SECTION 08 51 13

ALUMINUM WINDOWS

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\*\* NOTE TO SPECIFIER \*\* Universal Window and Door, LLC; replacement windows.
.
This section is based on the products of Universal Window and Door, LLC, which is located at:
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Marlborough, MA 01752
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Fax: 508-480-0019
Email: [request info (TonyM@universalwindow.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Universal+Window+and+Door,+LLC&coid=48092&rep=&fax=508-480-0019&message=RE:%20Spec%20Question%20(08520uwd):%20%20&mf=)
Web: [www.universalwindow.com](http://www.universalwindow.com)
 [ [Click Here](http://www.arcat.com/arcatcos/cos48/arc48092.html) ] for additional information.
The professionals at Universal invite you to benefit from over 41 years of integrity, high quality, innovation, service and exceptional value. We meet the building needs of our customers with outstanding aluminum replacement and new construction windows. Our historic line of windows meets the stringent requirements for buildings on the National Historic Register and National Park Service.
At Universal Window, we raise the bar. We pride ourselves in meeting and exceeding AAMA industry standards. Our commitment to state-of-the-art window design and manufacturing assures compliance with these standards, and results in the impressive performance of our products.
Multiple grid profiles authentically simulate the original windows, and Universal's new TrueWARM® warm-edge Technology assures unprecedented energy savings through use of new, low transmission materials at the critical edge seal area of multi-layer glass. Universal offers a full 15 year warranty on this patented, innovative process.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Thermally Improved Prime Replacement Windows:
			1. Series 800 Single Hung Commercial Window.
			2. Series 400 Double Hung Commercial Window.
			3. Series 1199 Double Hung Commercial Window.
			4. Series 550 Projected/Casement Window.
			5. Series 600 Projected/Casement Window.
		2. Historic Steel and Wood Replica Windows:
			1. Series 700 Steel Replica Window.
		3. Sliding Windows:
			1. Series 900 Sliding Commercial Window.
			2. Series 945 Sliding Heavy Commercial Window.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 07 60 00 - Flashing and Sheet Metal.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Architectural Manufacturers Association (AAMA):
			1. AAMA 901-10 - Voluntary Specification for Rotary & Linear Operators in Window Applications.
			2. AAMA 902-02 - Voluntary Specification for Weather-stripping and Sealants.
			3. AAMA 902-07 - Voluntary Specification for Sash Balances.
			4. AAMA 904-09 - Voluntary Specification for Multi-Bar Hinges in Window Applications.
			5. AAMA 908-09 - Voluntary Specification for Friction Based Sash Balances.
			6. AAMA 1502.6 - ANSI/AAMA 101-Voluntary Specifications for Aluminum Prime Windows and Sliding Doors.
		2. ASTM International (ASTM):
			1. ASTM E283 - 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 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
			3. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
			4. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. 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.
		3. Provide manufacturer's independent test results indication compliance with AAMA specifications and performance criteria.
		4. Shop drawings showing installation conditions throughout and catalogue cuts shall be submitted for approval. Shop drawings shall include elevations of all windows, minimum scale 1/2 inch equals 1 foot (13 mm equals 305 mm), and full size details of every conditions indicating thickness of aluminum, fastenings, the size and spacing of anchor, method of glazing, details of operations hardware, method and materials for weatherstripping, and method of attaching screens.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if colors have already been selected.

* + 1. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
		2. Verification Samples, Finish: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

\*\* NOTE TO SPECIFIER \*\* Delete samples if not required.

* + 1. Verification Sample, Window: One complete full-size sample window of type proposed for use shall be submitted for approval. Sample shall be complete with hardware, glazing, weather-stripping, anchors, screen and other accessories.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Manufacturer shall have been producing the model window used for this project and under current ownership for at least five years.
		2. Installer Qualifications: Minimum 2 years experience installing similar windows

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface finish, operation and installation workmanship.
			1. Finish areas designated by Architect.
			2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
			3. Refinish mock-up area as required to produce acceptable work.
	1. DELIVERY, STORAGE, AND HANDLING
		1. Materials shall be delivered, stored, handled, and installed so as not to be damaged or deformed.
		2. Store products in manufacturer's unopened packaging until ready for installation.
	2. PROJECT CONDITIONS
		1. 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 recommended limits.
		2. Coordinate work with that of all other trades affecting or affected by work of this section. Cooperate with such trades to assure the steady progress of all work under the contract.
	3. WARRANTY

\*\* NOTE TO SPECIFIER \*\* Typical. Delete if not required.

