

**SPECIFICATIONS
FOR
WINDOW RESTORATION & REPLACEMENT**

REHABILITATION OF THE TERRACE & RELATED FEATURES

**THE EXPLORERS CLUB
46 E. 70TH STREET
NEW YORK, NY**

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TABLE OF CONTENTS

INVITATION TO BID

BID FORM

SPECIFICATIONS

Division 1 GENERAL CONDITIONS

Section 01010: Summary of Work

01010-1 to 01010-4

Division 2 SITE WORK

Section 02060: Selective Demolition

02060-1 to 02060-5

Division 7 MOISTURE PROTECTION

Section 07900: Sealants and Caulking

07900-1 to 07900-2

Division 8 WINDOWS & DOORS

Section 08510: Steel Windows

08510-1 to 08510-9

Section 08810: Leaded & Painted Glass Restoration

08810-1 to 08810-12

Division 9 FINISHES

Section 09900: Painting

09900-1 to 09900-6

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 PROJECT DESCRIPTION

Base Scope of Work consists of the following:

- A. General: Provide permits as required by New York City Landmarks Preservation Commission (LPC) and New York City Department of Buildings for performance of work.
- B. Demolition: Removing and disposing select steel casement windows as indicated on the Drawings and Specifications Sections 02060 and 08510.
- C. Glass and Stained Glass Restoration (see Drawings and Specifications Section 08810):
1. Removal of leaded glass panels & painted glass inserts from steel casement windows, re-leading & reinstallation of glass into restored and new steel casement sash finished with powdercoat finish.
 2. Removal of leaded glass panels & painted glass inserts set in stone groove, re-leading & reinstallation of glass in original groove.
- D. Steel Casement Windows & Vents (see Drawings and Specifications Section 08510):
1. Providing and setting new steel casement window frames with factory-applied powdercoat finish in original openings using new S.S. anchors.
 2. Repairing existing window hardware and providing new hardware where missing.
- E. After steel casement window frames are removed, Contractor shall install 1/8" plexi-glass temporary protection in all openings until reinstallation of the frames.

- F. Caulking and sealing exterior perimeters of all windows (See Specifications Section 07900).
- G. Painting: Surface preparation and refinishing of select windows.

1.3 GENERAL REQUIREMENTS

- A. The Contractor shall obtain and pay for all permits and fees required.
- B. The Contractor shall verify all information pertaining to existing conditions by actual measurement and observation on the site. All discrepancies between actual conditions and those shown in the contract documents shall be reported to the Architect for evaluation before the affected construction is put in place. Failure to notify the Architect will not relieve the Contractor of the responsibility to perform the work as intended in the Contract Documents.
- C. Do all cutting, patching, and repairing as required to perform all of the work as may be required to complete the job.
- D. Maintain the structural stability and integrity of existing structure during the construction operations.

1.4 CONTRACTOR USE OF PREMISES

- A. General: Limit use of the premises to construction activities in areas indicated; allow for full Owner occupancy.
- B. Owner Occupancy: The Owner will occupy the site during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage.
- C. The Work will be sequenced in such a way as to provide the least possible interference to the activities of the Owner and to permit continued use of areas not under construction.
- D. Be responsible for keeping the site free of rubbish and debris, and in a neat orderly condition at all times. Clean up and remove all accumulated rubbish and debris for all trades on a daily basis.

1.5 TEMPORARY PROTECTION

- A. While work under this contract is in progress, protect existing building, grounds, contents, passersby and occupants, including those on adjacent property, whether public or private,

from damage or harm due to the work under this contract. Provide temporary protection, bridging, safety netting and other acceptable methods to protect persons and property from harm. Comply with laws, ordinances, regulations, and requirements of the agencies of New York having jurisdiction. At no additional cost, satisfactorily repair or replace, to architect's and owner's satisfaction, marred or damaged elements and surfaces.

- B. Where existing construction is removed provide adequate enclosure, tarpaulin or other temporary waterproof covers to protect against the elements. Remove protection only when new construction provides weather tight seal.
- C. Protect existing building fabric with securely anchored and maintained protection materials. At no additional cost, satisfactorily repair or replace, to architect's and owner's satisfaction, marred or damaged elements and surfaces.
- D. Remove temporary protection promptly on completion of construction activities when no longer needed.

1.6 TEMPORARY SCAFFOLDS

- A. General scaffolding at south and north elevations to be provided by others.
- B. Window restoration contractor shall provide additional scaffolding, staging, rigging, and similar items for proper execution of the work. Such apparatus, equipment, construction, and use shall meet applicable requirements of labor laws, codes, and regulations of authorities having jurisdiction.

1.7 UTILITY SERVICES

- A. Contractor shall not interrupt any utility service such as water, gas, steam, sewers, electricity, or fire protection serving the building or neighboring properties without written approval of the owner(s) and other authorities having jurisdiction.

1.8 INSURANCE REQUIREMENTS

- A. Comprehensive General Liability Policy:
 - 1. \$1,000,000 per occurrence
 - 2. \$2,000,000 annual aggregate
 - 3. Policy to include bodily injury, property damage, products, and completed operations coverage.
 - 4. Owner and Architect to be named as additional insured.

B. Worker's Compensation:

1. Owner to be listed as a certificate holder.

PART 2 - PRODUCTS (Not applicable).

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01010

SECTION 02060: SELECTIVE DEMOLITION

PART 1: GENERAL

1.1 SCOPE OF WORK

- A. This Section includes administrative and procedural requirements for the following work:
1. Removing and salvaging steel casement window sash.
 2. Removing steel window frames.
 3. Recycling and disposing non-hazardous construction and demolition waste.
 4. Providing and installing temporary protection to ensure water tightness.
 5. Providing temporary bracing and shoring as required.

1.2 DEFINITIONS

- A. Construction Waste: Building materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of removed construction materials for documentation or subsequent re-incorporation into the Work.
- F. Reuse: Reincorporation of salvaged construction materials into the work.
- G. Catalog: Match Marker (label and numbering) system to identify elements for reuse.

