

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 This section specifies the requirements for the supply and installation of a light-diffusing, insulated, glass panel system. The work includes providing and installing stackable glass-based panels complete with all associated hardware and flashing.

1.2 RELATED WORK

- .1 Masonry: Section 04 20 00
- .2 Structural Steel for Buildings: Section 05 12 13
- .3 Rough Carpentry: Section 06 10 00
- .4 Sheet Metal Flashing and Trim: Section
- .5 Sealants: Section 07 92 00
- .6 Glazing: Section 08 80 00

1.3 REFERENCES

- .1 American Society of Testing and Materials (ASTM):
 - .1 ASTM E283/E283M-19, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls and Tools Under Specified Pressure Differences Across Specimen.
 - .2 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - .3 ASTM E331-00 (R2016), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Station Air Pressure.
 - .4 ASTM C1036-16, Standard Specification for Flat Glass.
 - .5 ASTM C1048-18, Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
 - .6 ASTM E70-19, Standard Test Method for pH of Aqueous Solutions with the Glass Electrode.
 - .7 ASTM E84-19b, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
 - .8 ASTM D2244-16, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
-

- .9 ASTM C920-18, Standard Specification for Elastomeric Joint Sealants.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: submit manufacturer's technical data. Include construction details, material descriptions, profiles, and finishes of components.
 - .1 Insulation U-Factor
 - .2 Solar Heat Gain Coefficient
 - .3 Visible Light Transmission
- .3 Submit shop drawings that show elevations and details.
- .4 Shop drawings to be stamped by an Architect or Engineer licensed to practice in the Place of Work.
- .5 Submit installer certificate, signed by installer, certifying compliance with project qualification requirements. If the installer is not yet certified to install this product, the installer must submit written verification or assurance, from the manufacturer, of the commitment for installation instruction, training and certification specific to this project.
- .6 Submit product reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements set forth in subsection based on comprehensive testing of current products. Previously completed reports will be acceptable provided they show the current manufacturer and are indicative of products used on this project.
 - .1 Reports required are:
 - .1 Air Leakage (ASTM E283)
 - .2 Structural Performance (ASTM E330)
 - .3 Water penetration (ASTM E331)
- .7 Daylighting Study: visible light transmittance to be as agreed upon between the Consultant and the manufacturer and will be based on daylighting studies conducted using Radiance software developed by Lawrence Berkeley National Laboratory and as provided by the manufacturer as a part of this work. Studies to demonstrate the improvement of light distribution and light levels from the use of diffuse light from translucent glazings. Study will include modelling results of light levels throughout the space to be analyzed

1.5 QUALITY ASSURANCE

- .1 Single Source Responsibility for Glass: provide glass produced by a single primary manufacturer for each kind and condition of glass indicated and composed of primary glass obtained from a single source for each type and class required.
- .2 Installers must have their first installation of the product listed in subsection 2.1 supervised and approved by the manufacturer's technical product representative to attain the certification listed in subsection 1.4.5 herein. If the installer is not yet certified to install this product, the installer must submit written verification, from the manufacturer, of the commitment for installation instruction, training and certification specific to this project.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Protect panels and associated components and parts during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass.

1.7 PROJECT CONDITIONS

- .1 Environmental Conditions: do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.

1.8 WARRANTY

- .1 Submit Translucent Glazing Panel (TGP) manufacturer's warranty against defects and workmanship for a period of ten (10) years from date of purchase, including:
 - .1 Discolouration of veil material by more than 2.0ΔE (ASTM D2244)
 - .2 Loss of light transmittance greater than 3%, determined according to manufacturer's technical data
 - .3 Seal leakage
 - .4 Substantial deterioration of insulating insert.
 - .5 Crushing or corrosion of spacer
 - .6 Build-up of visible internal moisture

PART 2 - PRODUCTS

2.1 ACCEPTABLE "TRANSLUCENT WALL ASSEMBLY" MANUFACTURERS

- .1 Advanced Glazings Limited, P.O. Box 1460 Station "A", Sydney, N.S. Canada, B1P 6R7, phone (902) 794-2899, email info@advancedglazings.com

2.2 SYSTEM PERFORMANCE REQUIREMENTS

- .1 When requested, include structural analysis data signed and sealed by the professional engineer licensed to practice in the place of the Work.
- .2 Standard panel system to have less than 0.01 cfm/ft² air leakage by ASTM E283 at 6.24 PSF (50mph) and no water penetration by ASTM E331 at 15 PSF; and structural testing by ASTM E330.

