SECTION 08 62 00

UNIT SKYLIGHTS

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\*\* NOTE TO SPECIFIER \*\* VELUX America, LLC; Commercial and Residential unit skylight products.  
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This section is based on the products of VELUX America, LLC, which is located at:  
104 Ben Casey Dr.  
Fort Mill, SC 29708  
Toll Free Tel: 800-888-3589  
Tel: 803-396-5738  
Email: [request info (kim.stackhouse@velux.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=VELUX+America,+LLC&coid=36311&rep=&fax=&message=RE:%20Spec%20Question%20(08620vel):%20%20&mf=)  
Web: [www.veluxusa.com](http://www.veluxusa.com)   
 [ [Click Here](http://www.arcat.com/arcatcos/cos36/arc36311.html) ] for additional information.  
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 and providing energy efficient top lighting solutions. VELUX is one of the strongest brands in the global building materials and home improvement industry.  
Our product range contains a wide range of roof windows and skylights, along with solutions for flat roofs. In addition, VELUX offers many types of decoration and sunscreening, roller shutters, installation products, products for remote control and thermal solar panels for installation in roofs. VELUX Technology also supplies original VELUX components to our partners working in the field of roof window sunscreening.  
This specification includes commercial and residential unit skylights. Daylighting through the roofs of commercial buildings or residences provides many benefits that no other light source can offer. With VELUX products you can provide optimal light distribution at the building's core while minimizing glare and enhancing your architectural designs.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Commercial Unit Skylights.
    2. Residential Unit Skylights.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 06 10 00 - Rough Carpentry.
    2. Section 07 26 23 - Below-Grade Gas Retarders .
    3. Section 07 60 00 - Flashing and Sheet Metal.
    4. Section \_\_\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Roofing system at skylight.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. AAAA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors and skylights.
    2. CSA A440S1-09 - Canadian Supplemental to AAMA/WDMA/CSA 101/I.S.2./A440
    3. AAMA 502 - Voluntary Specifications for field Testing of Newly Installed Fenestration Products
    4. AAMA 2603 - Voluntary Specifications, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum and Panels
    5. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings
    6. ASTM E 283 - Standard test method for rate of air leakage through exterior windows, curtain walls and doors.
    7. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure.
    8. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
    9. ASTM E 408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques
    10. ASTM D 542: Standard Test Method for Index of Refraction of Transparent Organic Plastics.
    11. ASTM D 632: Standard Specification for Sodium Chloride
    12. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
    13. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics.
    14. ASTM 695: Standard Test Method for Compressive Properties of Rigid Plastics.
    15. ASTM D 790 - Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
    16. ASTM D 1003: Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics
    17. ASTM D 1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
    18. ASTM D 2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics.
    19. ASTM E 283 - Standard test method for rate of air leakage through exterior windows, curtain walls and doors.
    20. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure.
    21. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
    22. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials. (Impact glazing only)
    23. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Storm Shutters Impacted by Windborne Debris in Hurricanes. (Impact glazing only)
    24. ICC Evaluation Services Acceptance Criteria AC 17 - Acceptance Criteria for Sloped Glass Glazed Unit Skylights and Sloped Glass Glazing.
    25. National Fenestration Rating Council, NFRC - 100, Procedure for Determining Fenestration Product U-factors.
    26. National Fenestration Rating Council, NFRC - 200, Procedure for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence.
    27. National Fenestration Rating Council, NFRC 300, Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems.
    28. Operating Force per ASTM E 2068
    29. Occupational Safety & Health Administration, OSHA Standards - 29 CFR 1910.23, Guarding Floor Openings and Holes.
    30. Underwriters Laboratories Inc., UL 325, Standard for Door, Drapery, Gate, Louver and Window Operators and Systems.
    31. Factory Mutual FM 4430 - Approval Standard for Heat and Smoke Vents
    32. Factory Mutual FM 4431 - Approval Standard for Skylights
  1. DESIGN / PERFORMANCE REQUIREMENTS

\*\* NOTE TO SPECIFIER \*\* Edit for Commercial or Residential skylights from the following paragraphs and delete the paragraphs not required.

* + 1. Commercial Dynamic Dome Unit Skylights: CD, CE
       1. Unit Skylight Custom curb mount or self flashed with traditional thermal break and Legacy Frame:
          1. Model CD Dynamic dome skylight with a mill finish frame.
          2. Model CE Dynamic dome skylight with a gray painted frame.
       2. Certified to meet the requirements of AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS-11 or previous) as follows:

\*\* NOTE TO SPECIFIER \*\* All dynamic dome skylights certified, except sizes in 10 foot length.

* + - * 1. Performance Grade (Primary Designator): SKP-PG30 1670 x 2885 (66 x102)
        2. Design Pressure (DP): Minimum DP = +/- 30 psf (+/- 14.40 KPa). Dome shall not invert at positive design pressure.
        3. Water Test Pressure: Minimum 4.6 psf (220 Pa) with no leakage at 5 gallons per minute spray rate.
        4. Air Leakage Rate: Maximum 0.05 cfm/ft2 (0.3 L/s/m2)

\*\* NOTE TO SPECIFIER \*\* Include the following for Canadian air infiltration/exfiltration rating.

* + - * 1. Canadian Air Infiltration/Exfiltration Rating: Fixed (0.2 L/s/m2 maximum).
      1. 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.
      2. Air Infiltration: Maximum air leakage through tested size of 0.05 cfm/sq. ft. (0.3 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.)
      3. 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 4.6 lbf/sq. ft. (220 Pa).

\*\* NOTE TO SPECIFIER \*\* Retain one of the "Windborne Debris Resistance" Paragraphs if required by authorities having jurisdiction. Select LuxGuard Plus when retaining this Paragraph. LuxGuard Plus in maximum 5 foot by 8 foot size specified in windborne debris areas defined as High Velocity Hurricane Zone (Florida Building Code), or less.

* + - 1. Windborne-Debris Resistance:
         1. Provide unit skylights capable of resisting impact from windborne debris, based on the pass/fail criteria as determined from testing glazed units representative of those specified, according to ASTM E 1886 and ASTM E 1996. Missile Level D, and +65/-65 psf cycle pressure.
         2. High Velocity Hurricane Zone: Provide unit skylights capable of resisting impact from windborne debris, based on the pass/fail criteria as determined from testing glazed units representative of those specified, according to TAS 201, TAS 202, and TAS 203: Florida Building Code HVHZ requirements, and +65/-65 psf cycle pressure.
      2. Fire Testing for Roof Assemblies with Fire Classifications: Unit skylight tested in accordance with and listed as passing Class B Burning Brand test as described in ASTM E 108.
      3. Dome Burn Rate: Tested in accordance with ASTM D 635 with a documented rating of :
         1. CC2 for 100 percent impact modified acrylic
         2. CC1 for LuxGuard/LuxGuard Plus (polycarbonate).
      4. Dome Smoke Density Rating: Testing in accordance with ASTM D 2843 with a documented performance value less than or equal to 75.
      5. Dome Self-Ignition Temperature: Tested in accordance with ASTM D 1929 with a documented performance value greater than or equal to 650 degrees Fahrenheit.

\*\* NOTE TO SPECIFIER \*\* Retain the Factory Mutual Paragraph if required for project. Select LuxGuard Plus when retaining this Paragraph for skylights

* + - 1. Factory Mutual: Skylights Factory Mutual 4431 approved.

\*\* NOTE TO SPECIFIER \*\* Retain the Hail Resistance Paragraph when selecting LuxGuard, LuxGuard Plus, or SoCal skylights.

* + - 1. Dome Hail Resistance: Exterior dome tested in accordance with Factory Mutual 4430 to meet severe hail with 2.0 inch ice balls.
      2. Energy Performance ratings for any size commercial curb mounted unit skylight with dynamic dome as follows:

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs to suit the units specified.

