

This CSI Short Form Guide Specification implements the CSI Manual of Practice principle of cross referencing Division I sections for administrative and procedural requirements affecting more than one section. Cross references are also made to other specification sections within the Project Manual for work directly affecting the work described in this section. This cross referencing procedure avoids duplication of information. Cross references must be edited to reference only those sections used in the Project Manual. Specifier — Edit the following, adding and deleting as required for each project.

SECTION 08520 ALUMINUM WINDOWS

Series 250 Thermal C40/C30 Single Hung Windows

PART 1 GENERAL

1.01 Work Included

- A. Furnish and install aluminum commercial windows complete with hardware and related components as shown on drawings and specified in this section.
- B. All windows shall be WinTech Series 250 Thermal C40 (48" x 72")/ C30 (56" x 91") Single Hung. Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen (15) days prior to close of bidding.
 - 1. A sample window, '2'-0" x 3'-0" single unit, as per requirements of architect.
 - 2. Test reports documenting compliance with requirements of Section 1.05.

Specify glass and glazing in this section if window assemblies are to be glazed by the window manufacturer. If glazing is to be done by a different contractor, glass and glazing should be specified in Section 08800. WinTech recommends that the window manufacturer perform the glazing.

- C. Glass and Glazing
 - 1. All units shall be factory glazed.

OR

- 1. Reference Section 08800 for Glass and Glazing.

List work and materials related to this section but specified in other sections

1.02 Related Work

- A. Section 08400 - Entrances and Storefronts
- B. Section 08400 - Balanced Door Assemblies
- C. Section 08520 - Glazed Patio Doors
- D. Section 08900 - Glazed Curtain Walls
- E. Section 08960 - Slope Glazing Systems
- F. Section 10200 - Extruded Aluminum Sun Shading Device

1.03 Items Furnished but Not Installed

1.04 Items Installed but Not Furnished

1.05 Testing and Performance Requirements

- A. Test Units
 - 1. Air, water, and structural test unit shall conform to requirements set forth in AAMA/WDMA/CSA101/I.S.2/A440-05.
 - 2. Thermal test unit sizes shall be 4'-0" x 6'-0". Unit shall consist of a single hung window.
- B. Test Procedures and Performances
 - 1. Windows shall conform to all requirements for the window type referenced in 1.01.B. In addition, the following specific performance requirements shall be met.
 - 2. Air Infiltration Test
 - a. With window sash closed and locked, test unit in accordance with ASTM E 283 at a static air pressure difference of 1.56 psf.
 - b. Air infiltration shall not exceed 15 cfm per square foot.
 - 3. Water Resistance Test
 - a. With window sash closed and locked, test unit in accordance with ASTM E 331/ASTM E 547 at a static air pressure difference of 6.00 psf.
 - b. There shall be no uncontrolled water leakage.
 - 4. Uniform Load Structural Test
 - a. With window sash closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 45 psf, both positive and negative at H-C30 (56" x 91"), and 60 psf, both positive and negative at HC 40, (48" x 72"),
 - b. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause the window to be inoperable.
 - 5. Forced Entry Resistance
 - a. Windows shall be tested in accordance to ASTM F 588 or AAMA 1302.5 and meet the requirements of performance level 10.
 - 6. Condensation Resistance Test (CRF)
 - a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Condensation Resistance Factor (CRF) shall not be less than () (frame).
 - 7. Thermal Transmittance Test (Conductive U-Value)
 - a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Conductive thermal transmittance (U-Value) shall not be more than () BTU/hr/ft²/°F.

Unless otherwise specified, windows tested for condensation resistance and thermal transmittance shall be glazed with no more than two lites of clear, uncoated, annealed glass. Sealed insulating glass shall be of standard construction.

1.06 Quality Assurance

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the window manufacturer's letter of certification, stating the tested window meets or exceeds the referenced criteria for the appropriate window type.

1.07 References

1.08 Submittals

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

1.09 Delivery, Storage, and Handling

1.10 Warranties

- A. Total Window System
 - 1. The responsible contractor shall assume full responsibility and warrant for one (1) year the satisfactory performance of the total window installation which includes that of the windows, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
 - 2. Further, the responsible contractor shall warrant for five (5) years the seal integrity of the insulating glass.
 - 3. Any deficiencies during the warranty period due to such elements not meeting the specifications shall be corrected per the provisions of the warranty by the responsible contractor at his expense.

PART 2 PRODUCTS

2.01 Materials

- A. Aluminum
 - 1. Extruded aluminum shall be 6063-T5 or T6 alloy and tempered.
- B. Hardware
 - 1. Sweep latches shall be white bronze.
- C. Balances
 - 1. Balances shall be spiral balances.

Select balance required for balance performance class.

