(QUAKER TIMBERLINE AWN-Roto AWNING WINDOW)

SECTION 08 52 13 (08552) - ALUMINUM CLAD WOOD WINDOWS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Operating and Fixed Aluminum Clad Wood Window Units

   a. Project-Out Awning Aluminum Clad Wood Windows.

2. Glass and Glazing for Aluminum Clad Wood Windows.

3. Wood Blocking, Shims, Anchors, Clips, and all accessories necessary for a complete installation furnished and installed.

4. All aluminum trim and closure pieces

5. Installation labor, tools, equipment, and services necessary for installation of Aluminum Clad Wood Windows.

B. Related Sections:

1. Section 07 62 00 (07620) - Sheet Metal Flashing and Trim

2. Section 07 92 00 (07920) - Joint Sealants

3. Section 08 13 73 (08130) – Sliding Aluminum Doors and Frames

4. Section 08 41 13 (08410) – Aluminum Entrances and Storefront

5. Section 08 80 00 (08800) - Glazing

1.02 REFERENCES

A. Aluminum Association (AA)

1. DAF-45 – “Designation System for Aluminum Finishes”

B. American Architectural Manufacturers Association (AAMA):

1. 101 – “Voluntary Performance Specification for Windows, Skylights and Glass Doors”

2. 502 – “Voluntary Specification for Field Testing of Newly Installed Fenestration Products”

3. 611 – “Voluntary Specification for Anodized Architectural Aluminum”

4. 1503 – “Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections”

5. 2400 – “Voluntary Specification for Installation of Windows with a Mounting Flange in Stud Frame Construction”

6. 2604 – “Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels”

7. 2605 – “Voluntary Specification, Performance Requirements and Test Procedures for Superior Performance Organic Coatings on Aluminum Extrusions and Panels”

8. CW-10 – “Care and Handling of Architectural Aluminum from Shop to Site”

9. 904-09 – “Voluntary Specification for Multi-Bar Hinges in Window Applications”

C. American National Standards Institute (ANSI) Publications

1. Z97.1 – “Performance Specifications and Methods of Test for Safety Glazing Materials Used in Buildings”

D. ASTM International (ASTM) Publications:

1. C518 – “Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus”

2. C1036 – “Standard Specifications for Flat Glass”

3. C1048 – “Standard Specifications for Heat-Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated Glass”

4. D3985 – “Standard Test Method for Oxygen Gas Transmission Rate Through Plastic Film and Sheeting Using a Coulometric Sensor”

5. E90 – “Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements”

6. E283 – “Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen”

7. E330 – “Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference”

8. E331 – “Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference”

9. E413 – “Classification for Rating Sound Insulation”

10. E547 – “Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Differential”

11. E774 – “Standard Specification for Sealed Insulating Glass Units”

12. E1886 – “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”

13. E1996 - “Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes”

14. F588 - “Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact”

15. F1249 – “Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor”

E. Glass Association of North America (GANA):

1. “GANA Glazing Manual”

F. Federal Specifications (FS) Publications:

1. FS-RR-W-365A “Wire Fabric (Insect Screening)”

G. Insulating Glass Certification Council (IGCC)

H. Insulating Glass Manufacturers Alliance (IGMA) Publications:

1. Glazing Guidelines

I. National Fenestration Ratings Council (NFRC)

J. Screen Manufacturers Association (SMA) Publications:

1. 1004 “Specifications for Aluminum Tubular Frame Screens for Windows”

K. U.S. Consumer Product Safety Commission (CPSC) Publications:

1. 16 CFR Part 1201 “Safety Standard for Architectural Glazing Materials”

L. Window and Door Manufacturers Association (WDMA) Publications:

1. ANSI/AAMA/WDMA 101/I.S.2/NAFS-02 “Voluntary Performance Specification for Windows, Skylights and Glass Doors”

2. AAMA/AAMA/WDMA/CSA 101/I.S.2/A440 “Standard/Specification for Windows, Doors and Unit Skylights”

1.03 SUBMITTALS

A. Submit “Letter of Conformance” in accordance with Section 01 33 00 (01330) – with the following supporting data:

1. Product data for each type of aluminum window specified, including standard construction details, dimensions of individual components, profiles, finishes, hardware, and accessories.

2. Shop drawings for each type of window specified, including ¼-inch scale wall elevations, typical unit elevations at ¾-inch scale details, full size details of typical composite members and the following:

a. Panning Details

b. Flashing and drainage details.

c. Mullion details, including reinforcement and stiffeners.

d. Joinery details.

