SECTION 08 53 13
VINYL (PVC) WINDOWS

400 SERIES DOUBLE-HUNG
NEW CONSTRUCTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. All windows of the types and sizes as called for in this specification shall be furnished with all necessary hardware and miscellaneous equipment as herein specified and shall be manufactured by Crystal Windows & Doors Systems, LTD.

1.2 RELATED SECTIONS

A. Section 061000 – Rough Carpentry.

1.3 REFERENCES

A. American Society of Testing Materials (ASTM): *www.astm.org*
1. ASTM F 588- Standard Test Methods for Measuring the Force Entry Resistance of Window Assemblies, Excluding Glazing Impact
2. ASTM B 633 - Specification for Electrodeposited Coatings of Zinc on Iron and Steel
3. ASTM C 1036 – Standard Specification for Flat Glass
4. ASTM D 4216 - Specification for Rigid Poly (Vinyl Chloride) (PVC) and Related PVC and Chlorinated Poly (Vinyl Chloride) (CPVC) Building Products Compounds
5. ASTM D 4726 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Exterior-Profile Extrusions Used for Assembled Windows and Doors
6. ASTM E 1300 - Standard Practice for Determining Load Resistance of Glass in Buildings
7. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation

B. American Architectural Manufacturers Association (AAMA)
1. AAMA 701/702 - Combined Voluntary Specification for Pile Weather strip and Replaceable Fenestration Weather seals
2. AAMA 902 - Voluntary Specification for Sash Balances
3. AAMA/WDMA/CSA 101/1.S.2/A440 North American Fenestration Standard/Specifications for Windows, Doors and Skylights.

C. NAMI-National Accreditation Management Institute, Inc. *: www.namicertification.com*

D. National Fenestration Rating Council (NFRC) : *www.nfrc.org*
1. NRFC 100- Procedure for Determining Fenestration Product U Factors
2. NFRC 102- Procedure of Measuring the Steady-State Thermal Transmittance of Fenestration Systems.
3. NRFC 200- Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
4. NRFC 500- Procedure for Determining Fenestration Product Condensation Resistance Values

E. SGCC- Safety Glazing Certification Council.- *www.sgcc.org*
1. ANSI Z97.1-2004 American National Standard for Safety Glazing Materials used in Buildings - Safety Performance Specifications and Methods of Test.

F. U.S. Consumer Products Safety Commission (CPSC) Publications
1. 16 CFR 1201 Safety Standards for Architectural Glazing Materials

1.4 SUBMITTALS

A. See Section 013300 – Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's standard data sheets on each product to be used, including
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations
3. Installation methods.

C. Provide test reports from AAMA accredited laboratory certifying that window units are found to be in compliance with AAMA/WDMA/CSA 101/I.S.2/A440-08 and performance standards listed above.
1. Test reports shall be accompanied by verified "Notice of Product Certification" to assure product is active and currently listed at third party validation (NAMI) accredited by the American National Standards Institute (ANSI)
2. All testing shall be conducted using AAMA/WDMA/CSA 101/I.S.2/A440-17 Gateway Performance minimum specified test sizes.

D. Shop Drawings; Submit the following:

1. Elevation for each style window specified; indicate sizes, glazing types, muntin pattern and designs.
2. Schedule: Indicate each window in project; reference each unit to specific elevation detail.
3. Details: Head, jamb and sill details for each project condition.

E. Quality Assurance Submittals: Evidence of certifications of Double-hung window units required in Quality Assurance Article of this section

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum ten (10) years of documented experience producing products of the type Specified in this section.

B. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size.

C. Certifications:
1. Provide Double -Hung window units rated for air infiltration, water penetration and structural performance per AAMA/WDMA/CSA 101/1.S.2/A440 NAFS Specifications for Windows and certified by independent third-party agent.
2. Provide Double-Hung window units rated and certified for thermal performance by NFRC, and for seal integrity of insulating glass seal.

D. Mock-Up: Provide a mock up for evaluation of surface preparation techniques and application workmanship.

1. Finish area designated by Architect.
2. Do not proceed with remaining work until workmanship and color are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver windows to project site in undamaged condition; handle windows to prevent damage to components and to finishes.

B. Store products in manufacturer's unopened packaging, out of direct sunlight or high temperature locations, until ready for installations.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits

1.8 WARRANTY

A. *Refer to Crystal Window & Door Systems, Ltd. standard warranty*.

B. *Optional Extended Warranty (contact your Crystal sales representative).*

PART 2 PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturer: **Crystal Window & Door Systems, Ltd**., which is located at: 31-10 Whitestone Expressway, Flushing, NY 11354; Tel: 718. 961.7300; Tel: 800. 472.9988; Fax: 718.460.4594; Web: www.crystalwindows.com

B. Request for substitutions will be considered in accordance with provisions of Section 01 60 00.

C. Substitutions must be submitted to Architect two weeks prior to bid opening.

2.2 DOUBLE-HUNG – CRYSTAL VINYL SERIES 400 (New Construction)

A. Construction:

1. Vinyl Extrusions: Multi-chamber extrusions of impact-resistant exterior-grade rigid polyvinyl chloride (PVC) complying with ASTM D 4726, ASTM D 4216 and ASTM D 638 standards.
2. Insulating Glass Unit: Unit thickness 7/8 inch, permanently marked with ID from Certification Program.
   - **a.** Insulating Glass shall comply with the ASTM E 2190 standard.
   - **b.** Insulating Glass type selection shall comply with the ASTM E 1300 standard.
   - **c.** Air Chamber: Hermetically sealed space between panes. Clear Glass is standard, Low-E6, Low-E7 glazing as well as argon gas filling options available.
   - **d.** Low conductance spacer
   - **e.** Integral Muntin: Aluminum pre-finished matching window frame, factory-mounted between panes of insulating glass unit before sealing glass unit.
3. Operating Hardware: Lower sash shall be counterbalanced to remain in place during operation. Bottom sash shall tilt in for cleaning exterior glass surface. Top lite shall be fixed in the frame.
4. Fasteners: All screws and other miscellaneous fastening devices incorporated shall be of aluminum, stainless steel, or other non-corrosive material compatible with vinyl extrusions. Cadmium or zinc plated steel, where used, shall be in accordance with ASTM B 766 or ASTM B 633.
5. Weather-stripping: High-density woven pile shall be used in combination with continuous polyethylene rigid seal to minimize air infiltration.

