Part 1 General

1.01 SUMMARY

1. Provide all labor, material and equipment necessary to furnish and install aluminum windows as shown on drawings and specifications herein. Window shapes and accessories as specified and detailed shall establish the type of units and materials to be used to provide the functional performance and aesthetic requirements desired. Details indicate the required depth and profile.

1.02 RELATED REQUIREMENTS

Section 01600 – Product Requirements

Section 07900 – Joint Sealers

Section 08800 – Glass and Glazing

1.03 REFERENCE STANDARDS

1. AAMA/WDMA/CSA 101/I.S.2/A440-05 “Standard/Specification for Windows, Doors, and Unit Skylights”
2. AAMA 502 "Voluntary Specification for Field Testing of Newly Installed Fenestration Products"
3. AAMA 611 "Voluntary Specification for Anodized Architectural Aluminum"
4. AAMA 701/702 "Voluntary Specification for Pile Weatherstripping and Replaceable Fenestration Weatherseals”
5. AAMA 1503 “Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections”
6. AAMA 2603 “Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels”
7. AAMA 2604 “Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels”
8. AAMA 2605 “Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels”
9. ASTM E 90 “Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions”
10. ASTM E 283 "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen"
11. ASTM E 330 "Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference"
12. ASTM E 413 “Classification for Rating Sound Insulation”
13. ASTM E 547 "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Differential"
14. ASTM E 966 “Standard Guide for Field Measurements of Airborne Sound Insulation of Building Facades and Facade Elements”
15. ASTM E 1332 “Standard Classification for Determination of Outdoor-Indoor Transmission Class”
16. ASTM E 1425 “Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems”
17. ASTM E 1886 “Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials”
18. ASTM E 1996 “Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes”
19. ASTM E 2190 "Standard Specification for Insulating Glass Unit Performance and Evaluation"
20. ASTM F 588 “Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact”
21. FBC TAS 201 Large Missile Impact
22. FBC TAS 202 Uniform Static Air Pressure, Water Resistance, Air Infiltration, Forced Entry
23. FBC TAS 203 Cyclic Wind Pressure Loading
24. NFRC 100 “Procedure for Determining Fenestration Product U-Factors”
25. NFRC 200 “Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence”
26. NFRC 500 “Procedure for Determining Fenestration Product Condensation Resistance Values”
	1. PERFORMANCE REQUIREMENTS
27. Performance Grade:
28. H-DW-PG70
29. HS-DW-PG70
30. F-DW-PG70
31. Uniform Load Structural Test
32. With the primary sash in a closed position, and the secondary (exterior) set of sash in the full open position, test in accordance with ASTM-E-330. At a static air pressure difference of 70.0 pounds per square foot with pressure applied both positively and negatively.
33. Static air pressure difference shall be 1.5 times the design pressure used in 1.03 A. (1.5 is the factor used to provide a margin of safety in aluminum windows and is the minimum recommended by the AAMA).
34. At conclusion of test, there shall be no glass breakage; permanent damage to fasteners, hardware parts, support arms, or actuating mechanisms, nor any other damage which would cause the window to be inoperable. Permanent deformation of any frame, sash, or ventilator member shall not exceed 0.04% of its span.
35. Air Infiltration
36. *With primary sash in a closed and locked position, and the secondary (exterior) sash in the full open position, window shall be tested in accordance with ASTM-E283 and shall meet the following performance requirements.*
37. Air infiltration on windows with less than 18 feet of operable sash crack perimeter shall not exceed 2.8 cfm per square foot of window area when tested in a static pressure drop of 1.57 psf (equivalent to 25 mph wind velocity) or 6.3 cfm total when tested at 6.24 psf (equivalent to 50-mph wind velocity).
38. Air infiltration on windows with 18 or more feet of operable sash crack perimeter shall not exceed .05 cfm per square foot of window area at a static pressure drop of 1.57 psf or .15 cfm at 6.24psf.
39. Water Resistance
40. With the primary set of sash in the closed and locked position, and the secondary (exterior) sash in the full open position, the window shall be subjected to a pressure drop of 8.00 psf. After passing first test, window may also be tested with both sets of sash closed and latched and shall be subjected to a minimum pressure drop of 12.00 psf. All tests shall be performed with the screen removed. Tests shall be conducted in accordance with ASTM-547.
41. Thermal Performance
42. When tested in accordance with AAMA-1503 or according to NFRC-100 the thermal transmittance due to conduction (Uc) shall not exceed 0.57 on the entire specimen.
43. When tested in accordance with AAMA-1503 or according to NFRC-100 the Condensation Resistance Factor (CRF) shall not be less than 58 on the entire specimen.
44. Forced Entry Resistance
45. When tested in accordance with ASTM F 588, window shall perform to a minimum Performance Level 10.
46. Sound Transmission
47. Sound Transmission Class (STC). When tested in accordance with ASTM E1425, window shall perform to a minimum STC-45. Testing shall be performed in a NVLAP Certified Test Laboratory.
48. Outdoor Indoor Transmission Class (OITC). When tested in accordance with ASTM E1332, window shall perform to a minimum of OITC-30. Testing shall be performed in a NVLAP Certified Test Laboratory.
49. Windborne Debris (for glazing types to meet impact requirements, contact the manufacturer)
50. When tested in accordance with FBC TAS201, TAS202 and TAS203; or, ASTM E1886 and ASTM E1996, windows shall conform to protocol requirements as they relate to the specified Basic Wind Speed/Design Pressure for the project location.

