SECTION 084413 GLAZED ALUMINUM CURTAIN WALLS

This suggested guide specification has been developed using the current edition of the Construction Specifications Institute (CSI) "Manual of Practice," including the recommendations for the CSI 3 Part Section Format and the CSI Page Format. Additionally, the development concept and organizational arrangement of the American Institute of Architects (AIA) MASTERSPEC Program has been recognized in the preparation of this guide specification. Neither CSI nor AIA endorse specific manufacturers and products. The preparation of the guide specification assumes the use of standard contract documents and forms, including the "Conditions of the Contract," published by the AIA.

PART 1 - GENERAL

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 Summary

A. Section includes: Kawneer Architectural Aluminum Curtain Wall Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of curtain wall units.
   1. Types of Kawneer Curtain Wall and Glazed Assemblies include:
      a. 1600UT System™1 Curtain Wall:
         1) 1" double glazed insulating glass: 2-1/2" x 6" (63.5 x 152.4) or 7-1/2" (63.5 x 190.5), outside glazed pressure plate format.
         2) 1-3/4" triple glazed insulating glass: 2-1/2" x 6-3/4" (63.5 x 171.4) or 8-1/4" (63.5 x 209.5), outside glazed pressure plate format.
      b. 1600UT System™2 Curtain Wall:
         1) 1" double glazed insulating glass: 2-1/2" x 6" (63.5 x 152.4) or 7-1/2" (63.5 x 190.5), outside glazed structural silicone glazed (SSG) format.
         2) 1-3/4" triple glazed insulating glass: 2-1/2" x 6-3/4" (63.5 x 171.4) or 8-1/4" (63.5 x 209.5), outside glazed structural silicone glazed (SSG) format.

EDITOR NOTE: BELOW RELATED SECTIONS ARE SPECIFIED ELSEWHERE HOWEVER KAWNEER RECOMMENDS SINGLE SOURCE RESPONSIBILITY FOR ALL OF THESE SECTIONS AS INDICATED IN PART 1.6 QUALITY ASSURANCE.

B. Related Sections:
   1. 072700 "Air Barriers"
   2. 079200 "Joint Sealants"
   3. 083213 "Sliding Aluminum-Framed Glass Doors"
   4. 084113 "Aluminum-Framed Entrances and Storefronts"
   5. 084313 "Aluminum-Framed Storefronts"
   6. 084329 "Sliding Storefronts"
   7. 084433 "Sloped Glazing Assemblies"
   8. 085113 "Aluminum Windows"
   9. 086300 "Metal-Framed Skylights"
   10. 088000 "Glazing"
   11. 107113 "Exterior Sun Control Devices"
   12. 122600 "Interior Daylighting Devices"

1.3 Definitions

A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufactures Association (AAMA) – AAMA Glossary (AAMA AG).

1.4 Performance Requirements

EDITOR NOTE: AIR AND WATER PERFORMANCE RESULTS ARE BASED UPON ASTM AND AAMA STANDARDS. CONSULT YOUR LOCAL KAWNEER REPRESENTATIVE CONCERNING SPECIFIC PROJECT PERFORMANCE REQUIREMENTS.

A. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads. Failure also includes the following:
      a. Thermal stresses transferring to building structure.
      b. Glass breakage.
      c. Loosening or weakening of fasteners, attachments, and other components.
      d. Failure of operating units.

B. Delegated Design: Design glazed aluminum curtain walls, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

EDITOR NOTE: PROVIDE WIND LOAD DESIGN PRESSURES IN PSF AND INCLUDE APPLICABLE BUILDING CODE AND YEAR EDITION.

C. Wind loads: Provide Curtain Wall system; include anchorage, capable of withstanding wind load design pressures of (____) lbs./sq. ft. or (____)Pa, inward and (____) lbs./sq. ft. or (____)Pa, outward. The design pressures are based on the (____) Building Code; (____) Edition.

D. Structural-Test Performance: Test according to ASTM E 330 and TAS 202 as follows:
   1. When tested at positive and negative wind load design pressures, assemblies do not evidence deflection exceeding L/175 of clear span.
   2. A static air design load of 40 psf (1915 Pa) shall be applied in the positive and negative direction.
      a. When tested at 150% of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2% percent of clear span.
      b. Minimum test duration according to ASTM E 330 is 10 seconds.

