LEBLANC THERAPEUTIC DAY SCHOOL
WINDOW REPLACEMENT

58 SYCAMORE STREET
LOWELL, MA

PREPARED FOR:

LOWELL PUBLIC SCHOOLS

SPECIFICATION

SECTION 08 51 13

ALUMINUM WINDOWS

PART 1 GENERAL

1.1 SUMMARY OF WORK

A. Furnish and install aluminum architectural windows complete with hardware and related components including all trim, panning, column covers, flashings, and sealants as shown on drawings and specified in this section.
B. Removal of hazardous materials is not part of this work. If hazardous materials are discovered, stop work only in the area of the materials and notify the Owner and Architect immediately.
C. Conform to all applicable codes for demolition of windows, safety of adjacent work, safety of personnel, dust control, service utilities, discovered hazards, and hazardous waste.
D. Remove and dispose of all existing windows and trim as required to prepare for new windows. Salvage window treatments and deliver to Owner. Reinstall all window treatments as directed by the Owner.
E. Remove all protective grills and dispose of properly.
F. Patch and repair any damage to adjacent finishes both inside and outside to blend new and old work including, but not limited to woodwork, casings, drywall, plaster, sealants, caulking, and painting.
G. All units shall be factory glazed insulated glass with decorative muntins sealed between the lites.
H. Single Source Requirement: All window types and related products shall be by the same manufacturer.
I. All window openings shall be examined for existing conditions prior to bid and field measured prior to fabrication. No extra costs for conditions that are observable shall be allowed. Specially adapted window units to accommodate existing grills, louvers, pipes, fans, and similar protrusions shall be supplied at no additional cost.
J. All work is to be completed by August 21, 2015.
K. All work conducted before June 28, 2015 shall be restricted to between the hours of 3:00 p.m. to 11:00 p.m. Monday through Friday, and Saturday and Sunday from 8:00 a.m. to 5:00 p.m., holidays excluded. All work conducted between June 29 and August 21, 2015 shall be done during normal business hours.

1.2 REFERENCES

A. AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)
1. AAMA/WDMA/CSA 101/I.S.2 - 08 Standard/Specification for Windows, Doors, and Skylights
2. AAMA 1302.5 (1976) Voluntary Specifications for Forced-Entry Resistant Aluminum Prime Windows
3. AAMA 1503 (2009) Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections
4. AAMA 902 (1999) Voluntary Specification for Sash Balances
5. AAMA 2604 (2005) Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels

B. ASTM INTERNATIONAL (ASTM)
1. ASTM E283 (2004; R 2012) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
2. ASTM E331 (2000; R 2009) Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
3. ASTM E330 (2002; R 2010) Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

C. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1. NFPA 701 (2010) Standard Methods of Fire Tests for Flame Propagation of Textiles and Films

1.3 ALTERNATES

A. Alternate #1:
1. Provide new window treatments for all windows except as noted on drawings.
2. Window Treatment: As specified in Paragraph 2.5 below.

1.4 TESTING AND PERFORMANCE REQUIREMENTS

A. Test Units
1. Air, water, and structural test unit shall conform to requirements set forth in AAMA/WDMA/CSA 101/I.S.2/A440.

B. Test Procedures and Performances: Windows shall conform to all AAMA/WDMA/CSA 101/I.S.2/A440 requirements. In addition, the following specific performance requirements shall be met.
1. Air Infiltration Test
a. With window sash closed and locked, test unit in accordance with ASTM E283 at a static air pressure difference of 6.24 psf.
b. Air infiltration shall not exceed .10 cfm per sq. ft. of unit.
2. Water Resistance Test
a. With window sash closed and locked, test unit in accordance with ASTM E331 at a static air pressure difference of 12 psf.
b. There shall be no uncontrolled water leakage.
3. Uniform Load Deflection Test
a. With window sash closed and locked, test unit in accordance with ASTM E330 at a static air pressure difference of 50 psf, both positive and negative.
b. No member shall deflect over L/175 of its span.
4. Uniform Load Structural Test
a. With window sash closed and locked, test unit in accordance with ASTM E330 at a static air pressure difference of 75 psf, both positive and negative.
b. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause the window to be inoperable.
5. Forced Entry Resistance
a. Windows shall be tested in accordance to AAMA 1302.5 and meet the requirements of performance level 10.
6. Condensation Resistance Test (CRF)
a. With window sash closed and locked, test unit in accordance with AAMA 1503.
b. Condensation Resistance Factor (CRF) shall not be less than 55.
7. Thermal Transmittance Test (Conductive U-Value)
a. With window sash closed and locked, test unit in accordance with AAMA 1503.
b. Conductive thermal transmittance (U-Value) shall not be more than 0.66 BTU/hr/ft2/°F.