* + 1. Provide manufacturer's standard limited warranty for fabrication and tested performance:
			1. Manufacturer's standard guarantee shall be for a minimum of one year.
			2. Insulated glass units shall be provided with a one-year warranty.
			3. Manufacturer's warranty for materials only, excluding labor for installation.

\*\* NOTE TO SPECIFIER \*\* 400EXT, 400DUAL 800 series single hung window. Delete if not required.

* + 1. Provide manufacturer's standard limited warranty for fabrication and tested performance:
			1. Manufacturer's standard guarantee shall be for a minimum of one year.
			2. Insulated glass units shall be provided with a five-year warranty.
			3. Manufacturer's warranty for materials only, excluding labor for installation.

\*\* NOTE TO SPECIFIER \*\* 700 series, 400 series double hung window. Delete if not required.

* + 1. Provide manufacturer's standard limited warranty for fabrication and tested performance:
			1. Manufacturer's standard guarantee shall be for a minimum of ten years for window components and hardware excluding screening.
			2. Insulated glass units shall be provided with a ten-year warranty against seal failure due to factory defect unless otherwise approved by the architect.
			3. Manufacturer's warranty for materials only, excluding labor for installation.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Universal Window and Door, LLC, which is located at: 303 Mechanic St.; Marlborough, MA 01752; Toll Free Tel: 800-633-0108; Tel: 508-481-2850; Fax: 508-480-0019; Email: [request info (TonyM@universalwindow.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Universal+Window+and+Door,+LLC&coid=48092&rep=&fax=508-480-0019&message=RE:%20Spec%20Question%20(08520uwd):%20%20&mf=); Web: [www.universalwindow.com](http://www.universalwindow.com)

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
	1. WINDOWS
		1. The Work consists of supply and installation of aluminum windows and related items, as indicated on the drawings and specified herein. Such work includes but is not limited to the following:

\*\* NOTE TO SPECIFIER \*\* Edit list as required.

* + - 1. Windows and factory glazing,
			2. Insect screens
			3. Vandal resistant screens.
			4. Child protection screens.
			5. Sealant within window system.
			6. Hardware, accessories and appurtenances.
	1. THERMALLY IMPROVED PRIME REPLACEMENT WINDOWS

\*\* NOTE TO SPECIFIER \*\* Utilizes complete Thermal Break Sash and Master Frame for optimal insulating value.

* + 1. Single Hung, Rated Commercial Window:
			1. Product: Series 800 as manufactured by Universal Window and Door, LLC.
				1. Rating: H-C35 (Gateway 59 inches by 90 inches).

\*\* NOTE TO SPECIFIER \*\* Glass: Low-E, Solar Control, Argon, Tempered, Obscure, Wire or Spandrel options available.

* + - * 1. Glazing: 7/8 inch (22 mm) clear insulating glass made with Super Spacer edge technology. Top lite bead glazed to master frame for reduced air infiltration.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Window Grids: As detailed.
				2. Fabrication: Windows shall be of the thermally broken type, including sash and frame members. Dual assembly screws at sash corners for added strength. Main frame and sash members shall have a nominal wall thickness of not less that 0.062 inch (1.6 mm), and master frame depth of 2-5/8 inches (67 mm).
				3. Hardware: Single hung units shall be equipped with an integral lift handle on bottom sash with positive spring-loaded latch.
				4. Balance: Sash shall be counter balanced so that they remain open in any position. Balances shall be heavy-duty factory standard type as customary with the manufacturer and suitable for installation required. Balances shall conform to AAMA 902.2.

\*\* NOTE TO SPECIFIER \*\* Delete balance type not required.

Type: Block and Tackle balances (standard).

