SECTION 08810 ARCHITECTURAL GLASS

Display hidden notes to specifier by using “Tools”/”Options”/“View”/”Hidden Text”.

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\*\* NOTE TO SPECIFIER \*\* Vitro Architectural Glass; high performance architectural glass. This section is based on the products of Vitro Architectural Glass, which is located at:

Glass Technology Center 400 Guys Run Rd.

Cheswick, PA 15024

Toll Free Tel: (800) 887-6457

Fax: (800) 367-2986

Email:

Web: [http://www.vitroglazings.com](http://www.vitroglazings.com/) [[Click Here]](http://www.arcat.com/arcatcos/cos41/arc41842html?src=spec) for additional information.

Vitro Architectural Glass, North America’s largest and most trusted glass manufacturer, is responsible for many of the commercial glass industry’s most commonly specified products, including high-performance Solarban® low-emissivity (low-e) glasses, Starphire Ultra-Clear® glass and a range of performance-tinted glasses. As a global organization focused on producing glass for the architectural, automotive and containers markets, Vitro is committed to innovation and sustainable manufacturing and end-use, including the development of energy-efficient products and processes. By working closely with customers and partners, Vitro provides expert service and support to ensure that its projects meet or exceed ever- evolving requirements and satisfy demanding sustainability certifications..

PART 1 GENERAL

* 1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete types not required.

* + 1. High performance glass of the following types:
       1. Insulating glass.
       2. Low-e insulating glass.
       3. Reflective insulating glass.
       4. Reflective low-e insulating glass.
       5. Monolithic float glass..
  1. RELATED SECTIONS

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

* + 1. Section 08400 - Entrances and Storefronts: Exterior Entrances and Storefront.
    2. Section 08500 - Windows: Exterior Windows.
    3. Section 08900 - Glazed Curtainwall: Exterior Curtainwall.

REFERENCES

* + 1. ANSI Z97.1 - American National Standard for Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
    2. ASCE 7 - "Minimum Design Loads for Buildings and Other Structures".
    3. ASTM International (ASTM):
       1. ASTM C 162 - Standard Terminology of Glass and Glass Products.
       2. ASTM C 1036 - Standard Specification for Flat Glass.
       3. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass -- Kind HS, Kind FT Coated and Uncoated Glass.
       4. ASTM C 1172 - Standard Specification for Laminated Architectural Flat Glass.
       5. ASTM C 1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass.
       6. ASTM E 2188 - Standard Test Method for Insulating Glass Unit Performance.
       7. ASTM E 2189 - Standard Test Method for Testing Resistance to Fogging in Insulating Glass Units.
       8. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
  1. DEFINITIONS
     1. Manufacturers of Glass Products: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
     2. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
     3. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or other specified gas.
     4. Sealed Insulating Glass Unit Surface Designations:
        1. Surface 1 - Exterior surface of the outer glass lite.
        2. Surface 2 - Interspace surface of the outer glass lite.
        3. Surface 3 - Interspace surface of the inner glass lite.
        4. Surface 4 - Interior surface of the inner glass lite.
  2. PERFORMANCE REQUIREMENTS
     1. General: Provide glass capable of withstanding thermal movement and wind and impact loads (where applicable) as specified in paragraph B following.
     2. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
        1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
           1. Design Wind Loads: Determine design wind loads applicable to the Project according to ASCE 7, "Minimum Design Loads for Buildings and Other

Structures": Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Insert values required for project.

Basic Wind Speed: \_ mph.

Importance Factor: \_.

Exposure Category: \_ \_\_.

\*\* NOTE TO SPECIFIER \*\* Delete if not required for project.

* + - * 1. Specified Design Snow Loads: As indicated on Drawings, but not less than

snow loads applicable to Project as required by ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 7.0, "Snow Loads."

* + - * 1. Probability of Breakage for Vertical Glazing: \_ lites per 1000 for lites set vertically or not more than 15 degrees off vertical.

Wind Load Duration: Short duration, as defined in ASTM E 1300 or

seconds or less.

* + - * 1. Probability of Breakage for Sloped Glazing: \_ per 1000 for lites set greater than 15 degrees off vertical.

Wind Load Duration: Short duration, as defined in ASTM E 1300 or

seconds or less.

Snow Load Duration: Long duration, as defined in ASTM E 1300 or

days.

