



## **Chester Upland School District Toby Farms Intermediate School**

### **Renovations**

**Addenda No. 04  
Issued 04-13-23**

Please be advised that Addenda No. 04 is hereby released for the above listed solicitation. This addendum addresses the following items:

- **Specification Booklet: 08 44 13 Glazed Aluminum Curtain Walls**

## DIVISION 06 – OPENINGS

### SECTION 08 44 13 - GLAZED ALUMINUM CURTAIN WALLS

#### 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. This Section covers Kawneer Architectural Aluminum Curtain Wall Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of curtain wall framing.
- B. Types of Kawneer Aluminum Curtain Wall Systems include:
  - 1. 1600 Wall System@1 Curtain Wall:
    - a. Sight line: 2-1/2" (63.5 mm)
    - b. Outside-glazed pressure plate format
    - c. System depth: 6" (152.4 mm) or 7-1/2" (190.5 mm) for 1" (25.4 mm) insulating glazing
- C. Related Sections:
  - 1. 072700: Air Barriers
  - 2. 079200: Joint Sealants
  - 3. 084113: Aluminum-Framed Entrances and Storefronts
  - 4. 084313: Aluminum-Framed Storefronts
  - 5. 085113: Aluminum Windows
  - 6. 088000: Glazing

##### 1.3 Definitions

- A. For fenestration industry standard terminology and definitions, refer to the Fenestration & Glazing Industry Alliance (FGIA) Glossary (AAMA AG-13).

##### 1.4 Performance Requirements

- A. General Performance:
  - 1. Product to comply with the specified performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction, **as**

determined by testing of glazed aluminum curtain walls representing those indicated for this project.

2. 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.
3. Failure includes any of these events:
  - 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:**

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

**C. Wind Loads:**

1. The design pressures based on the IBC, (2018) Edition.

**D. Air Leakage:**

1. The test specimen shall be tested in accordance with ASTM E 283.
2. Air infiltration rate shall not exceed 0.06 cfm/ft<sup>2</sup> (0.3 l/s · m<sup>2</sup>) at a static air pressure differential of 6.2 psf (300 Pa).

**E. Water Resistance:**

1. Static:
  - a. The test specimen shall be tested in accordance with ASTM E 331.
  - b. There shall be no leakage at a minimum static air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.
2. Dynamic:
  - a. The test specimen shall be tested in accordance with AAMA 501.1.
  - b. There shall be no leakage at an air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.

**F. Uniform Load:**

1. A static air design load of 40 psf (1915 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330.
2. There shall be no deflection in excess of L/175 of the span of any framing member at design load.
3. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

**G. Seismic:**

1. When tested to AAMA 501.4, system must meet design displacement (elastic) of 0.010 times the story height and ultimate displacement (inelastic) of 1.5 times the design displacement.
2. When tested to AAMA 501.6, system must meet dynamic seismic drift causing glass fallout ( $\Delta$ Fallout) of 4.75" or 0.0300 times the story height.

**H. Thermal Transmittance (U-factor), Physical Test:**

1. Thermal transmittance test results in accordance with AAMA 1503 or CSA A440 are based upon 1" (25.4 mm) clear, low-emissivity coated glass insulating unit, (1/4" e=0.035, #2), 1/2" warm edge spacer and argon fill gas, 1/4").
2. When tested using AAMA 1503, the thermal transmittance (U-factor) shall not be more than 0.43 Btu/(hr·ft<sup>2</sup>·°F).

**I. Condensation Resistance Factor (CRF) or Temperature Index (TI):**

1. Condensation resistance test results in accordance with AAMA 1503 or CSA A440 are based upon 1" (25.4 mm) clear low emissivity coated insulating glass, (1/4" e=0.035, #2), 1/2" warm edge spacer and argon fill gas, 1/4").
2. When tested using AAMA 1503, the CRF<sub>frame</sub> and CRF<sub>glass</sub> (with low-emissivity glazing) shall not be less than 71 and 71 respectively.