Type: Ultra Lift.

Type: Spiral Balances

* + - * 1. Provide exterior installation components and interior trim as detailed and as follows:

\*\* NOTE TO SPECIFIER \*\* Delete components and trim not required.

Exterior panning systems.

Interior trim system.

Receptor systems

Nailing fin.

Flange frame.

Head expander and sill angle.

* + - 1. Single hung windows shall conform to the following performance criteria:
				1. Air infiltration: Not to exceed 0.18 cfm/ft @ 25 mph (1.57 psf).
				2. Water resistance: There shall be no leakage as defined in the high performance test method with a test pressure of 5.25 PSF.
				3. Uniform Load Deflection Test: Under an exterior uniform load of 30 PSF no member in the completely assembled window shall deflect more that 1/135 of its span. Test shall be conducted in accordance of ASTME 330-70.
				4. Uniform Load Structural Test: The window shall be subjected separately to an exterior uniform load of 52.5 PSF and an interior uniform load of 90 PSF. Tests shall be conducted in accordance with ASTME 330-70.
				5. Condensation Resistance Factor: The window shall be tested in accordance with AAMA 1502.6 standards and tests of thermal performance, and shall have a condensation resistance factor of no less than 50.

\*\* NOTE TO SPECIFIER \*\* Utilizes complete Thermal Break Sash and Master Frame for optimal insulating value. Delete if not required.

* + 1. Double Hung, Rated Heavy Commercial Window:
			1. Product: Series 400 as manufactured by Universal Window and Door, LLC.

\*\* NOTE TO SPECIFIER \*\* Delete performance not required.

* + - * 1. Rating: DH-HC45 (Gateway 60 inches by 96 inches).
				2. Rating: DH-HC65 (Gateway 48 inches by 60 inches).

\*\* NOTE TO SPECIFIER \*\* Glass: Low-E, Solar Control, Argon, Tempered, Obscure, Wire or Spandrel options available.

* + - * 1. Glazing: Both sashes shall be channel glazed using 1 inch (25 mm) clear insulating glass made with Super Spacer with a flexible "marine" type vinyl-glazing channel. The overall glass thickness of 1 inch (25 mm) with an air space measured 3/4 inch (19 mm) created by a desiccant-filled insulating foam spacer.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Window Grids: As detailed.
				2. Fabrication: Windows shall be of the thermally broken type, including sash and frame members. Both sashes are able to be removable after tilting without the use of special tools. Top sash to be held by "anti-creep" latch. Telescoping Sash Engineering provides optimum air and water protection.

\*\* NOTE TO SPECIFIER \*\* Model 400EXT muntin construction. Delete if not required,

* + - * 1. Muntins shall be of external applied trapezoid type-configurations shown on drawings.

\*\* NOTE TO SPECIFIER \*\* Model 400DUAL muntin construction. Delete if not required,

* + - * 1. Simulated Divided Lite Muntins shall be of external applied trapezoid type and between glass type-configurations shown on drawings.
				2. Deep double-step Hospital Sill provides superior ventilating and water performance.

\*\* NOTE TO SPECIFIER \*\* Delete hardware not required.

* + - * 1. Hardware: Double hung units shall be equipped with an integral lift handle on bottom sash; top of upper sash to have a continuous integral pull down handle.
				2. Hardware : Custodial
				3. Balance: Both upper and lower sash shall be counter balanced so that they remain open in any position. Balances shall be heavy-duty factory standard type as customary with the manufacturer and suitable for installation required. Balances shall conform to AAMA 902.2.

\*\* NOTE TO SPECIFIER \*\* Delete balance type not required.

Type: Block and Tackle balance (standard).

Type: Ultra Lift balance.

Type: Spiral balance

* + - * 1. Provide exterior installation components and interior trim as detailed and as follows:

\*\* NOTE TO SPECIFIER \*\* Delete components and trim not required.

Exterior panning systems.

Interior trim system.

Receptor systems

Nailing fin.

Flange frame.

Head expander and sill angle.

