



Fixed Curb Mount (FCM) Unit Skylight - Guide Specification

For over 70 years, VELUX has been delivering energy efficient daylight to living spaces where people, live, work, and play. VELUX is the world leader in harnessing the benefits of the sun, providing energy efficient top lighting solutions, and recognized as one of the strongest brands in the global materials and home improvement industry.

VELUX FCM skylights are designed for commercial and residential flat and sloped roof applications. Daylighting provided through VELUX skylights improves the energy efficiency and visual comfort of these residential and commercial spaces. The VELUX FCM skylight is a category leader with a maintenance free frame, structural seal, and durable thermal pane options with performance levels meeting project specifications. The thermal pane glazing options carry a 20 year warranty against seal failure, and have a specially formulated LoE³ – 366™ coating. This coating, specifically designed for skylight applications, provides a high visible light transmission while reducing solar heat gain and UV penetration.

VELUX test facilities ensure that new products comply with regulations and market demands for technical performance. VELUX testing ensures that our products are able to withstand the most difficult climatic conditions to which VELUX products are typically exposed to in the markets where they are sold. Our test procedures include load capacity, air and water tightness in a test chamber and a weather simulator, mechanical tests, impact test results, durability tests, U-factor and solar heat gain tests, burn brand resistance and visual inspection of the surface quality.

Contact **VELUX America Inc.**, Greenwood, SC 29648; www.VELUXusa.com; 800-888-3589, specifications@veluxusa.com.

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SECTION 08 62 00 –UNIT SKYLIGHTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fixed curb mount unit skylight with formed curb counterflashing for mounting on prefabricated roof curbs, for flat, low-slope and steep-slope roofing applications.

1.2 RELATED REQUIREMENTS

Specifier: If retaining optional "Related Sections" article, edit to include sections applicable to Project.

- A. Section 061053 "Miscellaneous Rough Carpentry" for site-built wood roof curbs for unit skylights.
- B. Division 07 roofing section for flashing and roofing terminations at unit skylight curbs.
- C. Section 077200 "Roof Accessories" for manufactured metal roof curbs for tubular unit skylights.
- D. Section 086300 "Metal-Framed Skylights" for aluminum-framed sloped glazing assemblies.

1.3 REFERENCE STANDARDS

Specifier: If retaining optional "References" article, edit to include standards cited in edited Section.

- A. General: Applicable edition of references cited in this Section is current edition published on date of issue of Project specifications, unless otherwise required by building code in force.
- B. American Architectural Manufacturers Association (www.aama.net), Window & Door Manufacturers Association (www.wdma.com), Canadian Standards Association (www.csagroup.org/us/en/services)
 - 1. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/ Specification for Windows, Doors, and Skylights (NAFS)
 - 2. CSA A440S1-09 – Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440
 - 3. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems
 - 4. AAMA 2603 – Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum and Panels
- C. ASTM International: www.astm.org:
 - 1. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
 - 2. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings
 - 3. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
 - 4. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
 - 5. ASTM E 408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques

6. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
 7. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes
- D. Code of Federal Regulations:
1. 29 CFR 1910.23 (e) (8) - Occupational Safety and Health Standards for Walking-Working Surfaces to Guard Floor and Wall Openings and Holes
- E. Illuminating Engineering Society of North America (IESNA): www.ies.org:
1. IESNA – The Lighting Handbook.
- F. National Fenestration Rating Council: www.nfrccommunity.org:
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
- G. National Fire Protection Association: www.nfpa.org:
1. NFPA 70 - National Electrical Code

1.4 COORDINATION

[Specifier: Retain option in paragraph below that corresponds to the type of curb used on Project.](#)

- A. Coordinate dimensions, locations, and details of skylight curbs [specified in Section 061053 "Miscellaneous Carpentry"] [specified in Section 077200 "Roof Accessories"] with unit skylight curb flashings. Verify requirements for roofing system terminations.
- B. Coordinate unit skylight interior termination locations with structural layout, ceiling grid layouts, and other ceiling-mounted items.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site prior to delivery of unit skylight and installation of roof deck.

1.6 ACTION SUBMITTALS

- A. Product Data: For unit skylights. Include standard construction details, product performance characteristics, and material descriptions, dimensions of individual components and profiles, and finishes.
 1. Include test reports of qualified independent testing agency or third party certificates verifying compliance with performance requirements.

Specifier: Retain "LEED Submittals" Paragraph when required for Project; this Paragraph stipulates documentation required from Contractor to support cited construction-phase credits.

