

BuildingName
The Description of the Project
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SPECIFICATION DIVISION 8

NUMBER SECTION DESCRIPTION

DIVISION 08 OPENINGS

SECTION 085113 - ALUMINUM WINDOWS

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DIVISION 08 OPENINGS
SECTION 085113 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard General Conditions, Supplemental General Conditions, Division 01 Specification Sections, and other applicable Specification Sections, apply to this Section.
- B. Related Sections:
 - 1. Division 07 Section: Air Barriers.
 - 2. Division 07 Section: Flashing and Sheet Metal.
 - 3. Division 08 Section "Aluminum-Framed Entrances and Storefronts."
 - 4. Division 08 Section "Glazed Aluminum Curtain Walls."

1.2 SUMMARY

- A. Section includes:
 - 1. Architectural Performance Class AW aluminum window units and related work as indicated on the Drawings.
 - a. Casement windows.
 - b. Double-hung windows.
 - c. Top-hinged windows.
 - d. Projected windows.
 - e. Fixed windows.
 - 2. Delegated Design: Aluminum windows designed by the manufacturer to comply with specified performance requirements and design criteria, including structural analysis data signed and sealed by the qualified Professional Engineer
- B. Work Provided Under This Section But Specified Under Other Sections:
 - 1. The Work of this Section and applicable portions of the work of the following Sections, that are related to this Section, shall be performed by a Prime contractor providing window products, to establish single source responsibility for aluminum windows and associated components.
 - a. Division 07 Section "Joint Sealants."
 - b. Division 08 Section "Glazing."

1.3 SUBMITTALS

- A. Product data for each type of window required, including:
 - 1. Construction details and fabrication methods.
 - 2. Profiles and dimensions of individual components.
 - 3. Data on hardware, accessories, and finishes.
 - 4. Recommendations for maintenance and cleaning of exterior surfaces.

- B. Shop drawings for each type of window required. Include information not fully detailed in manufacturer's standard product data and the following:
1. Layout and installation details, including anchors.
 2. Elevations at 1/4-inch = 1 foot scale and typical window unit elevations at 3/4-inch = 1 foot scale.
 3. Full-size section details of typical composite members, including reinforcement and stiffeners.
 4. Location of weep holes.
 5. Panning details
 6. Hardware including operators.
 7. Glazing details.
 8. Accessories.
- C. Delegated-Design Submittal: For windows indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified Professional Engineer responsible for their preparation.
- D. Samples for Initial Color Selection: Submit samples of each specified finish as indicated below.
1. Fluoropolymer Coatings: Submit samples consisting of actual coating chips and displaying manufacturer's range of colors for initial selection, including black and 3 additional non-metallic color choices closely approximating dark bronze anodized finish. Photographs or color printing are not acceptable.
 2. Anodized Coatings: Submit pairs of samples of the specified finish on 4-inch-long sections of aluminum extrusions. Include sample sets showing the full range of variations in color normally expected.
- E. Energy Performance Certificates: For windows, accessories, and components, from manufacturer.
1. Basis for Certification: NFRC-certified energy performance values for each window type.
- F. Test reports: Provide certified test reports from a qualified independent testing agency indicating that each type and size of window unit has been tested in accordance with specified test procedures and complies with each performance requirement indicated. Test results based on use of down-sized test units will not be accepted.
- G. Manufacturer's certification of compliance with requirements of the specified performance requirements of this Section.
- H. Field quality-control reports are submitted by Owner's Independent testing Agency.
- I. Signed original warranty documents from the window manufacturer indicating the specified terms and conditions for each window and component.

1.4 QUALITY ASSURANCE

- A. Manufacturers and Products: The products and manufacturers specified in this Section establish the standard of quality for the Work. Subject to compliance with all requirements, provide specified products from the manufacturers named in Part 2.
- B. Reference Standards: Products in this section shall be built, tested, and installed in compliance with the specified quality assurance standards; latest editions, unless noted otherwise.
 - 1. Applicable standards of the American Architectural Manufacturers Association (AAMA), including but not limited to:
 - a. AAMA/WDMA/CSA 101/I.S.2/A440 Voluntary Performance Specification for Windows, Skylights and Glass Doors - A North American Fenestration Standard.
 - b. AAMA 1503- Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections
 - c. AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
 - d. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.
 - e. AAMA 901 Voluntary Specification for Rotary & Linear Operators in Window Applications.
 - f. AAMA 902 Voluntary Specification for Sash Balances.
 - g. AAMA 910 Voluntary Life Cycle Specifications and Test Methods for AW Class Architectural Windows and Doors.
 - h. AAMA 505 Dry Shrinkage Performance and Composite Thermal Cycling Test Procedure.
 - 2. Standards of ASTM International which are referenced in other Articles in this Section.
 - 3. National Fenestration Rating Council (NFRC) Documents and Rating System, including, but not limited to:
 - a. NFRC 100 Procedure for Determining Fenestration Product U-factors.
 - b. NFRC 200 Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.
 - c. NFRC 500-2010 Procedure for Determining Fenestration Product Condensation Resistance Values.
- C. Delegated Design: A qualified Professional Engineer registered in Michigan, employed by the window manufacturer, shall design aluminum windows, and all accessories, for this project. The windows shall be manufactured, assembled and installed to withstand the structural load requirements as specified in this Section, and according to the Building Code. Expected loads calculated for the building, based on the wind load data indicated on the Drawings. Refer to Part 2 Performance Requirements for additional information.
- D. Installer Qualifications: Engage an experienced Installer who has completed installation of aluminum windows similar in design and extent to those required for the project and whose work has resulted in construction with a record of successful in-service performance.

- E. Single-Source Responsibility: Obtain aluminum window units from one source and by a single manufacturer.
- F. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed specified performance requirements and of documenting this performance by certification and labeling.
- G. Manufacturer's Preconstruction Testing Agency Qualifications: Qualified according to ISO/IEC 17025 and accredited by ICC-ES for preconstruction testing indicated.
- H. Product Options: The drawings indicate the size, profiles, and dimensional requirements, and aesthetic effects of aluminum windows and are based on products of a specific manufacturer. Aluminum windows by indicated approved manufacturers will be considered, provided deviations in dimensions and profiles are minor and do not alter the aesthetic effect as judged by the Owner and Architect. The burden of proof of equality is on the proposer.
- I. Tested Units: Provide window units that were successfully tested by a qualified independent testing laboratory, for the window manufacturer, to demonstrate compliance with specified standards.
- J. Field Testing: The Owner's independent Testing Laboratory will validate testing of windows installed in the building.

1.5 MANUFACTURER TESTING

- A. Preconstruction Testing Program: Perform tests specified in "System Performance Requirements" Article on manufacturer's laboratory samples in the following order:
 - 1. Structural-performance preloading at 50 percent of the specified wind-load design pressure when tested according to ASTM E 330.
 - 2. Air infiltration when tested according to ASTM E283.
 - 3. Water penetration under static pressure when tested according to ASTM E 331.
 - 4. Structural performance at design load when tested according to ASTM E 330.
 - 5. Repeat air filtration when tested according to ASTM E 283.
 - 6. Repeat water penetration under static pressure when tested according to ASTM E 331.
 - 7. Structural performance at maximum 150 percent of positive and negative wind-load design pressures when tested according to ASTM E 330.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Check actual window openings by accurate field measurements before fabrication and show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the Work.