning, I need to confirm if you are the property owner or acting as an agent on behalf of the owner. If you are not the owner and

representing them in this process, I will need an authorization letter from the owners in order to proceed and allow for you to represent them at the hearing.

2. Process

A. Information regarding the LC process, including the calendar and current Staff reports, can be found at:

https://www.cabq.gov/planning/boards-commissions/landmarks-commission/landmarks-commission-agendas-action-sheets

B. Timelines and LC calendar: The Landmarks Commission (LC) Public Hearing is scheduled for Wednesday, April 9, 2025. Final Staff Reports will be available on Wednesday, April 2, 2025.

3. Notification & Neighborhood Issues

Notification requirements for a Certificate of Appropriateness – Major are explained in Section 14-16-6-4(J), Public Notice (IDO, p. 422). The required notification consists of: 1) an emailed letter to neighborhood representatives indicated by the ONC, and ii) a mailed letter (first-class) to property owners within 100 feet of the subject site.

A. As per the office of Neighborhood Coordination (ONC), the required neighborhood associations include Downtown Neighborhoods Association, Huning Castle NA, and Raynolds Addition NA.

B. The notification requirements for property owners within 100 feet of the subject site have been correctly and thoroughly met.

C. Have any members of the public reached out to you with comments since the submittal of the application?

4. Posted Sign Agreement

A. The requirements for posting signs for the zone change are outlined in Section 6-4(J)(4), Posted Sign, (IDO pg. 426). The applicant must post at least one sign on each street that borders the property in question, ensuring that the sign is clearly visible from the street. The signs must remain posted for a minimum of 15 calendar days before the public meeting or hearing, as well as during the 15-day appeal period following any decision. Accordingly, the signs should be posted from March 26, 2025 through April 23, 2025.

Once the signs have been posted, please forward a photograph of the posted signs in case they should disappear before the hearing.

5. Certificate of Appropriateness – Major, Justification & Analysis

The proposed changes include the following:

General Changes:

Stucco Repair: Apply new stucco up to the finish floor level, aligning with the entry stairs. This will mitigate ongoing water damage affecting the base of the exterior siding and the foundation.

Siding Replacement: All exterior siding will be replaced with new wood siding, as the existing material is significantly deteriorated, with widespread paint flaking and structural damage. The replacement will match the original siding dimensions and profiles.

Window Replacement: Replace all windows with new windows that comply with the International Energy Conservation Code (IECC) while maintaining the original window styles and muntin patterns.

Front Entry (East Side, Facing 13th Street):

Reconfiguration of Entry: The proposal includes removing a secondary door and repositioning the main entry door to align with the front façade rather than its current recessed placement.

Front Porch Redesign: A new porch façade is proposed to improve the articulation of the front elevation.

Porch Stair Maintenance: Repainting the porch stairs to refresh the aesthetic while preserving historic integrity.

South Side (Facing Marquette):

Window Realignment: One window will be raised to match the head heights of adjacent windows for improved visual continuity.

Security Bar Removal: Remove security bars from an existing window to restore the historic appearance.

West Elevation (Rear, Facing Backyard):

Structural Window Reframing: A series of windows on the northwest corner lack proper headers; you are proposing to reframe them ensuring window head heights match adjacent windows.

Did I overlook any key details in the recap?

As we discussed during our telephone call this morning, please submit a PDF document containing the specifications for the windows and door you are proposing. I will need the PDFS submitted no later than Thursday, March 27, 2025. Additionally, I will need clear, detailed photographs that specifically highlight the areas affected by water damage, demonstrating its impact on both the foundation and the siding. These images will help assess the extent of the issue and ensure that the proposed solutions address the necessary repairs.

Let me know if you have any questions or need further clarification.

Thank you.

D) PUBLIC NOTICE

Gmail Richard P <richnpham@gmail.com>

305 13th Street NW_Public Notice Inquiry Sheet Submission

1 message

Office of Neighborhood Coordination <onc@cabq.gov> Tue, Mar 11, 2025 at 4:17 PM
To: "richnpham@gmail.com" <richnpham@gmail.com>

PLEASE NOTE:

The neighborhood association contact information listed below is valid for 30 calendar days after today's date.

Dear Applicant:

Please find the neighborhood contact information listed below. Please make certain to read the information further down in this e-mail as it will help answer other questions you may have.

Association Name	Association Email	First Name	Last Name	Email	Address Line 1	City	State	Zip	Mobile Phone	Phone
Downtown Neighborhoods Association		Sylvia	Holguin	sylvia4quality@gmail.com	1503 Marble Ave NW	Albuquerque	NM	87104		5168496883
Downtown Neighborhoods Association		Danny	Senn	1senn@sbcglobal.net	506 12th Street NW	Albuquerque	NM	87102	5058507700	
Huning Castle NA	hcnaalert@gmail.com	Brenda	Marks	brenda.marks648@gmail.com	1726 Chacoma Pl. SW	Albuquerque	NM	87104	4692356598	
Huning Castle NA	hcnaalert@gmail.com	Rudy	Garcia	rmgconsults@msn.com	1607 San Patricio SW	Albuquerque	NM	87104		5053859428
Raynolds Addition NA	raynoldsneighborhood@gmail.com	Janet	Manry	janet.manry@gmail.com	806 Lead Avenue SW	Albuquerque	NM	87102	8327073645	
Raynolds Addition NA	raynoldsneighborhood@gmail.com	Christopher	Frechette	margfish2@aol.com	1315 Gold Ave SW	Albuquerque	NM	87102		5052421478

The ONC does not have any jurisdiction over any other aspect of your application beyond this neighborhood contact information. We can't answer questions about sign postings, permit status, site plans, buffers, or project plans, so we encourage you to contact the Planning Department at: 505-924-3857 Option #1, e-mail: devhelp@cabq.gov, or visit: https://www.cabq.gov/planning/online-planning-permitting-applications with those types of questions.

Please note the following:

- You will need to e-mail each of the listed contacts and let them know that you are applying for an approval from the Planning Department for your project.
- Please use this online link to find the required forms you will need to submit your permit application. https://www.cabq.gov/planning/urban-design-development/public-notice.
- The Checklist you need for notifying neighborhood associations can be found here: https://www.cabq.gov/planning/codes-policies-regulations/integrated-development-ordinance-1/public-notice
- The Administrative Decision form you need for notifying neighborhood associations can be found here: https://documents.cabq.gov/planning/online-forms/PublicNotice/Emailed-Notice-Administrative-Print&Fill.pdf
- Once you have e-mailed the listed contacts in each neighborhood, you will need to attach a copy of those e-mails AND a copy of this e-mail from the ONC to your application and submit it to the Planning Department for approval.

If you have questions about what type of notification is required for your particular project or meetings that might be required, please click on the link below to see a table of different types of projects and what notification is required for each:

https://ido.abc-zone.com/integrated-development-ordinance-ido?document=1&outline-name=6-1%20Procedures%20Summary%20Table

Thank you,

Suzie

Suzie Flores

Senior Administrative Assistant

Office of Neighborhood Coordination (ONC) | City Council Department | City of Albuquerque

(505) 768-3334 Office

E-mail: suzannaflores@cabq.gov

Website: www.cabq.gov/neighborhoods

From: webmaster@cabq.gov <webmaster@cabq.gov>
Sent: Tuesday, March 11, 2025 3:12 PM
To: Office of Neighborhood Coordination <richnpham@gmail.com>
Cc: Office of Neighborhood Coordination <onc@cabq.gov>
Subject: Public Notice Inquiry Sheet Submission

[EXTERNAL] Forward to phishing@cabq.gov and delete if an email causes any concern.

Public Notice Inquiry For:

Landmarks Commission

If you selected "Other" in the question above, please describe what you are seeking a Public Notice Inquiry for below:

Contact Name

Richard Pham

Telephone Number

5056105622

Email Address

richnpham@gmail.com

Company Name

Company Address

City

Albuquerque

State

NM

ZIP

87112

Legal description of the subject site for this project:

016PEREA ADD N1/2 LOTS 17 23 24 X 25

Physical address of subject site:

305 13th Street NW

Subject site cross streets:

13th Street & Marquette Ave

Other subject site identifiers:

This site is located on the following zone atlas page:

J-13-Z

Captcha

x

J-13-Z OT FW 305 13th.pdf
421K

Gmail **Richard P <richnpham@gmail.com>**

Public Notice for Request: Certificate of Appropriateness at 305 13th St NW

1 message

Richard P <richnpham@gmail.com> Wed, Mar 12, 2025 at 10:59 AM
To: "hcnaalert@gmail.com" <hcnaalert@gmail.com>, raynoldsneighborhood@gmail.com
Cc: "sylvia4quality@gmail.com" <sylvia4quality@gmail.com>, 1senn@sbcglobal.net, "brenda.marks648@gmail.com" <brenda.marks648@gmail.com>, "rmgconsults@msn.com" <rmgconsults@msn.com>, "janet.manry@gmail.com" <janet.manry@gmail.com>, margfish2@aol.com

To the Neighborhood Associations and their representatives:

This is a public notice in regards to an application for a Certificate Appropriateness for the following address:
305 13th St NW
Albuquerque, NM 87102

Please see attached documents for relevant information.
Feel free to reach out to me at this email if there are any questions or concerns.

Sincerely,
Richard Pham

4 attachments

- **Photo Summary of Work.pdf**
  249K
- **J-13-Z OT FW 305 13th.pdf**
  421K
- **Letter of Introduction.pdf**
  387K
- **Emailed notification requiring a hearing.pdf**
  1675K

NOTICE

Residential Remodel

03.11.2025

PROJECT SITE
305 13th Street NW
Albuquerque, NM 87102

To whom it may concern:

Hello, my name is Richard Pham and I am a designer writing on behalf of Martha O'Neil who has recently become the owner of the residence located at 305 13th Street NW. We are writing to inform neighbors of our plans to restore the home back to livable conditions while reinvigorating the exterior appeal to fit within the design guidelines of the Fourth Ward Historic District.

General Changes:
- There currently is stucco at the base of the home. We are proposing to extend stucco up to the finish floor, aligned with the entry stairs. This is to help alleviate water damage that has occurred over time at the base of exterior siding with new wood siding as the current siding is damaged
- We propose to replace all exterior siding with new wood siding as the current siding is damaged in various places and the paint done in the past is flaking.
- Replace windows throughout to conform with IECC and current code (match window types and existing stiles and muntins)

Front Entry (east side facing 13th St) Changes:
- We are proposing to redo the front entry area as there are a few issues which conflict with its historic nature.
- We are proposing to remove the secondary door which has an integrated steel security gate.
- Currently the main entry door is recessed on the side of the deep entryway; we are proposing a new door at the face, and redoing the front porch facade to better articulate the front facade.

South Side Changes (facing Marquette):
- There is one window we would like to raise to match the window head heights on this elevation.
- Remove security bars that exist on one window.

West Elevation Changes (along the backyard):
- We need to reframe a series of windows on the northwest corner of the home as these windows do not have headers. We plan to match the window head height of the adjacent windows.

Attached to this letter are supplementary documentation, but if any additional concerns or questions shall be raised, please do not hesitate to contact me.

Sincerely,
Richard Pham
richnpham@gmail.com

[Note: Items with an asterisk (*) are required.]

Public Notice of a Proposed Project in the City of Albuquerque for Decisions Requiring a Meeting or Hearing Mailed to a Property Owner

Date of Notice*: March 11, 2025

This notice of an application for a proposed project is provided as required by Integrated Development Ordinance (IDO) **Subsection 14-16-6-4(K) Public Notice** to:

Property Owner within 100 feet*: _____

Mailing Address*: _____

Project Information Required by IDO Subsection 14-16-6-4(K)(1)(a)

1. Subject Property Address*: 305 13th St NW
   Location Description: Northwest corner of 13th St & Marquette Ave
2. Property Owner*: Martha O'Neil
3. Agent/Applicant* *[if applicable]*: Richard Pham
4. Application(s) Type* per IDO Table 6-1-1 *[mark all that apply]*
   - ☐ Conditional Use Approval
   - ☐ Permit _____ (Carport or Wall/Fence – Major)
   - ☐ Site Plan
   - ☐ Subdivision _____ (Minor or Major)
   - ☐ Vacation _____ (Easement/Private Way or Public Right-of-way)
   - ☐ Variance
   - ☐ Waiver
   - ☒ Other: Historic Certificate of Appropriateness - Major

   Summary of project/request[1]*: Exterior upgrades to residence in the Fourth Ward Historic District: new windows, new wall siding, and adjustments to the front entry way
5. This application will be decided at a public meeting or hearing by*:
   - ☐ Zoning Hearing Examiner (ZHE)
   - ☐ Development Review Board (DRB)
   - ☒ Landmarks Commission (LC)
   - ☐ Environmental Planning Commission (EPC)

[1] Attach additional information, as needed to explain the project/request.

[Note: Items with an asterisk (*) are required.]

Date/Time*: April 9, 2025 / 3:00 PM
Location*[2]: Online meeting via Zoom

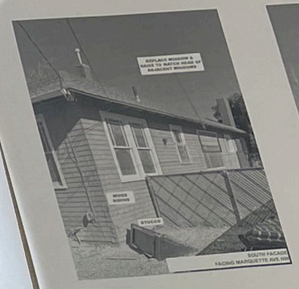
Agenda/meeting materials: http://www.cabq.gov/planning/boards-commissions
To contact staff, email devhelp@cabq.gov or call the Planning Department at 505-924-3860.