1.5 QUALITY ASSURANCE

A. Provide test reports from AAMA accredited laboratories certifying the performance as specified.
B. Test reports shall be accompanied by the window manufacturer's letter of certification, stating the tested window meets or exceeds the referenced criteria for the appropriate AAMA/WDMA/CSA 101/I.S.2/A440 class, grade, and type.

1.6 SUBMITTALS

A. Contractor shall submit shop drawings; finish samples, test reports, and warranties.
1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mulion section, corner section, etc.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Contractor shall properly store all materials in clean, dry, secure location offsite until ready to install or in on site storage trailer(s) at its own expense in a location designated by the owner.

1.8 WARRANTIES

A. Total Window System
1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total window installation which includes that of the windows, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at his expense during the warranty period.
B. Insulated Glass Units: Provide 10 year written warranty against loss of seal.

PART 2 PRODUCTS

2.1 WINDOW TYPES

A. All units shall conform to the requirements of AAMA/WDMA/CSA 101/I.S.2/A440 and as specified.
B. Performance Class/Performance Grade CW-PG50 Single Hung (SH): Types A, C, & F as shown on the drawings.
C. Performance Class/Performance Grade CW-PG50 Fixed Sash (F): Types D, E, & H as shown on the drawings.
D. Performance Class/Performance Grade CW-PG50 Awning (AW): Types B, G, & J as shown on the drawings.

2.2 MANUFACTURERS

A. For the purpose of establishing a standard of quality, the following manufacturers are acceptable. Other manufacturers whose products meet the requirements of the specifications are also acceptable.
1. Efco, a Pella Company, Series 660.
2. Graham Architectural Products Corp, Series 2200.
3. Kawneer, an Alcoa Company, Series 8400.
4. Litex, Inc., Model L701T.
5. Peerless Products, Inc., Series 9150.
6. Stergis Windows & Doors, Inc., Series 810 HC50
7. Winco Window Company, Series 4410.

2.3 MATERIALS

A. Aluminum
1. Extruded aluminum shall be 6063-T5 or T6 alloy and tempered.
B. Hardware
1. Sweep latches shall be of white bronze with a US25D brushed finish.
2. Latches shall be lockable; provide any special hardware keys for operation.
3. Provide two for each window wider than 36 inches.
C. Sash Lifts: Sash lifts must be continuous extrusions, integral with sash frames.
D. Sash Stops: Provide adjustable, lockable stops to limit the opening size; provide any special hardware keys for operation.
E. Balances
1. Balances shall be of appropriate size and capacity to hold sash in position in accordance with AAMA 902, Section 8.1.
2. Balances shall be high performance sash balances that are tested in accordance with AAMA 902.
3. Balances shall meet all minimum AAMA 902 Class 5 requirements with a minimum 0.30 Manually Applied Force ratio (MAF).
4. Balances shall be attached to a locking carrier system that slides on extruded rails in the jamb channels. Sash shall be field removable for installation and maintenance. Mounting brackets that are screw attached to the sash will not be allowed.
F. Weather-Strip
1. All primary weather-strip shall be manufacturer's standard neoprene or polypropylene pile.
G. Glass for Window Types A, C, D, E, & F
1. Insulated glass shall be 1 inch consisting of 1/4 inch exterior, air spacer, and 1/4 inch interior.
2. Exterior Lite: Clear Float, annealed, Low-E sputter coated on second surface.
3. Interior Lite: Clear Float, annealed.
4. Outdoor Appearance: Clear color, low-reflective glass product.
5. Type: Low-E Clear Insulating Glass "Sungate®" 100 (2) "Clear" by PPG Industries, Inc. or equal.
6. Performance Values:
a. Visible Light Transmission: 73%
b. U-Value Winter: 0.31
c. U-Value Summer: 0.32
d. SHGC: 0.51
e. Shading Coefficient: 0.59
f. Outdoor Visible Light Reflectance: 12%

