

**49 E. 96 Realty Corp.
49 East 96th Street
New York, NY 10128**

WINDOW REPLACEMENT POLICES

Dear Neighbors,

In April 2018, the Corporation's Proprietary Lease was amended to shift responsibility for maintaining, repairing, and replacing the building's windows from the Corporation to shareholders. The Corporation has adopted the attached Window Replacement Standards (the "Standards"), which provide the requirements and specifications for replacing windows in the building following the April 2018 amendment of the Proprietary Lease. The Corporation also has prepared the attached Window Replacement Agreement, which must be executed by any shareholders who wish to replace windows in their apartments.

Set forth below, are some general instructions and guidance for window replacement and maintenance in the building. These instructions are not intended to supplant the Window Replacement Standards.

Window Replacements

- **Group Replacements.** In February of each year, Lovett will distribute a notice to all Shareholders, asking if they are interested in coordinating with other shareholders to replace their windows as a group. Lovett will then disclose to all interested shareholders the names and contact information for all other interested shareholders so that this group can organize and coordinate. Lovett will not, however, act as a project manager. (A group of shareholders is coordinating to perform a group replacement in the summer of 2018. Please contact the Managing Agent immediately if you would like to join this group.) Shareholders are not required to replace their windows as part of a group, but instead may replace their windows on their own, consistent with the Standards.
- **Approved Installation Companies.** Shareholders must use one of three pre-approved installation companies: Adler Windows, Capris Windows, or Skyline Windows.¹ See the Standards for contact information. Window installers must follow the detailed installation specifications set forth in the Standards. Contacting an approved installation company is the first step in the process, and these companies will help you select appropriate windows and navigate the project. Be sure to provide a copy of the Standards to the installation companies.
- **Approved Window Types.** Shareholders may install either double hung windows or tilt and turn windows that are manufactured by one of three approved manufacturers: Adler Windows, Skyline Windows, or Crystal Windows. See the Standards for contact information. Any

¹ The Board of Directors will consider requests to use a non-pre-approved installation company on a case-by-case basis if special circumstance warrant using such a company.

windows selected for installation must satisfy the Standards. The Standards outline minimum requirements that must be met; Shareholders, at their option, may select an optional higher grade, i.e., triple pane glass, and should evaluate such options.

- **Required Submissions.** Shareholders are required to submit the following materials to the Managing Agent to obtain approval to proceed with a window replacement project:
 - An executed Window Replacement Agreement.
 - A copy of the shareholder's agreement with one of the approved installation / manufacturing companies.
 - All of the documents that are required for submission from the installation / manufacturing companies, as specified in the Standards.
 - A payment to 49 E. 96 Realty Corp. in the amount of \$750 to cover the costs associated with the building engineer's review of the project plans and inspection of the installation.
- **Required Approval.** The Corporation and its engineer will review materials submitted by the Shareholder, and will approve the project by executing and returning the Window / Terrace Door Replacement Agreement. Shareholders will not be permitted to commence work until they have received such approval from the Corporation.
- **Post Installation Inspection.** The building's engineer will perform an inspection of the installation to ensure full compliance with the Standards.
- **Window warranty.** All replacement windows must have a manufacturer's or supplier's warranty, and shareholders will be required to designate 49 E. 96 Realty Corp. as the owner of the windows for purposes of the warranty, and by executing the Window Replacement Agreement, shareholders assign any such warranty to 49 E. 96 Realty Corp.

Window Maintenance

- Subject to any requirements to preserve warranty coverage, the Building staff will continue to perform routine maintenance and repairs on windows at no cost to shareholders on a courtesy basis. Such routine repairs would include replacing broken locks or sashes and greasing hinges. The building will continue to maintain a standard supply of parts for such maintenance and repairs.
- The Building staff will continue to repair window seals, and will split the costs of these repairs 50/50 with shareholders.
- Any repairs to fix broken glass or other defects in a frame will be the sole responsibility of shareholders.

The Board of Directors

WINDOW REPLACEMENT AGREEMENT

This Agreement between 49 E. 96 REALTY CORP. (the "Corporation") with an address The Lovett Company, LLC, 109-15 14th Avenue, College Point, NY 11356 and (singly, jointly or collectively the "Shareholder") having a mailing address at 49 East 96th Street, New York, NY 10128.

WITNESSETH:

WHEREAS, the Shareholder desires to replace one or more windows or terrace doors (the "Work") in apartment ____ (the "Apartment") at 49 East 96th Street, New York, NY (the "Building");

WHEREAS, the proprietary lease (the "Lease") between the Shareholder and the Corporation provides that no windows or doors may be replaced in the Apartment without the prior consent of the Corporation;

WHEREAS, the Corporation has established Window Replacement Standards that Shareholders must comply with when replacing any windows or doors in the Apartment;

WHEREAS, the Shareholder desires to obtain consent from the Corporation to replace windows and/or doors in the Apartment;

NOW, THEREFORE, the parties agree as follows:

1. **Scope of Work.** Attached hereto as **Exhibit A** is a copy of the Corporation's Window Replacement Standards. Attached hereto as **Exhibit B** is a copy of Shareholder's agreement with Shareholder's contractor describing the Work to be performed and the type of windows or doors that will be installed. The Shareholder agrees that all windows or doors installed and work performed with respect to such installation will comply with the Window Replacement Standards. The Shareholder agrees that the Corporation reserves the right to require more detailed plans or specifications for submission if it is determined that Exhibit B lacks sufficient detail. The Corporation reserves the right to require a Major Alteration Agreement, if in its sole discretion the nature of the Work makes such an agreement appropriate.
2. **Consent to the Work.** Upon execution of this Agreement the Corporation hereby consents to the performance of the work described in Exhibit B in accordance with Exhibit A.
3. **Insurance.** The Shareholder shall not commence the Work unless and until the Shareholder shall have caused each of its contractors to furnish to the Corporation the insurance policies described on **Exhibit C** attached hereto or certificates thereof.