B. Performance:

1. Double Hung Units Air Infiltration shall not exceed 0.30 CFM/SqFt when tested in accordance with: AAMA/WDMA/CSA 101/1.S.2/A440-17
   - **a.** For specific product air infiltration performance, contact Crystals' Engineering Department.
2. Unit Water Penetration Resistance Pressure vs. size when tested in accordance with: AAMA/WDMA/CSA 101/1.S.2/A440-17
   - **a.** 3.76 psf for Class R-PG25 unit sizes up to 40.0" x 63.0"
   - **b.** 4.60 psf for Class LC-PG30 unit sizes up to 44.0" x 75.0"
3. Unit Performance Grade vs. size when tested in accordance with: AAMA/WDMA/CSA 101/1.S.2/A440-17
   - **a.** Class R-PG25 for unit sizes up to 40" x 63"
   - **b.** Class LC-PG30 for unit sizes up to 44.0" x 75.0"

4. Thermal Performance ratings vs. size when tested in accordance with: NFRC 100, 200 and 500
    a. Double -Hung Window shall achieve NFRC thermal u-value rating of 0.48 BTU/hr/SqFt/F° and a Solar Heat Gain Coefficient of 0.61 with clear glass and no argon gas fill.
    b. Double -Hung Window shall achieve NFRC thermal u-value rating of 0.30 BTU/hr/SqFt/F° and a Solar Heat Gain Coefficient of 0.29 using Low-E C270 on glass surface #2 and argon gas fill.
    c. Double -Hung Window shall achieve NFRC thermal u-value rating of 0.29 BTU/hr/SqFt/F° and a Solar Heat Gain Coefficient of 0.21 using Low-E C366 on glass surface #2 and argon gas fill.
    d. Double -Hung Window shall achieve NFRC thermal u-value rating of 0.26 BTU/hr/SqFt/F° and a Solar Heat Gain Coefficient of 0.49 using C180 on glass surface #2 and i89 on glass surface #4 and argon gas fill.

C. Configurations

1. Operation: Windows must be a true Double -Hung unit with both sashes operable and able to tilt inward for cleaning exterior glass surface.
2. Operating Hardware:
    a. Locks: Cam-type sash lock and keeper, capable of meeting ASTM F 588 forced entry resistance, engineered to force meeting stiles/rails with interlock for minimum air infiltration.
3. Weatherstripping: High-density woven pile (double seal) shall be used in combination with continuous polyethylene rigid seal, to minimize air infiltration.
4. Materials: All vinyl extrusions shall be rigid 100% virgin PVC. Head, jambs and sash rails shall have a main wall thickness of 0.070". Head and jambs profile shall have six tubular hollows for strength and thermal efficiency. Sash profiles shall be tubular extruded. Sill shall be 0.075" thick on main wall and have four tubular hollows
5. Frame construction: Frame shall have an integral pre-punched nailing fin and J-trim along the perimeter. All corners shall be mitered and fusion welded. Frame depth shall be 2-7/8". Sill shall be sloped to aid water run-off
6. Sash construction: All sash corners shall be mitered and fusion welded. There shall be integral interlock at the meeting rails. Window width over 36" shall have internal metal reinforcement at meeting rails.
7. Muntin: Integral, color matching window frame, Optional patterns to suit window sizes.
8. Finish: Shall be solid vinyl in off white. Optional Beige or Two-tone.
9. Styles and Sizes: As indicated on drawings
10. Screen construction: Standard screen shall be a half screen. The screen frame shall be roll formed of aluminum with all corners keyed. The screen mesh shall be charcoal fiberglass held-in-place with a flexible spline.

2.3 ACCESSORIES

A. Mullion Posts:

1. Exterior and interior mullion trim accessories including wood build out, drywall receiver and vinyl drywall return.

PART 3 EXECUTIONS

3.1 EXAMINATION

A. Installer to verify that project conditions are acceptable before beginning installation of products;

B. Verify that rough openings are as indicated, and are correct sizes for clearance spaces specified in manufacturer's instructions.

C. Correct any unacceptable conditions before proceeding with installation

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's printed installation instructions and approved shop drawings.

B. Install products plumb and in true alignment; fasten to achieve maximum operational effectiveness and best appearance of unit

C. Installation of flashing is specified in Section 07 62 00 - Sheet Metal Flashing and Trim.

D. Installation of joint sealers is specified in Section 07 90 00 - Joint Protection.

3.3 ADJUSTING AND CLEANING

A. Ensure that windows operate correctly, free from biding or other defects

B. Clean interior and exterior surfaces free of labels, mortar, plaster, paint, joint sealers, and other foreign matter to prevent damage to weather strip, and to prevent interference with operation of hardware.

C. Clean and restore soled surfaces; remove scraps and debris, and leave site in clean condition.

3.4 PROTECTION

C. Protect window unit from damage until substantial completion. Repair or replace damaged units

END OF SECTION