SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes aluminum-framed entrances and storefronts. The aluminum-framed entrance and storefront work includes the following:

1. Aluminum swing entrance doors and framing, including hardware, stripping and thresholds.
2. Aluminum sliding entrance doors, and framing, including hardware, stripping and thresholds.
3. Aluminum trim, and similar items.
4. Painting and coating in conjunction with the above aluminum items.
5. Internal steel and aluminum reinforcements.
6. Internal and perimeter sealing, joint fillers, and gasketing systems.
7. Anchors, shims, fasteners, inserts, expansion devices, accessories, support brackets and attachments.
8. Glass and glazing.
9. Security system components may be incorporated into the door and frame openings of all aluminum-framed entrance and storefront work at the Owner's option. Cooperate with the Owner's security system contractors if the Owner chooses to incorporate security system components during the course of the Work.

1.2 ACTION SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions for each aluminum-framed entrance and storefront product specified.

B. Shop Drawings: Submit shop drawings showing scaled elevations, plans, and sections of the aluminum-framed entrance and storefront work. Full scale sections shall be prepared and submitted for details of the assemblies that cannot be shown in the elevations or sections. Include with shop drawings metal thickness of all metal components, glass thicknesses, metal finishes, location and installation requirements of door hardware and reinforcements, and all other pertinent information as necessary or requested by the Architect to indicate compliance with the Contract Documents. Details of field connections, anchorage, and their relationship to the work of others shall be clearly indicated for the coordination of the work by other building trades. Details of fastening and sealing methods and product joinery shall be shown to ensure proper performance of the field installation. No work shall be fabricated until shop drawings for that work have been approved by Architect for fabrication.

1. Hardware Schedule: Organize schedule into sets based on hardware specified. Include name of item and manufacturer, and complete designation of every item required for each entrance door.
2. Indicate routing of electrical conduit and dimensions and locations of cutouts in doors and frames to accept electric hardware devices.

C. Samples: Submit samples of the following before any work is fabricated:

1. Three paired sets of samples for each exposed metal finish required. Sample finishes shall be on the specified alloy, temper, and thickness of metal required for the work. Where finishes involve color and texture variations, include sample sets showing the full range of variations expected. Furnish samples in either 12 inch lengths of rails, or 12 inch squares of sheet.

1.3 INFORMATIONAL SUBMITTALS

A. Structural Calculations: Submit, for information only, copies of structural calculations indicating complete compliance with the specified performance requirements. Calculations shall be prepared, signed and sealed by a Professional Engineer registered in the state wherein the work is to be erected.

B. Product Test Reports: Submit certified product test reports based on tests performed by an AAMA Accredited Laboratory clearly describing in written form, and in shop drawing form, compliance of each aluminum-framed entrance and storefront assembly with requirements indicated based on comprehensive testing.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Instructions: Submit copies of an assembled and bound maintenance manual, describing the devices and procedures to be followed in cleaning, adjusting, and maintaining the aluminum-framed entrance and storefront work. Include information for maintaining operable doors, operating hardware, and replacing weather stripping.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Subcontract the aluminum-framed entrance and storefront work to a firm which is specialized in the erection of entrances and storefronts and who has successfully installed work similar in design and extent to that required for the Project, in not less than three projects of similar scope to the satisfaction of the Architect, and whose work has resulted in construction with a record of successful in-service performance for a period of 10 years.

B. Standards: Comply with the applicable provisions and recommendations of the following standards below, where standards conflict the more stringent shall apply:

1. American Architectural Manufacturers Association (AAMA): "Aluminum Store Front and Entrance Design Guide Manual."
2. American Institute of Steel Construction (AISC), "Steel Construction Manual," Current Edition.
3. ANSI Z97.1 and Federal Standard 16 CFR 1201, Consumer Product Safety Commission (CPSC): "Safety Standard for Architectural Glazing Materials," as published in the Code of Federal Regulations (CFR). Comply with the applicable requirements of the laws, codes, ordinances and regulations of Federal and Municipal authorities having jurisdiction, wherever requirements conflict the more stringent shall be required. Obtain approvals from all such authorities. As a minimum provide safety glazing complying with ANSI Z97.1 for Category A performance and 16 CFR Part 1201 for Category II performance.
4. Welding Standards: Welding shall be performed by skilled and qualified mechanics. Welding shall be performed in accordance with the applicable provisions of AWS D1.1 "Structural Welding Code - Steel."