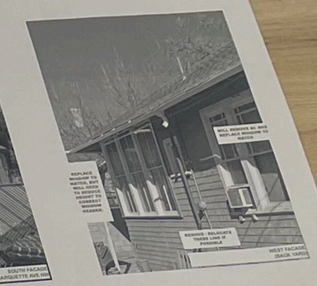
6. Where more information about the project can be found*[3]:
   email: richnpham@gmail.com

Project Information Required for Mail/Email Notice by IDO Subsection 6-4(K)(1)(b):

1. Zone Atlas Page(s)*[4]: J-13-Z
2. Architectural drawings, elevations of the proposed building(s) or other illustrations of the proposed application, as relevant*: Attached to notice or provided via website noted above
3. The following exceptions to IDO standards have been requested for this project*:
   ☐ Deviation(s) ☐ Variance(s) ☐ Waiver(s)
   Explanation*: N/A
4. A Pre-submittal Neighborhood Meeting was required by Table 6-1-1: ☐ Yes ☒ No
   Summary of the Pre-submittal Neighborhood Meeting, if one occurred:
5. ***For Site Plan Applications only****, attach site plan showing, at a minimum:
   - ☐ a. Location of proposed buildings and landscape areas.*
   - ☐ b. Access and circulation for vehicles and pedestrians.*
   - ☐ c. Maximum height of any proposed structures, with building elevations.*

[2] Physical address or Zoom link
[3] Address (mailing or email), phone number, or website to be provided by the applicant
[4] Available online here: http://data.cabq.gov/business/zoneatlas/





[Note: Items with an asterisk (*) are required.]

- ☐ d. **For residential development***: Maximum number of proposed dwelling units.
- ☐ e. **For non-residential development***:
  - ☐ Total gross floor area of proposed project.
  - ☐ Gross floor area for each proposed use.

Additional Information:

From the IDO Zoning Map[5]:

1. Area of Property *[typically in acres]*: 0.14 acres
2. IDO Zone District: R-1A
3. Overlay Zone(s) *[if applicable]*: Character Protection & Historic Protection Overlay Zones
4. Center or Corridor Area *[if applicable]*: Major Transit & Main Street Corridor

Current Land Use(s) *[vacant, if none]*: Residential, currently vacant

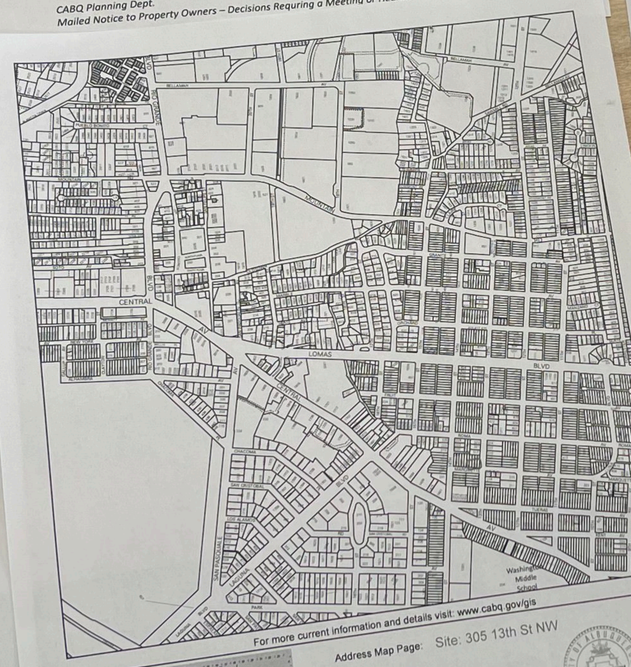
NOTE: Pursuant to IDO Subsection 14-16-6-4(L), property owners within 330 feet and Neighborhood Associations within 660 feet may request a post-submittal facilitated meeting. If requested at least 15 calendar days before the public meeting/hearing date noted above, the facilitated meeting will be required. To request a facilitated meeting regarding this project, contact the Planning Department at devhelp@cabq.gov or 505-924-3955.

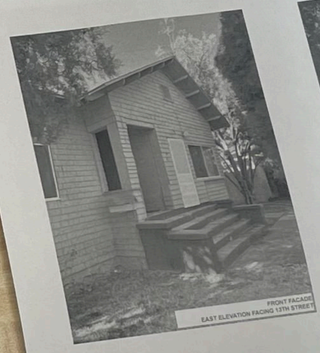
Useful Links

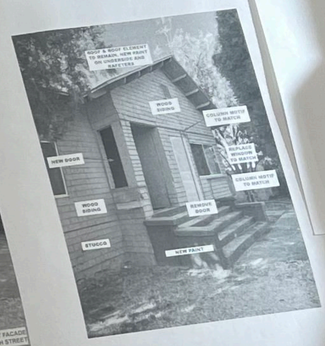
Integrated Development Ordinance (IDO):
https://ido.abc-zone.com/

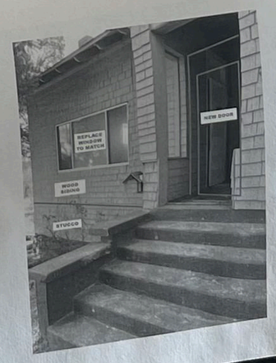
IDO Interactive Map
https://tinyurl.com/IDOzoningmap

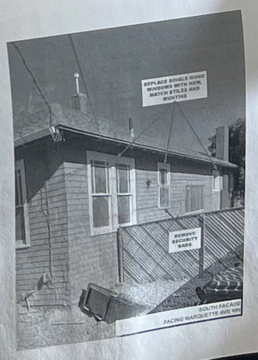
[5] Available here: https://tinurl.com/idozoningmap











Martha O'Neil
505 13th st NW
Albuquerque, NM 87102

Nicholas H Bullock
1500 Vista Del Valle
Las Cruces, NM 88007-8900

Martha O'Neil
305 13th St NW
Abq NM 87102

Cynthia Sontag
P.O. Box 1971
Abq, NM 87103

Martha O'Neil
305 13th St NW
Abq NM 87102

Michelle Garcia-Dunn
317 13th St NW
Abq, NM 87102

Martha O'Neil
305 13th St NW
Abq NM 87102

Phillip Camp
217 13th St NW
Abq, NM 87102

Martha O'Neil
305 13th St NW
Abq NM 87102

Estate of Harm & Marian Kraai
222 14th St NW
Abq, NM 87104

Martha O'Neil
305 13th St NW
Abq NM 87102

Christopher & Theresa Jaramillo
1326 Marquette Ave NW
Abq, NM 87102

Martha O'Neil
305 13th St NW
Abq NM 87102

Ben & Joann Abeyta
212 13th St NW
Abq, NM 87102

Martha O'Neil
305 13th St NW
Abq NM 87102

Christopher Granger-Jones & Gina Herzog
1322 Marquette Ave NW
Abq NM 87104

Martha O'Neil
305 13th St NW
Abq NM 87102

Christel Otway
213 13th St NW
Abq, NM 87102

Martha O'Neil
305 13th St NW
Albuquerque, NM 87102

Linda Larson
1321 Marquette Ave NW
Albuquerque, NM 87104

Martha O'Neil
305 13th St NW
Abq NM 87102

William Bachmann & Meghan Paige
321 13th St NW
Abq, NM 87102

Martha O'Neil
305 13th St NW
Abq NM 87102

Erik Kraai & Tania Peterson Kraai
320 13th St NW
Abq, NM 87102

Martha O'Neil
305 13th St NW
Abq NM 87102

Stephen Lawless & Lucille Ortiz-Lawless
1323 Marquette Ave NW
Abq, NM 87104

Martha O'Neil
305 13th St NW
Abq NM 87102

Kirtan Khalsa
4309 Rio Grande Blvd NW
Abq, NM 87107

Martha O'Neil
305 13th St NW
Abq NM 87102

Maja Sadikovic
1204 Marquette Ave NW
Abq NM 87102

Martha O'Neil
305 13th St NW
Abq NM 87102

Paul Lassa
1319 Marquette Ave NW
Abq NM 87104

Martha O'Neil
305 13th St NW
Abq NM 87102

Nicholas Gentry & Mary Lebeck
415 11th St NW
Abq NM 87102

Martha O'Neil
305 13th St NW
Abq, NM 87102

Richard Winterbottom & Kathryn Monaco
308 13th St NW
Abq NM 87102

Martha O'Neil
305 13th St NW
Abq NM 87102

Mary Salazar
220 14th St NW
Abq NM 87104

Martha O'Neil
305 13th St NW
Abq NM 87102

Joseph & Bernadette Serrano
1312 Roma Ave NW
Abq, NM 87104

Martha O'Neil
305 13th St NW
Abq NM 87102

Russell Janis
300 13th St NW
Abq, NM 87102

Martha O'Neil
305 13th St NW
Abq NM 87102

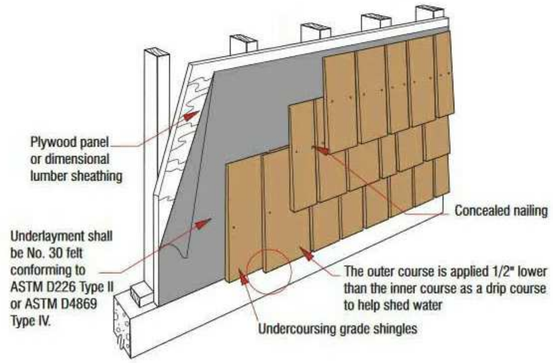
Alicia Athena Clark
1318 Marquette Ave NW
Abq, NM 87104

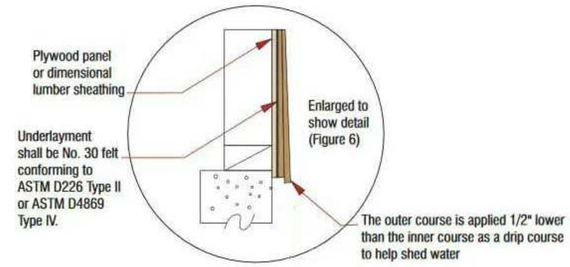
Martha O'Neil
305 13th St NW
Abq NM 87102

Jessica Rowland
214 13th St NW
Abq, NM 87102

E) ELEVATIONS

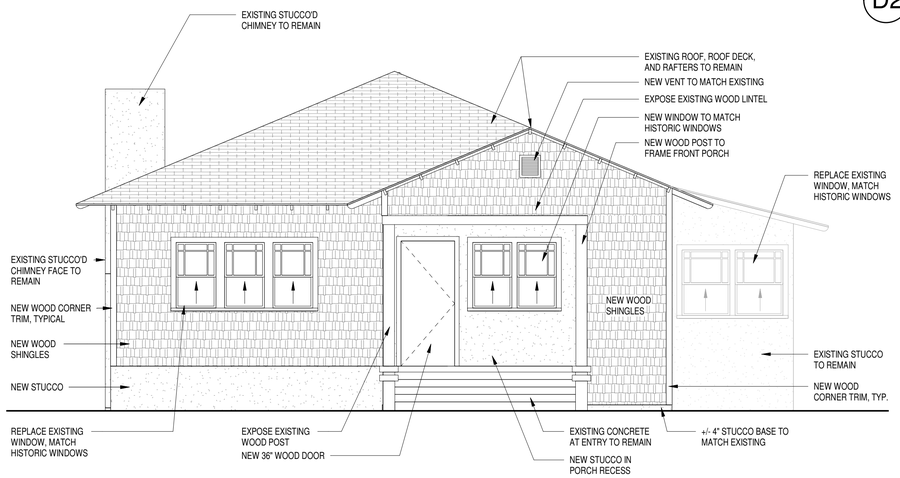
Revision 3/31/25





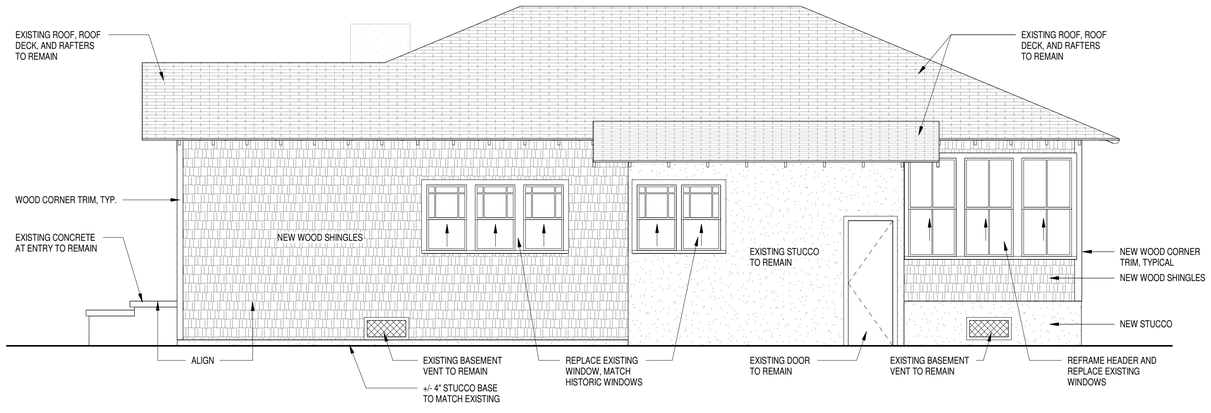
D2 WOOD SHINGLES SINGLE COURSE INSTALLATION DIAGRAM

SCALE: 3" = 1'-0"



