

**ADDENDUM NO. 1**

**PROJECT NAME:** Manter Hall Window Replacement  
**UNL PROJECT NUMBER:** C101P113

**DATE OF ISSUANCE:** March 21, 2012

**DATE OF BID OPENING:** April 10, 2012

The bid documents dated **March 5, 2012** for the above referenced project are amended by this addendum.

NOTICE: This Addendum is issued to all interested prospective bidders as an amendment to the project manual or other parts of the bidding (contract) documents for the above named project. Reference to this Addendum must be included in the Bid proposal. The information contained herein shall be fully incorporated into the contract documents as though originally included therein.

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**ADDITIONS**

Refer to the Technical Specifications that are attached – Add the Technical Specifications to the end of the Specifications Booklet for the Manter Hall Window Replacement Project (C101P113).

Please use these documents to evaluate and present your Bid Proposals for the Manter Hall Window Replacement Project (C101P113).

END OF ADDENDUM NO. 1

## **SECTION 024100 DEMOLITION**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Building demolition excluding removal of hazardous materials and toxic substances.
- B. Selective demolition of building elements for alterations purposes.
- C. Abandonment and removal of existing utilities and utility structures.

#### **1.2 RELATED REQUIREMENTS**

- A. Section 011000- Summary: Description of items to be removed by Owner,
- B. Section 011000. Summary: Description of items to be salvaged or removed for re-use by Contractor.

#### **1.3 SUBMITTALS**

- A. See Section 013300 - Submittal Procedures.
- B. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
  - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
  - 2. Identify demolition firm and submit qualifications.
  - 3. Include a summary of safety procedures.

#### **1.4 PROJECT CONDITIONS**

- A. Minimize production of dust due to demolition operations: do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- B. Comply with other requirements specified in Section 015000.

### **PART 2 PRODUCTS — NOT USED**

### **PART 3 EXECUTION**

#### **3.1 SCOPE**

- A. Remove all existing aluminum entrances, storefronts, curtainwalls, slope glazing, steel, flashings, sealant, and miscellaneous materials required to complete scope of work.

## **SECTION 024100 DEMOLITION**

### **3.2 GENERAL PROCEDURES AND PROJECT CONDITIONS**

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
  - 1. Obtain required permits.
  - 2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
  - 3. Provide, erect and maintain temporary barriers and security devices.
  - 4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
  - 5. Do not close or obstruct roadways or sidewalks without permission of UNL Project Manager.
  - 6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
  - 7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Protect existing structures and other elements that are not to be removed.
  - 1. Provide bracing and shoring.
  - 2. Prevent movement or settlement of adjacent structures.
  - 3. Stop work immediately if adjacent structures appear to be in danger.
- D. If hazardous materials are discovered during removal operations, stop work and notify Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's and mercury.
- E. Perform demolition in a manner that maximizes salvage and recycling of materials.
  - 1. Dismantle existing construction and separate materials.
  - 2. Set aside reusable, recyclable and salvageable materials; store and deliver to collection point or point of reuse.

### **3.3 EXISTING UTILITIES**

- A. Coordinate work with utility companies: notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.

## SECTION 024100 DEMOLITION

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner,

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

### 3.4 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on field observation and existing record documents only.

1. Verify that construction is as shown.

2. Report discrepancies to Owner before disturbing existing installation.

3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.

1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 015000 in locations required to eliminate construction debris from occupied spaces...

C. Remove existing work as indicated and as required to accomplish new work.

1. Remove items indicated on drawings.

D. Services (Including but not limited to removal of existing systems and equipment as required to complete scope of work.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.

2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

3. Verify that abandoned services serve only abandoned facilities before removal.

4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings remove back to source of supply where possible. otherwise cap stub and tag with identification.

E. Protect existing work to remain.

1. Prevent movement of structure provide shoring and bracing if necessary.

2. Perform cutting to accomplish removals neatly and as specified for cutting new work,

3. Repair adjacent construction and finishes damaged during removal work.

## **SECTION 024100 DEMOLITION**

4. Patch as specified for patching new work.

### **3.5 DEBRIS AND WASTE REMOVAL**

A. Remove debris, junk, and trash from site.

B. Leave site in dean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

**END OF SECTION**

## **SECTION 055000 - METAL FABRICATIONS**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Fabricated steel required to complete project scope.

#### **1.2 RELATED REQUIREMENTS**

- A. Section 099000 - Painting and Coating: Paint finish.

#### **1.3 REFERENCE STANDARDS**

- A. ANSI A14.3- American National Standard for Ladders — Fixed — Safety Requirements: 2002.
- B. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2008.
- C. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2007.
- D. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2009.
- E. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware: 2009.
- F. ASTM A 283/A 283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2003 (Reapproved 2007).
- G. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated. 1201105 ksi Minimum Tensile Strength; 2009a.
- H. ASTM A 325M - Standard Specification for Structural Bolts. Steel. Heat Treated 830 MPa Tensile Strength (Metric); 2009.
- I. ASTM A 500/A 500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes: 2010.
- J. AWS D1.1/D1.1M - Structural Welding Code - Steel, American Welding Society: 2010.
- K. SSPC-Paint 15- Steel Joist Shop Primer: Society for Protective Coatings: 1999 (Ed. 2004).
- L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic." and Type II, "Organic"; Society for Protective Coatings: 2002 (Ed. 2004).

#### **1.4 SUBMITTALS**

- A. See Section 013300 - Submittal Procedures,
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and applicable details.