C. Sample Installations:

1. General: Sample installations will be used as a standard for judging acceptability of work for the Project. Replace unsatisfactory work as directed. Maintain sample installations during construction as a standard for judging acceptability of the entrance and storefront work. Properly finished, maintained, and performing sample installations shall be retained as a portion of the completed work.
2. Size: Provide full sized sample installations to the extent indicated on the Drawings, or if not indicated, as directed by the Architect. Sample installations shall be built on site complete with all glass, aluminum framing, adjacent cladding materials, anchors, connections, sealants, and joint fillers as accepted on the final shop drawings. Do not take special precautions or use techniques that do not represent those to be used on the work.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Prior to the start of the aluminum-framed entrance and storefront work, and at the Contractor's direction, meet at the site and review the installation procedures and coordination with other work. Meeting shall include Contractor, Owner, aluminum-framed entrance and storefront installer, sealant installer, as well as any other subcontractors or material technical service representatives whose work, or products, must be coordinated with the aluminum-framed entrance and storefront work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packaging of components shall be so selected to protect the components from damage during shipping and handling.

B. Storage on Site: Store aluminum-framed entrance and storefront components in a location and in a manner to avoid damage to the components. Keep handling on site to a minimum. Exercise particular care to avoid damage to finishes of metals.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify dimensions of supporting structure by field measurements before fabrication so that the entrance and storefront work will be accurately designed, fabricated and fitted to the structure. Indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work. Use Contractor's lines and benchmarks as a basis for measurements.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating entrance and storefront work without field measurements. Coordinate supporting structure construction to ensure actual dimensions correspond to established dimensions.

B. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to, power supplies, fire alarm system and detection devices, access control system, security system, building control system.

1.8 WARRANTY

A. Special Warranty: Submit a 2 year written warranty, beginning from date of substantial completion, and executed by the Contractor, manufacturer and the aluminum-framed entrance and storefront installer agreeing to repair or replace components of entrance and storefront systems that develop defects in materials or workmanship within the specified warranty period. Defects include structural failures, sealant failures, deterioration of metals, metal finishes, failure of operating components to function properly, and any other evidence of failure or deterioration of the aluminum-framed entrance and storefront work to meet performance requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer Qualifications: The drawings and specifications are based on the building's standard's system. Award the fabrication of aluminum framed entrances and storefront components to a single firm specializing in the fabrication of aluminum framed entrances and storefront components who has successfully produced work similar in design and extent to that required for the project, in not less than three projects of similar scope to the satisfaction of the Architect, and whose work has resulted in construction with a record of successful in-service performance for a period of 5 years. The fabricator shall have sufficient production capacity, have organized quality control and testing procedures, and published written and illustrated installation manuals, to produce and properly install the aluminum framed entrances and storefront assemblies required without causing delay in progress of the Work. Other manufacturers capable of producing aluminum framed entrances and storefront systems meeting the performance requirements include the following:

1. EFCO Corporation division of Pella.
2. Moduline Division of Oldcastle Building Envelope.
3. TRACO div. of Kawneer Company, Inc.
4. Wausau Window and Window Wall Systems.
5. YKK AP America Inc.
6. Graham Architectural Products Corp.

