

SECTION 08 53 13 - VINYL WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes but is not limited to:

1. Vinyl-framed windows.
2. Vinyl window glazing.
3. Window screens
4. Accessories
5. Delegated design.

- B. Related Sections:

1. Section 07 27 00 "Air Barrier" for weather resistive barrier and air barrier.
2. Section 07 62 00 "Sheet Metal Flashing and Trim" for flashing.
3. Section 07 92 00 "Joint Sealants" for sealants and caulking.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review, discuss, and coordinate the interrelationship of vinyl windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealants, and protecting finishes.
3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.
5. Install typical window during pre-installation conference in coordination with other components of the Work.
6. Manufacturer's representative to be present for window pre-installation meeting and during window mock-up installation.
7. Manufacturer's representative to verify in writing that installation procedure represented by mock-up is in compliance with manufacturer's recommended installation procedures.
8. Review testing protocol.

1.4 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for vinyl windows.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
- C. Samples: For vinyl windows and components required.
 - 1. Exposed Finishes: Color and finish
 - 2. Exposed Hardware: Color and finish
- D. Product Schedule: For vinyl windows. Use same designations indicated on Drawings.
- E. Qualification Data: For manufacturer and Installer.
- F. Product Test Reports: For each type of vinyl window, for tests performed by a qualified testing agency.
- G. Sample Warranties: For manufacturer's warranties.
- H. Delegated-Design Submittal: Analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Detail anchoring and connection of window systems to substrate.
 - 2. Include design calculations.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating vinyl windows that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.
- B. Installer Qualifications: An installer acceptable to vinyl window manufacturer for installation of units required for this Project.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockup of typical wall area as shown on Drawings. Coordinate window mock-up with other related components of the Work requiring mock-ups.
 - 2. Wall area with window mock-up may not be incorporated as part of the Work. Window mock-up to remain on site for reference for duration of Project's window and siding installation. Remove mock-up only with approval of Architect.
 - 3. Install typical window as part of pre-installation conference.

4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace vinyl windows that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Failure to meet performance requirements.
 - b. Structural failures including excessive deflection, water leakage, and air infiltration.
 - c. Faulty operation of movable sash and hardware.
 - d. Deterioration of materials and finishes beyond normal weathering.
 - e. Failure of insulating glass.
 2. Warranty Period:
 - a. Window: 10 years from date of Substantial Completion.
 - b. Glazing Units: 20 years from date of Substantial Completion.
 - c. Use: Commercial

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. PlyGem; Builders Series
 2. JELD-WEN, Inc.
 3. Pella Corporation.
 4. VPI Inc.
 5. Approved substitution
- B. Source Limitations: Obtain vinyl windows from single source from single manufacturer.

2.2 WINDOW PERFORMANCE REQUIREMENTS

- A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
 1. Windows, profiles, components and materials to be certified under either:
 - a. The AAMA Certification Program and be labeled with AAMA Gold Certification Label.

- b. The WDMA Hallmark Certification Program and indicated with label.
- 2. Window assemblies to comply with current Energy Star rating for applicable region and bear the regional Energy Star label.
- 3. Windows to be rated and labeled with NFRC label.
- B. Delegated Design: Design anchoring and connection of window systems to substrate to meet indicated performance requirements.
- C. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:
 - 1. Minimum Performance Class: LC
 - 2. Minimum Performance Grade: 30
 - a. Lab Structural Test Pressure: $30 \times 1.5 = 45.0$ psf.
 - b. Lab Water Test Pressure: $30 \times 0.15 = 4.5$ psf
 - c. Field Water Test Pressure: $4.5 \times 0.667 = 3.0$ psf (with 1/3 reduction)
- D. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.30 Btu/sq. ft. x h x deg F (1.71 W/sq. m x K).
- E. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.30.
- F. Sound Transmission Class (STC): Rated for not less than 26 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
- G. Outside-Inside Transmission Class (OITC): Rated for not less than 26 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.
- H. Factory Mulling: Mulled window assemblies to be rated for not less than specified performance of individual component windows according to AAMA 450-06.
- I. Forced-Entry Resistance: Comply with CAWM 301-90.
- J. Product Condensation Resistance: Minimum of 55.

2.3 VINYL WINDOWS

- A. Operating Types: Provide the operating types in locations indicated on Drawings:
- B. Frames and Sashes: Impact-resistant, UV-stabilized PVC complying with AAMA/WDMA/CSA 101/I.S.2/A440.
 - 1. Finish: Integral color, beige.
 - 2. Gypsum Board Returns: Provide at interior face of frame.
 - 3. Mounting: Fin frame.
- C. Glass: Clear annealed glass, ASTM C 1036, Type 1, Class 1, q3.
 - 1. Kind: Fully tempered where indicated on Drawings and as required by code.