4. **Shareholder to Give Notice Prior to Commencement of Work.** Prior to commencing the Work, the Shareholder shall give at least five (5) days' prior written notice to the superintendent of the Building and the Managing Agent of the date on which the Work will commence and the estimated duration of the Work.
5. **Performance of the Work.**
 - (a) **In General.** The Shareholder shall perform the Work strictly in accordance with the Exhibits A and B and shall not perform any other work. In performing the Work, the Shareholder shall comply with (i) all applicable legal requirements, (ii) the requirements of all insurance policies covering the Work, the Apartment or the Building, (iii) this Agreement, (iv) the Lease, (v) the House Rules, (vi) the requirements of the Corporation, (vii) the Window Replacement Standards, and (viii) any directions given by the Managing Agent, the Corporation, or the superintendent of the Building.
 - (b) **Work Hours and Noise.** The Shareholder shall perform the Work diligently and in a manner so as not to disturb other residents of the Building. The Work shall be performed only on Mondays through Fridays (excluding holidays) between the hours of 8:00 A.M. and 4:30 P.M, provided however that any noisy work which may disturb other residents shall only be performed between the hours of 10:00 AM and 3:00 PM. The Work shall not be performed on weekends or holidays.
 - (c) **Labor Harmony.** The Shareholder shall cause its contractors and subcontractors to employ only such laborers as shall not conflict with any of the trade unions employed in the Building or otherwise cause disharmony with any Building service union.
6. **Inspection and Correction of the Work.** The Corporation shall have the right from time to time to inspect or observe the Work, and for this purpose the Shareholder shall provide access to the Apartment to the Managing Agent, the superintendent of the Building, and any other person the Corporation may authorize. The Shareholder shall promptly make all corrections required by the Corporation in order to conform to the requirements of this Agreement. If the Corporation so requires, such corrections shall include the removal and replacement of non-conforming work, solely at the Shareholder's cost and expense. The Corporation's failure to inspect shall not be considered a waiver of the Shareholder's obligation to comply with this Agreement.
7. **Damage or Adverse Effect Caused by the Work.** The Shareholder shall be responsible for any damage to, or any other adverse effect upon, the Apartment or the Building caused by or resulting from the Work, regardless of when such damage or adverse effect becomes apparent. If any such damage or adverse effect shall occur or arise, the Corporation may (a) require the Shareholder, at its expense, promptly to repair the damage or remedy the condition giving rise to such adverse effect and/or (b) repair such damage or remedy such condition at the Shareholder's expense.

Without limiting the generality of the foregoing, the Shareholder specifically acknowledges that this section shall be applicable to any damage to the exterior of the Building and any wall coverings or other finishes in the Building's hallways, elevators and other common areas (including, without limitation, the cost of cleaning, painting or repairing the same if soiled or otherwise damaged).

If the Managing Agent advises the Shareholder of any damage which, in the Managing Agent's opinion, was caused by the Work, the Shareholder shall promptly submit a claim to the Shareholder's insurance carrier and to the Shareholder's contractor(s) for submission to its insurance carrier, and the Shareholder agrees to use all reasonable efforts, and to cause its contractor(s) to use all reasonable efforts, to cause such insurance carriers to expeditiously review and settle all such claims for which they are responsible. The provisions of this paragraph shall not limit the Shareholder's liability under this section.

- 8. Indemnification by Shareholder.** Shareholder shall indemnify and hold harmless the Corporation, the Corporation's officers, directors and shareholders, the Managing Agent, and the other residents of the Building (all of the foregoing collectively the "Indemnified Persons") against any loss, cost, claim, damage (including damage to persons or property) or expense arising out of or related to the Work or any act or omission of Shareholder or any of its contractors, subcontractors, designers, architects, engineers or consultants, including reasonable attorney's fees and disbursements incurred by any of the Indemnified Persons in the defense of any such claim or any suit, action or proceeding based thereon. However, notwithstanding anything to the contrary herein, the Shareholder's obligations pursuant to this paragraph shall be limited by the applicable provisions of the New York State General Obligations Law, as are now in effect and as may be amended from time to time.
- 9. Fees and Costs.** Prior to the commencement of the Work, the Shareholder shall pay the Corporation a non-refundable fee of \$750 to cover, among other things, the Corporation's costs associated with an engineer's review of the proposed Work and an engineer's inspection of the Work. The Shareholder shall be responsible for all costs incurred by the Shareholder or the Corporation in connection with the Work or this Agreement, including any additional fees and disbursements of any attorney, architect, engineer or consultant retained by the Corporation in connection with the Work or this Agreement.
- 10. Additional Requirements.**

 - (a) Prohibited Construction Methods.** The Work shall not interfere with the Building's intercom, gas, electric, heating, air-conditioning or plumbing systems or any other Building system or service.
 - (b) Use of Public and Common Areas During Work.** The Shareholder shall not allow the halls, sidewalks, courtyards and other public areas to be used for the storage of building materials or debris. The Shareholder shall cause its contractor to cover with construction paper the floor of any back hall to be used in connection with the Work and shall also cause its

contractor to take all precautions necessary to prevent damage to the carpeting, wall coverings or other finishes in the Building's hallways, elevators and other common areas.

- (c) **Shareholder to Control Refuse, Dirt, Dust.** Shareholder shall take all precautions to prevent dirt and dust from permeating other parts of the Building during the progress of the Work, and shall place all materials and rubbish in barrels or bags before removing the same from the Apartment. All such barrels and bags and all rubbish, rubble, discarded equipment, empty packing cartons and other materials shall be removed from the Apartment and taken out of the Building at Shareholder's expense. Shareholder recognizes that only the service elevator may be used for such removal and only at such times as the superintendent of the Building may direct. Shareholder shall not permit any dumpster or garbage container to be left overnight in front of the Building and shall not permit any dumpster or garbage container to be left for more than five (5) consecutive days at the side of the Building. Notwithstanding the foregoing, the placement of any dumpsters shall comply with all governmental regulations, including without limitation, obtaining any necessary permits.
- (d) **Lead-Based Paint.** The Federal Task Force on Lead-Based Paint Hazard Reduction has recommended and Local Law 38 of 1999 of the City of New York requires in all buildings erected prior to January 1, 1960 certain maintenance practices, including (i) limiting access to the work area to only workers, (ii) isolating the work area with polyethylene plastic or equivalent, (iii) protecting the workers, (iv) protecting the Shareholder's belongings by covering or removing them from the work area, (v) wetting the painted surfaces before disturbing the paint and (vi) wetting the debris before sweeping. The Task Force has indicated that certain removal practices are unsafe, including (i) open flame burning, (ii) power sanding or sandblasting (unless a special vacuum attachment is used to contain dust), and (iii) dry scraping more than a de minimis surface area (de minimis means an area of less than one square foot per room). The Shareholder shall cause the Shareholder's contractors and/or workers to perform the Work consistently with the recommendations of the Task Force, and all other legal and other requirements, and shall upon completion of the Work perform specialized cleaning of the work area using methods designed to safely remove dust and debris which may contain lead. No more than sixty (60) days prior to beginning renovation activities in the Apartment, the Shareholder shall cause its contractor to provide to the Shareholder and any other occupant of the Apartment the Environmental Protection Agency (the "EPA") pamphlet entitled, Protecting Your Family from Lead in the Home, and the Shareholder shall furnish the Contractor with a written acknowledgment of receipt. The Shareholder hereby acknowledges that the Corporation has no liability or obligation in connection with this notification requirement of the EPA.

