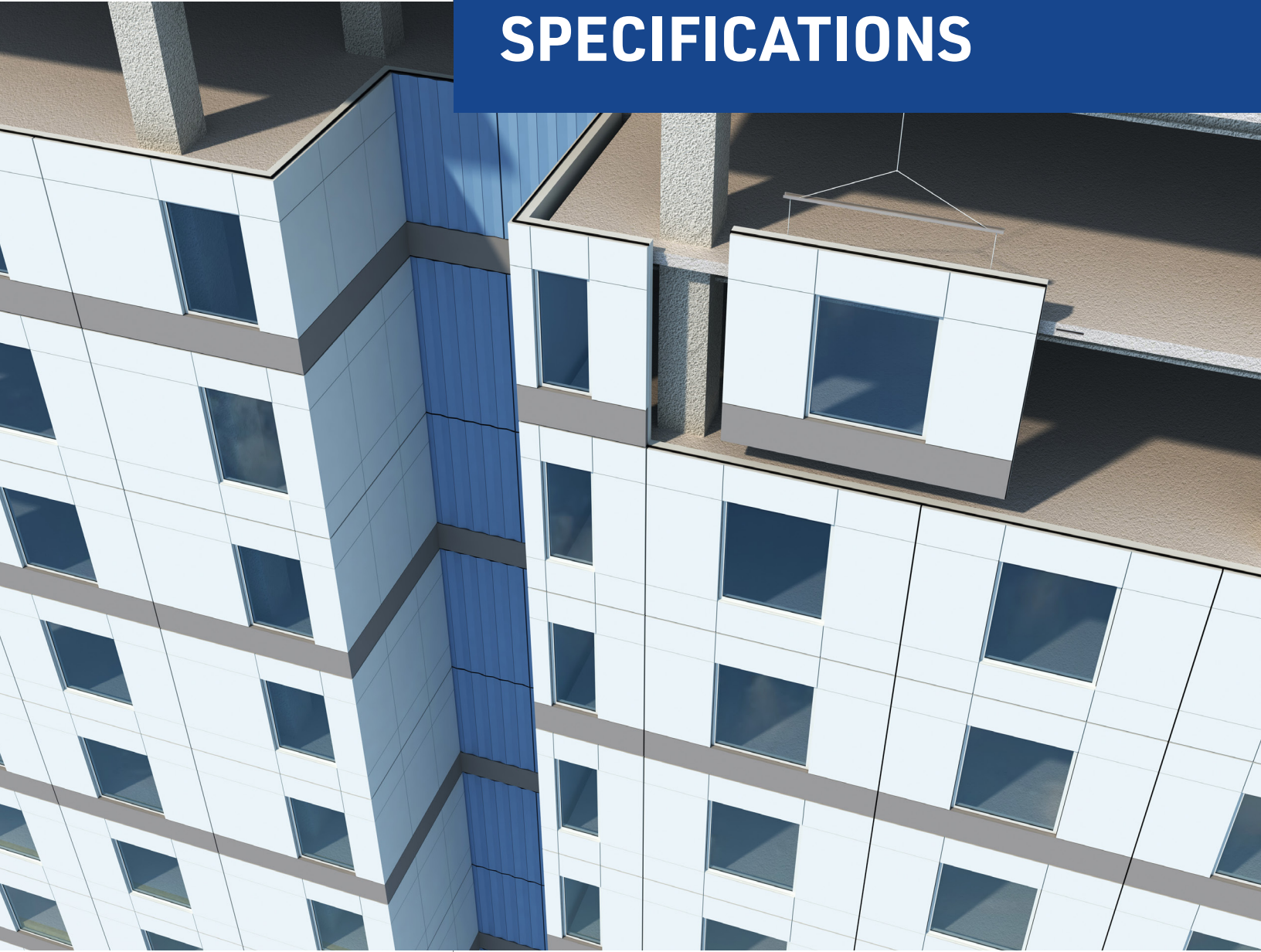


MiTek®

COMMERCIAL SOLUTIONS

ONEWALL™ SPECIFICATIONS



SECTION 084423
METAL FRAMED CURTAIN WALL SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal framed unitized curtain wall, shop assembled with continuous perimeter gaskets, pressure-equalized rainscreen cladding, exterior mineral wool insulation, vapor permeable water-resistive air barrier, exterior [gypsum] [cementitious] board sheathing, and light-gauge steel-framing.
- B. Batt insulation and vapor retarder sheet
[Note to Specifier - Batt insulation and vapor retarder sheet may be required on a product-specific basis depending on local code requirements, thermal compliance condition, or design team preference. In most PNW environments it should be acceptable to rely on a Type III Vapor Retarder such as latex or enamel paint on the finish drywall. Remove Part B if not applicable for Project.]
- C. Framed vision **[and spandrel]** glazing infill unit attached within rough opening of steel framing.
- D. Associated louvers, vents, flashing and operable sash.
- E. Firestopping between curtain wall and edge of floor slab.

