

## SECTION 08 80 00

### GLAZING

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes:
  - 1. Glass and plastic glazing.
  - 2. Glazing compounds and accessories.
  
- B. Related Sections:
  - 1. Section 06 41 00 - Architectural Wood Casework: Cabinets with requirements for glass shelves.
  - 2. Section 07 92 00 - Joint Sealants: Sealant and back-up material.
  - 3. [Section 08 12 13 - Hollow Metal Frames: Glazed borrowed lites.]
  - 4. [Section 08 13 13 - Hollow Metal Doors: Glazed doors.]
  - 5. [Section 08 14 00 - Flush Wood Doors: Glazed doors.]
  - 6. Section 13 49 00 - Radiation Protection: Lead glass

##### 1.02 REFERENCE STANDARDS

- A. American National Standards Institute:
  - 1. ANSI Z97.1 - Performance Specifications and Methods of Test for Glazing Materials Used in Buildings.
  
- B. ASTM International:
  - 1. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
  - 2. ASTM C1036 - Standard Specification for Flat Glass.
  - 3. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass.
  - 4. ASTM C1193 - Standard Guide for Use of Joint Sealants.
  - 5. ASTM E773 - Test Method for Accelerated Weathering of Sealed Insulating Glass Units.
  - 6. ASTM E774 - Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units.
  - 7. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings.
  - 8. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
  
- C. CBC - California Building Code.
  
- D. Glass Association of North America:
  - 1. GANA - Glazing Manual.
  - 2. GANA - Sealant Manual.
  
- E. [National Fire Protection Association:
  - 1. NFPA 80 - Standard for Fire Doors and Fire Windows.
  
- F. SIGMA - Sealed Insulated Glass Manufacturers Association:
  
- G. South Coast Air Quality Management District:
  - 1. SCAQMD Rule #1168 - Adhesive and Sealant Applications.

- H. Underwriters Laboratories Inc.:
  - 1. [UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies.]
  - 2. [UL 263 - Standard for Fire Tests of Building Construction and Materials.]

### 1.03 PERFORMANCE REQUIREMENTS

- A. Glass and glazing materials subject to human impact shall meet requirements of CBC Section 2406.
- B. Provide glass and glazing materials for continuity of building enclosure vapor retarder and air barrier:
  - 1. In conjunction with vapor retarder and joint sealer materials described in other sections.
  - 2. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
  - 3. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
- C. Select type and thickness of exterior glass to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with ASCE 7.
  - 1. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
  - 2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
  - 3. Thicknesses listed are minimum.

### 1.04 ADMINISTRATIVE REQUIREMENTS

- A. [Coordination: ]
- B. [Preinstallation Meeting: ]
- C. [Sequencing:]
- D. [Scheduling:]

### 1.05 [SUSTAINABLE CHARACTERISTICS]

- A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design compliance.
- B. Materials and Resources Characteristics:
  - 1. [Recycled Content Materials: Furnish materials with maximum available recycled content including:  
**SPEC NOTE List materials specified in this section required to have recycled content.**
    - a. [\_\_\_\_\_].
  - 2. [Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project site.]  
**SPEC NOTE List materials specified in this section required to be regional materials.**
    - a. [\_\_\_\_\_].
- C. Indoor Environmental Quality Characteristics:
  - 1. [Interior] Sealants and Sealant Primers: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.

### 1.06 SUBMITTALS

- A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.
- B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- D. Samples: Submit 4 samples 6 by 6 inch in size of glass and plastic units, showing coloration and design.
- E. Samples: Submit 6 inch long bead of glazing sealant, color as selected.
- F. Certificates: Certify that products meet or exceed specified requirements.
- G. Manufacturer's Certificate: Certify that glass meets or exceeds specified requirements.

#### **1.07 [SUSTAINABLE DESIGN SUBMITTALS]**

- A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design submittals.
- B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
  - 1. Materials Resources Certificates:
    - a. Certify source and origin for [salvaged] [and] [reused] products.
    - b. Certify recycled material content for recycled content products.
    - c. Certify source for regional materials and distance from Project site.
  - 2. [Indoor Air Quality Certificates:]
    - a. [Certify volatile organic compound content for each interior [adhesive ][and [sealant ] and related primer.]
      - 1) Provide product data for adhesives, sealants, sealants primer and aerosol adhesives used in the interior of the building highlighting VOC content of each product used. Adhesives and sealants must meet or exceed the VOC limits of SCAQMD Rule #1168. Refer to the LEED 2009 for New Construction and Major Renovations for acceptable VOC limits
      - 2) Provide a listing of each indoor adhesive, sealant, sealant primer and aerosol adhesive product used in the interior of the project. Include manufacture's name, product name, specific VOC data (g/L less water) for each product, and the corresponding allowable VOC from the referenced standard.
- C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
  - 1. Provide cost data for the following products:
    - a. [Salvage products.]
    - b. [Reused products.]
    - c. Products with recycled material content.
    - d. Regional products.