E. Deflection of Framing Members: At design wind pressure, as follows:
   1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding L/175 of the glass edge length for each individual glazing lite, or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less. Limit deflection of clear span of framing members to L/175 for spans less than or equal to 13'-6" (4.11 meters) and L/240 + ¼" for spans greater than 13'-6" (4.11 meters).
   2. Deflection Parallel to Glazing Plane: Limited to [L/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller] [amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch (3.2 mm)].
      a. Operable Units: Provide a minimum 1/16-inch (1.6 mm) clearance between framing members and operable units.
   3. Cantilever Deflection: Where framing members overhang an anchor point, limit deflection to two times the length of cantilevered member, divided by 175.

F. Seismic Story Drift: Accommodate design displacement of adjacent stories indicated.
   1. Design Displacement: Shall not exceed 1% of story height.
   2. Test Performance: Meeting criteria for passing based on building occupancy type when tested according to AAMA 501.4 at design displacement and 1.5 times the design displacement.

G. Water Penetration under Static Pressure: No evidence of water penetration through fixed glazing and framing areas when tested according to ASTM E 331 and TAS 202 at 15psf (720 Pa).

H. Water Penetration under Dynamic Pressure: No evidence of water penetration through fixed glazing and framing areas when tested according to AAMA 501.1 at dynamic pressure equal to 15psf (720 Pa).
   1. Maximum Water Leakage: [According to AAMA 501.1] [No uncontrolled water penetrating assemblies or water appearing on assemblies' normally exposed interior surfaces from sources other than condensation]. Water leakage does not include water controlled by flashing and gutters that is drained to exterior.

I. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures:
   1. Temperature Change (Range): 0 deg F (-18 deg C); 180 deg F (82 deg C).
   2. Test Interior Ambient-Air Temperature: [75 deg F (24 deg C)] .
   3. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5 for a minimum 3 cycles.

J. Energy Performance: Glazed aluminum curtain walls shall be tested in accordance with NFRC and AAMA Standards.

EDITOR NOTE: THERMAL TRANSMITTANCE AND CONDENSATION RESISTANCE TEST RESULTS IN ACCORDANCE WITH AAMA 1503 OR CSA A440 ARE BASED UPON 1" OR 1-3/4" CLEAR HIGH PERFORMANCE (HP) INSULATING GLASS UNITS WITH LOW-E, ARGON FILLED, WITH WARM EDGE SPACER. REFER TO THERMAL TRANSMITTANCE CHARTS IN ACCORDANCE WITH AAMA 507 FOR PROJECT SPECIFIC U-FACTORS, SHGC AND VT. REFER TO THERMAL PERFORMANCE MATRIX FOR NFRC VALUES.

   1. Thermal Transmittance (U-factor):
      a. 1600UT System™1 Curtain Wall:
         1) Glass and framing areas shall have U-factor of no greater than 0.33 with 1" (25.4) High Performance (HP) Glass as determined according to AAMA 1503 or Project specific ( ) BTU/Hr/Ft^2/°F per AAMA 507 or ( ) BTU/Hr/Ft^2/°F per NFRC 100.
         2) Glass and framing areas shall have U-factor of no greater than 0.24 with 1-3/4" (44.4) High Performance (HP) Triple Glazed as determined according to AAMA 1503 OR Project specific ( ) BTU/Hr/Ft^2/°F per AAMA 507 or ( ) BTU/Hr/Ft^2/°F per NFRC 100.

EDITOR NOTE: FOR IMPROVED U-FACTORS WITH FIBER GLASS PRESSURE PLATE BASED ON AAMA 507/NFRC100 SIMULATIONS PLEASE REFER TO THERMAL CHARTS IN ARCHITECTURAL DETAIL MANUAL, AVAILABLE ON KAWNEER.COM.

      b. 1600UT System™2 Curtain Wall:
         1) Project specific U-factor ( ) BTU/Hr/Ft^2/°F with 1" (25.4) Glass as determined per AAMA 507 or NFRC 100.
         2) Project specific U-factor ( ) BTU/Hr/Ft^2/°F with 1-3/4" (44.4) Triple Glazed Glass as determined per AAMA 507 or NFRC 100.

EDITOR NOTE: FOR IMPROVED U-FACTORS WITH FIBER GLASS PRESSURE PLATE BASED ON AAMA 507/NFRC100 SIMULATIONS PLEASE REFER TO THERMAL CHARTS IN ARCHITECTURAL DETAIL MANUAL, AVAILABLE ON KAWNEER.COM.

   2. Solar Heat Gain Coefficient: Glass and framing areas shall have a solar heat gain coefficient of no greater than [0.35] [0.40] [0.45] <Insert value> as determined according to NFRC 200.

3. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq.ft. (0.31 l/s.m_2) of fixed wall area as determined according to ASTM E 283 and TAS 202 at a minimum static-air-pressure differential of 6.24 psf (300 Pa).
4. Condensation Resistance: When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:
   a. 1600UT System™1 Curtain Wall:
      1) CRF_{glass} (1" Double Glazed HP) = 76, CRF_{frame} =79
      2) CRF_{glass} (1-3/4" Triple Glazed HP) = 81, CRF_{frame} =82
5. Condensation Index (I): when tested to CSA-A440-00, the Condensation Index shall not be less than:
   a. 1600UT System™1 Curtain Wall with aluminum pressure plate:
      1) I_{glass} (1" Double Glazed HP) = 67, I_{frame} =71
      2) I_{glass} (1-3/4" Triple Glazed HP) = 77, I_{frame} =74
   b. 1600UT System™1 Curtain Wall with fiber glass pressure plate:
      1) I_{glass} (1" Double Glazed HP) = 68, I_{frame} =76
      2) I_{glass} (1-3/4" Triple Glazed HP) = 78, I_{frame} =76

K. Sound Transmission: Provide glazed aluminum curtain walls with fixed glazing and framing areas having the following sound-transmission characteristics:
1. 1600UT System™1 Curtain Wall:
   a. STC-31 or OITC-25 when tested for laboratory sound transmission loss according to ASTM E 90 and ASTM E 1425, and based on 1" (25.4) double insulating glass (1/4", 1/2" AS, 1/4")
   b. STC-33 or OITC-27 when tested for laboratory sound transmission loss according to ASTM E 90 and ASTM E 1425, and based on 1-3/4" (44.4) triple insulating glass (1/4", 1/2" AS, 1/4", 1/2" AS, 1/4").

1.5 Submittals

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For glazed aluminum curtain walls. Include plans, elevations, sections, full-size details, and attachments to other work.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified preconstruction testing agency, for glazed aluminum curtain walls, indicating compliance with performance requirements.

F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed curtain wall systems, made from 12" (304.8 mm) lengths of full-size components and showing details of the following:
1. Joinery
2. Glazing

1.6 Quality Assurance

A. Installer Qualifications: Installer who has had successful experience with installation of the same or similar systems required for the project and other projects of similar size and scope.

B. Manufacturer Qualifications: A manufacturer capable of fabricating glazed aluminum curtain walls that meet or exceed performance requirements.

C. Source Limitations: Obtain aluminum curtain wall system through one source from a single manufacturer.

D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockups for type(s) of curtain wall elevation(s) indicated, in location(s) shown on Drawings.

F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section “Project Management and Coordination”.

1.7 Project Conditions

A. Field Measurements: Verify actual locations of structural supports for glazed aluminum curtain walls by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 Warranty

A. Manufacturer’s Warranty: Submit, for Owner’s acceptance, manufacturer’s standard warranty.

1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

PART 2 - PRODUCTS

EDITOR'S NOTE: RETAIN BELOW ARTICLE FOR PROPRIETARY METHOD SPECIFICATION; ADD PRODUCT ATTRIBUTES, PERFORMANCE CHARACTERISTICS, MATERIAL STANDARDS, AND DESCRIPTIONS AS APPLICABLE. DO NOT USE THE PHRASE "OR EQUAL" / "OR APPROVED EQUAL," OR SIMILAR PHRASES. USE OF SUCH PHRASES CAUSES AMBIGUITY IN THE SPECIFICATIONS BECAUSE OF THE DIFFERENT INTERPRETATIONS AMONG THE DIVERGENT PARTIES OF THE CONSTRUCTION PROCESS AND READERS OF THE SPECIFICATIONS. SUCH PHRASES REQUIRE EXTENSIVE AND COMPLETE REQUIREMENTS (PROCEDURAL, LEGAL, REGULATORY, AND RESPONSIBILITY) FOR DETERMINING "OR EQUAL."

