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The Description of the Project
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SPECIFICATION DIVISION 8

NUMBER SECTION DESCRIPTION

DIVISION 08 OPENINGS

SECTION 088010 - GLAZING (INTERIOR APPLICATIONS)

END OF CONTENTS TABLE

DIVISION 08 OPENINGS

SECTION 088010 - GLAZING (INTERIOR APPLICATIONS)

*UPDATED TO CORRELATE WITH LANGUAGE IN SECTION 088000 AND
MANUFACTURERS UPDATED - 5/05.*

UPDATED TO INCLUDE FIRE-RATED GLAZING PRODUCTS - 5/04.

*THIS SECTION HAS BEEN PRE-EDITED TO APPLY ONLY TO SMALL
INTERIOR PROJECTS. USE MASTER SPECIFICATION SECTION 088000
"GLAZING") FOR EXTERIOR GLASS.*

*RATHER THAN USING THIS SECTION, CONSIDER INCLUDING VERY SMALL,
NON-COMPLEX GLASS ITEMS IN RELATED SECTIONS. EXAMPLE: GLASS
LITES IN DOORS IN STEEL OR WOOD DOOR SECTIONS; GLASS LIGHTS IN
SIDELITES IN STEEL FRAME OR FINISH CARPENTRY SECTION.
HOWEVER, IF INCLUDING THIS SECTION FOR ANY APPLICATION,
INCLUDE ALL GLAZING APPLICATIONS WITHIN IT.*

PART 1 - GENERAL

1.1 SUMMARY

- A. Extent of glass and glazing work is indicated on drawings.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each glazing material and fabricated glass product required, including installation and maintenance instructions.
- B. Certificate: Submit certificates from respective manufacturers attesting that glass and glazing materials furnished for project comply with requirements.

1.3 DEFINITIONS

- A. Deterioration of Laminated Glass and Gel-Filled Dual-Glazed Units: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning glass units contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1.4 QUALITY ASSURANCE

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated.
 - 1. GANA Publications:
 - a. GANA's "Glazing Manual."

DELETE OPTION IN SUBPARAGRAPH BELOW IF NO LAMINATED GLASS IS SPECIFIED FOR PROJECT.

- b. GANA Laminated Division's "Laminated Glass Design Guide" and

DELETE BELOW IF NO SAFETY GLAZING IS REQUIRED. COORDINATE WITH PART 2 ARTICLES SPECIFYING MONOLITHIC, INSULATING AND LAMINATED GLASS PRODUCTS.

- B. Safety Glazing Standard: Comply with the following:
 - 1. Provide safety glass where indicated and where otherwise required by the Michigan Building Code.

REVISE PARAGRAPH BELOW FROM CATEGORY II MATERIALS TO CATEGORY I MATERIALS IF GLASS PANES ARE STATIONARY OR IN SWINGING DOORS AND ARE LESS THAN 9 SF IN AREA. REFER TO [HTTP://WWW.ACCESS.GPO.GOV/NARA/CFR/WAISIDX_03/16CFR1201_03.HTML](http://www.access.gpo.gov/nara/cfr/waisidx_03/16cfr1201_03.html) FOR COMPLETE DESCRIPTION OF CATEGORY I AND CATEGORY II MATERIALS.

- 2. Where safety glass is indicated, provide type of products indicated which comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.
 - a. Subject to compliance with requirements, provide safety glass permanently marked with certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to Owner.
- C. Fire Resistance Rated Wire Glass: Provide wire glass products that are identical to those tested per ASTM E 163 (UL 9) and are labeled and listed by Underwriters Laboratories (UL) or other testing and inspecting agency acceptable to Authorities Having Jurisdiction.
- D. Glazing for Fire-Rated Door Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by UL or Intertek/Warnock Hersey, for fire-protection ratings indicated, based on testing according to NFPA 252.

RETAIN PARAGRAPH ABOVE FOR DOORS AND PARAGRAPH BELOW FOR WINDOWS IF WIRED GLASS OR ANOTHER FIRE-RESISTIVE GLAZING PRODUCT IS SPECIFIED IN PART 2.

- E. Glazing for Fire-Rated Window Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by UL or Intertek/Warnock Hersey, for fire ratings indicated, based on testing according to NFPA 257.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect glass and glazing materials during delivery, storage, and handling to comply with manufacturer's directions. Prevent damage to glass and glazing materials.

DELETE THE WARRANTY BELOW UNLESS MULTI-LITE LAMINATED OR GEL-FILLED UNITS IN PART TWO ARE INCLUDED.