B. Source Limitations: Obtain aluminum framed entrances and storefronts from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General: Provide aluminum-framed entrance and storefront systems meeting or exceeding the following performance requirements:

1. Structural Properties:

   a. Lateral Loads: The aluminum-framed entrance and storefront work, including glass, shall be designed, fabricated and installed to withstand a maximum inward and outward lateral pressure of 5 lbf/sf for sidelights and 20 lbf/sq. ft. for the active door panels.

   b. Seismic Loads: As required by 2020 Building Code of New York State **.**
   c. Deflection Limitations:

1) Deflections: Base calculations for the following deflections upon the combination of maximum direct lateral pressures, building deflections, and erection tolerances.

a) The deflection of any framing member in a direction normal to the plane of the wall when subjected to the full lateral pressures specified above shall not exceed 1/175 of the glass edge length or 3/4 inch whichever is less, except limit deflection of glass to 1/2 inch.
b) Glass, sealants and interior finishes shall not be included to contribute to framing member strength, stiffness or lateral stability.

d. Dead Loads:

1) Maximum full deadload deflections, parallel (in-plane) to wall plane, of framing members shall not reduce glass bite or glass coverage, to less than 75 percent of the design dimension, and shall not reduce edge clearance to less than 25 percent of design dimension or 1/8 inch whichever is greater.
2) Limit deflections of metal members spanning door openings to 1/300. The clearance between the member and an operable door shall be no less than 1/16 inch.
3) Twisting (rotation) of the horizontals due to the weight of the glass shall not exceed 1 degree, measured between ends and center of each span.

e. Operational (Traffic) Loads: Design and fabricate aluminum-framed entrances to withstand the operating loads which result from heavy traffic conditions using the specified hardware, without measurable permanent deflection. Limit elastic deflections so as to provide the normal degree of rigidity required to avoid glass breakage, air leaks and other objectionable results of excessive flexibility. Provide weatherstripping at stiles, sill and head rails of door leaves, to minimize sound leaks.

1) Accommodate seismic movement as required by local code authorities to maintain exit doors in operable condition in case of seismic event.

B. Building Frame Movement: Design, fabricate and install aluminum-framed entrances and storefronts to withstand building movements including loading deflections, shrinkage, creep and similar movements.

C. Design Modifications:

1. Submit design modifications necessary to meet the performance requirements and field coordination.
2. Variations in details or materials shall not adversely affect the appearance, durability or strength of components.

3. Maintain the general design concept without altering size of members, profiles and alignment.

2.3 MATERIALS

A. Aluminum: Conform to the requirements published in AA "Aluminum Standards and Data," referenced ASTM standards and the following. All aluminum extrusions shall be manufactured to dimensional tolerances so as to eliminate any edge projection or misalignment at joints. Unless otherwise specified, provide alloy and temper as required to suit performance requirements and finish(es) indicated. Provide concealed extruded bars, rods, shapes and tubes in alloys as recommended by the fabricator to join or reinforce assembly of exposed aluminum components.

1. Alloys:

   a. Sheet and Plate: Alloy 5005 and ASTM B 209, "Anodizing Quality."
   b. Extruded Bars, Rods, Shapes, and Tubes: Alloy 6063 and ASTM B 221, "Anodizing Quality."
   c. Bars, Rods, and Wire: ASTM B 211.

2. Welding Rods and Bare Electrodes: AWS A5.10.

B. Carbon Steel: For carbon steel components required to join, reinforce or support the assembly of aluminum components provide carbon steel conforming to ASTM A 36/A 36M for structural shapes, plates, and bars; ASTM A 1008/A 1008M for cold-rolled sheet and strip; or ASTM A 1011/A 1011M for hot-rolled sheet and strip.

1. Refer to Section 055000, Metal Fabrications, for carbon steel framing, embedments, anchors, and welding that is not primary building structure nor furnished by the entrance and storefront fabricator but is required to transmit live and deadloads from the entrance and storefront framing to the primary building structure.

C. Glass and Glazing Materials: As specified in Section 088000 "Glazing."

D. Anchors and Fasteners:

1. Material: Carbon steel complying with either ASTM A325 or SAE Grade 5.
2. Anchor and Fastener Metal Alloy Types, Designations and Standards: Alloys as selected by fabricator to prevent corrosion resistance with the components fastened. Do not use self-drilling, self-tapping type fasteners.
3. Do not use exposed anchors and fasteners, except for hardware application. For hardware application, use countersunk Phillips flat-head machine screws finished to match framing members or hardware being fastened, unless otherwise indicated.
4. Where fasteners are subject to loosening or turn out from thermal and structural movements, lateral loads, or vibration, use self-locking devices.