Class 5, High Performance

- 1. Balances shall be of appropriate size and capacity to hold sash in position in accordance with AAMA 101, Section 2.2.1.3.2, and AAMA 902, Section 8.1.
 - 2. Balances shall be high performance sash balances that are tested in accordance with AAMA902 "Voluntary Specification for Sash Balances".
 - 3. Balances shall meet all minimum AAMA 902 Class 5 requirements with a minimum .30 Manually Applied Force ratio (MAF).
 - 4. Balances shall be attached to a locking carrier system that slides on extruded rails in the jamb channels. Sash shall be field removable for installation and maintenance. Mounting brackets that are screw attached to the sash will not be allowed.
- D. Weather-Strip
 - 1. All primary weather-strip shall be Pile with Fin.

WinTech recommends that the window manufacturer furnish and factory glaze the glass as specified by the architect. For this reason it is desirable that Glass and Glazing be made part of this section.

- E. Glass
 - 1. Insulating glass shall be 5/8 inch over all unit thickness, manufactured by WinTech consisting of:
 - a. () Exterior lite
 - b. Glass spacer to be the DuraSeal high performance flexible spacer system (as manufactured by TruSeal Corp) or equal
 - c. () Interior lite

F. Thermal Barrier

1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
2. The perimeter frame, sash and intermediate rail thermal barrier shall be poured and debridged thermal barrier made of two-part polyurethane.
3. At least the window frame sill extrusion shall have a mechanically staked system consisting of alternating aluminum cleats no more than one inch on center along the thermal barrier pocket. This is intended to minimize the effects of thermal barrier dry shrinkage.

2.02 Fabrication

A. General

1. All aluminum frame and vent extrusions shall have a minimum wall thickness of .062”.
2. Mechanical fasteners and hardware items shall not bridge thermal barriers. Thermal barriers shall align at all frame and vent corners.
3. Depth of frame and vent shall not be less than 2 ½”.

B. Frame

1. Frame components shall be mechanically fastened. All window frame and meeting rail horizontal to vertical corners shall be sealed with closed cell polyethylene gaskets to prevent water migration.

Applicable only to windows requiring screens.

C. Screens

1. Screen frames shall be roll formed.
2. Screen mesh shall be aluminum or fiberglass.

D. Glazing

1. All units shall be glazed with a pumpable silicone backbed with .040” glass spacer beads. Glass shall be held in place by a removable, extruded aluminum, glazing bead. Vinyl glazing beads not permitted. The aluminum glazing bead must be isolated from the glass by a pull-in glazing vinyl.

E. Finish

See separate finish specification for more details.

1. Anodic

- a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association Designation AA-M10-C22-(). Color shall be ().

Available colors are clear and dark bronze

AA Description	Description	Arch. Class	AAMA Guide Spec.
AA-M10-C22-A41	Clear Anodized	I	611-98
AA-M10-C22-A44	Color Anodized	I	611-98

OR

1. Organic

Finish all exposed areas of aluminum windows and components with manufacturer's standard baked-on polyester paint system in accordance with AAMA Guide Specification 2603-98. Color shall be ().

Available colors are manufacturer's standard bronze or manufacturer's standard white

OR

- 2. Organic
Finish all exposed areas of aluminum windows and components with high performance ()% PVDF fluoropolymer resin based paint system. Color shall be ().

High performance 70% PVDF fluoropolymer and 50% PVDF fluoropolymer finishes are available in standard and custom colors

AA Description	Description	AAMA Guide Spec.
AA-M12-C42-R1X	70% PVDF fluoropolymer	2605-98
AA-M12-C42-R1X	50% PVDF fluoropolymer	2604-98

PART 3 EXECUTION

3.01 Inspection

- A. Job Conditions
 - 1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

3.02 Installation

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Plumb and align window faces in a single plane for each wall plane, and erect windows and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.
- C. Adjust windows for proper operation after installation.
- D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

3.03 Anchorage

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

3.04 Protection and Cleaning

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

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SECTION 08520 ALUMINUM WINDOWS

Series 250 Thermal HS-C40 Horizontal Sliding Windows

PART 1 GENERAL

1.01 Work Included

- A. Furnish and install aluminum commercial windows complete with hardware and related components as shown on drawings and specified in this section.
- B. All windows shall be WinTech Series 250 Thermal C40 (71" x 60") Horizontal Sliding. Other manufacturers requesting approval to bid their product as equal must submit the following information fifteen days prior to close of bidding.
 - 1. A sample window, 3'-0" x 2'-0" single unit, as per requirements of architect.
 - 2. Test reports documenting compliance with requirements of Section 1.05.

Specify glass and glazing in this section if window assemblies are to be glazed by the window manufacturer. If glazing is to be done by a different contractor, glass and glazing should be specified in Section 08800. WinTech recommends that the window manufacturer perform the glazing.

- C. Glass and Glazing
 - 1. All units shall be factory glazed.

OR

- 1. Reference Section 08800 for Glass and Glazing.

