

SECTION 08800 - GLAZING

City of San Diego, CWP Guidelines

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing all glass, caulking materials, and appurtenant items required for all the glass and glazing work, complete.

1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.
 - 1. Section 07920 Sealants and Caulking
 - 2. Section 08110 Steel Doors and Frames
 - 3. Section 08410 Aluminum Entrances and Storefronts
 - 4. Section 08520 Aluminum Windows, Horizontal Sliding
 - 5. Section 10800 Toilet Accessories

1.3 CODES

- A. The WORK of this Section shall comply with the current editions of the following codes as adopted by the City of San Diego Municipal Code:
 - 1. Uniform Building Code

1.4 SPECIFICATIONS AND STANDARDS

- A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:
 - 1. Federal Specifications:

| | |
|-------------|--|
| DD-G-451 | Glass, Float or Plate, Sheet, Figured (Flat for Glazing, Mirrors and Other Uses) |
| DD-G-1403 | Glass, Float, Sheet, Figured, Coated (Heat-Strengthened and Tempered) |
| TT-S-001543 | Sealing Compound, Silicone Rubber Base (For Caulking, Sealing and Glazing in Buildings and Other Structures) |
 - 2. Commercial Standards:

| | |
|-------------|---|
| ASTM C 1036 | Primary Glass Standard |
| ASTM C 1048 | Heat Treated Glass Standard |
| ASTM D 2287 | Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds |

ASTM E 163 (UL 9)

Fire Resistance Rated Wire Glass

ANSI Z 97.1

Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test

3. Trade Standards:

Glazing Standards: CONTRACTOR shall comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except as indicated herein.

Safety Glazing Standard: Where safety glass is indicated or required by authorities having jurisdiction, CONTRACTOR shall provide the type of products indicated which comply with ANSI Z 97.1 and testing requirements of 16 CFR Part 1201 for category II materials.

Subject to compliance with requirements, CONTRACTOR shall provide safety glass permanently marked with certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.

"Glazing Specifications for Sealed Insulating Glass Units" by the Sealed Insulating Glass Manufacturers Association (SIGMA)

1.5 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted in compliance with Section 01300:

1. **Product Data:** Manufacturer's technical data shall be submitted for each glazing material and fabricated glass product required, including installation and maintenance instructions.
2. **Samples:** When requested by the CONSTRUCTION MANAGER, samples shall be submitted for verification purposes, 12-inch square samples of each type of glass indicated except for clear single pane units, and 12-inch long samples of each color required (except black) for each type of sealant or gasket exposed to view. Sealant or gasket sample shall be installed between two strips of material representative of adjoining framing system in color.

1.6 OWNER'S MANUAL

A. The following shall be included in the OWNER'S MANUAL in compliance with Section 01300:

1. **Certificate:** Certificates shall be submitted from respective manufacturers attesting that glass and glazing materials furnished for the project comply with requirements.
 - a. Separate certification shall not be required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authorities having jurisdiction.
2. **Compatibility and Adhesion Test Report:** A statement shall be submitted from the sealant manufacturer indicating that glass and glazing materials have been tested for

compatibility and adhesion with glazing sealants, and interpreting test results of material performance for recommendations on primers and substrate preparation needed to obtain adhesion.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. **Delivery of Materials:** Manufactured products shall be delivered in original, unbroken, packages, containers or bundles bearing the manufacturer's label.
- B. **Storage:** All products shall be carefully stored on wood blocking in an area that is protected from deleterious elements in a manner recommended by the product manufacturer. Storage shall be in a manner that will prevent damage to the material or marring of its finish.
- C. Glass and glazing materials shall be protected during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass and damage to glass and glazing materials from effects of moisture, including condensation, of temperature changes, of direct exposure to the sun, and from other causes.
 - 1. Where insulating glass units will be exposed to substantial altitude changes, hermetic seal ruptures shall be avoided through compliance with insulating glass fabricator's recommendations for venting and sealing.

1.8 SPECIAL WARRANTY

- A. **Manufacturer's Special Project Warranty on Laminated Glass:** A written warranty signed by manufacturer of laminated glass shall be provided agreeing to furnish f.o.b. point of manufacture, freight allowed to project site, within specified warranty period indicated below, replacements for those laminated glass units which develop manufacturing defects. Manufacturing defects shall be defined as edge separation or delamination which materially obstructs vision through glass.
 - 1. Warranty Period: Warranty period shall be manufacturer's standard, but not less than 4 years after date of substantial completion.
- B. **Manufacturer's Special Project Warranty on Coated Glass Products:** A written warranty shall be provided, signed by manufacturer of coated glass agreeing to furnish f.o.b. point of manufacture, freight allowed to project site, within specified warranty period indicated below, replacements for those coated glass units which develop manufacturing defects. Manufacturing defects shall be defined as peeling, cracking or deterioration in metallic coating due to normal conditions and not due to handling or installation or cleaning practices contrary to glass manufacturer's published instructions.
 - 1. Warranty Period: Warranty period shall be manufacturer's standard, but not less than 5 years after date of substantial completion.
- C. **Manufacturer's Special Project Warranty on Insulating Glass:** A written warranty shall be provided, signed by manufacturer of insulating glass agreeing to furnish f.o.b. point of manufacture, freight allowed to project site, within specified warranty period indicated below, replacements for those insulating glass units developing manufacturing defects. Manufacturing defects shall be defined as failure of hermetic seal of air space (beyond that due to glass breakage) as evidenced by intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coatings, if any, and other visual

indications of seal failure or performance; provided the manufacturer's instructions for handling, installing, protecting, and maintaining units have been complied with during the warranty period.

1. Warranty Period: Warranty period shall be manufacturer's standard, but not less than 10 years after date of substantial completion.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. **Manufacturer's Standards:** Glass and caulking materials shall be in accordance with the manufacturer's published literature and specifications for the products indicated.
- B. **Single Source Responsibility for Glass:** Materials shall be provided which are produced by a single manufacturer or fabricator for each kind and condition of glass indicated. Primary glass shall be obtained from a single source for each type and class required.
- C. CONTRACTOR shall provide glass and glazing that has been produced, fabricated and installed to withstand normal thermal movement, wind loading and impact loading (where applicable), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glass and glazing materials and other defects in the WORK.
 1. Normal thermal movement shall be defined as that resulting from an ambient temperature range of 120 degrees F (67 degrees C) and from a consequent temperature range within glass and glass framing members of 180 degrees F (100 degree C).
 2. Deterioration of insulating glass shall be defined as failure of the hermetic seal due to other causes than breakage which results in intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coating, if any, resulting from seal failure, and any other visual evidence of seal failure or performance.
 3. Deterioration of laminated glass shall be defined as the development of manufacturing defects including edge separation or delamination which materially obstructs vision through the glass.
 4. Deterioration of coated glass shall be defined as the development of manufacturing defects including peeling, cracking or other indications of deterioration in metallic coating due to normal conditions of use.

2.2 GLAZING MATERIALS

- A. **Glass Specifications:**
 1. Primary Glass Standard: Primary glass shall comply with ASTM C 1036, including type, class, quality, and, if applicable, form, finish, mesh and pattern.
 2. Glass shall conform to Federal Specifications DD-G-451.

3. Heat-Treated Glass Standard: Heat-treated glass shall comply with ASTM C 1048, including kind, condition, type, quality, class, and, if applicable, form, finish, and pattern.
4. Tempered glass shall also conform to Federal Specification DD-G-1403 (Tempered Glass).
5. Fire Resistance Rated Wire Glass: CONTRACTOR shall provide wire glass products that are identical to those tested per ASTM E 163 (UL 9) and are labeled and listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

6. Insulating Glass:

Insulating glass units shall be provided which are permanently marked either on spacer's or at least one component pane of units with appropriate certification label of the Insulating Glass Certification Council (IGCC).

Insulating glass units shall conform to SIGMA 65-7-2 as well as the preceding Federal Specifications.

- B. **Sizes:** Glass shall be fabricated to sizes required for glazing openings indicated, with edge clearances and tolerances complying with recommendations of glass manufacturer. Thicknesses shall be provided as indicated or, if not otherwise indicated, as recommended by glass manufacturer for application indicated.
- C. **Glazing Thickness:** Thicknesses of glass indicated are minimum thicknesses. Thicker glass shall be provided when required by the Building Code.
- D. **Labelling:** Glass shall be factory-labeled. Non-labeled glass will be rejected.

2.3 GLASS TYPES

A. All glass shall conform to the following requirements:

1. Type A - Tinted, Colored Float Glass: Type I (transparent glass, flat), Class 2 (tinted heat absorbing and light reducing), Quality q3 (glazing select), not less than 3/16-inch minimum thickness. The glass color shall be [gray] [bronze] and as follows:
 - a. Gray: Manufacturer's standard tint, with visible light transmittance of 41-43 percent and shading coefficient of 0.67 - 0.69 percent for 1/4-inch thick glass.
 - b. Bronze: Manufacturer's standard tint, with visible light transmittance of 50-52 percent and shading coefficient of 0.69 - 0.71 for 1/4-inch thick glass.
 - c. Type A sealed insulating glass units shall comply with paragraph 2.3A5.
2. Type B - Tinted, Colored, Fully-Tempered Float Glass: Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 2 (tinted heat absorbing and light reducing), Quality q3 (glazing select), with tint color and performance characteristics for 1/4-inch thick glass matching those indicated for non-heat-treated tinted float glass. The glass color shall be [gray] [bronze].

- a. Manufacture heat-treated glass by horizontal (roller hearth) process with roll wave distortion parallel with bottom edge of glass as installed, unless otherwise indicated.
3. Type C - Clear Float Glass: Conform to Federal Specification DD-G-451D, minimum thickness: 3/16-inch. Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select).
4. Type D - Clear, Fully-Tempered Float Glass: Conform to Federal Specification DD-G-1403C, minimum thickness 1/4-inch. Condition A (uncoated surface), Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select).
 - a. Heat-treated glass shall be manufactured by horizontal (roller hearth) process with roll wave distortion parallel with bottom edge of glass as installed, unless otherwise indicated.
5. Sealed Insulating Glass Units - General: Preassembled units shall be provided consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with ASTM E 774 for performance classification indicated as well as with other requirements for glass characteristics, air space, sealing system, sealant, spacer material, corner design, and desiccant.
 - a. Individual glass panes comprising sealed insulating glass units shall comply with product requirements specified elsewhere in this Section applicable to types, classes, kinds, and conditions of glass products indicated.
 - b. Fully-tempered panes shall be provided of kind and at locations indicated or, if not indicated, fully-tempered panes shall be provided where recommended by manufacturer for application indicated, and where safety glass is designated or required.
 - c. Performance Classification per ASTM E 774: Class A.
 - d. Thickness of Each Pane: As indicated.
 - e. Air Space Thickness: As indicated.
 - f. Sealing System: Manufacturer's standard.
 - g. Spacer Material: Manufacturer's standard metal.
 - h. Desiccant: Manufacturer's standard; either molecular sieve or silica gel or blend of both.
 - i. Corner Construction: Manufacturer's standard corner construction.
6. Type E - Clear, Insulating Glass: Units shall be of 1-inch minimum thickness, consisting of outside lite of 1/4-inch thick clear flat glass, 1/2-inch air space, and an inside lite of 1/4-inch thick clear float glass.
7. Type F - Clear, Tempered, Insulating Glass: Units shall be 1-inch minimum thickness, consisting of an outside lite of 1/4-inch thick tempered, clear float glass; 1/2-inch air space; and an inside lite of 1/4-inch thick tempered, clear float glass.

8. Type G - Tinted, Colored, Insulating Glass: Units shall be of 1-inch minimum thickness, consisting of an outside lite of 1/4-inch thick, tinted, colored [gray] [bronze] float glass; 1/2-inch air space; and 1/4-inch thick, clear float glass inside lite. [Tinted, colored, insulating glass in horizontal sliding window shall be same as above, except that units shall be 5/8-inch thick, consisting of 3/16-inch thick glass and 1/4-inch air space.]
9. Type H - Tinted, Colored, Tempered Insulating Glass: Units shall be 1-inch minimum thickness, consisting of an outside lite of 1/4-inch thick tinted, colored [gray] [bronze], tempered float glass; 1/2-inch air space; and 1/4-inch thick, clear, tempered float glass inside.
10. Type I - Clear, Polished Wired Glass: Type II (patterned and wired glass, flat), Class 1 (translucent), Quality q3 (glazing); complying with ANSI Z97.1; 1/4-inch thick; of form 1 (wired, polished both sides), mesh m1 (diamond).
11. Type J: Mirrors shall be 1/4-inch select mirror glazing quality mirrors. Metal framed mirrors shall be as indicated in Section 10800.
12. Type K: Obscure glass shall be a frosted or pattern glass conforming to Federal Specification DD-G-451D(1) and be not less than 3/16-inch thick and shall be tempered where indicated.
13. Type L: Opaque glass panels shall be tinted float glass, conforming to F.S. DD-G-1403C, 1/4-inch [] thick with ceramic grit fused to one side. Color shall be selected by the CONSTRUCTION MANAGER from the manufacturer's full range of colors.
14. Type M: Laminated safety glass shall be heat-tempered sheets of clear, heavy float glass, laminated and bonded by heat and pressure to a polyvinyl butyryl plastic interlayer of not less than 0.080-inch thick each. The laminated safety glass shall conform to Federal Safety Standards 16 CFR 1201 and shall meet the requirements of the Safety Glazing Certification Council (SGCC), which complies with ANSI Z 97.1 standards.

Laminated safety glass for the view windows into hydraulic structures shall consist of 3 layers of glass of the following thickness (based on pressure per square foot) for pressure shown:

- up to 1600 psf use 3 lites of 5/8-inch glass;
- up to 2000 psf use 3 lites of 3/4-inch glass; and
- up to 2600 psf use 3 lites of 7/8-inch glass.

The sizes and locations of view windows are indicated on Structural Drawings. If no pressures are indicated, the CONTRACTOR shall provide glass for 2600 psf.

15. Type N: Glazing panels shall be []-inch thick, [single-] [double-] faced, opaque panels of mineral fiber cement sheet, steam cured, with an acrylic three-coat thermally bonded finish coating system. Color shall be selected by the CONSTRUCTION MANAGER from the manufacturer's full range of colors, consisting of not less than 8 colors.
16. Type O: [Tinted bronze] [Clear] transparent [1/4] []-inch thick polycarbonate.