- .3 Structural loads; provide system capable of handling the following loads:

[SPEC NOTE: Consultant to fill this in, this will also determine size and thickness of glass units]

- .1 Positive Wind Load: _____ PSF
- .2 Negative Wind Load: _____ PSF

2.3 TRANSLUCENT INSULATING GLASS PANEL

- .1 Translucent Glass Panel (TGP) Design and Appearance:
 - .1 TGP to be of a design such as to present a monolithic glass section without visible internal framing, support or other solid member inside of the perimeter spacer. The ability to use nearly any type or manufacture of architectural flat glass shall enable the visual integration of translucent surfaces with those of nearby vision glass as well as ensuring that the appearance of the translucent glazing surfaces does not deteriorate over the life of the building.
- .2 Translucent Glass Panel Description:
 - .1 Air filled pre-assembled units consisting of:
 - .1 Two (2) lites of glass.
 - .2 Honeycomb transparent insulation core aligned perpendicular to glazing, for TGU thermal insulation.
 - .3 Translucent veils, attached to both glass surfaces.
 - .4 Glass lites connected together with aluminium spacer bar using structural silicone sealant.
 - .5 Airspace within TGU filled with air pressure equalized to atmospheric pressure with stainless steel capillary pressure equalization (vent) tube located within the toggle channel.
 - .6 TGP not to contain in excess of 0.01 parts per million by weight each of Volatile Organic Compounds, asbestos, resorcinol-formaldehyde, pheono-resorcinol formaldehyde, urea formaldehyde, CFC, HFC, HCFC, Halon, Benzene, Cadmium (and compounds, Carbon tetrachloride,

cyanide (and compounds) Toluene, Xylenes, Lead, 1, 1, 1, Trichlorethane, Trichlorethylene, MEDk, and MIK.

- .3 Overall thickness and size:
 - .1 Overall thickness: 3" (76.2mm) and 4" (110.0mm).
 - .2 Maximum overall size, edge of glass: 96" (2438mm) wide x 36" (914mm) high.
- .4 Translucent Glass Panel Performance:
 - .1 Thermal insulation (U-value): 0.2-0.040 (Btu/hr•ft²•°F/BTU)*
 - .2 Thermal insulation (R-value): 5.0-25.0 (hr•ft²•°F/BTU)*
 - .3 Light diffusing power (LDP): LDP >0.9
 - .4 Daylight transmittance: 7% to 55%*
 - .3 Shading coefficient: 0.08 to 0.61*
 - .4 Solar heat gain coefficient (no shade): SHGC=0.07 to 0.51*
 - .5 Sound transmittance class (STC) (ASTM E70): may exceed 52
 - .6 Maximum colour shift: [2 Δ E] over 5 years
 - .7 Flame spread (ASTM E84): five (5)
 - .8 Smoke developed (ASTM E84): ten (10) years

[SPEC NOTE: * - subject to glass, insulating core and veil combination]

.5 Glass:

[SPEC NOTE: Consultant to select]

- .1 Outboard lite: ¼" (6mm) tempered clear as manufactured by:
 - .1

[SPEC NOTE: Consultant to select]

- .2 Inboard lite: ¼" (6mm) tempered clear as manufactured by:
 - .1

[SPEC NOTE: Consultant to select]

.6 Veil set:

- .1 [SPEC NOTE: Consultant to select based on the desired level of visible transmittance]

2.4 ELASTOMERIC GLAZING SEALANTS AND PREFORMED GLAZING TAPES

- .1 General: provide products in accordance with Section 07 92 00 - Sealants and Glazing to Section 08 80 00 and of type indicated and complying with following requirements:
 - .1 Glazing sealants and glazing tapes: to glazing frame manufacturer's standards.
 - .2 Compatibility: select glazing sealants and tapes 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.
 - .3 Suitability: comply with recommendations of sealant and glass manufacturers for selection of glazing sealants and
-

tapes which have performance characteristics suitable for applications indicated and conditions at time of installation.