List work and materials related to this section but specified in other sections

1.02 Related Work

- A. Section 08400 - Entrances and Storefronts
- B. Section 08400 - Balanced Door Assemblies
- C. Section 08520 - Glazed Patio Doors
- D. Section 08900 - Glazed Curtain Walls
- E. Section 08960 - Slope Glazing Systems
- F. Section 10200 - Extruded Aluminum Sun Shading Device

1.03 Items Furnished but Not Installed

1.04 Items Installed but Not Furnished

1.05 Testing and Performance Requirements

- A. Test Units
 - 1. Air, water, and structural test unit shall conform to requirements set forth in AAMA/WDMA/CSA101/I.S.2/A440-05.
 - 2. Thermal test unit sizes shall be 4'-0" x 6'-0". Unit shall consist of a single horizontal sliding window.
- B. Test Procedures and Performances
 - 1. Windows shall conform to all requirements for the window type referenced in 1.01.B. In addition, the following specific performance requirements shall be met.
 - 2. Air Infiltration Test
 - a. With window sash closed and locked, test unit in accordance with ASTM E 283 at a static air pressure difference of 1.57 psf.
 - b. Air infiltration shall not exceed .15 cfm per square foot.
 - 3. Water Resistance Test
 - a. With window sash closed and locked, test unit in accordance with ASTM E 331/ASTM E 547 at a static air pressure difference of 6.0 psf.
 - b. There shall be no uncontrolled water leakage.
 - 4. Uniform Load Deflection Test
 - a. With window sash closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 40.0 psf, positive and negative pressure.
 - b. No member shall deflect over L/175 of its span.
 - 5. Uniform Load Structural Test
 - a. With window sash closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 60.0 psf, both positive and negative.
 - b. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause the window to be inoperable.
 - 6. Forced Entry Resistance
 - a. Windows shall be tested in accordance to ASTM F 588 or AAMA 1302.5 and meet the requirements of performance level 10.
 - 7. Condensation Resistance Test (CRF)
 - a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Condensation Resistance Factor (CRF) shall not be less than 55 (frame) and 62 (glass ¼" VE1-2M, ¼ CLR).
 - 8. Thermal Transmittance Test (Conductive U-Value)
 - a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Conductive thermal transmittance (U-Value) shall not be more than 0.56 BTU/hr/ft²/°F.

Unless otherwise specified, windows tested for condensation resistance and thermal transmittance shall be glazed with no more than two lites of clear, uncoated, annealed glass. Sealed insulating glass shall be of standard construction.

1.06 Quality Assurance

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the window manufacturer's letter of certification, stating the tested window meets or exceeds the referenced criteria for the appropriate window type.

1.07 References

1.08 Submittals

- A. Contractor, as may be requested, shall submit drawings, finish samples, test reports, and

warranties.

1. Samples of materials may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.

1.09 Delivery, Storage, and Handling

1.10 Warranties

A. Total Window System

1. The responsible contractor shall assume full responsibility and warrant for one (1) year the satisfactory performance of the total window installation which includes that of the windows, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
2. Further, the responsible contractor shall warrant for five (5) years the seal integrity of the insulating glass.
3. Any deficiencies during the warranty period due to such elements not meeting the specifications shall be corrected per the provisions of the warranty by the responsible contractor at his expense.

PART 2 PRODUCTS

2.01 Materials

A. Aluminum

1. Extruded aluminum shall be 6063-T5 or T6 alloy and tempered.

B. Hardware

1. Sweep latches will be white bronze
2. Sash shall ride on bronze roller with Stainless Steel axle and a raised track, so dirt will not interfere with normal operation.

C. Weather-Strip

1. All primary weather-strip shall be Pile with fin or equal.

WinTech recommends that the window manufacturer furnish and factory glaze the glass as specified by the architect. For this reason it is desirable that Glass and Glazing be made part of this section.

D. Glass

1. Insulating glass shall be 5/8 inch over all unit thickness, manufactured by WinTech consisting of:
 - a. () Exterior lite
 - b. Glass spacer to be the DuraSeal high performance flexible spacer system (as manufactured by TruSeal Corp) or equal
 - c. () Interior lite

E. Thermal Barrier

1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
2. The perimeter frame, sash and intermediate rail thermal barrier shall be poured and debridged thermal barrier made of two-part polyurethane.
3. At least the window frame sill extrusion shall have a mechanically staked system consisting of alternating aluminum cleats no more than one (1) inch on center along the thermal barrier

pocket. This is intended to minimize the effects of thermal barrier dry shrinkage.

2.02 Fabrication

A. General

1. All aluminum frame and vent extrusions shall have a minimum wall thickness of .062”.
2. Mechanical fasteners and hardware items shall not bridge thermal barriers. Thermal barriers shall align at all frame and vent corners.
3. Depth of frame and vent shall not be less than 2 ½”.

B. Frame

1. Frame components shall be mechanically fastened. All window frame and meeting rail horizontal to vertical corners shall be sealed with closed cell polyethylene gaskets to prevent water migration.

C. Sash

1. All sash extrusions shall have a minimum wall thickness of .062.
2. Sash vertical members shall telescope into the sash horizontals and be mechanically fastened.
3. The sash shall be single or double weather-stripped.