1.02 RELATED REQUIREMENTS

- F. Section 033000 - cast-in-place concrete: weld plates embedded in concrete for attachment of anchors.
- G. Section [_____]: for infill panels.
- H. Section 051200 - structural steel framing: steel attachment members.
- I. Section 055000 - metal fabrications: steel attachment devices.
- J. Section 085113 - aluminum windows.
- K. Section 088000 - glazing.
- L. Section 122400 - window shades: attachments to framing members.
- M. Section [_____]: window washing equipment requirements.

1.03 REFERENCE STANDARDS

- N. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site 2015.
- O. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure 2017.
- P. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems 2015.
- Q. AAMA 501.4 - Recommended Static Test Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Induced Interstory Drifts 2018.
- R. AAMA 503 - Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems 2014.
- S. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document) 2015.
- T. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).
- U. AAMA 612 - Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum 2017a.
- V. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections 2009.
- W. AAMA 1801 - Voluntary Specification for the Acoustical Rating of Exterior Windows, Doors, Skylights and Glazed Wall Sections 2013.

- X. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2017a.
- Y. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.
- Z. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2014.
- AA. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- BB. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- CC. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.
- DD. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2014.
- EE. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2013.
- FF. ASTM C1249 - Standard Guide for Secondary Seal for Sealed Insulating Glass Units for Structural Sealant Glazing Applications 2018.
- GG. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015.
- HH. ASTM C793 - Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants 2005 (Reapproved 2017).
- II. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants 2018.
- JJ. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- KK. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems 2016.
- LL. ASTM C1135 - Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants 2015.
- MM. ASTM C1184 - Standard Specification for Structural Silicone Sealants 2018, with Editorial Revision.
- NN. ASTM C1249 - Standard Guide for Secondary Seal for Sealed Insulating Glass Units for Structural Sealant Glazing Applications 2018.
- OO. ASTM C1401 - Standard Guide for Structural Sealant Glazing 2014.
- PP. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
- QQ. 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 2019.
- RR. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014.
- SS. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000 (Reapproved 2016).
- TT. ASTM E413 - Classification for Rating Sound Insulation 2016.
- UU. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference 2000 (Reapproved 2016).
- VV. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors 2002 (Reapproved 2018).

- WW. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference 2015.
- XX. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes 2017.
- YY. ASTM E2307 – Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus
- ZZ. FLA (PAD) - Florida Building Code Online - Product Approval Directory Current Edition.
- AAA. Miami (APD) - Approved Products Directory; Miami-Dade County Current Edition.
- BBB. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage, glazing, finish, framing, sheathing, air and water resistive barrier, sealant and transition materials and cladding products.
- C. Shop Drawings: Indicate system dimensions, opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
 - 1. Drawings to indicate design concept and tolerances, as well as demonstration of specified Performance Criteria and system movement extents. Clearly illustrate specific drainage and pressure equalization strategies as well as all transition conditions with other adjacent systems.
 - 2. Layout and configuration of anchorage and embedded devices.
 - 3. Reinforcing members.
- D. Shop Drawings: Provide details of proposed structural sealant glazing (SSG) and weather sealant joints indicating dimensions, materials, bite, thicknesses, profile, and support framing.
 - 1. Glass and glazing materials, reglazing sequence and window washing provisions.
- E. Samples: Submit two samples 12-inches by 12-inches in size illustrating finished aluminum surface, glazing, infill panels, and glazing materials.
- F. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- G. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.
- H. Structural Sealant Glazing (SSG): Submit product data and calculations showing compliance with performance requirements.
- I. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable to demonstrate performance if system size is equal to or less than the system size tested. If minor variations exist from same system design, an engineering judgement may be provided for demonstration of compliance.
- J. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- K. Designer's Qualification Statement.
- L. Manufacturer's Qualification Statement.
- M. Installer's Qualification Statement.

- N. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Design curtain wall and its structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the State in which the Project is located.
- B. Full-Size Performance Mock-up Testing: Have a specimen representative of project conditions tested by an independent testing agency for compliance with specified air infiltration and water penetration criteria.
[Note to Specifier – Can remove Item C if SSG is not included on project]
- C. Verify that each applicable component is appropriate for use in structural sealant glazing (SSG) application in regards to at least the following properties; size, shape, dimensions, material, self-life, storage conditions, and color.
- D. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than ten years of documented experience.
 - 1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
Insulating Glass Certification Council (IGCC).
Safety Glazing Certification Council (SGCC).
- E. Installer Qualifications: Company specializing in performing work of type specified and with at least ten years of documented experience and approved by manufacturer.
 - 1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.
North American Contractor Certification (NACC) for glazing contractors.
Equivalent independent third-party ANSI accredited certification.