#### **1.08 QUALITY ASSURANCE**

- A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods.

#### **1.09 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle materials in manner to prevent damaging.
- B. Deliver and store packaged materials in original containers bearing manufacturer's name.
- C. Deliver glass affixed with manufacturer's labels and do not remove labels prior to installation, inspection, or final approval.

#### 1.10 SITE CONDITIONS

- A. Environmental Requirements:
  - 1. Do not install glazing when ambient temperature is less than 50 degrees Fahrenheit.
  - 2. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

#### 1.11 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide a five year warranty to include coverage for insulated glass units from seal failure, interpane dusting or misting, and replacement of same.

### PART 2 PRODUCTS

#### 2.01 GLASS TYPES

- A. [Type GL-[\_\_\_\_,] ] Monolithic Glass: Clear float glass, 1/4 inch thick.]
- B. [Type GL-[\_\_\_\_,] ] Monolithic Glass: Clear tempered glass, 1/4 inch thick.]
- C. [Type GL-[\_\_\_\_,] ] Monolithic Glass: Clear wire glass.]
  - 1. Description: Rolled with welded wire 1/2 inch square mesh, polished both sides, 1/4 inch nominal thickness. Conform to ANSI Z97.1. Underwriters' Laboratory classified and labeled as a fire retardant material.
  - 2. Product: Pilkington "Pyroshield Wired Glass"; Sentinel Enterprises Inc.'s "Polished Wire Glass, Square Mesh"; Asahi Glass Co., Ltd.'s "Polished Crosswire Glass"; or equal.
- D. Type GL-[\_\_\_\_,] 20 Minute Fire-Rated and Impact Safety Rated Glass:
  - 1. Description:
    - a. Glass Thickness: 1/4 inch.
    - b. Impact safety rated in accordance with ANSI Z97.1.
    - c. Fire Rating: Listed and labeled by UL for 20 minutes when tested in accordance with ASTM E2010 and UL 10C.
    - d. Each piece of glass to be permanently labeled with appropriate label.
  - 2. Product: Technical Glass Products' "Fireglass 20"; or equal.
- E. [Type GL-[\_\_\_\_,] ] 45 Minute Fire-Rated and Impact Safety Rated Glass:]
  - 1. Description:
    - a. Glass Thickness: 5/16 inch.
    - b. Laminated fire-rated and impact safety-rated glazing material.
    - c. Impact safety rated in accordance with ANSI Z97.1.
    - d. Fire Rating: Listed and labeled by UL for 60 minutes when tested in accordance with ASTM E2010 and UL 10C.
    - e. Each piece of glass to be permanently labeled with appropriate label.
  - 2. Product: Technical Glass Products' "FireLite Plus"; or equal.

