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| **Solutions in Polycarbonate LLC** |  |
| **WindowTherm® Window Wall System Guide Specification** | |
|  | Ver. 0.81 Dated 2/15/2017 |

**SECTION 08 45 13 – STRUCTURED POLYCARBONATE PANEL ASSEMBLIES**

PART 1 – GENERAL

* 1. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplemental Conditions, along with Division 01 Specification Sections, apply to this Section.
   1. SUMMARY
2. Section includes aluminum framed assemblies glazed with structural polycarbonate panels as follows:
3. Vertically Glazed Assemblies – Windows
4. Vertically Glazed Assemblies – Window Wall Systems
   1. ACTION SUBMITTALS
5. Product Data: For glazing, aluminum, finish, and gaskets
6. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work
7. Samples: Include aluminum framing and glazing in color as specified
   1. INFORMATIONAL SUBMITTALS

A. Product Test Reports:

1. Panels:

a. ASTM E84 – Flame Spread & Smoke Development

b. ASTM D635 – Burn Extent

c. D1929 – Spontaneous & Self-Ignition Temperature

d. NFRC 201 – Center of Panel SHGC

2. System:

a. NFRC 101 – System U-Value

b. ASTM E283 – Air Infiltration

c. ASTM E330 – Structural Loading

d. ASTM E331 – Water Infiltration

1. Warranty: Sample Warranty for project
2. Maintenance data

1.5 QUALITY ASSURANCE

1. Installer Qualifications – Authorized factory installer who is trained specifically for the installation of structured polycarbonate panel assemblies is required for this project.

1.6 WARRANTY

1. Special Warranty: System Manufacturer agrees to repair or replace components of the panel system that fail in materials or workmanship within warranty period.
2. Failures include the following:
3. Structural failures due to excessive deflection under established design loads.
4. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
5. Uncontrolled Water infiltration.
6. Warranty period is **FIVE YEARS** from date of installation to be indicated on Warranty.
7. Polycarbonate Panel Warranty: System Manufacturer’s warranty that agrees to replace panels that exhibit signs of defect in the material
8. Defect include the following:
9. Yellowing in excess of 8% per ASTM D1003 from original pre-installed panels. The system manufacturer shall provide a 12” x 12” sample of the panel from the same material run as those panels provided for the project and to be catalogued and kept for reference by the building owner. This shall be the only means in which to validate the loss in light transmission and yellowing.
10. Delamination – Panel must not fiber bloom or require recoating in order to maintain warranty.
11. Hail damage – No damage to the panel shall occur from hail that is 20mm in diameter and a velocity less than 12 M/S.
12. Warranty period is **TEN YEARS** from date of installation to be indicated on Warranty.
13. Aluminum Finish Warranty: System Manufacturer agrees to repair or replace aluminum components on which finishes fail within the specified warranty period.
14. Failures include, checking, crazing, peeling, chalking, and fading of finishes.
15. Mill – One Year from installation against excessive wear and deterioration subject to chemical environmental conditions which could accelerate the deterioration of the aluminum.
16. Anodized Finish – Five Years from installation
17. Powder Coat – 10 Years from Installation
18. 70% Kynar Painted Finish – 20 Years from installation

PART 2 – PRODUCTS

2.1 MANUFACTURERS: Subject to compliance with the requirements of this Specification Section

1. Basis of Design: WindowTherm® as manufactured by

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1. Other manufacturers wishing to provide materials for this project must submit an application for prior approval 15 days prior to the originally published bid date for the project and be approved per Addendum. The burden of proof as to the acceptable nature of the product for inclusion on the project is the sole responsibility of the submitting manufacture at the discretion of the architect. It is the manufacturer’s responsibility to provide enough information and data with the request in order for the reviewing party to determine the suitability of the submitted product for inclusion on the project.

2.2 PERFORMANCE REQUIREMENTS

1. General Performance: Structured Polycarbonate Panel Assemblies shall withstand the effects of the following forces without failure due to defective manufacture, fabrication, installation, or other defects in construction:
2. Structural Loads
3. Thermal Movement
4. Failure includes the following
5. Deflection exceeding specific limits
6. Uncontrolled Water leakage
7. Thermal stresses transferred to the building structure
8. Loosening or weakening of fasteners, attachments, and other components
9. Structural Loads:
10. Wind Loads – Refer to Structural Notes on Drawings in Structural Section
11. Wind Speed – 90 mph
12. Importance Factor – 1
13. Exposure Category – B
14. Deflection Limits:
15. Window Structural Framing – Limited to L/120 for structural aluminum framing components
16. Glazing Components – Limited to L/60 for Tongue & Groove panel
17. Structural Testing Performance: Based upon ASTM D330
18. When tested at positive and negative wind load design pressures, assemblies do not show evidence of deflection exceeding specified limits.
19. When tested at 150% of positive and negative design wind load pressures, assemblies, including anchorage, do not show evidence of material failure, structural distress, and permanent deformation of main framing members exceeding 1% of span.
20. Test Durations: As required to satisfy current ASTM E330 requirements.
21. System Pressure shall be rated at **45psf** with a 150% safety factor
22. Water Penetration: Provide panel assemblies that do not evidence signs of water penetration through fixed glazing and framing areas when tested per ASTM E331 at a minimum static air pressure difference of 20% of positive wind load pressure but not less than **6.24psf.**
23. Air Infiltration: Provide Tongue & Groove panel system that allows for **0.60cfm** per square foot or less when tested in accordance with ASTM E289 at a pressure of 15psf.
24. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to both aluminum framing and polycarbonate panels.
25. Temperature Change Range – 150 degrees Fahrenheit