- .4 Elastomeric sealant standard: provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C920 requirements, including those for Type, Grade, Class and Uses.
- .5 Colours: provide colour of exposed sealants indicated or, if not otherwise indicated, as selected by the Consultant from the manufacturer's standard colours.

2.5 MISCELLANEOUS GLAZING MATERIALS

- .1 Compatibility: provide materials with proven record of compatibility with surfaces contacted in installation.
- .2 Cleaners, primers and sealers: type recommended by sealant or gasket manufacturer.
- .3 Setting Blocks, Spacers: must be compatible with translucent wall assembly.
- .4 All supporting materials will be non-ferrous materials supplied by the translucent wall assembly manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Have the glazing installer inspect work of the perimeter framing for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for existence of minimum required face or edge clearances; and for effective sealing of joinery. Have the glazing installer provide a written report, listing conditions detrimental to the performance of the translucent wall assembly. Do not proceed with the translucent wall assembly until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- .1 Clean all components of the translucent wall assembly including the glass panel, sill tray, starter backer plate, side jambs and header and other framing members prior to installation receive glass, immediately before glazing. Ensure all gaskets and seals are clean and free of damage and/or defects. Remove coatings,
-

which are not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.

- .2 Metal Protection:
 - .1 Where aluminium will contact dissimilar, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
 - .2 Where aluminium will contact concrete, masonry or pressure treated wood, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.

3.3 INSTALLATION, GENERAL

- .1 Glazing Standards:
 - .1 Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.
 - .2 Glass: to ASTM C1036 and ASTM C1048.
 - .2 Preparation of anchor points (bottom, sides, top) in the rough opening is required by others prior to installation of the translucent wall assembly. Consultant with the architect, general contractor and the installer will be required to ensure compliance of the manufacturer's installation procedures.
 - .3 Anchor component parts securely in place by permanent mechanical fasteners as approved by the manufacturer.
 - .4 Accommodate thermal and mechanical movements.
 - .5 Set perimeter framing in a bed of sealant compound or joint fillers or gaskets to provide weather-tight construction.
 - .6 Install joint sealants at the perimeter joints and with the panel system in accordance with the manufacturer's installation instructions.
 - .7 Apply anti-seize compound where stainless steel fasteners are used with stainless steel pem nuts.
 - .8 Comply with combined printed recommendations of glass manufacturers, manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirement are indicated, including those of referenced glazing standards.
-

- .9 Protect glass from edge damage during handling and installation; use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift TGU; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one (1) horizontal edge that would occur in vicinity of seating blocks so that these are located at top of opening. 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.
- .10 Apply primers to joint surfaces where required for adhesion of sealants, as determined by pre-construction sealant substrate testing.
- .11 Anchor components securely in place in manner indicated. Shim and allow for movement resulting from changes in thermal conditions. Provide separators and isolators to prevent corrosion, electrolytic deterioration, and "freeze-up" of moving joints.
- .12 Glazing: inspect glass and framing for compliance with manufacturing and installation tolerances, including size, squareness, and offsets at corners; for existence of minimum face or edge clearances; and for effective sealing of joinery.
 - .1 Avoid point loading of glass. Do not proceed with glazing work until unsatisfactory conditions have been corrected. Do not field-cut glass.
 - .2 Field-Glazed structural silicone glazing work: clean frames and glass surfaces with an approved solvent. Prime surfaces and apply structural sealant in accordance with manufacturer's recommendations. Clean excess structural sealant. Mechanically hold glass firmly in place until sealant is sufficiently cured. Install compressible backer rods in joint before applying weather seal sealant.

3.4 PROTECTION AND CLEANING

- .1 Remove non-permanent labels and clean surfaces.
 - .2 Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method recommended by glass manufacturer.
 - .3 Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces 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, remove by method recommended by glass manufacturer.
-

- .4 Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.