Applicable only to windows requiring screens.

D. Screens

1. Half screens only shall be permitted. The screen shall not be surface mounted.
2. Screen frames shall be extruded aluminum.
3. Screen mesh shall be aluminum or fiberglass.

E. Glazing

1. All lites (both sash and fixed) of the horizontal sliding window shall be inside glazed and weeped.
2. All units shall be glazed with the manufacturer’s standard sealant process provided the glass is held in place by a removable, extruded aluminum, glazing bead. The glazing bead must be isolated from the glazing material by a gasket.

F. Finish

See separate finish specification for more details.

1. Anodic

- a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association Designation AA-M10-C22-(). Color shall be ().

Available colors are clear and dark bronze

AA Description	Description	Arch. Class	AAMA Guide Spec.
AA-M10-C22-A41	Clear Anodized	I	611-98
AA-M10-C22-A44	Color Anodized	I	611-98

OR

1. Organic

Finish all exposed areas of aluminum windows and components with manufacturer’s standard baked-on polyester paint system in accordance with AAMA Guide Specification 2603-98. Color shall be ().

Available colors are manufacturer’s standard bronze or manufacturer’s standard white

OR

2. Organic

Finish all exposed areas of aluminum windows and components with high performance ()% PVDF fluoropolymer resin based paint system. Color shall be ().

High performance 70% PVDF fluoropolymer and 50% PVDF fluoropolymer finishes are available in standard and custom colors

AA Description	Description	AAMA Guide Spec.
AA-M12-C42-R1X	70% PVDF fluoropolymer	2605-98
AA-M12-C42-R1X	50% PVDF fluoropolymer	2604-98

PART 3 EXECUTION

3.01 Inspection

A. Job Conditions

1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

3.02 Installation

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Plumb and align window faces in a single plane for each wall plane, and erect windows and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.
- C. Adjust windows for proper operation after installation.
- D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

3.03 Anchorage

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

3.04 Protection and Cleaning

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

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SECTION 08520 ALUMINUM WINDOWS

Series 250 Thermal F-C60 Grade Fixed Windows

PART 1 GENERAL

1.01 Work Included

- A. Furnish and install aluminum commercial windows complete with related components as shown on drawings and specified in this section.
- B. All windows shall be WinTech Series 250 Thermal F-C60 (60" x 71") Fixed. Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen (15) days prior to close of bidding.
 - 1. A sample window, 3'-0" x 2'-0" single unit, as per requirements of architect.
 - 2. Test reports documenting compliance with requirements of Section 1.05.

Specify glass and glazing in this section if window assemblies are to be glazed by the window manufacturer. If glazing is to be done by a different contractor, glass and glazing should be specified in Section 08800. WinTech recommends that the window manufacturer perform the glazing.

- C. Glass and Glazing
 - 1. All units shall be factory glazed.

OR

- 1. Reference Section 08800 for Glass and Glazing.

List work and materials related to this section but specified in other sections

1.02 Related Work

- A. Section 08400 - Entrances and Storefronts
- B. Section 08400 - Balanced Door Assemblies
- C. Section 08520 - Glazed Patio Doors
- D. Section 08900 - Glazed Curtain Walls
- E. Section 08960 - Slope Glazing Systems
- F. Section 10200 - Extruded Aluminum Sun Shading Device

1.03 Items Furnished but Not Installed

1.04 Items Installed but Not Furnished

1.05 Testing and Performance Requirements

- A. Test Units
 - 1. Air, water, and structural test unit shall conform to requirements set forth in AAMA/WDMA/CSA101/I.S.2/A440-05.
 - 2. Thermal test unit sizes shall be 4'-0" x 6'-0". Unit shall consist of a fixed window.
- B. Test Procedures and Performances
 - 1. Windows shall conform to all requirements for the window type referenced in 1.01.B. In addition, the following specific performance requirements shall be met.
 - 2. Air Infiltration Test
 - a. Test unit in accordance with ASTM E 283 at a static air pressure difference of 1.57 psf.
 - b. Air infiltration shall not exceed .10 cfm per square foot.
 - 3. Water Resistance Test
 - a. Test unit in accordance with ASTM E 331/ASTM E 547 at a static air pressure difference of 9.00 psf.
 - b. There shall be no uncontrolled water leakage.
 - 4. Uniform Load Deflection Test
 - a. Test unit in accordance with ASTM E 330 at a static air pressure difference of 50 psf positive and negative pressure.
 - 5. Uniform Load Structural Test
 - a. Test unit in accordance with ASTM E 330 at a static air pressure difference of 90 psf, both positive and negative.
 - b. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause the window to be inoperable.
 - 6. Forced Entry Resistance
 - a. Windows shall be tested in accordance to ASTM F 588 or AAMA 1302.5 and meet the requirements of performance level 10.
 - 7. Condensation Resistance Test (CRF)
 - a. Test unit in accordance with AAMA 1503.1.
 - b. Condensation Resistance Factor (CRF) shall not be less than 50.
 - 8. Thermal Transmittance Test (Conductive U-Value)
 - a. Test unit in accordance with AAMA 1503.1.
 - b. Conductive thermal transmittance (U-Value) shall not be more than 0.60 BTU/hr/ft²/°F.