1.6 WARRANTY

- A. Manufacturer's Special Warranty on Fire-Rated Laminated Glass and Gel-Filled, Dual-Glazed Units: Manufacturer's standard form, made out to Owner and signed by manufacturer agreeing to replace units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

SELECT APPROPRIATE APPLICATIONS BELOW.

- B. Primary Glass:
AFG Industries.
Guardian Industries Corp.
Pilkington Group
PPG Industries, Inc.
Visteon.
- C. Wire and Patterned Glass:
AFG Industries.
Guardian Industries.
Pilkington Group.
- D. Laminated Glass:
AFG Industries.
Guardian Industries Corp.
Interpane Glass Company.
PPG Industries, Inc.
Oldcastle Glass Group.
- E. Fire Rated Glazing:

EDIT LIST AFTER SELECTING TYPE OF FIRE-RATED GLAZING TO BE USED. NOT ALL TYPES OF PRODUCTS ARE MADE BY EACH OF THE MANUFACTURERS LISTED.

1. Glaverbel S.A.; distributed by Interedge Technologies.
2. Interedge Technologies.
3. R. Four Ltd.; distributed by Technical Glass Products.
4. Nippon Electric Glass Co., Ltd.; distributed by Technical Glass Products.
5. Pilkington Group; distributed by Technical Glass Products.
6. SAFTI; a Division of O'Keeffe's, Inc.
7. Vetrotech Saint Gobain North America.

2.2 GLASS PRODUCTS

SELECT FROM UNITS BELOW. REFER TO AIA MASTERSPEC FOR ADDITIONAL GLASS TYPES.

- A. Clear Float Glass: ASTM C 1036 Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select).
- B. Tinted Float Glass: ASTM C 1036 Type I (transparent glass, flat), Class 2 (tinted heat absorbing and light reducing), Quality q3 (glazing select) and as follows:
 - 1. Gray: Manufacturer's standard tint.

WIRED GLASS IS NOT RECOGNIZED AS SAFETY GLAZING IN THE 2006 MBC, WHICH REQUIRES SAFETY GLAZING IN DOORS EXCEPT IN OPENINGS THROUGH WHICH A 3-INCH SPHERE IS UNABLE TO PASS.

USE OF WIRED GLASS IS ALSO LIMITED TO OPENINGS WITH A FIRE RATING OF 45 MIN. OR LESS.

THE USE OF WIRE GLASS IS NOT RECOMMENDED, PARTICULARLY IN ATHLETIC AND CHILD CARE FACILITIES.

- C. Wired Glass: ASTM C 1036 Type II (patterned and wired glass, flat), Class 1 (clear), Quality q6; complying with ANSI Z97.1; 1/4 inch thick; of form and mesh pattern indicated below:

SELECT ONE BELOW.

- 1. Polished Wire Glass: Form 1 (wired, polished both sides), Mesh m1 (diamond).
 - 2. Polished Wired Glass: Form 1 (wire, polished both sides) Mesh m2 (square).
- D. Patterned Glass: ASTM C 1036 Type II (patterned and wired glass, flat), Form 3 (patterned), Quality q8 (glazing), Finish f1 (patterned one side), of thickness, pattern and class indicated below:

BELOW ARE TWO EXAMPLES. OTHER PATTERNS ARE AVAILABLE FROM MANUFACTURERS LISTED IN 2.1.D.

- 1. Pattern p2 (geometric): 1/4 inch thick; Class 1 (translucent).
 - a. Manufacturer/Product: Subject to compliance with requirements, one of the following:
"Burlap"; Hordis Brothers.
"Flax"; AFG.
- 2. Pattern p3 (random): 1/4 inch thick; Class 1 (translucent).
 - a. Manufacturer/Product: Subject to compliance with requirements, one of the following:
"Industrex"; AFG.

THE FOLLOWING ARE SAFETY GLAZING MATERIALS.

- E. Clear Tempered Float Glass: ASTM C 1048 Condition A (uncoated surfaces), Type I (transparent glass, flat), Class I (clear), Quality q3 (glazing select), Kind FT (fully tempered).

- F. Laminated Safety Glass: ASTM C 1172, two panes of glass of equal thickness, laminated together with interlayer, and complying with requirements indicated below:
1. Thickness: Nominal 1/4 inch.
 2. Glass Characteristics: Float glass, Class 1 and clear for both panes; 1/8 inch thick for both panes.
 3. Interlayer: Clear PVB plastic, not less than 0.030 inches thick, unless specified otherwise in this Section.

2.3 FIRE-RATED GLAZING ASSEMBLIES

IF RETAINING ONE OR MORE PRODUCTS IN THIS ARTICLE, ALSO RETAIN APPLICABLE "GLAZING FOR FIRE-RATED DOOR ASSEMBLIES" OR "GLAZING FOR FIRE-RATED WINDOW ASSEMBLIES" PARAGRAPHS IN PART 1 "QUALITY ASSURANCE" ARTICLE.

NOTE THAT ALL OF THE PRODUCTS LISTED BELOW ARE REQUIRED TO BE INSTALLED AS PART OF AN APPROVED ASSEMBLY, AND THAT THE ASSEMBLY IS TESTED AS A UNIT.

- A. General: Products described in this article consist of tested assemblies containing both glazing material and manufacturer's approved framing systems.

PRODUCTS DESCRIBED IN FIRST PARAGRAPH AND ASSOCIATED SUBPARAGRAPHS BELOW DO NOT QUALIFY AS SAFETY GLAZING.

- B. Assemblies Containing Monolithic Ceramic Glazing Material: Proprietary product in the form of clear flat sheets of 3/16-inch nominal thickness weighing 2.5 lb/sq. ft., and as follows:

MODIFY SPECIFIED FIRE RATING AS REQUIRED FOR PROJECT. PRODUCTS LISTED BELOW CAN HAVE UP TO A 90-MINUTE RATING.

1. Fire-Protection Rating: 45 minutes, and permanently labeled by UL or Intertek/Warnock Hersey.
2. Product: Subject to compliance with requirements, provide one of the following:

DO NOT SELECT "PREMIUM FIRELITE" UNLESS APPEARANCE IS VERY IMPORTANT. PREMIUM IS CONSIDERABLY MORE EXPENSIVE THAN STANDARD, BUT PROVIDES BETTER OPTICAL CLARITY AND CLEARER COLOR.

- a. "Premium FireLite" (polished on both surfaces) by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products.
- b. "Standard FireLite" (unpolished on both surfaces) by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products.
- c. SGG Keralite FR-R (unpolished on both surfaces) by Vetrotech Saint Gobain North America.

PRODUCTS DESCRIBED IN PARAGRAPH AND ASSOCIATED SUBPARAGRAPHS BELOW DO QUALIFY AS SAFETY GLAZING.

FOR APPLICATIONS WHERE OPTICAL CLARITY IS EXTREMELY IMPORTANT, CHANGE "UNPOLISHED" TO "POLISHED" IN PARAGRAPH BELOW AND

DELETE KERALITE, WHICH IS ONLY AVAILABLE UNPOLISHED. COST FOR POLISHED PRODUCT WILL BE CONSIDERABLY HIGHER.

- C. Assemblies Containing Film-Faced Ceramic Glazing Material: Proprietary Category II safety glazing product in the form of a 3/16-inch-thick, ceramic glazing material unpolished on both surfaces, faced on one surface with a clear glazing film, and as follows:

MODIFY SPECIFIED FIRE RATING AS REQUIRED FOR PROJECT.

1. Fire-Protection Rating: 45 minutes, and permanently labeled by UL or Intertek/Warnock Hersey.
2. Product: Subject to compliance with requirements, provide one of the following:
 - a. "FireLite NT" by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products.
 - b. SGG Keralite FR-F by Vetrotech Saint Gobain North America.

PRODUCTS DESCRIBED IN PARAGRAPH AND ASSOCIATED SUBPARAGRAPHS BELOW ARE LAMINATED AND QUALIFY AS SAFETY GLAZING, WITH SIMILAR PERFORMANCE TO PRODUCTS ABOVE. THEY MAY BE MORE DURABLE BECAUSE THERE IS NO EXPOSED FILM WHICH COULD BE DAMAGED. HOWEVER, THEY ARE MORE EXPENSIVE THAN THE PRODUCTS ABOVE.

- D. Assemblies Containing Laminated Ceramic Glazing Material: Proprietary Category II safety glazing product in the form of 2 lites of clear ceramic glazing material laminated together to produce a laminated lite of 5/16-inch nominal thickness; polished on both surfaces; weighing 4 lb/sq. ft.; and as follows:

MODIFY SPECIFIED FIRE RATING AS REQUIRED FOR PROJECT. BOTH ARE AVAILABLE WITH UP TO A 3-HOUR RATING IN DOORS (SIZE LIMITATIONS APPLY) AND UP TO 90 MINUTES IN OTHER LOCATIONS.

1. Fire-Protection Rating: 45 minutes, and permanently labeled by UL or Intertek/Warnock Hersey.
2. Product: Subject to compliance with requirements, provide one of the following:
 - a. "FireLite Plus" (polished on both surfaces) by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products.
 - b. SGG Keralite FR-L (unpolished on both surfaces) by Vetrotech Saint Gobain North America.

PRODUCT IN FIRST PARAGRAPH AND SUBPARAGRAPHS BELOW DOES NOT PASS HOSE-STREAM TEST, BUT DOES QUALIFY AS SAFETY GLAZING. CONSIDER USING IN 20-MINUTE DOORS IN LIEU OF WIRED GLASS.

- E. Assemblies Containing Specially Tempered Monolithic Glass: Proprietary Category II safety glazing product in the form of a specially tempered 1/4-inch-thick monolithic lite, and as follows:

1. Fire-Protection Rating: 20 minutes, and permanently labeled by UL or Intertek/Warnock Hersey.
2. Product: Subject to compliance with requirements, provide one of the following:
 - a. "SuperLite" by SAFTI; a Division of O'Keefe's Inc.

- b. "PyroEdge-20" by Interedge Technologies.
- c. "Fireglass 20" by Technical Glass Products.
- d. "PyroSwiss Extra" by Vetrattech Saint-Gobain.

THE FOLLOWING TWO CATEGORIES OF FIRE-RESISTANT GLAZING ARE CONSIDERABLY THICKER THAN 1/4" AND WILL REQUIRE SPECIAL FRAMING TO FIT IN A DOOR OR WINDOW. CONSIDER USE ONLY WHERE A BARRIER TO RADIANT HEAT PER ASTM E119 IS REQUIRED.

- F. Assemblies Containing Laminated Glass with Intumescent Interlayers: Proprietary Category II safety glazing product in the form of multiple lites of Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1 (clear), Kind FT (fully tempered) float glass laminated with intumescent interlayers; and as follows:

- 1. Fire-Protection Rating: 60 minutes, and permanently labeled by UL or Intertek/Warnock Hersey.

MODIFY FIRE-PROTECTION RATING ABOVE AND PRODUCT NUMBER BELOW TO CORRESPOND WITH FIRE RATING REQUIRED FOR THE ASSEMBLY. THE THREE PRODUCTS BELOW MAY BE SEPDIIFIED WITH UP TO A 2-HOUR RATING, AND THEY QUALIFY AS A RADIANT AND CONDUCTIVE HEAT BARRIER.

- 2. Product: Subject to compliance with requirements, provide one of the following:
 - a. "PyroStop" by Pilkington Building Products North America and distributed by Technical Glass Products.
 - b. "Pyrobel-60-25" by Glaverbel S.A. and distributed by Interedge Technologies.
 - c. SGG Swissflam 60-N2 by Saint Gobain North America.

- G. Assemblies Containing Gel-Filled, Dual-Glazed Units: Proprietary Category II safety glazing product in the form of two lites of Condition A (uncoated surfaces), Type I (transparent flat glass), Class 1 (clear), Kind FT (fully tempered) float glass; with a perimeter metal spacer separating lites and dual-edge seal enclosing a cavity completely filled with clear, fully transparent, heat-absorbing gel.

- 1. Fire-Protection Rating: 60 minutes, and permanently labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.

THE FOLLOWING PRODUCT IS 1 1/8" THICK. MODIFY FIRE-PROTECTION RATING ABOVE AND PRODUCT NUMBER BELOW TO CORRESPOND WITH FIRE RATING REQUIRED FOR ASSEMBLY. ALSO AVAILABLE IN 45-MINUTE, 90-MINUTE AND 120-MINUTE RATINGS.

- 2. Product: Subject to compliance with requirements, "SuperLite II-XL 60 minute" by SAFTI; a Division of O'Keeffe's Inc.

2.4 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Edge Blocks and Setting Blocks: Neoprene, EPDM or silicone as required for compatibility with glazing sealants; of size shape and hardness recommended by manufacturer.
- C. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistance rating.

2.5 FABRICATION OF GLAZING UNITS

- A. 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.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Require Glazier to inspect work of framing erector for compliance with manufacturing and installation tolerances and for effective sealing of joinery. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members to receive glass, immediately before glazing.
- B. Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, tapes, and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.

3.3 GLAZING

- A. General: Comply with combined written instructions of manufacturers of glass, sealants, gaskets and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Provide edge and setting blocks to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.
- C. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

- D. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could when installed, could weaken glass and impair performance and appearance.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.4 PROTECTION AND CLEANING

- A. Protect glass from contact with contaminating substances resulting from construction operations.
- B. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.
- C. Wash glass on both faces by method recommended by glass manufacturer immediately before date of Substantial Completion.

END OF SECTION 088010