3. Samples: Provide full-size or partial-size sample of window illustrating glazing system, quality of construction and finish.

4. Product certificates signed by the window manufacturer certifying that window units comply with specified performance requirements.

5. Submit certified independent laboratory test reports verifying compliance with all test requirements of 1.05 PERFORMANCE REQUIREMENTS as requested by Architect.

1.04 DEFINITIONS

A. Performance grade number, included as part of the AAMA/WDMA/CSA 101/I.S.2/A440 product designation code, is actual design pressure in pounds force per square foot used to determine structural test pressure and water test pressure.

1.05 PERFORMANCE REQUIREMENTS

A. Certify that windows have been tested in accordance with American Architectural Manufacturers Association (AAMA/WDMA) Specification for Performance Class specified complying with the following performance standards:

1. AAMA/WDMA/CSA 101/I.S.2/A440 Performance Requirements: Provide aluminum clad wood windows of the performance class and grade indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440.
   a. Performance Class: P- AW

   b. Performance Grade: 70

2. Structural Test Performance Requirements (ASTM E330):

   a. Uniform Load Deflection Test: No deflection of any unsupported span L of test unit in excess of L/175 at both a positive and negative load of 70 PSF.

   b. Uniform Load Structural Test: Unit to be tested at 105 PSF, both positive and negative, with no glass breakage; damage to make windows inoperable; or permanent deformation of any main frame or ventilating member in excess of 0.2% of its clear span.

3. Water Resistance (ASTM E331 and ASTM E547): No uncontrolled water penetration at test pressure indicated.

   a. Class P-AW-70: 12.00 PSF

4. Air Infiltration (ASTM E283):

    a. Projected Awning Windows: Maximum 0.10 CFM per sq./ft. of total exterior surface area, when tested at a static air pressure differential of 6.24 PSF minimum.

    b. Fixed Windows: Maximum 0.10 CFM per sq./ft. of total exterior surface area, when tested at a static air pressure differential of 6.2 PSF minimum.

5. Operating Force (AAMA/WDMA/CSA 101/I.S.2/A440 Table 7.2): Maximum force to maintain motion perpendicular to lever in the plane of its motion.

    a. Class P-AW-70: 30.35 LBF maximum

B. Project Wind Loads:

Please specify design wind pressure, both positive and negative required by the governing building code, as calculated from ANSI A58.1, or as determined by boundary layer wind tunnel testing. Minimum for positive and negative pressure = 10.0 p.s.f.

1. The system shall be designed to withstand the following loads with respect to the plane of the wall:

    a. Positive pressure of ___ p.s.f. at non corner zones.

    b. Negative pressure of ___ p.s.f. at non corner zones.

    c. Negative pressure of ___ p.s.f. at corner zones.

1.06 QUALITY ASSURANCE

A. All window units shall be manufactured by a single source.

1. All windows in any one project must be by the same manufacturer and with comparable frame depth, profile, glazing bite, and installation requirements. Manufacturer must provide a window system that can incorporate all window configurations used on the project.

2. Standards: Requirements for aluminum windows, terminology and standard of performance, and fabrication workmanship are those specified

and recommended in AAMA/WDMA/CSA 101/I.S.2/A440 and The Aluminum Association (AA).

a. Actual Project Window sizes which do not exceed the "Minimum Test Size" as referred to in Gateway Performance Requirements table in (AAMA/WDMA/CSA 101/I.S.2/A440) shall be tested and certified at or exceeding the actual project maximum size in accordance with all other AAMA/WDMA/CSA 101/I.S.2/A440 requirements.

b. Actual Project Window sizes which exceed the "Minimum Test Size" as referred to in the Gateway Performance Requirements table in (AAMA/WDMA/CSA 101/I.S.2/A440) shall be tested and certified at or exceeding the actual project maximum size in accordance with all other (AAMA/WDMA/CSA 101/I.S.2/A440) requirements.

1.07 DELIVERY, STORAGE AND HANDLING

A. Transportation and Handling: Transport products by methods to avoid product damage, deliver in undamaged condition in manufacturer's unopened containers or packaging. Provide equipment and personnel to handle products by method to prevent soiling or damage. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

B. Storage and Protection: Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain with temperature and humidity ranges required by manufacturer's instruction.

1.08 WARRANTIES

A. Aluminum Clad Wood Window Warranty

1. Products: Submit a written warranty, executed by the window manufacturer, for the following:

a. Framing, sash components and hardware: A period of (1) year from the date of manufacture, against defective materials and workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which results in premature failure of the windows or parts, outside of normal wear.

b. Insulated glass units: A period of (10) years from the date of manufacture, against insulated glass seal failure unrelated to glass breakage.

c. In the event windows or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer's option.

d. Where applicable, materials which are applied to the face of insulated glass for the purpose of simulating division in glass openings (SDL's) are warranted against detaching from the glass surface for a period of (5) years.

e. Finish: Refer to Part 2, Section 2.06 "FINISHES" for warranty requirements.

f. Warranty for all components must be direct from the manufacturer (non- pass through) and non- prorated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.

2. Installation: Submit a written warranty, executed by the window installer, for a period of (1) year from the date of substantial completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.

a. In the event that installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer's option.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Approved Manufacturers:

1. Quaker Window Products Company, Inc. (800) 347-0438

a. Projected Awning Window: "TIMBERLINE AWN-Roto Series"

2. Substitutions: Only pre-approved products specified by the Architect will be acceptable. Submit the following information with proper documentation as required for pre-bid substitution requests, and at least (10) working days prior to bid date.

a. Independent test reports certifying that proposed product is in accordance with, and meets all criteria specified in Section 1.05 “PERFORMANCE REQUIREMENTS”.

b. Drawing details of elevations and sections, and samples in accordance with, and as specified in Section 1.03 “SUBMITTALS”.

c. Copy of manufacturer’s warranty specified in accordance with, and as specified in Section 1.08 “WARRANTIES”.

d. Any additional information requested by the Architect.

2.02 MATERIALS

A. Interior Wood:

1. Select soft wood, water repellent treated with preservative that meets WDMA I.S.4, KOP-Coat 111.

B. Aluminum Members:

1. Extruded aluminum prime billet 6063-T6 alloy for primary components, 6063-T6, or 6061-T6 for structural components, all in accordance with (ASTM B221).

C. Structural Thermal Barrier Construction:

1. Frame and sash members shall include a structural thermal barrier, applied in the manufacturer’s facility, using concealed low-conductance poured-in-place polyurethane in a pre-treated cavity.

2. After proper curing, the aluminum bridge section must be removed to provide a 11/16” minimum separation between interior and exterior metal surfaces.

3. The thermal barrier cavity shall have a manufactured mechanical lock applied consisting of abrading or lancing of the extrusion cavity prior to application of poured-in-place polyurethane.

4. Thermal Break Performance Requirements:

a. Thermal conductivity of barrier material: maximum 0.21 BTU-in/(hr-ft^2-°F) in accordance with (ASTM C 518).

b. Systems employing non-structural thermal barriers, or barrier systems absent of a mechanical lock application are not acceptable.

2.03 MANUFACTURED UNITS

A. Principal aluminum window frame members shall have a minimum 0.070" outside wall thickness, and .078" mounting webs, and sectional flanges.

B. Window frame depth shall be 6" minimum.

C. Glazing: Refer to Section 2.05 "GLASS MATERIALS".

D. Interior Exposed Surfaces: Ponderosa or Radiata Pine with no visible fastener holes.

E. Interior Wood Corner Assembly:

1. Interior wood components shall be constructed in a secure and workmanlike manner to perform as hereinafter specified. All wood joints shall be butt type, coped and jointed neatly and secured by means of screws anchored in integral ports.

2.04 COMPONENTS

A. All fasteners, tools, equipment, and other materials necessary for a complete installation shall be furnished by the Contractor.

1. Aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by the manufacturer to be noncorrosive and compatible with all window members, cladding, trim, hardware, anchors, and other components.

B. Locking handles, cases, and strikes to be die cast or stainless steel.

C. Thermoplastic or thermo-set plastic caps, housings, and other components to be injection-molded nylon, extruded PVC, or other suitable compound.

D. Hardware:

1. Hinging Hardware:

a. Hinges shall be 4-bar arm type in accordance with (AAMA 904-09) for Heavy Commercial and Architectural Grade Windows.

b. Hinge bars shall be constructed of stainless steel, with solid brass shoes, and nylon bearing washers at all pivot points.

c. Hinges shall include two friction adjusters per each.

d. All hinge components shall be concealed while window is in the closed position.

2. Locking Hardware:

a. Locks must hold securely up to 200 lbs. of force per lock for negative air pressure and forced entry resistance.

E. Insect Screens: Provide interior mounted insect screen panel for each operable sash.

Please select one of the following "line 1" items below for screen type

1. Screen Fabric:

a. 18 by 18 mesh of 0.012" fabric thickness, .008" yarn diameter. Comply with FS L-S-125B(4.4.9), Scale 1.

b. Screen wire shall contain a durable hydrophobic coating which repels water, and prevents dirt and debris from clinging to the screen

c. Screen wire product shall be "Greenguard" certified for low chemical emissions.

1. Screen Fabric: Aluminum: 18 by 16 mesh of 0.013" diameter wire. Comply with FS-RRW-365, Type VII, except black anodized or "gun metal" coating on wire.

2. Screen Frame: Provide aluminum frames and removable vinyl fabric retainer spline.

a. Finish shall match window.

Optional Item

1. Safety Device Stops: For operable windows, provide stops to prevent opening greater than *enter opening space measurement*. Stops shall be manufacturer's standard for intended use, and provided by the manufacturer.

2. Sills: Manufacturer's standard exterior sills, as shown on Drawings.

Optional Item

a. Nailing fin: manufacturer's standard nailing fin.

b. Sill Flashing: manufacturer's standard snap-on type, if required as shown on Drawings.

3. Mullions: Provide mullions and cover plates as shown, matching window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.

Optional Item

4. Muntins:

Select one of the Muntin options [item "a."] below if required

a. Internal Muntins:

1) Roll formed aluminum of specified width, located between glass panes within the sealed insulated glass unit.

2) Muntins shall have finish to match color of Window Frame.

a. Simulated Divided Lite Muntins:

1) Composition shall include:

i. Exterior applied extruded aluminum Muntin of specified width, continuously adhered to surface of glass with a high performance acrylic adhesive system.

ii. Roll formed aluminum of specified width, located between glass panes within the sealed insulated glass unit.

2) Interior applied Solid Ponderosa or Riata Pine Muntin of specified width, continuously adhered to surface of glass with a high performance acrylic adhesive system.

3) Finish of Exterior muntin components shall comply with Section 2.06 “FINISHES”.

4) Finish color of Exterior and Interior applied muntins, and internal muntins shall match Window Frame.

Optional Item

5. Panning:

   a. Provide extruded aluminum panning in accordance with (ASTM B221) by Window Manufacturer, type and size as indicated on Drawings.

   b. Panning shall be cut to fit by Window Manufacturer.

   c. Finish of Panning components shall comply with Section 2.06 “FINISHES”, and color shall match Aluminum Clad Wood Windows.

Optional Item

6. Receptor System / Subframe:

   a. Provide extruded aluminum, thermally broken Receptor System with Aluminum Clad Wood Windows by Window Manufacturer in accordance with (ASTM B221), as shown on Drawings.

   b. Finish of Receptor System components shall comply with Section 2.06 “FINISHES”, and color shall match Aluminum Clad Wood Windows.

2.05 GLASS MATERIALS:

Please select one of the [item “A.”] glass types below which is in accordance with design. The recommended Low-Emissivity (Low-E) coating is an option listed below; however, if the design requires tinted glass, or another specific type of (Low-E), please choose the blank option and add pertinent information

A. Clear Float Glass: ASTM C1036, Type 1 (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select) as manufactured by one of the following:

1. Approved Manufacturers:

   a. Cardinal Industries

b. Approved Substitution by Architect

A. Coated Low Emissivity Glass: Type 1 (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select), with coating type and performance characteristics complying with requirements specified below:

1. Low E Coating: Surface #2 on insulated units.

2. Approved Manufacturers:

a. "LoE^2- 272"; Cardinal Industries

b. Approved Substitution by Architect.

3. Whole Window U-Value shall be a maximum of 0.28.

For improved Whole Window U-Values using alternative glass coating options, please consult with Quaker Window Products.

A. *(Please specify if neither of the two above items are selected)*

B. Tempered Glass: Condition A (uncoated surfaces), Type 1 (transparent glass, flat), Class 1 (clear), Quality q3, clear, fully tempered safety glass (meet requirements of ANSI Z97.1).

1. All tempered glass shall conform to ASTM C1048, ANSI Z97.1, and CPSC 16 CFR Part 1201. Tempered glass shall bear permanent monogram indicating tempered quality. Fabrication marks on tempered glass shall be located to be concealed in completed installation.

C. Windows shall be glazed as follows:

1. Sound Transmission Class (STC) (ASTM E413): Provide glazing required for conforming to over all STC ratings as specified for aluminum windows.