**J. Sound Transmission Loss:**

1. When tested to ASTM E90 and ASTM E1425, the Sound Transmission Class (STC) and Outdoor/Indoor Transmission Class (OITC) shall not be less than:
  - a. STC 31 or OITC 26 based upon 1" (25.4 mm) insulating glass (1/4", 1/2" AS, 1/4")
  - b. STC 37 or OITC 30 based upon 1" (25.4 mm) laminated glass (1/4" laminated, 1/2" AS, 1/4" laminated)

**K. Windborne-Debris-Impact Resistance Performance:**

1. Performance shall be tested in accordance with TAS 201/203, ASTM E1886 and information in ASTM E1996:
  - a. Large-Missile Impact: For aluminum-framed systems located within 30 feet (9.1 m) of grade
  - b. Small-Missile Impact: For aluminum-framed systems located above 30 feet (9.1 m) of grade

**1.5 Submittals**

**A. Product Data:**

1. For each type of product indicated, include:
  - a. Construction details
  - b. Material descriptions
  - c. Dimensions of individual components and profiles

d. Finishes

**B. Shop Drawings:**

1. Plans
2. Elevations
3. Sections
4. Full-size details
5. Attachments to other work

**C. Samples for Initial Selection:**

1. Provide samples for units with factory-applied color finishes.

**D. Samples for Verification:**

1. Provide a verification sample for each type of exposed finish required, in manufacturer's standard sizes.

**E. Product Test Reports:**

1. Provide test reports for glazed aluminum curtain walls.
2. Test reports must be based on evaluation of comprehensive tests performed by a qualified preconstruction testing agency.
3. Test reports must indicate compliance with performance requirements.

**1.6 Quality Assurance**

**A. Installer Qualifications:**

1. Installer must have successfully installed the same or similar systems required for the project and other projects of similar size and scope.

**B. Manufacturer Qualifications:**

1. Manufacturer must be capable of fabricating glazed aluminum curtain walls that meet or exceed the stated performance requirements.

**C. Source Limitations:**

1. Obtain aluminum curtain wall system through one source from a single manufacturer.

**D. Product Options:**

1. 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.

2. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

E. Mockups:

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

F. Pre-installation Conference:

1. Conduct conference at project site to comply with requirements in Division 01 Project Management and Coordination Section.

## 1.7 Project Conditions

A. Field Measurements:

1. Verify actual locations of structural supports for glazed aluminum curtain walls by field measurements before fabrication.
2. Indicate measurements on shop drawings.

## 1.8 Warranty

A. Submit manufacturer's standard warranty for owner's acceptance.

B. Warranty Period:

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

## PART 2 PRODUCTS

### 2.1 Manufacturers

A. Basis-of-Design Product:

1. Kawneer Company, Inc.
2. 1600 Wall System®1 Curtain Wall types:
  - a. 1600 Wall System®1 Curtain Wall:
    - 1) Sight line: 2-1/2" (63.5 mm)
    - 2) Outside-glazed pressure plate format
    - 3) System depth: 6" (152.4 mm) 1" (25.4 mm) insulating
3. Tested to AAMA 501, ASTM E 1886, E 1996, and TAS 201, 202, 203

- B. Subject to compliance with requirements, provide a comparable product by the following:
1. EFCO, LLC.
  2. Tubelite, Inc.
  3. YKK Ap America Inc.
- C. Substitutions:
1. Refer to Division 01 Substitutions Section for procedures and submission requirements.
  2. Pre-Contract (Bidding Period) Substitutions:
    - a. Submit written requests ten (10) days prior to bid date.
  3. Post-Contract (Construction Period) Substitutions:
    - a. Submit written request in order to avoid installation and construction delays.
  4. Product Literature and Drawings:
    - a. Submit product literature and drawings modified to suit specific project requirements and job conditions.
  5. Certificates:
    - a. Submit certificate(s) certifying that the substitute manufacturer (1) attests to adherence to specification requirements for curtain wall system performance criteria, and (2) has been engaged in the design, manufacture, and fabrication of aluminum curtain walls for a period of not less than ten (10) years. (Company Name).
  6. Test Reports:
    - a. Submit test reports verifying compliance with each test requirement required by the project.
  7. Samples:
    - a. Provide samples of typical product sections and finish samples in manufacturer's standard sizes.
- D. Substitution Acceptance:
1. Acceptance will be in written form, either as an addendum or modification.
  2. Acceptance will be documented by a formal change order signed by the owner and contractor.

## 2.2 **Materials**

- A. Aluminum Extrusions:
1. Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish
  2. Not less than 0.070" (1.8 mm) wall thickness at any location for the main frame
  3. Complying with ASTM B221: 6063-T6 alloy and temper
- B. Aluminum Sheet Alloy:
1. Shall meet the requirements of ASTM B209.

C. Fasteners:

1. Aluminum, nonmagnetic stainless steel or other materials must be non-corrosive and compatible with aluminum members, trim hardware, anchors, and other components.

D. Anchors, Clips, and Accessories:

1. 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.
2. Anchors, clips, and accessories shall provide sufficient strength to withstand the design pressure indicated.

E. Pressure Plate:

1. Pressure plate shall be aluminum.
2. Pressure plate shall be fastened to the mullion with stainless steel screws.

F. Reinforcing Members:

1. 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.
2. Reinforcing members must provide sufficient strength to withstand the design pressure indicated.

G. Sealant:

1. 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:

1. Thermal separator shall be extruded of a silicone compatible elastomer that provides a minimum 1/4" (6.3 mm) separation.

I. Tolerances:

1. References 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:

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

- B. Glass:
  - 1. Insulating glass options:
    - a. 1" (25.4 mm)
- C. Brackets and Reinforcements:
  - 1. Manufacturer's standard high-strength aluminum with non-staining, non-ferrous shims for aligning system components.
- D. Framing Sealants:
  - 1. Shall be suitable for glazed aluminum curtain wall as recommended by sealant manufacturer.
- E. Fasteners and Accessories:
  - 1. Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories must be compatible with adjacent materials.
  - 2. Where exposed, fasteners and accessories shall be stainless steel.
- F. Perimeter Anchors:
  - 1. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- G. Packing, Shipping, Handling, and Unloading:
  - 1. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- H. Storage and Protection:
  - 1. Store materials so that they are protected from exposure to harmful weather conditions.
  - 2. Handle material and components to avoid damage.
  - 3. Protect material against damage from elements, construction activities, and other hazards before, during, and after installation.

## 2.4 Glazing

- A. Glazing to meet requirements in Division 08 Glazing Section.
- B. Available Glazing Options:
  - 1. 1600 Wall System@1 Curtain Wall:
    - a. System depth: 6" (152.4 mm) for 1" (25.4 mm) insulating glazing
- C. Glazing Gaskets:
  - 1. Gaskets to meet requirements of ASTM C864.

D. Spacers and Setting Blocks:

1. Manufacturer's standard elastomeric type

E. Bond-Breaker Tape:

1. Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

F. Glazing Sealants:

1. As recommended by manufacturer for joint type.

**2.5 Operable Units**

A. Doors comply with Division 08 Aluminum-Framed Entrances and Storefronts Section.

B. Windows comply with Division 08 Aluminum Windows Section.

**2.6 Fabrication**

A. Extrude or form 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 that 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 the 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

C. Curtain Wall Framing:

1. 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.

## 2.7 Aluminum Finishes

- A. Finish designations that are prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finishing:
  - 1. Kawneer Permanodic® AA-M10C21A31, AAMA 611, Architectural Class II Clear Anodic Coating (Color #17 Clear) (Standard)

## PART 3 EXECUTION

### 3.1 Examination

- A. With installer present, examine areas for compliance with requirements for installation tolerances and other conditions affecting performance of the work.
- B. Proceed with installation only after correcting unsatisfactory conditions.

### 3.2 Installation

- A. Curtain Wall System Installation:
  - 1. Install curtain wall systems plumb, level, and true to line, without warp or rack of frames, within manufacturer's prescribed tolerances, and complying with installation instructions.
  - 2. Provide support and anchor in place.
  - 3. Dissimilar Materials:
    - a. Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
  - 4. Glazing:
    - a. Glass shall be outside-glazed.
    - b. Glass shall be held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners that are spaced no more than 9" (228.6 mm) on center.
  - 5. Water Drainage
    - a. Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations.
    - b. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.
- B. Related Products Installation:
  - 1. Sealants (Perimeter):
    - a. Refer to Joint Treatment (Sealants) Section.
  - 2. Glass:

- a. Refer to Glass and Glazing Section.
- b. Reference: ANSI Z97.1, CPSC 16 CFR 1201, and GANA Glazing Manual.

### 3.3 **Adjusting, Cleaning, and Protection**

A. Adjusting: Not applicable.

B. Protection:

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

C. Cleaning:

1. Repair or replace damaged installed products.
2. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.
3. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during the construction period.
4. Remove construction debris from project site and legally dispose of debris.

**END OF SECTION 08 44 13**