* + - 1. Double hung to conform to the following performance criteria:
				1. Air infiltration: Not to exceed .10 cfm/ft @ 25 mph (1.57 psf). ASTM E283.
				2. Water resistance: There shall be no leakage as defined in the high performance test method with a test pressure of 11 psf. ASTM E547 & E331.

\*\* NOTE TO SPECIFIER \*\* Rating: DH-HC45 (Gateway 66 inches by 96 inches). delete if not required.

* + - * 1. Uniform Load Structural Test: The window shall be subjected separately to an exterior uniform load of 67.5 PSF and an interior uniform load of 67.5 PSF. Tests shall be conducted in accordance with ASTM E330

\*\* NOTE TO SPECIFIER \*\* Rating: DH-HC65 (Gateway 48 inches by 60 inches). Delete if not required.

* + - * 1. Uniform Load Structural Test: The window shall be subjected separately to an exterior uniform load of 97.5 PSF and an interior uniform load of 67.5 PSF. Tests shall be conducted in accordance with ASTM E330.
				2. Condensation Resistance Factor: The window shall be tested in accordance with AAMA 1502.6 standards and tests of thermal performance, and shall have a condensation resistance factor of no less than 46.
				3. Operating Force: Maximum of 42 lb.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Double Hung, Rated DH Commercial Window:
			1. Product: Series 1199 as manufactured by Universal Window and Door, LLC.
				1. Rating: DH-C50 (Gateway 54 inches by 90 inches).

\*\* NOTE TO SPECIFIER \*\* Glass: Low-E, Soft Coat, Solar Control, Argon, Tempered, Obscure, Wire or Spandrel options available.

* + - * 1. Glass: Both sashes shall be channel glazed using 7/8 inch (22 mm) thick double insulated glass with a flexible vinyl-glazing channel. The overall glass thickness of 7/8 inch (22 mm) with an air space measured 5/8 inch (16 mm) created by a desiccant-filled aluminum spacer.
				2. Glazing: Marine Glazing protects glass edge and assures easy repair.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Window Grids: External and internal as detailed.
				2. Fabrication: Window shall be of the thermally broken type, including sash and frame members. Deep double-step Hospital Sill provides superior ventilating and water performance. Special Tubular Sash Design gives added strength and long life. Main frame and sash members shall have a nominal wall thickness of not less that 0.062 inch (1.6 mm) and a master frame depth of 3-1/4 inches (83 mm).
				3. Finish: Painted finish at exterior windows and clear anodized at interior windows. Standard exterior finish shall be factory-applied thermo setting acrylic enamel complying with AAMA 603.8 criteria. Color selected by architect from manufacturer's standard.
				4. Hardware: Double hung units shall be equipped with an integral lift handle on bottom sash; bottom of upper sash to have a continuous integral pull down handle. Anti-Creep Lock on top sash creates stability for worry-free operation.
				5. Operation: Both sashes are able to be removable after tilting without the use of special tools. Both upper and lower sash shall be counter balanced so that they remain open in any position. Balances shall be heavy-duty factory standard type as customary with the manufacturer and suitable for installation required. Balances shall conform to AAMA 902.2.

\*\* NOTE TO SPECIFIER \*\* Delete balance type not required.

Balance: Block and Tackle (standard).

Balance: Ultra Lift.

Balance: Spiral.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Custodial Hardware assures safe operation (Ideal for schools and institutional use).
				2. Provide exterior installation components and interior trim as detailed and as follows:

\*\* NOTE TO SPECIFIER \*\* Delete components and trim not required.

Exterior panning systems.

Interior trim system.

Receptor systems

Nailing fin.

Flange frame.

Head expander and sill angle.

Installation clips.

Child guard screens.

Vandal resistant screens.

* + - 1. All double hung to conform to the following performance criteria:

\*\* NOTE TO SPECIFIER \*\* DH-C50 (Gateway 54 inches by 90 inches). Delete if not required.