2.4 ALUMINUM FRAMING SYSTEMS

1. Components: Multi-piece custom extruded aluminum framing as shown on drawings
2. Aluminum: Alloy and temper per manufacturer’s recommendation in order to meet structural loading as determined by the structural engineer.
3. Brackets, Clips, and Reinforcements: Components must be manufactured from extruded aluminum. Roll formed sheet metal is not acceptable.
4. Fasteners: All fasteners to be Stainless Steel.
5. Flashing: Aluminum sheet not less than 0.040” thick and pre-finished galvanized steel flashing not be less than 26 gauge.
6. Gaskets: Gaskets to be less than 60 Durometer in hardness, extruded with a compatible material for use with polycarbonate resin, and coated with a low friction treatment on the bearing surface. Butyl tapes are not acceptable.
7. Framing Sealants: Only neutral cure structural silicone sealants may be used. Urethane, or other type sealants are not acceptable.
8. Weep Hole: Weep holes must be pre-installed in the aluminum framing per manufacturer’s recommendations

2.5 STRUCTURAL POLYCARBONATE PANELS

1. Description: Translucent extruded polycarbonate sheet with cellular cross section that provides isolated airspaces and that has a co-extruded layer of UV protection
2. Self-Ignition Temperature: 800 degrees Fahrenheit or more per ASTM D1929
3. Spontaneous Ignition Temperature: 950 degrees Fahrenheit or more per ASTM D1929
4. Flame Spread: Not more than 25 per ASTM E84 for Class A rating
5. Smoke Development: Not to exceed 450 per ASTM E84 for Class A rating
6. Burn Extent: Not to exceed 25mm per D635 for CC1 rating
7. Panel Thickness: 40mm
8. Panel Color: Opal
9. Light Transmission: 42%

2.6 ALUMINUM FINISHES (choose one)

1. Mill
2. Anodized: AAMA 611, AA-M12C22a31, Class II 0.010mm or thicker finish in (Clear, Bronze, Black, Champaign)
3. Powder Coat: Per AAMA 2604 in (choose color)
4. 70% Kynar 2-Coat Painted finish: (choose color)

2.7 SEALANT

A. Type: One-component, neutral-cure, RTV (room temperature vulcanizing) silicone rubber sealant for structural and non-structural glazing, structural attachment of panel systems, and above-grade weather sealing joints with most common construction materials; Dow Corning® Contractors Weatherproofing Sealant, as manufactured by Dow Corning Corporation.

B. Compliance: Sealant shall meet or exceed requirements of these standards.

1. ASTM C920, Type S, Grade NS, Class 50, Use NT, G, A, and O.

2. ASTM C1184, Type S, Use G, A, and O.

3. GSA CID A-A-272A - Sealing Compound: Silicone Rubber Base

4. GSA CID A-A-1556 -Sealing Compound Elastomeric Type, Single Component

1. Color: To match Aluminum Framing Finish
2. Volatile organic compound (VOC) content: 28 grams/liter.
3. Urethane sealants are not acceptable for use on polycarbonate glazing and will void the warranty.
   1. GASKET
4. Gaskets: Gaskets to be less than 60 Durometer in hardness, extruded with a compatible material for use with polycarbonate resin, and coating with a low friction treatment on the bearing surface. No butyl tapes are allowed.

PART 3 – EXECUTION

3.1 INSTALLATION

1. General
2. Manufacturer to supply written installation instructions for compliance by installing contractor.
3. Damaged components must be replaced and not installed on project.
4. Joints to utilize splice guides to insure alignment between components is straight and within tolerance.
5. All aluminum joints to be sealed with neutral cure structural silicone sealants.
6. Metal Protection: Where aluminum components will contact dissimilar materials, protect against galvanic reaction by painting substrate surface with two coats of primer or a primer and finish coat.
7. Flashing:
8. For metal buildings, the sill, jamb and head flashing must be installed by others prior to installation prevent the infiltration of water at the window-to-building seam openings.
9. For other building types, sill flashing (optional) must be installed in sill base extrusion prior to installation to prevent the infiltration of water.
10. Alignment: Install components plumb and true in alignment with established lines and elevations.
11. Erection Tolerances: Install panel assemblies to comply with the following maximum tolerances:
12. Alignment Limit offset from true alignment to 1/8” where surfaces abutt in line, edge-to-edge, and at corners.
13. Location and Plane: Limit variation from true location and plane to 1/8’ in 10’0” feet but not greater than ½” over the entire length.

END OF SECTION 08 45 13