For sound transmission class requirements, please consult Quaker Window Products (800) 347-0438

D. Insulating Glass: Manufacturer's standard units that comply with specified quality standards and coatings.

a. Provide preassembled units consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with ASTM E774 for performance classification indicated as

well as with other requirements specified for glass characteristics, air space, sealing system, sealant, space material, and desiccants.

1) Total Thickness: 1”

2) Thickness of Each Pane: **(standard 1/8” or specify)**

3) Air Space Thickness: **(standard 3/4” or specify)**

For higher sound transmission class requirements, changes may be required to the highlighted values. Please consult Quaker Window Products (800) 347-0438

b. Exterior Pane of Glass:

1) Provide tempered glass where shown on Drawings and as required by local codes and ordinances.

c. Insulated Unit Sealing System:

1) Thermal conductivity of insulated glass spacer shall perform in accordance to the following:

a) Silicone: 0.202 BTU/hr-ft-F (0.350 W/m-K)

b) PIB 0.089 BTU/hr-ft-F (0.155 W/m-K)

c) Desiccant (loose fill): 0.017 BTU/hr-ft-F (0.030 W/m-K)

d) Spacer: 8.197 BTU/hr-ft-F (14.187 W/m-K)

2) Insulated glass unit spacer system must include a secondary dual seal. This also applied to solid foam warm edge seal glass spacer systems.

2.06 FINISHES

A. Finish of Exterior Aluminum Components

1. Finish of all exterior exposed areas of aluminum clad wood windows and components shall be applied in accordance with the appropriate AAMA Voluntary Guide Specification shown below:

Please select one of the following sets "a., b. & c." below

a. High Performance Organic Powder Coating conforming to (AAMA 2604), Voluntary Specification, Performance Requirements and Test Procedures which also meets the following standards:

    1) Powder Coating resin shall consist of Fluoroethylene Vinyl Ether (FEVE).

    2) Coatings which require a chrome based liquid primer or pretreatment are not allowed.

    3) Scratch resistance shall meet or exceed a pencil test of H in accordance with (ASTM D3363-00), "Standard Test Method for Film Hardness by Pencil Test."

    4) Abrasion resistance shall meet or exceed a Taber abrasion test of 1000 rotations in accordance with (ASTM D4060-14), "Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser".

b. Finish Warranty Period: 10 years from date of manufacture

c. Color Selection:

    1) Exterior Color: **Please select a color**

a. Superior Performance Organic Powder Coating conforming to (AAMA 2605), Voluntary Specification, Performance Requirements and Test Procedures which also meets the following standards:

    1) Powder Coating resin shall consist of Fluoroethylene Vinyl Ether (FEVE).

    2) Coatings which require a chrome based liquid primer or pretreatment are not allowed.

    3) Scratch resistance shall meet or exceed a pencil test of H in accordance with (ASTM D3363-00), "Standard Test Method for Film Hardness by Pencil Test".

    4) Abrasion resistance shall meet or exceed a Taber abrasion test of 1000 rotations in accordance with (ASTM D4060-14),

"Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser".

b. Finish Warranty Period: **15 years from date of manufacture

c. Color Selection:

1) Exterior Color: **Please select a color**

a. Electrolytically Deposited Anodic Coating, Class 1, Designation AAM12C21A44 conforming to (AAMA 611)

b. Finish Warranty Period: 5 years from date of manufacture

c. Color Selection: (clear, champagne, light bronze, medium bronze, dark bronze, or black)

1) Exterior Color: **Please select a color**

b) **Optional 20 year warranty is available for Superior Performance Organic Coatings. (AAMA 2605). Full warranty is for a standard, non-metallic and non-exotic color, and may require a clear topcoat in order to comply with full warranty period.

B. Finish of Interior Wood Components:

Please select one of the following "Line 1" items below

1. Unfinished by manufacturer. (Refer to Division 9 – Finishing)

1. Primed by manufacturer. (Refer to Division 9 – Finishing)

1. Pre-finished white by manufacturer.

1. (Please specify if no options above are selected)

2.07 FABRICATION

A. Fabricate windows allowing for minimum clearances and shim spacing around perimeter of assembly, yet enabling installation.

B. Rigidly fit main frame aluminum joints and corners with heavy-duty corner keys. Accurately fit and secure corners tight. Make corner joints flush, hairline, and weatherproof. Seal corner joints with sealant.

