1. **GENERAL**
	1. SECTION INCLUDES:
		1. High-Density Fiberglass Direct Glaze Rectangular and Polygon-shaped windows complete with frame and glazing.
	2. CONSTRUCTION SPECIFICATION INSTITUTE (CSI) MasterFormat Numbers and Titles
		1. 01 33 00: Submittal Procedures: Shop Drawings, Product Data and Samples
		2. 01 33 26: Source Quality Control Reporting
		3. 01 62 00: Product Options
		4. 01 65 00: Product Delivery Requirements
		5. 01 66 00: Storage and Handling Requirements
		6. 01 71 00: Examination and Preparation
		7. 01 73 19: Installation
		8. 01 74 23: Final Cleaning
		9. 01 76 00: Protecting Installed Construction
		10. 07 92 00: Joint Sealants
	3. REFERENCES
		1. ASTM International (ASTM):
			1. C1036: Standard Specification for Flat Glass
			2. C1048: Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass
			3. C1376: Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass
			4. E1105: Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference
			5. E1300: Standard Practice for Determining Load Resistance of Glass in Buildings
			6. E2190: Standard Specification for Insulating Glass Unit Performance and Evaluation
			7. E283: Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
			8. E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
			9. E547: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference
		2. American Architectural Manufacturer’s Association/Window and Door Manufacturer’s Association/Canadian Standards Association (AAMA/WDMA/CSA):
			1. AAMA/WDMA/CSA 101/I.S.2/A440: North American Fenestration Standard (NAFS)/Specification for Windows, Doors and Skylights
		3. Window & Door Manufacturer’s Association (WDMA):
			1. WDMA Hallmark Certification Program
		4. Insulating Glass Manufacturer’s Association/Insulating Glass Certification Council (IGMA/IGCC)
		5. American Architectural Manufacturer’s Association (AAMA):
			1. 502: Voluntary Specification for Field Testing Newly Installed Fenestration Products
			2. 611: Voluntary Specification for Anodized Architectural Aluminum
			3. 625: Voluntary Specification, Performance Requirements and Test Procedures for Superior Performance Organic Coatings on Fiber Reinforced Thermoset Profiles
			4. 2605: Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix)
			5. 2603: Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels
		6. National Fenestration Rating Council (NFRC):
			1. 101: Procedure for Determining Thermophysical Properties of Materials for Use in NFRC-Approved Software
			2. 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
	4. SUBMITTALS
		1. Shop Drawings: Submit shop drawings under provision of CSI MasterFormat Section 01 33 00.
		2. Product Data: Submit product data for certified options under provision of CSI MasterFormat Section 01 33 00. Product performance rating information may be provided via quote, performance rating summary (NFRC Data), or certified performance grade summary (WDMA Hallmark data).
		3. Samples:
			1. Submit corner section under provision of CSI MasterFormat Section 01 33 00.
			2. Specified performance and design requirements under provisions of CSI MasterFormat Section 01 33 00.
	5. QUALITY ASSURANCE
		1. Requirements: Consult local code for International Building Code (IBC) and International Residential Code (IRC) adoption year and pertinent revisions
		2. Performance Grade as certified by the North American Fenestration Standard (NAFS)
			1. [Single Units]: NOTE TO SPECIFIER: Glass pane thickness varies per size and performance level
				1. CW-PG-65-SP

Maximum frame size of 8’-5” (2565 mm) by 7’-11 1/2” (2425 mm), tested to 1.57 psf Air, 9.82 psf Water, +/- 65 psf Structural with tempered glass

* + 1. NFRC Certified U Factor:
			1. Gateway tested frame size of 4’-11 1/8” (1502 mm) by 3’-11 1/8” (1197 mm)

NOTE TO SPECIFIER: Refer to the Certified Performance Directory at [www.NFRC.org](http://www.nfrc.org/) for U-Value ratings with various glass types

* + 1. Forced Entry Resistance: Grade 10
	1. DELIVERY, STORAGE, AND HANDLING
		1. Comply with delivery, storage and handling per CSI MasterFormat Section 01 65 00
		2. Deliver in original packaging and protect from weather
		3. Store window units in an upright position in a clean and dry storage area above ground to protect from weather under provision of CSI MasterFormat Section 01 66 00
	2. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within the limits recommended by the manufacturer for optimum results. Do not install products under environmental conditions outside of the manufacture’s recommended limits.
	3. WARRANTY

# Complete and current warranty information is available at [www.marvin.com/warranty](http://www.marvin.com/warranty) (effective 7/29/2020). The following summary is subject to the terms, conditions, limitations and exclusions set forth in the Marvin Windows and Door Limited Warranty and Products in Coastal Environments Limited Warranty Supplement:

* + 1. Glass Components:
			1. Glass warranties apply to factory-installed glass or Marvin-supplied glass installed by Marvin-authorized service personnel. Standard insulating glass with stainless steel spacers is warranted against seal failure caused by manufacturing defects and resulting in visible obstruction through the glass for twenty (20) years in sizes up to sixty (60) square feet, and for ten (10) years in sizes sixty (60) square feet and larger. Non-tempered glass is warranted against stress cracks caused by manufacturing defects for ten (10) years. All other glass and glass features are provided with the same warranties, limitations, and exclusions Marvin receives from its supplier; contact Marvin for further details.
		2. Exterior Finish:
			1. Exterior composite cladding finish is warranted against manufacturing defects per AAMA 625, Section 5, for ten (10) years.
		3. Interior Finish:
			1. Factory-applied interior coated aluminum finish is warranted to be free from finishing defects for a period of ten (10) years.
		4. Non-Glass Components:
			1. Hardware and other non-glass components are warranted to be free from manufacturing defects for ten (10) years. Stainless steel hardware and hardware with PVD finishes installed in coastal environments are warranted to be free from manufacturing defects that result in abnormal deterioration of the finish for a period of ten (10) years. Other hardware finishes are not warranted in coastal environments. Electric operators and other motorized accessories are provided with the same warranties, limitations, and exclusions Marvin receives from its supplier; contact Marvin for further details.
1. **PRODUCTS**
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Marvin, States Avenue, Warroad, Minnesota 56763, 218-386-1430, [www.marvin.com](http://www.marvin.com/)
	2. FABRICATION
		1. Frame:
			1. Exterior: High-Density Fiberglass one piece