Unless otherwise specified, windows tested for condensation resistance and thermal transmittance shall be glazed with no more than two lites of clear, uncoated, annealed glass. Sealed insulating glass shall be of standard construction.

1.06 Quality Assurance

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the window manufacturer's letter of certification, stating the tested window meets or exceeds the referenced criteria for the appropriate A440-05 window type.

1.07 References

1.08 Submittals

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

1.09 Delivery, Storage, and Handling

1.10 Warranties

A. Total Window System

1. The responsible contractor shall assume full responsibility and warrant for one (1) year the satisfactory performance of the total window installation which includes that of the windows, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
2. Further, the responsible contractor shall warrant for five (5) years the seal integrity of the insulating glass.
3. Any deficiencies during the warranty period due to such elements not meeting the specifications shall be corrected per the provisions of the warranty by the responsible contractor at his expense.

PART 2 PRODUCTS

2.01 Materials

A. Aluminum

1. Extruded aluminum shall be 6063-T5 or T6 alloy and tempered.

C. Weather-Strip

1. All weather-strip shall be PVC or equal.

D. Thermal Barrier

1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
2. The perimeter frame, sash and intermediate rail thermal barrier shall be a poured and debridged thermal barrier made of two-part polyurethane.
3. At least the window frame sill extrusion shall have a mechanically staked system consisting of alternating aluminum cleats no more than one inch on center along the thermal barrier pocket. This is intended to minimize the effects of thermal barrier dry shrinkage.

WinTech recommends that the window manufacturer furnish and factory glaze the glass as specified by the architect. For this reason it is desirable that Glass and Glazing be made part of this section.

E. Glass

1. Insulating glass shall be a 1 inch over all unit thickness, manufactured by WinTech consisting of:
 - a. () Exterior lite
 - b. Glass spacer to be the DuraSeal high performance flexible spacer system (as manufactured by TruSeal Corp) or equal
 - c. () Interior lite

2.02 Fabrication

A. General

1. All aluminum frame and vent extrusions shall have a minimum wall thickness of .062".
2. Mechanical fasteners and hardware items shall not bridge thermal barriers. Thermal barriers shall align at all frame and vent corners.
3. Depth of frame and vent shall not be less than 2 ½".

B. Frame

1. Frame components shall be mechanically fastened. All window frame and meeting rail horizontal to vertical corners shall be sealed with closed cell polyethelene gaskets to prevent water migration.

C. Glazing

All units shall be glazed with a pumpable silicone backbed with .040” glass spacer beads. Glass shall be held in place by a removable, extruded aluminum, glazing bead. Vinyl glazing beads not permitted. The aluminum glazing bead must be isolated from the glass by a pull-in glazing vinyl.

D. Finish

See separate finish specification for more details.

1. Anodic
 - a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association Designation AA-M10-C22-(). Color shall be ().

Available colors are clear and dark bronze

AA Description	Description	Arch. Class	AAMA Guide Spec.
AA-M10-C22-A41	Clear Anodized	I	611-98
AA-M10-C22-A44	Color Anodized	I	611-98

OR

1. Organic

Finish all exposed areas of aluminum windows and components with manufacturer’s standard baked-on polyester paint system in accordance with AAMA Guide Specification 2603-98. Color shall be ().

Available colors are manufacturer’s standard bronze or manufacturer’s standard white

OR

2. Organic

Finish all exposed areas of aluminum windows and components with high performance ()% PVDF fluoropolymer resin based paint system. Color shall be ().

High performance 70% PVDF fluoropolymer and 50% PVDF fluoropolymer finishes are available in standard and custom colors

AA Description	Description	AAMA Guide Spec.
AA-M12-C42-R1X	70% PVDF fluoropolymer	2605-98
AA-M12-C42-R1X	50% PVDF fluoropolymer	2604-98

PART 3 EXECUTION

3.01 Inspection

- A. Job Conditions

1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

3.02 Installation

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Plumb and align window faces in a single plane for each wall plane, and erect windows and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.
- C. Adjust windows for proper operation after installation.
- D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

3.03 Anchorage

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

3.04 Protection and Cleaning

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

12/08/2005

This CSI Short Form Guide Specification implements the CSI Manual of Practice principle of cross referencing Division I sections for administrative and procedural requirements affecting more than one section. Cross references are also made to other specification sections within the Project Manual for work directly affecting the work described in this section. This cross referencing procedure avoids duplication of information. Cross references must be edited to reference only those sections used in the Project Manual. Specifier — Edit the following, adding and deleting as required for each project.

