Purpose and Applications: This guide specification covers Andersen® 100 Series windows. These windows are suitable for new construction, remodeling or replacement applications.

Product Features: 100 Series windows and patio doors are manufactured using a composite called Fibrex® material, consisting of 40 percent wood fiber and 60 percent thermoplastic polymer by weight. This material combines the strength and stability of wood with the low-maintenance features of vinyl. The wood fiber is reclaimed from the manufacture of Andersen wood windows. Featuring long-lasting reliability, deep, rich colors and reduced environmental impact, these windows never need painting and the finish will not fade, blister, crack, flake or peel. See the limited warranty for details. Product is available in custom sizes and with glass options to help meet U.S. ENERGY STAR performance criteria.

This Document: This guide specification document is provided by Andersen Corporation as a technical support tool incident to the sale of its products. Andersen Corporation is solely responsible for its content. This document should be reviewed and edited to suit Project requirements by a qualified design professional. Performance values expressed in this document may vary based on size, configuration and specified options. Product data contained in this guide specification is accurate as of the date of issue indicated above. Due to ongoing product changes, this data may change over time. Consult manufacturer for complete product information.

Contact Information: Contact manufacturer for more information on this or other products made by Andersen Corporation: Andersen Windows, Inc., Andersen Service Center, 100 Fourth Ave North, Bayport, MN 55003-1096. Telephone: (800) 299-9029.

Website: <http://www.andersenwindows.com/for-professionals>

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Editor Note: Edit document to suit Project requirements and specifier practice. Specifier notes are shown in blue text like this. Optional text [**is shown in bold with brackets like this**]. Locations where language for Project-specific requirements is to be inserted are shown like this: <**insert language**>. Remove specifier notes and unused optional text in final version of the specification document.

Editor Note: The Construction Specifications Institute (CSI) recommends and supports use of its current MasterFormat section title and numbering system, shown below.

SECTION 08 54 00 – COMPOSITE WINDOWS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Composite-framed windows of the following types: [**single-hung**] [**gliding**] [**casement**] [**awning**] [**and**] [**fixed**].

Editor Note: Revise paragraph below to suit Project requirements. Add section numbers and titles according to CSI MasterFormat and specifier practice. This paragraph is intended for use only when a reader might reasonably expect to find work requirements in this Section, but those requirements are actually located in another, related section.

B. Related Sections: Section(s) related to this section include:

1. <**Insert Work Title**>: <**Insert Division number**> Section <**Insert Section title**>.

Editor Note: Standards numbers and titles in the article below are provided for specifier information and reference. The purpose of this Article is to fully identify standards that are referenced elsewhere using abbreviated nomenclature. Retain, edit or delete article to suit specifier practice and Project requirements.

1.2 REFERENCES

A. General: Standards listed by reference form a part of this specification section. Standards listed are identified by issuing authority, abbreviation, designation number, title or other designation. Standards subsequently referenced in this Section are referred to by issuing authority abbreviation and standard designation.

B. American Architectural Manufacturers Association (AAMA):

1. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products.

2. AAMA 615 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Plastic Profiles.

3. NAFS - North American Fenestration Standard/Specification for windows, doors and skylights.

C. Andersen Unit Installation Guide.

D. ASTM International (ASTM):

1. ASTM C1036 - Standard Specification for Flat Glass.

2. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.

3. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.

4. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

5. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls.

6. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.

7. ASTM F2090 - Standard Specification for Window Fall Prevention Devices with Emergency Escape (Egress) Release Mechanisms.

E. Insulating Glass Certification Council (IGCC):

1. Insulating Glass Unit Certification.

F. Insulating Glass Manufacturers Alliance of Canada (IGMAC) and Canadian General Standards Board (CGSB):

1. Insulating Glass Units Standard CAN/CGSB 12.8-97.

G. International Standards Organization (ISO):

1. ISO 14021 - Environmental Labels and Declarations -- Self-Declared Environmental Claims (Type II Environmental Labeling).

H. National Fenestration Rating Council (NFRC):

1. NFRC 100 - Procedure for Determining Fenestration Product U-factors.

2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.

I. U.S. Environmental Protection Agency (EPA):

1. ENERGY STAR.

J. Window and Door Manufacturers Association (WDMA):

1. WDMA Hallmark Certification Program for Manufacturers.

1.3 ADMINISTRATIVE REQUIREMENTS

Editor Note: Retain paragraph below if pre-installation meetings are required and edit to suit Project requirements.

A. Pre-installation Meetings: Conduct pre-installation meeting to clarify Project requirements, substrate conditions, manufacturer’s installation instructions and manufacturer’s warranty requirements.

1.4 PERFORMANCE REQUIREMENTS

Editor Note: Project requirements in paragraph below might include but not be limited to design wind load, wind speed, maximum design deflection, importance factor, exposure category, performance class and grade.

A. Structural Performance Requirements:

1. Comply with requirements of NAFS.

2. <**Insert requirements**>.

Editor Note: Retain paragraph below if compliance with a whole-building rating system (such as USGBC LEED, GBI GreenGlobes, or other) or specific sustainability-related design and construction aspects is required. Edit to suit Project requirements. Project requirements might include but not be limited to energy performance, recycled material content, regional materials or indoor air quality.

B. Environmental Performance Requirements: <**Insert requirements**>.

1.5 SUBMITTALS

A. Product Data: For each type of product required.

B. Shop Drawings: Showing methods of installation, plans, sections, elevations and details of walls, specified loads, flashings, vents, sealants, and interfaces with all materials not supplied by the window manufacturer, and identification of proposed component parts and finishes.