NOTE TO SPECIFIER: Installation is screw through jamb, nailing fin is intended for placement

* + - 1. Interior: Extruded Aluminum Covers
				1. Dual-pane 15/16” (24 mm) glass, covers are 2-7/8” (73 mm) deep
				2. [Dual-pane] [Triple-pane] 1-1/4” (32 mm) glass, covers are 2 19/32” (66 mm) deep NOTE TO SPECIFIER: Glass pane thickness varies based on unit size
			2. Overall Thickness: 1-7/16” (37 mm)
			3. Frame Depth: 5-1/2” (140 mm) or greater
			4. Structural Support

NOTES TO SPECIFIER

Glazing General:

* Specifier: Select the applicable glazing type and configuration, refer to the Architectural Detail Manual or Marvin Representative for additional information.

Glazing Pane Thickness:

* Glass types are dependent thickness and availability. Consult ADM or OMS for availability
* Triple-Pane IG pane thicknesses are limited to 4.7mm and below
* Low ELR are limited to pane thicknesses of 5.7mm and below
* Low ERS with other Low E coatings are limited to pane thicknesses of 5.7mm and below
* Obscure (Pattern 62) with Low E are limited to pane thicknesses of 4.7mm and below
* Frost with Low E are limited to pane thicknesses of 5.7 and 3.9 mm
* Tints are limited to pane thicknesses of 5.7mm
* Capillary tubes are required in air spaces for high elevation

Glazing Spacer:

* Stainless Steel spacers on all shapes with angles 45 degrees and larger
* Aluminum spacers on all shapes with angles less than 45 degrees
	+ 1. Glazing:
			1. Top (horizontal) [Dual-Pane] insulating laminated one lite glass with preserve film on interior and exterior panes, rectangular shaped units only
				1. Insulating glass per ASTM E2190
				2. Glass thickness shall be sized to rated design pressure per ASTM E-1300
			2. [Dual-Pane] [Triple-Pane] insulating tempered one lite glass
				1. Safety glazing per CPSC 16 CFR 1201, SGCC, & CAN/CGSB
			3. Configurations:
				1. Dual-Pane insulating glass:

15/16” (24 mm)] thickness

Surface Treatment:

Low E Coating: [Low E2] [Low E3]

Gas Fill:

[Air with capillary tubes] [Argon]

* + - * 1. Triple-Pane insulating glass:

1-1/4” (32 mm) Overall thickness

Surface Treatment:

[Low E2/E1] [Low E3/E1]

Gas Fill:

[Air with capillary tubes] [Argon]

* + - 1. Perimeter spacer material:
				1. [Black painted Stainless Steel] [Black painted Aluminum]
				2. Seal: Black PIB with silicone sealant
		1. Finish:
			1. Interior Frame
				1. Painted extruded aluminum covers with acrylic coating applied that meets AAMA 2603 requirements in [Ebony] [Stone White]
			2. Exterior Corner Covers and underside surface
				1. Painted extruded aluminum covers with 70% PVDF coating applied that meets AAMA 2605 requirements in [Bronze] [Ebony] [Gunmetal] [Stone White]
			3. Exterior Frame:
				1. High-Density Fiberglass coated with a Fluoropolymer FEVE (fluoroethylene vinyl ether) resin with ceramic pigments designed to meet AAMA 625 requirements [Bronze] [Ebony] [Gunmetal] [Stone White]
			4. [Split finishes optional between Interior and Exterior]

1. **EXECUTION**
	1. EXAMINATION AND PREPARATION
		1. Verification of Condition:
			1. Before installation, verify openings are plumb, square and of proper dimensions as required in CSI MasterFormat Section 01 71 00
			2. Report frame defects or unsuitable conditions to the General contractor before proceeding
		2. Acceptance of Condition:
			1. Beginning of installation confirms acceptance of existing conditions
	2. INSTALLATION
		1. Assemble and install window/door unit(s) per manufacturer’s instruction with reviewed and approved shop drawing.
		2. Installation to comply with CSI MasterFormat Section 01 73 19
		3. Install sealant and related backing materials at perimeter of unit or assembly in accordance with CSI MasterFormat Section 07 92 00. Recommend using low-expansion foam sealant.
		4. Install accessory items as required
	3. FIELD QUALITY CONTROL
		1. Unless otherwise specified, air leakage resistance tests shall be conducted at a uniform static pressure of 75 Pa (~1.57 psf). The maximum allowable rate of air leakage shall not exceed 2.3 L/sm2 (~0.45 cfm/ft2)
		2. Unless otherwise specified, water penetration resistance testing shall be conducted per AAMA 502 and ASTM E1105 at 2/3 of the fenestration products design pressure (DP) rating using “Procedure B” – cyclic static air pressure difference. Water penetration shall be defined in accordance with the test method(s) applied
	4. CLEANING AND PROTECTION
		1. Protect installed construction as required in CSI MasterFormat Section 01 76 00
		2. Remove visible labels and adhesive residue per manufacturer’s instruction
		3. Leave windows and glass in a clean condition, final cleaning as required in CSI MasterFormat Section 01 74 23
		4. Protecting windows from damage by chemicals, solvents, paint or other construction operations that may cause damage

END OF SECTION