E. Weather Stripping:

1. Compressible Weatherstripping: Compressible weatherstripping gaskets fabricated from extruded multi-fingered PVC, silicone or neoprene, replaceable, held in adjustable depth extruded metal strips to be mortised into edge of door panels for minimum exposure, metal finish to match finish of door.
2. Sliding Weather Stripping: Wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing complying with AAMA 701 requirements, replaceable, held in adjustable depth extruded metal strips to be mortised into edge of door panels for minimum exposure.

2.4 HARDWARE

A. General: Provide hardware indicated and as scheduled. Finish exposed parts to match butt or pivot finish, unless otherwise indicated.

2.5 SEALING MATERIALS

A. Concealed Sealing Materials: All sealing materials concealed within the entrances and storefronts shall be silicone, compatible with and adherent to each material it will be in contact with, as recommended by the manufacturer to fulfill performance requirements.

B. Exposed Sealing Materials: Sealants, exposed at entrance and storefront perimeter joints in contact with adjacent cladding materials are specified in Section 079200 "Joint Sealants."

2.6 FABRICATION

A. General: Fabricate the entrances and storefronts to the designs, shapes, and sizes shown using the materials specified and shown to produce assemblies which meet or exceed the performance requirements. To the greatest extent possible complete fabrication, assembly, finishing, hardware applications and other work before shipment to Project site.

1. Metal Wall Thickness: Provide shapes as shown and as required to suit the performance requirements but with wall thickness of not less than 1/8 inch.
2. Door Stile and Rail Dimensions:

    a. Bottomrails: Provide minimum 10 inches high one piece bottomrail unless otherwise indicated on the Drawings.
    b. Stiles and Top Rail Dimensions: **Match building standard for stile dimensions:** Thin stile; less than 1-3/4 inches wide.
    c. Door Thickness: 1-3/4 inches.

d. Preglaze door units to greatest extent possible, in coordination with installation and hardware requirements. Glazing, whether in factory or in field, shall be performed in accordance with Section 088000 "Glazing."
e. Fabricate all doors and frames to accommodate the swing direction shown.

3. Provide extruded aluminum entrance door inserts at door frames designed with bosses sized to receive selected door gasket.

B. Glazing Stops and Gaskets: Provide continuous interior glazing stops with concealed fasteners for all doors and frames. Provide stops with hairline joints at corners. Provide stops with beveled, not square, shouldered profile unless otherwise shown.

C. Glass Components: Provide holes and cutouts in glass to receive hardware and accessories before tempering glass. Drill, countersink, and chamfer holes using tooling, materials and methods which are selected and applied to prevent spalling of the cut glass surfaces at holes and cutouts. The internal surface of holes and cutouts shall be smooth with minimal roughness from drilling operations. Do not cut, drill, or make other alterations to glass after tempering.
1. Fully temper glass using horizontal (roller-hearth) process and fabricate so, when installed, roll-wave distortion is parallel with bottom edge of door or lite.
2. Heat Soaking: After tempering, expose 100% of all fabricated glass units to European Standard EN14179 heat soaking process to reduce the potential for inclusion related glass breakage.
3. Factory assemble components and factory install hardware to greatest extent possible.

D. Metal Components: Doors and frames shall be cut, reinforced, drilled and tapped in strict accordance with the printed door hardware manufacturer's templates and instructions. Provide solid steel hardware reinforcements, securely fastened to doors and frames where door hardware is to be attached.

1. Security system components may be incorporated into the door and frame openings of all entrance doors and frames. Provide all cutouts required by the Owner's security system vendor and all prewiring for vendor provided security system devices. Wherever storefront and entrance framing components are to receive wiring, provide unobstructed clear paths free of burrs and sharp objects with pull strings to facilitate wiring.

E. Joints in Metal Work: All exposed work shall be carefully fitted and matched to produce continuity of line and design, with all joints, being accurately fitted for hairline contact and rigidly secured. Where additional rigidity or strength is required to satisfy the performance requirements reinforce entrance components with aluminum or carbon steel shapes, bars, and plates.