SECTION 08520 ALUMINUM WINDOWS

Series 250 Thermal AP-C50 Grade Projected Windows

PART 1 GENERAL

1.01 Work Included

- A. Furnish and install aluminum commercial windows complete with hardware and related components as shown on drawings and specified in this section.
- B. All windows shall be WinTech Series 250 Thermal AP-C50 (48" x 96") Projected (FX/PO/FX/PI). Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen (15) days prior to close of bidding.
 - 1. A sample window, 3'-0" x 2'-0" single unit, as per requirements of architect.
 - 2. Test reports documenting compliance with requirements of Section 1.05.

Specify glass and glazing in this section if window assemblies are to be glazed by the window manufacturer. If glazing is to be done by a different contractor, glass and glazing should be specified in Section 08800. WinTech recommends that the window manufacturer perform the glazing.

- C. Glass and Glazing
 - 1. All units shall be factory glazed.

OR

- 1. Reference Section 08800 for Glass and Glazing.

List work and materials related to this section but specified in other sections

1.02 Related Work

- A. Section 08400 - Entrances and Storefronts
- B. Section 08400 - Balanced Door Assemblies
- C. Section 08520 - Glazed Patio Doors
- D. Section 08900 - Glazed Curtain Walls
- E. Section 08960 - Slope Glazing Systems
- F. Section 10200 - Extruded Aluminum Sun Shading Device

1.03 Items Furnished but Not Installed

1.04 Items Installed but Not Furnished

1.05 Testing and Performance Requirements

- A. Test Units
 - 1. Air, water, and structural test unit shall conform to requirements set forth in AAMA/WDMA/CSA101/I.S.2/A440-05.
 - 2. Thermal test unit sizes shall be 48" x 72". Unit shall consist of a project-out over fixed over project-in window.
- B. Test Procedures and Performances
 - 1. Windows shall conform to all ANSI/AAMA/NWWDA 101/I.S.2/NAFS-02 requirements for the window type referenced in 1.01.B. In addition, the following specific performance requirements shall be met.
 - 2. Air Infiltration Test
 - a. With ventilators closed and locked, test unit in accordance with ASTM E 283 at a static air pressure difference of 1.57 psf.
 - b. Air infiltration shall not exceed .10 cfm per square foot.
 - 3. Water Resistance Test
 - a. With ventilators closed and locked, test unit in accordance with ASTM E 331/ASTM E 547 at a static air pressure difference of 7.50 psf.
 - b. There shall be no uncontrolled water leakage.
 - 4. Uniform Load Deflection Test
 - a. With ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 50 psf positive and negative pressure.
 - 5. Uniform Load Structural Test
 - a. With ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 75 psf, both positive and negative.
 - b. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause the window to be inoperable.
 - 6. Forced Entry Resistance
 - a. Windows shall be tested in accordance to ASTM F 588 or AAMA 1302.5 and meet the requirements of performance level 10.
 - 7. Condensation Resistance Test (CRF)
 - a. With ventilators closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Condensation Resistance Factor (CRF) shall not be less than 50.
 - 8. Thermal Transmittance Test (Conductive U-Value)
 - a. With ventilators closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Conductive thermal transmittance (U-Value) shall not be more than 0.60 BTU/hr/ft²/°F.

Unless otherwise specified, windows tested for condensation resistance and thermal transmittance shall be glazed with no more than two lites of clear, uncoated, annealed glass. Sealed insulating glass shall be of standard construction.

1.06 Quality Assurance

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the window manufacturer's letter of certification, stating the tested window meets or exceeds the referenced criteria for the appropriate ANSI/AAMA/NWWDA 101/I.S.2/NAFS-02 window type.

1.07 References

1.08 Submittals

- A. Contractor, as may be requested, shall submit drawings, finish samples, test reports, and

warranties.

1. Samples of materials may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.

1.09 Delivery, Storage, and Handling

1.10 Warranties

A. Total Window System

1. The responsible contractor shall assume full responsibility and warrant for one (1) year the satisfactory performance of the total window installation which includes that of the windows, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
2. Further, the responsible contractor shall warrant for five (5) years the seal integrity of the insulating glass.
3. Any deficiencies during the warranty period due to such elements not meeting the specifications shall be corrected per the provisions of the warranty by the responsible contractor at his expense.

PART 2 PRODUCTS

2.01 Materials

A. Aluminum

1. Extruded aluminum shall be 6063-T5 or T6 alloy and tempered.

B. Hardware

1. Locking handles shall be cam type and manufactured from a white bronze alloy with a US25D brushed finish.
2. Operating hardware shall be 4-bar stainless steel arms or equal.

C. Weather-Strip

1. All weather-strip shall be Dual Durometer Vinyl Bulb or equal.

D. Thermal Barrier

1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
2. The perimeter frame, sash and intermediate rail thermal barrier shall be a poured and debridged thermal barrier made of two-part polyurethane.
3. At least the window frame sill extrusion shall have a mechanically staked system consisting of alternating aluminum cleats no more than one inch on center along the thermal barrier pocket. This is intended to minimize the effects of thermal barrier dry shrinkage.