1.3 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. The work described in this section is related to work described in the following Sections:
1. Section 01010 – Summary of Work
 2. Section 07900 – Sealants and Caulking
 3. Section 08810 – Leaded & Painted Glass Restoration
 4. Section 08510 – Steel Windows

5. Section 09900 – Painting

1.4 SUBMITTALS

- A. Shop Drawings: Indicate demolition and removal sequence, location and construction of temporary work, protection and waterproofing.
- B. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, type of waste, means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 - 2. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - 3. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - 4. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.
- C. The Contractor shall provide a plan describing the dismantling process and documenting the cataloging system to be used during construction. The Contractor shall provide a narrative detailing intended removal and handling methods.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for demolition work, dust control and safety of public. See Subchapter 19 of Title 27 of the Building Code of the City of New York ("Safety of Public and Property During Construction Operations").
- B. Obtain required permits from authorities.
- C. Do not close or obstruct egress width to any building or site exit.
- D. Do not disable or disrupt building fire or life safety systems.
- E. Conform to procedures applicable when hazardous or contained materials are discovered.

1.6 PROJECT CONDITIONS

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.

- B. Cease operations immediately if structure appears to be in danger and notify Architect/Engineer. Do not resume operations until directed.

PART 2: PRODUCTS Not used

PART 3: EXECUTION

3.1 PREPARATION

- A. Erect and maintain weatherproof closures for exterior openings.
- B. Protect existing materials and finishes which are not to be demolished or salvaged.
- C. Prevent movement of structure; provide bracing and shoring as required.

3.2 WASTE MANAGEMENT

- A. General: Implement waste reduction management plan as approved by Architect. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

3.3 DEMOLITION

- A. Demolish in an orderly and careful manner. Protect existing supporting structural members, waterproofing and finishes to remain.
- B. Remove demolition and construction waste from site except where specifically noted otherwise. Do not burn or bury materials on site.
- C. Remove materials as Work progresses according to waste reduction management plan. Upon completion of Work, leave areas in clean condition.
- D. Remove temporary Work.

3.4 SALVAGING REMOVED MATERIAL

- A. Prior to commencing work, the Contractor shall perform a complete existing conditions survey.
 - 1. Thoroughly photograph the window sash in place prior to removal.

2. Inspect window openings and notify Architect of any conditions impeding the safe removal, temporary storage or transportation of the sash before commencing removal.
- B. The Contractor shall be responsible for compliance with all Federal, State and local laws and regulations relative to disposal, and for payment of fees for removal or disposal.
 - C. Leaded and painted glass sash shall be removed by the Contractor as indicated on the contract drawings. Methods used for removal, reinstallation, and disposal of existing materials shall be in accordance with the contract documents and subject to the approval of the Architect.
 1. Carefully remove the sash and provide suitable protection for transport to the studio.
 - D. Catalog sash with methods approved by the Architect. Cataloging shall be sufficient to allow each component to be reassembled in the same location, position and orientation as in the existing construction.
 - E. All materials resulting from removal and approved for disposal by the Architect shall be appropriately disposed of by the Contractor.
 - F. Extreme care shall be taken when disassembling and handling the components. The Contractor is expected to take appropriate measures to protect every piece of historic material from any form of damage, wear, and/or tear. Any damage caused by the contractor's operations will be replaced as directed by the Architect at the Contractor's expense.
 - G. Damaged leaded glass panels and glass material shall be replaced in kind. The Contractor will be required to identify a source to supply like or visually compatible lead and glass. The Contractor will be required to submit a sample of the replacement material(s) to the Architect for approval. A search for compatible glass could be extensive.
 - H. Salvageable panels shall be placed on suitable blocking at the approved storage location to keep them out of contact with the terrace paving or ground. Components shall be supported so as to avoid damage to members while in storage.
 - I. A lifting, moving, and storage plan shall be submitted to the Architect for review and approval prior to commencement of work.

- J. Salvaged items for Documentation:
1. If needed off-site, pack or crate items and identify contents of containers.
 2. Store items in a secure area until completion of project.
 3. Dispose of salvaged items upon approval of Architect.

3.5 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
B. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.

3.6 RECYCLING DEMOLITION WASTE

- A. Recycle in accordance with local regulations.

3.7 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 2. Polystyrene Packaging: Separate and bag materials.
 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 4. Paint Containers (metal or HDPE): Clean waste residues and separate from containers prior to recycling.

3.8 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

END OF SECTION

SECTION 07900 -SEALANTS AND CAULKING

PART 1: GENERAL

1.01 SCOPE OF WORK

A. Provide all materials, labor, equipment, and perform all operations for the complete installation of work in this section:

1. Caulk around existing windows and door subject to repair and restoration.

1.02 RELATED SECTIONS

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

B. The work described in this section is related to work described in the following Sections:

1. Section 08510 Steel Windows
2. Section 09990 Painting

1.02 SAMPLES/SUBMITTALS

A. Manufacturer's Data" Submit copies of manufacturer's specifications, recommendations and installation instructions for sealants. Sample of caulking for Architect's approval.

1.03 DELIVERY, STORAGE, HANDLING AND PROTECTION

A. All materials shall be delivered to the job site in factory-sealed containers clearly labeled as to product, manufacturer, color, and/or other pertinent characteristics.

B. All materials for use in the work of this Section shall be stored under environmental conditions recommended by the manufacturer.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Materials shall be used only at the manufacturer's recommended temperature tolerances.

PART 2: PRODUCTS

- A. **Compatibility:** Sealant shall be compatible with joint surfaces, joint fillers and other materials in joint system. Provide only manufacturer's recommended materials which are known to be fully compatible with the actual installation condition, as shown by manufacturers' published data or certification.
- B. **Color:** Provide manufacturer's standard colors as selected by Architect.
- C. **Polyurethane Sealant:** Non-staining, non-sagging, gun-grade, flexible, durable, polyurethane compound of approved manufacture. "Sikaflex 1A" manufactured by Sika Corp., Lyndhurst, N.J. or approved equal.
- D. All transom clear leaded and painted glass panels set in limestone groove shall be caulked with Dow Corning 795 Silicone or approved equal.