All contractors who perform painting or work causing disturbance to the walls must submit "Lead Paint Certification"

- 11. Shareholder to Comply with Law.** The Shareholder shall not do or permit any act or thing to be done contrary to any legal requirement, or which will invalidate or be in conflict with any provision of any liability, casualty or other insurance policies carried by Shareholder or for Shareholder's benefit. The Shareholder shall comply with all federal, state and local laws, rules and regulations pertaining to the Work, including any such laws, rules and regulations pertaining to lead-based paint, asbestos and other hazardous materials now known or hereafter discovered.
- 12. Maintenance and Repair of the Work.** Notwithstanding anything to the contrary contained in the Lease, the Shareholder shall be responsible for the maintenance, repair and replacement of the Work and any portions of the Apartment affected by the Work, and for all costs incurred by the Corporation or the Shareholder in connection therewith. Furthermore, the Shareholder releases the Corporation, the Managing Agent, and the Corporation's agents and employees from any liability for damage to the Work or any portion of the Apartment affected by the Work however arising.
- 13. Removal of the Work.** In the event that, at any time during or following the completion of the Work, the Corporation or its agents or contractors shall require access to, through, under or beyond any area altered by the Work, the Shareholder shall, promptly upon request, remove such portions of the altered areas as shall be necessary so as to provide the needed access. All costs incurred in connection with any such removal and, if applicable, any reinstallation or replacement of such portion(s) removed, shall be borne solely by the Shareholder, and neither the Corporation nor the Managing Agent shall have any liability or obligation therefor. Repair, replacement or reinstallation of built-ins, or any paint, wallpaper, floors or other decorative finishes, removed or installed by the Shareholder as part of the Work shall be the Shareholder's responsibility, if feasible (as to which the Corporation makes no representation).
- 14. Assignment of Warranties.** All of the windows or doors installed in the Apartment must have one or more manufacturer's or supplier's warranties, and the Shareholder hereby assigns such warranties to the Corporation to the extent such warranties are assignable. The Shareholder will provide to the Corporation a copy of such warranties.
- 15. Miscellaneous.** This Agreement and the Lease represent the only agreements between the Corporation and the Shareholder relative to the subject matter hereof. This Agreement may not be changed orally. This Agreement shall be binding on legal representatives, successors and authorized assigns. Captions are for the purposes of convenience of reference only and are not to be considered in interpreting this Agreement. THE CORPORATION AND SHAREHOLDER WAIVE TRIAL BY JURY IN ANY ACTION OR PROCEEDING UNDER THIS AGREEMENT.
- 16. Shareholder's Breach and Corporation's Remedies.** Any breach by the Shareholder of any of the provisions of this Agreement shall constitute a breach of the Lease and shall entitle the Corporation to exercise all of the rights and remedies therein provided. In addition, the Corporation shall also have the right: (a) to suspend the Work and prevent workers from entering the Apartment for any

purpose other than to remove their tools, and/or (b) to revoke its consent to the Work, and/or (c) to exercise any of the rights and remedies provided for herein. The remedies provided for herein and in the Lease shall not be exclusive and the Corporation shall also be entitled to exercise any of the remedies provided by applicable law.

IN WITNESS WHEREOF, Shareholder and the Corporation have executed this Agreement.

By: Shareholder

Date: _____

49 E. 96 REALTY CORP.

By THE LOVETT COMPANY, LLC

By: Managing Agent

Date: _____

Exhibit A

WINDOW REPLACEMENT STANDARDS

Exhibit B

Exhibit C

INSURANCE REQUIREMENTS

Each of Shareholder's contractors shall provide insurance of the types and in not less than the limits set forth below with a company or companies satisfactory to the Corporation, licensed to do business in the State of New York, and all such policies shall name the Corporation, the Corporation's officers, directors and shareholders, the Corporation's Designated Engineer and the Managing Agent as additional named insureds. No diminution of limits of insurance will be permitted.

(i) WORKER'S COMPENSATION as required by law together with Employer's Liability Insurance and Disability Benefits Insurance as required by the State of New York.

(ii) COMMERCIAL GENERAL LIABILITY including Contractor's Liability and Blanket Contractual Liability (oral or written), all on an occurrence basis with Personal Injury Coverage, which shall include mental anguish as well as standard conditions, and Broad Form Property Damage, without any exclusion relating to Explosion, Collapse and Underground Property Damage.

The policy will contain the "Broad Form Comprehensive General Liability" endorsement in Section 1 in such form; the exclusion pertaining to liability assumed by the Contractor under any contract or agreement (Section II Section B(1)) is to be deleted. The Completed Operations Coverage is to extend for a period of one year following termination of the Work and Contractual Indemnity Coverage is also to extend for one year following termination of the Work. The policy is also to include (a) Owners Protective Liability Coverage, (b) Knowledge of Occurrence and Notice of Occurrence endorsements and (c) Unintentional Errors and Omissions clause. The policy shall also include coverage with respect to asbestos exposure if the Work involves any asbestos-containing material, and shall not include a sunset clause without the Corporation's consent.

\$2,000,000 BODILY INJURY & PROPERTY DAMAGE (combined single limit)

(iii) COMPREHENSIVE AUTOMOBILE LIABILITY, including non-ownership and hired car coverage, as well as owned vehicles:

\$1,000,000 BODILY INJURY & PROPERTY DAMAGE (combined single limit)

(iv) UMBRELLA LIABILITY, BODILY INJURY, PERSONAL INJURY AND PROPERTY DAMAGE. If umbrellas are written in more than one company any layers above the first one shall follow the form of the primary umbrella.

\$1,000,000 (combined single limit)

Insurance policies must name the Corporation, the Corporation's officers, directors and shareholders, the Managing Agent and the Shareholder, as named insureds.

Prior to the commencement of any work hereunder, policies or detailed certificates of insurance shall be furnished to the Corporation showing that such insurance is in full force and the premiums due thereunder have been paid. Such certificates shall provide that the said insurance may not be canceled, terminated or modified without ten (10) days written advance

notice thereof to the Corporation. The Contractor shall promptly furnish the Corporation with copies of any endorsements subsequently issued amending insurance coverage or limits.