WinTech recommends that the window manufacturer furnish and factory glaze the glass as specified by the architect. For this reason it is desirable that Glass and Glazing be made part of this section.

E. Glass

1. Insulating glass shall be a 1 inch over all unit thickness, manufactured by WinTech consisting of:
 - a. () Exterior lite
 - b. Glass spacer to be the DuraSeal high performance flexible spacer system (as manufactured by TruSeal Corp) or equal
 - c. () Interior lite

2.02 Fabrication

- A. General
 - 1. All aluminum frame and vent extrusions shall have a minimum wall thickness of .062”.
 - 2. Mechanical fasteners and hardware items shall not bridge thermal barriers. Thermal barriers shall align at all frame and vent corners.
 - 3. Depth of frame and vent shall not be less than 2 ½”.
- B. Frame
 - 1. Frame components shall be mechanically fastened. All window frame and meeting rail horizontal to vertical corners shall be sealed with closed cell polyethelene gaskets to prevent water migration.
- C. Ventilator
 - 1. All vent extrusions shall be tubular.
 - 2. Each corner shall be mitered, reinforced with an extruded corner key, and hydraulically crimped.
 - 3. Each vent shall utilize two rows of weather stripping installed in specifically designed dovetail grooves in the extrusion. The exterior gasket will be omitted at the vent bottom rail for project-out vents and at the vent top rail for project-in vents, allowing air to pressure equalize the void between the vents and frame.

Applicable only to windows requiring screens.

- D. Screens
 - 1. Screen frames shall be extruded.
 - 2. Screen mounting holes in the window frame shall be factory drilled and screens factory installed.
 - 3. Screen mesh shall be aluminum or fiberglass.
- E. Glazing
 - 1. All units shall be glazed with a pumpable silicone backbed with .040” glass spacer beads. Glass shall be held in place by a removable, extruded aluminum, glazing bead. Vinyl glazing beads not permitted. The aluminum glazing bead must be isolated from the glass by a pull-in glazing vinyl.
- F. Finish

See separate finish specification for more details.

- 1. Anodic
 - a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association Designation AA-M10-C22-(). Color shall be ().

Available colors are clear and dark bronze

AA Description	Description	Arch. Class	AAMA Guide Spec.
AA-M10-C22-A41	Clear Anodized	I	611-98
AA-M10-C22-A44	Color Anodized	I	611-98

OR

- 1. Organic
 - Finish all exposed areas of aluminum windows and components with manufacturer's standard baked-on polyester paint system in accordance with AAMA Guide Specification 2603-98. Color shall be ().

Available colors are manufacturer's standard bronze or manufacturer's standard white

OR

2. Organic

Finish all exposed areas of aluminum windows and components with high performance ()% PVDF fluoropolymer resin based paint system. Color shall be ().

High performance 70% PVDF fluoropolymer and 50% PVDF fluoropolymer finishes are available in standard and custom colors

AA Description	Description	AAMA Guide Spec.
AA-M12-C42-R1X	70% PVDF fluoropolymer	2605-98
AA-M12-C42-R1X	50% PVDF fluoropolymer	2604-98

PART 3 EXECUTION

3.01 Inspection

- A. Job Conditions
 - 1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

3.02 Installation

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Plumb and align window faces in a single plane for each wall plane, and erect windows and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.
- C. Adjust windows for proper operation after installation.
- D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

3.03 Anchorage

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

3.04 Protection and Cleaning

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

12/08/2005

- A. Test Units
 - 1. Air, water, and structural test unit shall conform to requirements set forth in AAMA/WDMA/CSA101/I.S.2/ A440-05.
 - 2. Thermal test unit sizes shall be 4'-0" x 6'-0". Unit shall consist of a single horizontal sliding window.
- B. Test Procedures and Performances
 - 1. Windows shall conform to all requirements for the window type referenced in 1.01.B. In addition, the following specific performance requirements shall be met.
 - 2. Air Infiltration Test
 - a. With window sash closed and locked, test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf.
 - b. Air infiltration shall not exceed .10 cfm per square foot.
 - 3. Water Resistance Test
 - a. With window sash closed and locked, test unit in accordance with ASTM E 331/ASTM E 547 at a static air pressure difference of 6.0 psf.
 - b. There shall be no uncontrolled water leakage.
 - 4. Uniform Load Deflection Test
 - a. With window sash closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 40.0 psf, positive and negative pressure.
 - b. No member shall deflect over L/175 of its span.
 - 5. Uniform Load Structural Test
 - a. With window sash closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 60.0 psf, both positive and negative.
 - b. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause the window to be inoperable.
 - 6. Forced Entry Resistance
 - a. Windows shall be tested in accordance to ASTM F 588 or AAMA 1302.5 and meet the requirements of performance level 10.
 - 7. Condensation Resistance Test (CRF)
 - a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Condensation Resistance Factor (CRF) shall not be less than 55 (frame) and 62 (glass ¼" VE1-2M, ¼ CLR).
 - 8. Thermal Transmittance Test (Conductive U-Value)
 - a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Conductive thermal transmittance (U-Value) shall not be more than 0.56 BTU/hr/ft²/°F.