* + - * 1. Air infiltration: Not to exceed .10 cfm/ft @ 1.57 psf.
				2. Water resistance: There shall be no leakage as defined in the high performance test method with a test pressure of 7.5 psf.
				3. Uniform Load Deflection Test: Under an interior uniform load of 75 PSF no member in the completely assembled window shall deflect more that 1/135 of its span. Test shall be conducted in accordance of ASTME 330.
				4. Condensation Resistance Factor: The window shall be tested in accordance with AAMA 1502.6 standards and tests of thermal performance, and shall have a condensation resistance factor of no less than 46.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Double Hung, Rated AW Heavy Commercial Window:
			1. Product: Series 550 as manufactured by Universal Window and Door, LLC.

\*\* NOTE TO SPECIFIER \*\* Delete performance not required.

* + - * 1. Rating: H-AW55 (Gateway 60 inches by 99 inches).
				2. Rating: H-HC65 (Gateway 60 inches by 99 inches).

\*\* NOTE TO SPECIFIER \*\* Glass: Low-E, Solar Control, Argon, Tempered, Obscure, Wire or Spandrel options available.

* + - * 1. Glass: 1 inch (25 mm) clear insulating glass made with Super Spacer, the world's only TrueWARM® edge technology
				2. Glazing: Marine Glazing protects glass edge and assures easy repair

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Window Grids: As detailed.
				2. Fabrication: Window shall be of the thermally broken type, including sash and frame members. Deep double-step Hospital Sill provides superior ventilating and water performance. Special Tubular Sash Design gives added strength and long life.

\*\* NOTE TO SPECIFIER \*\* Model 550DUAL muntin construction. Delete if not required,

* + - * 1. Simulated Divided Lite Muntins shall be of external applied trapezoid type and between glass type-configurations shown on drawings.
				2. Finish: Painted finish at exterior windows and clear anodized at interior windows.
				3. Operation: Anti-Creep Lock on top sash creates stability for worry-free operation.

\*\* NOTE TO SPECIFIER \*\* Delete balance type not required.

* + - * 1. Balance: Block and Tackle balances (standard).
				2. Balance: Ultra Lift.
				3. Balance: Spiral Balances

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Custodial Hardware assures safe operation (Ideal for schools and institutional use).
				2. Provide exterior installation components and interior trim as detailed and as follows:

\*\* NOTE TO SPECIFIER \*\* Delete components and trim not required.

Exterior panning systems.

Interior trim system.

Receptor systems

Nailing fin.

Flange frame.

Head expander and sill angle.

* + - 1. All double hung to conform to the following performance criteria:

\*\* NOTE TO SPECIFIER \*\* H-AW55 (Gateway 60 inches by 99 inches). Delete if not required.

* + - * 1. Air infiltration: Not to exceed .20 cfm/ft @ 6.24 psf.

\*\* NOTE TO SPECIFIER \*\* H-HC65 (Gateway 60 inches by 99 inches). Delete if not required.

* + - * 1. Air infiltration: Not to exceed .10 cfm/ft @ 1.57 psf.
				2. Water resistance: There shall be no leakage as defined in the high performance test method with a test pressure of 11 psf.

\*\* NOTE TO SPECIFIER \*\* H-AW55 (Gateway 60 inches by 99 inches). Delete if not required.

* + - * 1. Uniform Load Deflection Test: Under an interior uniform load of 82.5 PSF no member in the completely assembled window shall deflect more that 1/135 of its span. Test shall be conducted in accordance of ASTME 330.

\*\* NOTE TO SPECIFIER \*\* H-HC65 (Gateway 60 inches by 99 inches). Delete if not required.

* + - * 1. Uniform Load Deflection Test: Under an interior uniform load of 97.5 PSF no member in the completely assembled window shall deflect more that 1/135 of its span. Test shall be conducted in accordance of ASTME 330.
				2. Forced Entry: Grade 10.

\*\* NOTE TO SPECIFIER \*\* Utilizes complete Thermal Break vent and master frame for optimal insulating. Delete if not required.

* + 1. Projecting Windows, Architectural / Heavy Commercial.
			1. Product: Series 600 as manufactured by Universal Window and Door, LLC.

\*\* NOTE TO SPECIFIER \*\* Delete rating not required.