In the event of the failure of the Contractor to furnish or maintain such insurance, the Corporation shall have the right, at its option, at any time:

(a) to revoke permission to perform the work and to deny entry into the Building of all workers, except that if such workers are escorted by a member of the Building's staff, they shall be permitted to remove their tools and supplies, or

(b) to take out and maintain the said insurance for and in the name of the Corporation, the Contractor or the Shareholder and, in such a case, the Shareholder agrees to pay the cost thereof and to furnish all information and consents necessary to permit the Corporation to take out and maintain such insurance for and in the name of the Corporation, the Contractor or the Shareholder.

Compliance with the foregoing requirements to carry insurance and furnish certificates shall not relieve the Shareholder from liability assumed under any provisions of this Agreement.

The Contractor's insurance policy shall also contain in substance the following endorsement:

This insurance shall not be invalidated should the insured waive, in writing, prior to a loss, any or all right of recovery against any party for the loss occurring to the property described herein.

Nothing in this Exhibit C shall constitute a waiver of or limitation of any other rights or remedies the Corporation may have for consequential damages or otherwise.



Window Replacement Standards

49 East 96 Street
New York, NY 11201

May 13, 2018

Paradigm Architecture Design & Consulting

5 Penn Plaza • New York, NY 10001 • Phone (212) 507- 8778
140 East Ridgewood Ave • Paramus, NJ 07652 • Phone (201) 493-9900
www.paradigm-adc.com

Window Replacement Standards- 49 East 96 Street

Acceptable window styles



Double Hung



Tilt and Turn

Window Operations



Cleaning a tilt in sash for a double hung window



Cleaning a tilt and Turn Window

Approved Installers:

Adler Windows

175-16 Liberty Avenue, Jamaica, New York 11433

Capri Windows

316 Onderdonk Ave, Ridgewood, NY 11385

Skyline Windows

220 East 138Th St, Bronx, Ny 10451

Approved Window Manufacturers:

Adler Windows

175-16 Liberty Avenue, Jamaica, New York 11433

Skyline Windows

220 East 138Th St, Bronx, Ny 10451

Crystal Windows

31-10 Whitestone Expy, Flushing, NY 11354

Installer/ Supplier must submit the following for each apartment or for several apartments at the same time.

Certificate of Insurance.

Proof of Worker Compensation Coverage.

EPA Certification for Lead Remediation.

Investigation of existing Asbestos Containing material, and abatement plan for same.

Specification Sheet for windows to be used.

Guidelines for anchoring from the manufacturer meeting wind load requirements.

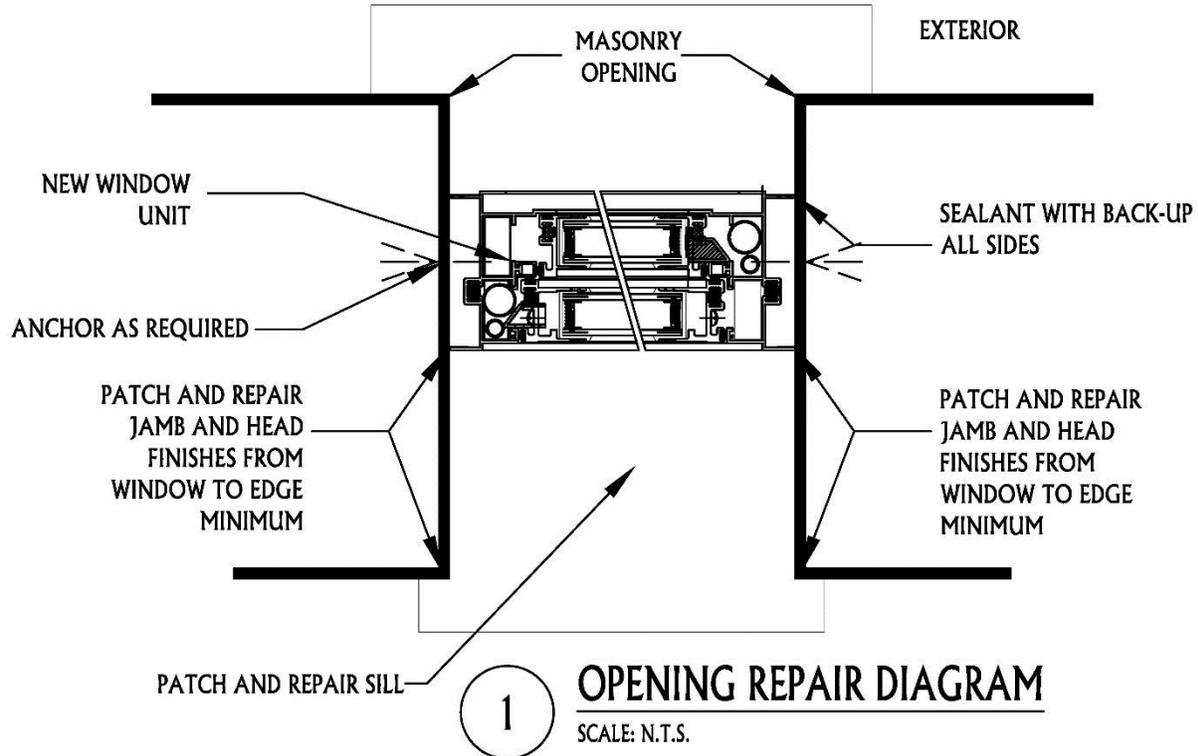
Diagram of window installation, including all capping, flashing etc.

Diagram of configuration of units and location of windows to be replaced within the apartment.

Sidewalk Shed permit application, if required.

Performance specification for each type of units, to show compliance with guidelines.

The existing interior surround will be returned to its original new condition with matching materials.



Installation of window units as shown above, include all cap moldings required to provide a waterproof condition.

All installations will be brick to brick. No frame to frame replacement will be accepted.

All new window configurations will match existing window arrangements. No Additional mullions will be added to change the window configuration only existing transoms, or sidelights will be recreated.

NO grids will be accepted.

A horizontal mullion in the center of the sash For Tilt & Turn units, replicating to look of a double hung, will be accepted.

Exterior color will be dark bronze anodized.

Interior color as selected by shareholder.

Screen color to be black.

DOUBLE HUNG WINDOWS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish and install aluminum windows as per specifications stipulated in this section.
- A. Factory-installed glass & glazing.