Unless otherwise specified, windows tested for condensation resistance and thermal transmittance shall be glazed with no more than two lites of clear, uncoated, annealed glass. Sealed insulating glass shall be of standard construction.

1.06 Quality Assurance

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the window manufacturer's letter of certification, stating the tested window meets or exceeds the referenced criteria for the appropriate window type.

1.07 References

1.08 Submittals

- A. Contractor, as may be requested, shall submit drawings, finish samples, test reports, and

warranties.

1. Samples of materials may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.

1.09 Delivery, Storage, and Handling

1.10 Warranties

A. Total Window System

1. The responsible contractor shall assume full responsibility and warrant for one (1) year the satisfactory performance of the total window installation which includes that of the windows, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
2. Further, the responsible contractor shall warrant for five (5) years the seal integrity of the insulating glass.
3. Any deficiencies during the warranty period due to such elements not meeting the specifications shall be corrected per the provisions of the warranty by the responsible contractor at his expense.

PART 2 PRODUCTS

2.01 Materials

A. Aluminum

1. Extruded aluminum shall be 6063-T5 or T6 alloy and tempered.

B. Hardware

1. Cam handles will be white bronze
2. Stainless steel casement arms.

C. Weather-Strip

1. All primary weather-strip shall be Dual Durometer Vinyl Bulb or equal.

WinTech recommends that the window manufacturer furnish and factory glaze the glass as specified by the architect. For this reason it is desirable that Glass and Glazing be made part of this section.

D. Glass

1. Insulating glass shall be 1" inch over all unit thickness, manufactured by WinTech consisting of:
 - a. () Exterior lite
 - b. Glass spacer to be the DuraSeal high performance flexible spacer system (as manufactured by TruSeal Corp) or equal
 - c. () Interior lite

E. Thermal Barrier

1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
2. The perimeter frame, sash and intermediate rail thermal barrier shall be poured and debridged thermal barrier made of two-part polyurethane.
3. At least the window frame sill extrusion shall have a mechanically staked system consisting of alternating aluminum cleats no more than one inch on center along the thermal barrier pocket. This is intended to minimize the effects of thermal barrier dry shrinkage.

2.02 Fabrication

A. General

- 1. All aluminum frame and vent extrusions shall have a minimum wall thickness of .062”.
- 2. Mechanical fasteners and hardware items shall not bridge thermal barriers. Thermal barriers shall align at all frame and vent corners.
- 3. Depth of frame and vent shall not be less than 2 ½”.

B. Frame

- 1. Frame components shall be mechanically fastened. All window frame and meeting rail horizontal to vertical corners shall be sealed with closed cell polyethelene gaskets to prevent water migration.

C. Sash

- 1. All sash extrusions shall have a minimum wall thickness of .062.
- 2. Sash vertical members shall telescope into the sash horizontals and be mechanically fastened.
- 3. The sash shall be single or double weather-stripped.

Applicable only to windows requiring screens.

D. Screens

- 1. Half screens only shall be permitted. The screen shall not be surface mounted.
- 2. Screen frames shall be extruded aluminum.
- 3. Screen mesh shall be aluminum or fiberglass.

E. Glazing

- 1. All units shall be glazed with the manufacturer’s standard sealant process provided the glass is held in place by a removable, extruded aluminum, glazing bead. The glazing bead must be isolated from the glazing material by a gasket.0

F. Finish

See separate finish specification for more details.

1. Anodic

- a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association Designation AA-M10-C22-(). Color shall be ().

Available colors are clear and dark bronze

AA Description	Description	Arch. Class	AAMA Guide Spec.
AA-M10-C22-A41	Clear Anodized	I	611-98
AA-M10-C22-A44	Color Anodized	I	611-98

OR

1. Organic

Finish all exposed areas of aluminum windows and components with manufacturer’s standard baked-on polyester paint system in accordance with AAMA Guide Specification 2603-98. Color shall be ().

Available colors are manufacturer’s standard bronze or manufacturer’s standard white

OR

2. Organic

Finish all exposed areas of aluminum windows and components with high performance ()% PVDF fluoropolymer resin based paint system. Color shall be ().

High performance 70% PVDF fluoropolymer and 50% PVDF fluoropolymer finishes are available in standard and custom colors

AA Description	Description	AAMA Guide Spec.
AA-M12-C42-R1X	70% PVDF fluoropolymer	2605-98
AA-M12-C42-R1X	50% PVDF fluoropolymer	2604-98

PART 3 EXECUTION

3.01 Inspection

- A. Job Conditions
 - 1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

3.02 Installation

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Plumb and align window faces in a single plane for each wall plane, and erect windows and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.
- C. Adjust windows for proper operation after installation.
- D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

3.03 Anchorage

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

3.04 Protection and Cleaning

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

1/3/06