C. Samples: Selection and verification samples for finishes, colors and textures. Submit two complete sample sets of each type of material required.

D. Certificates: Signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.

E. Test and Evaluation Reports: Showing compliance with specified performance characteristics and physical properties.

F. Manufacturer’s Instructions: Manufacturer installation, storage, and other instructions.

Editor Note: Retain paragraph below if compliance with a whole-building rating system (such as USGBC LEED, GBI GreenGlobes, or other) or specific sustainability-related design and construction aspects is required. Edit to suit Project requirements.

G. Sustainable Design Submittals in Compliance with ISO 14021.

H. Qualification Statements: For manufacturer and installer.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Member in good standing of The Insulating Glass Certification Council (IGCC).

2. Hallmark Certified Manufacturer and member in good standing of the Window and Door Manufacturers Association (WDMA).

3. Member in good standing of U.S. Green Building Council.

4. U.S. ENERGY STAR Partner.

5. Capable of demonstrating an extended history of window and door design, production and innovation.

Editor Note: Retain when a separate installer warranty is required.

B. Installer Qualifications:

1. Minimum five years’ experience in the commercial installation of products required for the Project.

2. Experience on at least five projects of similar size, type and complexity as the Project.

3. An entity utilizing workers competent in techniques required by manufacturer for product types and applications indicated.

1.7 DELIVERY, STORAGE AND HANDLING

A. Comply with manufacturer’s ordering instructions and lead time requirements to avoid construction delays.

B. Deliver materials to Project in manufacturer’s original unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials and accessories protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by manufacturer off ground, under cover and not exposed to weather and construction activities.

1.8 WARRANTY

Editor Note: Coordinate article below with Conditions of the Contract and with Division 01 Closeout Submittals (Warranty) Section.

A. Special Warranty: Manufacturer's transferrable, non-prorated limited warranty.

1. Warranty Period, Glass: 20 years.

2. Warranty Period, Non-Glass Parts: 10 years.

3. Warranty Period, Color Fade: 10 years.

Editor Note: Retain paragraph below if a separate installation warranty, not provided by manufacturer, is required and edit to suit Project requirements.

B. Special Warranty: Installer's standard form in which installer agrees to repair or replace composite windows that fail due to poor workmanship or faulty installation within the specified warranty period.

1. Warranty Period: <**Insert number of years**> years from date of Substantial Completion.

PART 2 PRODUCT

Editor Note: Add product features, performance characteristics, material standards, and descriptions as applicable. Use of terms such as "or equal" or "approved equal" or similar may cause ambiguity in specifications, requiring verification (procedural, legal and regulatory) and assignment of responsibility for the determination of "equal" products. Therefore it is recommended that terms such as these be avoided.

2.1 COMPOSITE WINDOWS

A. General: Provide composite windows complying with the performance requirements indicated and tested according to NAFS.

B. Basis-of-Design Product: Subject to compliance with requirements provide Andersen Corporation: Andersen 100 Series windows.

C. Substitution Limitations: [**No substitutions**] [**All other manufacturers: Submit substitution request in accordance with Section 01 25 00 - "Substitution Procedures"**] <**Insert substitution limitations**>.

2.2 MATERIALS

Editor Note: Fibrex composite material combines the strength and stability of wood with the low-maintenance features of vinyl. With Fibrex material, a special polymer formulation surrounds and coats each wood fiber in the manufacturing process, providing exceptional resistance to rot and fungal growth. Fibrex material is strong so frames can be made narrower than with other framing materials. Narrower frames mean more glass viewing area. Fibrex material has insulating properties on par with wood, vinyl or fiberglass and can be made into nearly any style of window.

A. Material Composition: Extruded composite profile consisting of 40 percent reclaimed pre-consumer wood fiber and 60 percent thermoplastic polymer, by weight.

B. Manufacturer Designation: Fibrex material.

Editor Note: Andersen Corporation employs manufacturing strategies to optimize recycled content. Efficient use of materials reduces overall resource consumption and demand for additional materials. Recycling materials and content in construction and building components help reduce the demand for natural resources. Pre-consumer recycled content varies by product. For more information contact Andersen Corporation, or go to www.Andersenwindows.com.

C. Pre-consumer Recycled Content: <**Insert percentage**> percent minimum, third-party certified.

Editor Note: Black color interior is only available with Black color exterior. Dark Bronze color interior is only available with Dark Bronze color exterior. Sandtone color interior is only available with Sandtone color exterior. White color interior is available with all exterior color options.

D. Interior Color: [**Black] [Dark Bronze] [Sandtone] [White]**.

E. Exterior Color: [**Black**] [**Dark Bronze**] [**Sandtone**] [**Terratone**] [**White**].

Editor Note: Copy article below for each window type, edit to suit Project and product requirements and re-insert text as many times as needed to describe additional window types.

2.3 WINDOW <**Insert window designation(s) used on Drawings**>.

A. Window Type: [**Single-Hung**] [**Gliding**] [**Casement**] [**Awning**] [**Fixed**] [**As indicated on Drawings**] [**As indicated in window schedule**] <**Insert window type**> <**Insert manufacturer model or part number designation**>.

B. Performance Requirements: Comply with NAFS.

Editor Note: Retain one or more sub-paragraphs below as applicable to Project requirements. The performance level shown is based on the size indicated.

1. Single-hung, Performance Class and Grade: LC-PG30 (47-1/2 inches by 89-1/2 inches), LC-PG50 (47-1/2 inches by 77-1/2 inches).

2. Gliding, Performance Class and Grade: LC-PG30 (71-1/2 inches by 71-1/2 inches), LC-PG50 (71-1/2 inches by 59-1/2 inches).

3. Casement, Performance Class and Grade: LC-PG40 (71-1/2 inches by 71-1/2 inches), LC-PG50 (71-1/2 inches by 71-1/2 inches).

4. Awning, Performance Class and Grade: LC-PG40 (47-1/2 inches by 95.5 inches) LC-PG50 (47-1/2 inches by 95-1/2 inches).

5. Fixed, Performance Class and Grade: LC-PG40 (95-1/2 inches by 84-1/4 inches), LC-PG50 (95-1/2 inches by 71-1/2 inches).

Editor Note: WDMA standard is < 0.3 cfm/ft². Retain sub-paragraph below for commercial buildings.

C. Air Infiltration Requirements:

1. Air Infiltration Rate: **< 0.2 cfm/sf²**.

D. Environmental Qualifications:

Editor Note: Some Andersen products are ENERGY STAR certified with select glass options. Contact manufacturer for more information. Retain when ENERGY validation is required.

1. ENERGY STAR performance.

2. Indoor air quality performance.

Editor Note: Retain paragraph below when single-hung or gliding windows are required.

E. Weatherstrip Type and Material: Three fins and pile, polypropylene.

Editor Note: Retain paragraph below when venting or stationary sash windows are required.

F. Weatherstrip Type and Material: Flexible tubular and leaf, vinyl.

G. Overall Depth: 3-1/4 inches (82.6 mm).

H. Attachment Flange: [**1-3/8 inches flange setback**] [**1 inch flange setback with stucco key**] [**No flange**] [**Insert Frame**].

I. Hardware:

Editor Note: Retain paragraph below when casement or awning windows are required.

1. Operator Gear Type and Material: Rotary, die cast zinc.

2. Hinge Type and Material: Hinged, 300 series stainless steel with heavy gauge arms.

3. Operator Handle Type and Material: Folding, polycarbonate with integral color.

4. Sash Lock Type and Material: Single actuations, galvanized steel and engineered polymer components.

Editor Note: Retain paragraph below when single-hung or gliding windows are required.

5. Hardware Type and Material: Self-latching, polycarbonate with integral color.

Editor Note: Retain paragraph below when single-hung windows are required.

6. Balance Type and Material: Spring loaded block and tackle, galvanized steel.

Editor Note: Retain paragraph below when gliding windows are required.

7. Rollers and Guides Type and Material: Dual adjustable, brass with extruded glide track.

Editor Note: Retain paragraph below when window opening control device is required.

8. Window Opening Control Device: Provide device to restrict operable sash to less than 4 inches maximum clear opening and releasable, in compliance with ASTM F2090, [**Black**] [**Stone**] [**White**].

Editor Note: Retain paragraph below when vent limitation hardware is required. Vent limitation hardware cannot be used on windows required for emergency escape and rescue.

9. Vent Limitation Hardware: Provide fixed vent limiters to limit sash travel to less than 4 inches maximum clear opening.

Editor Note: Retain paragraph below when divided lights are required. Grille type and location are a determining factor in overall window thermal performance. Coordinate with required U-Factor in GLAZING Article and with manufacturer’s information on product availability.

J. Divided Lights:

Editor Note: Retain sub-paragraph below when Full Divided Light Grilles are required and edit to suit Project requirements. Grille spacers will match the insulated glass spacer available in Black or Stainless Steel – see glazing articles.

1. Full Divided Light: Permanent exterior and interior attachment, spacer between glass panes.

a. Style: Contoured profile.

b. Width: [**3/4 inch (19 mm)**] [**2-1/4 inches (57 mm)**].

c. Pattern: [**As shown in Drawings**] <**Insert pattern designation**>.

d. Spacer Color: [**Match insulated glass spacer**]

e. Exterior Color: [**Match window**] <**Insert requirements**>.

f. Interior Color: [**Match window**] <**Insert requirements**>.

Editor Note: Retain sub-paragraph below when Simulated Divided Light Grilles are required and edit to suit Project requirements.

2. Simulated Divided Light: [**Permanent exterior and interior attachment, no spacer between glass panes**].

a. Style: Contoured profile.

b. Width: [**3/4 inch (19 mm)**] [**2-1/4 inches (57 mm)**].

c. Pattern: [**As shown in Drawings**] <**Insert pattern designation**>.

d. Exterior Color: [**Match window**] <**Insert requirements**>.

e. Interior Color: [**Match window**] <**Insert requirements**>.

Editor Note: Retain sub-paragraph below when Finelight with Exterior Grilles are required and edit to suit Project requirements. Available in 3/4 inch (19 mm) width only.

3. Finelight with Exterior Grille: Permanently applied exterior with permanently installed between glass panes.

a. Style: Contoured profile.

b. Width: [**3/4 inch (19 mm)**].

c. Pattern: [**As shown in Drawings**] <**Insert pattern designation**>.

d. Exterior Color: [**Match window**] <**Insert requirements**>.

e. Interior Color: [**Match window**] <**Insert requirements**>.

Editor Note: Retain sub-paragraph below when Finelight Grilles-Between-the-Glass are required and edit to suit Project requirements. Available in 3/4 inch (19 mm) width only.

4. Finelight Grille: Permanently installed between glass panes.

a. Style: Contoured profile.

b. Width: [**3/4 inch (19 mm)**].

c. Pattern: [**As shown in Drawings**] <**Insert pattern designation**>.

d. Exterior Color: [**Match window**] <**Insert requirements**>.

e. Interior Color: [**Match window**] <**Insert requirements**>.

K. Insect Screens:

1. Frame Material: Roll-formed aluminum.

2. Frame Color: Match window frame.

3. Insect Screen Material: [**Fiberglass cloth**] [**TruScene stainless steel wire**] secured with vinyl spline.

Editor Note: Windows installed in combination must be designed and installed so as to attain a level of structural performance meeting requirements of the authority having jurisdiction. Refer to product literature or consult with an Andersen product representative. Non-reinforced mullions are ½” wide and 3 1/8” deep. Reinforced mullions are ¾” wide and 5 1/8” deep.

L. Mullions:

1. Type: Non-reinforced fiberglass mullion system configured to be structurally sound, designed in accordance with AAMA 450 and Hallmark certified.
2. Type: Reinforced fiberglass mullion system configured to be structurally sound, designed in accordance with AAMA 450 and Hallmark certified.

Editor Note: Retain article below when windows using Andersen High-Performance Low-E glass are required. Glass type is a significant factor in determining overall window U-Factor. Copy article below for each window type, edit to suit Project and product requirements and re-insert text as many times as needed to describe additional window types. To view the performance values, go to <http://www.andersenwindows.com/for-professionals>

2.4 GLAZING <**Insert window designation(s) used on Drawings**>.

Editor Note: Select required U-Factor in paragraph below and coordinate with required glazing type. U-Factors provided are based on whole-window performance, not on center-of-glass. Coordinate selection below with manufacturer’s product information. Actual unit energy performance values will vary depending upon Performance Grade (PG) rating, unit size, type, glass options, and accessories such as grilles.

A: Thermal Transmission (U-Factor), NFRC 100:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.27 without grilles**] [**0.27 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.27 without grilles**] [**0.27 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.30 without grilles**] [**0.30 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.30 without grilles**] [**0.30 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.28 without grilles**] [**0.28 with grilles**] <**Insert U-Factor value**>.

B. Solar Heat Gain Coefficient (SHGC), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.28 without grilles**] [**0.26 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.28 without grilles**] [**0.26 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.31 without grilles**] [**0.28 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.31 without grilles**] [**0.28 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.33 without grilles**] [**0.29 with grilles**] <**Insert SHGC value**>.

C. Visible Light Transmittance (VLT), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.47 without grilles**] [**0.43 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.47 without grilles**] [**0.43 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.53 without grilles**] [**0.48 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.53 without grilles**] [**0.48 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.56 without grilles**] [**0.50 with grilles**] <**Insert VLT value**>.

Editor Note: Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC) performance varies depending on window type and whether standard or upgrade features are specified. Coordinate selection below with manufacturer’s product information.

D. Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC), ASTM E90:

Editor Note: Retain sub-paragraph below for casement or awning windows. In all cases, the second set of optional performance data is for unbalanced glass.

1. [**30/25**] [**33/28 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

2. [**25/21**] [**32/26 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

3. [**25/21**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

4. [**29/24**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

E. Glass Units: Provide insulating glass units certified through [**Insulating Glass Certification Council as conforming to the requirements of IGCC and ASTM E2190**] [**Insulating Glass Manufacturers Alliance of Canada (IGMAC) conforming to the requirements of Canadian General Standards Board CAN/CGSB 12.8**].

1. Manufacturer Designation: Andersen High-Performance Low-E Glass.
2. Glazing Configuration: Dual Pane

3. Seal and Spacer Type: Dual sealed insulating glass units with polyisobutylene primary seal, silicone secondary seal and stainless steel spacers.

4. Glass Spacer Color: [**Black**] [**Stainless Steel**].

5. Glass Type: [**Flat glass, ASTM C1036**] [**Heat strengthened tempered glass, ASTM C1048**].

6. Glass Pattern: [**Obscure**] [**Cascade**] [**Reed**] [**Fern**] [**Satin Etch**] [**None**].

Editor Note: Retain article below when windows using Andersen High-Performance Low-E Sun glass are required. Glass type is a significant factor in determining overall window U-Factor. Copy article below for each window type, edit to suit Project and product requirements and re-insert text as many times as needed to describe additional window types. To view the performance values, go to <http://www.andersenwindows.com/for-professionals>

2.5 GLAZING <**Insert window designation(s) used on Drawings**>.

Editor Note: Select required U-Factor in paragraph below and coordinate with required glazing type. U-Factors provided are based on whole-window performance, not on center-of-glass. Coordinate selection below with manufacturer’s product information. Actual unit energy performance values will vary depending upon Performance Grade (PG) rating, unit size, type, glass options, and accessories such as grilles.

A: Thermal Transmission (U-Factor), NFRC 100:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.28 without grilles**] [**0.28 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.28 without grilles**] [**0.28 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.30 without grilles**] [**0.30 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.30 without grilles**] [**0.30 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.28 without grilles**] [**0.28 with grilles**] <**Insert U-Factor value**>.

B. Solar Heat Gain Coefficient (SHGC), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.17 without grilles**] [**0.16 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.17 without grilles**] [**0.16 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.19 without grilles**] [**0.17 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.19 without grilles**] [**0.17 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.20 without grilles**] [**0.18 with grilles**] <**Insert SHGC value**>.

C. Visible Light Transmittance (VLT), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.26 without grilles**] [**0.24 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.26 without grilles**] [**0.24 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.30 without grilles**] [**0.26 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.30 without grilles**] [**0.26 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.31 without grilles**] [**0.28 with grilles**] <**Insert VLT value**>.

Editor Note: Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC) performance varies depending on window type and whether standard or upgrade features are specified. Coordinate selection below with manufacturer’s product information.

D. Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC), ASTM E90:

Editor Note: Retain sub-paragraph below for casement or awning windows. In all cases, the second set of optional performance data is for unbalanced glass.

1. [**30/25**] [**33/28 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

2. [**25/21**] [**32/26 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

3. [**25/21**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

4. [**29/24**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

E. Glass Units: Provide insulating glass units certified through [**Insulating Glass Certification Council as conforming to the requirements of IGCC and ASTM E2190**] [**Insulating Glass Manufacturers Alliance of Canada (IGMAC) conforming to the requirements of Canadian General Standards Board CAN/CGSB 12.8**].

1. Manufacturer Designation: Andersen High-Performance Low-E Glass.
2. Glazing Configuration: Dual Pane

3. Seal and Spacer Type: Dual sealed insulating glass units with polyisobutylene primary seal, silicone secondary seal and stainless steel spacers.

4. Glass Spacer Color: [**Black**] [**Stainless Steel**].

5. Glass Type: [**Flat glass, ASTM C1036**] [**Heat strengthened tempered glass, ASTM C1048**].

6. Glass Pattern: [**Obscure**] [**Cascade**] [**Reed**] [**Fern**] [**Satin Etch**] [**None**].

Editor Note: Retain article below when windows using Andersen High-Performance Low-E SmartSun glass are required. Glass type is a significant factor in determining overall window U-Factor. Copy article below for each window type, edit to suit Project and product requirements and re-insert text as many times as needed to describe additional window types. To view the performance values, go to <http://www.andersenwindows.com/for-professionals>

2.5 GLAZING <**Insert window designation(s) used on Drawings**>.

Editor Note: Select required U-Factor in paragraph below and coordinate with required glazing type. U-Factors provided are based on whole-window performance, not on center-of-glass. Coordinate selection below with manufacturer’s product information. Actual unit energy performance values will vary depending upon Performance Grade (PG) rating, unit size, type, glass options, and accessories such as grilles.

A: Thermal Transmission (U-Factor), NFRC 100:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.27 without grilles**] [**0.27 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.27 without grilles**] [**0.27 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.29 without grilles**] [**0.29 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.29 without grilles**] [**0.29 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.27 without grilles**] [**0.27 with grilles**] <**Insert U-Factor value**>.

B. Solar Heat Gain Coefficient (SHGC), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.19 without grilles**] [**0.17 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.19 without grilles**] [**0.17 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.21 without grilles**] [**0.19 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.21 without grilles**] [**0.19 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.22 without grilles**] [**0.20 with grilles**] <**Insert SHGC value**>.

C. Visible Light Transmittance (VLT), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.43 without grilles**] [**0.38 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.43 without grilles**] [**0.38 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.48 without grilles**] [**0.43 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.48 without grilles**] [**0.43 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.50 without grilles**] [**0.45 with grilles**] <**Insert VLT value**>.

Editor Note: Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC) performance varies depending on window type and whether standard or upgrade features are specified. Coordinate selection below with manufacturer’s product information.

D. Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC), ASTM E90:

Editor Note: Retain sub-paragraph below for casement or awning windows. In all cases, the second set of optional performance data is for unbalanced glass.

1. [**30/25**] [**33/28 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

2. [**25/21**] [**32/26 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

3. [**25/21**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

4. [**29/24**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

E. Glass Units: Provide insulating glass units certified through [**Insulating Glass Certification Council as conforming to the requirements of IGCC and ASTM E2190**] [**Insulating Glass Manufacturers Alliance of Canada (IGMAC) conforming to the requirements of Canadian General Standards Board CAN/CGSB 12.8**].

1. Manufacturer Designation: Andersen High-Performance Low-E Glass.
2. Glazing Configuration: Dual Pane

3. Seal and Spacer Type: Dual sealed insulating glass units with polyisobutylene primary seal, silicone secondary seal and stainless steel spacers.

4. Glass Spacer Color: [**Black**] [**Stainless Steel**].

5. Glass Type: [**Flat glass, ASTM C1036**] [**Heat strengthened tempered glass, ASTM C1048**].

6. Glass Pattern: [**Obscure**] [**Cascade**] [**Reed**] [**Fern**] [**Satin Etch**] [**None**].

Editor Note: Retain article below when windows using Andersen High-Performance dual-pane glass are required. Glass type is a significant factor in determining overall window U-Factor. Copy article below for each window type, edit to suit Project and product requirements and re-insert text as many times as needed to describe additional window types. To view the performance values, go to <http://www.andersenwindows.com/for-professionals>

2.6 GLAZING <**Insert window designation(s) used on Drawings**>.

Editor Note: Select required U-Factor in paragraph below and coordinate with required glazing type. U-Factors provided are based on whole-window performance, not on center-of-glass. Coordinate selection below with manufacturer’s product information. Actual unit energy performance values will vary depending upon Performance Grade (PG) rating, unit size, type, glass options, and accessories such as grilles.

A: Thermal Transmission (U-Factor), NFRC 100:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.41 without grilles**] [**0.41 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.42 without grilles**] [**0.42 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.46 without grilles**] [**0.46 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.46 without grilles**] [**0.46 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.45 without grilles**] [**0.45 with grilles**] <**Insert U-Factor value**>.

B. Solar Heat Gain Coefficient (SHGC), NFRC 200:

Editor Note: Retain sub-paragraph below for casement or awning windows.

1. [**0.52 without grilles**] [**0.47 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for casement or awning windows.

2. [**0.52 without grilles**] [**0.47 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.58 without grilles**] [**0.52 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.58 without grilles**] [**0.52 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.61 without grilles**] [**0.55 with grilles**] <**Insert SHGC value**>.

C. Visible Light Transmittance (VLT), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.54 without grilles**] [**0.49 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.54 without grilles**] [**0.49 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.61 without grilles**] [**0.54 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.61 without grilles**] [**0.54 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.64 without grilles**] [**0.57 with grilles**] <**Insert VLT value**>.

Editor Note: Sound Transmission Class (STC) / Outdoor-Indoor Transmission Classification (OITC) performance varies depending on window type and whether standard or upgrade features are specified. Coordinate selection below with manufacturer’s product information.

D. Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC), ASTM E90:

Editor Note: Retain sub-paragraph below for casement or awning windows. In all cases, the second set of optional performance data is for unbalanced glass.

1. [**30/25**] [**33/28 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

2. [**25/21**] [**32/26 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

3. [**25/21**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

4. [**29/24**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

E. Glass Units: Provide insulating glass units certified through [**Insulating Glass Certification Council as conforming to the requirements of IGCC and ASTM E2190**] [**Insulating Glass Manufacturers Alliance of Canada (IGMAC) conforming to the requirements of Canadian General Standards Board CAN/CGSB 12.8**].

1. Manufacturer Designation: Andersen High-Performance Low-E Glass.
2. Glazing Configuration: Dual Pane

3. Seal and Spacer Type: Dual sealed insulating glass units with polyisobutylene primary seal, silicone secondary seal and stainless steel spacers.

4. Glass Spacer Color: [**Black**] [**Stainless Steel**].

5. Glass Type: [**Flat glass, ASTM C1036**] [**Heat strengthened tempered glass, ASTM C1048**].

6. Glass Pattern: [**Obscure**] [**Cascade**] [**Reed**] [**Fern**] [**Satin Etch**] [**None**].

Editor Note: Retain article below when windows using Andersen High-Performance PassiveSun glass are required. Glass type is a significant factor in determining overall window U-Factor. Copy article below for each window type, edit to suit Project and product requirements and re-insert text as many times as needed to describe additional window types. To view the performance values, go to <http://www.andersenwindows.com/for-professionals>

2.7 GLAZING <**Insert window designation(s) used on Drawings**>.

Editor Note: Select required U-Factor in paragraph below and coordinate with required glazing type. U-Factors provided are based on whole-window performance, not on center-of-glass. Coordinate selection below with manufacturer’s product information. Actual unit energy performance values will vary depending upon Performance Grade (PG) rating, unit size, type, glass options, and accessories such as grilles.

A: Thermal Transmission (U-Factor), NFRC 100:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.28 without grilles**] [**0.28 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.28 without grilles**] [**0.28 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.30 without grilles**] [**0.30 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.30 without grilles**] [**0.30 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.29 without grilles**] [**0.29 with grilles**] <**Insert U-Factor value**>.

B. Solar Heat Gain Coefficient (SHGC), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.46 without grilles**] [**0.42 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.46 without grilles**] [**0.42 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.52 without grilles**] [**0.46 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.52 without grilles**] [**0.46 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.54 without grilles**] [**0.48 with grilles**] <**Insert SHGC value**>.

C. Visible Light Transmittance (VLT), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.52 without grilles**] [**0.47 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.52 without grilles**] [**0.47 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.59 without grilles**] [**0.52 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.59 without grilles**] [**0.52 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.61 without grilles**] [**0.55 with grilles**] <**Insert VLT value**>.

Editor Note: Sound Transmission Class (STC) / Outdoor-Indoor Transmission Classification (OITC) performance varies depending on window type and whether standard or upgrade features are specified. Coordinate selection below with manufacturer’s product information.

D. Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC), ASTM E90:

Editor Note: Retain sub-paragraph below for casement or awning windows. In all cases, the second set of optional performance data is for unbalanced glass.

1. [**30/25**] [**33/28 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

2. [**25/21**] [**32/26 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

3. [**25/21**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

4. [**29/24**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

E. Glass Units: Provide insulating glass units certified through [**Insulating Glass Certification Council as conforming to the requirements of IGCC and ASTM E2190**] [**Insulating Glass Manufacturers Alliance of Canada (IGMAC) conforming to the requirements of Canadian General Standards Board CAN/CGSB 12.8**].

1. Manufacturer Designation: Andersen High-Performance Low-E Glass.
2. Glazing Configuration: Dual Pane

3. Seal and Spacer Type: Dual sealed insulating glass units with polyisobutylene primary seal, silicone secondary seal and stainless steel spacers.

4. Glass Spacer Color: [**Black**] [**Stainless Steel**].

5. Glass Type: [**Flat glass, ASTM C1036**] [**Heat strengthened tempered glass, ASTM C1048**].

6. Glass Pattern: [**Obscure**] [**Cascade**] [**Reed**] [**Fern**] [**Satin Etch**] [**None**].

Editor Note: Retain article below when windows using Andersen High-Performance Low-E glass with HeatLock technology are required. Glass type is a significant factor in determining overall window U-Factor. Copy article below for each window type, edit to suit Project and product requirements and re-insert text as many times as needed to describe additional window types. To view the performance values, go to <http://www.andersenwindows.com/for-professionals>

2.8 GLAZING <**Insert window designation(s) used on Drawings**>.

Editor Note: Select required U-Factor in paragraph below and coordinate with required glazing type. U-Factors provided are based on whole-window performance, not on center-of-glass. Coordinate selection below with manufacturer’s product information. Actual unit energy performance values will vary depending upon Performance Grade (PG) rating, unit size, type, glass options, and accessories such as grilles.

A: Thermal Transmission (U-Factor), NFRC 100:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.24 without grilles**] [**0.24 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.24 without grilles**] [**0.24 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.26 without grilles**] [**0.26 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.26 without grilles**] [**0.26 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.24 without grilles**] [**0.24 with grilles**] <**Insert U-Factor value**>.

B. Solar Heat Gain Coefficient (SHGC), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.27 without grilles**] [**0.25 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.27 without grilles**] [**0.25 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.31 without grilles**] [**0.28 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.31 without grilles**] [**0.28 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.32 without grilles**] [**0.29 with grilles**] <**Insert SHGC value**>.

C. Visible Light Transmittance (VLT), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.46 without grilles**] [**0.42 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.46 without grilles**] [**0.42 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.52 without grilles**] [**0.46 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.52 without grilles**] [**0.46 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.55 without grilles**] [**0.49 with grilles**] <**Insert VLT value**>.

Editor Note: Sound Transmission Class (STC) / Outdoor-Indoor Transmission Classification (OITC) performance varies depending on window type and whether standard or upgrade features are specified. Coordinate selection below with manufacturer’s product information.

D. Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC), ASTM E90:

Editor Note: Retain sub-paragraph below for casement or awning windows. In all cases, the second set of optional performance data is for unbalanced glass.

1. [**30/25**] [**33/28 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

2. [**25/21**] [**32/26 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

3. [**25/21**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

4. [**29/24**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

E. Glass Units: Provide insulating glass units certified through [**Insulating Glass Certification Council as conforming to the requirements of IGCC and ASTM E2190**] [**Insulating Glass Manufacturers Alliance of Canada (IGMAC) conforming to the requirements of Canadian General Standards Board CAN/CGSB 12.8**].

1. Manufacturer Designation: Andersen High-Performance Low-E Glass.
2. Glazing Configuration: Dual Pane

3. Seal and Spacer Type: Dual sealed insulating glass units with polyisobutylene primary seal, silicone secondary seal and stainless steel spacers.

4. Glass Spacer Color: [**Black**] [**Stainless Steel**].

5. Glass Type: [**Flat glass, ASTM C1036**] [**Heat strengthened tempered glass, ASTM C1048**].

6. Glass Pattern: [**Obscure**] [**Cascade**] [**Reed**] [**Fern**] [**Satin Etch**] [**None**].

Editor Note: Retain article below when windows using Andersen High-Performance Low-E SmartSun glass with HeatLock technology are required. Glass type is a significant factor in determining overall window U-Factor. Copy article below for each window type, edit to suit Project and product requirements and re-insert text as many times as needed to describe additional window types. To view the performance values, go to <http://www.andersenwindows.com/for-professionals>

2.9 GLAZING <**Insert window designation(s) used on Drawings**>.

Editor Note: Select required U-Factor in paragraph below and coordinate with required glazing type. U-Factors provided are based on whole-window performance, not on center-of-glass. Coordinate selection below with manufacturer’s product information. Actual unit energy performance values will vary depending upon Performance Grade (PG) rating, unit size, type, glass options, and accessories such as grilles.

A: Thermal Transmission (U-Factor), NFRC 100:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.23 without grilles**] [**0.23 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.24 without grilles**] [**0.24 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.25 without grilles**] [**0.25 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.25 without grilles**] [**0.25 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.23 without grilles**] [**0.23 with grilles**] <**Insert U-Factor value**>.

B. Solar Heat Gain Coefficient (SHGC), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.18 without grilles**] [**0.17 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.18 without grilles**] [**0.17 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.20 without grilles**] [**0.19 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.20 without grilles**] [**0.19 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.21 without grilles**] [**0.19 with grilles**] <**Insert SHGC value**>.

C. Visible Light Transmittance (VLT), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.42 without grilles**] [**0.38 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.42 without grilles**] [**0.38 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.47 without grilles**] [**0.42 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.47 without grilles**] [**0.42 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.49 without grilles**] [**0.46 with grilles**] <**Insert VLT value**>.

Editor Note: Sound Transmission Class (STC) / Outdoor-Indoor Transmission Classification (OITC) performance varies depending on window type and whether standard or upgrade features are specified. Coordinate selection below with manufacturer’s product information.

D. Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC), ASTM E90:

Editor Note: Retain sub-paragraph below for casement or awning windows. In all cases, the second set of optional performance data is for unbalanced glass.

1. [**30/25**] [**33/28 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

2. [**25/21**] [**32/26 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

3. [**25/21**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

4. [**29/24**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

E. Glass Units: Provide insulating glass units certified through [**Insulating Glass Certification Council as conforming to the requirements of IGCC and ASTM E2190**] [**Insulating Glass Manufacturers Alliance of Canada (IGMAC) conforming to the requirements of Canadian General Standards Board CAN/CGSB 12.8**].

1. Manufacturer Designation: Andersen High-Performance Low-E Glass.
2. Glazing Configuration: Dual Pane

3. Seal and Spacer Type: Dual sealed insulating glass units with polyisobutylene primary seal, silicone secondary seal and stainless steel spacers.