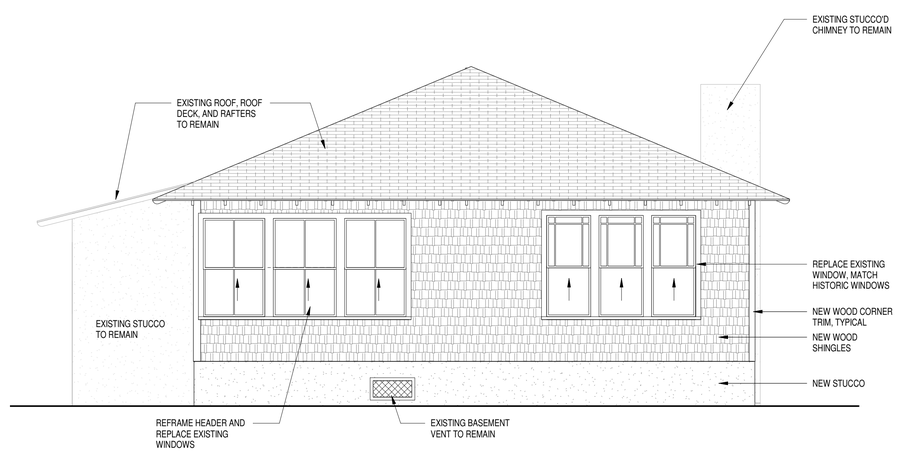
B1 EAST ELEVATION

SCALE: 1/4" = 1'-0"



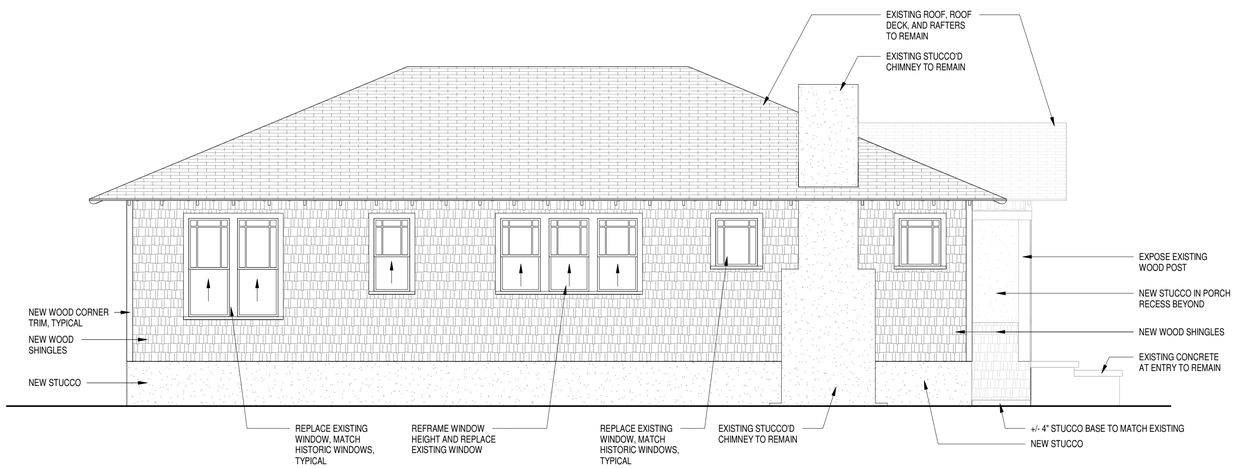
B2 NORTH ELEVATION

SCALE: 1/4" = 1'-0"



A1 WEST ELEVATION

SCALE: 1/4" = 1'-0"



A2 SOUTH ELEVATION

SCALE: 1/4" = 1'-0"

CONSULTANTS

305 13TH STREET REMODEL

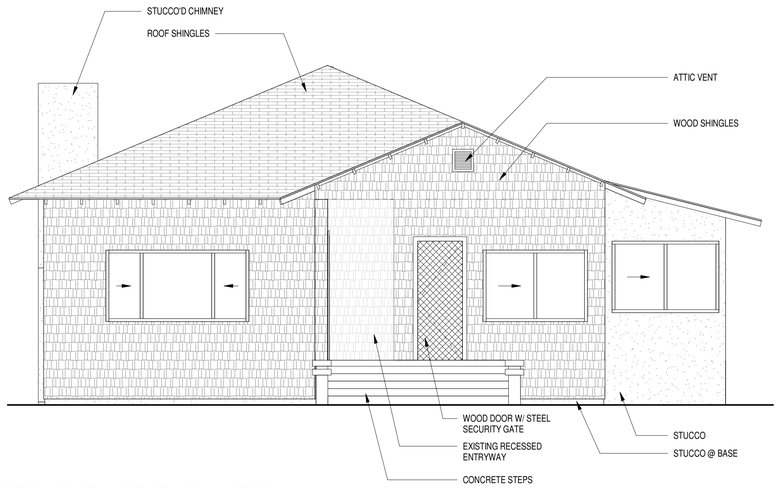
MARK	DATE	DESCRIPTION

PROJECT #	2201
FILE:	305 13TH_CF.RVT
DATE:	3/31/2025
DRAWN BY:	Author
CHECKED BY:	Checker

ELEVATIONS

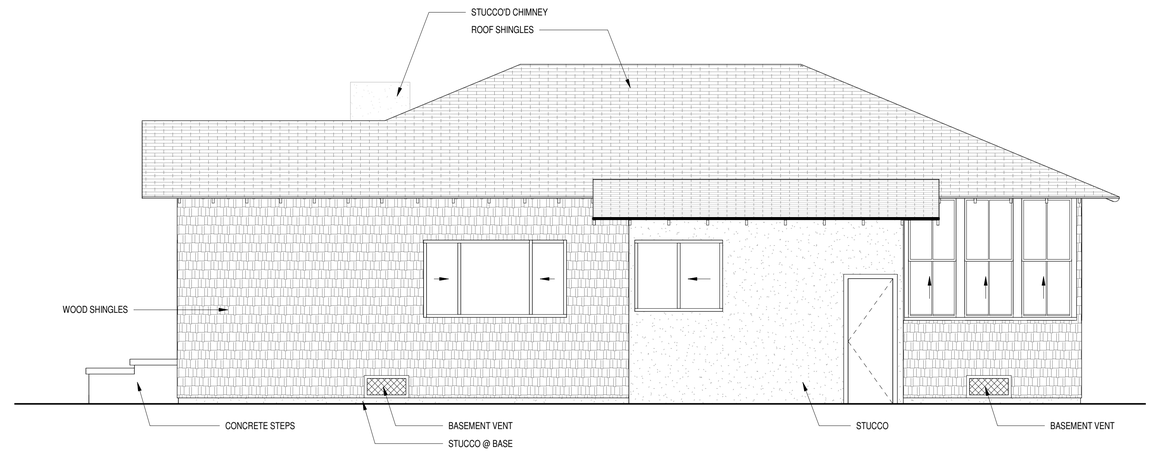
AH102

SHEET _ OF _



B1 EXISTING EAST ELEVATION

SCALE: 1/4" = 1'-0"



B2 EXISTING NORTH ELEVATION

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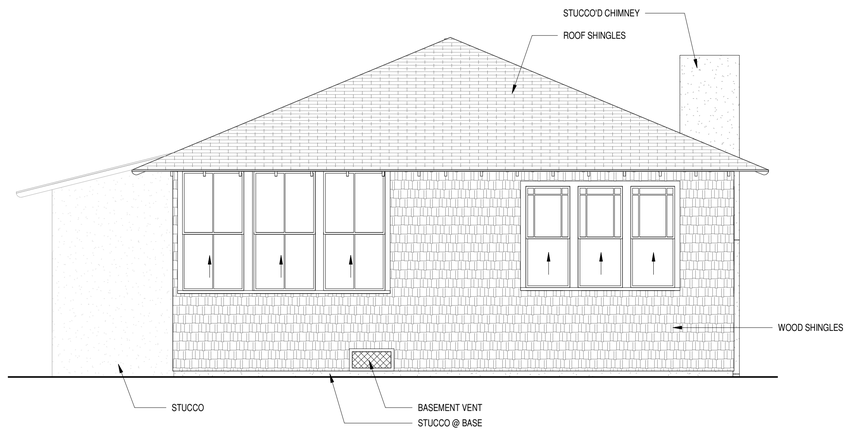
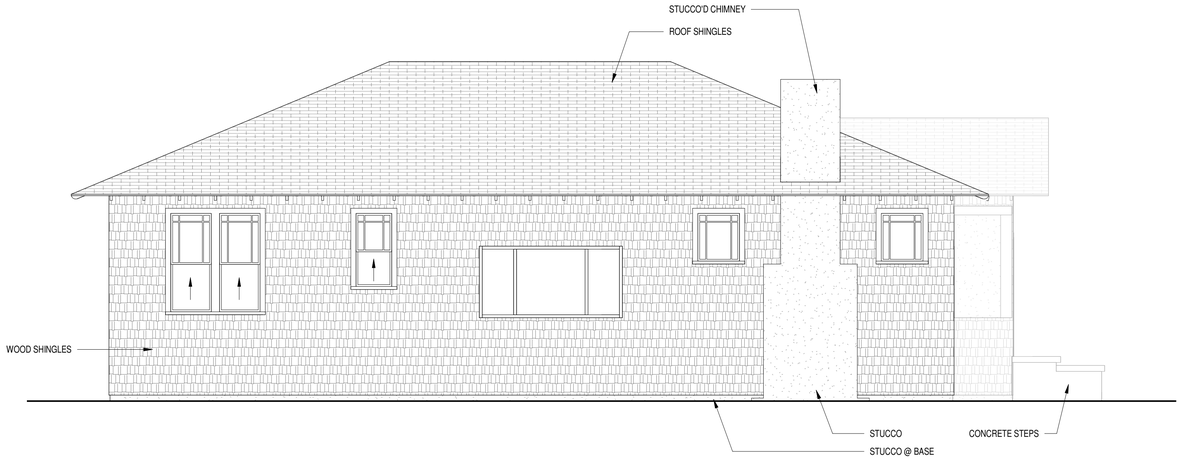


A1 EXISTING WEST ELEVATION

SCALE: 1/4" = 1'-0"



A2 EXISTING SOUTH ELEVATION

SCALE: 1/4" = 1'-0"

CONSULTANTS

305 13TH STREET REMODEL

MARK	DATE	DESCRIPTION

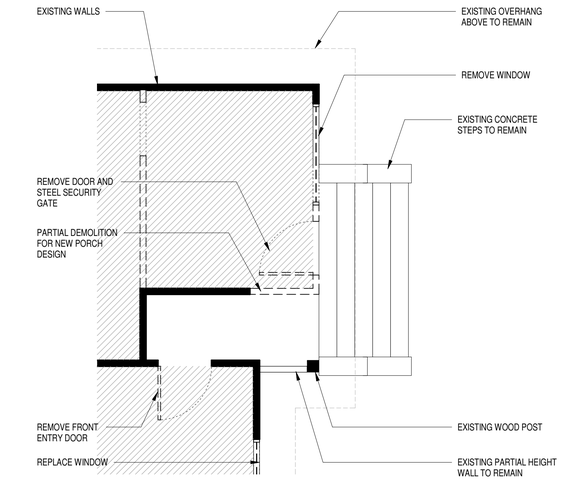
PROJECT #	2201
FILE:	305 13TH_CF.RVT
DATE:	3/12/2025
DRAWN BY:	Author
CHECKED BY:	Checker

EXISTING ELEVATIONS

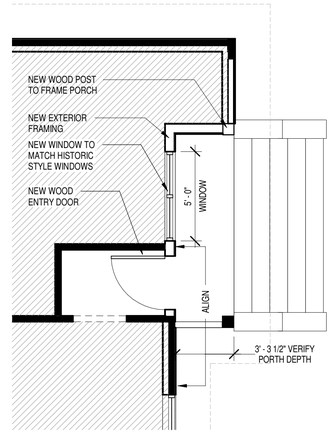
AH103

SHEET _ OF _

A1 SITE PLAN
SCALE: 1" = 10'-0"



B2 EXISTING FRONT ENTRY PLAN
SCALE: 1/4" = 1'-0"



B1 NEW FRONT ENTRY PLAN
SCALE: 1/4" = 1'-0"