* + - * 1. Rating: AP-AW 135, (Gateway 60 inches by 36 inches).
				2. Rating: AP-HC 100, (Gateway 60 inches by 32 inches).
				3. Rating: AP-AW-135 (Gateway 60 inches by 36 inches).
				4. Rating: AP-HC 100, (Gateway 60 inches by 32 inches).

\*\* NOTE TO SPECIFIER \*\* Glazing: All types available including Low-E, Soft Coat, Solar Control, Argon, Tempered, Obscure, Wire or Spandrel. Refer to glass specifications. Delete glass thickness not required.

* + - * 1. Glass: 1 inch (25 mm) clear insulating glass. The standard overall glass thickness 1/8 inch lites with an air space measured 3/4 inch created by a desiccant-filled aluminum spacer.
				2. Glass: 5/8 inch (16 mm) clear insulating glass created by a desiccant-filled aluminum spacer.
				3. Glass: 1/4 inch (6 mm) clear glass.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Window Grids: As detailed.
				2. Glazing: Both sash and fixed frames shall be channel glazed with an exterior glazing tape and an interior snap in glazing bead.
				3. Fabrication: Main frame and sash members shall have a nominal wall thickness of 0.115 inch (3 mm) and master frame depth of 2 inches (51 mm). Special tubular vent design for added strength and long life.
				4. Hardware: Project Out units shall be equipped with 1 or more cam handles on sash. Heavy duty 4 bar hinges, stainless steel with brass slide.
				5. Provide exterior installation components and interior trim as detailed and as follows:

\*\* NOTE TO SPECIFIER \*\* Delete components and trim not required.

Exterior panning systems.

Interior trim system.

Receptor systems

Nailing fin.

Flange frame.

Head expander and sill angle.

* + - 1. Projected windows to conform to the following AAMA/NWDA 101/I.S. 2-97 and AAMA 910-93 Life Cycle criteria:
				1. Air infiltration: Not to exceed .10 cfm/ft @ 6.24 psf (50 mph).
				2. Water resistance: There shall be no leakage as defined in the high performance test method with a test pressure of 15.00 psf.
				3. Torsion Test at 15 lbf.
				4. Uniform Load Deflection Test: Under an exterior uniform load of 85 psf no member in the completely assembled window shall deflect more that 1/135 of its span. Test shall be conducted in accordance of ASTME 330-70.
				5. Uniform Load Structural Test: The window shall be subjected to a uniform load. Tests shall be conducted in accordance with ASTME 330-70.

\*\* NOTE TO SPECIFIER \*\* Delete performance not required.

AP-AW 135 project out, Uniform structural load: 202.5 psf.

AP-HC 100 project out, Uniform structural load: 150 psf.

AP-AW-135 project in Uniform structural load 202.5 psf.

AP-HC 100 project in, Uniform structural load: 150 psf.

* + - * 1. Condensation Resistance Factor: The window shall be tested in accordance with AAMA 1502.6 standards and tests of thermal performance, and shall have a condensation resistance factor of no less than 54.
	1. HISTORIC STEEL AND WOOD REPLICA WINDOWS

\*\* NOTE TO SPECIFIER \*\* Allows replication of steel "floating vent" windows Utilizes complete Thermal Break vent and master frame for optimal insulating Specially designed for the narrow sightline needs of historic projects, approved on NPS funded buildings. Fixed to vent sightlines can be made even, or stepped to faithfully meet design goals. Delete if not required.

* + 1. Historic Steel and Wood Replica Windows / Heavy Commercial.
			1. Product: Series 700 Project Out/Fixed Narrow Sightline Window as manufactured by Universal Window and Door, LLC.
				1. Rating: AP-HC80 (Gateway 60 inches by 36 inches outward projecting).

\*\* NOTE TO SPECIFIER \*\* Glazing: All types available including Low-E, Soft Coat, Solar Control, Argon, Tempered, Obscure, Wire or Spandrel. Refer to glass specifications.

* + - * 1. Glass: The standard overall glass thickness of 1-1/8 inches (29 mm) with two air spaces measured 3/8 inch (9.5 mm) consisting of 3 mm RLE soft-coat Low-E/Argon gas/3mm clear annealed/Argon gas/3mm RLE soft-coat Low-E separated with Edgetech "warm edge" super spacer.