C. Develop drainage holes with moisture pattern to exterior.

D. Prepare components to receive anchor devices. Fabricate anchorage items.

Insert Section 2.06 only if applicable at discretion of specifier.

2.08 SUSTAINABLE DESIGN

A. Sustainable Design: The materials specified in this section are intended to have applicable credits toward LEED® certification. Provide documentation in accordance with USGBC's LEED for New Construction and Major Renovation *(insert one) version 2.2 or version 3 (2009),* verifying that the components, processes or assemblies specified herein conform to the following requirements.

Select the credits required for the specified level of certification being sought. Modify the criteria as needed to coincide with other LEED® standards

1. EA Credit 1: Optimize Energy Performance

2. Provide area weighted overall U-Factor in accordance with Section 2.05.

    a. Provide area weighted center of glass or overall SHGC in accordance with Section 2.05 / A.

    b. Provide area weighted center of glass or overall SHGC in accordance with Section 2.05 / A.

3. EA Credit 2: On site renewable energy

    a. Provide coordination for glazing of photovoltaic panels or other energy generating glazing.

4. MR Credit 1.1 and 1.2: Building Reuse

    a. Provide windows and accessories which allow easy retrofit and minimal demolition into existing building conditions.

5. MR Credit 4.1 and 4.2: Recycled Content.

    a. Provide aluminum framing with overall recycled content values of minimum 60%. All secondary aluminum must comply with alloy and

temper requirements outlined in Section 2.02 / A / 1.

b. Overall recycled content must contain the following levels of post and pre consumer recycled content.
   a) Post consumer content no less than 5%
   b) Pre consumer content no less than 50%

c. Submit documentation outlining recycled content percentages (post and pre consumer content separately) and the weight of aluminum in proportion to the overall assembly weight.

NOTE: Glass components are a large portion of total assembly weight and do not contribute to the recycled content value.

6. MR Credit MR 5.1 and 5.2: Regional Materials *(only for projects located within 500 miles of Freeburg, Missouri)*

   a. Provide assemblies that are **manufactured** as well as use materials that are **harvested, recovered or extracted** from within 500 miles of the job site.

7. EQ Credit 2: Increased ventilation
   a. Provide operable vents with occupant-enabled hardware.

   b. Provide operable vent quantity and sizes as shown on project drawings.

8. EQ Credit 4.1 and 4.2: Low-Emitting Materials (adhesives, sealants / paints and coatings)

   a. Verify that the as shipped product does not require any on site application of adhesives, sealants, paints or coatings other than perimeter or installation sealants.

   b. All interior “on site” applied primers, structural glazing adhesives, metal to metal sealants and cosmetic seals must meet applicable South Coast Air Quality Management District (SCAQMD) Rule #1168 VOC limits.

9. EQ Credit 6.2: Controllability of Systems - Thermal Comfort

   a. Provide operable vents with occupant-enabled hardware.

   b. Provide operable vent quantity and sizes as shown on project drawings.

10. EQ Credit 8.1 and 8.2: Daylight and Views

a. Provide Glass with visual light transmittance (VT) as specified in Section 2.05 / A.

b. Provide operable vent quantity and sizes as shown on project drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions:

1. Verify that building substrates permit installation of windows according to the manufacturer's instructions, approved shop drawings, calculations and contract documents.

2. Do not install windows until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Erection of Aluminum Windows

1. Install windows with skilled tradesmen in exact accordance with approved Shop Drawings, Installation Instructions, Specifications, and in accordance with (AAMA 101/I.S.2./ A440).

2. Windows must be installed plumb, square, and level for proper weathering and operation. Jambs must not be “sprung”, bowed, or warped during installation.

3. Any uncoated aluminum components of Aluminum Clad Wood Window shall be insulated from direct contact with steel, masonry, concrete, or other dissimilar metals by bituminous paint, zinc chromate primer, nonconductive shims, or other suitable insulating materials.

B. Field Tests

1. Field testing procedure of installed windows shall be in accordance with AAMA 502.

2. The test pressure used during the field test procedure shall be 2/3 of the rated test pressure of the test specimen in accordance with AAMA 502. There shall be no optional variances over 2/3 used during testing.

3. Initial field testing must be performed prior to no more than 5% of windows have been installed.

4. All field testing expenses shall be at the burden of the contractor.

3.02 ADJUSTING AND CLEANING

A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, or other debris. Protection from this point shall be the responsibility of the General Contractor.

END OF SECTION