- F. [Type GL-[\_\_\_\_],] 60 Minute Fire-Rated and Impact Safety Rated Glass: Same Glass Type GL-[\_\_\_\_],  
]except with 60 minute fire rating.]
- G. [Type GL-[\_\_\_\_],] Laminated Glass - Clear.]  
a. Laminated glass consisting of two panes of glass and PVB interlayer.  
b. Outer Lite: 1/8 inch thick clear glass.  
c. PVB Interlayer: 0.060 inch.  
d. Inner Lite: 1/8 inch thick clear glass.  
e. Overall Thickness: 1/4 inch.
- H. [Type GL-[\_\_\_\_],] Acoustical Glass - Clear:]  
1. Description:  
a. Laminated glass consisting of two panes of glass and PVB interlayer.  
b. Outer Lite: 1/2 inch thick clear glass.  
c. PVB Interlayer: 0.060 inch.  
d. Inner Lite: 1/4 inch thick clear float glass.  
e. Overall Thickness: 3/4 inch.  
f. Sound Transmission Classification (STC): 41.  
2. Product: Viracon's "Acoustical Glass"; or equal.
- I. [Type GL-[\_\_\_\_],] Acoustical Glass - Opaque:]  
1. Description:  
a. Laminated glass consisting of two panes of glass and PVB interlayer.  
b. Outer Lite: 1/2 inch thick clear glass.  
c. PVB Interlayer: 0.060 inch, Viracon "Pure White No. 210700".  
d. Inner Lite: 1/4 inch thick clear glass.  
e. Overall Thickness: 3/4 inch.  
f. Sound Transmission Classification (STC): 41.  
2. Product: Viracon's "Acoustical Glass"; or equal.
- J. [Type GL-[\_\_\_\_],] Insulating Glass:]  
1. Outdoor Lite: Clear float glass with Low-E coating on #2 surface. 1/4 inch thick.  
2. Indoor Lite: Clear float glass, 1/4 inch thick.  
3. Overall Thickness: One inch.  
4. Product: PPG Industries, Inc.'s "Solarban [\_\_\_\_]"; Viracon's "Solarscreen [\_\_\_\_] Insulating Glass,  
Product [\_\_\_\_]"; or equal.
- K. [Type GL-[\_\_\_\_],] Patterned Tempered Laminated Glass:]  
1. Outer Lite: Clear tempered glass, 1/4 inch thick.  
2. Inner Lite: Clear tempered glass, 1/4 inch thick.  
3. Interlayer: As required to achieve required design.  
4. Overall Thickness: 1/2 inch.  
5. Product: Pulp Studio Inc.'s "Fiber Collection 100, 2006, 3300 or other"; or equal.
- L. [Type GL-[\_\_\_\_],] Radiation Shielding Glass: Specified in Section 13 49 00 - Radiation Protection.]

## 2.02 COMPONENTS

- A. [Flat Glass: Minimum 1/4 inch unless otherwise indicated.]  
1. Clear Float Glass: ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select.
- B. [Safety Glass: Conform to ANSI Z97.1, minimum thickness 1/4 inch unless otherwise indicated.]

1. Clear Heat Strengthened Glass: ASTM C1048, Kind HS, Condition A uncoated surfaces, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select.
  2. Clear Fully Tempered Glass: ASTM C1048, Kind FT, Condition A uncoated surfaces, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select.
- C. [Fire Resistive Glass: As indicated in Glass Types.]
- D. [Acoustical Laminated Glass and Laminated Glass: ASTM C1172.]
1. Outer Lite: As indicated in Glass Types.
  2. Innerlayer: 0.060 high impact aircraft polyvinyl buteral (PVB), unless otherwise noted.
  3. Inner Lite: As indicated in Glass Types.
  4. Overall Thickness: As indicated in Glass Types.
- E. [Insulated Glass Units:]
1. Description: ASTM E2190 in accordance with ASTM E2188 and E2189, two sheets of glass with 1/2 inch sealed air space containing dry air between, dual seal silicone.
    - a. Outdoor Lite: As indicated in Glass Types.
    - b. Indoor Lite: As indicated in Glass Types.
    - c. Overall Thickness: As indicated in Glass Types.

### 2.03 RELATED MATERIALS

- A. [Large Size Custom Mirrors:]
1. Glass: 1/4 inch clear polished plate, mirror glazing quality, copper-backed, edges painted black.
  2. Frames: ASTM A167, Type 302, stainless steel with No. 4 finish, maximum 1/2 inch face dimension, sizes as shown.
  3. Backing: 1/4 inch plywood or hardboard.
  4. Attachment Devices: Continuous stainless steel “J” molding with stainless steel fasteners at bottom of edge of mirror.

### 2.04 GLAZING MATERIALS

- A. Sealant: Sealants to have maximum volatile organic compound content in accordance with SCAQMD Rule #1168.
1. Description: One-part silicone type, neutral cure.
  2. Product: Dow Corning Corp.'s “795 Silicone Building Sealant”; General Electric Co.'s “Silpruf Sealant Series SCS-2000”; or equal.
- B. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option I; color as selected.
- C. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- D. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C864 Option I. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- E. Pressure Tape: Preformed butyl compound with integral resilient tube spacing device, 10 to 15 Shore A durometer hardness; coiled on release paper; black color.