- D. Insulating-Glass Units: ASTM E 2190, certified through IGCC as complying with requirements of IGCC.
 - 1. Glass: ASTM C 1036, Type 1, Class 1, q3.
 - a. Tint: Clear.
 - b. Kind: Fully tempered where indicated on Drawings and as required by code.
 - 2. Lites: Two.
 - 3. Filling: Fill space between glass lites with argon.
 - 4. Low-E Coating: as required to meet requirements.
- E. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
- F. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.
 - 1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.
- G. Projected Window Hardware:
 - 1. Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E 405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.
 - a. Type and Style: As selected by Architect from manufacturer's full range of types and styles.
 - 2. Hinges: Manufacturer's standard type for sash weight and size indicated.
 - 3. Single-Handle Locking System: Operates positive-acting arms that pull sash into locked position. Provide one arm on sashes up to 29 inches (735 mm) tall and two arms on taller sashes.
- H. Horizontal-Sliding Window Hardware:
 - 1. Sill Cap/Track: Manufacturer's standard of dimensions and profile indicated; designed to comply with performance requirements indicated and to drain to the exterior.
 - 2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.
 - 3. Roller Assemblies: Low-friction design.
- I. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.
- J. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.4 ACCESSORIES

- A. Sill Drainage Mesh: Woven plastic mesh suitable to provide sill drainage behind window nail flange;
 1. Frost King - Thermwell Products Co. Inc., VX620 Plastic Gutter Guard.
- B. Shims: Size and shape suitable to provide sill drainage and structural support under window.
 1. Polypropylene or Polystyrene Shims; 6,000-8,000 psi according to ASTM D695.
 2. Adhesive-backed Dense Neoprene Setting Blocks; 80 - 85 Shore "A" hardness according to ASTM D-2240.
- C. For other accessories, flexible flashing and tapes see Section 07 27 00 "Air Barrier"
- D. For sealants see Section 07 92 00 "Sealants"

2.5 INSECT SCREENS

- A. General: Fabricate insect screens to fully integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.
- B. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
 1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.
 2. Finish for Interior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range.
 3. Finish for Exterior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range Insert finish.
- C. Glass-Fiber Mesh Fabric: 18-by-14 (1.1-by-1.4-mm) or 18-by-16 (1.0-by-1.1-mm) mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D 3656.
 1. Mesh Color: Manufacturer's standard gray.

2.6 FABRICATION

- A. Fabricate vinyl windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- B. Glaze vinyl windows in the factory.
- C. Weather strip each operable sash to provide weathertight installation.

- D. Mullions: Provide mullions and cover plates, compatible with window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding the same design wind loads and water resistance rating of individual window units. Provide manufacturer's standard finish to match window units.
- E. Hardware: Mount hardware through double walls of vinyl extrusions or provide corrosion-resistant reinforcement.
- F. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Clean and prepare window frame and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants". Perform sealant pull test as noted in joint sealant section.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.

1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing Services: Testing and inspecting of installed windows shall take place as follows:
 1. Testing Methodology: Testing of windows for water resistance shall be performed according to ASTM E1105, cyclic method.
 1. Field Water-Resistance Testing:
 - a. Test Pressure:
 - 1) Field Water Test Pressure: $4.5 \times 0.667 = 3.0$ psf (with 1/3 AAMA reduction)
 - b. Allowable Water Infiltration:
 - 1) No water penetration to interior surface of window sash or glazing.
 - 2) Water contained within drained flashing, gutters, and sills shall not be considered failure.
 2. Testing Extent: Mock-up window and three windows of each type or 10 percent of each type whichever number is greater, as selected by Architect and a qualified independent testing and inspecting agency. Windows shall be tested after perimeter sealants have cured. Owner reserves the right to test additional windows.
 3. Test Reports: Prepared according to AAMA 502.
- C. Testing Coordination: Coordinate testing with appropriate phase and completeness of work.
 1. Windows to be tested after cladding system has been installed unless otherwise agreed.
 2. Windows to be tested before interior insulation, finishes and trim is installed unless otherwise agreed.
- D. Remove and replace noncomplying windows with new windows and retest as specified above. Windows may be repaired at the sole discretion of the Owner.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or repaired windows with specified requirements.
 1. For each non-complying window, field test the replacement or repaired window and field test two additional untested windows at contractor's expense.
- F. Prepare test and inspection reports.
- G. Contractor to provide:
 1. On-site source of water within 150 feet of each test location.
 2. Access to the interior and exterior of the building, to include any lifts, staging, rigging and or scaffolding that may be necessary.
 3. Clear, unobstructed access to the test openings; to include the removal and replacement of items such as interior rough framing, trim, finishes and fire/smoke protection.
 4. Repair of any damage that may result from the testing process.

3.4 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
- B. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.
 - 1. Keep protective films and coverings in place until final cleaning.
- C. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.
- D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION 08 53 13