CONSULTANTS

305 13TH STREET REMODEL

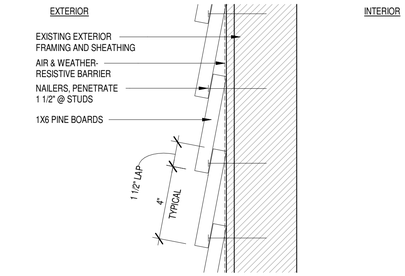
MARK	DATE	DESCRIPTION

PROJECT #	2201
FILE:	305 13TH_CF.RVT
DATE:	3/12/2025
DRAWN BY:	RP
CHECKED BY:	RP

SITE PLAN & ENTRY PLAN

AH101
SHEET _ OF _

Original submittal



D4 WOOD SIDING SECTION DETAIL
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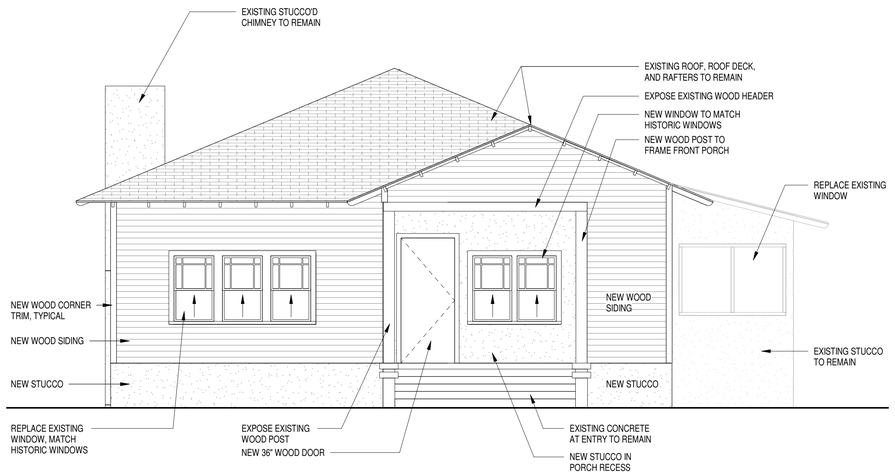

B1 EAST ELEVATION
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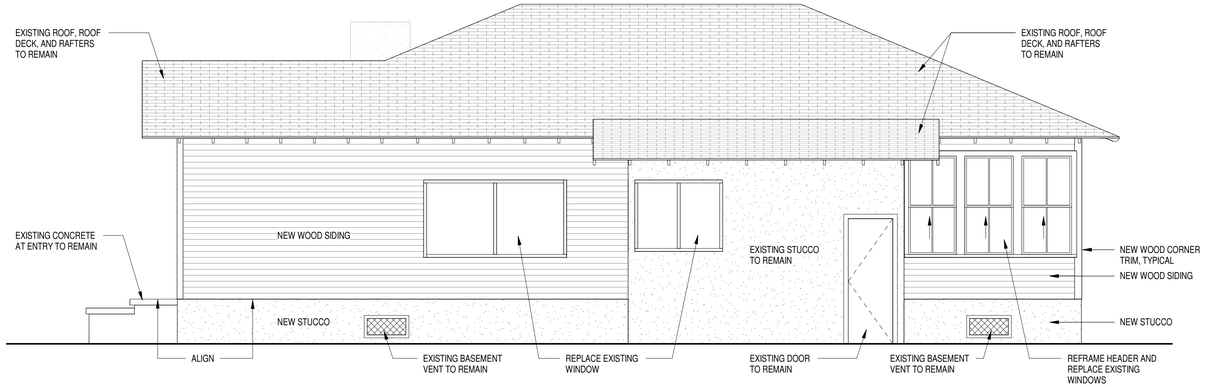

B2 NORTH ELEVATION
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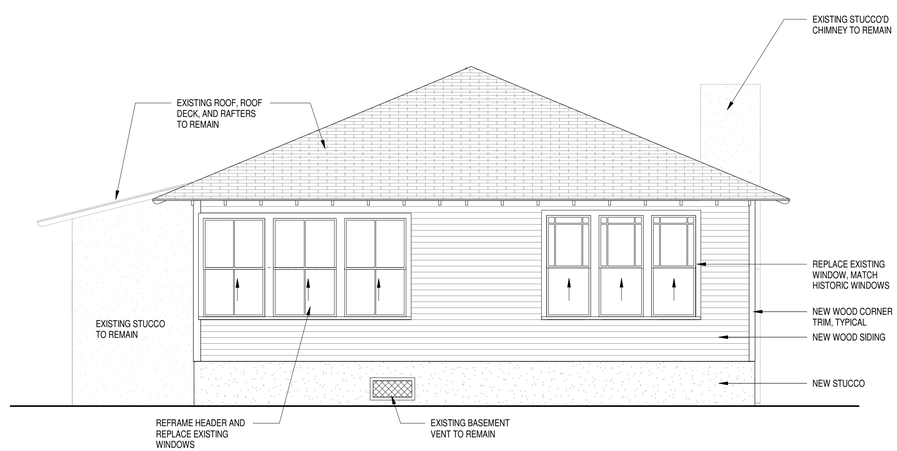

A1 WEST ELEVATION
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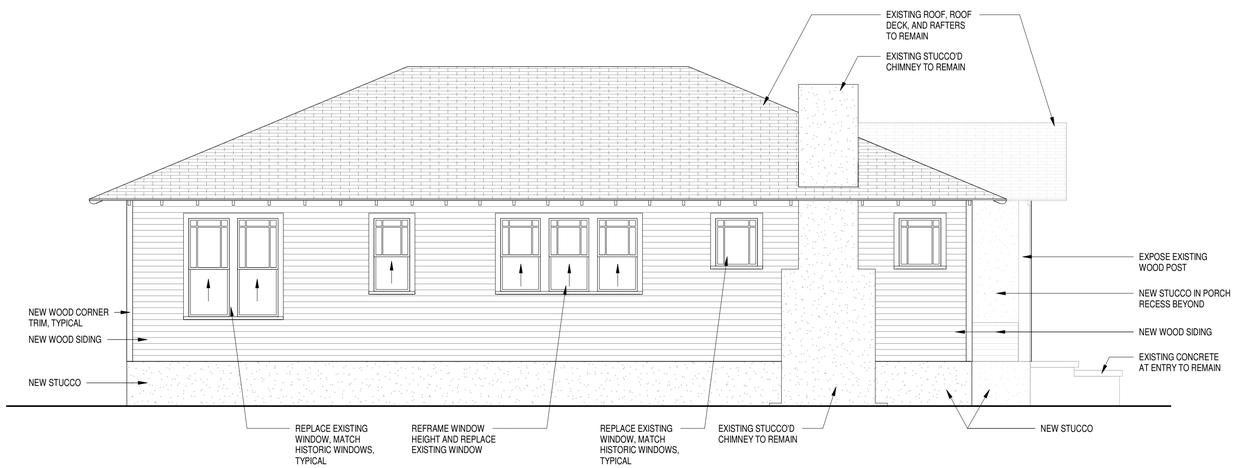

A2 SOUTH ELEVATION
SCALE: 1/4" = 1'-0"

CONSULTANTS

305 13TH STREET REMODEL

MARK	DATE	DESCRIPTION

PROJECT #	2201
FILE:	305 13TH_CF.RVT
DATE:	3/12/2025
DRAWN BY:	Author
CHECKED BY:	Checker

ELEVATIONS

AH102
SHEET _ OF _

PRESERVATION BRIEF #16: THE USE OF SUBSTITUTE MATERIALS ON HISTORIC BUILDING EXTERIORS

16 PRESERVATION BRIEFS

The Use of Substitute Materials on Historic Building Exteriors

John Sandor, David Trayte, and Amy Elizabeth Uebel

National Park Service
U.S. Department of the Interior
Technical Preservation Services

The *Secretary of the Interior's Standards for Rehabilitation* generally require that deteriorated distinctive architectural features of a historic property be repaired rather than replaced. Standard 6 of the *Standards for Rehabilitation* further states that when replacement of a distinctive feature is necessary, the new feature must "match the old in composition, design, color, texture, and other visual properties, and, *where possible*, materials" (emphasis added). While the use of matching materials to replace historic ones is always preferred under the *Standards for Rehabilitation*, the Standards also purposely recognize that flexibility may sometimes be needed when it comes to new and replacement materials as part of a historic rehabilitation project. Substitute materials that closely match the visual and physical properties of historic materials can be successfully used on many rehabilitation projects in ways that are consistent with the Standards.

The flexibility inherent in the *Standards for Rehabilitation* must always be balanced with the preservation of the historic character and the historic integrity of a building, of which historic materials are an important aspect. Any replacement work reduces the historic integrity of a building to some degree, which can undermine the historic character of the property over time. With limited exceptions, replacement should only be considered when damage or deterioration is too severe to make repair feasible. When needed replacement is made with a material that matches the historic material, the impact on integrity can be minimal, especially when only a small amount of new material is needed. When a substitute material is used for the replacement, the loss in integrity can sometimes, although not always, be greater than that of a matching material. Also, whether historic or substitute material, there is a point where the amount of replacement can become excessive and the building's historic integrity is diminished to an unacceptable degree, regardless of the material used—that is, a loss of authenticity and the physical features and characteristics closely associated with the property's historic significance.

The term *substitute materials* is used to describe building materials that have the potential to match the appearance, physical properties, and related attributes of historic materials well enough to make them alternatives for use in current preservation practice when historic materials require replacement.

Compelling reasons to use a substitute material instead of the historic material include the unavailability or poor performance of the historic material, or environmental pressures or code-driven requirements that necessitate a change in material. When using a substitute material for replacement it is critical that it match the historic material in all of its visual and physical properties to preserve the historic character of the building and minimize the impact on its integrity.

Substitute materials can be cost-effective, permit the accurate visual duplication of historic materials, and provide improved durability. While the behavior of traditional, historic materials is generally well understood, the behavior of newer materials can be less established and sometimes less predictable. Substitute materials are most successful when the properties of both the original material and the substitute are thoroughly understood by all those involved in the design and construction process. The architect must be adept at the selection of substitute materials and their incorporation into architectural plans and specifications. The contractor or tradesperson in the field must also be experienced with their use.

This Preservation Brief provides general guidance on the use of substitute materials as replacement materials for distinctive features on the exterior of historic buildings. Due to the ever-evolving product market for construction materials, this Brief does not provide specifications for substitute materials. This guidance should be used in conjunction with qualified professionals who are knowledgeable in current construction and historic preservation practices.

This Brief includes a discussion of the appropriate use of substitute materials and provides a path for decision-making in their use. In considering the use of substitute materials, such issues as the deterioration or failure of the historic building component and material must be understood. The existing component's physical and visual properties, profile, surface texture, dimensions, and performance should be identified to establish the basis for evaluating a possible replacement material. The physical and visual properties of the various substitute materials available should also be assessed and compared to the original material for their physical and visual compatibility. Lastly, the suitability of a given substitute replacement material should be determined based on how well the material matches both the physical and visual properties of the existing material as well as any specific performance or application needs. The Brief's descriptions of common substitute materials are not meant to be comprehensive, and, as the performance history of newer materials continues to grow and new materials are developed, available options will change, and our understanding of current material performance will continue to evolve.

Historical Use of Substitute Materials

The tradition of using affordable and common materials in imitation of more expensive and less available materials is a long one. At Mount Vernon, for example, George Washington used wood painted with sand-impregnated paint to imitate rusticated stone. This technique, along with scoring stucco into block patterns, was common in Colonial America to imitate stone.

Nineteenth-century technology made a variety of materials readily available and widely used that were not only able to imitate traditional materials but were also cheaper to fabricate and easier to use. Traditionally, carved stone units were individually worked. Molded or cast materials greatly increased efficiency in creating repetitive elements. Cement-based products such as cast stone could provide convincing imitations of natural stone with carefully chosen aggregates and cements and was typically a commercially manufactured product. It could be tooled like natural stone, though that could reduce much of the cost advantage. These carefully-crafted cementitious products were widely used as trim elements for masonry structures or as the face material for an entire building. At the other end of the spectrum, mail-order catalogs provided a wide variety of forms for molding concrete that were merely evocative of natural stone and did little to match its appearance. Concrete masonry units could be fabricated locally and on site, avoiding expensive quarrying and shipping costs.

Offering similar efficiencies as cast stone for reproducing repetitive and even complex decorative shapes, terra cotta could mimic the surface characteristics of stone with various textures and glazes. It was popular in the late nineteenth and early twentieth centuries for details on stone or brick buildings as well as for the entire skin of large and elaborately detailed buildings.

Cast iron was also used to imitate stone, often with very decorative profiles, for a variety of architectural features ranging from window hoods to columns, piers, balustrades, and even whole façades. Cast iron offered its own set of efficiencies including cost, fabrication time, and weight, but required a painted finish.

While cast stone, terra cotta, and cast iron offered efficiencies over quarried and, particularly, carved stone, they were not cheap or impermanent materials. Less costly, but also less durable, stamped or brake-formed sheet metal, typically galvanized, could also be used instead of masonry for cornices, window hoods, roofing tiles, and even entire building façades.

Substitute Materials and Applying the Standards for Rehabilitation

The *Standards for Rehabilitation* are focused on preserving the important and distinctive character-defining features of a historic property (Standards 2 and 6), and they are to be applied in a reasonable manner, taking into account economic and technical feasibility (36 CFR 67.7 and 36 CFR 68). The Standards have an inherent flexibility that facilitates their application to diverse projects, historic properties, and conditions. They are to be applied on a "cumulative-effect" basis, when the overall effect of all work in the context of the specific conditions of the property and the project is consistent with the property's historic character.

The *Standards for Rehabilitation* require that the replacement of a distinctive feature match the old in physical and visual properties. While the use of matching materials is always preferred, the Standards purposely allow for the use of substitute materials when the use of original materials is not reasonably possible, such as in consideration of economic and technical feasibility or in new construction. They also provide additional flexibility in the treatment of secondary, less distinctive features that are less important in defining the historic character of the property. The *Standards for Rehabilitation* recognize that flexibility is appropriate to facilitate "a compatible use for a property … while preserving those portions or features which convey its historical, cultural, or architectural values" (definition of "Rehabilitation," 36 CFR 67.2(b)).