2.1 Manufacturers

A. Basis-of-Design Product:
   1. Kawneer Company Inc.
   2. 1600UT System™1 Curtain Wall or 1600UT System™2 Curtain Wall
   3. Frame depth options: 6" (152.4) & 7-1/2" (190.5) with 1" (25.4) Double Glazed Insulating Glass; 6-3/4" (171.4) & 8-1/4" (209.5) with 1-3/4" (44.4) Triple Glazed Insulating Glass
   4. Tested to AAMA 501-05 and TAS 202

EDITOR'S NOTE: RETAIN BELOW FOR ALTERNATE MANUFACTURERS/PRODUCTS AS SPECIFIED IN THE CONTRACT DOCUMENTS. COORDINATE BELOW WITH BID DOCUMENTS (IF ANY), AND DIVISION 1 ALTERNATES SECTION. CONSULT WITH KAWNEER COMPANY FOR RECOMMENDATIONS ON ALTERNATE MANUFACTURERS AND PRODUCTS MEETING THE DESIGN CRITERIA AND PROJECT REQUIREMENTS. KAWNEER RECOMMENDS OTHER MANUFACTURERS REQUESTING APPROVAL TO BID THEIR PRODUCT AS AN EQUAL MUST SUBMIT THEIR REQUEST IN WRITING (10) DAYS PRIOR TO CLOSE OF BIDDING.

B. Subject to compliance with requirements, provide a comparable product by the following:
   1. Manufacturer: (_____)
   2. Series: (_____)
   3. Profile dimension: (_____)

C. Substitutions: Refer to Substitutions Section for procedures and submission requirements.
   1. Pre-Contract (Bidding Period) Substitutions: Submit written requests ten (10) days prior to bid date.
   2. Post-Contract (Construction Period) Substitutions: Submit written request in order to avoid curtain wall installation and construction delays.
   3. Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
   4. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for curtain wall system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum curtain walls for a period of not less than ten (10) years. (Company Name).
   5. Test Reports: Submit test reports verifying compliance with each test requirement required by the project.
   6. Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.

D. Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.2 Materials

A. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.8) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.

B. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.

C. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.

D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

E. Pressure Plate: Pressure plate shall be either aluminum or fiberglass and fastened to the mullion with stainless steel screws. Fiberglass pressure plate shall be tested to ASTM D638, D790, D695, D953, D3846.

F. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

G. Sealant: For sealants required within fabricated curtain wall system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

H. Thermal Barrier: Thermal barrier consists of 1" (25.4 mm) separation between the interior and exterior metal members in a typical condition. Thermal barrier assembly shall be tested to the thermal cycling requirements of ASTM E2692 and show no sign of degradation following the test.

I. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 Curtain Wall Framing

A. Framing Members: Manufacturer's standard extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
   1. Glazing System: 4 sided captured or 2 sided SSG.
   2. Glazing Plane: Front.

B. Glass: 1" (25.4) and 1-3/4" (44.4) insulating glass option. 1/4" (6.3) or 1" (25.4) for Spandrel applications.

C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

D. Framing Sealants: Shall be suitable for glazed aluminum curtain wall as recommended by sealant manufacturer.

E. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.

F. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

G. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

H. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle curtain wall material and components to avoid damage. Protect curtain wall material against damage from elements, construction activities, and other hazards before, during and after installation.

2.4 Glazing

A. Glazing: Comply with Division 08 Section “Glazing”. Following glazing options are available.
   1. 1600UT System™1 Curtain Wall: Outside glazed pressure plate format with 1" (25.4) double glazed and 1-3/4" (44.4) triple glazed insulating glass.
   2. 1600UT System™2 Curtain Wall: Outside glazed structural silicone glazed (SSG) format with 1" (25.4) double glazed and 1-3/4" (44.4) triple glazed insulating glass.

B. Glazing Gaskets: Gaskets to meet the requirements of ASTM C864.

C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

E. Glazing Sealants: As recommended by manufacturer for joint type.

2.5 Operable Units

A. Doors: Comply with Division 08 Section “Aluminum-Framed Entrances and Storefronts”.

B. Windows: Comply with Division 08 Section “Aluminum Windows”.

2.6 Accessory Materials

A. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762 mm) thickness per coat.

B. Versoleil™ SunShade – Outrigger/Single Blade System: An aluminum sunshade (consisting of outriggers, louvers, and fascia which may be selected from standard configurations, modified configurations, or customized) that is anchored directly to the vertical curtain wall mullions. Outriggers shall be painted (Select from Kawneer’s standard paints and colors. Custom colors are available upon request.). Louvers and fascia shall be painted or anodized (Select from Kawneer’s standard paints and colors, custom colors are available upon request, or Kawneer’s anodized finishes.).