* + - * 1. Thermal Transmittance: NFRC 100 maximum U-factor:

Double Dome:

Impact Modified Acrylic (1S1N2): 0.74

LuxGuard and LuxGuard Plus (3P1C2 and 2P1C2): 0.73

* + - * 1. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum SHGC:

Double Dome:

Impact Modified Acrylic (1S1N2): 0.48

LuxGuard and LuxGuard Plus (3P1C2 and 2P1C2): 0.46

* + - * 1. Visible Transmittance (Vt) and Percent Haze: ASTM D 1003:

Double Dome:

Impact Modified Acrylic (1S1N2): Vt = 68.9 percent, Haze = 100 percent

LuxGuard (3P1P2): Vt = 61.9 percent, Haze = 100 percent

LuxGuard Plus (2P1P2): Vt = 61.1 percent, Haze = 100 percent

* + - 1. Fall Protection Standard Compliance: 29 CFR 1910.23: Skylight dome, [safety screen or security bars tested to support a minimum of 400 pounds over 1 square foot of the surface.
    1. Commercial Custom Size Thermal formed Unit Skylight: CS2, CK2
       1. Unit Skylight Custom curb mount or self flashed with traditional thermal break and Legacy Frame:
          1. Model CS2 Double blown dome
          2. Model CK2 Double formed pyramid dome
       2. Design to meet the load requirements per size of unit skylight capable of withstanding loads indicated without failure including the following:
          1. Thermal stresses transferred to the building structure.
          2. Framing members transferring stresses, including those caused by thermal and structural movement, to glazing.
          3. Noise or vibration created by thermal and structural movement and wind.
          4. Loosening or weakening of fasteners, attachments, and other components.
          5. Sealant failure.

\*\* NOTE TO SPECIFIER \*\* Plastic glazing materials are controlled under model codes. Verify local requirements of authorities having jurisdiction and revise to suit.

* + - 1. Fire-Test-Response Characteristics: Provide plastic sheets identical to those tested for the following fire-test-response characteristics, per ASTM test method indicated below, by UL or other testing and inspecting agencies acceptable to authorities having jurisdiction. Identify plastic sheets with appropriate markings of applicable testing and inspecting organization.
         1. Self-Ignition Temperature: 750 degrees F (343 degrees C) or greater when tested per ASTM D 1929 on plastic sheets in the thickness intended for use.
         2. Smoke density of 15 percent or less when tested per ASTM D 2843 on plastic sheets in the thickness intended for use.
         3. Relative-Burning Characteristics: As follows, when tested per ASTM D 635.

Acrylic: Burning rate of 1.18 inch per minute or less when tested on plastic glazing with a nominal thickness of 0.118 inch or the thickness intended for use. Burning rate of 0.71 inch per minute or less when tested on plastic glazing with a nominal thickness of 0.235 inch.

* + - 1. Thermal response characteristics: Provide plastic sheet identical to those tested for the following thermal performance test:
         1. Heat distortion temperature when tested per ASTM D 648 of at least 203 degrees F (95 degrees C).
      2. Fall Protection Standard Compliance: 29 CFR 1910.23: Skylight dome, [safety screen or security bars tested to support a minimum of 400 pounds over 1 square foot of the surface.
    1. Residential Skylights:

\*\* NOTE TO SPECIFIER \*\* Select and edit the paragraphs for the model number(s) required and delete those not required.

* + - 1. Model VCE/VCM/VCS venting curb mounted skylights are independently certified in accordance with listed standards for compliance with unit skylight provisions of the 2011 edition of the International Building Code and International Residential Code. VCE/VCM/VSS skylights are certified as being tested and labeled in accordance with AAMA/WDMA/CSA/101/I.S.2/A440, and capable of withstanding the following values indicated without failure:

\*\* NOTE TO SPECIFIER \*\* Select the glazing performance required from the following three paragraphs and delete those not required.

* + - * 1. Model VCE/VCM/VCS venting curb mount skylight with Laminated Glass (04 or 08); withstands dead and live loads caused by pressure and uplift of wind acting normal to plane of roof to a download pressure of 11,052 (230 psf) and an uplift pressure of 2,154Pa (45.0) as tested in accordance with ASTM E 330.
        2. Model VCE/VCM/VCS venting curb mount skylight with Laminated Glass (06); withstands dead and live loads caused by pressure and uplift of wind acting normal to plane of roof to a download pressure of 11,052 (230 psf) and an uplift pressure of 2,872Pa (60.0) as tested in accordance with ASTM E 330. Tested and certified in accordance with ASTM E 1886-02 and ASTM E 1996-02, cycle pressure plus or minus 50 psf, missile level C, wind zone 3.
        3. Model VCE/VCM/VCS venting curb mount skylight with Laminated Glass (10); withstands dead and live loads caused by pressure and uplift of wind acting normal to plane of roof to a download pressure of 55,062 (1150 psf) and an uplift pressure of 3,111Pa (65.0) as tested in accordance with ASTM E 330.
        4. Limit member deflection to flexure limit of glass with full recovery of glazing materials.
        5. System to accommodate, without damage to components or deterioration of seals, movement between insulated glass unit and perimeter sealant.
        6. Air leakage through assembly limited to a maximum of 0.60 L/s/m2 (0.11 cfm/ft2), tested at a reference differential pressure across assembly of 75 Pa (1.6 psf) in accordance with ASTM E 283.
        7. Water infiltration: No water penetration noted when tested in accordance with ASTM E 331 with a test pressure differential of 720 Pa (15 psf).
        8. Weep drainage system designed to channel condensation occurring in glazing channel, or migrating moisture occurring within system to exterior by means of gasket with integrated condensation gutter.
        9. Thermal Performance: Tested, certified, and labeled in accordance with NFRC 100 and 200 procedures, Model VCE/VCM/VSS with laminated glass has u-factor values of 0.53 and SHGC ratings of 0.24 for both glazing.

\*\* NOTE TO SPECIFIER \*\* Select the following paragraph if required and delete if not required.

* + - * 1. Solar Operator: Provide with Optional Solar Powered sunscreen accessory for light control and increased energy performance.
      1. Model FCM fixed curb mounted skylights are independently certified in accordance with listed standards for compliance with unit skylight provisions of the 2011 edition of the International Building Code and International Residential Code. FCM skylights are certified as being tested and labeled in accordance with AAMA/WDMA/CSA/101/I.S.2/A440, and capable of withstanding the following indicated values without failure:

\*\* NOTE TO SPECIFIER \*\* Select the glazing performance required from the following three paragraphs and delete those not required.

* + - * 1. Model FCM curb mount skylight with laminated glass (04 or 08); withstands dead and live loads caused by pressure and uplift of wind acting normal to plane of roof to a download pressure of 11,990 Pa (250 psf) and an uplift pressure of 5745 Pa (120 psf) as tested in accordance with ASTM E 330.
        2. Model FCM curb mount skylight with laminated glass (06); withstands dead and live loads caused by pressure and uplift of wind acting normal to plane of roof to a download pressure of 8,829 Pa (80 psf) and an uplift pressure of 4,788 Pa (100 psf) as tested in accordance with ASTM E 330.
        3. Model FCM curb mount skylight with laminated glass (10); withstands dead and live loads caused by pressure and uplift of wind acting normal to plane of roof to a download pressure of 6,462 Pa (135 psf) and an uplift pressure of 46,444 Pa (970 psf) as tested in accordance with ASTM E 330. Tested and certified in accordance with ASTM E 1886 and ASTM E 1996, Cycle Pressure plus or minus 50 psf, missile level D, wind zone 3
        4. Air leakage: Maximum of 0.2 l/s/m2 (0.04 CFM/ft2) of total unit area, tested at a differential pressure of 75 Pa (1.57 psf) in accordance with ASTM E 283.
        5. Water infiltration: No water penetration noted as tested in accordance with ASTM E 331 with a test pressure differential of 720 Pa (15.0 psf).
        6. Limit member deflection to flexure limit of glass with full recovery of glazing materials.
        7. System accommodates, without damage to components or deterioration of seals, movement between and frame and curb.
        8. Thermal Performance: Tested, certified, and labeled in accordance with NFRC 100 and 200 procedures, Model FCM with laminated glass has u-factor values of 0.46 and SHGC ratings of 0.27.

\*\* NOTE TO SPECIFIER \*\* Select the following paragraph if required and delete if not required.

* + - * 1. Solar Operator: Provide with Optional Solar Powered sunscreen accessory for light control and increased energy performance.
      1. Model VS/VSE/VSS venting deck mounted skylights are independently certified in accordance with listed standards for compliance with unit skylight provisions of the 2011 editions of the International Building Code and International Residential Code. VS/VSE/VSS skylights are certified as being tested and labeled in accordance with AAMA/WDMA/CSA/101/I.S.2/A440, and capable of withstanding the following indicated values without failure:
         1. Model VS/VSE/VSS skylights with laminated glass (04) are tested in accordance with ASTM E 330 to withstands dead and live loads caused by pressure and uplift of wind acting normal to plane of roof:

\*\* NOTE TO SPECIFIER \*\* Select the glazing performance required from the following four paragraphs and delete those not required.