H. Glass for Window Types B, G, H, & J (windows at grade)
1. Insulated glass shall be 1 inch consisting of 1/4 inch exterior, air spacer, and 1/4 inch interior.
2. Exterior Lite: 1/4 inch Laminated safety glass, clear.
3. Interior Lite: 1/4 inch Clear Float, annealed, except provide obscure privacy glass on interior lite only for those units as noted on the drawing.
4. Appearance and Performance Values to match Types A, B, & C.
I. Muntins:
1. Muntins shall be permanently affixed and factory installed between the two insulated glass lites.
J. Sealant
1. Exterior: One part polyurethane, color to match frame.
2. Interior: Acrylic, paintable.
3. Backer Rod: Closed cell polyethylene foam plastic.
K. Thermal Barrier
1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
2. Sills, and all other frames and sash shall be thermally broken using the latest technology in two-part, high-density polyurethane. A nonstructural thermal barrier is unacceptable.
L. Flashing: .032 inch aluminum, factory finished with PVDF coating, color to match window frames.
M. Panels: Provide insulated metal faced panels in lieu of glass units as required in custom units where penetrations of existing louvers, grills, pipes, and other penetrations preclude the use of glass glazing.

2.4 FABRICATION

A. General
1. All aluminum frame and vent extrusions shall have a minimum wall thickness of .062 inch. Frame sill members shall have a minimum wall thickness of .094 inch.
2. Mechanical fasteners, welded components, and hardware items shall not bridge thermal barriers. Thermal barriers shall align at all frame and vent corners.
3. Depth of frame shall not be less than 3 3/4 inches.
4. All fasteners shall be stainless steel or other corrosion resistant material.
B. Frame
1. Frame components shall be mechanically fastened.
C. Sash
1. All sash extrusions shall have a minimum wall thickness of .062 inch.
2. All horizontal sash extrusions shall be tubular.
3. Corner connections shall be mechanically fastened.
D. Glazing
1. All units shall be inside glazed with the manufacturer's standard sealant process provided the glass is held in place by a removable, extruded aluminum glazing bead. The glazing bead must be isolated from the glazing material by a gasket.
2. Units shall be capable of being re-glazed from the interior.
E. Finish: Finish all exposed areas of aluminum windows and components with PVDF fluoropolymer in conformance with AAMA 2604. Color shall be as selected by owner from manufacturer's standard.
F. Flashing and Receptors: Provide continuous sub-sill receptor and flashing the full width of opening and depth of unit to inside. Turn up ends to form a pan and seal watertight. Turn up back edge behind face of window frame not less than 1/4 inch. Provide front edge with drip. Seal all fasteners watertight and do not puncture flashing with window unit fasteners. Provide weeps and drainage channels to ensure positive drainage. Do not obstruct weep holes with sealant.
G. Trim: Includes casings, closures, column covers, and panning, interior and exterior. Provide trim to cover exposed construction joints and to form transitions between new and existing surfaces.
1. Fabricate of aluminum not less than 0.062 inch thick.
2. Extruded or formed sections shall be straight, true, and smooth on exposed surfaces.
3. Exposed external corners shall be mitered and internal corners coped; fitted with hairline joints.
4. Reinforce joints with not less than 1/8-inch thick aluminum.
5. Design to allow unrestricted expansion and contraction of members and window frames.
6. Secure to window frames with machine screws or expansion rivets.
7. Exposed screws, fasteners or pop rivets are not acceptable on exterior of the casing or trim cover system.
8. Seal all concealed joints behind trim and joints between trim and exposed finished surfaces.