1.07 PROJECT CRAFTSMANSHIP MOCK-UP

- A. See Section 014000 - Quality Requirements, for general requirements for mock-ups.
Specifiers Note: Choose one of the two items below.
- B. Locate on-site where directed by Architect; mock-up may remain as part of the Work.
- C. Locate off-site where directed, and remove when directed.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.09 FIELD CONDITIONS

- A. Do not install accessories and sealants when ambient temperature or substrate surface temperatures are less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation. Comply with manufacturers written cold weather application instructions.
- B. Cold Weather Conditions:
 - 1. Site Fluid-Applied, Vapor-Permeable Joint Flashing: Comply with manufacturer's cold weather application written instructions when atmospheric temperatures or substrate surface temperatures are less than 40 Degrees F (4 Degrees C).
- C. Exposure: Comply with manufacturer's limitations on exposure of applied product.
 - 1. Do not apply air barrier joint flashing to sheathing surface that is frozen or has frost.
- D. Protect adjacent substrates from environmental conditions that affect air barrier performance.
- E. Schedule work for inspection of air barrier applications prior to concealment.
- F. Ensure air barriers are cured before covering with other materials.

1.10 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a ten year period after Date of Substantial Completion.
- C. Provide ten year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide ten year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.
- E. Provide five year manufacturer warranty against failure of weather tightness, including water leaks into the interior, air leaks with air change values in excess of either code or manufacturer's stated values, and excessive condensation found to be caused by the unit system.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Mitek OneWall

2.02 AIR- AND WATER-RESISTIVE ASSEMBLY PERFORMANCE REQUIREMENTS

- A. Air- and Water-Resistive Assembly Performance: Air- and water-resistive board assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier system and as a water resistive barrier flashed to direct incidental water to wall exterior, and interface with adjacent building air barrier system components.
- B. Air- and Water-Resistive Board Assemblies: Capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations and transitions at perimeter conditions without deterioration and air-leakage exceeding specified limits.

[Note to Specifier - When designing the permeability layers of the exterior envelope, note that air- and water-resistive sheathing board systems on the market have markedly varying system perm ratings ranging from 0.5 to 25 perms. The Georgia-Pacific DensElement Barrier System rating is 25 perms or more.]

- C. Water Vapor Permeance; Panel Assembly: 25 perms (1149 ng/Pa x s x sq. m) or more as tested according to ASTM E 96/E 96M, Procedure B.

[Note to Specifier - Retain "Fire-Resistance-Rated Assemblies" Paragraph below where air barrier and water-resistive board is part of fire-resistance-rated assemblies. Indicate design designations of specific assemblies on Drawings.]

- D. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by a qualified testing agency.
- E. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.

[Note to Specifier - Retain "Fire Propagation Characteristics" Paragraph below only if products specified are part of a fire-resistance-rated assembly. Indicate rating, testing agency, and testing agency's design designation on Drawings. Consult PROSOCO representative for details of tested systems.]

- F. Fire Propagation Characteristics: Provide air- and water-resistive board assembly qualified as a component of a comparable wall assembly that has been tested or engineered to pass NFPA 285.

2.03 METAL FRAMED UNITIZED CURTAIN WALL SYSTEM

- A. Metal Framed Unitized Curtain Wall: Factory fabricated, factory finished, pressure-equalized units comprised of custom extruded aluminum, standard steel framing, and exterior sheathing, with integral water-resistive air barrier, framed vision **[and spandrel]**

glazing infill, rainscreen cladding with related flashings, continuous dry-gasket perimeter water shedding joints, anchorage and attachment devices.

1. Steel stud framed unit: Exterior **[gypsum]** sheathing panel with integral water-resistive air barrier and associated transition membranes, insulation, and rainscreen cladding attached to standard steel framing with custom aluminum extrusion members at framing perimeters for continuity of water shedding and air barrier control layers between adjacent units. Interlocking vertical mullions and stack joints with dry gasket seals and accommodating required differential movement dimensions between adjacent units and structure. Moisture weeped to exterior at base of each unit by series of weeps and baffles.
2. Glazing infill:

[Note to specifier: Choose between a and b depending on type of glazing on project.]