Maximum download pressure for sizes S01 and S06 are 11,252 Pa (235.0 psf).

Maximum download pressure for sizes M08 and smaller are 12,928 Pa (270.0 psf).

Maximum uplift pressure for sizes S01 and S06 are 2,394 Pa (50.0 psf).

Maximum uplift pressure for sizes M08 and smaller are 3,352 Pa (70 psf).

\*\* NOTE TO SPECIFIER \*\* Note the following pressures are minimum tested pressures for most sizes and glazing types. Contact manufacturer for ratings for size and glazing specific ratings.

* + - * 1. Air leakage: Less than or equal to 0.7 l/s/m2 (0.13 CFM/ft2) of total unit area, measured at a pressure of 75 Pa (1.57 psf) as tested in accordance with ASTM E 283.
        2. Water infiltration: No water penetration noted as tested in accordance with ASTM E 331 with a test pressure differential of 720 Pa (15.0 psf).
        3. VSE skylight is UL listed
        4. Skylights with impact glazing (06): Tested and certified in accordance with ASTM E 1886 and ASTM E 1996, cycle pressure plus or minus 50 psf, missile level C, wind zone 3.
        5. Limit member deflection to flexure limit of glass with full recovery of glazing materials.
        6. System accommodates without damage to components or deterioration of seals, movement between sash and frame and perimeter framing.
        7. Weep drainage system designed to channel, condensation, or migrating moisture occurring within system to exterior by means of integrated condensation gasket.
        8. Florida Product Approval listing for all glazing variant: FL-13309
        9. Thermal Performance: Tested, certified, and labeled in accordance with NFRC 100 and 200 procedures, Model VS/VSE/VSS with tempered glass (05) and laminated glass (04) has u-factor values of 0.43 and 0.42 respectively and SHGC ratings of 0.23 for both glazings. Visible transmittance (Vt) for both glazing is at least 0.53.

\*\* NOTE TO SPECIFIER \*\* Select the following paragraph if required and delete if not required.

* + - * 1. Solar Operator: Provide with Optional Solar Powered sunscreen accessory for light control and increased energy performance.
      1. FS fixed deck mounted skylights are independently certified in accordance with listed standards for compliance with unit skylight provisions of the 2011 edition of the International Building Code and International Residential Code. FS skylights are certified as being tested and labeled in accordance with AAMA/WDMA/CSA/101/I.S.2/A440, and capable of withstanding the following indicated values without failure:
         1. Model FS skylights with laminated glass (04 or 06 or 08 or 10) are tested in accordance with ASTM E 330 to withstands dead and live loads caused by pressure and uplift of wind acting normal to plane of roof:

\*\* NOTE TO SPECIFIER \*\* Select the glazing performance required from the following four paragraphs and delete those not required.

Maximum download pressure for sizes S06 and smaller are 7670 Pa (160 psf) 4,788 Pa (100.0 psf).

Maximum download pressure for sizes M08 and smaller are 16,758 Pa (350 psf).

Maximum uplift pressure for sizes S06 and smaller are 3,351 Pa (70 psf).

Maximum uplift pressure for sizes M08 and smaller are 5,027 Pa (105 psf).

\*\* NOTE TO SPECIFIER \*\* Note the following pressures are minimum tested pressures for most sizes and glazing types. Contact manufacturer or WDMA's certified product directory for addition ratings related to specific glazing or sizes.

* + - * 1. Air leakage: Less than or equal to 0.3 l/s/m2 (0.05 CFM/ft2) of total unit area, measured at a pressure of 75 Pa (1.57 psf) as tested in accordance with ASTM E 283.
        2. Water infiltration: No water penetration noted as tested in accordance with ASTM E 331 with a test pressure differential of 720 Pa (15.0 psf).
        3. Skylights with impact glazing (06): Tested and certified in accordance with ASTM E 1886 and ASTM E 1996, cycle pressure plus or minus 50 psf, missile level C, wind zone 3.
        4. Limit member deflection to flexure limit of glass with full recovery of glazing materials.
        5. System accommodates without damage to components or deterioration of seals, movement between sash and frame and perimeter framing.
        6. Weep drainage system designed to channel, condensation, or migrating moisture occurring within system to exterior by means of integrated condensation gasket.
        7. Florida Product Approval listing for all glazing variant: FL-13308

\*\* NOTE TO SPECIFIER \*\* Select the following paragraph if required and delete if not required.

* + - * 1. Solar Operator: Provide with Optional Solar Powered sunscreen accessory for light control and increased energy performance.

\*\* NOTE TO SPECIFIER \*\* Include the following paragraph for power operated skylights only. Delete if not required..

* + 1. Electrical Components, Devices, and Accessories: Listed and Labeled as defined in NFPA 70, by a qualified testing agency and marked for intended location and application.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Preparation instructions and recommendations.
        2. Storage and handling requirements and recommendations.
        3. Installation methods.
     3. Shop Drawings: Indicate configurations, dimensions, locations, fastening methods, and installation details.

\*\* NOTE TO SPECIFIER \*\* Delete the following paragraphs if LEED is not applicable. See manufacturers literature for other design based LEED credit capabilities.

* + 1. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
       1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
       2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if colors have already been selected.

* + 1. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
    2. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
    3. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
    4. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic cleaning and maintenance of all components.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
     2. Installer Qualifications: Company specializing in installing products similar to those specified in this section with minimum five years documented experience.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
       1. Finish areas designated by Architect.
       2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
       3. Refinish mock-up area as required to produce acceptable work.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Deliver products in manufacturer's original containers dry, undamaged, with seals and labels intact.
     2. Store products in manufacturer's unopened packaging until ready for installation.
  2. SEQUENCING
     1. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
     2. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
  3. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
  4. WARRANTY

\*\* NOTE TO SPECIFIER \*\* Select one of the following warranty paragraphs as required and delete those not required. Manufacturer's standard limited warranty form in which manufacturer agrees to repair or replace components of skylights that fail in materials or workmanship under normal use within specified warranty period. Failures include, but are not limited to, the following; Deterioration of metals, metal finishes, dome, and other materials beyond normal weathering; Breakage of polycarbonate glazing; and Product leaks.

* + 1. Commercial Skylights:
       1. 15 Year Limited Warranty: Polycarbonate dome skylights including hail breakage for hailstones 2 inches and less in diameter. Mill finished aluminum skylight frames.
       2. 10 Year Limited Warranty: Yellowing of acrylic and polycarbonate skylight domes.
       3. 5 Year Limited Warranty: Acrylic and impact modified acrylic dome skylights, skylight model CDS with polycarbonate dome, aluminum curbs, external safety cage, internal safety screen accessory, internal security bars accessory, ventilation curb extension.
       4. 1 Year: Steel curbs
    2. Residential Skylights:
       1. Insulated Glass Warranty: Provide manufacturer's 20 year limited warranty to repair or replace defects in materials or workmanship.
       2. Skylight Components: Provide manufacturer's 10 year limited no leak warranty to repair or replace defects in materials or workmanship.
       3. Electronic Components: Provide manufacturer's 5 year limited warranty to repair or replace defects in materials or workmanship.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: VELUX America, LLC, which is located at: 104 Ben Casey Dr.; Fort Mill, SC 29708; Toll Free Tel: 800-888-3589; Tel: 803-396-5738; Email: [request info (kim.stackhouse@velux.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=VELUX+America,+LLC&coid=36311&rep=&fax=&message=RE:%20Spec%20Question%20(08620vel):%20%20&mf=); Web: [www.veluxusa.com](http://www.veluxusa.com)

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
  1. MATERIALS

\*\* NOTE TO SPECIFIER \*\* Select one the following paragraphs for Commercial Skylight or Residential Skylights as required and delete the paragraph not required.

* + 1. Commercial Skylights:
       1. Extruded aluminum retaining angle. Extruded aluminum alloy 6063-T5 with minimum effective thickness of 0.055 inch. Mitered and welded corner assembly in mill finish.
       2. Extruded aluminum inner frame with integral condensation gutter. Extruded aluminum alloy 6063-T5 with minimum effective thickness of 0.055 inch unless noted. Mitered and welded corner assembly in mill finish.

\*\* NOTE TO SPECIFIER \*\* Use the following paragraph for Commercial Skylight Model CMA and CVA only. Delete if not applicable.