PART 3 - EXECUTION

- A. Clean joint surfaces immediately before installation of sealant. Remove dirt, old caulking, insecure coatings, moisture, and other substances which would interfere with bond of sealant. Joints and spaces to receive sealant shall be thoroughly dry before installation.
- B. Employ only proven installation techniques, which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets.
- C. Do not allow sealants or compound to overflow or spill onto adjoining surfaces, or to migrate into voids.
- D. Cure sealant compound in compliance with manufacturer's instructions, in order to obtain cohesive strength and surface durability.
- E. All work and adjacent surfaces shall be left in a clean and undamaged condition.

END OF SECTION 07900

SECTION 08510 - STEEL WINDOWS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide all materials, labor, equipment and perform all operations for the complete installation of work in this section. Work shall include, but be limited to, the following:
 - 1. Providing and installing new steel casement sash & frames as indicated in the Drawings.

1.2 RELATED WORK UNDER OTHER SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Section 07900 Sealants & Caulking
 - 2. Section 08810 Leaded & Painted Glass Restoration
 - 3. Section 09900 Painting

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. General: Provide steel window units that comply with performance requirements specified, as demonstrated by testing manufacturer's corresponding stock windows according to test methods indicated.
- B. Design Requirements: Comply with structural performance, air infiltration, and water penetration requirements indicated.
 - 1. Testing: Test each type and size of required window unit through a recognized independent testing laboratory or agency for compliance with specified performance requirements.
 - 2. Structural Performance: Provide window units with no failure or permanent deflection for positive (inward) and negative (outward) test pressure of 30 lbf per sq. ft., when tested in accordance with ASTM E 330.

3. Air Infiltration: Provide units with an air infiltration rate of not more than 0.50 cfm per ft. of operable sash joint, for an inward test pressure of 1.56 lbf per sq. ft., when tested in accordance with ASTM E 283.
 4. Air Infiltration: Provide units with an air infiltration rate of not more than 1.0 cfm per ft. of operable sash joint, for an inward test pressure of 1.56 lbf per sq. ft., when tested in accordance with ASTM E 283.
 5. Water Penetration: Provide units with no water penetration as defined in the test standard at an inward test pressure of 2.86 lbf per sq. ft., when tested in accordance with ASTM E 331.
- C. Crack Tolerances: Before leaving the factory, test each type and size of required window units with ventilators closed and locked, for compliance with the following tolerances specified by the Steel Window Institute (SWI):
1. Casement Units: It shall not be possible to insert freely a steel feeler gage 2 inches wide by 0.020 inch thick between more than 40 percent of the inside metal to metal contacts between frames and ventilators without forcing.

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.
1. Product data for each type of window are required, including:
 - a. Construction details and fabrication methods.
 - b. Profiles and dimensions of individual components.
 - c. Data on hardware, accessories, and finishes.
 - d. Weight per foot of each steel section.
 - e. Recommendations for maintenance and cleaning of exterior surfaces.
 2. Shop drawings for each type of window are required. Include information not fully detailed in manufacturer's standard product data and the following:
 - a. Layout and installation details, including anchors.
 - b. Elevations of continuous work at 1/4 inch = 1 foot scale and typical window unit elevations at 3/4 inch = 1 foot scale.
 - c. Full-size section details of typical composite members, including reinforcement.
 - d. Hardware, including operators.
 - e. Accessories.
 - f. Glazing details.

3. Samples for Initial Color Selection: Submit samples of each specified finish on 12-inch long sections of window members.
4. Samples for Verification Purposes: The Architect reserves the right to require additional samples that show fabrication techniques and workmanship, and design of hardware and accessories.
5. Material Test Reports: Engage a recognized independent testing laboratory or agency to perform tests specified. Provide certified test results showing that each type, grade and size of window unit complies with performance requirements indicated.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed installation of steel window units similar in design and extent to those required for the project and whose work has resulted in construction with a record of successful in-service performance.
- B. Standards: Comply with applicable recommended specifications of the Steel Window Institute except to the extent more stringent requirements are indicated.
- C. Single Source Responsibility: Provide steel windows produced by a single manufacturer capable of showing prior production of units similar to those required.
- D. Design Concept: The drawings indicate the size, profiles and dimensional requirements of the steel window types required and are based on the specific types and models indicated. Steel window units by other manufacturers may be considered provided deviations from dimensions and profiles indicated are minor and do not change the design concept as approved by the Architect.
- E. Fire Resistance: Where windows are indicated to be "Fire Resistant" provide units complying with NFPA 80, Class E. Comply with governing regulations.
 1. Provide units bearing the Underwriters Laboratories label.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Check actual window openings by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work.
 1. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit of window units.

1.7 SEQUENCING AND SCHEDULING

- A. Scheduling: Except where steel window units have been preglazed before installation, complete field painting of window units before installation of glass.

1.8 WARRANTY

- A. Steel Window Warranty: Submit a written warranty, executed by the window manufacturer, agreeing to repair or replace window units that fail in materials or workmanship within the specified warranty period. Failures include, but are not necessarily limited to:
 - 1. Structural failures including excessive deflection, excessive leakage or air infiltration.
 - 2. Faulty operation of ventilators and hardware.
 - 3. Deterioration of metals, metal finishes and other materials beyond normal weathering.
- B. Warranty Period: 5 years after the date of Substantial Completion.
- C. The warranty shall not deprive the Owner of other rights or remedies that the Owner may have under other provisions of the Contract Documents and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements , provide products of Hope's Architectural Products, Inc. or equal subject to approval by the Architect.

2.2 MATERIALS

- A. Steel Window Members: Provide frame and ventilator members formed from hot-rolled new billet steel sections. Size and weight of principal frame and ventilator members shall conform to the following requirements:
 - 1. Standard Intermediate Windows: Combined weight of frame and ventilator members shall not be less than 3.0 lb per lineal ft.. Front to back depth of frame or ventilator section shall not be less than 1-1/4 inches.