1.2 REFERENCES

- A. AAMA - American Architectural Manufacturers Association:
 - 1. AAMA/WDMA/CSA 101/I.S.2/A440-08 "North American Fenestration Standard/Specification for Windows, Doors, and Skylights."
 - 2. AAMA/WDMA/CSA 101/I.S.2/A440-05 "Standard/Specification for Windows, Doors, and Unit Skylights."
 - 3. AAMA 502-08 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
 - 4. AAMA 611-98 - Voluntary Specification for Anodized Architectural Aluminum.
 - 5. AAMA 701/702-04 - Voluntary Specification for Pile Weatherstripping and Replaceable Fenestration Weatherseals.
 - 6. AAMA 800-07 - Voluntary Specifications and Test Methods for Sealants.
 - 7. AAMA 902-07 - Voluntary Specification for Sash Balances.
 - 8. AAMA 910-93 - Voluntary Life Cycle' Specifications and Test Methods for Architectural Grade Windows and Sliding Glass Doors.
 - 9. AAMA 1503-98 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections.
 - 10. AAMA 2603-02 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - 11. AAMA 2604-05 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - 12. AAMA 2605-05 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. ASTM – American Society for Testing and Materials:
 - 1. ASTM E 283-04 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - 2. ASTM E 330-02 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference.
 - 3. ASTM E 331-00 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 - 4. ASTM E 547-00 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Differential.
 - 5. ASTM F 588; 1997 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact
 - 6. ASTM E 2190-02 - Standard Specification for Insulating Glass Unit Performance and Evaluation.

- C. NFRC - National Fenestration Rating Council.
 - 1. NFRC 100-04 - Procedure for Determining Fenestration Product U Factors.
 - 2. NFRC 102-04 - Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.
 - 3. NFRC 500-04 - Procedure for Determining Fenestration Product Condensation Resistance Values.
- D. IGCC - Insulating Glass Certification Council.
- E. SGCC - Safety Glazing Certification Council.
 - 1. Z97.1-04 American National Standard for Safety Glazing Materials used in Buildings - Safety Performance Specifications and Methods of Test.
 - 2. 16 CFR 1201 Consumer Product Safety Commission Safety Standard for Architectural Glazing Materials - codified at Title 16, Part 1201 of the Code of Federal Regulations.
- F. ANSI Z97.1 - American National Standard For Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test/Consumer Products Safety Commission CPSC 16 CFR 1201.

1.3 SUBMITTALS

- A. Submit information as per requirements of Section 1.3.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings:
 - 1. Elevation for each style window specified indicating its size, glazing type, muntin type and design.
 - 2. Manufacturer's head, jamb and sill details and section views for each window type specified.
- D. Schedules:
 - 1. Provide a window schedule indicating the type, size, color, and operation of each unit specified. Coordinate with window mark types found in the Contract Drawings.
- E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- F. Verification Samples: For each finish product specified, samples may be subsequently installed on the project.

1.4 SYSTEM DESCRIPTION

- A. Operation: DOUBLE HUNG with TILT-IN SASH for cleaning.
- B. AAMA Rating: CW-PG50-H when tested according to AAMA/WDMA/CSA 101/I.S.2/A440-08 at the gateway size of 56" x 91."
- C. Construction: 3 1/4 inch frame depth. Wall thickness: 0.062"/0.078" frame/sill; 0.062" sash. Factory finished extruded aluminum frame and sash members with integral structural polyurethane thermal break.
- D. Glazing: 7/8 inch insulating glass; black reusable flexible PVC channel gasket.

1.5 HARDWARE

A. Balances:

1. Balances shall provide a positive lifting force through the full range of sash travel. Sash travel shall be limited on oversize units.
2. When properly adjusted, balances shall hold the sash stationary at any open position.
3. Balances shall be factory calibrated of type Spiral (or Ultra-Lift balance or Block and Tackle).

B. Head Lock: Automatic aluminum spring-loaded head lock shall secure top sash in closed position.

C. Sill Lock: Continuous automatic aluminum spring-loaded sill lock shall secure bottom sash in closed position.

D. Tilt latches: Custodial-operated locking tamper-proof tilt latches.

E. Lift Handles: Integral continuous lift handles on bottom sash.

B. Limit Stops: Jamb-mounted limit stops.

1.6 WEATHERSTRIPPING

A. Sash: High-density woven pile shall be used in combination with continuous polyethylene rigid seal to minimize air infiltration.

B. Securely stake and join at corners. Provide drainage to exterior as necessary.

1.7 PERFORMANCE REQUIREMENTS

A. Air, Water and Structural Performance Requirements.

When tested in accordance with cited test procedures, windows shall meet or exceed the following performance criteria, as well as those indicated in AAMA 101 and 101/I.S.2/A440-08 for performance grade of unit specified unless otherwise noted herein.

1. Air Test Performance Requirements:

a. Performance: Air infiltration maximum 0.30 cfm per square foot at 1.6 psf pressure differential when tested in accordance with ASTM E283 for sliding sealed products.

2. Water Test Performance Requirements:

a. No uncontrolled water leakage at 7.5 psf static pressure differential when tested in accordance with ASTM E331 and ASTM E547.

3. Structural Test Performance Requirements:

a. Uniform Load Deflection Test

- 1) No deflection of any unsupported span L of test unit (framing rails, muntins, Mullions, etc.) in excess of L/175 at both a positive and negative load of design test pressure when tested in accordance with ASTM E330.
- 2) Structural reinforcing that is not standard on units being furnished is not allowed.

b. Uniform Load Structural Test:

- 1) Unit to be tested at 1.5 x design test pressure, both positive and negative, acting normal to plane of wall in accordance with ASTM E330.
- 2) No glass breakage; permanent damage to fasteners, hardware parts, or anchors; damage to make windows inoperable; or permanent deformation of

any main frame or ventilator member in excess of 0.2% of its clear span.

- B. Forced Entry Resistance Test: ASTM F 588, Type and Grade as indicated for each Product.
- C. Thermal Performance Requirements
 - 1. Perform thermal computer simulation in accordance with the configuration specified in NFRC 100.
 - 2. Computed Thermal Transmittance (U-Value) shall not exceed 0.43 BTU/hr/sq.ft./°F for the whole window assembly.
 - 3. Computed Solar Heat Gain Coefficient (SHGC) shall not exceed 0.36 for the whole window assembly.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All windows specified in this section shall be supplied by a manufacturer which has been fabricating/manufacturing commercial grade aluminum windows of similar quality and performance for a minimum of ten (10) years.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing windows of the same type and scope as specified, preferably AAMA certified installers.
- C. Provide test reports from AAMA accredited laboratory certifying that window units are found to be in compliance with AAMA/WDMA/CSA 101/I.S.2/A440-08 and performance standards listed above.
 - 1. Test reports shall be accompanied by the window manufacturer's letter of certification stating that the tested window meets or exceeds criteria for the appropriate AAMA/WDMA/CSA 101/I.S.2/A440 test.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation in accordance with manufacturer's recommendations.
- B. Protect units against damage from the elements, construction activities and other hazards before, during, and after installation.