* + - 1. Integral condensation gutter. Extruded aluminum alloy 6063-T5 with minimum effective thickness of 0.055 inch unless noted. Mitered and welded corner assembly in mill finish.
      2. Double-sided very high bond adhesive closed cell foam tape glazing seal
      3. Plastic Sheet: Monolithic, formable, acrylic or polycarbonate sheets with weather and impact resistance. Glazing double sealed with back beaded silicone sealant and a butyl seal.
         1. ASTM D 1003; Light transmittance of 91 percent for clear acrylic.
         2. ASTM D 542; Reflective index of 1.49.
         3. ASTM D 638; Tensile strength: Rupture 11.03 M PSI / Elasticity 490 M PSI.
         4. ASTM D 790; Flexural strength: Rupture 17M PSI / Elasticity 490 M PSI.
         5. ASTM D 695; Comparative strength: Yield 17.9M PSI / Elasticity 490 M PSI.
         6. ASTM D 632; Shear strength: 8.9M PSI.
      4. Fasteners: 8x1 stainless steel hex washer head, provided by installer. Skylight assembly fasteners zinc electroplated.

\*\* NOTE TO SPECIFIER \*\* Include the following optional paragraph if required and delete if not required.

* + - 1. Thermal-break with 1/2 inch (12.5 mm) polyurethane thermal break.
      2. Aluminum Finish: Manufacturer's standard satin mill finish.
    1. Residential Skylights:
       1. Exterior Aluminum Frame and sash covers: Roll-formed 15 gauge, 1.5 mm (0.06 inch) thick, prefinished neutral gray, production engineered and fabricated to fit.
       2. Exterior Cladding: Prefinished, production engineered and fabricated to fit.

\*\* NOTE TO SPECIFIER \*\* Include one or more of the following paragraphs as required for the products specified and delete the ones not required.

* + - * 1. Deck mounted skylights:

Roll formed 0.65 mm (22 gauge) aluminum frame covering, 0.57 mm (23 gauge) aluminum sash coverings.

Roll formed 0.55 mm (23 gauge) copper frame coverings, 0.50 mm (24 gauge) copper sash coverings.

* + - * 1. Curb mounted skylights:

Roll formed 1.5 mm (15 gauge) aluminum frame and sash coverings.

* + - * 1. Venting Curb Mount Interior Frame and Sash: Acrylonitrile-butadiene styrene (ABS) with white ASA finish.
      1. Wood: Kiln-dried, laminated Ponderosa Pine:

\*\* NOTE TO SPECIFIER \*\* Include one of the following paragraphs as required and delete the one not required.

* + - * 1. Prefinished with two coats of white finish.
        2. Stain grade Ponderosa Pine.

\*\* NOTE TO SPECIFIER \*\* Include one or more of the following paragraphs as required for the products specified and delete the ones not required.

* + 1. Operators and Operator Accessories:

\*\* NOTE TO SPECIFIER \*\* The following paragraph is standard on all electric venting skylights (VSE/VCE). Delete if not required.

* + - 1. Electric Motors: 120 V, 40 watts, 60 Hz rating assembly that uses a robust chain driven system to open the skylight 11 inches. Provided with a 2.4 GHz radio frequency remote control.

\*\* NOTE TO SPECIFIER \*\* Include one or more of the following optional paragraphs as required for the products specified and delete if not required.

* + - * 1. Optional KLR 200 touch screen remote control.
        2. Optional interface controls include the KLF/repeater sensor interface and the KLI 500 wall mounted keypad.
      1. Manual control rods and extension poles for manually operated venting skylights (VS).
      2. Battery operated control rod.
      3. In reach crank handles.
    1. Fasteners:
       1. Venting curb mounted skylight lens to sash #8 x 1-1/2 inch stainless steel wood screw and #8 x 2-1/2 inch, #2 Phillips, pan head screws.
       2. Skylight frame to curb #8 x 1-3/4 inch stainless steel self-drill screws.
       3. Deck seal mounting flange to roof decking 1-1/4 inch double hot dipped zinc coated ring shank nails.
    2. Mounting System: Continuous corrosion resistant steel with a durable foam seal and rough opening alignment notches.

\*\* NOTE TO SPECIFIER \*\* Select the commercial skylight(s) required from the following paragraphs and delete those not required. Indicate size, location, and profile or section of each unit on Drawings or on the schedule at the end of this section.

* 1. COMMERCIAL UNIT SKYLIGHTS
     1. Dynamic Dome Unit Skylight (Model CD and CE)
        1. Description: Dynamic dome, curb mounted fixed skylight utilizing extruded aluminum frame counter-flashing with welded corners, an interior 100 percent thermally broken gasket for condensation drainage, structural sealant, and accessories, as required to meet installation and performance requirements indicated. Dynamic dome skylights shall be suitable for installation on roof curbs ranging from 0 degrees up to 60 degrees from horizontal.
        2. Model:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required and delete those not required.

* + - * 1. Model CD1 is a single dynamic dome skylight with mill finish aluminum frame.
        2. Model CD2 is a double dynamic dome skylight with mill finish aluminum frame.
        3. Model CD3 is a triple dynamic dome skylight with mill finish aluminum frame.
        4. Model CD4 is a dynamic dome skylight utilizing a flat mutli-walled polycarbonate sheet for energy performance with mill finish aluminum frame.
        5. Model CE1 is a single dynamic dome skylight with neutral gray powder coat finished aluminum frame.
        6. Model CE2 is a double dynamic dome skylight with neutral gray powder coat finished aluminum frame.
        7. Model CE3 is a triple dynamic dome skylight with neutral gray powder coat finished aluminum frame.
        8. Model CE4 is a dynamic dome skylight utilizing a flat multi-walled polycarbonate sheet for energy performance skylight with neutral gray powder coat finished aluminum frame.
      1. Size:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required and delete those not required. Dynamic dome skylights are not available as a stocked product for all sizes and glazing options. Sizes 36x36, 36x60, 48x48, 48x72, 48x96, 60x60, 60x72 and 72x72 are stocked in the impact modified acrylic glazing material. Size 48x96 also stocked in polycarbonate (LuxGuard) material.

* + - * 1. \_\_\_\_\_ inches by \_\_\_\_\_ inches.
        2. As indicated on the Drawings.
        3. As specified on the Schedule at the end of this Section.
      1. Counter-flashing Frame: Extruded aluminum retaining angle and an extruded aluminum inner frame. Corners are welded and counter flashes curb a minimum of 1.625 inches (41 mm).
      2. Dynamic Dome: Height 30 percent of skylight width, vacuum formed with precise repeating geometric patterns, and overall shape to maximize strength and daylight at low solar elevation angles 10 to 40 degrees. Outer dome is formed of smooth sheet to transmit all incident daylight through outer dome. Initial rise of the dome is at an angle of at least 60 degrees to horizontal to harvest daylight at low solar elevation angles 10 through 40 degrees.

\*\* NOTE TO SPECIFIER \*\* Select the following paragraph for polycarbonate domes as required and delete if not required.

* + - 1. Provide polycarbonate domes with integral UV blocking cap layer that prevents long-term yellowing, and insures material strength and performance stability.
      2. Glazing:

\*\* NOTE TO SPECIFIER \*\* Select profile and colors required from the following paragraphs and delete those not required.

* + - * 1. Single dome: (LuxGuard) formed from polycarbonate sheet, color clear or white, with UV blocking cap layer.

\*\* NOTE TO SPECIFIER \*\* Select double dome glazing(s) material required for project. LuxGuard has air, water and structural certification and LuxGuard Plus certified for air, water, structural, wind borne debris regions, high velocity hurricane zones and Factory Mutual. Prismatic inner dome is available in all dynamic domes sizes except 7272. Delete those that are not required.

* + - * 1. Double dome:

Impact Modified Acrylic, Outer dome 100% impact-modified acrylic, 0.150 inches in thickness, color clear or white. Inner dome 50% impact modified acrylic, color clear or white.

Prismatic Impact Modified Acrylic, Outer dome 100% impact-modified acrylic, 0.150 inches in thickness, color clear or white. Inner dome prismatic 50% impact modified acrylic, color clear or white.

Acrylic - outer dome, color clear, white or bronze acrylic. Inner dome clear or white acrylic.

Polycarbonate (LuxGuard) Outer dome polycarbonate, 0.118 inches in thickness, color clear or white, with UV blocking cap layer. Inner dome polycarbonate, 0.118 inches in thickness, color clear or white.