1.05 QUALITY ASSURANCE

1. All testing shall be performed by an independent architectural testing laboratory accredited by the American Architectural Manufactures Association (AAMA), the National Voluntary Laboratory Accreditation Program (NVLAP) and the International Conference of Building Officials (ICBO) and such other accreditation as may be required by state of local building regulations.
2. The manufacturer shall provide the architect and owner a notarized affidavit of compliance certifying that the doors furnished for this project are identical in every aspect of design, component parts (including sealants and the application thereof, reinforcing members, etc.) and fabrication techniques as the doors tested in the laboratory for which test reports have been furnished.

1.06 SUBMITTALS

1. Window manufacturer shall supply test reports from an AAMA- and NVLAP- accredited laboratory certifying compliance with performance specifications for each type of window supplied for this project.
2. Window manufacturer shall supply product data for each type of window required, including:
3. Construction details and fabrication methods.
4. Data on hardware and accessories.
5. Recommendations for maintenance and cleaning of exterior surfaces.
6. Before proceeding with the manufacture of windows, the window contractor shall submit complete shop drawings with installation details for the Architect’s approval. These drawings shall also show window elevations, details of all window sections, collateral materials, details of anchorage, associated hardware.
7. Window manufacturer shall submit three [3] samples of finish.
8. Window manufacturer shall submit a copy of the product warranty to be applied to this project.

1.07 WARRANTY

1. The manufacturer shall warrant the product against material defects or defects in manufacturing. If a defect is discovered and brought to the attention of the Manufacturer, the defect will be corrected at no cost to the owner. Warranty shall not be pro-rated. Warranties requiring the owner to return windows to the factory for repair or replacement shall not be accepted.
2. Windows: warrant for Ten [10] years against defects in material or workmanship under normal use.
3. Insulating glass units: warrant seal for Ten [10] years against visual obstruction from film formation or moisture collection between internal glass surfaces, excluding that caused by glass breakage or abuse.
4. Finish: warranty supplied by finish manufacturer. (Select warranty to match finish selection in §2.04, then delete others including this note)

Organic finish conforming to AAMA 2605-05: warrant for Ten [10] years against chipping, peeling, cracking, chalking, or fading.

Organic finish conforming to AAMA 2604-05: warrant for Five [5] years against chipping, peeling, cracking, chalking, or fading.

Organic finish conforming to AAMA 2603-02: warrant for One [1] years against chipping, peeling, or cracking.