\*\* NOTE TO SPECIFIER \*\* Multiple grid options to create Simulated Divided Lite (SDL), exterior, between glass or interior. Delete if not required.

* + - * 1. Window Grids: As detailed.
				2. Glazing: Both sash and fixed frames shall be channel glazed using an exterior glazing tape and an interior snap in glazing bead.
				3. Fabrication: Main frame and sash members shall have a nominal wall thickness of 0.115 inch (3 mm) and master frame depth of 3-1/4 inches (83 mm). Special tubular vent design provides added strength and long life.
				4. Hardware: Project Out units shall be equipped with 1 or more cam handles on sash. Heavy duty 4 bar stainless hinges with brass slide.
				5. Provide exterior installation components and interior trim as detailed and as follows:

\*\* NOTE TO SPECIFIER \*\* Delete components and trim not required.

Exterior panning systems.

Interior trim system.

Receptor systems.

Self-Mulling, I-Mullions or Structural Mullions.

Flange Frame, Backer Rod Stops, Installation Clips.

Special finishes and custom Architectural finishes.

* + - 1. Projected windows to conform to the following AAMA/NWDA 101/I.S. 2-97 and AAMA 910-93 Life Cycle criteria:
				1. Air infiltration: Not to exceed .10 cfm/ft @ 6.24 psf (50 mph).
				2. Water resistance: There shall be no leakage as defined in the high performance test method with a test pressure of 15 psf.
				3. Uniform Load Structural Test: The window shall be subjected to a uniform load of 120 psf. Tests shall be conducted in accordance with ASTME 330-70.
	1. SLIDING WINDOW, COMMERCIAL

\*\* NOTE TO SPECIFIER \*\* Utilizes complete Thermal Break sash and master frame for optimal insulating value. Delete if not required.

* + 1. Sliding Window, Commercial
			1. Product: Series 900 as manufactured by Universal Window and Door.
				1. Rating: HS-C65 (Gateway 71 inches by 59 inches).

\*\* NOTE TO SPECIFIER \*\* Glazing: All types of glass are available, including Low-E, Argon, Tempered, Obscure, Wire and Spandrel. Refer to glass specifications.

* + - * 1. Glass: The overall glass thickness of 7/8 inch (22 mm) with an air space measured 5/8 inch (16 mm) created by a desiccant-filled aluminum spacer.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Window Grids: Internal Colonial grids as detailed.
				2. Glazing: Glass shall be channel glazed with a flexible vinyl-glazing channel or glazing tape and bead. Fixed lite glazed to master frame for reduced air infiltration.
				3. Fabrication: Main frame and sash members shall have a nominal wall thickness of not less that 0.062 inch (1.6 mm), sill thickness of .090 inch (2.3 mm) and master frame depth of 3-1/4 inches (83 mm). Dual assembly screws at sash corners for added strength. Tank Sill for improved water performance.
				4. Operation: Tandem rollers on each sliding panel to enhance smooth operation.
				5. Hardware: Sliding panels shall be equipped with an integral handle and spring loaded latch that shall automatically engage to locked position when window is closed.
				6. Provide exterior installation components and interior trim as detailed and as follows:

\*\* NOTE TO SPECIFIER \*\* Delete components and trim not required.

Exterior panning systems.

Interior trim system.

Receptor systems

Head Expander and Sill Angle.

Child Guard.

Vandal Screens.

Nailing fin.

* + - 1. Sliding windows to conform to the following performance criteria:
				1. Air infiltration: Not to exceed .20 cfm/ft @ 25 mph (1.57 psf).
				2. Water resistance: There shall be no leakage as defined in the high performance test method with a test pressure of 9.75 PSF.
				3. Uniform Load Deflection Test: Under an exterior uniform load of 97.5 PSF no member in the completely assembled window shall deflect more that 1/135 of its span. Test shall be conducted in accordance of ASTME 330-70.
				4. Uniform Load Structural Test: The window shall be subjected separately to an exterior uniform load of 97.5 PSF and an interior uniform load of 90 PSF. Tests shall be conducted in accordance with ASTME 330-70.
				5. Condensation Resistance Factor: The window shall be tested in accordance with AAMA 1502.6 standards and tests of thermal performance, and shall have a condensation resistance factor of no less than 53.