Polycarbonate (LuxGuard) Outer dome polycarbonate, 0.118 inches in thickness, color clear or white, with UV blocking cap layer. Inner dome prismatic polycarbonate, 0.118 inches in thickness, color clear or white.

Polycarbonate (LuxGuard Plus) Outer dome polycarbonate, 0.150 inches in thickness, color clear or white, with UV blocking cap layer. Inner dome polycarbonate, 0.118 inches in thickness, color [clear] [white].]

Polycarbonate (LuxGuard Plus) Outer dome polycarbonate, 0.150 inches in thickness, color clear or white, with UV blocking cap layer. Inner dome prismatic polycarbonate, 0.118 inches in thickness, color clear or white.

Infrared Blocking Acrylic Outer dome Lucite EcoShade, 0.118 inches in thickness, color iridescent. Inner dome clear polycarbonate, 0.118 inches in thickness.

Infrared Blocking Acrylic - Outer dome Lucite EcoShade, 0.118 inches in thickness, color iridescent. Inner dome clear prismatic polycarbonate, 0.118 inches in thickness.

* + - * 1. Triple Dome:

\*\* NOTE TO SPECIFIER \*\* Select triple dome glazing(s) material required for project. For triple pane, use clear polycarbonate inner dome with infrared blocking outer dome.

Outer dome clear polycarbonate (LuxGuard), 0.118 inches in thickness. Middle dome clear polycarbonate 0.118 inches in thickness. Inner dome 0.118 inch thick, clear or white polycarbonate.

Outer dome clear polycarbonate (LuxGuard), 0.118 inches in thickness. Middle dome clear polycarbonate 0.118 inches in thickness. Inner dome 0.118 inch thick, clear or white prismatic polycarbonate.

Outer dome iridescent infrared blocking acrylic, 0.118 inches in thickness. Middle dome clear polycarbonate 0.118 inches in thickness. Inner dome 0.118 inch thick, clear or white polycarbonate.

* + - * 1. Energy Dome: Outer dome clear polycarbonate (LuxGuard) 0.118 inches in thickness with UV blocking cap layer. Inner glazing flat 5/8 inches thick, clear multi-walled polycarbonate.
    1. Curb Mounted Fixed, Thermoformed Acrylic Dome Skylight: CS2, CK2 Curb Mounted Skylight.
       1. Unit Skylight Custom curb mount or self flashed with traditional thermal break and Legacy Frame:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required and delete the one not required.

* + - * 1. Model CS2 Double blown dome
        2. Model CK2 Double formed pyramid dome
      1. Description: Factory-assembled, curb-mounted unit consisting of plastic glazing, gasketing, inner frame that installs directly on site built or prefabricated curbs. Skylight is in compliance with OSHA's 29 CFR 1910.23 specification for fall protection.
      2. Size:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required and delete those not required. CAP commercial skylights are made to order to custom sizes between 12 inches by 12 inches and 102 inches by 150 inches in 1/4 inch increments.

* + - * 1. \_\_\_\_\_ inches by \_\_\_\_\_ inches.
        2. As indicated on the Drawings.
        3. As specified on the Schedule at the end of this Section.
      1. Frame: Extruded aluminum retaining angle and an extruded aluminum inner frame. Corners are mitered and welded.
      2. Condensation Control: Fabricate skylight units with integral internal gutters to collect and condensation.

\*\* NOTE TO SPECIFIER \*\* Include the following optional paragraph if required and delete if not required.

* + - * 1. Provide with nonclogging weeps to dispose of condensation.

\*\* NOTE TO SPECIFIER \*\* Include the following optional paragraph if required and delete if not required.

* + - 1. Thermal Break: Fabricate skylight units with 1/2 inch (12.5 mm) thermal barrier separating interior metal framing from materials exposed to outside temperature.
      2. Glazing: Thermoformed acrylic Dome

\*\* NOTE TO SPECIFIER \*\* Select profile and colors required from the following paragraphs and delete those not required.

* + - * 1. Profile:

\*\* NOTE TO SPECIFIER \*\* Select profile required from the following paragraphs and delete those not required.

CS-2 Profile: Double dome inner and outer glazing.

CK-2 Profile: Pyramid outer glazing and dome inner glazing.

CK-3 Profile: Hip-Ridge outer glazing and dome inner glazing.

* + - * 1. Glazing:

\*\* NOTE TO SPECIFIER \*\* Select the glazing required from the following paragraphs and delete those not required.

Clear over clear acrylic with visible light transmittance greater than 82 percent.

Clear over white acrylic with full light diffusion and visible light transmittance greater than 44 percent.

White over clear acrylic with full light diffusion and visible light transmittance greater than 44 percent.

Bronze over clear acrylic with dimmed lighting and visible light transmittance around 19 percent.

Clear Polycarbonate over clear acrylic with improved fire and impact resistance visible light transmittance greater than 82 percent.

Clear Polycarbonate over white acrylic with improved fire and impact resistance and full light diffusion and visible light transmittance greater than 44 percent.

Clear polycarbonate over clear prismatic acrylic with full light diffusion and a visible light transmittance greater than 80 percent.

* + 1. Curb Mounted Maintenance Free Fixed, Thermoformed Acrylic Dome Skylight: Velux CMA Maintenance Free Skylight, curb mounted.
       1. Description: Factory-assembled, curb-mounted unit consisting of plastic glazing with a neutral gray finished frame and a maintenance free PVC interior that installs directly on site built or prefabricated curbs.
       2. Size:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required and delete those not required. CMA Maintenance Free Skylight are available in a variety of custom sizes up to 8.5 feet by 12.5 feet; as well as a full stocked program for common sizes. Contact the manufacturer for stocked sizes.

* + - * 1. \_\_\_\_\_ inches by \_\_\_\_\_ inches.
        2. As indicated on the Drawings.
        3. As specified on the Schedule at the end of this Section.
      1. Frame: Extruded aluminum retaining angle and an extruded aluminum inner frame. Corners are mitered and welded.
      2. Condensation Control: Fabricate skylight units with integral internal gutters to collect and condensation.

\*\* NOTE TO SPECIFIER \*\* Include the following optional paragraph if required and delete if not required.

* + - * 1. Provide with nonclogging weeps to dispose of condensation.

\*\* NOTE TO SPECIFIER \*\* Include the following optional paragraph if required and delete if not required.

* + - 1. Thermal Break: Fabricate skylight units with 1/2 inch (12.5 mm) thermal barrier separating interior metal framing from materials exposed to outside temperature.
      2. Glazing: Thermoformed acrylic dome.
         1. Profile:

CMA Profile: Double dome inner and outer glazing.

* + - * 1. Glazing:

\*\* NOTE TO SPECIFIER \*\* Select glazing required from the following paragraphs and delete those not required.

Clear over clear acrylic with high visible light transmittance.

Clear over white acrylic with full light diffusion and high visible light transmittance.

White over clear acrylic with full light diffusion and high visible light transmittance.

Bronze over clear acrylic with dimmed lighting and lower visible light transmittance.

* + 1. Commercial Unit Skylight Accessories:

\*\* NOTE TO SPECIFIER \*\* Select Aluminum or Steel Curbs and delete the one not required. Standard sizes are width and length 24x48, 24x96, 24x120, 36x60, 36x72, 36x96, 36x120, 48x48, 48x60, 48x72, 48x96, 48x120, 60x60, 60x72, 60x96, 60x120, and 72x72. Standard Curb height are 9, 12 and 16 inches and nominal curb thickness ise 1.5 inches.

* + - 1. Aluminum Curb: Provide Curb Sizes as indicated on the Drawings:

\*\* NOTE TO SPECIFIER \*\* Curbs are shipped Factory Engineered and Install or Separate Select one of the following two paragraphs and delete the one not required.

* + - * 1. Factory Engineered Curb: Factory engineered 14 gauge aluminum curb with fully welded corners, and a continuous 1 inch by 4 inch nominal pressure treated wood nailer mounted to the top flange of the curb. Curb is factory insulated with 3/4 inch thick, 3 pound density fiberglass insulation. Curb roof mounting flange shall be 3 inches wide.

Provide curb without safety screen or security bars.

Provide insulated curb with interior fall protection safety screen constructed from 0.1875 inch steel mesh with a 6 inch on center grid spacing. Safety screen shall meet fall protection requirements by supporting a minimum static load of 400 pounds per square foot. Model, ICE.

Provide insulated curb with exterior fall protection safety screen constructed from 0.1875 inch steel mesh with a 4 inch on center grid spacing. Safety screen shall meet fall protection requirements by supporting a minimum static load of 400 pounds per square foot. Model, CAE.

Provide insulated curb with security bars constructed from 0.5 inch cold rolled steel with a 6 inch on center grid spacing. Model, CRGA.

* + - * 1. Separate Factory Insulated Curb: Factory insulated aluminum curb, 1.5 inches in thickness with 20 gauge mill finished aluminum exterior and 22 gauge mill finished aluminum interior. Curb factory insulated with 1.5 inches of polyisocyanurate board providing an R-value of 8.5. Curb roof mounting flange shall be a minimum 2.75 inches in width.
      1. Steel Curb: Provide Curb Sizes as indicated on the Drawings:

\*\* NOTE TO SPECIFIER \*\* All steel curbs provided with integral safety screen, unless indicated otherwise. Curbs are available without safety screens or security bars, but must be specified with no safety screen or security bars.

* + - * 1. Factory Insulated Curb: Factory engineered steel curb fabricated from 18 or 14 gauge galvanized steel with fully welded corners, all welds factory primed with galvanized paint, and continuous 2 inch by 2 inch nominal pressure treated wood nailer mounted to the top flange of the curb. Curb is factory insulated with 1.5 inch thick, 3 pound density fiberglass insulation. Interior liner of curb fabricated from 20 gauge steel and primed white. Curb roof mounting flange shall be a minimum of 3 inches in width.

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs to include the equipment required and delete those not required.

Provide curb without safety screen or security bars.

Provide insulated curb with interior fall protection safety screen constructed from 0.1875 inch steel mesh with a 6 inch on center grid spacing. Safety screen shall meet fall protection requirements by supporting a minimum static load of 400 pounds per square foot. Model, ICE.

Provide insulated curb with exterior fall protection safety screen constructed from 0.1875 inch steel mesh with a 4 inch on center grid spacing. Safety screen shall meet fall protection requirements by supporting a minimum static load of 400 pounds per square foot. Model, CAE.

Provide insulated curb with security bars constructed from 0.5 inch cold rolled steel with a 6 inch on center grid spacing. Model, CRGA.

* + - * 1. Non-insulated curb: Factory engineered steel curb fabricated from 18 or 14 gauge galvanized steel with fully welded corners, all exterior welds factory primed with galvanized paint, and continuous 2 inch by 4 inch nominal pressure treated wood nailer mounted under the top flange of the curb. Curb roof mounting flange shall be a minimum of 3 inches in width.

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs to include the equipment required and delete those not required.

Provide curb without safety screen or security bars.

Provide insulated curb with interior fall protection safety screen constructed from 0.1875 inch steel mesh with a 6 inch on center grid spacing. Safety screen shall meet fall protection requirements by supporting a minimum static load of 400 pounds per square foot. Model, ICE.

Provide insulated curb with exterior fall protection safety screen constructed from 0.1875 inch steel mesh with a 4 inch on center grid spacing. Safety screen shall meet fall protection requirements by supporting a minimum static load of 400 pounds per square foot. Model, CAE.

Provide insulated curb with security bars constructed from 0.5 inch cold rolled steel with a 6 inch on center grid spacing. Model, CRGA.

\*\* NOTE TO SPECIFIER \*\* Select the residential skylight(s) required from the following paragraphs and delete those not required. Indicate size, location, and profile or section of each unit on Drawings or on the schedule at the end of this section.

* 1. RESIDENTIAL UNIT SKYLIGHTS
     1. Curb Mount Venting Skylight: Velux Curb Mount Venting skylight.
        1. Description: Factory-assembled, site built curb mounted unit consisting of Acrylonitrile-butadiene styrene (ABS) pre-finished white interior frame and sash, exterior structurally glazed, roll-formed aluminum sash and frame cover, production fabricated glazing and anchorage.
        2. Configuration: Outward opening, top hinged, production-installed.

\*\* NOTE TO SPECIFIER \*\* Select the Model required from the following paragraphs and delete the one not required.

* + - * 1. Model VCM: Manually operable chain operator with:

In reach crank handle.

Manual control rod.

* + - * 1. Model VCE: Electrically operable chain operator and a remote control with:

Motorized control rod.

Remote operation distance up to 30 foot (9 m).

Power Requirement:

120v 60Hz.

* + - * 1. Model VCS Solar operator, 2.4 GHz radio frequency remote control and a chain driven operator powered by a solar charged battery operator. Battery pack is a 9 cell Panasonic NiMH 10.8V, 2100 mAH.
      1. Finish:
         1. Exterior surfaces: Aluminum exterior sash frame finished with neutral gray Kynar 500 polyvinylidene fluoride resin finish. Exterior venting curb mount frame, finished with neutral gray powder coat.
         2. Interior Surface: White ABS.
      2. Size:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required and delete those not required.

* + - * 1. Size 2222: 25-1/2 inches by 25-1/2 inches outside curb dimension.
        2. Size 2234: 25-1/2 inches by 37-1/2 inches outside curb dimension.
        3. Size 2246: 25-1/2 inches by 49-1/2 inches outside curb dimension.
        4. Size 3030: 33-1/2 inches by 33-1/2 inches outside curb dimension.
        5. Size 3046: 33-1/2 inches by 49-1/2 inches outside curb dimension.
        6. Size 3434: 37-1/2 inches by 37-1/2 inches outside curb dimension.
        7. Size 4646: 49-1/2 inches by 49-1/2 inches outside curb dimension.
        8. As indicated on the Drawings.
        9. As specified on the Schedule at the end of this Section.
      1. Gasketing: Factory applied EPDM, Santoprene, and foam gaskets.
      2. Operator Covers: White ABS Frame / Sash Hinge: Extruded aluminum two piece ball and claw design extending the width of the frame and sash.
      3. Flashing:

\*\* NOTE TO SPECIFIER \*\* Select one of the following flashing option paragraphs as required and delete the one not required. Use custom flashing provided by others for applications where ECL and ECW flashings are not suitable.

* + - * 1. Type ECL Flashings prefabricated step flashing system designed for use with roofing materials 3/4 inch thick and for slopes of 2:12 (10 degrees) to 60 degrees.
        2. Type ECW Flashing engineered prefabricated gutter flashing system, designed for use with high profiled roofing materials, and for slopes 14 to 60 degree.
        3. Custom as specified in Section 07 60 00 - Flashing and Sheet Metal.
      1. Screen: Aluminum screen profile, spring metal clip attachment, 0.28 mm glass fiber thread with PVC coating, charcoal in color.
      2. Dual Sealed Glazing: Dual sealed thermal pane with warm edge technology, 95 percent argon gas fill, and with three layers of LoE3 that increases visible light over standard low-e coatings while lowering the solar heat gain.

\*\* NOTE TO SPECIFIER \*\* Include one or more of the following paragraphs as required for the products specified and delete the ones not required.

* + - * 1. 04, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.030 inch interlayer.
        2. 06, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.090 inch interlayer.
        3. 08, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.030 inch white interlayer.
    1. Curb Mount Fixed Skylight: Velux FCM Fixed Curb Mount skylight.
       1. Description: Factory-assembled, aluminum counter flashing system with corner keys. All units are factory glazed with structural silicone-based primary seal.
       2. Configuration: Fixed.
       3. Finish:
          1. Exterior surfaces: Aluminum exterior sash frame finished with neutral gray Kynar 500 polyvinylidene fluoride resin finish.
       4. Size:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required and delete those not required.

* + - * 1. Size 1430: 17-1/2 inches by 33-1/2 inches outside curb dimension.
        2. Size 1446: 17-1/2 inches by 49-1/2 inches outside curb dimension.
        3. Size 2222: 25-1/2 inches by 25-1/2 inches outside curb dimension.
        4. Size 2230: 25-1/2 inches by 33-1/2 inches outside curb dimension.
        5. Size 2234: 25-1/2 inches by 37-1/2 inches outside curb dimension.
        6. Size 2246: 25-1/2 inches by 49-1/2 inches outside curb dimension.
        7. Size 2270: 25-1/2 inches by 73-1/2 inches outside curb dimension.
        8. Size 3030: 33-1/2 inches by 33-1/2 inches outside curb dimension.
        9. Size 3046: 33-1/2 inches by 49-1/2 inches outside curb dimension.
        10. Size 3434: 37-1/2 inches by 37-1/2 inches outside curb dimension.
        11. Size 3446: 37-1/2 inches by 49-1/2 inches outside curb dimension.
        12. Size 4646: 49-1/2 inches by 49-1/2 inches outside curb dimension.
        13. As indicated on the Drawings.
        14. As specified on the Schedule at the end of this Section.
      1. Weatherstripping: Factory applied santoprene weatherstripping and condensation gutter around entire inner frame.
      2. Flashing:

\*\* NOTE TO SPECIFIER \*\* Select one of the following flashing option paragraphs as required and delete the one not required. Use custom flashing provided by others for applications where ECL and ECW flashings are not suitable.