1.10 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.11 WARRANTY

- A. *Refer to Refer to Manufacturers and Installers. standard warranty.*
- B. *Optional Extended Warranty (as selected by owner).*

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: See page 1
- B. Requests for substitutions will be considered.

2.2 Aluminum:

- A. Extruded aluminum prime billet 6063-T5 or 6063-T6 alloy for primary components; 6063-T5, 6063-T6, or 6061-T6 for structural components; all meeting the requirements of ASTM B221.
- B. Aluminum sheet alloy 5005 H 32 (for anodic finish), meeting the requirements of ASTM B209 or alloy 3003 H 14 (for painted or unfinished sheet).

2.3 Thermal Barrier:

- A. Structural Thermal Barrier:
 - 1. Structural thermal barrier shall consist of poured-in-place polyurethane polymer that shall transfer shear during bending and provide composite action between frame components.
- B. Non Structural Thermal Barriers:
 - 1. Non structural thermal barriers are used only in conjunction with structural thermal barriers. The purpose of non structural thermal barriers is to enhance thermal performance of the primary structural thermal barriers by inhibiting heat transfer through thermal radiation and convection. Non structural thermal barriers shall not be used as primary load carrying members.
 - 2. Rigid non structural thermal barriers shall be constructed of extruded polyvinylchloride (PVC).

2.4 GLASS

- A. Glazing Materials:
 - 1. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical. Design glass to resist design wind pressure based on glass type factors for short-duration load.
 - 2. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
 - 3. Strength: Where float glass is indicated, provide annealed float glass. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.
 - 4. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated.
 - a. U-Factors: Total-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as BTU/sq.ft x h x deg F (W/sq. m x K).
 - b. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 - c. Visible Reflectance: Center-of-glazing values, according to NFRC 300.
 - 5. Float Glass: ASTM C 1036, Type 1, Quality-Q3, Class 1 (clear) unless otherwise indicated.
 - 6. Coated Glass: ASTM C 1376, Type 1, Quality-Q3, Class 1 (clear) unless otherwise indicated, of kind and condition indicated.
 - 7. Laminated Glass: ASTM C 1172, Type 1, Quality-Q3, Class 1 (clear) unless otherwise indicated, of kind and condition indicated.

- B. Insulating Glass Units:
1. Factory-assemble units consisting of sealed lites of glass separated by a PPG Intercept Spacer system consisting of a one-piece, metallic, U-channel design that creates an effective thermal barrier to help reduce conducted heat loss through the window.
 2. Insulating glass units shall be sealed with an integral dessicant matrix and a butyl sealant extruded around the entire perimeter of the spacer to achieve a seal. The sealant applied is to be Dual Seal Equivalent (DSE). Interspace to be filled with air or argon gas as required by thermal computer simulation.
 3. Insulating Glass Types: Low-E coated, insulating glass units.
 - a. Overall Unit Thickness: 7/8" (22mm)
 - b. Thickness of Each Glass Lite: 1/8", 3/16" or 1/4 inch
 - c. Outdoor Lite: Class 1 (Clear) float glass, or fully tempered float glass.
 - d. Interspace Content: Air or Argon Gas.
 - e. Indoor Lite: Class 1 (Clear) float glass, or fully tempered float glass.
 - f. Low-E Coating: Sputtered on second or third surface.
 - g. Glass Winter Night time U-Value: 0.26 maximum.
 - h. Solar Heat Gain Coefficient: 0.46 maximum.
 - i. Provide safety glazing labeling, if necessary.

2.5 WINDOW ACCESSORIES

Provide the following accessories as specified in the contract drawings. Finish to match window frames or as selected by the Architect:

- A. Wrap Around Panning
- B. Preset Panning
- C. Snap Trim/Clips
- D. Expanders
- E. Receptors
- F. Subsills and Subsill Anchors
- G. Mullions and Mullion Covers
- H. Exterior Sills
- I. Interior Stools
- J. Muntins

2.6 FINISHES

- A. Conforming to AAMA 2604-05 specification, finish on all extruded aluminum shall consist of zero or near-zero VOC, organic POWDER COAT with a baked on super-durable thermosetting polyester resin, electro-statically applied on five-stage pre-treated aluminum surface. Equivalent to 50% Kynar polyvinylidene fluoride liquid paint finishes. Powder coat material to be as manufactured by Sherwin Williams or PPG Powder Coatings.
- B. Color to be selected from Manufacturer's Standard Color Dark Bronze exterior- interior as selected by owner.

- 2.7 Insect Screens:
- A. Screen frames shall consist of tubular extruded aluminum profiles with finish to match window frames.
 - B. Fiberglass mesh (18 X 16) with PVC spline.
- 2.8 Steel components including attachment fasteners shall be 300 series stainless steel except as noted.
- 2.9 Thermoplastic or thermo-set plastic caps, housings and other components shall be injection-molded nylon, extruded PVC, or other suitable compound.
- 2.10 Sealants:
- 1. Sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
 - 2. Frame joinery sealants shall be suitable for application specified and as tested and approved by window manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Owner of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.4 ANCHORAGE

- A. Anchor window units and/or assemblies sufficiently to maintain permanent positions when subjected to normal thermal movement, specified building movement and specified wind loads.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Final operating adjustment shall be made after glazing work is complete. Operating sash and ventilator shall operate smoothly and shall be weathertight when in locked position
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 DISPOSAL OF DEBRIS

- A. A.Remove all garbage off site and legally dispose of existing windows and debris generated from the installation of the new windows.

3.7 OPTIONAL FIELD TESTING

- A. At the discretion and expense of Owner or Owner's representative, perform on-site testing of installed units in conformance with AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Glass Doors. Conduct air and water infiltration testing with the window manufacturer, contractor, and owner present.
- B. An AAMA accredited lab will be hired by the owner to perform the required testing.

3.8 ADJUSTMENT AND CLEAN UP

- A. Adjust all products, sash, vents, and hardware after installation, as necessary to provide proper operation and a weather tight installation.
- B. Remove any labels and dirt from the window.

END OF SECTION

TILT & TURN WINDOWS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish and install aluminum windows as per specifications stipulated in this section.
- B. Factory-installed glass & glazing.

1.2 REFERENCES

- A. AAMA - American Architectural Manufacturers Association:
 - 1. AAMA/WDMA/CSA 101/I.S.2/A440-08 "North American Fenestration Standard/Specification for Windows, Doors, and Skylights."
 - 2. AAMA/WDMA/CSA 101/I.S.2/A440-05 "Standard/Specification for Windows, Doors, and Unit Skylights."
 - 3. AAMA 502-08 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
 - 4. AAMA 611-98 - Voluntary Specification for Anodized Architectural Aluminum.
 - 5. AAMA 701/702-04 - Voluntary Specification for Pile Weatherstripping and Replaceable Fenestration Weatherseals.
 - 6. AAMA 800-07 - Voluntary Specifications and Test Methods for Sealants.
 - 7. AAMA 902-07 - Voluntary Specification for Sash Balances.
 - 8. AAMA 910-93 - Voluntary Life Cycle' Specifications and Test Methods for Architectural Grade Windows and Sliding Glass Doors.
 - 9. AAMA 1503-98 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections.
 - 10. AAMA 2603-02 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - 11. AAMA 2604-05 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - 12. AAMA 2605-05 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. ASTM – American Society for Testing and Materials:
 - 1. ASTM E 283-04 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - 2. ASTM E 330-02 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference.
 - 3. ASTM E 331-00 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 - 4. ASTM E 547-00 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Differential.
 - 5. ASTM F 588; 1997 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.
 - 6. ASTM E 2190-02 - Standard Specification for Insulating Glass Unit Performance and Evaluation.

- C. NFRC - National Fenestration Rating Council.
 - 1. NFRC 100-04 - Procedure for Determining Fenestration Product U Factors.
 - 2. NFRC 102-04 - Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.
 - 3. NFRC 500-04 - Procedure for Determining Fenestration Product Condensation Resistance Values.
- D. IGCC - Insulating Glass Certification Council.
- E. SGCC - Safety Glazing Certification Council.
 - 1. Z97.1-04 American National Standard for Safety Glazing Materials used in Buildings - Safety Performance Specifications and Methods of Test.
 - 2. 16 CFR 1201 Consumer Product Safety Commission Safety Standard for Architectural Glazing Materials - codified at Title 16, Part 1201 of the Code of Federal Regulations.
- F. ANSI Z97.1 - American National Standard For Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test/Consumer Products Safety Commission CPSC 16 CFR 1201.

1.3 SUBMITTALS

- A. Submit information as per requirements of Section 1.3.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings:
 - 1. Elevation for each style window specified indicating its size, glazing type, muntin type and design.
 - 2. Manufacturer's head, jamb and sill details and section views for each window type specified.
- D. Schedules:
 - 1. Provide a window schedule indicating the type, size, color, and operation of each unit specified. Coordinate with window mark types found in the Contract Drawings.
- E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- F. Verification Samples: For each finish product specified, samples may be subsequently installed on the project.

1.4 SYSTEM DESCRIPTION

- A. Operation: DUAL ACTING (TILT/TURN)
- B. AAMA Rating: AW-PG70-DAW when tested according to AAMA/WDMA/CSA 101/I.S.2/A440-08 at the gateway size of 60" x 99"
- C. Construction: 3 1/4 inch frame depth. Wall thickness: 0.093" frame/sill; 0.093" sash. Factory finished extruded aluminum frame and sash members with integral structural fiberglass reinforced polyamide thermal barrier.
- D. Glazing: 1 1/4 inch insulating glass; monolithically bonded to the sash frame with double-sided

structural glazing tape (SGT) on the interior, and the exterior edge shielded by a polyamide glazing bead with an integral bulb gasket.

1.5 HARDWARE

- A. Handle: Lever handle mounted to sash interior with concealed screws. Turning the handle shall activate a concealed aluminum slide bar with integral sash locks to engage keepers attached to the frame on multiple points around the sash perimeter as required by window size.
- B. Hinges: Extruded aluminum butt-type hinges with heavy-duty stainless steel pin to rotate vent inward on vertical axis (turn operation) or pivot vent on horizontal axis (tilt operation) as determined by handle rotation.

1.6 WEATHERSTRIPPING

- A. Frame: EPDM "gooseneck" type gasket with integral grooves fitted into the frame extrusion to provide a continuous primary seal between frame and sash. EPDM gasket to be joined and sealed at corners.
- B. Sash: Two rows of compression type bulb gasket, one on the interior and one on the exterior.

1.7 PERFORMANCE REQUIREMENTS

- A. Air, Water and Structural Performance Requirements:

When tested in accordance with cited test procedures, windows shall meet or exceed the following performance criteria, as well as those indicated in AAMA 101 and 101/I.S.2/A440-08 for performance grade of unit specified unless otherwise noted herein.

- 1. Air Test Performance Requirements:
 - a. Performance: Air infiltration maximum 0.10 cfm per square foot at 6.2 psf pressure differential when tested in accordance with ASTM E283 for sliding sealed products.
- 2. Water Test Performance Requirements:
 - a. No uncontrolled water leakage at 12 psf static pressure differential when tested in accordance with ASTM E331 and ASTM E547.
- 3. Structural Test Performance Requirements:
 - a. Uniform Load Deflection Test
 - 1) No deflection of any unsupported span L of test unit (framing rails, muntins, mullions, etc.) in excess of L/175 at both a positive and negative load of design test pressure when tested in accordance with ASTM E330.
 - 2) Structural reinforcing that is not standard on units being furnished is not allowed.
 - b. Uniform Load Structural Test:
 - 1) Unit to be tested at 1.5 x design test pressure, both positive and negative, acting normal to plane of wall in accordance with ASTM E330.
 - 2) No glass breakage; permanent damage to fasteners, hardware parts, or anchors; damage to make windows inoperable; or permanent deformation of any main frame or ventilator member in excess of 0.2% of its clear span.
- B. Forced Entry Resistance Test: ASTM F 588, Type and Grade as indicated for each Product.
- C. Thermal Performance Requirements
 - 1. Perform thermal computer simulation in accordance with the configuration specified in NFRC 100.
 - 2. Computed Thermal Transmittance (U-Value) shall not exceed 0.37 BTU/hr/sq.ft./°F for the whole window assembly.

3. Computed Solar Heat Gain Coefficient (SHGC) shall not exceed 0.36 for the whole window assembly.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All windows specified in this section shall be supplied by a manufacturer which has been fabricating/manufacturing commercial grade aluminum windows of similar quality and performance for a minimum of ten (10) years.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing windows of the same type and scope as specified, preferably AAMA certified installers.
- C. Provide test reports from AAMA accredited laboratory certifying that window units are found to be in compliance with AAMA/WDMA/CSA 101/I.S.2/A440-08 and performance standards listed above.
 1. Test reports shall be accompanied by the window manufacturer's letter of certification stating that the tested window meets or exceeds criteria for the appropriate AAMA/WDMA/CSA 101/I.S.2/A440 test.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation in accordance with manufacturer's recommendations.
- B. Protect units against damage from the elements, construction activities and other hazards before, during, and after installation.