\*\* NOTE TO SPECIFIER \*\* Heavy Commercial design built on our 900 Series proven track record. Meeting rails optimized for increased deflection resistance without heavy sightlines. Delete if not required.

* + 1. Sliding Window / Heavy Commercial
			1. Product: Series 945 as manufactured by Universal Window and Door.
				1. Rating: HS-HC 45 (Gateway 99 inches by 79 inches).

\*\* NOTE TO SPECIFIER \*\* Glazing: All types of glass are available, including Low-E, Argon, Tempered, Obscure, Wire and Spandrel. Refer to glass specifications.

* + - * 1. Glass: The overall glass thickness of 7/8 inch (22 mm) with an air space measured 5/8 inch (16 mm) created by a desiccant-filled aluminum spacer.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Window Grids: Internal Colonial grids as detailed.
				2. Glazing: Glass shall be channel glazed with a flexible vinyl-glazing channel or glazing tape and bead. Fixed lite glazed to master frame for reduced air infiltration.
				3. Fabrication: Utilizes complete Thermal Break sash and master frame for optimal insulating value. Fixed lite glazed to the master frame for reduced air infiltration. Dual assembly screws at sash corners for added strength. Tank Sill for superior water resistance. Main frame and sash members shall have a nominal wall thickness of not less that 0.062 inch (1.6 mm), sill thickness of .090 and master frame depth of 3-1/4 inches (83 mm).
				4. Operation: Tandem rollers on each sliding panel to enhance smooth operation.
				5. Hardware: Sliding panels shall be equipped with an integral handle and spring loaded latch that shall automatically engage to locked position when window is closed.
				6. Provide exterior installation components and interior trim as detailed and as follows:

\*\* NOTE TO SPECIFIER \*\* Delete components and trim not required.

Exterior panning systems.

Interior trim system.

Receptor systems

Head Expander and Sill Angle.

Child Guard.

Vandal Screens.

Nailing fin.

* + - 1. Sliding windows to conform to the following performance criteria:
				1. Air infiltration: Not to exceed .20 cfm/ft @ 50 mph (6.24 psf)
				2. Water resistance: There shall be no leakage as defined in the high performance test method with a test pressure of 9.00 PSF.
				3. Uniform Load Deflection Test: Under an exterior uniform load of 67.5 PSF no member in the completely assembled window shall deflect more that 1/135 of its span. Test shall be conducted in accordance of ASTME 330-70.
				4. Condensation Resistance Factor: The window shall be tested in accordance with AAMA 1502.6 standards and tests of thermal performance, and shall have a condensation resistance factor of no less than 53.
	1. FABRICATI0N
		1. Aluminum shall be of commercial quality aluminum alloy 6063-T5 free from defects impairing strength durability. All window members shall be of extruded aluminum and shall have a guaranteed minimum ultimate tensile strength of 22,000 PSI, and a yield of 670,000 PSI. Secondary members such as self-alignment clips, weatherstripping, guides and components shall be made of a suitable and compatible material.
		2. Muntins and grids shall be of configurations shown on drawings.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Paint Finish: Standard finish shall be electrostatically applied baked-on acrylic color finish, with a 5-stage chromate undercoating conforming to AAMA 603.8 standards. Color as selected by architect from manufacturer's standard. Finish shall conform to AAMA 603.8 standard.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Chemical Finish: Clear anodized.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction.
			1. Windows shall be installed, plumb and square, and properly shimmed.
			2. Windows shall be installed in strict accordance with approved shop drawings.
	4. PROTECTION
		1. Protect installed products until completion of project.
		2. Clean interior and exterior surfaces of window units of mortar, plaster, paint spattering spots, and other foreign matter to present a neat appearance and to prevent fouling of weathering surfaces and weatherstripping, and to prevent interference with the operation of hardware.
		3. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION