SECTION 08 80 00
GLAZING

PART 1 – GENERAL

1.1 SUMMARY

A. General requirements and definition of glass types for glazing work specified under other individual specifications.

B. Furnish and install the following:

1. Tempered glass in hollow metal doors and frames.
2. Wireless fire resistant rated glazing in designated rated doors and frames.
3. All materials required to properly install glass furnished hereunder, including sealant, tapes, setting blocks, and spacers.

C. Work of this section includes installation of glazing beads furnished under related sections.

1.2 RELATED REQUIREMENTS

A. Section 06 10 00 - ROUGH CARPENTRY: Installation of steel door frames.

B. Section 07 92 00 - JOINT SEALANTS: Requirements for sealants and backing materials.

C. Section 08 11 13 - HOLLOW METAL DOORS AND FRAMES: Steel doors, door and window frames, and related glazing stops, for both fire-resistance rated (labeled) and non-rated (labeled) conditions.

1.3 REFERENCES

A. Referenced Standards: Comply with applicable requirements of the following standards and those others referenced in this Section, under the provisions of Section 01 42 00 - REFERENCES. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

1. AAMA 804.1 - Ductile Back-Bedding Compound.
2. ASTM C 1036 - Flat Glass.
3. ASTM C 1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
4. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.
5. Consumer Product Safety Commission (CPSC) 16CFR 1201 Code of Federal Regulations for Architectural Glazing Materials.
6. Federal Safety Standards for Architectural Glazing Materials 16CFR1201.
7. NFPA Publication 80 - Fire Doors and Windows.
8. SGCC: Certified Products Directory, and Certification Guidelines.

B. Inclusionary References: The following reference materials are hereby made a part of this Section by reference thereto:

1. GANA Laminated Glazing Reference Manual (2009 edition).
2. GANA - Glazing Manual (50th Anniversary edition).
3. Consumer Product Safety Commission-Safety Standard for Architectural Glazing Materials.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. General: Coordinate the work of this Section with the respective trades responsible for installing interfacing and adjoining work for proper sequence of installation, and ensure that the work performed hereunder is acceptable to such trades for the installation of their work.

B. Sequencing:

1. Field Measurements:
   a. Take field measurements before preparation of shop drawings and fabrication, where possible, to ensure proper fitting of Work.
   b. Allow for adjustments within specified tolerances wherever taking of field measurements before fabrication might delay Work.

1.5 SUBMITTALS

A. Information and Review Submittals: Submit the following under provisions of Section 01 33 00 - SUBMITTAL PROCEDURES:

1. Product Data:
   a. Product data sheets on glazing products: Provide chemical, functional, and environmental characteristics, size limitations, special application requirements. Identify available colors.
   b. Sample Warranty: Provide copies of manufacturers' actual warranties for all materials to be furnished under this Section, clearly defining all terms, conditions, and time periods for the coverage thereof.
2. Shop Drawings: Show sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.
   a. Plans and elevations 1/4 inch scale of each type of glazing assembly, and mirror assembly; indicate dimensions, and reference details. Verify dimensions with field measurements.
3. Verification Samples:
   a. 12 x 12 inch pieces of each specified type and thickness of glass, bearing labels indicating locations where each type of glass will be used.
   b. Glazing tape: 12 inch length of specified type and size.
4. Certificates: Manufacturer's written certification stating that the materials installed, meet or exceed the requirements specified under this Section.

B. Closeout Submittals: Submit the following under provisions of Section 01 78 00 - CLOSEOUT SUBMITTALS.

1. Bonds and Warranty Documentation:
   a. Manufacturer’s Warranties and Guarantees as specified elsewhere herein this Section.

1.6 QUALITY ASSURANCE

A. General: Perform glazing work in accordance with GANA - Glazing Manual, FGMA Glazing Manual, SIGMA and LSGA standards for glazing and installations methods.

1. Notify the Architect where conflicts apply between referenced standards and existing materials, and existing methods of construction.

B. Glass Labeling:

1. General: Manufacturer's Label shall be acid-etched, sandblasted, ceramic-fired, laser- etched, embossed, or other similar type which, once applied, cannot be removed without being destroyed.
2. Safety glass: Label tempered and laminated safety glass with permanent manufacturer's label on each light with the mark visible after installation.
    a. Furnish SGCC certification for safety glass in compliance with CPSC 16 CFR 1201 Cat 1 or Cat 11, or ANSI Z-97.1.
3. Fire-rated glass: Label each individual glazing unit with appropriate UL, Warnock Hersey, or other approval labeled markings with the listing mark visible after installation.

C. Qualifications:

1. Fabricators: Glazier specializing in applying the work of this Section with a minimum of 5 years' experience.
2. Installer/Applicator: Minimum of 3 years documented experience demonstrating previously successful work of the type specified herein.

1.7 DELIVERY, STORAGE AND HANDLING

A. Delivery and Acceptance Requirements:

1. Do not deliver items to the site, until all specified submittals have been submitted to, and approved by, the Architect.
2. Deliver materials in labeled, protective packages, when and as required.

B. Storage and Handling Requirements:

1. Store and handle in strict compliance with manufacturer's instructions and recommendations of GANA Glazing Manual. Use clean gloves and tools when handling materials, avoid contamination. Use rolling blocks and suction cups to move glass units not in shipping crates.
    a. Carefully store materials to avoid overloading any building component or structure.
    b. Do not unpack material until it is to be set, unless un-packing is required for inspection by the Architect.
2. Protect factory finished materials from damage due to moisture, direct sunlight, excessive temperatures, surface contamination, corrosion and damage from construction operations and other causes.

1.8 SITE CONDITIONS

A. Do not install glazing when ambient temperature is less than 50 degrees Fahrenheit.

B. Maintain minimum ambient temperature before, during and 24 hours after

installation of glazing compounds.

1.9 WARRANTY

A. General: Submit warranties under provisions of Section 01 78 00 - CLOSEOUT SUBMITTALS.

B. Manufacturer Warranty/Guarantee: All shall include replacement of defective glass and mirrors, and delivery of replacement glass products furnished f.o.b. from point of manufacturer to project site.

1. Laminated glass: Manufacturer's 4 year written guarantee covering against defects in materials and workmanship of laminated glass and replacement of the same. Warranty shall be effective from date of original factory shipment to site.

a. Provide coverage in Guarantee for manufacturing defects, including failure of laminated glass units as evidenced by edge separation, delamination, or discoloration of inner layer.

PART 2 - PRODUCTS

2.1 GLASS - GENERAL

A. General requirements for glass: Of domestic and foreign manufacture, conforming to the referenced standards and with the additional requirements specified herein; factory labeled on each pane stating the strength, type, thickness and quality; with all labels remaining on glass until final cleaning.

1. Glass thickness shown and heat treatment specified are minimum requirements. Provide glass thickness and heat treatment as required to meet specified performance criteria, State and local codes and ordinances.

B. Float Glass: Comply with ASTM C 1036, Class 1 clear, quality q3 glazing select.

C. Heat Strengthened Glass: Comply with ASTM C 1048 HS, heat strengthened, Class 1 clear, quality q3 glazing select.

D. Tempered Glass: Comply with ASTM C 1048 FT, fully tempered, Class 1 clear, quality q3 glazing select, conforming to ANSI Z97.1.

E. Laminated glass: consisting of an outer face and inner face of specified glass, factory laminated to translucent polyvinyl butyl (PVB) innerlayer equal to Monsanto "Saflex" or DuPont "Butacite. Certified by Safety Glazing Certification Council. Glass shall be free from foreign substances and air pockets.

2.2 GLASS – TYPES

A. Glass Type 1: Not Used

B. Glass Type 2: Not Used.

C. Glass Type 3: Not Used

D. Glass Type 4: 8mm-9 mm thick (5/16 inch-3/8 inch) transparent wire-less fire rated ceramic glazing material with polished finish.

1. Acceptable Manufacturers: Subject to compliance with the requirements specified herein, manufacturers offering products which may be incorporated in the work include the following, or approved equal:

a. Nippon Electric Glass Co., Ltd., “Firelite Plus”.
b. Vetrotech Saint-Gobain, “SSG Keralite FR-L”.
c. SAFTI First, “Pyran Platinum L”.

2. For fire rated door assemblies, conform with latest edition of ASTM E152, ASTM E163, NFPA-80, NFPA 252, NFPA 257.
3. Conforms to ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.
4. Permanently identify each individual glazing unit with a listing mark visible after installation.
5. In accordance with manufacturer's specifications, Firelite Plus must be glazed into frames with a similar rating, using silicone glazing compound which shall be supplied with the Firelite Plus material.

2.3 FABRICATION

A. General: Do not fabricate materials until all specified submittals have been submitted to, and approved by, the Architect.

B. Fabricate glass as required to openings with edge clearances and bite on glass as recommended by the manufacturer with clean-cut edges where concealed, and smooth- ground, polished and seamed edges where exposed to view. Do not cut, seam, nip or abrade glass after heat-tempering.
1. For non-tempered to be cut at site, provide glass larger than required so as to obtain clean cut edges without seaming or nipping.

C. Fabricate glass with the following edge treatments.
1. Exposed edges: Polished-finished radiused (penciled).
2. Concealed edges: Cut edges with minimum edge work.
3. Butt-joint edges: Flat round and finished with edges eased.

D. Shop Fabrication:
1. All vision panels and baffles shall be cut to size by manufacturer or by fabricator prior to delivery to site. All glass edges shall be ground smooth, polished and eased. Provide all necessary holes wherever required by the approved Shop Drawings, drilled and tapped to suite project requirements. Do all cutting and drilling prior to tempering.

2.4 ACCESSORIES

A. Glazing tape: Preformed butyl-polyisobutylene rubber with 100 percent solids contained in extruded tape roll form and complying with AAMA 804.1; coiled on release paper; of sizes required for proper glazing. equal to one of the following:
1. Protective treatments 3030 or 606.
2. Tremco Preshimmed 440.
3. Woodmont Chem-Tape 40.