## **SECTION 055000 - METAL FABRICATIONS**

### **PART 2 PRODUCTS**

#### **2.1 MATERIALS - STEEL**

- A. Steel Sections: ASTM A 36/A 36M,
- B. Plates: ASTM A 283.
- C. Pipe: ASTM A 53/A 53M, Grade B Schedule 40. black finish.
- D. ASTM A 460/A 480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip: 2009b.
- E. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar: 2003.
- F. Welding Materials: AWS D1.1tD1.1M; type required for materials being welded.
- G. Shop and Touch-Up Primer: SSPC-Paint 15. Type I - Red Oxide.
- H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic,

#### **2.2 FABRICATION**

- A. Fit and shop assemble items In largest practical sections for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where noted otherwise.

#### **2.3 FABRICATED ITEMS**

- A. Miscellaneous Framing and Supports. Provide steel framing and supports as required for all applications that are not a part of structural steel framework.

#### **2.4 FINISHES - STEEL**

- A. Prepare surfaces to be primed in accordance with SSPC-SP2.
- B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- C. Prime Painting: One coat.

## **SECTION 055000 - METAL FABRICATIONS**

### **2.5 FABRICATION TOLERANCES**

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

#### **3.2 PREPARATION**

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

#### **3.3 INSTALLATION**

- A. Install items plumb and level, accurately fitted. free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated.
- D. Perform field welding in accordance with AWS DI. 1 IDi .1 M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

#### **3.4 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 Inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes joint sealants for the following locations:

- 1. Exterior joints in vertical surfaces and non-traffic horizontal surfaces as indicated below:
  - a. All horizontal and vertical joints in terracotta cornice.
  - b. Joints between metal flashings and unit masonry or stone copings.
  - c. Other joints as indicated.

**1.3 SUBMITTALS**

- A. General: Submit submittals according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data from manufacturers for each joint sealant product required.

**1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to Project site in original unopened containers or bundles with labels.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

**1.5 PROJECT CONDITIONS**

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 deg F.
  - 2. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

**PART 2 -PRODUCTS**

**2.1 MANUFACTURERS**

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1.Dow Corning Corp.
- 2.General Electric Company
- 3.Pecora Corporation.
- 4.Sonneborn/ChemRex, BASF Building Systems.
- 5.Sika Corporation.

**2.2 MATERIALS, GENERAL**

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates.

B. Colors: Colors shall be selected from manufacturer's full range of standard colors.

**2.3 ELASTOMERIC JOINT SEALANTS**

A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing elastomeric sealants that comply with ASTM C 920and ASTM C 920 classifications for Type, Grade, Class, and Uses.

**2.4 JOINT SEALANT BACKING**

A. Plastic Foam Joint Fillers: Preformed, compressible, resilient, non-staining, non-waxing, non-extruding strips of flexible plastic foam of closed-cell non-absorbing, non-outgassing, polyethylene foam or proprietary material of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

- 1.Provide Sonneborn Soft Backer-Rod or equal.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

**2.5 MISCELLANEOUS MATERIALS**

A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces.

**PART 3 -EXECUTION**

**3.1 PREPARATION**

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer.
- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer. Confine primers to areas of joint sealant bond.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces. Remove tape immediately after tooling without disturbing joint seal.

**3.2 INSTALLATION OF JOINT SEALANTS**

- A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Sealant Installation Standard: ASTM C 1193.
- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
  - 1. Install joint fillers to provide support of sealants during application.
  - 2. Install bond breaker tape between sealants where backer rods are not used.
- D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
- E. Tooling of Non-sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Remove excess sealants from surfaces adjacent to joint.
  - 1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

**3.03 CLEANING**

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

## **SECTION 079200 JOINT SEALANTS**

### **3.4 PROTECTION**

- A. Protect joint sealants during and after curing period. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that any installations with repaired areas are indistinguishable from original work.

### **3.5 JOINT SEALANT SCHEDULE**

#### **A. EXTERIOR JOINT SEALANTS**

- 1. Polyurethane Sealant: Type M or S, Grade NS, Class 25, Uses NT, T,G, A, M and O. Provide Dynatrol II or IXL by Pecora; or Sonolastic NP1 or NP2 by BASF equivalent product of other approved manufacturers.
  - a. Exterior joints in existing between metal framing and/or flashings and stone, concrete, mortar, or masonry.
- B. 2. Silicone Weatherseal Sealant: Type M or S, Grade NS, Class 50, Uses NT, G, A and O. Provide Dow Corning 795 or equal by approved manufacturers.
  - a. Exterior metal to metal joints between framing and flashings.
  - b. Exterior metal to glass joints and/or weatherseal.

END OF SECTION 079200

## SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

### 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: Architectural Aluminum Storefront Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront units.
- 1. Types of Aluminum Storefront Systems include:
  - a. Storefront System – 2" x 4-1/2" (50.8 mm x 114.3 mm) nominal dimension; Thermal; Center Glazed.
  - b. 500 Swing Door; Wide stile, 5" (127 mm) vertical face dimension, 1-3/4" (44.5 mm) depth, 7-1/2" top-rail, 6" cross-rail, 10" bottom rail.

##### Related Sections:

Division 078466 "Fire-Resistant Joint systems" for fire resistive material installed between aluminum  
Division 079200 "Joint Sealants" for joint sealants installed as part of the aluminum storefront system  
system

- 1. Division 084113 "Aluminum-Framed Entrances and Storefronts"
- 1. Division 084313 "Aluminum-Framed Storefronts"
- 1. Division 084413 "Glazed Aluminum Curtain Walls"
- 1. Division 084433 "Sloped Glazing Assemblies"

#### 1.3 DEFINITIONS

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

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Aluminum-framed storefront system shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
  - 1. Design Wind Loads: Determine design wind loads applicable to the Project from basic wind speed indicated in miles per hour, according to ASCE 7, Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings.
    - a. Basic Wind Speed (MPH): ( 90 MPH)

Storefront System Performance Requirements:

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1. Wind loads: Provide storefront system; include anchorage, capable of withstanding wind load design pressures based on 25 psf. Or the International Building Code; 2009 Edition, which ever is greater.
2. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. 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 6.24 psf (300 Pa).
3. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 8 psf (383 Pa) as defined in AAMA 501.

Uniform Load: A static air design load of 20 psf (958 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member. 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.

### Aluminum Framed Entrance Performance Requirements:

1. Air Infiltration: For single acting offset pivot or butt hung entrances in the closed and locked position, the test specimen shall be tested in accordance with ASTM E 283 at a pressure differential of 6.24 psf (300 Pa) for single doors and 1.567 psf for pairs of doors. A single 3'0" x 7'0" (915 mm x 2134 mm) entrance door and frame shall not exceed 0.50 cfm per square foot. A pair of 6'0" x 7'0" (1830 mm x 2134mm) entrance doors and frame shall not exceed 1.0 cfm per square foot.
  - a. Structural Performance: Corner strength shall be tested per the manufacturers dual moment load test procedure and certified by an independent testing laboratory to ensure weld compliance and corner,

### 1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum frame storefront system indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum framed storefront system and components required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum framed storefront.
- F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12" (300 mm) lengths of full-size components and showing details of the following:

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1. Joinery, including concealed welds.
2. Anchorage.
3. Expansion provisions.
4. Glazing.
5. Flashing and drainage.

### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of providing aluminum framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- C. Source Limitations: Obtain aluminum framed storefront system through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum framed storefront system and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.
  1. Do not modify intended aesthetic effects, as judged and accepted solely by Owner. If modifications are proposed, submit comprehensive explanatory data to Owner for review.
- E. 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 dimensions of aluminum framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

### 1.8 WARRANTY

- A. Manufactures Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
  1. Warranty Period: Two (2) years from Date of Substantial Completion.

## SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Basis-of-Design Products:
  - 1. Kawneer Company Inc., Trifab® 451T (thermal) Storefront System, 2" x 4-1/2" (50.8 mm x 114.3 mm) System Dimensions, glass to be Center Glazed.
  - 2. Kawneer 500 Wide stile, 5" vertical stile, 7-1/2 top rail, 10" bottom rail
- B. Subject to compliance with requirements, provide a comparable product by the following:
  - 1. Manufacturer(s): Efcó, YKK,
- 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 storefront 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 storefront system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum storefronts for a period of not less than ten (10) years.
  - 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 aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
- C. 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.

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- D. 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.
- E. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- F. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.

### 2.3 STOREFRONT FRAMING SYSTEM

Thermal Barrier Construction: Kawneer 451T-CG Basis of design:

- 1. Thermal Break with a 1/4" (6.4 mm) separation consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
  - a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
- D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- E. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

### 2.4 GLAZING

As specified in Division 08 Section "Glazing"

### 2.5 HARDWARE

- A. General: Provide hardware fabricated from aluminum, stainless steel or other corrosion resistant materials compatible with aluminum, designed for smooth operation, tightly close and secure aluminum entrance doors.
- B. Hardware
  - 1. Weatherstripping
    - a. Meeting stiles on pairs of doors shall be equipped with an adjustable astragal utilizing wool pile with Polymeric fin.

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- b. The door weathering on a single acting offset pivot or butt hung door and frame (single or pairs) shall be comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.
2. Sill Sweep: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners (Necessary to meet specified performance tests).
  3. Threshold: Extruded aluminum, one piece per door opening, with ribbed surface.
  4. Butt Hinge: 4-1/2 x 4-1/2. Stainless Steel w/ Powder Coating & Non Removable Pin.
    - a. Three hinges per door leaf up to 7'-0". Add One additional hinge for every 12" over 7'-0"
  5. Exit Device: Vonduprin HD x 99 NL x 990 NL
  6. Removable Mullion on Pairs: Equal to LCN KR4954
  7. Surface Closers: LCN 4040 x Cush x Blade Stop Spacer
  8. Cylinders: Contractor to provide to UNL Key Services for keying and installed by entrance supplier.
  9. Coordinate all hardware installation with UNL – Building Systems Maintenance
  10. Hardware finish to match entrance unless noted otherwise.

### 2.6 ACCESSORY MATERIALS

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section "Joint Sealants."
- B. 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.

### 2.7 FABRICATION

Framing Members, General: Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
  2. Accurately fit joints; make joints flush, hairline and weatherproof.
  3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
  4. Physical and thermal isolation of glazing from framing members.
  5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  6. Provisions for field replacement of glazing.
  7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- B. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
  - C. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
  - D. Storefront Framing: Fabricate components for assembly using manufactures standard installation instructions. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

### 2.8 ALUMINUM FINISHES

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

Factory Finishing:

1. AA-M12C22A44, AAMA 611, Architectural Class I, Dark Bronze Anodic Coating.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight framed aluminum storefront system installation.

1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
4. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing aluminum framed storefront system, accessories, and other components.
- B. Install aluminum framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- D. Install aluminum framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within sliding door to the exterior.
- E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

## **SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS**

### **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 by a qualified vendor representative.

a. Water Infiltration Tests: Conduct field tests in accordance with AAMA 501.2-03. No uncontrolled water leakage is permitted when tested at 30 psi.

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. Clean aluminum surfaces immediately after installing aluminum framed storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

B. Remove dirt & debris from glass immediately after installation. Comply with glass manufacturer's written recommendations for cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.