F. Shop Assembly: As far as practicable, all fitting and assembly work shall be done in a fabrication shop.

G. Exposed Fasteners: Not permitted.

2.7 ALUMINUM FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.

B. Finish Application:

1. Apply thermosetting acrylic enamel coatings to all exposed surfaces of storefront and entrance components.
2. Apply anodized coatings to all exposed surfaces of storefront and entrance components.

C. Appearance of Finished Work: During production, maintain large size color range samples for use in comparing against production material. Variations in appearance of abutting or adjacent pieces are acceptable if they are within the range of approved samples. Noticeable variations in the same piece are not acceptable.

D. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

E. Class II, Clear Anodic Finish: Complying with AA-M10C22A31 for an Architectural Class II finish and the following:

1. Metal Preparation and Pretreatment: Remove die markings prior to finishing operations. Perform this work in addition to the finish specified. Scratches, abrasions, dents and similar defects are unacceptable.
2. Thickness: Minimum 0.4 mil, weighing not less than 15.5 mg per sq. in., minimum apparent density of 38 g per cubic in.
3. Performance Criteria: Meets or exceeding AAMA 611.
4. Color: Medium matte finished, clear natural anodized matching Architect's sample.
5. Post Anodizing Finish (Sealing): Anodized finishes shall be fully sealed by the manufacturer or processor according to procedures recommended by the licensor of the process. Maximum weight loss shall be 2.6 mg/sq. in.

F. Class II, Color Anodic Finish: Complying with AA-M12C22A32/A34 for an Architectural Class II finish and the following:

1. Metal Preparation and Pretreatment: Remove die markings prior to finishing operations. Perform this work in addition to the finish specified. Scratches, abrasions, dents and similar defects are unacceptable.
2. Thickness: Minimum 0.4 mil, weighing not less than 15.5 mg per sq. in., minimum apparent density of 38 g per cubic in.
3. Performance Criteria: Meets or exceeding AAMA 611.
4. Color: Medium matte finished, integrally colored or electrolytically deposited color anodized matching Architect's sample.

5. Post Anodizing Finish (Sealing): Anodized finishes shall be fully sealed by the manufacturer or processor according to procedures recommended by the licensor of the process. Maximum weight loss shall be 2.6 mg/ sq. in.

G. Thermosetting Acrylic Enamel Coating: Complying with AAC12R1X and the following:

1. Thermosetting acrylic enamel finish coating containing either an acrylic based resin, polyester based resin, or not less than 50 percent of "Kynar 500" or "Hylar 5000" fluorocarbon resin specially formulated for spray application to extrusions and preformed aluminum metal shapes. Pretreatment of aluminum surface and application of the finish shall be performed under specifications issued by the licensed formulator to approved applicator. Remove die markings, scratches, abrasions, dents and other blemishes before applying finish. Coating films shall be uniform and free from flow lines, streaks, blisters, sags or other surface imperfections in the dry-film state on all surfaces.
2. Thickness: Minimum 1.0 mil total dry film thickness (+/- 0.2 mil).
3. Coating Performance Criteria: Acrylic based resin shall meet or exceed AAMA 2603, 50% kynar based resin shall meet or exceed AAMA 2604.
4. Color: One custom color to match Architect's paint sample.
5. Manufacturer, Coating System: One of the following:

a. PPG Paints; Duracron Thermosetting Acrylic and Polycron Thermosetting Acrylic resin or Acrynar 50% pvdf.
b. Sherwin-Willams (formally Valspar, Inc.); Acroflur.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate entrance and storefront work with the work of other Sections and provide items to be placed during the installation of other work at the proper time to avoid delays in the work.

B. Place such items, including concealed overhead framing, accurately in relation to the final location of entrance and storefront components.

3.2 EXAMINATION

A. Examine the substrates, adjoining construction, and conditions under which the Work is to be installed. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Before beginning installation of the entrance and storefront work examine all parts of the existing building structural frame indicated to support the entrance and storefront work. Notify Contractor in writing, of any dimensions, or conditions, found which will prevent the proper execution of the entrance and storefront work, including specified tolerances. Use Contractor's offset lines and bench marks as basis of measurements.

