RIVERSIDE SCHOOL
WINDOW REPLACEMENT

73 WOBURN 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 as shown on drawings and specified in this section.
B. 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.
C. Remove all air conditioner units and store or dispose of as directed by the Owner. Install new air conditioners furnished by the Owner. Provide side panels and weather stripping and support brackets for each unit as required.
D. 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.
E. All units shall be factory glazed insulated glass with decorative muntins sealed between the lites.
F. Single Source Requirement: All window types and related products shall be by the same manufacturer.
G. 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.
H. All work is to be completed by November 29, 2014.
I. All work shall be conducted Monday through Friday from 3:00 p.m. to 11:00 p.m. and Saturday and Sunday from 8:00 a.m. to 5:00 p.m., holidays excluded.

1.2 REFERENCES

A. AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)
1. AAMA/WDMA/CSA 101/I.S.2 - 97 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

1.3 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.

B. Test Procedures and Performances: Windows shall conform to all AAMA/WDMA/CSA 101/I.S.2 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 1.57 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 6.25 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 45 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 60 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.

1.4 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 class, grade, and type.

1.5 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, mullion section, corner section, etc.

1.6 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.

1.7 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 and as specified.
B. Performance Class/Performance Grade: Single Hung HC40 (SH-HC40): Types A & B as shown on the drawings.
C. Performance Class/Performance Grade: Fixed Sash HC40 (F-HC40): Types C & D 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
2. Graham Architectural Products Corp.
3. Stergis Windows & Doors, Inc.
4. Kawneer, an Alcoa Company
5. Peerless Products, Inc.
6. Winco Window Company
7. Litex, Inc.

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: Type A.

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 1 requirements with a minimum 0.70 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, B, & C
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. 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 Type D
1. Insulated glass shall be 1 inch consisting of ¼ inch exterior, air spacer, and ¼ inch interior.
2. Exterior Lite: 1/4" Laminated safety glass, clear.
3. Interior Lite: 1/4" Clear Float, annealed.

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 are 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.

2.4 FABRICATION

A. General
1. All aluminum frame and vent extrusions shall have a minimum wall thickness of .062". Frame sill members shall have a minimum wall thickness of .094".
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 1/4".

B. Frame
1. Frame components shall be mechanically fastened.

C. Sash
1. All sash extrusions shall have a minimum wall thickness of .062".
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 sill 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, 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. Wood trim to match existing wood casings may be used on interior.
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.

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 air conditioner units and store or dispose of as directed by the Owner. Install new air conditioners furnished by the Owner. Provide side panels and weather stripping as needed. Provide support brackets for each unit as required. 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.
D. 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.
E. Plumb and align window faces in a single t 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.
F. Adjust windows for proper operation after installation.
G. 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.
H. Patch and repair any damage to adjacent surfaces inside and out to blend new work with existing.

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. 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

Watermark
175 Cabot Street • Lowell, MA 01854
Phone: 978.452.9696 • Fax: 978.453.9988

CONSULTANTS

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WINDOW REPLACEMENT
73 WOBURN STREET
LOWELL, MA
PREPARED FOR:
LOWELL PUBLIC SCHOOLS

MARK	DATE	DESCRIPTION
A	09/03/14	ISSUED FOR RE-BID

PROJECT NO: 14401-03
MODEL FILE: A-1.dwg
DRAWN BY: LSP
CHK'D BY: POB

SHEET TITLE
COVER & SPECIFICATION

A-1
SHEET 1 OF 2

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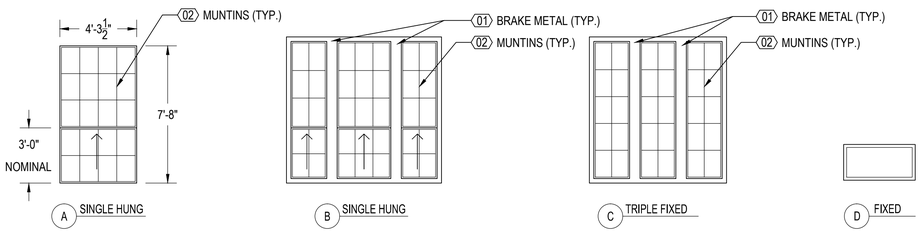
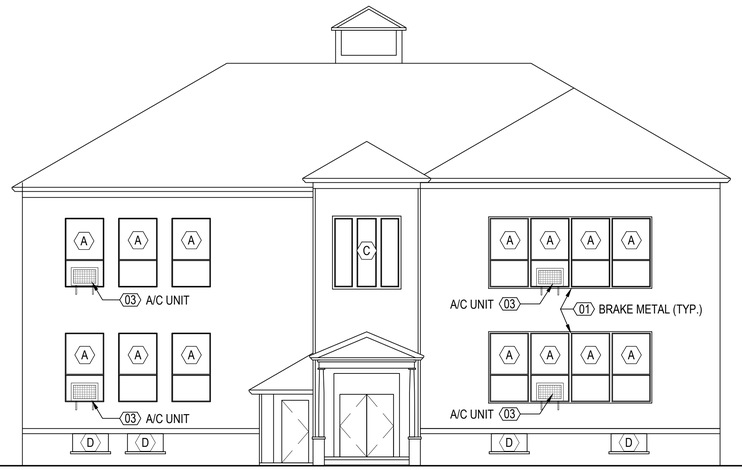