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

**END OF SECTION 084113**

## SECTION 084413 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. Section Includes: Architectural Aluminum Curtain Wall Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of curtain wall framing.
  - 1. Aluminum Curtain Wall includes:
    - a. 2-1/2" x 6" inside/outside glazed format.
- B. Related Sections:
  - 1. Division 078466 "Fire-Resistant Joint systems" for fire resistive material installed between aluminum storefront system and floor intersections
  - 2. Division 079200 "Joint Sealants" for joint sealants installed as part of the aluminum storefront system
  - 3. Division 084113 "Aluminum-Framed Entrances and Storefronts"
  - 4. Division 084313 "Aluminum-Framed Storefronts"
  - 5. Division 084413 "Glazed Aluminum Curtain Walls"
  - 6. Division 084433 "Sloped Glazing Assemblies"
  - 7. Division 088000 "Glazing"

#### 1.3 DEFINITIONS

- A. AA DAF-45 - Designation System for Aluminum Finishes: The Aluminum Association, Inc.;2003.
- B. AAMA CW-1 0- Care and Handling of Architectural Aluminum From Shop to Site: American Architectural Manufacturers Association: 2004.
- C. AAMA 611 - Voluntary Specification for- Anodized Architectural Aluminum; American Architectural Manufacturers Association: 1998.
- D. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2005.
- E. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers: 2005.
- F. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2008.
- G. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products: 2009.
- H. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate: 2007.
- I. ASTM B 209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric), 2007.
- J. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2008.

## SECTION 084413 GLAZED ALUMINUM CURTAIN WALLS

- K. ASTM B 221 M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2007.
- L. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004.
- M. ASTM E 330- Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2002 (Reapproved 2010).
- N. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference. 2000 (Reapproved 2009).
- O. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

### 1.4 SYSTEM DESCRIPTION

- A. General Performance: Aluminum-framed storefront system shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
  - 1. Design Wind Loads: Determine design wind loads applicable to the Project from basic wind speed indicated in miles per hour, according to ASCE 7, Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings.
    - a. Basic Wind Speed (MPH): ( 90 MPH)
- A. Curtainwall System Performance Requirements:
  - 1. Wind loads: Provide Curtain Wall system; include anchorage, capable of withstanding wind load design pressures of 25 lbs./sq. ft. inward and 25 lbs./sq. ft. outward or design pressures based on the International Building Code; 2009 Edition, whichever is greater
  - 2. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. 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 6.24 psf (300 Pa).
  - 3. Water Resistance, (static): The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a static air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.
  - 4. Water Resistance, (dynamic): The test specimen shall be tested in accordance with AAMA 501.1. There shall be no leakage at an air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.
  - 5. Uniform Load: A static air design load of 50 psf (2394 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member at design load. At 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.
  - 6. Seismic: Phase I: 3 stroke cycles using .005 x the story height – no damage or failure. Phase II: 3 stroke cycles using .010 x the story height – no damage or failure.
  - 7. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.61.

## SECTION 084413 GLAZED ALUMINUM CURTAIN WALLS

8. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than  $73_{\text{frame}}$  and  $61_{\text{glass}}$  (clear), or Condensation Index (I): when tested to CSA-A440-00, the Condensation Index shall not be less than  $63_{\text{frame}}$  and  $52_{\text{glass}}$  (clear).

### 1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum curtainwall system.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum framed curtainwall system and components required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum framed curtainwall.
- F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12" (300 mm) lengths of full-size components and showing details of the following:
  - 1. Joinery, including concealed welds.
  - 2. Anchorage.
  - 3. Expansion provisions.
  - 4. Glazing.
  - 5. Flashing and drainage.

### 1.6 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Installer Qualifications: Installer experienced (as determined by contractor) to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to product manufacturer.
  - 2. Manufacturer Qualifications: Manufacturer capable of providing structural calculations, applicable independent product test reports, installation instructions, a review of the application method, customer approval and periodic field service representation during construction.
  - 3. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

### 1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of aluminum framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings

### 1.8 WARRANTY

- A. Project Warranty: Refer to "Conditions of the Contract" for project warranty provisions.
- B. Manufacturer's Product Warranty: Submit, for Owner's acceptance, manufacturer's warranty for curtain wall system as follows:

## SECTION 084413 GLAZED ALUMINUM CURTAIN WALLS

1. Warranty Period: Two (2) years from Date of Substantial Completion.

### 1.9 DELIVERY, STORAGE & HANDLING

- A. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. 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 curtain wall installation.

## PART 2 – PRODUCTS

### 2.1 Manufacturers (Acceptable Manufacturers/Products)

- A. Basis-of-Design Products:
  - 1. Kawneer Company Inc., 1600 Wall, System 3 (thermal) Curtainwall, 2-1/2" x 6" System Dimensions.
- B. Alternate products, subject to compliance with requirements, provide a comparable product by the following:
  - 1. Manufacturer(s): Efc0, YKK, Wausau Metals
- 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 storefront 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 storefront system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum storefronts for a period of not less than ten (10) years
  - 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.

### 2.2 MATERIALS

- A. Aluminum (Curtain Wall and Components):
  - 1. Material Standard: Extruded Aluminum, ASTM B 221, 6063-T6 alloy and temper.
  - 2. Member Wall Thickness: Each framing member shall provide structural strength to meet specified performance requirements.
  - 3. 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.
  - 4. 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.

## SECTION 084413 GLAZED ALUMINUM CURTAIN WALLS

5. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
6. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

### 2.3 ACCESSORIES

- A. Fasteners: Where exposed, shall be Stainless Steel.
- B. Gaskets: Glazing gaskets shall be extruded EPDM rubber.
- C. Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- D. Thermal Barrier: Verticals shall utilize IsoStrut<sup>®</sup> consisting of a rigid polymer that provides a mechanical and chemical bond between the thermal break material and extrusion. Horizontals shall utilize a silicone compatible elastomer thermal break separator which will adhere to silicone sealant.

### 2.4 GLAZING

- A. As specified in Division 08 Section "Glazing"

### 2.5 FABRICATION

- A. General:
  1. Fabricate components per manufacturer's installation instructions and with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
  2. Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.
  3. Prepare components to receive anchor devices. Fabricate anchors.
  4. Arrange fasteners and attachments to conceal from view.

### 2.6 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finishing:
  1. AA-M12C22A44, AAMA 611, Architectural Class I, Dark Bronze Anodic Coating.

### 2.7 SOURCE QUALITY CONTROL

- A. Source Quality: Provide aluminum curtain walls specified herein from a single source.
  1. Building Enclosure System: When aluminum curtain wall are part of a building enclosure system, including entrances, entrance hardware, windows, curtain wall system and related products, provide building enclosure system products from a single source manufacturer.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive curtain wall system and sill plate is level in accordance with manufacturer's acceptable tolerances.
  1. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

## SECTION 084413 GLAZED ALUMINUM CURTAIN WALLS

### 3.2 INSTALLATION

- A. General: Install curtain wall systems plumb, level, and true to line, without warp or rack of frames with manufacturer's prescribed tolerances and installation instructions. Provide support and anchor in place.
  - 1. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
  - 2. Weathertight Construction: Install sill members and other members in a bed of sealant or with joint filler or gaskets, to provide weathertight construction. Coordinate installation with wall flashings and other components of construction.
    - a. Refer to Joint Treatments (Sealants) Section for installation requirements.
- B. Related Products Installation Requirements:
  - 1. Sealants (Perimeter): Refer to Joint Treatment (Sealants) Section.
  - 2. Glass: Refer to Glass and Glazing Section.
    - a. Reference: ANSI Z97.1, CPSC 16 CFR 1201 and GANA Glazing Manual.

### 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 by a qualified vendor representative.
    - a. Water Infiltration Tests: Conduct field tests in accordance with AAMA 501.2-03. No uncontrolled water leakage is permitted when tested at 30 psi.
- B. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

### 3.4 PROTECTION AND CLEANING

- 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.

END OF SECTION 084413

## SECTION 084433 SLOPED GLAZING ASSEMBLIES

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

#### 1.2 SUMMARY

- A. Section Includes: Architectural Aluminum Sloped Glazing Systems, including perimeter trims, accessories, shims and anchors, and perimeter sealing of sloped glazed framing.
1. Types of Aluminum Sloped Glazing include:
    - a. Sloped Glazing Systems) – 2-1/2" x 4-3/4" (63.5 x 120.7) or 2-1/2" x 6" (63.5 x 152.4) or as required to meet design criteria.
- B. Related Sections:
1. Division 078466 "Fire-Resistant Joint systems" for fire resistive material installed between aluminum storefront system and floor intersections
  2. Division 079200 "Joint Sealants" for joint sealants installed as part of the aluminum storefront system
  3. Division 084113 "Aluminum-Framed Entrances and Storefronts"
  4. Division 084313 "Aluminum-Framed Storefronts"
  5. Division 084413 "Glazed Aluminum Curtain Walls"
  6. Division 084433 "Sloped Glazing Assemblies"
  7. Division 088000 "Glazing"

#### 1.3 DEFINITIONS

- A. AA DAF-45 - Designation System for Aluminum Finishes: The Aluminum Association, Inc.;2003.
- B. AAMA CW-1 0- Care and Handling of Architectural Aluminum From Shop to Site: American Architectural Manufacturers Association: 2004.
- C. AAMA 611 - Voluntary Specification for- Anodized Architectural Aluminum; American Architectural Manufacturers Association: 1998.
- D. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2005.
- E. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers: 2005.
- F. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2008.
- G. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products: 2009.
- H. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate: 2007.
- I. ASTM B 209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric), 2007.
- J. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2008.
- K. ASTM B 221 M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2007.

## SECTION 084433 SLOPED GLAZING ASSEMBLIES

- L. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004.
- M. ASTM E 330- Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2002 (Reapproved 2010).
- N. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference. 2000 (Reapproved 2009).
- O. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

### 1.4 SYSTEM DESCRIPTION

- A. Sloped Glazing system performance requirements:
  - 1. Wind loads: Provide Sloped Glazing system; include anchorage, capable of withstanding wind load design pressures of 25 lbs./sq. ft. inward and 25 lbs./sq. ft. outward or design pressures based on the International Building Code; 2009 Edition, whichever is greater.
  - 2. Snow loads: Provide Sloped Glazing system; include anchorage, capable of withstanding design loads based on the International Building Code; 2009 Edition.
  - 2. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft<sup>2</sup> (.0003 m<sup>3</sup>/s-m<sup>2</sup>) at a static air pressure differential of 6.24 PSF (300 Pa).
  - 3. Water Resistance, (static): The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a static air pressure differential of 12 PSF (575 Pa) as defined in AAMA 501.
  - 4. Water Resistance, (dynamic): The test specimen shall be tested in accordance with AAMA 501.1. There shall be no leakage at an air pressure differential of 12 PSF (575 Pa) as defined in AAMA 501.
  - 5. Uniform Load: A static air design load of 20 PSF (958 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member at design load. At 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.

### 1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum slope glazed system.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum framed slope glazed system and components required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum slope glazed system.

## SECTION 084433 SLOPED GLAZING ASSEMBLIES

F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12" (300 mm) lengths of full-size components and showing details of the following:

1. Joinery, including concealed welds.
2. Anchorage.
3. Expansion provisions.
4. Glazing.
5. Flashing and drainage.

### 1.6 QUALITY ASSURANCE

- A. Qualifications:
1. Installer Qualifications: Installer experienced (as determined by contractor) to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to product manufacturer.
  2. Manufacturer Qualifications: Manufacturer capable of providing structural calculations, applicable independent product test reports, installation instructions, a review of the application method, customer approval and periodic field service representation during construction.
  3. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

### 1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of aluminum framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings

### 1.8 WARRANTY

- A. Project Warranty: Refer to "Conditions of the Contract" for project warranty provisions.
- B. Manufacturer's Product Warranty: Submit, for Owner's acceptance, manufacturer's warranty for curtain wall system as follows:
1. Warranty Period: Two (2) years from Date of Substantial Completion.

### 1.9 DELIVERY, STORAGE & HANDLING

- A. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. 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 curtain wall installation.

## SECTION 084433 SLOPED GLAZING ASSEMBLIES

### PART 2 - PRODUCTS

#### 2.1 Manufacturers (Acceptable Manufacturers/Products)

- A. Basis-of-Design Products:
  - 1. Kawneer Company Inc., 1600 Slope Glazed System, System depth as required to meet design criteria.
- B. Alternate products , subject to compliance with requirements, provide a comparable product by the following:
  - 1. Manufacturer(s): Efc0, Ykk, Wausau Metals
- 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 storefront 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 storefront system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum storefronts for a period of not less than ten (10) years
  - 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

#### 2.2 MATERIALS

- A. Aluminum (Sloped Glazing and Components):
  - 1. Material Standard: ASTM B 221; 6063-T6 alloy and temper
  - 2. Member Wall Thickness: Each framing member shall provide structural strength to meet specified performance requirements.
  - 3. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

#### 2.3 ACCESSORIES

- A. Fasteners: Where exposed, shall be Stainless Steel.
- B. Gaskets: Glazing gaskets shall comply with ASTM C 864 and be extruded of a silicone compatible EPDM, TPV or equal rubber that provides for silicone adhesion.
- C. Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- D. Thermal Barrier: Thermal separator shall be extruded of a silicone compatible PVC (Poly Vinyl Chloride) that provides for silicone adhesion.

#### 2.4 GLAZING

- A. As specified in Division 08 Section "Glazing"

#### 2.5 FABRICATION

- A. General:
  - 1. Fabricate components per manufacturer's installation instructions and with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

## SECTION 084433 SLOPED GLAZING ASSEMBLIES

2. Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.
3. Prepare components to receive anchor devices. Fabricate anchors.
4. Arrange fasteners and attachments to conceal from view.

### 2.6 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finishing:
  1. AA-M12C22A44, AAMA 611, Architectural Class I, Dark Bronze Anodic Coating.

### 2.7 SOURCE QUALITY CONTROL

- A. Source Quality: Provide aluminum curtain walls specified herein from a single source.
  1. Building Enclosure System: When aluminum curtain wall are part of a building enclosure system, including entrances, entrance hardware, windows, curtain wall system and related products, provide building enclosure system products from a single source manufacturer.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive slope glazed system and sill plate is level in accordance with manufacturer's acceptable tolerances.
  1. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

### 3.2 INSTALLATION

- A. General: Install sloped glazing systems plumb, level, and true to line, without warp or rack of frames with manufacturer's prescribed tolerances and installation instructions. Provide support and anchor in place.
  1. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
  2. Glazing: Glass shall be outside glazed and held in place with extruded aluminum pressure plates anchored to the rafters using stainless steel fasteners.
  3. Water Drainage: Water shall be typically diverted to the rafters and exit to the exterior of the building through weeps in the baffle and gutter. Typical horizontal covers and pressure plates will not require weep holes.
  4. All curb construction to support sloped glazing is to be designed by the architect and building engineer to be rigid with negligible deflection (either horizontally or vertically) under design loads.
- B. Related Products Installation Requirements:
  1. Sealants (Perimeter): Refer to Joint Treatment (Sealants) Section.
  2. Glass: Refer to Glass and Glazing Section.
    - a. Reference: ANSI Z97.1, CPSC 16 CFR 1201 and GANA Glazing Manual.

## **SECTION 084433 SLOPED GLAZING ASSEMBLIES**

### **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 by a qualified vendor representative.
    - a. Water Infiltration Tests: Conduct field tests in accordance with AAMA 501.2-03. No uncontrolled water leakage is permitted when tested at 30 psi.
- B. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

### **3.4 PROTECTION AND CLEANING**

- A. Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum sloped glazing 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.

**END OF SECTION 084433**

## **SECTION 088000 GLAZING**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Glass and glazing.
- B. Glazing compounds and accessories.
- C. Aluminum framing for doors and sidelights.

#### **1.2 RELATED REQUIREMENTS**

- A. Section 079000 - Joint Sealers: Silicone sealers for glazing.
- B. Section 084313 - Aluminum-Framed Storefronts.
- C. Section 084413 - Glazed Aluminum Curtain Walls.
- E. Section 084433 – Slope Glazing Assemblies.

#### **1.3 REFERENCE STANDARDS**

- A. ASTM C 864. Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005.
- B. ASTM C 920. Standard Specification for Elastomeric Joint Sealants: 2010.
- C. ASTM C 1036 - Standard Specification for Flat Glass; 2006.
- D. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass: 2004.
- E. ASTM C 1172 - Standard Specification for Laminated Architectural Flat Glass; 2009.
- F. ASTM C 1193 - Standard Guide for Use of Joint Sealants: 2009.
- G. ASTM E 773 - Standard Test Method for Accelerated Weathering of Sealed Insulating Glass Units; 2001.
- H. ASTM E 774 - Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units; 1997.
- I. ASTM E 1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2009a.
- J. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2008.
- K. GANA (GM) - GANA Glazing Manual, Glass Association of North America; 2004.
- L. GANA (SM) - FGMA Sealant Manual; Glass Association of North America; 2008.
- M. SIGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units. Sealed Insulating Glass Manufacturers Association; 2004.

## **SECTION 088000 GLAZING**

### **1.4 PERFORMANCE REQUIREMENTS**

- A. Select type and thickness of exterior glass to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with 2009 IBC code requirements and all local amendments.
1. Use the procedure specified in ASTM E 1300 to determine glass type and thickness.
  2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
  3. Thicknesses listed are minimum.

### **1.5 SUBMITTALS**

A. See Section 013300- Submittal Procedures.

B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements.

Identify available colors.

D. Samples: Submit two samples 12 x 12 inch in size of glass units, showing coloration and design.

### **1.6 FIELD CONDITIONS**

A. Do not install glazing compounds when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

### **1.7 WARRANTY**

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

## **PART 2 PRODUCTS**

### **2.1 GLASS MATERIALS**

- A. Float Glass: All glazing is to be float glass unless otherwise indicated.
1. Annealed Type: ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
  2. Heat-Strengthened and Fully Tempered Types: ASTM C 1048.
  3. Tinted Types: Color and performance characteristics as indicated.

## **SECTION 088000 GLAZING**

4. Thicknesses: As indicated: for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.
- B. Clear Float Glass: annealed.
1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear. Quality Q3, ¼" min. thickness.
- C. Tinted Float Glass: annealed.
1. Comply with ASTM C 1036, Type I, Solar Bronze tinted flat, Class 1. Quality Q3, ¼" min. thickness..
- C. Safety Glass: fully tempered.
1. Comply with 16 CFR 1201 test requirements for Category II.
  2. Comply with ASTM C 1048, Condition A uncoated, Type 1, Class 1, Quality q3, ¼" min. thickness..
- D. Laminated Glass: Float glass laminated in accordance with ASTM C 1172.
1. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
  2. Plastic Interlayer: 0.060 inch thick, minimum.
  3. Where fully tempered is specified or required, provide glass that has been tempered by the tongless horizontal method.
  4. Thickness: 5/16" min. thickness.
- E. Low E Glass: Float type, heat strengthened, tempered.
1. Coating on inner surface.
  2. Low E equal to Solarban 60

### **2.2 SEALED INSULATING GLASS UNITS**

- A. Sealed Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E 2190.
  2. Edge Spacers: Aluminum bent and soldered corners.
  3. Edge Seal; Glass to elastomer with supplementary silicone sealant.
  4. Purge interpane space with dry hermetic air.
- B. Insulated Low E Glass Units: Double pane with glass to elastomer edge seal
1. Outer pane as scheduled, inner pane of as scheduled.
  2. Place low E coating on No.2 surface within the unit, Low E equal to Solarban 60
  3. Durability: Certified by an independent testing agency to comply with ASTM E 2190.
  4. Total Thickness: 1 inch unless scheduled otherwise.
- C. Comply with ASTM E 774 and E 773.
- D. Purge Interpane space with dry air.

### **2.3 GLAZING COMPOUNDS**

- A. Silicone Sealant See Section 079000 - Joint Sealers for structural silicone sealers for exterior cap bead sealant; color as selected from manufacturers standards.

## **SECTION 088000 GLAZING**

### **2.4 GLAZING ACCESSORIES**

- A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness. ASTM C 864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1x16 inch x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option L Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self-adhesive on one face.
- C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness: coiled on release paper: black color.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

### **3.2 PREPARATION**

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.
- E. Install sealant in accordance with manufacturer's instructions.

### **3.3 INSTALLATION - EXTERIOR**

- A. Factory install glazing in exterior aluminum frames using manufacturers standard glazing methods.

### **3.4 INSTALLATION - DRY METHOD**

- A. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.
- B. Locate and secure glazing pane using glazing clips and/or stops.
- C. Fill gaps between glazing and stops with glazing gaskets until flush with sight line. Apply silicone cap bead and Tool surface to straight line where required.

## **SECTION 088000 GLAZING**

### **3.5 CLEANING**

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

### **3.6 PROTECTION**

- A. After installation, mark pane with an 'X by using removable, non-marking plastic tape or paste.

### **3.7 SCHEDULE**

- A. Tinted Tempered Float(Type A): Glazing @ all exterior entrance doors.
- B. Tinted, Low-E Insulated Float Glass (Type B): Glazing @ all storefronts, curtainwalls not noted or required to be safety glass by code.
- C. Tinted, Low-E, Tempered Insulated Float Glass (Type C): Glazing in or adjacent to doors. within 18 inches of walking surfaces, and elsewhere subject to human impact or as required by code.
- D. Tinted Insulated, Tempered over Heat Strengthened Laminated Glass (Type D): Glazing @ all slope glazing assemblies.

**END OF SECTION**

## **SECTION 099000 PAINTING AND COATING**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints, stains, varnishes, and other coatings.
- C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
- D. Do Not Paint or Finish the Following Items:
  - 1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
  - 2. Items indicated to receive other finishes.
  - 3. Items indicated to remain unfinished.
  - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
  - 5. Floors, unless specifically so indicated.
  - 6. Glass.
  - 7. Concealed pipes, ducts, and conduits.
- E. See Schedule - Surfaces to be Finished, at end of Section.

#### **1.2 RELATED REQUIREMENTS**

- A. Division 5 - Metals: Prime painted steel items for field finish.

#### **1.3 REFERENCE STANDARDS**

- A. 40 CFR 59, Subpart D. National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D 16- Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2008.
- C. ASTM D 4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.

#### **1.4 DEFINITIONS**

- A. Conform to ASTM D 16 for interpretation of terms used in this section.

#### **1.5 SUBMITTALS**

- A. See Section 013300 . Submittal Procedures.
- B. Product Data: Provide data on all finishing products, including VOC content.
- C. Samples: Submit two paper Chip samples illustrating range of colors and textures available for each surface finishing product scheduled.

## **SECTION 099000 PAINTING AND COATING**

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

E. Maintenance Data Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

### **1.6 QUALITY ASSURANCE**

A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three (3) years experience.

### **1.7 REGULATORY REQUIREMENTS**

A. Conform to applicable code for flame and smoke rating requirements for products and finishes.

### **1.8 DELIVERY, STORAGE, AND HANDLING**

A. Deliver products to site In sealed and labeled containers inspect to verify acceptability.

B. Container Label Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F. in ventilated area, and as required by manufacturer's instructions.

### **1.9 FIELD CONDITIONS**

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.

F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

### **1.10 EXTRA MATERIALS**

A. See Section 016000- Product Requirements, for additional provisions.

## SECTION 099000 PAINTING AND COATING

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions

B. Manufacturer:

1. Tnemec.

C. Other Approved Manufacturers:

1. Diamond Vogel.
2. Glidden Paint Company..
3. Pittsburgh Paint Co. [www.pittsburghpaints.com](http://www.pittsburghpaints.com).
4. Iowa Paint.
5. Pratt & Lambert Paints [www.prattandlambert.com](http://www.prattandlambert.com).
6. Sherwin-Williams Co: [www.sherwin-williams.com](http://www.sherwin-williams.com).

D. Substitutions: See Section 016000- Product Requirements.

#### 2.2 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.

1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
2. Supply each coating material in quantity required to complete entire project's work from a single production run.
3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as 'best' by the manufacturer.

C. Volatile Organic Compound (VOC) Content:

1. Provide coatings that comply with the most stringent requirements specified in the following:
  - a. 40 CFR 59, Subpart D—National Volatile Organic Compound Emission Standards for Architectural Coatings.
2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59. Subpart D (EPA Method 24). exclusive of colorants added to a tint base and water added at project site or other method acceptable to authorities having jurisdiction.

#### 2.3 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not: commercial quality.

## **SECTION 099000 PAINTING AND COATING**

B. Patching Material Latex filler.

C. Fastener Head Cover Material: Latex filler.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Gypsum Wallboard: 12 percent.
2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
3. Interior Wood: 15 percent, measured in accordance with ASTM D 4442.

#### **3.2 PREPARATION**

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Surfaces: Correct defects and dean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate, rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

H. Gypsum Board Surfaces to be painted. Fill minor defects with filler compound. Spot prime detects after repair.

I. Galvanized Surfaces to be painted: Remove surface contamination and oils and wash with solvent, Apply coat of etching primer.

## SECTION 099000 PAINTING AND COATING

J. Un corroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface: spot prime after repairs.

K. Corroded Steel and Iron Surfaces to be Painted: Remove existing corrosion, grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of corrosion and/or scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of corrosion inhibitor solution. Prime paint entire surface: spot prime after repairs.

L. Shop-Primed Steel Surfaces to be Finish Painted Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches

### 3.3 APPLICATION

A. Apply products in accordance with manufacturer's instructions,

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance.

D. Sand wood and metal surfaces lightly between coats to achieve required finish.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

F. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### 3.4 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

### 3.5 SCHEDULE - SURFACES TO BE FINISHED

A. Do Not Paint or Finish the Following Items

1. Items fully factory-finished unless specifically noted.
2. Fire rating labels, equipment serial number and capacity labels.

B. Paint the surfaces described below under Schedule - Paint Systems.

C. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.

1. Paint all insulated and exposed pipes occurring in finished areas to match background surfaces, unless otherwise indicated.
2. Paint shop-primed items occurring in finished areas.

## SECTION 099000 PAINTING AND COATING

3. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces
4. Paint dampers exposed behind louvers, grilles, 36 inches to match face panels.

### 3.6 SCHEDULE - EXTERIOR SURFACES

- A. Steel - Unprimed:
1. One coat acrylic primer.
  2. Two coats acrylic-exterior enamel, semi-gloss.
- B Steel - Shop Primed:
1. One coat acrylic primer.
  2. Two coats acrylic enamel, semi-gloss.

### 3.7 SCHEDULE - INTERIOR SURFACES (TO BE USED FOR REPAIR OF EXISTING SURFACES)

- A. Wood-Painted:
1. One coat non-toxic, ready-mixed latex-based primer sealer.
  2. Two coats non-toxic, ready-mixed latex-based low-sheen (eggshell), enamel.
- B. Wood - Transparent:
1. Solvent-based, air-drying paste-type wood filler.
  2. Two coats polyurethane finish, satin gloss.
  3. Apply finish to all surfaces of doors prior to installation of hardware.
  4. Class "K Fire Retardant Varnish System (Wood ceilings only).
- C. Wood - Veneer Paneling:
1. Three coats polyurethane finish, satin gloss.
- D. Concrete Floors - Sealed Concrete
1. For all exposed concrete floors.
  2. L&M "Seal Hard" penetrating sealer.
- E. Concrete, Concrete Block:
1. One coat acrylic or epoxy block filler/primer.
  2. One coat alkali-resistant acrylic-latex primer.
  3. Two coats acrylic-enamel, low luster.
- F. Steel - Unprimed:
1. One coat ferrous metal primer.
  2. Two coats acrylic enamel, semi-gloss.
- G. Steel - Primed:
1. Touch-up original primer.
  2. Two coats acrylic-enamel, semi-gloss..

## **SECTION 099000 PAINTING AND COATING**

### **3.8 DISPOSAL OF MATERIALS**

A. All left over and unused painting and finishing products, except those noted above under "Extra Materials", shall be removed from the site and disposed of in a legal manner.

### **3.9 SCHEDULE**

A. Colors to match aluminum framing; color as selected by Owner..

B. Interior colors to match existing.

END OF SECTION