- F. Foam Plastic Tape: Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to affect an air barrier and vapor retarder seal.
- G. [Fire-Resistant Glazing Materials: Materials used to obtain required fire-resistant rating.]
- H. [Adhesive for Mounting Mirrors:]
  - 1. Description: Adhesive must meet the following requirements:
    - a. Fast curing adhesive mastic manufactured specifically for setting mirrors with support at bottom edge only; resistant to water, shock, cracking, vibration and thermal expansion; compatible with mirror backing paint.
    - b. Recommended by mirror manufacturer; to be used in spot-application of 1/8 to 1/2 inch thickness and with less than 25 percent of mirror back area in contact with adhesive
    - c. Meet all applicable air quality requirements.
    - d. Meet or exceed VOC limits for adhesives and sealants. Adhesives must meet or exceed the VOC limits of SCAQMD Rule #1168 by, and all sealants used as filler must meet or exceed Bay Area Air Quality Management District Reg. 8, Rule 51.
  - 2. Product: Palmer Products Corp.'s "QuikSet Mirro-Mastic"; or equal.

## 2.05 FABRICATION

- A. Provide polished and eased exposed glass edges.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine glass and openings to receive glass and verify that:
  - 1. There are no defects that would affect glass and glazing work.
  - 2. Openings for glazing are correctly sized and within tolerance.
  - 3. Surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.
  - 4. Rivets, screws, bolts, welding fillets, or other projections from clearances in glazing rabbets have been removed.
  - 5. All installed glass has UL and other required permanent identification markings (acid etched, no stickers) visible and legible on each lite.
- B. Do not start glazing until defects have been corrected.

### 3.02 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.
- E. Install sealant in accordance with manufacturer's instructions.

### 3.03 INSTALLATION

- A. General Requirements:
  - 1. Perform installation in accordance with GANA Glazing Manual and reviewed Shop Drawings.
  - 2. Cut and set glass to full fit and play consistent with expansion and contraction requirements and for absolute security under maximum high velocity wind or vacuum stresses.
  - 3. Maintain edge clearance at least equal to glass thickness from perimeter of glass to inside of rabbet.
  - 4. Maintain minimum 1/8 inch clearance between faces of glass and adjacent stop or bead.
  - 5. Provide setting blocks at sill to transmit wind loads from glass to sash. Provide shims at head and jambs at shop-glazed units.
  - 6. Accurately size and cut clean for each glazing condition. Do not nip edges.
  
- B. [[Acoustical Laminated Glass[ and ]Laminated Glass]:
  - 1. Protect vinyl at edges against oil, water, or solvent.
  - 2. Provide setting blocks under glass.
  - 3. Apply protective tape to glass edges if recommended by glass manufacturer.
  - 4. Apply protective tape to glass edges if recommended by glass manufacturer.
  - 5. In all other respects, follow approved manufacturer's recommendations.
  
- C. [Fire Resistive Glass:]
  - 1. Install in accordance with glass manufacturer's recommendations.
  - 2. [Install wire glass with wires running horizontal and vertical.]]
  
- D. Installation - Exterior/Interior Dry Method (Gasket Glazing)
  - 1. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
  - 2. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
  - 3. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.
  
- E. [Insulating Glass: Install in accordance with glass manufacturer's recommendations.]
  
- F. [Glazing of Interior Pressed Metal Frames: Use pressure tape and sealant as noted to eliminate rattle and reduce sound transmission.]
  
- G. Sealant Application:
  - 1. Neatly tool sealant or compound joints to compress material and improve adhesion. Repair air pockets exposed by tooling.
  - 2. Meet requirements of Section 07 92 00 - Joint Sealants unless otherwise indicated.
  - 3. Ensure removal of protective coatings from aluminum surfaces.
  
- H. [Large Size Custom Mirrors:] [Adhesive Mounting of Mirrors:]
  - 1. Support mirror on mirror frame extrusion.
  - 2. Apply adhesive in accordance with adhesive manufacturer's instructions. Apply minimum 2 inch diameter spots of adhesive between mirror and substrate at no more than 2 feet apart. Do not cover more than 25 percent of mirror back.
  - 3. Apply mirror to substrate so that area not covered with adhesive will remain open for ventilation, with 1/8 inch minimum clearance from substrate. Provide temporary rigid supports until adhesive has set.

### 3.04 CLEANING

- A. Remove glazing materials from finish surfaces.
  
- B. Remove labels after Work is complete.



- C. Clean glass and adjacent surfaces.

**3.05 PROTECTION OF INSTALLED WORK**

- A. Protect installed Work under provisions of Section 01 76 00 - Protecting Installed Work.
- B. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

**END OF SECTION**