Examples of Historical Use of Substitute Materials

Figure 2a. Casting concrete blocks to mimic quarried stone was a popular late 19th- to mid 20th-century technique. Concrete masonry units could be completed by local craftsman, saving time and shipping costs. Photo: John Sandor, NPS.

Figure 2b: The 19th century also produced a variety of metal products used to imitate other materials. Across the country, cast iron was used in storefronts to imitate stone. Photo: John Sandor, NPS.

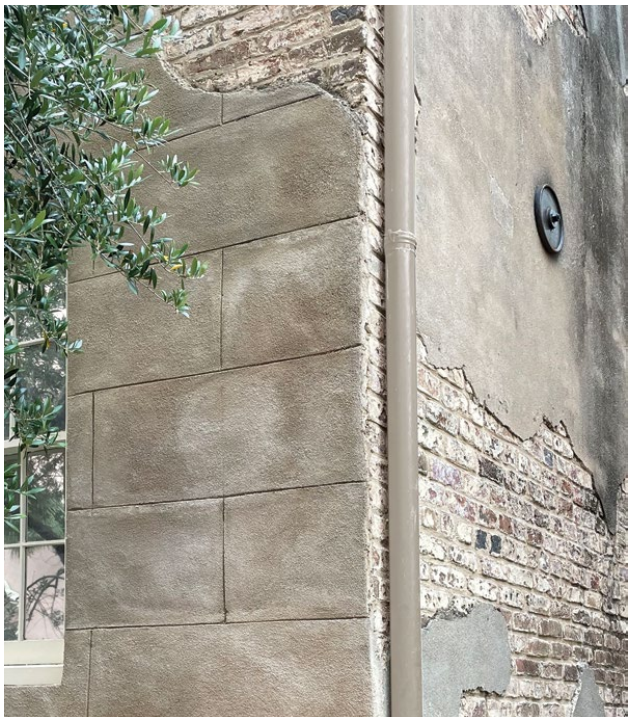

Figure 2c: Stucco has been used to imitate a number of building materials for many centuries. Seen here, stucco was applied to a brick structure and scored to represent a stone façade. Photo: John Sandor, NPS.

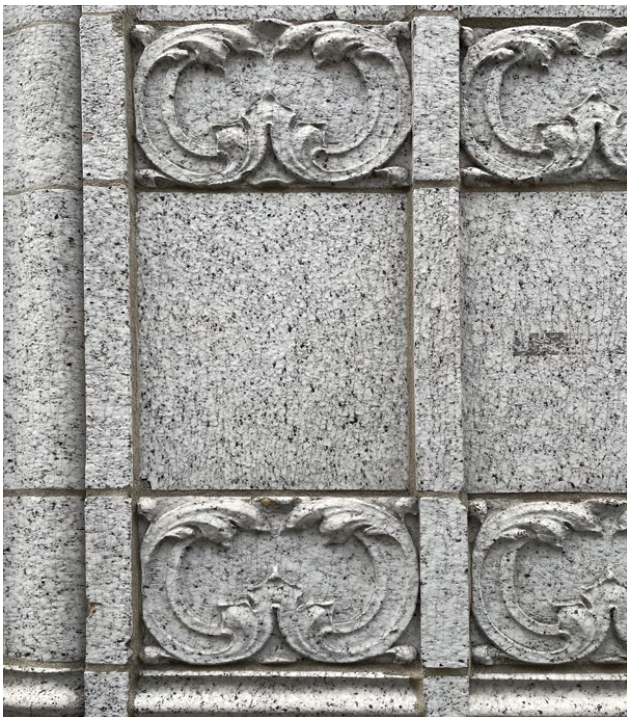

Figure 2d: Terra cotta gained popularity in the late 19th century as a cheap and lightweight alternative to stone. Glazing techniques allowed the blocks to imitate a variety of natural stone materials. Photo: John Sandor, NPS.

These examples of one material used to imitate another, more often in initial construction than for later repair and replacement purposes, are referred to as *imitative materials* in the *Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings*, updated in 2017, that accompany the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. These imitative materials, while evoking other materials, usually had distinctive qualities of their own and were not always a very close match in appearance to the historic material they were meant to imitate.

Many of the traditional materials discussed above are still available and used to replace damaged or missing original features, both to replace matching historic materials and sometimes as substitute materials. Because of their extensive use over time and their known physical and chemical properties, cast stone, cast iron, and terra cotta are well understood substitute materials. This continued usage and familiarity means their installation requirements and service life are well established, which in turn makes it easier to determine when and how to use these traditional materials as substitutes for a deteriorated material. However, innovation in replacement materials continues, and new products (many of them consisting of synthetic materials) are continually introduced. These non-traditional products are an increasing part of both the new construction and rehabilitation industries. Some materials, like glass fiber reinforced polymers, glass fiber reinforced concrete, or fiber cement, have been in use long enough for an accurate prediction of their service life and performance. Other newer, non-traditional materials may be too new to have established performance records, thus, understanding their material properties is critical, and their use should be approached with more caution.

When to Consider Using Substitute Materials in Preservation Projects

According to the *Standards for Rehabilitation*, deterioration should generally be addressed through repair if in repairable condition. Repair can entail a variety of treatments that retain the unit of building material and remove and patch or replace only the damaged portion. This approach can be done with traditional methods and materials such as a dutchman, where like-kind material is precisely inserted into wood or stone, or it may employ other materials such as epoxies for wood repair or cementitious compounds for masonry. As long as the repair methods are sound and do not damage or accelerate the deterioration of the historic material, repairs are generally preferable to replacement of an entire element. More complex manufactured products, typical of more recent historic materials (as well as a lot of modern building materials generally), may be more difficult to repair, if they can be repaired at all.

There are situations, however, when the level of deterioration makes localized repairs infeasible and entire features or units of historic material must be replaced. While achieving an effective match of all of the visual qualities of a material can be challenging, even when replacement is in kind, it can be even more challenging when the replacement is a substitute material. A good visual match is not the only consideration when a substitute material is to be used for incremental replacement within a larger assembly of historic material. When an individual siding board or a single block of ashlar is being replaced, it is usually best achieved with the original material. Introduction of a different material into an intact assembly requires that its inherent properties, such as expansion and contraction, moisture resistance, or permeability, be thoroughly considered relative to those of the surrounding historic materials to avoid causing damage.

Figure 3: Incremental repair is best done using in-kind material to minimize differences in the performance characteristics that could negatively affect the overall assembly. Photo: NPS.

Figure 4. While occasionally used to imitate other materials such as wood or slate shingle, many asbestos shingles and siding materials had their own distinct shape and profile. No longer manufactured today, alternative materials must be found to replace these materials when they are distinctive features on a historic structure. Drawing: Association for Preservation Technology, Building Technology Heritage Library.

Figure 5. (Left) Asbestos shingles were often used as a substitute for traditional slate roof shingles. The historic asbestos roof on this rehabilitation project had reached the end of its lifespan and required complete replacement. (Right) Given the limited replacement materials available to match the historic asbestos shingles, utilizing natural slate was determined to be the best visual match for the original shingles and design intent in this instance. Photos: Crosskey Architects.

Circumstances in which the use of substitute materials may generally be considered appropriate, taking into consideration technical and economic feasibility reasons, include: the unavailability of historic materials; the unavailability of skilled artisans or historic craft techniques; inadequate durability of the original materials; the replacement of a secondary feature; construction of a new addition; the reconstruction of a missing feature; code-required performance; and for enhanced resilience and sustainability:

- **Unavailability of historic material.** A common reason for using substitute materials is the difficulty in finding a good match using the historic material (particularly a problem for masonry materials where the color and texture are derived from the material itself). This may be due to the actual unavailability of the material or to protracted delivery dates, particularly if the material cannot be sourced domestically. It is not uncommon for a local quarry that is no longer in operation to have been the source of an original stone. If another quarry cannot supply a satisfactory match, a substitute material such as dry-tamp cast stone or textured precast concrete may be an appropriate alternative, if care is taken to ensure that the detail, color, and texture of the original stone are matched. Even when the color is successfully matched, the appearance of a cementitious product may diverge from that of the historic stone as the substitute material ages.

  Many manufactured materials that were used historically on buildings are no longer made. Terne-plated steel, which was the material most typically used for painted standing-seam or flat-seam roofing, is no longer made. However, because it was always painted, other metals including galvanized steel or copper can generally be substituted if painted. When the historic material needing to be replaced is a manufactured product developed as an imitation of a natural material, which was the case with asbestos shingles meant to imitate slate, the natural material may now be an appropriate substitute material to consider for the manufactured one that is no longer produced.

- **Unavailability of skilled artisans or historic craft techniques**. These two issues can complicate any preservation or rehabilitation project. This is particularly true for intricate ornamental work, such as carved wood, carved stone, wrought iron, or cast iron. While skilled craftsmen may not be as difficult to find as they once were, there can still be limitations geographically, even in finding less specialized skills, and particularly if a project is small. Technical advances have allowed some stone or wood carvers to take advantage of computerized equipment, but complex designs will likely still require hand work. It may also be possible to mimic a carved element using a material that can be cast in a mold, adding significant efficiency where an historic element survives from which a mold can be made. Options for casting include aluminum, cast stone, fiberglass, glass fiber reinforced concretes, and terra cotta, but not all carved elements can be duplicated by a casting, and mold-making and casting still require skilled craftsmen.

- **Inadequate durability of the original material.** Some historic building materials were of inherently poor quality or were not durable. In other cases, one material was naturally incompatible with other materials on the building, causing staining or galvanic corrosion. Examples of poor-quality materials are very soft sandstones, which eroded quickly, and brownstone, which is vulnerable to delamination. In some cases, more durable natural stones may be visually similar enough to stand in for these soft stones but cast stone or another material may be needed to achieve an appropriate match.

The ready availability of manufactured ornamental wood features fed a nineteenth-century taste for decorative architectural details that were often used on the exterior of buildings with little concern for how they would be affected by moisture or maintained. Even old-growth wood from decay-resistant species often could not prevent features with severe exposure from eventually needing to be replaced. Today's available commercial supplies of lumber no longer provide the denser, more decay-resistant wood of old-growth forests, so even careful matching to species, which is not always possible, will not yield a replacement equal in performance to the historic material. Old-growth wood is likely to be very expensive, if it can be found, and may not be available from a sustainable, environmentally responsible source. When features with severe exposure need to be replaced or reproduced, substitute materials that are less susceptible to decay can have a longer life, and when the feature is painted, as exterior wood features generally are, the visual effect of a substitute material can be minimal.

- **Replacement of a secondary feature.** When it is necessary to replace a less distinctive, secondary feature that is less important in defining the historic character of the property, there is more flexibility in how it can be replaced. While it may be less important to find an exact match in materials when replacing such a feature, the retention of the overall historic character should still guide selection of an appropriate replacement material. For example, replacing secondary features such as those with limited visibility (e.g., siding materials on a rear elevation) may permit replacement materials that are similar in appearance or character without having to be a perfect match.

Figure 6. The dramatic difference in the number of growth rings between old-growth wood and wood that was recently harvested from second- or third-growth forests is indicative of the diminished dimensional stability and durability of most lumber currently available. Photo: Zachary Dettmore.

- **Construction of a new addition.** The *Standards* require that new additions to historic buildings and related new construction be differentiated from the old as well as be compatible with the historic character of the property and its site and environment. Using materials that evoke, without matching, the historic material can be an effective means of achieving the needed balance between compatibility and

Figure 7. A new addition replaced non-historic construction on the rear elevation of this building. Fiber cement gives the addition a compatible appearance without replicating the exposure for thickness of the historic siding. Photo: Ward Architecture + Preservation.

differentiation for new additions and new construction. Even if differentiation is achieved through design rather than materials, there generally is no basis for requiring the use of matching historic materials for new additions and new construction as part of a rehabilitation project.

- **Reconstruction of a missing feature.** Many buildings lose significant features over the course of their lives for reasons such as those previously discussed. When a missing feature is to be reconstructed, the importance of matching the original material may be less important to the effect replacing the missing feature may have on the overall historic character and appearance of the building. Though replacement of missing features must be substantiated by documentary, physical, or pictorial evidence, in many cases the authenticity of the material may be secondary to the overall visual qualities. The use of a more cost-effective substitute material for the construction of a missing feature can often be an important factor in the feasibility of undertaking such work.

- **Code-required performance.** Modern building codes are regularly amended to require higher performance levels for new and existing buildings in such areas as life safety, seismic retrofits, and accessibility. Rehabilitation projects often trigger compliance with code requirements that were not in place when a building was constructed. Although building codes may often allow for the retention of historic materials and assemblies, substitute materials can offer an alternative in situations when the historic materials are non-compliant and cannot otherwise be reasonably retained. In these instances, a change in material may be appropriate to meet code requirements, while in other instances selecting the optimal code compliance method for the project may achieve code-compliant solutions that also allow for the preservation of a building's historic materials and finishes.