C. InLighten™ Light Shelf: aluminum light shelf system consisting of anchor channels, support beams, fascia trims and Aluminum Composite Material (ACM) panels that is anchored directly to the Curtain Wall intermediate horizontal members.
   1. Light Shelf: Interior mounted shelf to reflect daylight deeper into interior space.
   2. Light Shelf System to consist of:
      a. Aluminum Composite Material (ACM) panel, 4mm thick.
      b. Translucent polycarbonate panel, 4mm/16mm thick.
      c. ACM finish on upper and lower surface shall be selected from Kawneer standard finishes.
      d. Extruded Aluminum outriggers and fascia.
      e. Extruded aluminum anchor designed to secure to compatible verticals of framing system. Anchor shall be designed to engage shelf so as to allow the shelf to rotate down and hang on its own safely for cleaning.
      f. Extruded aluminum shear blocks designed to hinge on the anchors to allow rotating individual shelves for cleaning.
      g. Panel /Shelf projection shall not exceed 30" (762mm).
      h. Mullion spacing of framing system shall not exceed 6’ (1.83 m) on center.
      i. Panel /Shelf deflection shall not exceed L/120 of horizontal span length.

3. Framing System to Support Light Shelf shall be: (select appropriate framing system)
   a. Curtain wall framing system.
   b. Storefront Framing System.
4. Submittals.
   a. Manufacturer's Installation Instructions.
   b. Samples for Verification.
      1) Factory applied finish as selected by architect.
      2) Functioning Light Shelf sample demonstrating operation.
   c. Shop Drawing including:
      1) Plans, elevations, sections, fabrication and installation details.

D. Validation from manufacture of single-source for light shelf and framing system and compatibility between the system.

2.7 Fabrication

A. Form or extrude aluminum shapes before finishing.

B. Fabricate components that, when assembled, have the following characteristics:
1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Provisions for field replacement of glazing from exterior.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
7. Internal weeping system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
8. Double seal design with primary air and vapor barrier at interior side of glazed aluminum curtain wall and secondary seal weeped and vented to exterior.

C. Curtain Wall Framing: Fabricate components for assembly using shear block system following manufacturer's standard installation instructions.

D. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 Aluminum Finishes

EDITOR NOTE: SELECT BELOW FINISH AND COLOR FROM KAWNEER'S STANDARD COLORS. CUSTOM COLORS ARE AVAILABLE UPON REQUEST FROM THE KAWNEER COMPANY. OTHER PIGMENTED ORGANIC COATINGS CONFORMING TO AAMA 2603 ARE AVAILABLE. CONSULT WITH YOUR KAWNEER REPRESENTATIVE FOR OTHER SURFACE TREATMENTS AND FINISHES.

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Factory Finishing:
1. Kawneer Permanodic™ AA-M10C21A44 / AA-M45C22A44, AAMA 611, Architectural Class I Color Anodic Coating (Color _____).
2. Kawneer Permanodic™ AA-M10C21A41 / AA-M45C22A41, AAMA 611, Architectural Class I Clear Anodic Coating (Color #14 Clear) (Optional).
3. Kawneer Permanodic™ AA-M10C21A31, AAMA 611, Architectural Class II Clear Anodic Coating (Color #17 Clear) (Standard).
4. Kawneer Permafluor™ (70% PVDF), AAMA 2605, Fluoropolymer Coating (Color _____).
5. Kawneer Permadize™ (50% PVDF), AAMA 2604, Fluoropolymer Coating (Color _____).
6. Kawneer Permacoat™ AAMA 2604, Powder Coating (Color _____).
7. Other: Manufacturer _____ Type _____ (Color _____).

PART 3 - EXECUTION

3.1 Examination

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

EDITOR NOTE: COORDINATE BELOW ARTICLE WITH MANUFACTURER'S RECOMMENDED INSTALLATION DETAILS AND INSTALLATION INSTRUCTIONS.

3.2 Installation

A. General:
1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure non-movement joints.

5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
7. Seal joints watertight unless otherwise indicated.

B. Metal Protection:
1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

G. Install glazing as specified in Division 08 Section "Glazing."

3.3 Field Quality Control

A. Field Tests: Architect shall select curtain wall units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.
1. Testing: Testing shall be performed per AAMA 503 by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements.
a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft^2, which ever is greater.
b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 8 psf (383 Pa).

B. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

3.4 Adjusting, Cleaning and Protection

A. Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum curtain wall system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.

B. Cleaning: Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

DISCLAIMER STATEMENT

This guide specification is intended to be used by a qualified construction specifier. The guide specification is not intended to be verbatim as a project specification without appropriate modifications for the specific use intended. The guide specification must be used and coordinated with the procedures of each design firm, and the particular requirements of a specific construction project.

END OF SECTION 084413