- B. Trim members, including glazing beads, screen frames, retainers for weatherstripping, flashing and similar items shall be extruded aluminum, formed sheet aluminum or stainless steel. Trim located entirely on the interior face of windows may be of formed steel.
- C. Fasteners: Provide bronze, brass, stainless steel or other metal fasteners warranted by the manufacturer to be noncorrosive and compatible with steel window members, trim, hardware, anchors and other components.
 - 1. Exposed Fasteners: If exposed fasteners are used, provide Phillips, flat-head machined screws that match the finish of the member or hardware being fastened, as appropriate.
- D. Anchors, Clips and Window Accessories: Provide units of stainless steel, hot-dip zinc coated steel or iron complying with ASTM A 123, or bronze/brass. Provide units with sufficient strength to withstand design pressure indicated.
- E. Compression-Type Glazing Strips and Weatherstripping: Provide compressible stripping for glazing and weatherstripping such as molded EPDM or neoprene gaskets complying with ASTM D 2000, Designation 2BC415 to 3BC620, or molded PVC gaskets complying with ASTM D 2287, or molded expanded EPDM or neoprene gaskets complying with ASTM C 509, Grade 4.
- F. Sealant: For sealants required within fabricated window units, provide type recommended by the manufacturer for joint size and movement. Sealant shall remain permanently elastic, nonshrinking, and nonmigrating. Comply with Division 7 Section "Caulking & Sealants" of these specifications for selection and installation of sealants.
- G. Glass and Glazing Materials: Refer to the "Glass and Glazing" sections of these specifications.

2.3 HARDWARE

- A. Hardware: All new hardware shall match original in profile and finish. Hardware shall be of sufficient strength to perform the function for which it is intended.

2.4 ACCESSORIES

- A. General: Provide the manufacturer's standard accessories that comply with indicated standards.

- B. Weatherstripping: Provide the manufacturer's standard weatherstripping, of materials specified, applied to inside metal contact line of each operating sash or vent.

2.5 CASEMENT WINDOWS

- A. Hardware: Provide the following equipment and operating hardware:
 - 1. Operating Device: Gear-type rotary operator located on the jamb at the sill.
 - 2. Operating Device: Combination lever handle and cam-type latch.
 - 3. Hinges: Concealed four-bar friction hinges with adjustable slide shoe (2 per ventilator).
 - 4. Hinges: Heavy duty 3-knuckle butt hinges with nylon bushings (2 per ventilator).
 - 5. Hinges: Provide standard duty, concealed, four-bar friction egress hinges with adjustable slide shoe (2 per ventilator), where indicated. Provide hinge designed to achieve 90 degree ventilator opening.
 - 6. Hinges: Extension hinges or pivots, nonfriction type (2 per ventilator).
 - a. Provide ventilator operation that provides access for cleaning.
 - 7. Lock: Lift type cam-action lock.
 - 8. Limit Device: Stay bar with an adjustable hold-open device.

2.6 FABRICATION

- A. General: Fabrication steel window units to comply with indicated standards. Include a complete system for assembly of components and anchorage of window units.
 - 1. Provide units that are reglazable without dismantling ventilator framing.
 - 2. Prepare window ventilators for glazing except where preglazing at the factory is indicated.
- B. Provide weepholes and internal water passages to conduct infiltrating water to the exterior.
- C. Provide water-shed members above side-hinged ventilators and similar lines of natural water penetration.
- D. Subframes: Provide subframes formed of hot-rolled or cold-rolled steel matching window units of the profile indicated. Provide not less than 2-inch deep sections fabricated of 1/8-inch thick steel. Miter or cope corners, weld and dress smooth. Finish to match window units.

- E. Provide mullions and cover plates formed of hot-rolled or cold-rolled steel matching window units, complete with anchors for support to structure and for installation of window units. Provide mullions of profile indicated. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, in the manner indicated.
- F. Glazing Stops: Provide screw-applied or snap-on glazing stops coordinated with glass selection and glazing system as indicated. Finish glazing stops to match window units, if fabricated of steel; otherwise provide the manufacturer's standard finish as selected by the Architect.
- G. Glazing Clips: Where face glazing (without stops) is indicated, furnish glazing clips for concealment in glazing compound.
- H. Preglazed Fabrication: Preglaze window units at the factory where possible and practical for applications indicated. Comply with glass and glazing requirements of the "Glass and Glazing" sections of these specifications.

2.7 FINISHES

- A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.
- B. Surface Preparation: Before fabrication clean surfaces of dirt, oil, grease, and other contaminants followed by a zinc-phosphate pretreatment applied in accordance with the window manufacturer's recommendations.
- C. Galvanized Windows: After fabrication, provide galvanize treatment consisting of chemical cleaning complying with SSPC-SP 1 and pickling treatment complying with SSPC-SP 8, followed by a hot-dip galvanizing complying with ASTM A 123.
 - 1. After galvanizing provide a 1.0-mil dry film thickness, shop-applied finish consisting of a hot-phosphate solution treatment followed by a chromic-acid rinse, drying and a special dip-metal primer coating and oven drying for 30 minutes at 300 deg F.
- D. Shop Prime Coat Finish: After fabrication provide 1.0-mil dry film thickness shop prime coat finish consisting of a hot alkali solution cleaning, followed by a rinse and hot-phosphate solution treatment, then a chromic-acid rinse, drying and a special-dip metal primer coating, and oven drying for 30 minutes at 300 deg F.
- E. Shop-Applied Special Coating: Provide the manufacturer's special, 1.5-mil dry film thickness, electrostatically applied baked-on coating of acrylic or polyester enamel.

1. Provide color selected by the Architect from the manufacturer's standard colors.
 2. Provide color matching the Architect's sample.
- F. Protect shop finishes from damage due to shipping, handling, and exposures prior to application of field finish or prior to time of substantial completion where shop finish is the final finish.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspect openings before beginning installation. Verify that rough or masonry openings are correct and the sill plate is level.
1. Masonry surfaces shall be visibly dry and free of excess mortar, sand and other construction debris.