Review design-phase credits available related to unit skylights, including contribution to IEQ Cr 6.1 Controllability of Systems, IEQ Cr 8.1. Daylighting, EA Cr 1 Energy Optimization, and ID Cr 1 Innovation in Design credits. Consult VELUX representative for detailed support data.

B. LEED Submittals:

1. Credit MR 4 Recycled Content: Documentation indicating the following:

- a. Percentages by weight of post-consumer and pre-consumer recycled content.
- b. Total weight of products provided.
- c. Include statement indicating costs for each product having recycled content.

C. Shop Drawings: For unit skylight work. Include plans, elevations, sections, details, and connections to supporting structure and other adjoining work.

1. Lighting photometric study indicating compliance with performance requirements in accordance with IESNA. Include layout, spacing criteria and foot-candle report.

1.7 INFORMATIONAL SUBMITTALS

Specifier: Retain paragraphs below when Project requirements include compliance with Federal Buy American provisions. VELUX Fixed Curb Mount skylights complies with requirement.

A. Buy American Act Certification: Submit documentation certifying that products comply with provisions of the Buy American Act 41 U.S.C 10a – 10d.

B. Florida State Product Approval Listing Number: Indicating that products comply with requirements of Florida State Building Code. www.floridabuilding.org/pr/pr_app_srch.aspx

C. Warranty: Sample of special warranty.

1.8 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data.

1.9 QUALITY ASSURANCE

Specifier: VELUX America, Inc. has been producing skylights in the US for over 30 years and in Europe for an additional 30 years prior to that. VELUX has a reputation among architects and contractors as the most reliably performing skylight in the world.

A. Manufacturer Qualifications: A qualified manufacturer listed in this Section with minimum 30 years' experience in the US manufacturing similar products in successful use on similar projects and able to provide unit skylights meeting requirements.

Specifier: Retain "Approval of Manufacturers and Comparable Products" Subparagraph if Owner will consider product substitutions.

1. Approval of Manufacturers and Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
 - a. Completed and signed Substitution Request form.
 - b. Product data, including photometric data and independent test data indicating compliance with requirements.
 - c. Sample product warranty.

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of unit skylights that fail in materials or workmanship under normal use within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Deterioration of metals, metal finishes, dome, and other materials beyond normal weathering.
 - b. Breakage of glazing.
 2. Warranty Period:
 - a. Unit Skylight and Flashing Product Warranty: 10 years from date of purchase.
 - b. Unit Skylight and Flashing Installation "No Leak" Warranty: 10 years from date of purchase.
 - c. Hail Breakage Warranty for Skylight Glass: 10 years from the date of purchase on all insulated glass units using laminated glass.
 - d. Insulating Glass Seal Failure Warranty: 20 years from date of purchase.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide products of **VELUX America Inc.**, Greenwood, SC 29648; www.VELUXusa.com; (800) 878-3589, specifications@veluxusa.com.

Specifier: Retain "Substitutions" Paragraph and select one of two options based upon Project requirements.

- B. Substitutions: [None allowed by Owner] [As permitted under Instructions to Bidders and Section 012500 "Substitution Procedures"].
- C. Source Limitations: Obtain unit skylights through single source from single manufacturer.

2.2 Fixed Curb Mounted (FCM) Unit Skylights

- A. System Description: Fixed curb mounted unit skylight with a roll-formed aluminum frame counter-flashing joined by corner keys, an interior condensation drainage gasket, an insulated glass unit, structural sealant, mounting fasteners, flashing and accessories, as required to meet installation and performance requirements indicated. FCM skylights shall be suitable for installation on roof curbs ranging from 0 degrees up to 60 degrees from horizontal.

1. Basis of Design: **VELUX America, Inc, Model FCM Fixed Curb Mount Skylight.**

Specifier: **FCM** standard unit sizes are not available as a stocked product for all glazing options. Specify special width and height sizes by "make sizes" which are maximum skylight clearance dimensions. The minimum make size width is 18.75 inches (476 mm) and maximum make size width is 50.75 inches (12.9 cm). The minimum make size height is 18.75 inches (476 mm) and maximum make size height is 76.5 inches (19.4 cm). Make size dimensions are only available in ¼ inch (6 mm) increments (0, ¼, ½, ¾) for width and height.