- a. Pressure-fit dry gasket glazing in aluminum frame, inside glazed at head and fixed tuck-glazed frame at sill and jambs.
 - b. Structural Silicone Glazed (SSG) glazing in aluminum frame, sealed to exterior face of structural frame on all four sides of frame.
3. Fabrication Method: Shop/factory unitized system.
 4. Glazing Method: Shop/factory glazed system, shop-installed in punched opening within framed unit.
 5. Vertical Mullion Dimensions: 2-1/4 inches wide by 4 1/2 inches deep.
 6. Exposed Metal Finish:

For exposed extrusions, metal panels and miscellaneous metal accessories: Superior performing organic coatings. Color per Architect's approved sample.

Factory finish surfaces that will be exposed in completed assemblies.

Fabrication of extrusions completed prior to application of paint.

Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.

7. Provide flush joints and corners, weather sealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
8. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
9. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
10. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly.

Air barrier at opaque areas primarily in line with face of sheathing.

Air barrier at glazing located at interior face of aluminum frame, with accessory transition products for integration with air barrier at face of sheathing beyond rough opening.

Vapor retarder located on the interior side of framing, to be installed after units are set, and fully sealed to frame.

11. Perimeter Clearance: Coordinate extent of units with adjacent construction to allow for designed joint dimension, accounting for expected movement and tolerances.
12. Preparation for Window Treatments: Wrap rough opening with foil-faced self-adhered membrane (FFSAM), continuously sealed water resistive air barrier at face of sheathing and integrating with back angle at inboard plane of window frame at sill.

2.04 PERFORMANCE REQUIREMENTS

- B. Design and size components to withstand the following load requirements without damage or permanent set.

1. Design Wind Loads: Comply with the requirements of the building codes applicable to the project site, the requirements of ASCE 7-16, and the following:

[Note to specifier: Per AAMA laboratory tests, Basis of Design system is capable of resisting +/- 30psf Design Wind Loads.]

Positive Design Wind Load: [] lbf/sq ft (Pa).

Negative Design Wind Load: [] lbf/sq ft (Pa).

Measure structural performance by testing in accordance with ASTM E330/E330M, using test loads equal to 1.5 times the design wind loads and 60 seconds duration of maximum pressure. Wind pressures for this testing are to be based on Allowable Stress (0.6 x LRFD pressures).

Framing Supporting Glass:

For spans less than 13 feet 6 inches (4115 mm). Limit framing member deflection normal to wall plane to L/175 of clear span. Limit center of glass deflection to flexure limit of glass or 1", whichever is less and with full recovery of glazing materials.

For spans over 13 feet 6 inches (4115 mm), limit member deflection normal to wall to a maximum of 1/240 of span plus 1/4 inch (1/240 of span plus 6.4 mm), with full recovery of glazing materials.

Member Deflection: Limit member deflection parallel to wall to L/360 or 1/8", whichever is less, due to dead load.

Framing Supporting Opaque Cladding:

Plaster or Stucco finishes: Limit deflection to 1/360 of span length

Other Brittle Finishes: Limit deflection to 1/240 of span length

Flexible Finishes: Limit deflection to 1/120 of span length.

2. Seismic Loads: Design and size components to withstand seismic loads and sway displacement in accordance with requirements of ASCE 7-16 and the requirements of the building codes applicable to the project site.
3. Inter-story Differential Lateral Movement (Elastic – Serviceability): Meeting pass/fail criteria of AAMA 501.4, when tested at design displacement of 0.010 times greater adjacent story height, maximum, and 1.5 times design displacement, through three complete cycles.
4. Movement: Accommodate the following movement without damage to components or deterioration of seals:

Expansion and contraction caused by 180 degrees F (82 degrees C) surface temperature.

Movement of curtain wall relative to perimeter framing.

Deflection of structural support framing, under permanent and dynamic loads.

Shortening of structural concrete columns.

Creep of structural concrete members.

Inter-story drift of [] ().

Mid-span slab edge deflection of [] inch ([] mm).

[Note to specifier: Per AAMA laboratory tests, Basis of Design system can accommodate max. 5/8" mid-span slab edge deflection]

B. Fire Resistance Performance of Perimeter Fire Barriers:

1. Meet requirements for 3-hour fire rating, based on ASTM E2307.

C. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:

1. Test Pressure Differential: 15 psf (720 Pa).
2. Test Method: ASTM E331.
3. Test Method: AAMA 501.1.

D. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft (0.3 L/sec sq m) of wall area, when tested in accordance with ASTM E283/E283M at 6.27 psf (300 Pa) pressure differential across assembly.

E. Thermal Performance Requirements:

1. Condensation Resistance Factor of Framing: [50, 60, 70 or []], minimum, measured in accordance with AAMA 1503.
2. Overall U-value Including Glazing: [] Btu/(hr sq ft deg F) ([] W/(sq m K)), maximum.

3. Thermal Resistance of Framing: [_____] (deg F hr sq ft)/Btu ([_____] (K sq m)/W), minimum.
4. Thermal Resistance of Vision Areas: [_____] (deg F hr sq ft)/Btu ([_____] (K sq m)/W), minimum.