3.2 INSTALLATION

- A. Comply with manufacturer's specifications and recommendations for installation of window units, hardware, operators, and other components of the work.
- B. Set window units plumb, level and true to line, without warp or rack of frames or ventilators. Provide proper support and anchor securely to surrounding construction with approved fasteners.
1. Separate zinc-coated steel and other corrodible surfaces from sources of corrosion of electrolytic action at points of contact with other materials, by inserting a bituminous coating or plastic sheet materials.
- C. Set sill members and other members in a bed of compound or with joint fillers or gaskets, as shown, to provide weathertight construction. Refer to the "Caulking & Sealants" Section of Division 7 for compounds, fillers, and gaskets to be installed concurrently with window units. Coordinate installation with wall flashings and other components of the work.
1. Seal exterior joints between sash, trim and mullions watertight with sealant.
 2. Compounds, joint fillers, and gaskets to be installed after installation of window units are specified as work in another Section in Division 7.
 3. Repair abraded areas of factory applied finishes.

3.3 ADJUSTING

- A. Adjust operating ventilators and hardware to provide a tight fit at contact points and weatherstripping, for smooth operation and a weathertight closure.

3.4 CLEANING

- A. Clean surfaces promptly after installation of windows. Exercise care to avoid damage to the finish. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.
- B. Clean glass of preglazed units promptly after installation of windows. Comply with requirements of the "Glass and Glazing" Section for cleaning and maintenance.

3.5 PROTECTION

- A. Initiate and maintain protection and other precautions required through the remainder of the construction period, to ensure that, except for normal weathering, window units will be free of damage or deterioration at the time of Substantial Completion.

END OF SECTION 08510

SECTION 08810 - LEADED AND PAINTED GLASS RESTORATION

PART 1: GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide all materials and labor to professionally document, repair, conserve, restore, and re-install all leaded glass/stained glass panels, as indicated on the Drawings and in the Window Schedules. Work shall include, but not be limited to:
1. Removal of leaded glass panels & painted glass inserts from steel casement windows, re-leading & reinstallation of glass into restored and new steel casement windows and door.
 2. Removal of leaded glass panels & painted glass inserts set in stone groove, re-leading & reinstallation of glass in original groove.

1.02 RELATED WORK UNDER OTHER SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. The work described in this section is related to work described in the following Sections:
1. Section 02061 Selective Demolition
 2. Section 07900 Sealants and Caulking
 3. Section 08510 Steel Windows

1.03 QUALITY ASSURANCE

- A. Reference Standards: Comply with the provisions of all applicable ASTM and ANSI Standards unless more stringent standards are listed in the Contract Documents.
1. ASTM C1036 Specification for Flat Glass
 2. ASTM C1048 Standard Specification for Heat-Treated Flat Glass

3. ASTM C1279 Test Method for Non-Destructive Photoelastic Measurement of Edge and Surface Stresses in Annealed, Heat-Strengthened, and Fully Tempered Flat Glass
 4. ANSI Z97.1 Safety Performance Specifications and Methods of Test for Safety Glazing Materials Used in Buildings
- B. Restoration/Conservation Specialist: Work must be performed by a firm having not less than 10 years successful experience in comparable leaded glass restoration projects, and employing personnel skilled in the restoration processes and operations indicated. Architect reserves the right to see sample work of all individuals designated to perform each phase and/or type of work.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect materials during storage and work from wetting and from staining or intermixture with other materials or contaminants.
- B. Transport panels removed from sash or frames to the Glass Studio or designated off-site storage facility by the end of the working day. Store all glass panels in a dry, temperature controlled location until re-installation.
- C. Store loose glass in shallow wooden cases/drawers set on tracing at all times that the glass is not receiving work. Do not stack glass. Return glass to case set on well-identified position of panel tracing immediately after receiving Work.

1.05 SUBMITTALS

- A. Product & Materials Data: Submit manufacturer's technical data for each product and material indicated in specifications, including recommendations for their application, installation, and use. Include test reports and certificates substantiating that products comply with requirements and have shown at least 10 years of satisfactory performance. Include all safety data sheets.

1.06 STUDIO MOCK-UPS & TEST SAMPLES

- A. Prior to the start of the general glass panel restoration or cleaning, prepare the following samples where directed by the Architect.

1. General Recording: Provide adequate and accurate recording of all materials, material components, applications, and all special conditions relating to the sample work
2. Glass Cleaning: Provide cleaning test panel sections for each type of glass cleaning indicated, including but not limited to: each type of painted glass surface; each type of stained glass surface; each type of colored glass surface; each type of glass cleaning product, material, applicator, and application procedure. Size and location of tests shall be designated by the Architect.
3. Glass Crack Repair: Provide test panel sections for each type of glass crack repair method indicated, including but not limited to: copper foiling; epoxy edge glue; silicone edge treatment; and laminations.
4. Fixing of Existing & New Paints/Finishes: Provide test glass pieces for each treatment and procedure including: firing samples; coatings; flux treatment samples; and matting agents or other additives.

PART 2: PRODUCTS

2.01 GENERAL

- A. Product & Material Quality: All replacement materials, restoration materials and products, cleaning materials, protective glazing system materials, and new fabrication materials shall be of the highest grade and quality available on the current material and product market.
- B. Product Compatibility: Contractor shall provide products which are recommended by manufacturers to be fully compatible with indicated or existing substrates, or provide separation materials as required to eliminate contact between incompatible materials.
- C. Clear Replacement Glass: All clear replacement glass shall be Lamberts Light Restoration Glass, manufactured by Glashutte Lamberts Waldsassen GmbH, Schitzenstrasse 1, 95652 Waldsassen, Germany, and distributed by S.A. Bendheim West Co. Inc., 61 Willet Street, Passaic, NJ 07055, or approved equal.
- D. Silicone Sealant:

1. All cracks in clear and painted glass shall be edge glued with Dow Corning 734 Silicone or approved equal.
2. All transom clear leaded and painted glass panels set in limestone groove shall be caulked with Dow Corning 795 Silicone or approved equal.