- B. Aluminum Frame Counter-flashing: Maintenance-free, roll-formed aluminum, 15 gauge, 0.06 inch (1.5 mm) thick with neutral grey Kynar® 500 polyvinylidene fluoride resin finish. Counter-flashing frames joined with neutral grey corner keys constructed from injection molded Acrylonitrile Styrene Acrylate (ASA)-Luran.
 - 1. Unit Sizes: [1430], [1446], [2222], [2230], [2234], [2246], [2270], [3030], [3046], [3434], [3446], [4646], [special order] [as indicated on Drawings].
- C. Condensation Drainage Gasket: Factory applied black thermoplastic rubber gasket mounted around the entire interior aluminum frame assembly providing a thermal break weather seal and drainage for interior condensation.
- D. Insulated Glass Unit: Factory assembled with low emissivity exterior pane and clear interior pane separated by a stainless steel spacer sealing the space between panes with 95% argon gas.

Specifier: Retain 0.125 inch thick pane for FCM sizes less than 4646, and for FCM sizes 4646 and greater retain 0.16 inch thick pane. Retain "Neat® exterior coating" when specifying laminated interior pane.

- 1. Exterior Pane: [0.125 inch (3mm)] [0.16 inch (4mm)] thick tempered glass with [Neat® exterior coating and] interior surface coated with three layers of low emissivity silver (LoE³) coatings.

Specifier: Retain one of the three interior pane options below. VELUX product codes list the tempered interior pane as 05 glazing. Laminated panes are listed by VELUX as 04 with clear interlayer, 08 "White laminated" with white interlayer. VELUX offers two interior pane options for wind-borne debris regions. The wind-borne debris laminated interior pane with standard polyvinyl butyral interlayer is listed by VELUX as an impact 06 glazing for use in wind zone 3 regions requiring a class C missile level. VELUX lists the wind-borne debris pane with Sentryglasplus® interlayer as Miami-Dade 07 glazing which is certified for use in Miami-Dade portions of Florida. Laminated panes are typically required by building codes when any portion of the glass is higher than 12 feet above finished floor. VELUX laminated panes are marketed as "Clean, Quiet and Safe" glass.

- 2. Interior Pane:
 - a. Tempered, Clear 0.125 inch (3mm) tempered glass
 - b. Laminated, Two clear 0.090 inch (2.3 mm) heat-strengthened panes with a 0.030 inch (0.76 mm) [clear] [white] polyvinyl butyral interlayer sandwiched together.
 - c. Laminated for wind-borne debris regions, Two clear 0.090 inch (2.3 mm) heat-strengthened panes with a 0.090 inch (2.3 mm) clear [polyvinyl butyral] [Sentryglasplus®] interlayer sandwiched together.

- E. Structural Sealant: Factory applied silicone sealant, black color, bonding the glass pane to the aluminum frame and suitable for external exposure.

Specifier: FCM skylight sizes 1430, 1446, 2222, 2230, 2234, 2246 supplied with 12 mounting fasteners, and FCM skylights sizes 2270, 3030, 3046, 3434, 3446 and 4646 supplied with 14 mounting fasteners. FCM skylights using Miami-Dade 07 glazing in sizes larger than 2222 require 20 screws.

- F. Mounting Fasteners: #8 x 1.75 inch (44 mm) stainless steel, black zinc coated, self-drilling screws provided with skylight. [12] [14] [20] field installed screws secures skylight to site built curb as indicated in manufacturer's installation instructions.

2.3 Flashings

Specifier: Type ECL step flashing designed for use with roofing material less than 0.75 inch (19 mm) thick (typically asphalt shingles, cedar shingles and slate) and for use on roof slopes 10 degrees or greater and not more than 60 degrees. Type ECW high profile flashing designed for use with high profiled roofing materials (clay tile, concrete tile and cedar shakes) not greater than 4.75 inches (120 mm) in height, and for use on roof slopes 14 to 60 degrees. ECL or ECW flashing is required with skylight in order for VELUX 10 year "No Leak" warranty to be valid.

- A. Step Flashing: Roll formed aluminum, neutral grey finish, factory engineered and fabricated seams, consisting of head flashing, sill flashing, step flashing pieces and adhesive underlayment suitable for use with 4 inch (100 mm) and 6 inch (150 mm) curbs on roof pitches 10 to 60 degrees from horizontal.

1. Basis of Design: **VELUX America, Inc, ECL Step Flashing.**

2. Size: As required for skylight sizes indicated.

3. Material:

- a. Head flashing 23 gauge (0.57 mm) thick aluminum with polyester lacquer finish.
- b. Sill flashing 22 gauge (0.65 mm) thick aluminum with Kynar 500 finish.
- c. Step pieces 23 gauge (0.57 mm) thick aluminum with polyester lacquer finish.
- d. Adhesive underlayment: 9 inches (229 mm) wide x 21 feet (6.4 m) length x 0.03 inch (0.8 mm) thick, SBS modified bitumen with white polyethylene backing sheet.