  For example, fire codes may require increased resistance to flame spread for buildings within dense urban environments where building proximity and separation between buildings is a concern. Some substitute materials are non-combustible, have good ratings for flame spread, and can provide an alternative to help meet

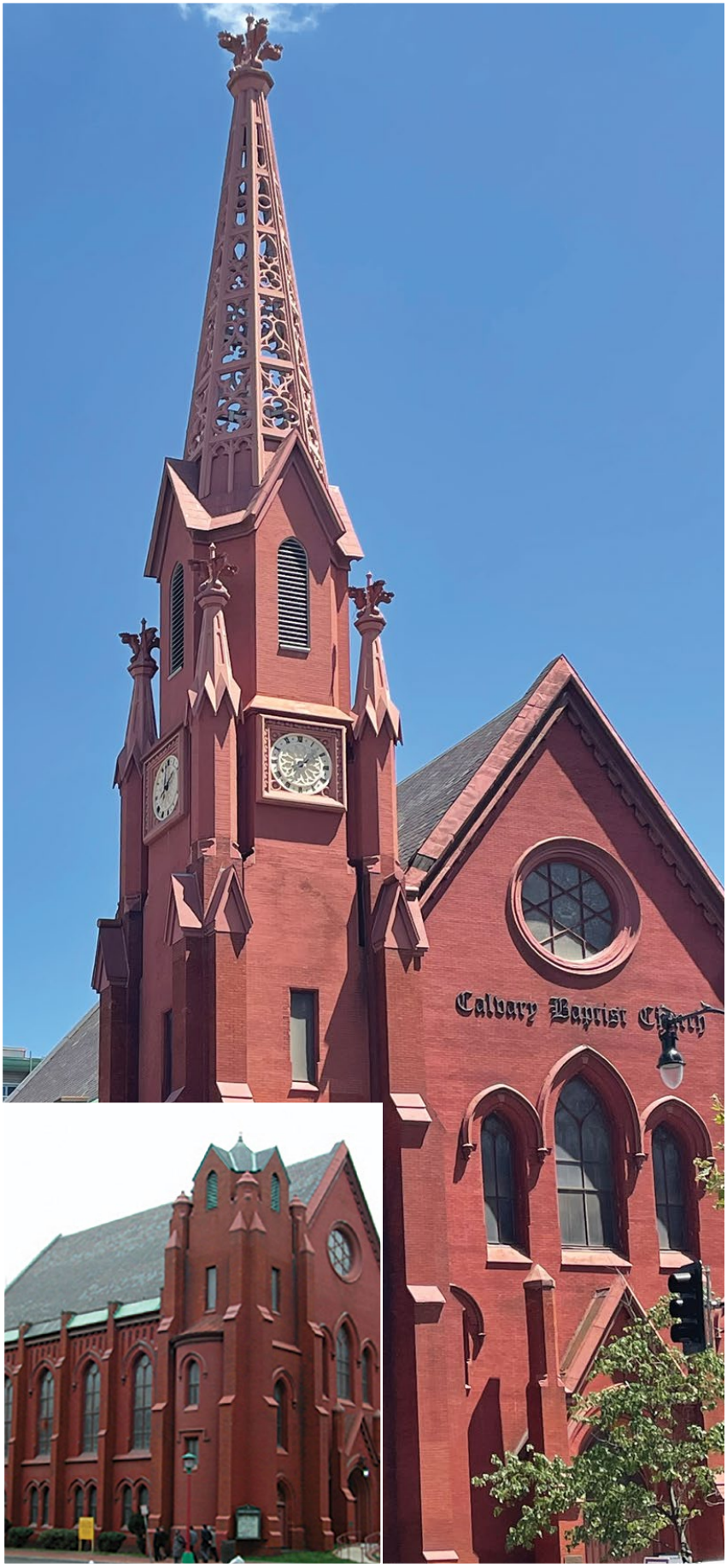

Figure 8. A long-missing cast-iron steeple was reconstructed in aluminum and fiber-reinforced polymer (FRP). Photo: John Sandor, NPS, Inset: Quinn Evans.

fire code requirements. Depending on the building component and the material, however, a substitute material may not resist fire any better than the historic material. In addressing code issues, all feasible alternatives should be considered to minimize the impact on the historic character of the building while still meeting code requirements.

With specific provisions in building code related to issues such as seismic hazards, the choice of materials for features inherently unstable in a seismic event can be a key part of a code-compliant retrofit solution. Elements at risk of falling such as parapets, finials, and overhanging cornices may be made safe by anchoring them to new structural frames. However, for some heavy masonry features, especially where there is deterioration or the feature is difficult to effectively brace, adequately anchoring the existing feature may not prove feasible. In such cases removing and replacing these features with lighter-weight replicas that incorporate a resilient structural framework can help preserve the historic character of the building while improving life safety performance.

- **Enhanced resilience and sustainability.** Wildfires, earthquakes, floods, hurricanes, and other extreme weather events put historic buildings and their occupants at risk and may require adaptive treatments that are more invasive than might be accepted in other circumstances, including related to the use of substitute materials. In these contexts, it is still necessary to try to minimize impacts on a building's historic character as much as possible while still adapting it to be more resilient. Widespread wildfires, for example, have increased demand for fire resistant materials for the exterior building envelope. Flood events may necessitate the replacement of historic materials that have been damaged or inundated with hazardous substances in contaminated floodwaters. When undertaking repairs in such circumstances, substitute materials may offer greater resilience to anticipated future exposure to natural hazard risks.

  Similarly, efforts to improve energy efficiency and performance may include the use of substitute materials as replacement components when modifications to building assemblies are required and the historic materials cannot be preserved. When evaluating substitute materials in the context of sustainability objectives, factors such as the environmental impact of production, the full life cycle of products, and the embodied carbon of the materials already in place should be carefully analyzed. There may be more sustainable choices for a replacement material, including the use of more traditional materials in place of manufactured products that may consist of non-renewable resources or hazardous materials. While some synthetic substitute materials are made from recycled materials or are otherwise sustainably produced, many are not repairable, salvageable, or recyclable themselves, and they may have shorter lifespans to their historic material counterparts. When either greater resilience or sustainability is a factor, all feasible alternatives should be considered in finding a balanced approach that maintains historic character while meeting resilience and sustainability goals.

Substitute Materials and Economic Feasibility

Economic feasibility is inevitably a concern when choosing a material for any part of a project, whether a historic or substitute material, but it should not be the sole determinant factor at the expense of maintaining the

Figure 9. Previously bricked-in openings below the flood line were reopened and new aluminum windows installed with cellular PVC trim detailed to hold back moderate flood waters and survive exposure to water. Photo: John Sandor, NPS.

historic character and historic integrity of a building. Other factors may prompt the consideration of a substitute material, such as the cost of maintaining the historic material, because it is comparatively difficult or costly to reach or access, or the frequency of required maintenance the historic material needs. Additionally, where in-kind replacement material is found to be prohibitively expensive, it may be reasonable to consider a substitute that offers an alternative and is a good physical and visual match. Not all substitute materials are, however, cost-effective replacements. Long-term durability and maintainability are other factors that should be considered in conjunction with initial cost.

Maintenance of a material, particularly where accessibility is difficult or expensive, can be an important part of a

cost evaluation. Maintenance costs should not be considered without also considering life-cycle expenses. While some substitute materials may offer reduced initial costs, they may be as or more costly than traditional materials to maintain over time. For example, many substitute materials are not readily repairable, necessitating full replacement when damaged. The cost to replace a material or assembly at the end of its lifespan may also be greater than the accumulated incremental expense to maintain the historic material, particularly if it is a more traditional, repairable material. Maintenance cost should never be the sole reason for replacing a historic material that is not deteriorated.

Criteria for the Appropriate Use of Substitute Materials

Substitute materials must meet three basic criteria to be considered: they must be compatible with the historic materials in appearance; their physical properties must be similar to those of the historic materials, or the materials must be installed in a manner that tolerates differences; and they must meet certain basic performance expectations over an extended period of time.

- **Matching the Appearance of the Historic Material**
  Any material's appearance varies depending on the nature of the material and how it is used. Some historic materials, such as wood and ferrous metals, were typically painted, making the color of the substitute unimportant, though the texture of the surface, which telegraphs through a paint layer, is still an important consideration. Texture can be a large part of distinguishing a material formed by hand from one that is machine-made. Many historic materials, such as most building stones, are used without any coating, making the color, pattern, and reflectivity, as well as surface texture, dependent on the material itself. Matching the color and surface characteristics of a historic natural material with a man-made substitute can often be quite difficult.

  When the color and surface characteristics of an existing material are important, cleaning the material should be the starting point for evaluating a potential matching material. In situations where there are subtle variations in color and texture within the original material, the substitute material should be similarly varied so that it is not conspicuous by its uniformity. If a material is custom fabricated, a sufficient number of samples should be supplied to permit on-site comparison of color, texture, detailing, and other critical visual qualities. For a manufactured product with preset choices of color or texture, it may be necessary to look at samples from more than one manufacturer to find the best match. Similarly, prefabricated products, such as roofing slate, may offer limited, if any, choice of unit size, which can be a critical factor for achieving a good match. A substitute material should not be used to replace distinctive, character-defining materials and features if an adequate match in design and appearance is not possible.

  As all exposed materials are subject to ultraviolet degradation, samples of a new material, particularly when custom formulated, should be prepared during the early planning phases to allow for evaluation of the effects of weathering on color stability. When that is not possible, or if a prefabricated product is used, the fabricator or manufacturer may be able to identify regional locations where equivalent products have been installed long enough ago to get a better sense of how the material weathers and performs.

  While a perfect match is the desired goal for replacing distinctive features, it is not always possible, even when the same matching material is chosen for the replacement. When any compromise

Figure 10. Polymer slates offer a choice of shapes but not sizes, limiting their ability to achieve a good visual match for some historic slate. With the size of the polymer slates (right) being nearly twice that of the historic slates (left), the scale of the entire feature is incompatibly altered. The molded edges of this material, which contribute to its ability to replicate slate, would be lost if each shingle was resized by cutting. Photo: John Sandor, NPS.

Figure 11. The thickness of the wood siding on the front (left) creates a deeper shadow line than is achieved with the fiber cement siding used on the side (right) elevation. While the exposure can be adjusted, fiber cement siding is not available in a matching thickness. Photo: John Sandor, NPS.

must be made in the precision of the match, it is wise to consider the vantage point from which the material will be seen. Sometimes what seems important at close range, such as variations in the texture of a surface, may be secondary to other aspects of the material when viewed from some distance. The closer a feature is to the viewer, the more closely the material and craftsmanship should match the original. An on-site mock-up using a sample of the proposed material can help evaluate whether it is an adequate visual match.

- **Matching the Physical Properties of the Historic Material**
  Carefully chosen substitute materials can often closely match the appearance of historic materials, but their physical properties may differ greatly. These differences are most critical when incrementally replacing components of a larger assembly that retains significant historic material. The chemical composition of the material (e.g., the presence of acids, alkalis, salts, or metals) should be evaluated to ensure that the replacement materials will be compatible with the adjacent historic materials. Materials that will cause galvanic corrosion or other chemical reactions must be isolated from one another.

  The thermal- and moisture-driven expansion and contraction coefficients of each adjacent material must be within narrow limits or be accommodated

Figure 12. Cellulose composite materials, like wood, expand and contract with moisture. Here it was used to reconstruct a missing storefront. Unlike solid wood that is dimensionally stable parallel to the grain, this composite moves equally in all dimensions, resulting in gaps that were not adequately anticipated in the design. Photo: John Sandor, NPS.

by carefully designed joints and fasteners. Joints can play a role both in accommodating movement of materials as well as in managing moisture, either to keep it from entering the enclosure assembly or to let it escape from the building envelope, or both. Because some synthetic materials are less permeable to moisture than more traditional materials, installations must take into account the potential to trap moisture and cause deterioration of historic and new materials. An assembly incorporating new and historic materials should be designed so that if material failures occur, the failures occur within the new material rather than the historic one.

During installation, surface preparation is critical to ensure proper attachment. Deteriorated underlying material must be removed or stabilized. Non-corrosive anchoring devices or fasteners that are designed to carry the new material and to withstand wind, rain, snow, and other destructive elements should be used. Since physical failures often result from poor anchorage or improper installation techniques, a structural engineer should be included in planning any major project. For readily available, off-the-shelf materials, manufacturers' recommendations for attachment and spacing should be followed.

Nearly all substitute materials have some properties that are different from the historic materials they may replace. Even when substitute materials are isolated from historic materials and features, it is important to understand the substitute materials' properties in order to use them successfully.

- **Performance of the Material Over Time**
  When more traditional materials are used to replace damaged historic materials and features, their performance is predictable in most cases. An exception may be modern wood that has durability and other prop-

erties different than those of historic wood from old-growth forests. Many of the materials used as substitutes have been in use long enough to provide some idea of how they perform over time. Other material may only have test results from accelerated weathering. The length of manufacturer warranties may be an indicator of expected durability and lifespan. Warranties only predict a manufacturer's expectation of a product's performance and are no guarantee that the manufacturers will still be in business at the time needed to stand behind them. Just as new manufacturers emerge with new materials, others disappear. Where possible, projects involving substitute materials in similar installations and exposures should be examined before selecting a new, less-tested material. It is unrealistic to expect a substitute material, which can be quite different in composition than the historic material, not to age differently.

Even traditional materials will not perform well if not used or detailed appropriately, and experienced architects, engineers, fabricators, and installers rely on their professional knowledge and experience to ensure proper installation and techniques when working with familiar materials. This is just one of many reasons that using the original materials for needed replacement is usually the best choice. Some of the materials now available as substitutes have properties that differ greatly from the traditional materials they may be used to replace. It is critical to the successful performance of substitute materials that everyone involved in the selection, design, and installation fully understands the material's properties, especially how it is different than the material it is replacing, and how that will affect the surrounding materials and building systems.