* + - * 1. Maximum Lateral Deflection: For the following types of glass supported on all 4 edges, provide thickness required that limits center deflection at design wind pressure to times the short side length or 1 inch, whichever is less.

For monolithic-glass lites heat treated to resist wind loads.

For insulating glass.

* + 1. Thermal Movements: Provide glazing that allows for thermal movements resulting from ambient and surface temperatures changes acting on glass framing members and glazing components.
    2. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
       1. For monolithic-glass lites, properties are based on units with lites 1/4 inch (6.0 mm) thick.
       2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
       3. Center-of-Glass Values: Based on using LBL-44789 WINDOW 5.0 computer program for the following methodologies:
          1. U-Factors: NFRC 100 expressed as Btu/ sq. ft. per h per degree F.
          2. Solar Heat Gain Coefficient: NFRC 200.
          3. Solar Optical Properties: NFRC 300.
  1. SUBMITTALS
     1. Submit under provisions of Section 01300.
     2. Product Data: For each glass product and glazing material indicated.
     3. Verification Samples: For the following products, in the form of 12 inch (305 mm) square samples for insulating glass units.
     4. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
     5. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
        1. For solar-control low-e-coated glass, provide documentation demonstrating that manufacturer of coated glass is certified by coating manufacturer.
     6. Qualification Data: For installers.
     7. Product Test Reports: For each of the following types of glazing products.
        1. Tinted float glass.
        2. Coated float glass.
        3. Insulating glass.
     8. Warranties: Special warranties specified in this Section.
  2. QUALITY ASSURANCE
     1. Sustainable Design Certification: Glass shall be Cradle to Cradle Certified, minimum Level, Cradle to Cradle Innovation Institute.
     2. Fabricator Qualifications: Vitro Certified Fabricator Network, as acceptable to the manufacturer.
     3. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level-2 (Senior Glaziers) or Level-3 (Master Glaziers).
     4. Source Limitations for Glass: Obtain the following through one source from a single manufacturer for each glass type: Clear float glass, coated float glass and insulating glass.
     5. Glass Product Testing: Obtain glass test results for product test reports in "Submittals" Article from a qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
     6. Glazing Publications: Comply with published recommendations of glass product manufacturers and industry organizations, including but not limited to those below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
        1. FGIA Publication for Insulating Glass: SFGIA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."
        2. NGA Publications: “Laminated Glazing Reference Manual”; “Glazing Manual.”
        3. AAMA: “Sloped Glazing Guidelines.”
        4. FGIA: “Guidelines for Sloped Glazing.”
     7. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following testing and inspecting agency:
        1. Insulating Glass Certification Council.
        2. Associated Laboratories, Inc.
        3. Fenestration and Glazing Industry Alliance.
     8. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, Fenestration and Glazing Industry Alliance ANSI Z97.1.
        1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
        2. Lites more than 9 sq ft (0.84 sq m) in area are required to be Category II materials.
        3. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sf (0.84 sq m) in area, provide glazing products that comply with Category II materials, and for lites 9 sf (0.84 sq m) or less in area, provide glazing products that comply with Category I or II materials.
  3. DELIVERY, STORAGE, AND HANDLING
     1. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
     2. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.
  4. WARRANTY
     1. Manufacturer's Warranty for Coated-Glass Products: Manufacturer's standard form, made out to the glass fabricator in which the coated glass manufacturer agrees to replace coated glass units that deteriorates during normal use within the specified warranty period. Deterioration of the coated glass is defined as peeling and/or cracking, or discoloration that is not attributed to glass breakage, seal failure, improper installation, or cleaning and maintenance that is contrary to the manufacturer’s written instructions.
        1. Warranty Period: 10 years from date of manufacture.
     2. Manufacturer's Warranty on Insulating Glass: Manufacturer's standard form in which the insulating glass unit manufacturer agrees to replace insulating-glass units that deteriorate during normal use within the specified warranty period. Deterioration of insulating glass units is defined as an obstruction of vision by dust, moisture, or a film on the interior surfaces of the glass caused by a failure of the hermetic seal that is not attributed to glass breakage, improper installation, or cleaning and maintenance that is contrary to the manufacturer’s written instructions.
        1. Warranty Period: 10 years from date of manufacture.
     3. Manufacturer’s Warranty on Laminated Glass: Manufacturer’s standard form in which the laminated glass manufacturer agrees to replace laminated glass units that deteriorate during normal use within the specified warranty period. Deterioration of laminated glass is defined as defects, such as discoloration, edge separation, or blemishes exceeding those allowed by ASTM C 1172 that are not attributed to glass breakage, improper installation, or cleaning and maintenance that is contrary to the manufacturer’s written instructions.
        1. Warranty Period: 10 years from date of manufacture.
     4. Manufacturer’s Warranty on Laminated Spandrel Glass: Manufacturer’s standard form in which the laminated glass manufacturer agrees to replace spandrel glass units that deteriorate during normal use within the specified warranty period. Deterioration of spandrel glass is defined as defects, such as discoloration, edge separation, or blemishes exceeding those allowed by ASTM C 1172 that are not attributed to glass breakage, improper installation, or cleaning and maintenance that is contrary to the manufacturer’s written instructions.
        1. Warranty Period: 10 years from date of manufacture.