- B. High Profile Flashing: Roll formed aluminum, neutral grey finish, factory engineered and fabricated seams, consisting of head flashing, sill flashing, side gutter pieces, counter flashing and adhesive underlayment suitable for use with 4 inch (100 mm) and 6 inch (150 mm) curbs on roof pitches 14 to 60 degrees from horizontal.

1. Basis of Design: **VELUX America, Inc, ECW High Profile Flashing.**

2. Size: As required for skylight sizes indicated.

3. Material:

- a. Head flashing 23 gauge (0.57 mm) thick aluminum with polyester lacquer finish.
- b. Sill flashing 22 gauge (0.65 mm) thick aluminum with Kynar 500 finish and 9 inch (229 mm) pleated apron.
- c. Side gutter pieces 23 gauge (0.57 mm) thick aluminum with polyester lacquer finish.
- d. Counter-flashing 23 gauge (0.57 mm) thick with 4 inch (100 mm) curb counter flashing, aluminum with polyester lacquer finish.

- e. Adhesive underlayment: 12 inches (305 mm) width x 21 feet (6.4 m) length x 0.03 inch (0.8 mm) thickness, SBS modified bitumen with white polyethylene backing sheet.

2.4 ACCESSORIES

Specifier: VELUX accessory tray (ZZZ 199) required for blind installation in FCM skylight. Accessory tray only available in VELUX standard FCM sizes and for FCM standard sizes mounted at a 90 degree rotation. VELUX recommends installing blinds with at least 10 degrees of pitch to ensure proper operation.

- A. Accessory Tray: Rigid white fiberglass frame, site assembled, mounts directly to site built curb for interior mounting of VELUX blinds. Provide for units in which blinds are indicated.

- 1. Basis of Design: **VELUX America, Inc, Accessory Tray Model ZZZ 199.**

Specifier: Retain only one of two options below based on project requirements. Venetian blind only available in white color.

- B. Blinds: [Field installed] [Factory installed]
 - 1. Manual operation with [blackout] [light filtering] [venetian] blind type with [white] [beige] [special] color as indicated on drawings. [Blind operation controlled by adjustable length telescopic rod.]
 - 2. Solar operation with [blackout] [light filtering] blind type with [white] [beige] [special] color as indicated on drawings. 24 volt dc blinds operated via 2.4 GHz radio frequency [basic wall mounted remote control provided with blind] [control pad provided separately].

2.5 PERFORMANCE REQUIREMENTS

- A. Unit Skylight Standard, FCM 4646 or smaller unit with tempered Lo-E 366 coated exterior glass pane and interior pane as follows:
AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS-11 or previous):

Specifier: Retain first four Subparagraphs below and delete following four Subparagraphs for IBC 2012 and 2015 code requirements; verify requirements of authorities having jurisdiction. In paragraphs "Performance Grade" and "Design Pressure", select only interior glazing option meeting project requirements. Refer to specification section 2.2.D.2 for additional interior pane details and descriptions.

- 1. Performance Grade (Primary Designator):
 - a. [Laminated with 0.030 inch (0.76 mm) Interlayer: "SKG-PG120 Size Tested 1308 x 1308 mm (51 x 51 in.)".]
 - b. [Tempered: "SKG-PG100 Size Tested 1308 x 1308 mm (51 x 51 in.)".]
 - c. [Laminated with 0.090 inch (2.3 mm) PVB Interlayer: "SKG-PG100 Size Tested 1308 x 1308 mm (51 x 51 in.)".]
- 2. Design Pressure (DP):
 - a. [Laminated with 0.030 inch (0.76 mm) Interlayer: DP = +250/-120 psf (+11.9/-5.75 kPa)]
 - b. [Tempered: DP = +100/-140 psf (+4.9/-6.7 kPa)]

- c. [Laminated with 0.090 inch (2.3 mm) PVB Interlayer: DP = +100/-80 psf (+4.9/-3.83 kPa)]
- 3. Water Test Pressure: 15 psf (0.72 kPa) with no leakage at 5 gallons per minute spray rate.
- 4. Air Leakage Rate: 0.030 cfm/ft² maximum.