[Note to Specifier: Choose and edit acoustical performance requirements as required for project.]

F. Acoustical Performance Requirements:

1. Sound Attenuation: STC of [50, 35 or _____], minimum, from exterior to interior.
2. Test Method: ASTM E90, with calculation in accordance with ASTM E413.
3. Test Method: AAMA 1801 using 5/16 inch (7.9 mm) inch laminated exterior glazing, 1/2 inch (12.7 mm) air space and 3/16 inch (4.7 mm) annealed interior glazing.

2.05 COMPONENTS

- A. Aluminum Framing Members: Custom aluminum extrusions, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
1. Framing members for interior applications need not be thermally broken.
 2. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.

B. Steel Stud Framing:

1. Min. 16-gauge steel studs and tracks.
2. Min. G90 galvanizing

Wall Sheathing: Air- and Water-Resistive Sheathing Board: ASTM C 1177/C 1177M, glass-mat-faced gypsum sheathing board.

[Note to Specifier - DensElement Barrier System is a combination of Georgia-Pacific "DensElement" sheathing and "DensDefy Liquid Flashing"]

a. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Gypsum LLC; DensElement® Barrier System or a comparable product by one of the following:

[Insert manufacturer's name].

Board Thickness: 5/8-inch (15.9 mm) thick.

Board Type: Type X.

[Note to Specifier - SI (metric) module dimensions are not readily obtainable; verify availability by special order with manufacturer. Boards 48 inches (1219 mm) or 1200 mm wide can be installed horizontally but are usually installed vertically; edges must be protected by a WRB or must be sealed.]

Board Size: 48- by 96-inches (1219 by 2438 mm) for vertical and horizontal installations.

Air- and Water-Resistive Flashing Thickness: Minimum 16 mils (0.41 mm) wet film thickness.

Physical and Performance Properties:

1. Air Permeance; ASTM E 2178: Maximum 0.004 cfm/sq. ft. (0.02 L/s x sq. m) of surface area at 1.57-lbf/sq. ft. (75-Pa) pressure difference.
2. Water Vapor Permeance: 25 perms (574 ng/Pa x s x sq. m) or more when tested according to ASTM E 96/E 96M, Procedure B.
3. Combustion Characteristics; ASTM E 84: Class A.
4. Board Product Antifungal Properties; ASTM D 3273: 10; zero defacement.
5. VOC Content - Fluid-Applied Flashing: 50 g/L or less.
6. UV and Weathering Resistance: Maximum 12-month exposure.

[Note to Specifier: Item D is integral to the 3-hour fire performance of the Basis of Design system, but project specifics may require adjustments to the insulation thickness or locations.]

Item E can also be affected by Climate Zone, project requirements, and local code. Adjust or remove as necessary as applicable for project.]

C. Semi-Rigid Mineral Wood Board Insulation:

1. Basis-of-Design Product: Thermafiber FireSpan 90 Insulation
 - a. Within Stud Cavity: **[3"] or []** thick mineral wool board with foil-facer on the interior-facing side.
 - b. Exterior Side of Stud Cavity: **[2"] or []** thick mineral wool board, unfaced.
2. ASTM C 665 Type 1 preformed glass or mineral fiber batt; friction fit
3. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0, when tested in accordance with ASTM E 84.
4. R-Value: 4.3 per inch.
5. Density: 8.0 pcf (nominal).

D. Vapor Retarder: Interior Vapor Retarder On Inside Face of Studs of Exterior Walls

1. Basis-of-Design Product: Certainteed Membrain

E. Air Barrier Accessory Materials:

1. General: Provide compatible air barrier accessory materials furnished or recommended by air barrier manufacturer as required by Project conditions to produce a complete air barrier assembly identical to tested assemblies meeting performance requirements.
2. Joint Backing: See Section 079200 "Joint Sealants" for backing materials.
3. Primer: Liquid primer recommended by air barrier manufacturer for exposed gypsum core edges.

Basis-of-Design Product: Subject to compliance with requirements, provide PROSOCO, Inc.; PorousPrep Sealer.

Color: Blue.

4. Fluid-Applied Air Barrier Flashing: Application to joints, fasteners, penetrations, openings and material transitions.

Basis-of-Design Product: Subject to compliance with requirements, provide Georgia Pacific DensDefy Liquid Flashing.

Color: Orange

5. Flashing and Transition Strip: Preformed silicone extrusion, 24 mils (0.61 mm) thick.

Basis-of-Design Product: Subject to compliance with requirements, provide PROSOCO, Inc.; SureSpan EX

Pecora XL-Span Preformed Silicone Transition Membrane

6. Self-Adhered Transition Membrane

Basis-of-Design Product: Subject to compliance with requirements, provide Georgia Pacific DensDefy Transition Membrane

F. Fasteners:

1. Screws for Fastening Board Product Air barriers to Cold-Formed Metal Framing: Steel drill screws, ASTM C 1002, in length recommended by sheathing manufacturer for sheathing thickness.