Part 2 Products

* 1. MANUFACTURER
1. Basis of Design: St. Cloud Window, Inc., 390 Industrial Blvd. Sauk Rapids, MN 56379 Phone: 800-383-9311, Fax: 320-255-1513, www.stcloudwindow.com
2. SCW920i – Hung
3. SCW940i – Horizontal Rolling
4. SCW960i – Fixed Lite
5. No substitutions will be accepted.
6. Terminology used herein may include reference to that manufacturer’s proprietary products. Such references shall be construed only for the purpose of establishing the quality of materials and workmanship to be applied under this section, and shall not be construed as limiting competition.
7. Requests for substitutions of products or manufacturers other than the Base Bid must be submitted to the Architect Ten [10] business days prior to the bid date. Requests for substitutions must demonstrate that the product seeking approval meets or exceeds the design and performance specifications of the Base Bid. Products not pre-approved by the Architect in writing via addendum will not be accepted. Substitutions must comply with the requirements of section 01600 – Product Requirements.

2.02 MATERIALS

1. Aluminum Extrusions
2. Shall be accurately extruded aluminum alloy 6063-T6.
3. All sash, screen, and frame members shall have a minimum wall thickness of 0.062.
4. Sill frame shall be constructed of extruded tubular shapes and shall include an aluminum closed weep system to prevent accumulation of water in sill. Tubular shapes that are formed by snapped-on or slide-together extrusions shall not be accepted.
5. Exterior and interior frame sill shall have a minimum slope of 5 degrees
6. Insect Screen
7. All screen frames to be tubular extruded aluminum, finished with 18 x 16 screen cloth, securely held in place by means of reusable vinyl spline. Roll-formed screen frames shall not be accepted.
8. Provide screens on operating vents as indicated on the architectural plans.
9. Mesh to be: Fiberglass (Aluminum) (Stainless Steel)
10. Thermal Barrier
11. All frame members shall be thermally broken by an extruded PVC thermal-barrier which shall provide complete metal-to-metal separation between the inner and outer frame members of not less than ¼”. The thermal-barrier shall interlock to both halves of the frame, securely locking them together, though not inhibiting the expansion and contraction of either part. A bead of sealant shall be applied to the complete perimeter of the window to seal the joints between the frame and thermal-barrier. A poured and de-bridged thermal-barrier will not be accepted.
12. Gaskets
13. All corner joints of the master frame shall have neoprene gaskets to insure a weather-tight seal.
14. Weather-stripping
15. All sashes shall be double weather-stripped with 100% woven pile and Mylar center fins conforming to AAMA 701/702. Weatherstripping to be secured within extruded shapes of the aluminum profiles to prevent movement. Surface applied weather strip shall not be accepted.
16. Hardware
17. All interior sash rails shall have a spring-loaded metal plunger, hook or cam lever type lock (keyed locking cylinder).
18. Sash Rollers: All horizontal rolling window sashes shall have a minimum of two sash rollers per sash made of Delrin material operating on a stainless steel axle. Rollers shall be recessed into the bottom sash rail so as not to protrude beyond the sash extrusion or weather-strip. Stainless steel rollers will not be accepted.
19. Balances: All sashes must be fully balanced with a minimum of two balances per sash. Balances are to be made of zinc die cast metal with nylon rollers. Balances must provide a positive lifting force through the full range of sash travel and hold the sash stationary at any open position without the use of auxiliary frictional devices or holding pins. Overhead balances and/or exposed balance cables or cords will not be acceptable. Balances are to be housed inside of jamb sash rails and made removable with the use of take-out clips for ease of replacement without the use of special tools.
20. Glazing
21. All glazing shall comply with the performance requirements outlined in section 08800 – Glass and Glazing, referenced in 1.02.
22. All operable sashes shall be marine-glazed with reusable flexible glazing vinyl.
23. All fixed glass to be set against sealant tape and wet sealed with a cap bead at the exterior. Interior lite to be dry sealed with a push-in glazing gasket.
24. Nominal glass thickness and type shall be:
25. Exterior glass lite
26. Thickness: 1/4" (1/2” Insulating Glass w/ Cardinal 272 Low E)
27. Tint: clear (bronze) (gray) (green) (blue)
28. Type: annealed (tempered)
29. Interior glass lite
30. Thickness: 9/16” overall
31. Tint: clear
32. Type: laminated interlayer .090” Sentry Glass Plus
33. Muntin:
34. Muntin grids shall be extruded aluminum with exposed surfaces finished to match window exterior and interior colors; surface applied to the interior and exterior of the exterior most glass lite.
35. Muntin grids shall be surface applied to the interior and exterior of the glass lite.
36. Grid patterns to be designated by architect.

2.03 FABRICATION

1. Window shall consist of two separate frames permanently interlocked by a rigid vinyl thermal-barrier. All joints of the frame and sash shall be butt type, secured by means of thread-cutting type screws anchored into screw ports which shall be an integral part of frame members. All corner joints shall be joined neatly in a manner to provide weather-tight connection. Sash corners to be internally sealed. All sharp milled edges and corners of sash and screen frame shall be de-burred and made smooth. The meeting rail shall be of tubular construction, double weather-stripped and interlocked when in a closed position. Window unit is to be constructed in a manner that will facilitate the replacement of worn or damaged parts, hardware, or weather-strip.

2.04 FINISH

1. Interior: (Choose only one of the following and delete all remaining verbiage including this note)
2. Anodized Finish: Class II (etched and anodized to 0.4 mil), conforming to AAMA 611-98
3. Color to be Clear
4. Anodized Finish: Class I (etched and anodized to 0.7 mil), conforming to AAMA 611-98
5. Color to be: Clear, Black, Dark Bronze, Med. Bronze, Lt. Bronze, or Champagne
6. Polyvinylelidene Fluoride PVDF Organic Coatings: Finish shall be 70% fluoropolymer (PVDF) organic coating in a color selected by Architect. Applied coatings shall meet or exceed AAMA 2605-05, including 10 years Florida exposure and 4000 hours humidity tests
7. Color to be:
8. Polyvinylelidene Fluoride PVDF Organic Coatings: Finish shall be 50% fluoropolymer (PVDF) organic coating in a color selected by Architect. Applied coatings shall meet or exceed AAMA 2604 -05, including 5 years Florida exposure and 3000 hours humidity tests
9. Color to be:
10. Pigmented Organic Coatings: Finish shall be Baked Enamel organic coating in a color selected by Architect. Applied coatings shall meet or exceed AAMA 2603 -02, including 1 year Florida exposure and 1500 hours humidity tests.
11. Color to be:
12. Exterior: (Choose only one of the following and delete all remaining verbiage including this note)
13. Anodized Finish: Class II (etched and anodized to 0.4 mil), conforming to AAMA 611-98
14. Color to be Clear
15. Anodized Finish: Class I (etched and anodized to 0.7 mil), conforming to AAMA 611-98
16. Color to be: Clear, Black, Dark Bronze, Med. Bronze, Lt. Bronze, or Champagne
17. Polyvinylelidene Fluoride PVDF Organic Coatings: Finish shall be 70% fluoropolymer (PVDF) organic coating in a color selected by Architect. Applied coatings shall meet or exceed AAMA 2605-05, including 10 years Florida exposure and 4000 hours humidity tests
18. Color to be:
19. Polyvinylelidene Fluoride PVDF Organic Coatings: Finish shall be 50% fluoropolymer (PVDF) organic coating in a color selected by Architect. Applied coatings shall meet or exceed AAMA 2604 -05, including 5 years Florida exposure and 3000 hours humidity tests
20. Color to be:
21. Pigmented Organic Coatings: Finish shall be Baked Enamel organic coating in a color selected by Architect. Applied coatings shall meet or exceed AAMA 2603 -02, including 1 year Florida exposure and 1500 hours humidity tests.
22. Color to be:

Part 3 Erection

3.01 INSTALLATION

1. All window and related window components shall be installed in accordance with requirements of the owner and the approved shop drawings of the Manufacturer. Installation shall be by a contractor who is experienced and who shall document at least one other projects of similar nature and scope for which the window products were successfully installed.
2. All materials shall be erected plumb, level and true, relative to the building structure. The maximum variation from plumb and level shall not exceed 1/8” (plus or minus) over ten feet.
3. Approved insulation materials shall be installed in the frame cavity on the interior portion of the window frame. Area adjacent to the exterior of the window frame shall remain uninsulated. The window installer shall use caution in the insulation operation to avoid overlapping insulation materials across the thermal-barrier connector thus bridging the two separate frame members.

3.02 CAULKING

1. A grade “A” type urethane caulking compound: Pecora, Tremco, Vulkem, or equal as approved by the Architect, shall be applied per the installation drawings and details at all points where the aluminum master frame and/or panning intersects the masonry or other exterior wall finish. The caulking material shall be applied in a manner which insures a continuous air- and water-tight perimeter seal. Color to match the color of the aluminum windows unless specified otherwise by the Architect.

3.03 TESTING

1. Laboratory Testing
2. At the discretion of the owner, one or a number of *window units delivered to the project* shall be tested by a certified testing laboratory to verify that glass, glazing, hardware and finish are in conformance to the project specification. Should any component of the test specimen fail to conform to project specification, action shall be taken by the window manufacture to correct each deficiency for every window on the project at no additional cost to the owner
3. The owner shall assume the cost of the initial verification testing. However, should product be found to be non-compliant, the manufacture shall reimburse the owner for the cost of the initial test. At the architect’s discretion, subsequent testing may be required and the cost of this test shall be borne by the manufacture.
4. Field Testing
5. On-site testing shall be conducted at owner’s discretion and expense. Up to three test specimens shall be selected by owner or architect.
6. On-site testing shall be conducted for air infiltration and water leakage as specified in section 1.04 – A and b, by an AAMA-certified architectural testing laboratory in accordance with AAMA 502, Method B.
7. On-site testing shall be conducted for sound transmission as specified in section 1.04 – F and G, by NAVLAP-certified acoustic testing laboratory in accordance with ASTM E966 and including flanking test. Using ASTM E413 and ASTM E1332, respectively, specimens tested in the field shall be within five (5) points of the laboratory STC test results and three (3) points of the laboratory OITC test results furnished with product qualification.
8. If a test specimen shall fail any aspect of the field test, it shall be repaired or replaced and re-tested. At the architect’s direction, up to three (3) additional windows may be tested. Upon completion of re-testing, all window units shall be repaired or replaced in the same manner as the test specimen (s) to assure compliance with project performance specification.
9. The cost of re-testing and all subsequent repairs and other associated expenses shall be borne by the window manufacture and/or window contractor.

3.04 ADJUSTMENTS, PROTECTION, AND CLEANING

1. After installation, the erector shall remove all sealants, caulking and other misplaced materials from all surfaces, including adjacent work. The window frame, sash and glass shall be cleaned thoroughly with materials and methods recommended by the window and glass manufacturers and shall not cause any defacement of the work.
2. Installer shall make any and all adjustments to window sash and hardware to cause the operating sash to function properly and in accordance with the manufactures standards
3. Protection of glass and window materials: Protect from contact with contaminating substances resulting from construction operations. After installation and cleaning of windows by window contractor, the general contractor shall be responsible for maintaining the cleanliness and protection of the window from damage from other trades.
4. Remove all sealant, caulking and other misplaced materials from all surfaces, including adjacent work. The window frames, casing, and glass shall be thoroughly cleaned with materials and methods recommended by the window and glass manufacturer and shall not cause any defacement of the work.
5. The general contractor shall be responsible for the protection of the work from damage by other trades.