1.10 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.11 WARRANTY

- A. *Refer to Manufacturers and Installers. standard warranty.*
- B. *Optional Extended Warranty (as selected by owner).*

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: See page 1
- B. Requests for substitutions will be considered.

2.2 Aluminum:

- A. Extruded aluminum prime billet 6063-T5 or 6063-T6 alloy for primary components; 6063-T5, 6063-T6, or 6061-T6 for structural components; all meeting the requirements of ASTM B221.
- B. Aluminum sheet alloy 5005 H 32 (for anodic finish), meeting the requirements of ASTM B209 or alloy 3003 H 14 (for painted or unfinished sheet).

2.3 Thermal Barrier

- A. Structural Thermal Barrier:

1. Structural thermal barriers shall consist of polyamide nylon 6.6 struts reinforced with glass fibers oriented in all three axis. Main frame members shall use twin polyamide struts not less than 18.6mm in length. Sash members shall use a polyamide strut not less than 29.7mm in length.
2. Polyamide struts shall be mechanically crimped into aluminum profiles using integral extruded races. Aluminum races shall be mechanically knurled as per polyamide strut manufacturer's recommendations. Shear strength of finished assembly shall be per AAMA TIR-A8-04.
3. Non-Structural Thermal Barriers: Non-structural thermal barriers are used only in conjunction with structural thermal barriers. The purpose of non-structural thermal barriers is to enhance thermal performance of the primary structural thermal barriers (polyamide struts) by inhibiting heat transfer through thermal radiation and convection. Non-structural thermal barriers shall not be used as primary load carrying members.
4. Rigid non-structural thermal barriers shall be constructed of extruded polyvinylchloride (PVC).

2.4 GLASS

A. Glazing Materials:

1. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical. Design glass to resist design wind pressure based on glass type factors for short-duration load.
2. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
3. Strength: Where float glass is indicated, provide annealed float glass. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.
4. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated.
 - a. U-Factors: Total-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as BTU/sq.ft x h x deg F (W/sq. m x K).
 - b. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 - c. Visible Reflectance: Center-of-glazing values, according to NFRC 300.
5. Float Glass: ASTM C 1036, Type 1, Quality-Q3, Class 1 (clear) unless otherwise indicated.
6. Coated Glass: ASTM C 1376, Type 1, Quality-Q3, Class 1 (clear) unless otherwise indicated, of kind and condition indicated.
7. Laminated Glass: ASTM C 1172, Type 1, Quality-Q3, Class 1 (clear) unless otherwise indicated, of kind and condition indicated.

B. Insulating Glass Units:

1. Factory-assemble units consisting of sealed lites of glass separated by a PPG Intercept Spacer system consisting of a one-piece, metallic, U-channel design that creates an effective thermal barrier to help reduce conducted heat loss through the window.
2. Insulating glass units shall be sealed with an integral dessicant matrix and a butyl sealant extruded around the entire perimeter of the spacer to achieve a seal. The sealant applied is to be Dual Seal Equivalent (DSE). Interspace to be filled with air or argon gas as required by thermal computer simulation.
3. Insulating Glass Types: Low-E coated, insulating glass units.
 - a. Overall Unit Thickness: 1 1/4" (31.7mm)
 - b. Thickness of Each Glass Lite: 3/32" , 1/8" or 1/4 inch
 - c. Outdoor Lite: Class 1 (Clear) float glass, or fully tempered float glass.
 - d. Interspace Content: Air or Argon Gas.

- e. Indoor Lite: Class 1 (Clear) float glass, or fully tempered float glass.
- f. Low-E Coating: Sputtered on second or third surface.
- g. Glass Winter Night time U-Value: 0.27 maximum.
- h. Solar Heat Gain Coefficient: 0.46 maximum.
- i. Provide safety glazing labeling, if necessary.

2.5 WINDOW ACCESSORIES

Provide the following accessories as specified in the contract drawings. Finish to match window frames or as selected by the Architect:

- A. Wrap Around Panning
- B. Preset Panning
- C. Snap Trim/Clips
- D. Expanders
- E. Receptors
- F. Subsills and Subsill Anchors
- G. Mullions and Mullion Covers
- H. Exterior Sills
- I. Interior Stools
- J. Muntins

2.6 FINISHES

- A. Conforming to AAMA 2604-05 specification, finish on all extruded aluminum shall consist of zero or near-zero VOC, organic POWDER COAT with a baked on super-durable thermosetting polyester resin, electro-statically applied on five-stage pre-treated aluminum surface. Equivalent to 50% Kynar polyvinylidene fluoride liquid paint finishes. Powder coat material to be as manufactured by Sherwin Williams or PPG Powder Coatings.
- B. Color to be selected from Manufacturer's Standard Color Chart Dark Bronze exterior- interior as selected by owner.

2.7 Insect Screens:

- A. Screen frames shall consist of tubular extruded aluminum profiles with finish to match window frames.
- B. Fiberglass mesh (18 X 16) with PVC spline.

2.8 Steel components including attachment fasteners shall be 300 series stainless steel except as noted.

2.9 Thermoplastic or thermo-set plastic caps, housings and other components shall be injection-molded nylon, extruded PVC, or other suitable compound.

2.10 Sealants:

- 1. Sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
- 2. Frame joinery sealants shall be suitable for application specified and as tested and

approved by window manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.4 ANCHORAGE

- A. Anchor window units and/or assemblies sufficiently to maintain permanent positions when subjected to normal thermal movement, specified building movement and specified wind loads.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Final operating adjustment shall be made after glazing work is complete. Operating sash and ventilator shall operate smoothly and shall be weathertight when in locked position.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 DISPOSAL OF DEBRIS

- A. Remove all garbage off site and legally dispose of existing windows and debris generated from the installation of the new windows.

3.7 OPTIONAL FIELD TESTING

- A. At the discretion and expense of Owner or Owner's representative, perform on-site testing of installed units in conformance with AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Glass Doors. Conduct air and water infiltration testing with the window manufacturer, contractor, and owner present.
- B. An AAMA accredited lab will be hired by the owner to perform the required testing.

3.8 ADJUSTMENT AND CLEAN UP

- A. Adjust all products, sash, vents, and hardware after installation, as necessary to provide proper operation and a weather tight installation.
- B. Remove any labels and dirt from the window.

END OF SECTION