G. Glazing: As specified in Section 088000.

1. For Vision Framing: Type [].
2. For Spandrel Panels: Type [].

[Note to Specifier: The window product used will vary per project, so the intent would be that the project will have its own aluminum window spec section that you just reference here.]

H. Aluminum Windows: As specified in Section 085113.

1. [Note to Specifier: Choose applicable infill cladding panel types for project below.
- 2.

I. Infill Cladding Panels:

1. Aluminum Sheet: [_____] inch ([_____] mm) thick
2. Insulated Aluminum Sheet: [_____] -inch thick
3. Insulated Steel Sheet: [_____] -inch thick
4. Terracotta Panels: [_____] -inch thick
5. Stone Veneer Panels: [_____] -inch thick
6. Composite Panels: [_____] -thick, comprised of [_____] and [_____].

[Note to Specifier: Choose appropriate finish below.]

7. Exterior Finish: [Class I natural anodized; Class II natural anodized; Class I color anodized; Class II color anodized; Natural anodized with organic seal; Color anodized with organic seal; Superior performing organic coatings; or [_____].

Color as approved by Architect.

[Note to Specifier: Cladding support is assumed to typically be comprised of continuous galvanized steel furring. Depending on project energy requirements, intermittent clips or other thermally improved furring may be necessary. Thermal clips are included as an option in this case.]

J. Cladding support: [Continuous aluminum extrusion hook and rail assembly] or [Continuous galvanized steel Z-furring] or [Intermittent fiberglass clips]

1. Basis of Design [**Aluminum extrusion hook and rail assembly**]: Custom-profile 6063-T6 aluminum extrusion hook and rail assembly, including support hook profiles attached to cladding system and rail support profiles attached to primary framing assembly.
2. Basis of Design [**Z-furring**]: 16-gauge G185 galvanized steel Z-shaped furring members and cladding attachments.
3. Basis of Design [**Clip**]: Cascadia Windows and Doors; Cascadia Clip fiberglass thermal spacer clip.

K. Louvers: Extruded aluminum blades and frame; fabricated to eliminate blade flutter

1. Blades: [**45 degree**] or [_____] slope with storm-proof shape.
2. Frames with integral drainage along verticals.
3. Finish: Same as curtain wall mullion sections.
4. Aluminum blank-off panel at rear for field cutting and sizing to suit mechanical duct attachment.
5. Provision for insulation interior of backpan as required for energy performance.

L. Louver Screening:

1. Bird or insect screen of [_____] size at exhaust louvers inside surface.

2.06 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Sheet Aluminum: ASTM B209 (ASTM B209M).
- C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- D. Structural Steel Sections: ASTM A36/A36M; shop primed.
- E. Structural Supporting Anchors: See Section 051200.
- F. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.
- G. Structural Supporting Anchors Attached to Reinforced Concrete Members: Design for structural connection with bolts or other approved means to a steel member or assembly structurally attached to the reinforced concrete structure.
- H. Fasteners: Stainless steel; type as required or recommended by curtain wall manufacturer.
- I. Exposed Flashings: Aluminum sheet, 20-gauge, 0.032 inch (0.81 mm) minimum thickness; finish to match framing members.
- J. Concealed Flashings: Galvanized steel, 26-gauge, 0.0179 inch (0.45 mm) minimum base metal thickness.

- K. Concealed Flashings: Sheet aluminum, 26-gauge, 0.017 inch (0.43 mm) minimum thickness.
- L. Concealed Flashings: Stainless steel, 26-gauge, 0.0187 inch (0.48 mm) minimum thickness.
- M. Firestopping: As specified in Section 078400.
- N. Structural Sealant Glazing (SSG) Adhesive: Neutral curing, silicone sealant formulated for SSG applications in compliance with ASTM C1184 and structural glazing industry guidelines, ASTM C1401.
 - 1. SSG adhesive in compliance with ASTM C920; [Type S - Single-component; Type M - Multicomponent], Grade NS, Class 50, Use NT, G, and A.
 - 2. Ultimate Tensile Strength: Minimum of 50 psi (345 kPa) as determined by test method ASTM C1135 under the following conditions.
Exposure to air temperatures of 190 degrees F (88 degrees C) and minus 20 degrees F (minus 29 degrees C).
Water immersion for seven (7) days, minimum.
Exposure to weathering for 5,000 hours, minimum.
 - 3. Sealant Design Tensile Strength: 20 psi (139 kPa), maximum.
 - 4. Hardness: 20 to 60 with Type A-2 durometer in compliance with test method ASTM C661.
 - 5. Shelf Life: Six (6) months, minimum.
 - 6. Color: Black.
 - 7. Volatile Organic Compound (VOC) Content: Less than 20 g/l.
 - 8. SSG sealant tested for compatibility with glazing accessories in compliance with ASTM C1087, tested for accelerated weathering in compliance with ASTM C793, and in compliance with insulating glass secondary sealant design standards of ASTM C1249.
 - 9. Manufacturers:
Dow Chemical Company; DOWSIL 121 Structural Glazing Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html.
Dow Chemical Company; DOWSIL 983 Structural Glazing Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html.
Dow Chemical Company; DOWSIL 995 Silicone Structural Glazing Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html.
Dow Chemical Company; Dowsil 795 Silicone Structural Glazing Sealant (for field applied structural glazing conditions: consumer.dow.com/en-us/industry/ind-building-construction.html
Pecora Corporation; Pecora 895 NST Structural Glazing Sealant: pecora.com/wp-content/uploads/2016/01/895-NST-1.pdf
Substitutions: See Section 016000 - Product Requirements.
- O. Weather Seal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories, cladding, and trims.
- P. Exposed Sill Flashing Sealant: Elastomeric, silicone or STPE, and compatible with flashing material.
- Q. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- R. Glazing Accessories: As specified in Section 088000.
- S. Foil Faced Self-Adhered Flashing Membrane: ProtectoWrap SafSeal Butyl, 45 mil.
- T. Shop and Touch-Up Primer for Steel Components: Zinc oxide, alkyd, linseed oil primer appropriate for use over blast cleaned steel.
- U. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.07 FINISHES

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

- B. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils (0.018 mm) thick.
- C. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils (0.018 mm) thick.
- D. Natural Anodized Finish with Organic Seal: AAMA 612 Clear anodic coating with non-aqueous electro-deposited organic seal; not less than 0.7 mils (0.018 mm) thick.
- E. Color Anodized Finish with Organic Seal: AAMA 612 Electrolytically deposited colored anodic coating with non-aqueous electro-deposited organic seal; not less than 0.7 mils (0.018 mm).
- F. Superior Performing Organic Coatings System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, and at least 80 percent of aluminum extrusion and panels surfaces having minimum total dry film thickness (DFT) of 1.2 mils, 0.0012 inch (0.030 mm).
 - 1. Manufacturers:
 PPG Metal Coatings; Duranar: www.ppgmetalcoatings.com.
 Sherwin-Williams Company; SHER-NAR 5000: oem.sherwin-williams.com.
 Valspar; Fluropon: www.valsparcoilextrusion.com.
 [_____].
 Substitutions: See Section 016000 - Product Requirements.
- G. Color: As indicated on drawings.
- H. Color: To be selected by Architect from manufacturer's full range.
- I. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other related work.
- B. Verify that curtain wall openings and adjoining air and vapor seal materials are ready to receive work of this section.
- C. Verify that anchorage devices have been properly installed and located.

INSTALLATION

- A. Install curtain wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install rough opening membrane flashings at head, sill and jambs. Seal to adjacent work to form water tight barrier.
- G. Install firestopping at each floor slab edge.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Install louvers and associated flashings where they occur.
 - 2. Fit blank-off plates tight to ductwork.
- J. Pressure Plate Framing: Install glazing and infill panels in accordance with Section 088000, using glazing method required to achieve performance criteria.
- K. Structural Sealant Glazing (SSG) Adhesive: Install structural sealant glazing adhesive and weatherseal sealant in accordance with manufacturer's instructions.
- L. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 INSTALLATION OF AIR- AND WATER-RESISTIVE SHEATHING BOARDS

- A. Discard each air- and water-resistive sheathing board with damage that compromises continuity or impairs performance as an air barrier, and is unable to be repaired according to manufacturer's written repair instructions.
 - 1. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Comply with ASTM C 1280, GA-253, and manufacturer's written instructions.
 - 1. Fasten sheathing boards to cold-formed metal framing with specified screws in pattern indicated.
 - 2. Install sheathing boards with a 1/4-inch- (6.4-mm-) gap where they abut masonry or similar materials that might retain and transmit moisture to them.
- C. Cut sheathing boards at penetrations, edges, and other obstructions of work to allow for application of air barrier accessory materials. Fit sheathing boards closely against abutting construction.
- D. Install sheathing boards with long dimension perpendicular or parallel to framing. Abut ends and edges of sheathing boards centered over face of framing members. Offset sheathing boards joints by not less than one stud spacing.
 - 1. Apply sheathing boards in pieces sized to provide minimum number of joints and optimum sheathing board arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- E. Space fasteners maximum 8 inches (203 mm) o.c. and set back a minimum of 3/8 inch (905 mm) from edges and ends of sheathing boards and as required in indicated fire-resistance-rated designs.
 - 1. Apply fasteners so heads are seated flush to board product air barrier membrane surface without breaking or punching through the surface.