2.5 WINDOW TREATMENT (ALTERNATE #1)

A. Provide room darkening spring roller shades conforming to NFPA 701, including hardware, accessory items, mounting brackets, and fastenings, as a complete unit produced by one manufacturer.
B. Submittals:
1. Product data including operating and maintenance instructions.
2. Results of Fire Resistance, Flame Spread, and Smoke Contribution tests.
3. Manufacturer's standard color chart.
4. Samples of shade material, 6 by 6 inches. 1
5. Ten year minimum limited Warranty.
C. Shade Material: Opaque, 12 oz., 4-ply, fire retardant vinyl coated fiberglass fabric with stitched and locked hems. Treat needle holes with filler to make lightproof. Color as selected from manufacturer's standards.
D. Roller tube: Extruded aluminum or steel. Diameter, wall thickness, and material as required by the manufacturer to accommodate the shade size for smooth operation and to prevent excessive deflection.
E. Fabric attachment: Spline lock system or double sided adhesive specifically developed to attach coated textiles to metal to eliminate horizontal impressions in fabric.
F. Roller idler assembly: Molded nylon and/or zinc-plated steel. Field adjustable without removal of shade roller tube; size as required to support 150 percent of the full weight of each shade.
G. Brackets & End Caps: For inside, outside, or ceiling mount as required. Treat steel features for corrosion resistance.
H. Fascia: L-shaped aluminum extrusion to conceal shade roller and hardware that snaps onto end caps without requiring exposed fasteners.
I. Bottom Bar: Steel or wood sized as required to maintain shade straight and level.
J. Pulls: Stainless steel chain or braided nylon rated to 90 lb. minimum breaking strength.

PART 3 EXECUTION

3.1 INSPECTION

A. Job Conditions
1. Field verify all dimensions of all openings. Sizes shown on drawings are nominal only.
2. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

3.2 INSTALLATION

A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
B. Remove old windows and dispose of properly. Remove only the amount of windows which can be installed in one day. Provide temporary weather and security closure for openings. Phase work with owner to minimize disruption to ongoing operations which must continue during normal business hours without interruption.
C. Remove all security grills and dispose of properly.
D. Remove all window treatments (shades and/or blinds) and place in location designated by the Owner. Reinstall all window treatments as directed by the Owner.
Alternate #1: Remove all window treatments and dispose of properly. Install new window treatments on all windows except as noted on drawings.
E. Provide all flashing and receptors and seal watertight to substrate as required for a complete watertight installation. Take care not to puncture flashings with window or trim fasteners; all fasteners shall be sealed watertight.
F. Plumb and align window faces in a single plane with the same reveal for each wall plane, and erect windows and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads. Fasteners shall be concealed when windows are closed. All fasteners shall be concealed to the extent practicable.
G. Modify custom window units to accommodate existing grills, louvers, pipes, and other existing penetrations that are to remain. Install insulated metal faced panels in lieu of glass units as required. Provide labor and materials as required to temporarily remove and reinstall all such items as required including any plumbing, mechanical, electrical, or other specialized trade. Seal all penetrating joints watertight.
H. Adjust windows for proper operation after installation.
I. Furnish and apply sealants to provide a weather tight installation at all joints, fasteners, and intersections and at opening perimeters inside and out. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.
J. Patch and repair any damage to adjacent surfaces inside and out to blend new work with existing including painting the entire wall if necessary.

3.3 PROTOTYPE

A. One window shall be installed as a prototype to establish a level of quality for the remainder of the work.
1. The prototype window shall be approved by the Owner prior to the installation of any other windows.
2. Any windows installed prior to the approval of the prototype are at the contractor's risk.
3. Any part of the prototype not approved shall be corrected prior to approval.
4. The approved prototype shall become a permanent part of the work.
5. The contractor shall remove and reinstall and/ or retrofit any work which does not conform to the standards of the approved prototype.

3.4 ANCHORAGE

A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.5 PROTECTION & CLEANING

A. After completion of window installation, windows shall be inspected, adjusted, put into working order and cleaned inside and out, free of labels, dirt, etc.
B. Scratched glass is not acceptable and shall be repaired or replaced.
C. The entire work site shall be cleaned and returned to pre-construction condition. All temporary installations, excess materials, equipment, tools, and trash shall be removed.

3.6 CLOSE OUT

A. Deliver any special tools, hardware keys, and maintenance data to the Owner.
B. Provide written signed warranties, specific to this project.

END OF SECTION

City of Lowell Public Schools

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MARK	DATE	DESCRIPTION
1	03-10-15	ADDENDUM # 1
A	03-04-15	ISSUED FOR BID

PROJECT NO: 14401-##
MODEL FILE: A-1.dwg
DRAWN BY: LSP
CHK'D BY: POB
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SHEET TITLE
COVER & SPECIFICATION

A-1
SHEET 1 OF 2

Plot Date: 3/9/2015 3:02:24 PM File Path: J:\01 Projects\14XXX\14401-03 Lowell Public Schools Exterior Windows\1.0 Working Files - Leblanc\1.1 Drawings\1.1.1 Sheet Files\A-1.dwg