2.4 ELASTOMERIC GLAZING SEALANTS AND PREFORMED GLAZING TAPES

- A. **General:** Products shall be provided of type indicated and complying with the following requirements:
1. **Compatibility:** Glazing sealants and tapes shall be selected of proven compatibility with other materials with which they will come into contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
 2. **Suitability:** Recommendations of sealant and glass manufacturers shall be complied with for selection of glazing sealants and tapes which have performance characteristics suitable for applications indicated and conditions at time of installation.
 3. **Elastomeric Sealant Standard:** Manufacturer's standard chemically curing, elastomeric sealant shall be provided of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class and Uses.
 4. **Colors:** Color of exposed sealants shall be provided as indicated or, if not otherwise indicated, as selected by CONSTRUCTION MANAGER from manufacturer's standard colors.
- B. **Two-Part Polysulfide Glazing Sealant:** Type M; Grade NS; Class 25; Uses NT, M, G, A, and as applicable, to uses indicated, O.
- C. **One-Part Non-Acid-Curing Silicone Glazing Sealant:** Type S; Grade NS, Class 25; Uses NT, G, A, and, as applicable, to uses indicated, O; conforming to Federal Specifications TT-S-001543A non-sag type, and complying with the following requirements for modulus and additional joint movement capability.
1. **Low Modulus:** Tensile strength of 45 psi or less at 100 percent elongation when tested per ASTM D 412 after 14 days at 77 degrees F (20 degrees C) and 50 percent relative humidity.
- D. **Preformed Butyl-Polyisobutylene Glazing Tape:** Manufacturer's standard solvent-free butyl-polyisobutylene formulation shall be provided with a solids content of 100 percent; complying with AAMA A 804.1; in extruded tape form; non-staining and non-migrating in contact with nonporous surfaces; packaged on rolls with a release paper on one side; with or without continuous spacer rod as recommended by manufacturers of tape and glass for application indicated.
- E. **View Window Gaskets:** Glazing gaskets for view windows in hydraulic structures shall be black neoprene having a 75 (plus or minus 5) Shore "A" Durometer hardness and be chemically compatible for the sealant used.

2.5 MISCELLANEOUS GLAZING MATERIALS

- A. **Compatibility:** Materials shall be provided with proven record of compatibility with surfaces contacted in installation.
- B. **Cleaners, Primers and Sealers:** Type recommended by sealant or gasket manufacturer.
- C. **Setting Blocks:** Neoprene, EPDM or silicone blocks shall be provided as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness.

- D. **Spacers:** Neoprene, EPDM or silicone blocks, or continuous extrusions shall be provided as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.
- E. **Edge Blocks:** Neoprene, EPDM or silicone blocks shall be provided as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement of glass.
- F. **Compressible Filler Rods:** Closed-cell or waterproof-jacketed rod stock shall be provided of synthetic rubber or plastic foam, flexible and resilient, with 5 to 10 psi compression strength for 25 percent deflection.

2.6 MANUFACTURERS

- A. Products of the type indicated shall be of the following manufacture (or equal):

- 1. Glazing Accessory Products:

- a. Two-Part Polysulfide Glazing Sealant:

- "Chem-Calk 200"; Bastik Construction Products Div.
 - "Synthacalk GC-5"; Pecora Corp.

- b. One-Part Non-Acid Curing Medium-Modulus Silicone Glazing Sealant:

- "Dow Corning 795"; Dow Corning Corp.
 - "Silpruf"; General Electric Corp.
 - "Gesil"; General Electric Corp.
 - "Spectrum 2"; Tremco, Inc.

- c. Preformed Butyl-Polyisobutylene Glazing Tape without Spacer Rod:

- "Chem-Tape 40"; Bastik Construction Products Div.
 - "Extru-Seal"; Pecora Corp.
 - "PTI 303" Glazing Tape; Protective Treatments, Inc.
 - "Tremco 440 Tape"; Tremco, Inc.

- 2. Glass Products:

- a. Clear and Tinted Float Glass:

- AFG Industries, Inc.
 - Ford Glass Division
 - Guardian Industries Corp.
 - LOF Glass, Inc.
 - PPG Industries, Inc.
 - Saint-Gobain/Euroglass

- b. Wire Glass:

- AFG Industries, Inc.
 - Guardian Industries Corp.
 - Hordis Brothers, Inc.
 - Pilkington Sales (North American) Limited

- c. Heat-Treated Glass:
 - AFG Industries
 - Cardinal IG
 - Environmental Glass Products
 - Falconer Glass Division
 - Ford Glass Division
 - Guardian Industries Corp.
 - Hordis Brothers, Inc.
 - LOF Glass, Inc.
 - PPG Industries, Inc.
 - Saint-Gobain/Euroglass
 - Spectrum Glass Prod. Div., H.H. Robertson Co.
 - Viracon, Inc.