Treat all countersunk fasteners that penetrate through fiberglass with specified fluid-applied flashing used for sealing joints.
 - 2. Securely attach sheathing boards to substrate by fastening as indicated, complying with the following:

[Note to Specifier - Retain one of first two subparagraphs below, as required to comply with requirements of Project and local codes.]

Table 2304.9.1, "Fastening Schedule," in the IBC.

Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.

ICC-ES evaluation report for fastener.
 - 3. Use corrosion resistant sheet metal screw fasteners. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections.
- F. Coordinate wall sheathing boards installation with flashing and air barrier accessory material installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

3.04 INSTALLATION OF AIR BARRIER ACCESSORY MATERIALS

- A. General: Install accessory materials according to air barrier manufacturer's written instructions and AAMA 714. Install AB to adjacent components of building air barrier system, including, but not limited to, roofing system air barrier, exterior fenestration systems, door framing, and other openings.
- B. Apply primer according to manufacturer's written installation instructions.
- C. Seal punctures, voids, and seams. Patch with fluid-applied flashing extending 1 inch (26 mm) beyond repaired areas.
- D. Seal wall penetrations according to manufacturer's written installation instructions and recommendations.
- E. Connect and seal exterior wall air barrier continuously to subsequently installed adjacent systems air barriers.

[Note to Specifier - Retain "Wall Openings Transition Assembly Installation" Paragraph below when using Tremco's ETA assembly at aluminum-framed wall openings; coordinate with requirements in corresponding Division 08 openings Sections.]

- F. Wall Openings Transition Assembly Installation: Apply wall opening transition assembly so that a minimum of 2 inches (51 mm) of coverage is achieved over adjacent sheathing board substrate.
1. At a minimum, wrap foil-faced self-adhered membrane (FFSAM) into the rough opening sill, with fluid flashing applied to the rough opening jambs and head. Otherwise, wrap FFSAM into all four sides of rough opening.
 2. Where fluid flashing is installed at jambs and head, apply a detailing bead of fluid flashing to inside corners at each end of framed opening sill over FFSAM where meets jambs prior to application of fluid flashing to jambs and head.
 3. Lap FFSAM at sill over back angle, and extend fluid flashing membrane at jamb onto FFSAM at sill, lapping a minimum 2" onto FFSAM.
 4. Install metal flashing at sill attached to underside of sill frame but shimmed off FFSAM to allow for drainage from under sill to exterior.
 5. Install metal head flashing and seal top of metal flashing to air barrier with fluid-applied flashing.

3.05 TOLERANCES

- A. Maximum Variation from Plumb:
1. 1/8-inch maximum in 26 feet-0 inches, or 1/4-inch maximum in 52 feet-0 inches.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm). Edge projection will not be permitted.
- C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 1 inch (25.4 mm) and minimum of 1/4 inch (6 mm).

3.06 FIELD QUALITY CONTROL

- A. Provide services of curtain wall manufacturer's field representative to observe for proper installation of system and submit report.
- B. See Section 014000 - Quality Requirements, for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
- C. See Section 014000 - Quality Requirements, for general testing and inspection requirements.
- D. Water-Spray Test: Provide water spray quality test of installed curtain wall components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
1. Perform a minimum of two tests in each designated area as directed by Architect.
 2. Conduct tests in each area prior to 10 percent, 50 percent, and 90 percent completion of this work.
- E. Provide field testing of installed metal framed curtain wall system by AAMA accredited or qualified independent laboratory in accordance with AAMA 503 during construction process and before installation of interior finishes.
1. Perform a minimum of two tests in each designated area as directed by Architect.
 2. Conduct tests in each area prior to 10 percent, 50 percent, and 90 percent completion of this work.
 3. Field test for water penetration in accordance with ASTM E1105 with uniform static air pressure difference (Procedure A) not less than 10 psf (479 Pa), with a minimum of 8 psf (383 Pa).
No water penetration shall be permitted to the interior face of the assembly during and/or at conclusion of test.
 4. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 1.57 psf (75 Pa).
Maximum allowable rate of air leakage is 0.09 cfm/sq ft (0.5 L/s sq m).
- F. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

- G. Costs for additional required tests due to failed testing will be the responsibility of the Contractor.

3.07 ADJUSTING

- A. Where occurs, adjust operating sash for smooth operation.

3.08 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, take care to remove dirt from corners, and wipe surfaces clean.
- C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

3.09 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

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