PART 2 PRODUCTS

* 1. MANUFACTURERS
     1. Acceptable Manufacturer: Vitro Architectural Glass; Glass Technology Center, 400 Guys Run Rd., Cheswick, PA 15024. ASD. Toll Free Tel: (855) 887-6457. Fax: (800) 367-2986. Web: [http://www.vitroglazings.com.](http://www.vitroglazings.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 01600.
  1. GLASS PRODUCTS
     1. Annealed Float Glass: ASTM C 1036, Type I (transparent flat glass), Quality-Q3; of class indicated.
     2. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; of class, kind, and condition indicated.
        1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.
        2. Provide Kind HS (heat-strengthened) float glass in place of annealed float glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.
        3. For uncoated glass, comply with requirements for Condition A.
        4. For coated vision glass, comply with requirements for Condition C (other uncoated glass).
        5. Provide Kind FT (fully tempered) float glass in place of annealed or Kind HS (heat- strengthened) float glass where safety glass is indicated or required.
     3. Sputter-Coated Float Glass: ASTM C 1376, float glass with metallic-oxide or -nitride coating deposited by vacuum deposition process after manufacture and complying with other requirements specified.
     4. Tempered Patterned Glass: ASTM C 1048, Kind FT (fully tempered), Type II (patterned flat glass), Class 1 (clear), Form 3 (patterned); and of quality, finish, and pattern specified.
     5. Insulating-Glass Units, General: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 2188 / E 2189 for and with requirements specified in this Article and in Part 2 "Insulating-Glass Units" Article.
        1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.
        2. Provide Kind FT (fully tempered) glass lites where safety glass is indicated or required.
        3. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated for insulating-glass units are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
        4. Sealing System: Comply with requirements in Section 07920 - Joint Sealants. Dual seal, with primary and secondary sealants of polyisobutylene and silicone.
        5. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:
           1. Spacer Material: Aluminum with mill or clear anodic finish.
           2. Desiccant: Molecular sieve or silica gel, or blend of both.
           3. Corner Construction: Manufacturer's standard corner construction.
  2. FABRICATION OF GLAZING UNITS

1. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
   1. EXTERIOR SPANDREL GLASS
      1. Type: Spandrel Glass
         1. ASTM C1048 and ASTM C1036, Type 1, Condition B, Quality Q3
         2. Water based/Low-Voc
            1. Basis of Design Coating: Spandrelite™
            2. Coating Color:

Black

Warm Gray

White

* + - * 1. Coating Location: Second Surface – Monolithic, Fourth Surface – Dual IGU
        2. Weakening of Glass: Tested to not lower the tensile strength of heat-treated glass.
        3. Coating Inspection: Pass ASTM C1376 at 15 feet for absence of pin holes, voids, screen marks and small opaque particles.
        4. Fallout-resistance:

Passes ASTM C1048 for an assembly of glass and adhered reinforcing material.

Coating Thickness: 4 mil wet film thickness applied to 6 mm tempered glass.

* + - * 1. Material Sustainability:

HPD v2.1.1 threshold level 100 ppm.

Living Future Institute: Contains No Red List Materials.

* + - 1. Glass:
         1. Monolithic Glass Type: [Float] [Heat Strengthened] [Fully Tempered]

Manufactured by Vitro Architectural Glass

Clear

Thickness: 6mm

* + - * 1. Insulating Glass Unit Type: [\_\_\_\_\_\_\_\_\_\_\_]

Manufactured by Vitro Architectural Glass

PART 3 EXECUTION

* 1. INSTALLATION
     1. Refer to Section 08800 - Glazing for installation requirements.

END OF SECTION