4. Glass Spacer Color: [**Black**] [**Stainless Steel**].

5. Glass Type: [**Flat glass, ASTM C1036**] [**Heat strengthened tempered glass, ASTM C1048**].

6. Glass Pattern: [**Obscure**] [**Cascade**] [**Reed**] [**Fern**] [**Satin Etch**] [**None**].

Editor Note: Retain article below when windows using Andersen High-Performance Low-E PassiveSun glass with HeatLock technology are required. Glass type is a significant factor in determining overall window U-Factor. Copy article below for each window type, edit to suit Project and product requirements and re-insert text as many times as needed to describe additional window types. To view the performance values, go to <http://www.andersenwindows.com/for-professionals>

2.10 GLAZING <**Insert window designation(s) used on Drawings**>.

Editor Note: Select required U-Factor in paragraph below and coordinate with required glazing type. U-Factors provided are based on whole-window performance, not on center-of-glass. Coordinate selection below with manufacturer’s product information. Actual unit energy performance values will vary depending upon Performance Grade (PG) rating, unit size, type, glass options, and accessories such as grilles.

A: Thermal Transmission (U-Factor), NFRC 100:

Editor Note: Retain sub-paragraph below for casement or awning windows.

1. [**0.24 without grilles**] [**0.24 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for casement or awning windows.

2. [**0.25 without grilles**] [**0.25 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.26 without grilles**] [**0.26 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.26 without grilles**] [**0.26 with grilles**] <**Insert U-Factor value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.24 without grilles**] [**0.24 with grilles**] <**Insert U-Factor value**>.

B. Solar Heat Gain Coefficient (SHGC), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.42 without grilles**] [**0.38 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.42 without grilles**] [**0.38 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.47 without grilles**] [**0.42 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.47 without grilles**] [**0.42 with grilles**] <**Insert SHGC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.49 without grilles**] [**0.44 with grilles**] <**Insert SHGC value**>.

C. Visible Light Transmittance (VLT), NFRC 200:

Editor Note: Retain sub-paragraph below for casement windows.

1. [**0.51 without grilles**] [**0.46 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for awning windows.

2. [**0.51 without grilles**] [**0.46 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

3. [**0.57 without grilles**] [**0.51 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

4. [**0.57 without grilles**] [**0.51 with grilles**] <**Insert VLT value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

5. [**0.60 without grilles**] [**0.54 with grilles**] <**Insert VLT value**>.

Editor Note: Sound Transmission Class (STC) / Outdoor-Indoor Transmission Classification (OITC) performance varies depending on window type and whether standard or upgrade features are specified. Coordinate selection below with manufacturer’s product information.

D. Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC), ASTM E90:

Editor Note: Retain sub-paragraph below for casement or awning windows. In all cases, the second set of optional performance data is for unbalanced glass.

1. [**30/25**] [**33/28 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for single-hung windows.

2. [**25/21**] [**32/26 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for gliding windows.

3. [**25/21**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

Editor Note: Retain sub-paragraph below for fixed windows.

4. [**29/24**] [**32/27 with unbalanced glass**] <**Insert STC/OITC value**>.

E. Glass Units: Provide insulating glass units certified through [**Insulating Glass Certification Council as conforming to the requirements of IGCC and ASTM E2190**] [**Insulating Glass Manufacturers Alliance of Canada (IGMAC) conforming to the requirements of Canadian General Standards Board CAN/CGSB 12.8**].

1. Manufacturer Designation: Andersen High-Performance Low-E Glass.
2. Glazing Configuration: Dual Pane

3. Seal and Spacer Type: Dual sealed insulating glass units with polyisobutylene primary seal, silicone secondary seal and stainless steel spacers.

4. Glass Spacer Color: [**Black**] [**Stainless Steel**].

5. Glass Type: [**Flat glass, ASTM C1036**] [**Heat strengthened tempered glass, ASTM C1048**].

6. Glass Pattern: [**Obscure**] [**Cascade**] [**Reed**] [**Fern**] [**Satin Etch**] [**None**].

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that all substrate conditions are suitable for installation in compliance with manufacturer’s recommendations.

B. Do not begin installation until substrates have been properly prepared and any conditions not in compliance with manufacturer’s recommendations have been corrected.

3.2 INSTALLATION

A. General: Comply with manufacturer’s product recommendations, including but not limited to the Andersen Unit Installation Guide, and installation information in product literature and on product packaging. Comply with Drawings [**and Shop Drawings**] for installing windows, hardware, accessories, and other components.

B. Install windows plumb, level and square. Anchor windows securely to structure in correct orientation to flashing and adjacent construction as indicated. Comply with installation instructions for proper flashing integration of window into wall system. Install windows so as to drain water penetration to the exterior.

C. Adjust sashes, insect screens, ventilators, hardware and accessories as applicable for correct fit. Adjust weatherstrip for smooth operation and weather-tight closure.

3.3 FIELD QUALITY CONTROL

A. Manufacturer’s Field Services: If requested by Owner, provide manufacturer’s field service consisting of product use recommendations and periodic site visits for observation of product installation in accordance with manufacturer’s recommendations.

1. Site Visits: <**Insert site visit requirements**>.

Editor Note: Retain article below if field tests for air and water leakage are required. Edit to suit Project requirements including testing services and methodology.

B. Field Testing: Provide field testing of installed units.

1. Test units in compliance with AAMA 502.

2. Use test equipment calibrated according to ASTM E1105.

3.4 CLEANING

A. Refer to manufacturer for guidance on timing for when best to remove protective films and non-permanent labels after installation.

B. Remove excess sealant, soiling, dirt and other substances. Clean window frame and glass surfaces. Avoid damaging coatings and finishes.

C. Touch-up, repair or replace glass or other window components broken, scratched or damaged during construction prior to Substantial Completion.

D. Remove and lawfully dispose of construction debris from Project site.

3.5 PROTECTION

A. Protect installed windows and finish surfaces from damage during construction until completion of Project and acceptance by Owner.

(END OF SECTION 08 54 00 – COMPOSITE WINDOWS)