3.3 INSTALLATION

A. General: Comply with manufacturer's written instructions for protecting, handling, and installing entrance and storefront systems. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints.

1. Cut and trim component parts of the entrance and storefront work during erection only with the approval of the manufacturer or fabricator, and in accordance with his recommendations. Restore finish completely to protect material and remove all evidence of cutting and trimming. Remove and replace members where cutting and trimming has impaired strength or appearance, as directed by Architect.
2. Set components within the erection tolerances with uniform joints. Place components on shims and fasten to supporting substrates using bolts and similar fasteners. Use stainless steel shims at structural connections only. U shaped shims at structural connections are not permitted. Use aluminum, stainless steel, or high impact polystyrene shims at other connections.
3. Do not erect components which are warped, deformed, bowed, dented, defaced or otherwise damaged as to impair its strength or appearance. Remove and replace members damaged in the process of erection.
4. No holes or slots shall be burned, cut into, or field drilled in building framing members without the written acceptance of the structural engineer.

B. Entrance and Storefront Framing: Install framing components plumb and true in alignment with established lines and grades without warp or rack of framing members.

C. Entrance Doors: Doors shall be securely anchored in place to a straight, plumb and level condition, without distortion. Adjust doors to operate smoothly, without binding, with hardware functioning properly. Weatherstripping contact, and hardware movement, shall be field tested and final adjustment, and lubrication, made for proper operation and performance of doors.

1. Door Hardware: Refer to Section 087100 "Door Hardware."
2. Install surface-mounted hardware according to manufacturer's written instructions using concealed fasteners to greatest extent possible.
3. Set, seal, and grout floor closer cases as required to suit hardware and substrate indicated.

D. Install glazing to comply with requirements of Section 088000 "Glazing," unless otherwise indicated.

E. Install perimeter sealant to comply with requirements of Section 079200 "Joint Sealants," unless otherwise indicated.

F. Concealed Sealing Components: Apply sealant and gasket components which are integral to the entrance and storefront systems in strict accordance with the each component manufacturer's printed instructions. Before applying components remove all mortar, dust, dirt, moisture, and other foreign matter which will be deleterious to the intended performance of the component. Mask adjoining exposed surfaces to avoid spilling, dripping, dropping or other unintended contact of the sealing components onto adjacent exposed surfaces.

3.4 ERECTION TOLERANCES

A. The entrance and storefront systems shall be fabricated and erected to accommodate the dimensional tolerances of the structural frame while providing the following as installed tolerances.

1. Variation from theoretical calculated position as located in plan or elevation in relation to established floors lines, column lines and other fixed elements of the structure, including variations from plumb, level, straight and member size: +/- 1/4 inch max in any 20'-0" run, column-to-column bay, or floor-to-floor height.
2. Alignment: Where surfaces abut in line, and meet at corners, limit offset from true alignment to 1/32 inch.
3. Variation from angle, or plumb, shown: +/- 1/8 inch max in any 10'-0" run or story height, non-cumulative.
4. Variation from slope, or level, shown: +/- 1/8 inch max in any 20'-0" run or column-to-column bay, non-cumulative.

3.5 ANCHORAGE

A. Anchorage of the entrance and storefront work to the structure shall be in accordance with the accepted shop drawings.

3.6 WELDING

A. Weld with electrodes and by methods recommended by manufacturer of material being welded, and in accordance with AWS D1.1 for concealed steel members.

3.7 REMOVAL OF DEBRIS

A. All debris caused by, or incidental to, the erection of the entrance and storefront work shall be removed from the site and disposed of legally.

3.8 CLEANING

A. Clean metal surfaces promptly after installation, exercising care to avoid damage to factory finished exposed surfaces.

B. Wash glass on both faces not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer. Remove excess glazing and sealant compounds, dirt, and other substances.

C. Immediately remove any deleterious material from surfaces of aluminum.

3.9 PROTECTION

A. Institute protective measures required throughout the remainder of the construction period to ensure that entrance and storefront work will be without damage or deterioration, at time of acceptance.

END OF SECTION