B. Setting blocks: Neoprene, 80-90 shore A durometer hardness, certified to be “silicone compatible”; sized as follows:
1. Length: 0.1 inch per square foot of glass, but not less than 4 inches.
2. Width: equal to glazing rabbet space minus 1/16 inch.
3. Height to suit glazing method and pane weight and area.

C. Spacers: Neoprene, 60-80 shore A durometer hardness; sized as required.

D. Glazing sealant:

1. General glazing sealant: One-part medium modulus, neutral curing, synthetic rubber sealant, having a useful life expectancy of at least 20 years, conforming to ASTM

   C 920, Type S, grade NS, Class 25 for uses NT, G and A, FS TT-S-001543A, Type, Class A. Color as selected by Architect.

   a. Dow Corning Corporation, Midland MI; product, “Silicone Glazing Sealant”.
   b. General Electric Company (GE Silicones) Waterford NY; product, “SilGlaze II SCS2800”.
   c. Tremco, Beachwood OH: product, “Proglaze.

E. Bond-breakers and backing materials: Type recommended by manufacturer of sealants and gaskets.

F. Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

G. Adhesive for back painted glass, clear silicone:

1. Dow Corning Corporation, Midland MI; product, “791”.
2. General Electric Company (GE Silicones) Waterford NY; product, “Silpruf”.
3. Pecora Corporation, Harleysville PA; product, “895”.
4. Sika Corp, Lyndhurst NJ; product, “Sika Sil-C 995”.

2.5 ACCESSORIES FOR WIRE-LESS FIRE-RATED GLAZING

A. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent.

B. Silicone Sealant: One-part neutral curing silicone, medium modulus sealant, Type S; Grade NS; Class 25 with additional movement capability of 50 percent in both extension and compression (total 100 percent); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable. Available Products:

1. Dow Corning Corporation, Midland MI.; product, “795”.
2. General Electric Company (GE Silicones) Waterford NY.; product “Silglaze-II 2800”
3. Tremco, Beachwood OH.; product, “Spectrem 2”.

C. Setting Blocks: Neoprene, EPDM, or silicone; tested for compatibility with glazing compound; of 70 to 90 Shore A hardness.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Inspect receiving surfaces and ensure that they are dry and free from dust, or other foreign materials before glazing. Clean all surfaces with cloth saturated with mineral spirits of high- flash naphtha as recommended by glazing tape manufacturer, before glazing.

B. Field Measurements: Verify that field measurements are as indicated on approved

Shop Drawings.

1. Check all openings, prior to glazing, to make certain that the opening is square, plumb and secure in order that uniform face and edge clearances are maintained.
2. Determine the actual sizes required by measuring the receiving openings. Size glass and mirrors to permit required clearance and bite around full perimeter of glass, as set forth in the referenced FGMA standards, or as recommended by the glass manufacturer. Do not nip edges, to remove flares or to reduce oversize dimensions, under any circumstance.

C. Beginning of installation means acceptance of existing conditions.

3.2 GENERAL INSTALLATION OF GLASS HAVING PERMANENT LABELS

A. Install glass units so that appropriate manufacturer's permanent label for safety glass, and permanent label for fire-rated glass are visible.

3.3 INSTALLATION - DRY GLAZING

A. Utilize dry glazing methods for field installation of glass in interior doors and frames.
   1. Install in vision panels in fire-rated doors and frames to requirements of NFPA 80.

B. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch (2 mm) above sight line.

C. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.

D. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane.

E. Place glazing tape on free perimeter of glazing in manner as described above.

F. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

G. Knife trim protruding tape.

3.4 INSTALLATION - WET GLAZING

A. Place setting blocks at quarter points on web of sill receiving member. Set glass unit in place with equal spaces on all sides.

B. Install spacers at a spacing not exceeding 24 inches apart uniformly around perimeter, between interior face of glass unit and the fixed glazing rabbet.

C. Apply a continuous heel bead of specified sealant between the outer edges if the glass unit and the web of the receiving member, in sufficient quantity to engage the leg of the applied glazing stop, when installed.

D. As the glazing stop is being applied, install spacers between the outer face of the glass unit and the stop, locating the spacers directly opposite the previously installed interior spacers. Install the glazing stops, ensuring that all clearances around the perimeter of the glass unit conform to the requirements of the respective standards referenced herein.

E. Apply a continuous bead of sealant around the exterior and interior perimeters, between the glass unit and the fixed rabbet, and between the glass unit and the applied glazing stop, extending the sealant material slightly above the sight line to permit proper tooling thereof.

F. Tool all exposed sealant at a 45 degree angle away from the glass surface, leaving the sealant surface uniformly dense and smooth.

G. Immediately remove all excess sealant from surfaces of metal and glass.

3.5 PROTECTION

A. Protect glass from breakage immediately upon installation. Use streamers or ribbons suitably attached to framing and held free of the glass. Do not apply warning markings directly to the glass.

B. Cover glass to protect it from activities that might abrade the glass surface.

3.6 CLEANING

A. Clean glass surfaces promptly after installation, exercising care to avoid damage to the same. Remove excess glazing tape, labels, dirt, and other contaminants.

END OF SECTION