Specifier: Delete first four Subparagraphs above and retain first four Subparagraphs below for IBC 2009 and NBC code requirements, including CSA A440S1-09; verify requirements of authorities having jurisdiction. In paragraphs "Performance Class and Grade" and "Design Pressure", select only interior glazing option meeting project requirements. Refer to specification section 2.2.D.2 for additional interior pane details and descriptions.

- 5. Performance Class and Grade (Primary Designator)
 - a. [Laminated with 0.030 inch (0.76 mm) Interlayer: "Class CW-PG90 Size Tested 1308 x 1308 mm (51 x 51 in.)-SKG".]
 - b. [Tempered: "Class CW-PG100 Size Tested 1308 x 1308 mm (51 x 51 in.)-SKG".]
 - c. [Laminated with 0.090 inch (2.3 mm) PVB Interlayer: "Class CW-PG60 Size Tested 1308 x 1308 mm (51 x 51 in.)-SKG".]
 - 6. Design Pressure (DP):
 - a. [Laminated with 0.030 inch (0.76 mm) Interlayer: DP = +175/-90 psf (+8.38/-4.3 kPa)]
 - b. [Tempered: DP = +100/-105 psf (+4.9/-5.03 kPa)]
 - c. [Laminated with 0.090 inch (2.3 mm) PVB Interlayer: DP = +100/-60 psf (+4.9/-2.87 kPa)]
 - 7. Water Test Pressure: 15 psf (0.72 kPa) with no leakage at 5 gallons per minute spray rate.
 - 8. Canadian Air Infiltration/Exfiltration Rating: Fixed. (0.2 L/s/m² maximum)
- B. Unit Skylight Standard, 2270 size and smaller unit with tempered Lo-E 366 coated exterior glass pane and laminated interior pane with 0.030 inch (0.76 mm) interlayer.
AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS-11 or previous):

Specifier: Retain first four Subparagraphs below and delete following four Subparagraphs for IBC 2012 and 2015 code requirements; verify requirements of authorities having jurisdiction.

- 1. Performance Grade (Primary Designator): "SKG-PG100 Size Tested 660 x 1854 mm (26 x 73 in.)".
- 2. Design Pressure (DP): +200/-100 psf (+9.58/-4.79 kPa).
- 3. Water Test Pressure: 15 psf (0.72 kPa) with no leakage at 5 gallons per minute spray rate.
- 4. Air Leakage Rate: 0.030 cfm/ft² maximum

Specifier: Delete first four Subparagraphs above and retain first four Subparagraphs below for IBC 2009 and NBC code requirements, including CSA A440S1-09; verify requirements of authorities having jurisdiction.

- 5. Performance Class and Grade (Primary Designator): "SKG-PG75 Size Tested 660 x 1854 mm (26 x 73 in.).
- 6. Design Pressure (DP): +150/-75 psf (+7.18/-3.59 kPa).

7. Water Test Pressure: 15 psf (0.72 kPa) with no leakage at 5 gallons per minute spray rate.
 8. Canadian Air Infiltration/Exfiltration Rating: Fixed (0.2 L/s/m² maximum).
- C. Daylighting: Provide daylighting photometric performance comparable to basis of design product at layout indicated, based upon daylighting profile of March 21, 9:00 am local time, at Project location by simulation in accordance with IESNA guidelines.
- D. Air Infiltration: Maximum air leakage through tested size of 0.030 cfm/sq. ft. (1.5 L/s/sq. m) of fixed area as determined according to ASTM E 283 at a static-air-pressure differential of 1.57 lbf/sq. ft. (75Pa.)
- E. Water Penetration under Static Pressure: No evidence of water penetration through unit when tested according to ASTM E 331 at a static-air-pressure differential of 15 lbf/sq. ft. (720 Pa).

Specifier: Retain one of the "Windborne Debris Resistance" Paragraphs if required by authorities having jurisdiction. Select FCM 0006 or 0007 glazing when retaining this Paragraph. FCM 0006 glazing is typically for use in windborne debris areas classified as Wind Zone 3 or less. FCM 0007 glazing meets Miami-Dade requirements and windborne debris areas classified as High Velocity Hurricane Zone or Wind Zone 4.

- F. Windborne-Debris Resistance:
1. [Wind Zone 3 or Less: Provide unit skylights capable of resisting impact from windborne debris, based on the pass/fail criteria as determined from testing glazed representative of those specified, according to ASTM E 1886 and ASTM E 1996. Missile Level C, Wind Zone 3 requirements, and +50/-50 psf cycle pressure minimum.]
 2. [Miami-Dade (High Velocity Hurricane Zone) or Less: Provide unit skylights capable of resisting impact from windborne debris, based on the pass/fail criteria as determined from testing glazed representative of those specified, according to TAS 201 and TAS 203: Florida Building Code HVHZ requirements, and +70/-70 psf cycle pressure minimum. ("Miami-Dade" protocols)]
- G. Fire Ratings for Roof Assemblies with Fire Classifications: Unit skylight tested in accordance with ASTM E 108 and listed as passing Burning Brand test with target classification of Class B.
- H. Energy Performance ratings for any size fixed curb mounted unit skylight with tempered Lo-E 366 coated exterior glass pane and interior pane as follows:

Specifier: Retain only interior pane option in the 3 paragraphs below that corresponds to the type of insulated glass pane used on Project.

1. Thermal Transmittance: NFRC 100 maximum U-factor:
 - a. [Clear Laminated with 0.030 inch (0.76 mm) Interlayer: 0.48 Btu/hr*ft²*deg F (2.73 W/m²*deg C).]
 - b. [Tempered: 0.49 Btu/hr*ft²*deg F (2.78 W/m²*deg C).]
 - c. [Laminated with 0.090 inch (2.3 mm) PVB Interlayer: 0.46 Btu/hr*ft²*deg F (2.61 W/m²*deg C).]
 - d. [Laminated with 0.090 inch (2.3 mm) Sentryglasplus® Interlayer: 0.46 Btu/hr*ft²*deg F (2.61 W/m²*deg C).]

e. [White Laminated with 0.030 inch (0.76 mm) Interlayer: 0.48 Btu/hr*ft²*deg F (2.73 W/m²*deg C).]

2. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum SHGC:

- a. [Clear Laminated with 0.030 inch (0.76 mm) Interlayer: 0.27]
- b. [Tempered: 0.27]
- c. [Laminated with 0.090 inch (2.3 mm) PVB Interlayer: 0.27]
- d. [Laminated with 0.090 inch (2.3 mm) Sentryglasplus® Interlayer: 0.27]
- e. [White Laminated with 0.030 inch (0.76 mm) Interlayer: 0.26]

3. Visible Transmittance (Vt): NFRC 200 maximum Vt:

- a. [Clear Laminated with 0.030 inch (0.76 mm) Interlayer: 0.63]
- b. [Tempered: 0.64]
- c. [Laminated with 0.090 inch (2.3 mm) PVB Interlayer: 0.62]
- d. [Laminated with 0.090 inch (2.3 mm) Sentryglasplus® Interlayer: 0.63]
- e. [White Laminated with 0.030 inch (0.76 mm) Interlayer: 0.47]

I. Fall Protection Standard Compliance: 29 CFR 1910.23: Passed for all laminated fixed curb mount unit skylights.

2.6 MATERIALS

- A. Aluminum Sheet: Flat sheet complying with ASTM B 209/B 209M.
- B. Joint Sealants: As specified in Section 079200 "Joint Sealants."
- C. Mastic Sealants: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

2.7 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with unit skylight installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install unit skylights in accordance with manufacturer's written instructions and approved shop drawings. Coordinate installation of units with installation of substrates, air and vapor retarders, roof insulation, roofing membrane, and flashing as required to ensure that each element of the Work performs properly and that finished installation is weather tight.
 - 1. Anchor unit skylights securely to supporting substrates.
 - 2. Install unit skylights on curbs specified in another section with tops of curbs parallel to finished roof slope.
- B. Where metal surfaces of unit skylights will contact incompatible metal or corrosive substrates, including preservative-treated wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation recommended in writing by unit skylight manufacturer.
- C. For custom flashings, install unit skylight curb counter-flashing to produce weatherproof seal with curb and overlap with roofing system termination at top of curb.

3.3 FIELD QUALITY CONTROL

Specifier: Retain option in "Testing Agency" Paragraph below assigning responsibility for testing agency, if required.

- A. Testing Agency: [Owner will engage] [Engage] testing agency to perform tests and inspections.
 - 1. Test for water leaks according to AAMA 501.2 after installation and curing of sealants but prior to installation of interior finishes.
 - 2. Perform test for total area of each unit skylight.
- B. Work will be considered defective if it does not pass tests and inspections.
- C. Additional testing and inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

3.4 CLEANING AND PROTECTION

- A. Clean exposed unit skylight surfaces according to manufacturer's written instructions. Touch up damaged metal coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Replace glazing that has been damaged during construction period.
- C. Protect unit skylight surfaces from contact with contaminating substances resulting from construction operations.

END OF SECTION