2.02 STAINED GLASS PANEL SYSTEM: MATERIALS

- A. Replacement Art Glass: shall match the original in reflected and transmitted light quality, quantity and color of light, texture, thickness, color, shade, and in method of manufacture. Replacement glass shall be as per approved samples.
- B. Leaded Glass Panel Setting Material: mortar to match original setting, consistency and color. No additives are to be used unless otherwise accepted by the Architect.
- C. Panel Installation Materials & Accessories: to be as required to properly and securely install and set all panels while providing a complete installation. All materials and accessories to be non-ferrous and include but are not limited to: glazing points; clips; shims; angles; beads; setting blocks; spacers; and any other necessary items needed to permanently or trail set leaded glass panels.
- D. Lead Comes: to be fabricated from an alloy containing identical tin; antimony; and trace elements as per approved samples.
1. Lead comes to match the existing profile, thickness, width, height, heart thickness, and all other size and visual characteristics unless otherwise instructed by the Architect.
 2. Provide specialty leads designed to receive glass plating where applicable as per approved samples.
- E. Leaded Glass Panel Setting Material: linseed oil based putty of approved type, consistency and color. No additives are to be used unless otherwise accepted by the Architect.
- F. Support Bars: shall be round steel bars of the approved diameter sample for each location and condition. The bar ends shall be as per the Contract Drawings and as per approved samples for each location and condition.
- G. Tie Wires: shall be non-ferrous.

- H. Division Bars: to be cambered steel I-beam components as per the Contract Drawings and as per approved samples for each location and condition. I-beam ends and connections to as per approved samples for each location and condition.

2.03 LEADED GLASS PANEL STEEL FRAMING SYSTEM: FABRICATION & ASSEMBLY

- A. Properly Mark and match-mark all materials for field assemblies.
- B. Where finishing is required, complete assembly, including welding of units, before start of finishing operations.
- C. All holes shall be accurately drilled or punched at right angles to the member. Burning or drifting unfair holes will not be permitted. Holes that must be enlarged shall be reamed. Holes for the attachment or passage or work by others shall be provided as required. All burrs shall be removed.
- D. Form all components true to shape, accurate in size, square and/or as required to adapt to each existing condition, and free from all distortion or defects.
- E. Verify dimensions and site conditions prior to fabrication.
- F. Fabricate components with joints neatly fitted, welded, and ground smooth.
 - 1. Cut members to accurate lengths to achieve tight joint connections.
 - 2. Provide all proper and appropriate allowances for expansion and contraction.
 - 3. Trial fit members during fabrication to assure accurate configuration and fit.

PART 3: EXECUTION

3.01 GENERAL PROTECTION

- A. Contractor shall provide adequate temporary protection of the building throughout all phases of the Work.
 - 1. Protect persons, motor vehicles, surrounding surfaces of building elements receiving work, building site, and surrounding buildings from injury resulting from masonry any aspects of all phases of the Work. Operations of the Owner are not to be disturbed without prior written consent.

2. Prevent cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces.
3. Erect temporary protection over pedestrian walkways and at points of entrance and exit for persons and vehicles which must remain in operation during the course of all Work performed within this Contract Section.

3.02 DOCUMENTATION

A. Numbering: The window, panel, and glass numbering system shall be as per approved shop drawings. This system shall remain constant throughout the Work.

1. Contractor shall mark all rubbings, slides, and photographs in the lower right hand corner with the window and panel numbers clearly shown. Markings shall be legible in photo materials.

B. Pre-Work Photo Documentation: The following documentation shall be performed prior to the removal of any glass panel from its setting, and/or any work on the glass or glass panels including but not limited to temporary stabilization and/or cleaning. Loose glass to be laid out on a light table with appropriate and consistent white light in the same configuration as the original panel. Size, type, and distance of the lighting from the glass shall be constant for all similar modes of photography. All photography must be evaluated and approved by the Architect prior to any work.

3.03 EXAMINATION, REVIEW AND INSPECTION

A. Leaded Glass Panel Examination In-Situ: Contractor shall examine leaded glass panels to be removed, and denote prior to the glass panel removal any glass pieces or panel sections that should be removed, adjusted, stabilized, or otherwise treated as protective measures towards avoiding any damage to any section or element of the glass panel during the removing process. All proposed protective measures shall be approved by the Owner's Engineer prior to any work or application.

B. Leaded Glass Panel Examination In Studio: Contractor shall examine areas and elements to be cleaned, painted, or otherwise treated; and conditions under which treatment is to be applied. Contractor shall correct unsatisfactory conditions before proceeding. Where existing coatings are to be treated, Contractor shall verify condition of existing elements prior to any work or application.

3.04 GLASS CRACK REPAIR

- A. General: Clean all glass edges prior to glass repair work.
- B. Use one of the following methods for repairing cracks & re-attaching broken glass edges. Method applied for each condition shall be as per Architect's direction.
- C. Copper Foil Technique
 - 1. This technique is best used when glass edges are jagged, roughened, or chipped in a manner in which the adherence and continuity of the edge glue might be diminished.
 - a. Do not use this technique on painted glass or other primary decorative areas unless necessary for structural stability and approved by Architect.
 - 2. Test soldering iron type and heat temperatures on samples of glass pieces similar to those to be attached towards determining a safe heat threshold without breaking the glass or affecting the painted or coated finish.
 - 3. Wrap intersecting edges of broken glass with back-bedded copper foil. Fold the foil over onto both surface panes of the glass, and enhance adherence by flattening with a smooth, rounded, and properly shaped wooden tool.
 - 4. Trim the foil within 1/32" of either side of the crack unless foil is over chipped area. Conform to shape of shape of chipped area as necessary.
 - 5. Place the glass together on a flat plane, and align painted design work so that all continuity of the paint lines and the glass edges is maintained. Retain glass position with raised tacks along the perimeter until soldering is complete.
 - 6. Apply a flux composed of rosin dissolved in alcohol to the copper surface with a fine artist's brush. Avoid allowing flux onto painting glass surface.
 - 7. Apply controlled heat and solder joint using an iron with a tip no greater than 1/4" and 60/40 tin/lead solder. Build up a crown to the solder bead. Flip joined pieces, and repeat process on reverse side.