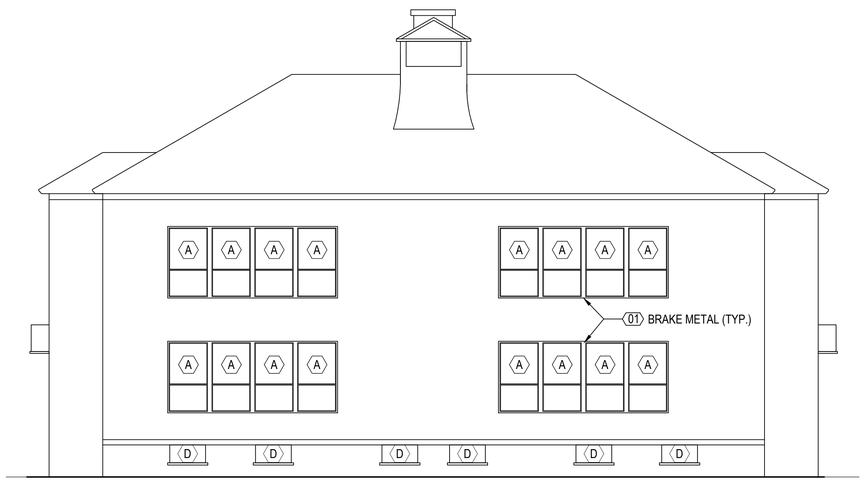
WINDOW TYPES
SCALE: 1/4"=1'-0"



1 LEFT ELEVATION
SCALE: 1/8"=1'-0"

2 FRONT ELEVATION
SCALE: 1/8"=1'-0"

3 RIGHT ELEVATION
SCALE: 1/8"=1'-0"



4 REAR ELEVATION
SCALE: 1/8"=1'-0"

NOTES:

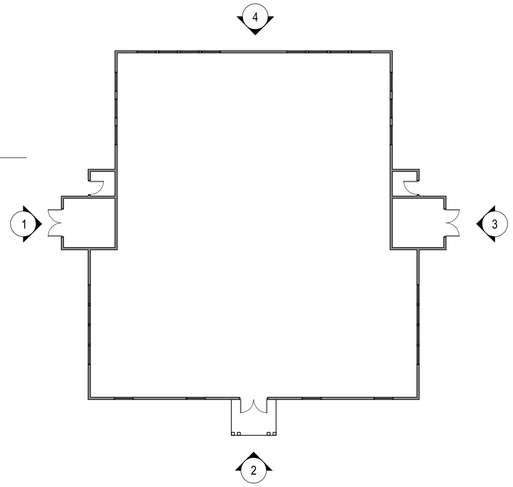
1. ALL WINDOW DIMENSIONS SHALL BE FIELD VERIFIED.

XX KEYNOTES:

01 BRAKE METAL: REPLACE BRAKE METAL COVER BETWEEN WINDOWS WITH NEW BRAKE METAL TO MATCH EXISTING.

02 MUNTINS: PROVIDE DECORATIVE ALUMINUM MUNTINS BETWEEN THE INSULATING GLASS LITES AS SHOWN.

03 AIR CONDITIONING UNIT: REMOVE AIR CONDITIONING UNITS. INSTALL NEW AIR CONDITIONING UNITS FURNISHED BY THE OWNER. PROVIDE SIDE PANELS, WEATHER STRIPPING, AND SUPPORT BRACKETS FOR EACH UNIT AS REQUIRED.



FLOOR PLAN
SCALE: 1/16"=1'-0"

PLAN NORTH

0 2' 4' 8'
Scale: 1/4" = 1'-0"

0 4' 8' 16'
Scale: 1/8" = 1'-0"

Watermark
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MARK	DATE	DESCRIPTION
A	03/03/14	ISSUED FOR RE-BID

PROJECT NO: 14401-03
MODEL FILE: A-2.dwg
DRAWN BY: LSP
CHK'D BY: POB

SHEET TITLE
ELEVATIONS

A-2
SHEET 2 OF 2