- c. Laminated Glass:
 - Advanced Coating Technology
 - Environmental Glass Products
 - Falconer Glass Industries
 - Ford Glass Division
 - Guardian Industries Corp.
 - Hordis Brothers, Inc.
 - PPG Industries, Inc.
 - Saint-Gobain/Euroglass
 - Viracon, Inc.

- d. Insulating Glass:
 - Advanced Coating Technology
 - AFG Industries, Inc.
 - Cardinal IG
 - Environmental Glass Products
 - Falconer Glass Industries
 - Ford Glass Division
 - Guardian Industries Corp.
 - Hordis Brothers, Inc.
 - Independent Insulating Glass
 - PPG Industries, Inc.
 - Spectrum Glass Prod. Div., H.H. Robertson Co.
 - Viracon, Inc.

PART 3 -- EXECUTION

3.1 GENERAL

- A. **Reference Standards:** Products shall be installed in accordance with manufacturer's recommendations and referenced glazing standards except where more stringent requirements are indicated herein.

- B. **Complete System:** Glass and glazing system shall be installed complete with all stops, blocks, channels, beads, sealants, and glass to form a completely installed watertight installation.
- C. Glazing channel dimensions as indicated are intended to provide for necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses with reasonable tolerances. Glazier shall adjust as required by job conditions at time of installation.
- D. **Pre-Inspection:** CONTRACTOR shall require glazier to inspect WORK of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for presence and functioning of weep system; for existence of minimum required face or edge clearances; and for effective sealing of joinery. CONTRACTOR shall obtain glazier's written report listing conditions detrimental to performance of glazing WORK. CONTRACTOR shall not allow glazing WORK to proceed until unsatisfactory conditions have been corrected.

3.2 GLAZING APPLICATION SCHEDULE

- A. Glass types for the various locations shall conform to the following schedule:

| [1. Exterior Locations: | Glass Type |
|--|------------|
| Windows of heated or cooled spaces, unless otherwise noted | G |
| Windows of unoccupied spaces, typical | A |
| Entrance doors | B |
| Window wall lites | B |
| Sliding glass doors | G |
| Door lites | B] |
| | |
| [2. Interior Locations: | |
| Windows, 18 inches above floor, typical | C |
| Windows and window wall lites within 18 inches of floor | D |
| Entrance doors | D |
| Door lites | D |
| Sound windows and door lites | E |
| View window glass in hydraulic structures | M] |

3.3 PREPARATION

- A. Preparation work such as priming and cleaning shall be done with materials and procedures specified in the printed recommendations of the manufacturer. Surfaces shall be dry and free from dust, dirt, and film. All priming shall be completed and thoroughly dried before glazing.
- B. Glazing channels and other framing members shall be thoroughly cleaned to receive glass, immediately before glazing. Coating which are not firmly bonded to substrates shall be removed. Lacquer shall be removed from metal surfaces where elastomeric sealants are indicated for use.