8. Clean off all excess flux immediately after cooling.

D. Silicone Edge Gluing

1. Use silicone edge gluing for all painted glass and pieces of glass with unnatural cracks and lines of cracks due to excessive heat and/or other extraneous conditions.
 - a. Use this method rather than epoxy edge gluing due to its greater extent of reversibility unless special structural or aesthetic conditions demand the use of epoxy.
2. Align the two pieces to be joined over a light table, while being taped together with "3M #471" tape along the line of intersection on both sides of the glass.
3. Slit the front side of the tape along the crack. Gently fold the glass pieces back, while using the tape on the reverse side as a hinge.
4. Sparingly apply approved silicone sealant to both edges of the glass. Allow the silicone to set as per manufacturer's recommendation prior to folding back of glass piece.
5. Lower the pieces back to the flat plane. Remove excess silicone from all glass surfaces. Add additional tape, and do not move re-joined glass pieces until glue has cured as per the manufacturer's recommendations.

E. Epoxy Edge Gluing

1. Use of this technique is subject to specific direction and/or approval by the Architect.
2. Align glass pieces and tape both sides as per Silicone Edge Gluing.
3. Slit the tape on the upper side of the glass with a razor.
4. Infuse approved epoxy into the crack while monitoring the epoxy saturation of the crack over a light table.
5. Immediately remove all excess epoxy from all glass surfaces as per epoxy manufacturer's recommendations. Do not allow epoxy to set on glass surfaces.

6. Add additional tape as necessary to stabilize pieces during curing period. Do not move re-joined pieces of glass until epoxy is totally cured as per manufacturer's recommendations.

3.05 GLASS REPLACEMENT

- A. **General:** All missing glass and glass deemed non-repairable by the Architect shall be replaced with glass that matches the original in all respects, including but not limited to: color; texture; light transmission; hue; color saturation; reflective quality; surface etching or decoration; thickness; components; or any other qualities that would keep the replacement glass indiscernible from the original glass. All replacement glass to be as per approved samples.
- B. **Glass Quality & Condition:** All glass shall be of the highest quality and be free of: non-intentional surface imperfections; inconsistencies of color or thickness; cracks; and fractures. No glass with any of these non-desirable conditions shall be installed into the panel. Any glass that is fractured, cracked, or otherwise damaged during the installation of the glass piece and/or the glass panel shall be replaced. No repair of new glass shall be allowed without approval from the Architect.
- C. **Coatings:** All existing and/or original: painting, staining, matting, obscuring, shall be replicated to match the original in all respects, including but not limited to: design, color, depth, thickness, gloss, light reflection and transmission, application sequence, and all other qualities that would keep the new coatings indiscernible from the original treatment. All treatments and painting materials and methods shall be as per approved samples.
- D. **General Standards:** Follow all general: material; product; preparation; inspection and examination; painting control standards; painting; coating; firing; testing; samples; mock-ups; and all other necessary standards and applicable standards listed throughout the Contract Documents.
- E. **New Glass Cutting Edges:** All glass edges shall be neatly and evenly cut following the exact contour of the glass it is replacing. All glass edges shall be square; free from projections; and free from dips not conforming to the contour of the glass shape. Provide proper and adequate allowances for lead came heart thickness and other special conditions. All glass edges shall be generally smooth without sharp points; all glass cutting shall be performed with then highest quality professional tools kept sharp at all times, or replaced as necessary; all glass surfaces shall be thoroughly clean prior to scoring. Carefully and properly cut off ends of sharp points that result from acute angles in the glass design prior to

leading. Any new glass piece that does not properly interface with the contour of the adjacent glass, or is not evenly and properly covered by the lead came flange, or is cut too large so as to apply pressure to the lead and/or adjacent glass shall be corrected and replaced.

3.06 LEADING

- A. Provide lead comes of the same: profile; height; visual width and depth of flange and head; and heart thickness unless otherwise specified by the Architect.
- B. Provide specialty lead as necessary to adapt to over-plating needs.
- C. Run continuous leads perpendicular to support bars; cross weave leads wherever possible.
- D. All lead shall be properly and evenly cut with no greater than 1/8" even space between each lead end, and soldered with approved solder.
- E. All lead ends shall be cleaned and scraped of all deposits and oxidation with a medium strength copper wire brush to assure proper and consistent performance of the soldering. No corrosive bristles shall be used.
- F. Carefully clean all flux and flux films from glass surfaces immediately after soldering.
- G. Any daylight discerned between random glass edges and new lead comes due to prior glass edge damage or inadequate original cutting, is to be covered with a lead flange cut from flat lead stock soldered onto the lead came matrix.

3.07 LEAD CAME CEMENTING/RE-CEMENTING

- A. Cement all lead comes on both sides of the panel using a stiff linseed oil based putty.
- B. All putty shall be applied in a dry state and gently and evenly set into the lead came flanges by hand without distorting or otherwise damaging the lead came flanges or profiles.
- C. Maintain similar pressure and continuity of fill unless special delicate conditions warrant less hand pressure. No voids or random build-ups of putty shall be allowed.

- D. Gently flatten the flanges of all flat lead came with a blunt and smooth wooden lathekin while applying even pressure until flange is evenly approximately 1/8" from the glass surface. Flat flanges should be distortion free with no sudden humps or dips.
- E. Cut away all excess putty flush with the outside edge of the lead came flanges with the appropriate shaped wood lathekin (no metal instrument to be allowed); thoroughly clean all excess putty and oils from glass surfaces using cheese cloths and whiting (replace cheese cloths regularly and as necessary; store or dispose of cloths in the proper manner immediately- avoid fire and spread of fire).

