

SECTION 08 53 16
CAST-IN "FIXED" WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. uPVC-framed, factory-glazed, cast-in windows.

1.02 RELATED REQUIREMENTS

- A. Section 03 10 00 - Concrete Formwork
- B. Section 03 20 00 - Concrete Reinforcing
- C. Section 03 30 00 - Cast-in-Place Concrete

1.03 REFERENCE STANDARDS

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights.
- B. *AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.**
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- D. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- E. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- F. ASTM E331 - Standard test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- G. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference
- H. *ASTM E1423 - Standard Practice for Determining Steady State Thermal Transmittance of Fenestration Systems.**
- I. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.
- J. *NFRC 100 - Procedure for Determining Fenestration Product U-factors.**

1.04 DEFINITIONS

- A. For fenestration industry standard terminology and definitions, refer to American Architectural manufacturer's Association (AAMA) – AAMA Glossary (AAMA-AG).

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate window unit placement with concrete panel depth and reinforcing layout.
- B. Preinstallation Meeting: Convene at least [two][] weeks before starting work of this section.
 - 1. Review installation requirements with manufacturer's representative.

1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component profiles and dimensions, finishes, glass.
- C. Shop Drawings: Provide rough opening dimensions, sections, and details for any non-standard units.

- D. Samples: [Two][] samples, 24" by 24" inch (304.8 by 304.8 mm) size, showing window frame, glazing, [and factory finishes].
- E. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements equal to or in excess of those specified.
- F. Specimen warranty.

1.07 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company capable of fabricating windows that meet or exceed performance requirements indicated and having documentation of performance including test reports and calculations.

1.08 MOCK-UPS

- A. See Section 01 40 00 - Quality Requirements for additional requirements.
- B. Construct [one][] mock-up, [] feet ([] m) long by [] feet ([] m) wide, indicating [].
- C. Locate where directed.
- D. Mock-up may remain as part of work.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Jig, brace, and box the window frame assemblies for transport to minimize flexing of members or joints.
- B. Store window units under cover and elevated above grade.
- C. Protect finished surfaces from damage prior to installation.

1.10 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Frame Warranty: uPVC frame will be free from peeling, flaking, chipping, blistering, and corrosion during the Warranty Period. Complete form in Owner's name and register with warrantor.
 - 1. Warranty Period: 5 years
- C. Insulated Glass Warranty: The installed and sealed insulating glass unit is warranted against defects resulting in material obstruction of vision due to film formation on the internal glass surfaces caused by dust or moisture in the air space of the sealed unit during the Warranty Period. Complete forms in Owner's name and register with warrantor.
 - 1. Warranty Period: 10 years
- D. Finish Warranty: Paint will not delaminate, blister, flake, crack, check, or peel in such a way as to adversely affect the appearance of the uPVC frame. Complete forms in Owner's name and register with warrantor.
 - 1. Warranty Period: 5 years

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Cast-in Fixed Windows:
 - 1. Integrated Window Systems; Tilt Series: www.iwstilt.com
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DESCRIPTION

- A. Integrated Window System: Factory fabricated integrated frame of modular, extruded, hollow, ultra-violet-resistant, color-through unplasticized polyvinyl chloride (uPVC); with factory-installed glazing, perimeter drip cap, and integrated frame profile for cast-in-place mounting.
 - 1. Window Type: fixed window
 - 2. Configuration: As indicated on drawings.
 - 3. Size: [] by [] inches][as indicated on Drawings].

EDITOR NOTE: 32 SQUARE FEET (4 BY 8 FEET) IS MAXIMUM SIZE TESTED.

4. Profile Options: Concrete Chamfer, Integrated Chamfer, Flush no chamfer.
5. Frame Depth: as indicated in Drawings.
EDITOR NOTE: BASE DEPTH IS 7-1/2 INCHES, SEE CHART FOR ADDITIONAL TRIM PROFILES AND DEPTHS AVAILABLE.
6. Interior Finish: [integral color (white)][factory-finished].
 - a. Factory-Finish Color Options: [dark bronze] [mill] [white][custom, to match Architect's sample].
7. Exterior Finish: [integral color][factory-finished].
 - a. Factory-Finish Color Options: [dark bronze] [mill] [white][custom, to match Architect's sample].
8. Framing Members: Integrated fusion welded corners, with internal reinforcement where required for structural rigidity; No exposed fasteners.
9. Glazing Stops, Trim, Flashings, and Accessory Pieces: Extruded rigid uPVC, fitting tightly into frame assembly.

2.03 PERFORMANCE REQUIREMENTS

- A. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
 1. Performance Class (PC): CW.
 2. Performance Grade (PG): 100, with minimum design pressure (DP) of 130.33 psf (6240 Pa).
- B. Design Pressure (DP): In accordance with [applicable codes][ASCE 7][the following].
 1. Positive Design Wind Load: 130.33 psf (6240 Pa).
 2. Negative Design Wind Load: 130.33 psf (6240 Pa).
- C. Measure performance of units by testing in accordance with ASTM E330/E330M, using test pressure equal to 1.5 times the design wind pressure and 10 second duration of maximum load.

EDITOR NOTE: VALUES LISTED BELOW ARE BASED UPON 1" LOW-E, ARGON FILLED INSULATING GLASS. OTHER GLASS TYPES MAY YIELD IMPROVED U-FACTORS AND CFR

- D. Center of Glass Condensation Resistance Factor (CRF): 58, minimum, the lower value of the glass and frame window components and determined in accordance with AAMA 1503.
- E. Center of Glass Thermal Transmittance (U-value): 0.26, maximum, including glazing, measured on window sizes required for this project.
- F. *Fenestration Assembly Thermal Transmittance (U-value): Comply with ASHRAE Std 90.1 I-P for building envelope requirements for applicable climate zone.**
- G. Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E547 at differential pressure of 20.05 pounds per square foot (960 Pa).
- H. Air Leakage: less than 0.01 cfm/sq ft (0.1 L/sec sq m) maximum leakage when tested at 6.27 psf (300 Pa) pressure difference in accordance with ASTM E283/E283M.
- I. Forced Entry Resistance (FER): Tested to comply with ASTM F588 requirements having at least Grade 10 performance for each required window assembly.

2.04 COMPONENTS

- A. Glazing: Insulated double pane, annealed or tempered glass, clear, low-E coated, argon filled.
 1. Glass Stops: Integrated uPVC glazing bead with color matching frame.
 2. Setting Blocks: Manufacturer's standard.
 3. Glazing Method: Wet-glazed with curable structural sealant from interior.

2.05 FABRICATION

- A. Fabricate framing and sash members with fusion welded corners and joints, in a rigid jig. Supplement frame sections with internal reinforcement where required for structural rigidity.

- B. Form sills in one piece, sloped for wash.
- C. Factory glaze window units.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify formwork and reinforcing are installed as indicated in shop drawings.
- B. Verify bond breaker was applied and chamfers are installed.

3.02 INSTALLATION

- A. Install window unit assemblies in accordance with manufacturer's instructions and applicable building codes.
- B. Seat window plumb and level, flush and in full perimeter contact with base slab, and maintain dimensional tolerances and alignment with adjacent work.
- C. Keep protective components in place during concrete pouring and finishing.

3.04 FIELD QUALITY CONTROL

- A. Provide services of window manufacturer's field representative to observe for proper installation of system and submit report.

3.05 CLEANING

- A. Remove protective material from glazing and pre-finished surfaces.
- B. Wash surfaces by non-abrasive methods as recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

END OF SECTION