* + - * 1. Type ECL Flashings prefabricated step flashing system designed for use with roofing materials 3/4 inch thick and for slopes of 2:12 (10 degrees) to 60 degrees.
        2. Type ECW Flashing engineered prefabricated gutter flashing system, designed for use with high profiled roofing materials, and for slopes 14 to 60 degree.
        3. Custom as specified in Section 07 60 00 - Flashing and Sheet Metal.
      1. Dual Sealed Glazing: Dual sealed thermal pane with warm edge technology, 95 percent argon gas fill, and with three layers of LoE3 silver that increases visible light over standard low-e coatings while lowering the solar heat gain.

\*\* NOTE TO SPECIFIER \*\* Include one or more of the following paragraphs as required for the products specified and delete the ones not required.

* + - * 1. 04, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.030 inch interlayer.
        2. 06, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.090 inch interlayer.
        3. 07, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.090 inch SentryGlasPlus interlayer.
        4. 08, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.030 inch white interlayer.

\*\* NOTE TO SPECIFIER \*\* Include the following optional accessories if required. Delete if not required. Accessory tray is required for use with blinds.

* + - 1. Optional Accessories
         1. Accessory Tray: Rigid white fiberglass frame, site assembled, mounts directly to site built curb for interior mounting of VELUX blinds.
         2. Blinds:

\*\* NOTE TO SPECIFIER \*\* Select installation type, blind type and color and operation from the following paragraphs and delete those not required.

Field installed.

Factory installed.

Blind Type:

Light blocking double pleated solar operated blind with standard remote control.

Light filtering single pleated solar operated blind with standard remote control.

Blind Color:

White

Beige

Color as indicated on Drawings.

Manual operation with blind operation controlled by adjustable length telescopic rod.

Solar Operator with 24 VDC blinds operated via 2.4 GHz radio frequency and basic wall mounted remote control provided with blind.

* + 1. Deck Mount Venting Skylight: Velux No Leak Venting skylight.
       1. Description: Factory-assembled, deck mounted, top hinged unit consisting of wooden pre-finished interior frame and sash, exterior structurally glazed, roll-formed metal sash and frame cover, production fabricated glazing and anchorage.
       2. Configuration: Outward opening, top hinged, production-installed.

\*\* NOTE TO SPECIFIER \*\* Select the Model required from the following paragraphs and delete the one not required.

* + - * 1. Model VS: Manually operable chain operator with:

In reach crank handle.

Manual control rod.

* + - * 1. Model VSE: Electrically operable chain operator and remote control with:

Power Requirement: 120V, 40 watts 60Hz.

\*\* NOTE TO SPECIFIER \*\* Select the optional equipment required from the following paragraphs and delete the ones not required.

Optional Equipment:

Optional touch screen remote control capable of operating a combination of 200 skylights and sun screen accessories.

KLF 100 sensor interface and/or signal repeater

WLB 100 battery back up

KLI 110 wall mounted control switch

* + - * 1. Model VSS: Solar operator, 2.4 GHz radio frequency remote control and a chain driven operator powered by a solar charged battery operator with a 9 cell Panasonic NiMH 10.8V, 2100 mAH battery pack.
      1. Finish:
         1. Exterior surfaces:

\*\* NOTE TO SPECIFIER \*\* Select the exterior surface finish required from the following paragraphs and delete the ones not required.

Roll formed aluminum exterior sash frame covering finished with neutral gray Kynar 500 polyvinylidene fluoride resin finish.

Roll formed copper exterior sash frame covering with a mill finish.

* + - * 1. Interior Wood Frame Surface:

\*\* NOTE TO SPECIFIER \*\* Select the interior surface finish required from the following paragraphs and delete the ones not required.

White finish.

Stain grade wooden frame and sash.

* + - 1. Size:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required and delete those not required.

* + - * 1. Size C01: 21 inches by 26-7/8 inches rough opening.
        2. Size C04: 21 inches by 37-1/8 inches rough opening.
        3. Size C06: 21 inches by 45-3/4 inches rough opening.
        4. Size C08: 21 inches by 54-7/16 inches rough opening.
        5. Size MO4: 30-1/16 inches by 37-7/8 inches rough opening.
        6. Size MO6: 30-1/16 inches by 45-3/4 inches rough opening.
        7. Size MO8: 30-1/16 inches by 54-7/16 inches rough opening.
        8. Size SO1: 44-1/4 inches by 26-7/8 inches rough opening.
        9. Size SO6: 44-1/4 inches by 45-3/4 inches rough opening.
        10. As indicated on the Drawings.
        11. As specified on the Schedule at the end of this Section.
      1. Weather stripping: Factory applied neoprene and thermoplastic elastomer weather stripping throughout entire frame and sash, profiled to effect weather seal.
      2. Condensation Control: Integral internal condensation collection system and drainage slots.
      3. Operator Covers: White ABS.
      4. Frame / Sash Hinge: Extruded aluminum two piece ball and claw design extending the width of the frame and sash.
      5. Flashing Accessories:

\*\* NOTE TO SPECIFIER \*\* Select one of the following flashing option paragraphs as required and delete those not required.

* + - * 1. EDL for shingle and thin roofing materials. Prefabricated step flashing system designed for use with roofing materials less than 3/4 inch thick and for slopes of 14 degrees to 85 degrees.
        2. EDM for metal roofing materials like standing seam. Prefabricated gutter flashing system designed for use with roofing material greater than 3/4 inch thick, or high profile material, and for roof slopes of 14 degrees to 85 degrees. Sill flashing section consists of corrugated apron to allow form fit of high profile material.
        3. EDW for tile or thick roofing material. Prefabricated flashing system designed for use with high profile tile roofing materials and for roof slopes of 14 degrees to 85 degrees. Sill flashing section consists of corrugated apron to allow form fit of roofing material profile.
        4. EKL for stacking skylight side by side and over and under with thin roofing materials.
        5. EKW for stacking skylights side by side and over and under with high profile roofing materials.
        6. Type ECB site-built curb counter flashing kit for sloped applications less than 14 degrees.
      1. Screen: Aluminum screen profile, spring metal clip attachment, 0.28 mm glass fiber thread with PVC coating, charcoal in color.
      2. Dual Sealed Glazing: Dual sealed thermal pane with warm edge technology, 95 percent argon gas fill, and with three layers of LoE3 silver that increases visible light over standard low-e coatings while lowering the solar heat gain.

\*\* NOTE TO SPECIFIER \*\* Include one or more of the following paragraphs as required for the products specified and delete the ones not required.

* + - * 1. 04, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.030 inch interlayer.
        2. 06, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.090 inch interlayer.
        3. 08, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.030 inch white interlayer.
        4. 10, Tempered LoE3 pane over a laminated tempered interior pane with a 0.030 inch interlayer to achieve higher snow load ratings.
      1. Optional Accessories:

\*\* NOTE TO SPECIFIER \*\* Select the optional accessories required from the following paragraphs and delete the ones not required.

* + - * 1. Blinds

Field installed.

Factory installed.

Type:

Light blocking double pleated solar operated blind with standard remote control.

Light filtering single pleated solar operated blind with standard remote control.

Blind Color:

White

Beige

Color as indicated on Drawings.

Manual operation with blind operation controlled by adjustable length telescopic rod.

Solar Operator with 24 VDC blinds operated via 2.4 GHz radio frequency and basic wall mounted remote control provided with blind.

* + 1. Deck Mount Fixed Skylight: Velux FS No Leak Fixed skylight.
       1. Description: Factory-assembled, deck mounted unit consisting of wooden pre-finished interior frame, exterior structurally glazed, roll-formed metal frame cover, production fabricated glazing and anchorage.
       2. Configuration: Fixed, deck mounted.
       3. Finish:
          1. Exterior surfaces:

\*\* NOTE TO SPECIFIER \*\* Select the exterior surface finish required from the following paragraphs and delete the ones not required.

Roll formed aluminum exterior sash frame covering finished with neutral gray Kynar 500 polyvinylidene fluoride resin finish.

Roll formed copper exterior sash frame covering with a mill finish.

* + - * 1. Interior Wood Frame Surface:

\*\* NOTE TO SPECIFIER \*\* Select the interior surface finish required from the following paragraphs and delete the ones not required.

White finish.

Stain grade wood frame.

* + - 1. Size:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required and delete those not required.

* + - * 1. Size AO6: 14-1/2 inches by 45-3/4 inches rough opening.
        2. Size C01: 21 inches by 26-7/8 inches rough opening.
        3. Size C04: 21 inches by 37-7/8 inches rough opening.
        4. Size C06: 21 inches by 45-3/4 inches rough opening.
        5. Size C08: 21 inches by 54-7/16 inches rough opening.
        6. Size C12: 21 inches by 70-1/4 inches rough opening.
        7. Size D26: 22-1/2 inches by 22-15/16 inches rough opening.
        8. Size D06: 22-1/2 inches by 45-3/4 inches rough opening.
        9. Size MO2: 30-1/16 inches by 30 inches rough opening.
        10. Size MO4: 30-1/16 inches by 37-7/8 inches rough opening.
        11. Size MO6: 30-1/16 inches by 45-3/4 inches rough opening.
        12. Size MO8: 30-1/16 inches by 54-7/16 inches rough opening.
        13. Size SO1: 44-1/4 inches by 26-7/8 inches rough opening.
        14. Size SO6: 44-1/4 inches by 45-3/4 inches rough opening.
        15. As indicated on the Drawings.
        16. As specified on the Schedule at the end of this Section.
      1. Weather stripping: Factory applied neoprene and thermoplastic elastomer weatherstripping throughout entire frame, profiled to effect weather seal.
      2. Condensation Control: Integral internal condensation collection system and drainage slots.
      3. Flashing Accessories:

\*\* NOTE TO SPECIFIER \*\* Select one of the following flashing option paragraphs as required and delete those not required.

* + - * 1. EDL for shingle and thin roofing materials. Prefabricated step flashing system designed for use with roofing materials less than 3/4 inch thick and for slopes of 14 degrees to 85 degrees.
        2. EDM for metal roofing materials like standing seam. Prefabricated gutter flashing system designed for use with roofing material greater than 3/4 inch thick, or high profile material, and for roof slopes of 14 degrees to 85 degrees. Sill flashing section consists of corrugated apron to allow form fit of high profile material.
        3. EDW for tile or thick roofing material. Prefabricated flashing system designed for use with high profile roofing materials and for roof slopes of 14 degrees to 85 degrees. Sill flashing section consists of corrugated apron to allow form fit of roofing material profile.
        4. EKL for stacking skylight side by side and over and under with thin roofing materials.
        5. EKW for stacking skylights side by side and over and under with thick roofing materials.
        6. Type ECB site-built curb counter flashing kit for sloped applications less than 14 degrees.
      1. Dual Sealed Glazing: Dual sealed thermal pane with warm edge technology, 95 percent argon gas fill, and with three layers of LoE3 silver that increases visible light over standard low-e coatings while lowering the solar heat gain.

\*\* NOTE TO SPECIFIER \*\* Include one or more of the following paragraphs as required for the products specified and delete the ones not required.

* + - * 1. 04, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.030 inch interlayer.
        2. 06, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.090 inch interlayer.
        3. 08, Tempered LoE3 pane over a laminated heat strengthened interior pane with 0.030 inch white interlayer.
        4. 10, Tempered LoE3 pane over a laminated tempered interior pane with a 0.030 inch interlayer to achieve higher snow load ratings.
      1. Optional Accessories:

\*\* NOTE TO SPECIFIER \*\* Select the optional accessories required from the following paragraphs and delete the ones not required.

* + - * 1. Blinds

Field installed.

Factory installed.

Type:

Light blocking double pleated solar operated blind with standard remote control.

Light filtering single pleated solar operated blind with standard remote control.

Blind Color:

White

Beige

Color as indicated on Drawings.

Manual operation with blind operation controlled by adjustable length telescopic rod.

Solar Operator with 24 VDC blinds operated via 2.4 GHz radio frequency and basic wall mounted remote control provided with blind.

* 1. FABRlCATlON

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required for the skylights specified and delete those not required.

* + 1. Fabricate commercial skylight framing components as follows:
       1. Factory fit and assemble components.
       2. Provide with accurately fitted joints and ends coped or mitered to produce hairline joints free of burrs and distortion.
       3. Fabricate to drain water passing joints, condensation and moisture occurring or migrating within skylight system to the exterior.
       4. Accommodate expansion, contraction, and field adjustment, and provide for minimum clearance and shimming at skylight perimeter.
       5. Ensure that glazing is thermally and physically isolated from framing members.
       6. Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
       7. Fit and secure joints by heliarc welding.
    2. Fabricate residential FCM, VCE and VCM skylight framing components as follows:
       1. Fabricate roll-formed aluminum sash frame with mitered corners, molded ASA UV resistant corner keys, silconed for weather tight fit. Fabricated roll-formed aluminum frame with welded corners.
       2. Fabricate frame components within minimum tolerances enabling installation and movement of frame and dynamic movement of perimeter sealant.
       3. Weather stripping: Factory applied gaskets. EPDM weather stripping between the frame and sash, Sanoprene weather stripping and condensation drain between the structural glazed unit and the sash, and foam with PSA to provide a weather seal between the VCM/E and the curb.
       4. Permit external drainage channels for migration of moisture to exterior. Provide internal drainage of glazing spaces to exterior through sanoprene gasket with integrated condensation gutter.
       5. All units factory glazed with silicone sealant.
    3. Fabricate residential FS, VSE and VS skylight framing components as follows:
       1. Fabricate frame with slip mortise and tendon corners that are glued and nailed for strength and stability.
       2. Fabricate frame components with precision tolerances enabling installation and movement of sash and dynamic movement of perimeter weather stripping.
       3. Provide permanent external drainage channels to manage water flow and drain to the exterior. Provide internal drainage of glazing spaces to exterior through gasketing.
       4. Assemble insect screen of rolled aluminum rectangular sections. Sections are square cut and assembled using square corner keys. Fit mesh taut and secure with vinyl spline.
       5. All units factory glazed with hot melt silicone-based exterior seal.
       6. No site fabrication needed.
       7. Rough opening to be framed per manufacturer's listed dimensions.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
      3. Dissimilar material protection.
         1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
         2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
         3. Where aluminum will contact pressure-treated wood, separate dissimilar materials by methods recommended by manufacturer.
   3. INSTALLATION
      1. Install in accordance with manufacturer's instructions.
      2. Coordinate with installation of roof deck and other substrates to receive skylight units
      3. Provide thermal isolation when components penetrate or disrupt building insulation. Pack fibrous insulation in rough opening to maintain continuity of thermal barriers.
      4. Coordinate with installation of vapor barriers, roof insulation, roofing, and flashing as required to assure that each element of the work performs properly and that combined elements are waterproof and weathertight.
      5. Align skylights level, free of warp or twist, maintain dimensional tolerances.
      6. Anchor units securely to supporting substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.
      7. Counter Flashing: Where counter flashing is required as component of the skylight, install to provide an adequate waterproof overlap with roofing or roof flashing. Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.

\*\* NOTE TO SPECIFIER \*\* Include the following paragraph for residential skylights and delete if not required.

* + 1. Install manufacturer's engineered perimeter flashing in accordance with manufacturer's installation instructions to achieve weather tight installation.
  1. CLEANING AND PROTECTION
     1. Protect installed products until completion of project.
     2. Remove labels and protective material from surfaces.
     3. Clean exposed metal and plastic surfaces according to manufacturer's instructions. Touch up damaged metal coatings.
     4. Clean and polish plastic skylight units, inside and out prior to date of Substantial Completion.
  2. SCHEDULES

\*\* NOTE TO SPECIFIER \*\* Retain Paragraph below if required to suit project requirements. Identify products by name on the Drawings or use this paragraph to define the location of each type of material to be used. The following are some examples of schedule references. Edit as required to suit project or delete and identify products on the Drawings.

* + 1. :
    2. :

END OF SECTION