Many traditional building materials can be repaired either with traditional methods and materials or with more modern conservation techniques using substances like epoxies. However, many modern substitute materials (particularly synthetic ones) are not as easily repaired, if repairable at all, as their more traditional counterparts. Confirming that a material is repairable may be important for those used, e.g., where impact or significant wear or abrasion is likely.

Finally, it is critical that the substitute materials be documented as part of the historical record of the building so that proper care and maintenance of all of the building materials continue, ensuring the continued life of the historic building.

Choosing an Appropriate Substitute Material

Once all reasonable options for repair and replacement in kind have been considered and sufficient justification for substitute materials has been established, the choice among the variety of substitute materials currently available must be made. Rapidly developing technologies allow a wide variety of materials to choose from that are intended to mimic historic materials. Many of the materials that were historically used as substitutes for more traditional historic materials have themselves become historic, and some of these early substitutes continue to be reasonable options as substitute materials today. No substitute material will exactly match the historic material in all aspects, but many are able to adequately match the appearance and relevant physical attributes to make for a potential substitute. If a substitute material is not

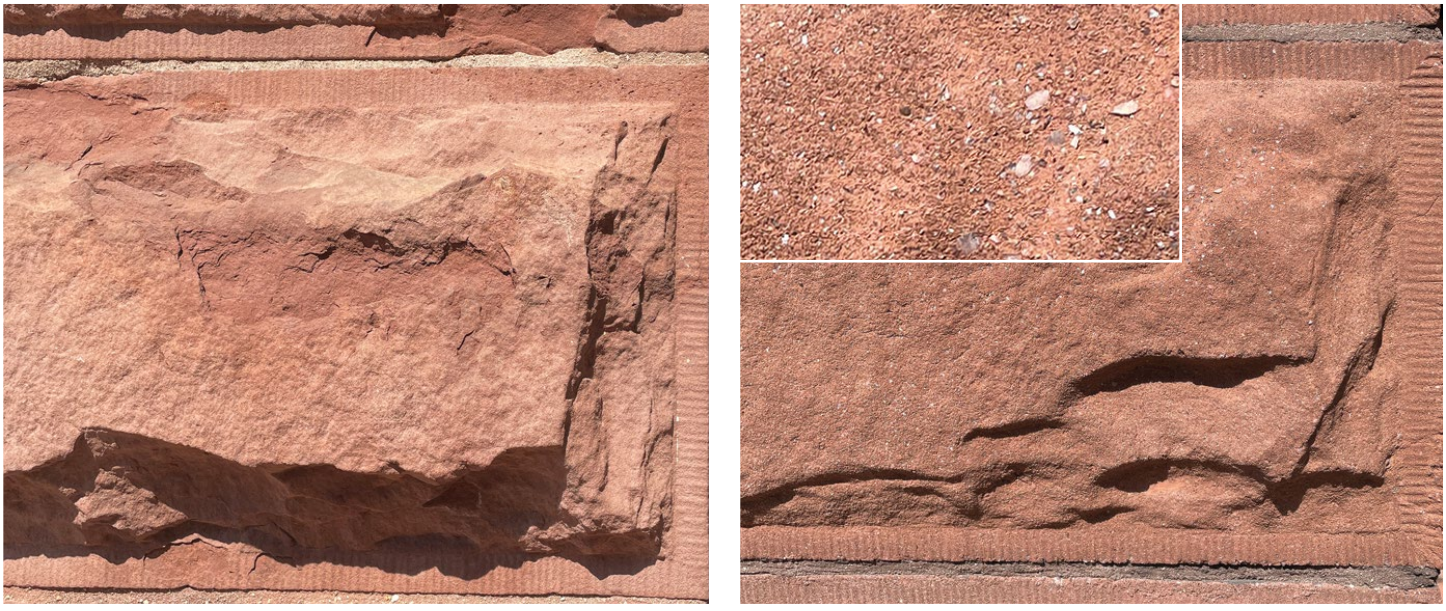

Figure 13. Cast stone was used to effectively replace individual blocks of sandstone. Both the original (left) and the substitute material (right) retain similar physical and visible properties. Having weathered for over 30 years, some erosion of the binder has revealed quartz grains of the aggregate (inset), but it is only noticeable upon close inspection. Photo: John Sandor, NPS.

an adequate physical and visual match given the specific conditions of the building and the project, then it should not be used to replace distinctive, character-defining materials and features.

Listed below are various building components or features and the substitute materials which may, in some circumstances, be considered for use as possible replacement materials in a historic rehabilitation project consistent with the *Standards for Rehabilitation*. This list includes different substitute material options available today for these building features and poses questions that should be asked and considered when choosing between the original material and various types of substitute materials. This is followed by a list of some of the more commonly used, currently available materials that may have some applications as substitute materials and the properties of each that affect their suitability for use as substitutes. This list should not be read as an endorsement of any of these materials, generally, or their appropriateness for use as a substitute material, but it serves as a reminder that the successful use of any building material requires a careful consideration of its properties relative to where and how it will be used.

Considering Substitute Materials

Considering the use of a substitute material should begin with the following questions about the conditions and location where it will be used:

- Will the significance or visibility of the historic feature require a very precise match?
- Is the entire feature being replaced or just a component of it?
- Are pre-existing conditions contributing to the failure of the existing material, and, if so, how will they be addressed/corrected?
- Is the need for replacement due to inherent deficiencies of the original material?
- Will the material need to resist any environmental hazards such as flooding or fire?

Historic Features and Substitute Materials

Historic Building Features

Potential Substitute Materials	**Masonry** Stone, terra cotta	**Architectural Metals** Cast & wrought iron, steel, pressed metal	**Siding** Wood, asbestos	**Roofing** Wood shingle, slate, tile	**Decking** Tongue-and-groove & square-edge wood	**Molding / Trim** Wood
Aluminum	●	●	●			●
Cast Stone & Precast Concrete	●			●		
Fiber Reinforced Concretes	●					
Glass Fiber Reinforced Polymers	●	●				
Fiber Cement			●	●		●
Mineral / Polymer Composite			●	●	●	●
Cellulose Fiber / Polymer Composite			●	●	●	●
Non-composite Polymers		●			●	●
Cellular PVC			●		●	●

The above chart lists materials that are sometimes used as substitutes for replacement of historic building features. Even within a given category, all materials may not be equally suitable as a substitute replacement material for the actual historic material or feature. Any substitute material should be selected based on its specific physical and visual characteristics, conditions, and intended application consistent with the Secretary of the Interior's Standards for Rehabilitation.

Historic Building Features: Criteria for selecting an appropriate replacement material

Masonry

FEATURES: corbels, brackets, balusters, cornices, window and door surrounds, friezes, wall surfaces, horizontal surfaces, incidental ornament, columns

HISTORIC MATERIALS: terra cotta, cast stone, stone, concrete

POTENTIAL SUBSTITUTES: cast stone, pre-cast concrete, GFRC, GFRP, non-composite polymers (polyurethane), cast or stamped metal

Questions to ask about the replacement material:

- Can it serve a structural function?
- How is the material affected by moisture?
- Can the material survive flooding and be reused?
- Can it reproduce the surface texture of the original?
- Is its shrinkage in curing low enough to allow it to be molded from existing stones?
- Can matching color be achieved without a coating and with UV stability?
- Can an adequate match of the surface (color and texture) be achieved with a coating?
- Is a coating required?
- If it is not self-supporting, is it lightweight enough to be supported by an underlying framework?
- Can multiple original units be replicated with a single replacement piece?
- Where thermal movement is different from the original material, how will joints accommodate?
- Is the material combustible?

Architectural Metals

FEATURES: pilasters, door and window surrounds, cornices, incidental ornament, columns, spandrels, ceilings, sheathing, roofing

HISTORIC MATERIALS: cast and wrought iron, steel, bronze, lead, aluminum, and stamped steel (usually galvanized or terne-coated)

POTENTIAL SUBSTITUTES: GFRP, aluminum, non-composite polymer (polyurethane), GFRC, metallic/polymer composite

Questions to ask about the replacement material:

- Will the replacement material serve a structural or cosmetic role?
- Will it expand and contract with temperature change enough to require special accommodation in its installation?
- If part of an assembly of mixed materials, how will any expansion and contraction of the dissimilar materials be accommodated?
- Will the replacement material increase deterioration of the historic or surrounding elements, for instance due to galvanic corrosion, moisture entrapment, jacking of original material, off-gassing creating a corrosive environment, or poor original design of the historic material?
- How will the replacement material mimic the surface color/patination of the original material?
- If a coating is needed, what preparation is needed, and what is its durability or service life of the finish?
- What attachment and support systems are necessary?
- If the original element is structural, but the new material is not, how can supplemental structure be introduced to support the new?

Figure 14. Surface texture is an important aspect in matching the appearance of a historic material, especially when a material is viewed at close range. As seen in these two images, many of the substitute materials produced for siding and trim have an embossed wood grain, making them incompatible for replacing historic wood that was typically planed to a smooth surface. Some substitute products are available with a smooth surface as well. Photos: John Sandor, NPS.

Siding

FEATURES: clapboard, tongue-and-groove or shiplap siding, board and batten, shingles

HISTORIC MATERIALS: wood and asbestos

POTENTIAL SUBSTITUTES: cellular PVC, wood fiber/polymer composite, fiber cement, mineral/polymer composite

Questions to ask about the replacement material:

- What are the widths, lengths, profiles, thicknesses, and textures available?
- What, if any, are the finishing requirements, and/or is it available factory-finished?
- How well does it hold paint, and can prefinished surfaces be renewed?
- What tools are needed to cut it, and can it be machined?
- Does it absorb moisture and, if so, to what effect?
- Can the material survive flooding and be reused?
- Will it expand and contract with temperature change enough to require special accommodation in its installation?
- What characteristics can affect its handling (e.g., weight, flexibility, brittleness)?
- Does it have specific fastening requirements?
- Is it susceptible to insect damage?
- What is its impact resistance?
- Does it have a flame spread rating?
- What is the expected lifespan and/or warranty?

Roofing

HISTORIC MATERIALS: wood shingle, slate shingle, asbestos shingle, clay tile, concrete tile, metal

POTENTIAL SUBSTITUTES: fiber cement, mineral/polymer composite, wood fiber/polymer composite, pre-cast concrete, metal

Questions to ask about the replacement material:

- What sizes and shapes are available?
- What are color choices?
- What is the color stability of the new material, and how will it age/weather?
- What is the impact resistance?
- What is its flame spread rating?
- What are the installation requirements of the new material?
- Can the feature being replaced be custom-produced if ready-made ones of the new material are not an accurate match?
- What is the expected lifespan and/or warranty?

Decking

FEATURES: tongue-and-groove, square-edge flooring

HISTORIC MATERIALS: wood

POTENTIAL SUBSTITUTES: cellular PVC, wood fiber/polymer composite, mineral/polymer composite, non-composite polymers (solid PVC)

Questions to ask about the replacement material:

- What are the widths, lengths, and textures available?
- Is it site painted or prefinished?
- How well does it hold paint, and can prefinished surfaces we renewed?
- What tools are needed to cut it, and can it be machined?
- What dimensional span does its strength allow?
- Does it absorb water, and if so, to what effect?
- Can the material survive flooding and be reused?
- Does it require a drainage plane, or can it be installed atop a membrane?
- Will it expand and contract with temperature change enough to require special accommodation in its installation?
- Is it susceptible to insect damage?
- Is it impact resistant?
- Does it have a flame spread rating?
- What is the expected lifespan and/or warranty?

Molding / Trim

FEATURES: run moldings, flat boards, casings, cornice, frieze, railings, balustrade, columns

HISTORIC MATERIALS: wood, metal

POTENTIAL SUBSTITUTES: cellular PVC, wood fiber/polymer composite, mineral/polymer composite, non-composite polymer (polyurethane), GFRP, sheet metal

Questions to ask about the replacement material:

- What are the widths, lengths, and textures available?
- What, if any, are the finishing requirements and/or is it available factory-finished?
- How well does it hold paint, and can prefinished surfaces be renewed?
- What tools are needed to cut it, and can it be machined?
- Does it absorb moisture, and if so, to what effect?
- Can the material survive flooding and be reused?
- Will it expand and contract with temperature change enough to require special accommodation in its installation?
- What characteristics can affect its handling (e.g., weight, flexibility, brittleness)?
- Does it have specific fastening requirements?
- Is it susceptible to insect damage?
- What is its impact resistance?
- Does it have a flame spread rating?
- What is the expected lifespan and/or warranty?

Figure 15. Tongue-and-groove porch flooring is manufactured in several different substitute materials. Each type has different properties, though most are more moisture-resistant than wood. The prefinished product shown can be painted when worn, but repainting is not recommended for some product choices. Photo: Oak Alley Foundation.

Potential Substitute Materials: Matching properties and performance needs

Physical Composition and Properties

After assessing different material options based on the intended application, the appropriateness of a substitute material should also be considered in context of the material's physical composition, associated properties, and necessary visual match.

Aluminum

MATERIAL: Aluminum is a highly corrosion-resistant alloy that can be cast, wrought, or extruded. Molten aluminum is cast into permanent (metal) molds or one-time sand molds forming cast aluminum. Extruded aluminum is formed by passing heated aluminum through a die which produces the desired form. Wrought aluminum is worked using the heated metal and then bending, stamping, and otherwise shaping the metal. If not self-supporting, aluminum elements are generally screwed or bolted to a structural frame. Aluminum can be welded, but more often sections, particularly extruded ones, are mechanically connected.

PROPERTIES:

- Isotropic
- Lightweight
- Thermal movement greater than cast iron or wood
- Corrosion-resistant, but direct contact with other metals may trigger galvanic corrosion
- Lower structural strength that iron or steel
- Ductile - less brittle than cast iron
- Non-combustible
- Retains high definition through molding process and produces crisp profiles through extrusion
- Can be given a durable metallic finish through anodization. Surface etching required for paint adhesion
- Can be machined into a large variety of shapes/ dimensions

Figure 16. Aluminum is a highly corrosion-resistant metal that is commonly used as a substitute material for cast iron. Aluminum can be a more affordable and lightweight alternative to cast iron that retains a similar texture, shape, and maintenance cycle. Photo: NPS.

Figure 17. The balustrade consists of multiple prior campaigns of using cast stone to replace the natural stone. The effective match for the surface texture and color of the original stone allowed individual elements to be incrementally replaced only when they had failed, thus retaining the maximum amount of original material as long as possible. Photo: EverGreene Architectural Arts.

Cast Stone & Precast Concrete

MATERIAL: A cement lime and aggregate mixture that is dry-tamped into a mold is generally referred to as cast stone. Cast stone is one of the original substitute materials. Its longevity has proved that the material ages compatibly with stone. A wet mix of cement and aggregate poured into molds also has a long history of being used to produce concrete masonry units mimicking stone and roofing tiles mimicking clay tile. Both methods have minimal shrinkage during curing, though they employ different curing and finishing techniques. Both can include reinforcing bars and anchorage devices installed during fabrication. The dry-tamp fabrication method is especially effective at producing an outer surface with the appearance of stone.

PROPERTIES:

- Isotropic
- Weight equivalent to stone
- Expansion/contraction similar to stone
- Water absorption may differ from that of any particular stone
- Can be structural
- Non-combustible
- Vapor-permeable
- May achieve a wide range of color and surface textures by varying mix, but use of pigments may reduce UV stability
- Can be coated
- May be tooled to match the appearance of tooled stone
- Repairs similarly to stone

Figure 18. Missing historic terra cotta spandrel panels on all floor levels were recreated utilizing glass fiber reinforced concrete (GFRC) replacements. New spandrels were fabricated as individual components and attached with metal clips between historic terra cotta piers. Photo: Kris Frail, Dewberry.

Fiber Reinforced Concretes (GFRC, CFRC)

MATERIAL: Fiber reinforced concretes are lightweight concrete compounds modified with additives and reinforced with alkaline resistant glass fibers (GFRC), or less frequently carbon fibers (CFRC). They are generally fabricated as thin-shelled panels and applied to a separate structural frame or anchorage system. GFRC is typically sprayed into forms, although it can be poured, and anchoring devices are included in the fabrication. The color is derived from the natural aggregates and, if necessary, a small percentage of added pigments. Because of its low shrinkage in curing, it can be produced using molds taken directly from the building.

PROPERTIES:

- Isotropic
- Lighter weight than solid masonry
- Expansion/contraction similar to stone
- No load bearing capacity, so underlying framework must be used to accommodate any loads
- Material can be fire-rated
- Vapor-permeable
- Can be produced in larger sections efficiently reproducing repetitive elements or features that were originally made up of small individual units
- Large range of colors achievable by varying aggregates, but when pigments are needed UV stability may be reduced
- May be left uncoated or may be painted

Figure 19. A new, lightweight fiber reinforced polymer is attached to a new metal armature to replicate damaged and missing elements of a terra cotta cornice. Photo: Quinn Evans.

Glass Fiber Reinforced Polymers (FRP, Fiberglass)

MATERIAL: Fiberglass is the most well-known of the FRP products generally produced as a thin, rigid, laminate shell formed by pouring a polyester or epoxy resin gelcoat into a mold. When tack-free, layers of chopped glass or glass fabric are added along with additional resins. The surface gel coat can be pigmented or painted. Reinforcing rods and attachment devices can be added when necessary. Because of is low shrinkage in curing, it can be produced using molds taken directly from the building. Rather than being produced as standard components, FRP is custom fabricated for individual applications.

PROPERTIES

- Isotropic
- Lighter weight than masonry, similar to sheet metal
- More thermally driven expansion than masonry or metals
- No load bearing capacity, so underlying framework must be used to accommodate any loads
- High strength to weight ratio
- Flammable
- Not vapor-permeable
- Can be produced in larger sections efficiently reproducing repetitive elements or features that were originally made up of small individual units
- May be difficult to match false joints in multi-unit assemblies to actual joints that need to accommodate movement
- Color can be incorporated into the surface gel-coat, or the surface may be coated

Figure 20. Cement board was used to replace a non-historic infill and mimics the configuration of a typical vehicular door of the period. Photos: Historic Augusta.

Fiber Cement

MATERIAL: Fiber cement products are made from fiber, sand that is ground to a powder, cement, and proprietary additives to reduce moisture absorption. The fiber used in roof products is glass fiber alone, whereas siding and trim board products are primarily wood fiber. The material is formed with a smooth or textured surface, cut to standard sizes of panels, boards, or shingles, and cured in an autoclave. Roofing material has integral color, but board and siding products are produced with a primer, if not fully factory finished. Most siding and trim boards are embossed with a wood grain on one surface and are smooth on the other, the smooth side being the appropriate surface to imitate planed wood.

PROPERTIES:

- Products are minimally orthotropic
- Heavier and more brittle than wood, limiting available lengths
- Very little thermal- and no moisture-driven movement
- Low water absorption, but not recommended for ground or roof contact
- Class A flame spread
- Resists insect damage
- Available in limited thicknesses and widths
- Not machinable, but may be cut with special carbide blades; cutting requires dust collection and personal protective equipment
- Cut edges require sealing
- Available unfinished, primed, or prefinished, and must be painted (with latex paint)
- 15-year limited warranty typical

Figure 21. A mineral polymer composite siding was available in the profile very similar to the historic siding. The replacement siding was used where the original material was almost completely missing beneath a more modern covering. Areas where the original wood was largely intact were replaced with matching wood to sustain more of the material integrity of the building. Photo: Belk Architecture.

Mineral / Polymer Composite

MATERIAL: Calcium carbonate or fly ash are mineral ingredients held in a matrix of various polymers to produce materials formed or molded into a number of building products. Additives found in some of the roofing products include pigments and UV stabilizers. Some use a substantial portion of recycled material. Different combinations yield products with different properties, each formulated for a specific building component. When the material is fly ash with some glass fibers bound in a matrix of polyurethane, it is identified as polyash. Siding, trim, bead board, and deck products are primed or prefinished, whereas roof products have integral color.

PROPERTIES:

Fly ash (siding and trim)

- Isotropic
- Heavier and more brittle than wood, and lacking structural capacity
- Little thermal or moisture-driven movement
- Sufficiently low water absorption to permit ground contact
- Class C flame spread
- Resists insect damage
- Available in limited thicknesses and widths
- Machinable with carbide tools blades; requires dust collection
- Cut edges do not require sealing
- Must be painted
- 30-year limited warranty typical

Calcium carbonate or recycled rubber (roofing)

- Isotropic
- More thermally-driven movement than slate or wood
- Little to no moisture absorption
- As shingles: lighter and more flexible than slate
- As tongue-and-groove decking: heavier and harder than wood
- Not vulnerable to insect damage
- Available in limited dimensions
- As shingles: Class 4 impact resistance, and flame spread ratings ranging from Class A to Class C depending on the specific product
- As shingles: integral color, that may be subject to fading
- As tongue-and-groove decking: prefinished with non-renewable finish, and can be cut with woodworking tools
- 50-year limited warranties on roofing products typical

Cellulose Fiber / Polymer Composite

MATERIAL: Wood strands or fibers are coated with resin for moisture resistance and zinc-borate for insect and fungal-decay resistance, then consolidated under heated pressure. Solid composite core boards are cut from sheets of material, then factory-primed or finished. Resulting siding and trim board products can be referred to as engineered wood, fiber board, or hardboard. Products may be embossed with a wood grain or have a smooth finish, the smooth side being the appropriate surface to imitate planed wood. Siding, trim, and tongue-and-grove decking with a slightly different properties are produced by extruding polyvinyl chloride (PVC) combined with non-wood cellulose. Roofing shingles are molded from fine wood fibers, color additives, and UV stabilizers bound with polypropylene or polyethylene (thermoplastics).

Figure 22. A porch was reconstructed using posts fabricated on site from a smooth-surface cellulose/polymer composite material. Though the face of the posts are painted, the lack of paint on the bottom at the cut ends is not consistent with manufacturers' recommendations. This treatment will allow moisture to be absorbed, shortening the life of the new replacement feature. Photo: John Sandor, NPS.

PROPERTIES:

Predominantly Cellulose (siding, trim and decking)

- Minimal thermal movement
- Resistant to moisture-driven movement
- Lighter and more flexible than solid wood, but lacks structural capacity
- Rice hull cellulose: can span typical floor-framing spacing as decking
- Low water absorption (for wood, no ground or roof contact)
- Class A or Class C flame spread
- Resists insect damage
- Available in limited dimensions
- Machinable with woodworking tools
- Wood cellulose: Cut edges must be sealed and may need additional surface prep for finish; must be painted if unfinished or primed, also available prefinished
- Rice hull cellulose: Accepts stain/paint, but no finish required
- 30–50 year limited warranty, depending on manufacturer

Predominantly Polymer (roofing)

- Minimal thermal movement
- Little to no moisture absorption
- Lighter and more flexible than slate
- Class 4 impact-resistance
- Class A flame spread
- Available in limited shingle size
- 50-year limited warranty typical

Figure 23. 3-D printing using various polymers is occasionally used to replicate missing metal or wood features. This new application is continually being refined, but the application can be successful when a painted, lightweight feature needs to be replicated. Photo: NPS.

Non-composite Polymers

MATERIALS: The main two polymer materials used without significant other components are polyurethane and polyvinyl chloride (PVC). Polyurethane millwork is constructed of urethane foam created by mixing isocyanate and resin. The polyurethane mixture is kept under pressure in a mold as it expands to any desired shape. These molded products have a closed-cell, foamed core with a denser surface skin. Polyurethane products can have exterior applications but are more often used for interior features. Polyvinyl chloride (PVC) in a solid extruded form is another polymer that can have architectural application as tongue-and-groove decking. Various polymers formed using 3-D printing are also being explored as replacements for painted metal or wood ornamental features.

PROPERTIES: Each of the two groupings has distinct physical properties

Urethane Foam (moldings and decorative elements)

- Lightweight and flexible, but lacking structural capacity
- More thermally-driven movement than wood or stone, but less than cellular PVC
- Does not absorb water
- Flammable
- Resists insect damage
- Can be cut with standard woodworking tools
- Adhesive and mechanical fasteners both recommended for installation
- Supplied primed and must be painted (latex paint)
- Lifetime limited warranty typical

Solid PVC (flooring)

- Isotropic
- Heavier and less flexible that wood
- Minimal thermal movement
- Does not absorb water
- Strength to span typical floor-framing spacing
- Impact-resistance greater than wood
- Class A flame spread
- No insect susceptibility
- Good paint adhesion, but also available prefinished
- 20-year warranty typical

Cellular Polyvinyl Chloride (PVC)

MATERIAL: Varying amounts of calcium carbonate and a foaming agent are added to melted PVC before passing through an injection die and then a calibrator to produce the shape and size of the finished product. Cellular PVC is produced as sheets, boards, and moldings. Differences in the specifics of the equipment and the rate of cooling create two varieties of product, with distinct properties. One is known as free-foam, having a fairly consistent structure throughout its section, and the other is identified as Celuka, having a skin that is denser than its core. This primarily affects the ease with which the product can be milled and shaped. The material is white and needs no applied finish. When produced for decking the material has a colored and textured wear layer over the PVC core.

PROPERTIES

- Isotropic
- Lighter and more flexible than wood
- Less strong than wood (in tension and shear), but can span typical floor- framing spacing as decking
- More impact-resistance than wood
- Negligible water absorption; no moisture-driven movement, unlike wood
- Subject to thermal expansion and contraction significantly greater than wood, though the thermal movement is less for the same dimension than the cross-grain moisture-driven movement of wood
- For longer pieces, thermal movement requires manufacturer's specifications to be followed for attachment, and inclusion of expansion joints when installed at low temperature (joints should be glued)
- Class A flame spread
- Resists insect damage
- Machinable with woodworking tools, though cut edges may need additional surface prep for finish
- Good paint adhesion; if painted, high light reflectance (HLV) is recommended to minimize heat driven expansion
- 25–30-year limited warranty, depending on manufacturer

Figure 24. Cellular PVC when painted can be used to replace deteriorated wood features. This beadboard set in a wood frame was not historically designed to shed water effectively and had deteriorated. Cellular PVC was able to match the appearance of the wood details, while its properties were well matched to the shady location, painted finish, and limited size and configuration within the overall assembly; thus, it should provide a long-lasting solution for this application. Photo: Jennifer Balson Alvarez, NPS.

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