3.4 INSTALLATION

- A. Glass shall be protected from edge damage during handling and installation; use a rolling block in rotating glass units to prevent damage to glass corners. Glass shall not be impacted against metal framing. Suction cups shall be used to shift glass units within openings; pry bar shall not be used to raise or drift glass. Glass shall be rotated with flares or bevels along one horizontal edge which would occur in vicinity of setting blocks so that these are located at top of opening.
- B. Concealed edges of glass shall be clean, straight cut, and free from chips and fissures. All glass shall be shop-cut, with proper allowance of size for installed lite. Allow for maximum grip on all edges. Glass shall be set with equal bearing on entire width of pane. Nipping glass on the job site will not be allowed. Remove from project and dispose of glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.
- C. **Weather and Temperature Limitations:** No WORK of this Section shall be performed in damp, foggy, or rainy weather. WORK shall not proceed unless temperatures are within manufacturer's printed recommendations.
- D. Units of glass shall be set in each series with uniformity of pattern, draw, bow and similar characteristics.
- E. **Glazing Beads:** Glass in glazing beads or channels shall be in accordance with manufacturer's printed installation instructions. Materials shall not be stretched.
- F. **Metal Glazing Beads:** Where metal glazing beads or stops occur and where vinyl glazing beads are not used, the glass shall be set on setting blocks and be completely bedded in glazing compound. Metal glazing beads furnished by the manufacturer shall be installed in accordance with manufacturer's printed instructions. Compound shall be trimmed flush to sight line.
- G. **Gasket Glazing:** Glass set in a reglet with gasket glazing shall be set on glazing tape. All voids around the perimeter and between glass and stop shall be filled with glazing compound to provide completely watertight installation. Tape and compound shall be trimmed flush to sight line.
- H. **Sealant Application:** Sealant shall be applied on the inside glass surface below the glazing bead. The void below vinyl to bottom of glazing reglet shall be filled to maintain a weathertight seal.
 - 1. Compressible filler rods or equivalent back-up material shall be provided as recommended by sealant and glass manufacturers to prevent sealant from extruding into glass channel weep systems and from adhering to joints' back surface as well as to control depth of sealant for optimum performance, unless otherwise indicated.
 - 2. Sealants shall be forced into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.
 - 3. Exposed surfaces of sealants shall be tooled to provide a substantial "wash" away from glass. Pressurized tapes and gaskets shall be installed to protrude slightly out of channel to eliminate dirt and moisture pockets.
- I. Setting blocks of proper size shall be installed in sill rabbet, located one quarter of glass width from each corner, but with edge nearest corner not closer than 6 inches from corner,

unless otherwise required. Blocks shall be set in a thin course of sealant which is acceptable for heel bead use.

- J. Spacers shall be provided, inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (length plus height), except where gaskets or glazing tapes with continuous spacer rods are used for glazing. 1/8-inch minimum bite of spaces shall be provided on glass and thickness equal to sealant width shall be used, except with sealant tape, thickness shall be employed which is slightly less than final compressed thickness of tape.
- K. Edge blocking shall be provided to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.
- L. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, adequate anchorage shall be provided to ensure that gasket will not "walk" out when installation is subjected to movement.
- M. Wedge-shaped gaskets shall be miter-cut at corners and gaskets shall be installed in manner recommended by gasket manufacturer to prevent pull away at corners; seal corner joints and butt joints with sealant recommended by gasket manufacturer.
- N. **View Window Watertightness:** The CONTRACTOR shall coordinate the WORK of all trades to ensure view windows in the hydraulic structures are watertight. The glazing gaskets at view window shall have corners vulcanized. Glass shall be set into a full sealant setting bed to prevent water from reaching laminations and causing delamination.
- O. **Safety Markings:** Glass, glazing panels, and glazing shall be protected by markings or devices which clearly indicated the presence of glass to other workers and materials handlers. Taping or marking which would cause a permanent stain on the glass shall not be used. Labels shall remain on the glass until final cleaning.

3.5 TESTING

- A. After installation is complete, all exterior glazing, except for aluminum entrance doors, shall be given a leak test by flooding the installed surfaces from bottom to top, using 3/4-inch minimum hose with nozzle.

3.6 ACCEPTANCE AND CLEANING

- A. Glass shall be protected from contact with contaminating substances resulting from construction operations. If contaminating substances come into contact with glass, they shall be removed immediately by method recommended by glass manufacturer.
- B. Glass surfaces adjacent to or below exterior concrete and other masonry surfaces shall be examined at frequent intervals during construction, but not less often than once a month, for build-up of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, they shall be removed by a method recommended by glass manufacturer.
- C. Glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period shall be removed and replaced.

- D. Not more than 4 days prior to final acceptance of the WORK, nonpermanent labels shall be removed and the surfaces shall be cleaned. Glass shall be washed on both faces by method recommended by glass manufacturer.

** END OF SECTION **