3.08 LEADED GLASS PANEL INSTALLATION

- A. Apply all linseed oil based putty back-bedding in an even, consistent, continuous manner without voids, build-ups or significant variances in sufficient degree to cause the putty to ooze out from behind the perimeter lead came without any gaps remaining between the glass panel and the rabbet.
- B. Install and attach panels: plumb; level; square; without warp or twist; and in true and proper alignment at the approved elevation height while being in the correct position to properly and neatly interface with all adjacent window, reinforcement, and general building elements and materials.
- C. Apply even pressure along the perimeter of the panel to establish an even and proper setting; install approved spacers to adjust level or squareness of panel; install all necessary and approved glazier points, clips, and other general fasteners in a manner to appropriately and securely attach the panel in place.
- D. If outside stops are required, apply linseed oil putty on outside face of perimeter leads prior to installation stops. Install all stops as per approved shop drawings in a neat, straight, and proper manner while imposing no excessive or uneven pressure on the leaded glass panels.
- E. Install putty bevel over all installed panels in a straight, even, neat, and appropriate manner. Cut putty bevel edge along the glass panel perimeter so as to evenly and neatly reveal approximately 1/16" of the perimeter lead came flange edge.
- F. Remove all excess bedding putty and outside putty and related oils immediately after panel installation with cheese cloths and whiting.

- G. Wrap and twist all tie wires to the support bars in coordination with the panel installation.
- H. Inspect all completed work. Perform all minor adjustments as necessary. Remove all dirt, putty, oils, and other foreign matter from all glass panel and surrounding window elements and surfaces.
- I. Do not disassemble scaffolding or other access until installation has been inspected and approved by the Architect.

3.09 GENERAL CLEAN-UP

- A. Remove and dispose of masking materials and debris following completion and installation. Clean windows and non-masonry areas as required. Site shall be left in same condition as when Contractor arrived.
- B. Contractor shall remove hazardous or unsightly accumulations of debris promptly, at least daily. Contractor shall remove cartons, crates, wrappings, and other trash from all building sections and sites daily.
- C. Contractor shall be responsible for containment, removal, and disposal of all residual materials in accordance with all city, state, and federal environmental regulations.
- D. Any disturbance to the site caused by carrying out of the work shall be restored to its original condition prior to the final acceptance and certified completion of the work.

3.11 GUARANTEE

- A. To the owner agreeing to replace or repair defective materials and workmanship required to maintain all leaded glass panel glazing system work, and all other work performed within this Contract Section.
- B. Guarantee period shall be 5 years after date of substantial completion.

END OF SECTION

SECTION 09900 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes:
 - 1. Field-painting select steel window components with an aliphatic acrylic polyurethane system coating.
 - 2. Field painting select wood window components with alkyd primer and paint.

1.3 SUBMITTALS

- A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
 - 1. Product data for each paint system specified, including block fillers and primers.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.
- B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.

- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.
 - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).

- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).

- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:
 - 1. Aliphatic Acrylic Polyurethane system for steel substrate: Series 73 "Endura-Shield" manufactured by TNEMEC, Kansas City, MO (800-863-6321) or equal subject to approval by Architect.
 - 2. Alkyd paint system for wood substrate: "High Gloss Alkyd House Paint (110)" manufactured by Benjamin Moore, Montvale, NJ (855-724-6802) or equal subject to approval by Architect.

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.
- B. Material Quality: Provide the manufacturer's best-quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
- C. Colors: Provide color selections made by the Architect from the manufacturer's full range of standard colors.

2.3 PRIMERS

- A. Primers: Provide the manufacturer's recommended factory-formulated primers that are compatible with the substrate and finish coats indicated.
- B. Products: Subject to compliance with requirements, provide primers as recommended by manufacturer of finish coat system.

2.4 EXTERIOR FINISH PAINT MATERIAL

- A. Finish Paint: Provide the manufacturer's recommended factory-formulated finish-coat materials that are compatible with the substrate and undercoats indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which coating will be performed for compliance with paint application requirements. Surfaces receiving finish must be thoroughly dry before coating is applied.
 - 1. Do not begin to apply finish until unsatisfactory conditions have been corrected.
 - 2. Start of finishing will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be coated, or provide surface-applied protection prior to surface preparation and finishing. Remove these items, if necessary, to completely finish the items and adjacent surfaces. Following completion of finishing operations in each space or area, have items reinstalled by workers skilled in the trades involved.
- B. Cleaning: Before applying coating or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and finishing so dust and other contaminants from the cleaning process will not fall on wet, newly finished surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be finished according to the manufacturer's instructions for each particular substrate condition and as specified.
- D. Materials Preparation: Carefully mix and prepare finish materials according to manufacturer's directions.

3.3 APPLICATION

- A. General: Apply finish according to manufacturer's directions.

- B. Do not coat over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable coating.
 - 1. All window frames shall be black gloss finish.
 - 2. Provide finish coats that are compatible with primers used.
 - 3. The term exposed surfaces includes areas visible when permanent or built-in fixtures, convactor covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
- C. Scheduling Coating: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for finishing as soon as practicable after preparation and before subsequent surface deterioration.
 - 1. Allow sufficient time between successive coats to permit proper drying in accordance with manufacturer's instructions.
- D. Application Procedures: Apply paints and coatings according to the manufacturer's directions.
- E. Minimum Coating Thickness: Apply materials no thinner than the manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.
- F. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others. Recoat primed and sealed surfaces according to manufacturer's instructions.

3.4 CLEANING & PROTECTION

- A. Cleanup: At the end of each work day, remove empty containers, rags, rubbish, and other discarded coating materials from the site.
- B. Protect work of other trades against damage by coating. Correct damage by cleaning, repairing or replacing, and refinishing, as acceptable to Architect.
- C. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

1. At completion of construction activities of other trades, touch up and restore damaged or defaced finished surfaces, in accordance with manufacturer's instructions.

END OF SECTION 09900