

This Specifications Sheet utilizes the Construction Specifications Institute (CSI) MasterFormat™. The 1995 edition numbers are listed first; *numbers in italics are from the 2004 edition*. Options and dimensions are indicated by brackets []. Specifier Notes precede specification text; edit for project requirements or delete in final copy. Metric conversion is calculated by multiplying: Number of Inches x 25.4 = Millimeters, rounded off. Manufactured by Kolbe & Kolbe Millwork Co., Inc., Wausau, Wisconsin.

SECTION 08525 or 08 52 13.02
ULTRA SERIES MAJESTA
SINGLE HUNG, DOUBLE HUNG, STUDIO, AND TRANSOM WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

Clad Majesta Double Hung [single hung] [fixed studio] [transom] windows complete with hardware, glazing, weatherstripping, [half screen option on single hung units only] [jamb extensions] [removable grilles] [grilles-in-the-airspace] [performance divided lites] and standard or specified anchorages, trim, attachments, and accessories. [Mulled direct set transoms] [Mulled sash set transoms] [Stand alone direct set transoms] [Stand alone sash set transoms] are also available.

1.02 RELATED SECTIONS

SPECIFIER NOTE: Revise sections below to suit project requirements and to include desired options.
Consult state and local building codes for specific requirements.

The MasterFormat 1995 edition numbers are listed first; *numbers in italics are from the 2004 edition*.

- Section 01330 or 01 33 00 – Submittal Procedures.
- Section 01620 or 01 62 00 – Product Options.
- Section 01630 or 01 25 00 – Product Substitution Procedures.
(2004 title: Substitution Procedures.)
- Section 01650 or 01 65 00 – Product Delivery Requirements.
- Section 01660 or 01 66 00 – Product Storage and Handling Requirements.
- Section 01730 or 01 73 00 – Execution.
- Section 01740 or 01 74 00 – Cleaning.
(2004 title: Cleaning and Waste Management.)
- Section 01760 or 01 76 00 – Protecting Installed Construction.
- Section 06100 or 06 10 00 – Rough Carpentry.
- Section 06200 or 06 20 00 – Finish Carpentry.
- Section 07210 or 07 21 00 – Building Insulation.
(2004 title: Thermal Insulation.)
- Section 07900 or 07 92 00 – Joint Sealants.
- Section 08800 or 08 80 00 – Glazing.
- Section 09900 or 09 90 00 – Paints and Coatings.
(2004 title: Painting and Coating.)

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM):
1. ASTM E283-04' - Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.

2. ASTM E330-02' - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
 3. ASTM E547-00' - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
 4. ASTM E1425-07' or AAMA 1801 - Certification of Acoustical Performance
 5. ASTM F588-07' or AAMA 1302.5 - Standard for Forced-Entry Resistance
 6. ASTM E 1996-06' - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes.
 7. ASTM E 1886-05' - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
 8. ASTM E2190-08' - Standard Specification for Insulating Glass Unit Performance and Evaluation
- B. American Architectural Manufacturers Association/Window and Door Manufacturers Association (AAMA/WDMA), American National Standards Institute/Window and Door Manufacturers Association (ANSI/WDMA), Canadian Standards Association (CSA).
1. AAMA/WDMA/CSA 101/I.S.2/A440-05 and 101/I.S.2/A440-08' - Voluntary Specifications for Aluminum, Vinyl (PVC), and Wood Windows and Doors.
 2. WDMA I.S.4-07A Water Repellent Preservative Treatment for Millwork.
- C. National Fenestration Rating Council (NFRC)
1. NFRC 100-2004' & 2010' - Determining Fenestration U-Factor.
 2. NFRC 100-2004' & 2010' - Test Procedure for Thermal Transmittance of Fenestration.
 3. NFRC 200-2004' & 2010' - Determining Fenestration SHGC & Tv.
 4. ASTM E1423-06' - Determining Thermal Transmittance of Fenestration Systems.
 5. NFRC 500-2010' - Determining Fenestration Product Condensation Resistance.
- D. WDMA Hallmark Program
1. WDMA Hallmark Program Procedural Guide C.S.-1
- E. Consumer Product Safety Commission (CPSC)
1. CPSC 16 CFR 1201 - Safety Glazing Standards
 2. ANSI Z-97.1 - Safety Glazing Standards for Tempered Glass

1.04 SYSTEM DESCRIPTION

See the Technical Information section at the beginning of this manual for the Air, Water, Structural Test Reports and Energy Rating Reports. For updated reports, please visit our website <http://www.kolbe-kolbe.com>.

- A. Minimum Design and Performance Requirements
1. The required design pressure(s) for windows and doors is _____ psf.
 2. Air, water, structural, and forced entry resistance shall be at levels which meet the specified design pressure as per AAMA/WDMA/CSA 101/I.S.2/A440-05, 101/I.S.2/A440-08' or ANSI/AAMA/NWWDA 101/I.S. 2-97
 3. Unique unit's performance, when not tested, may be addressed by a manufacturer's Statement of Qualification.
 4. Mullion design shall be adequate for required design pressure.
- B. Energy Ratings
- All units tested are one-lite, LoE²-270, argon filled, with Kolbe ID No. as listed on the NFRC Label adhered to each unit. Values are certified per NFRC and units are labeled per state requirements.
1. Unique, non-listed units may have U & SHGC determined by NFRC procedures and listed on a manufacturer's Statement of Qualification. The U-value required for this project is _____. The SHGC value required for this project is _____.
- C. Sound Transmission Class

1. Special conditions may require the window unit and glazing to meet a Sound Transmission Class (STC) rating as designated by the performance requirements. The STC rating required for this project is _____.
- D. Emergency Escape and Rescue:
 1. Larger widths/heights with standard hardware will comply with emergency escape and rescue requirements of Building Codes (greater or equal to 5.7 sq. ft. of clear opening).
- E. Restriction of Bottom Sash Travel:
 1. Bottom sash is to be limited to a travel distance of 102 mm [4"] [specify other distance]. The limiter hardware color is [Bright Brass] [Rustic Umber] [Satin Nickel].

1.05 SUBMITTALS

- A. Shop Drawings: Submit shop drawings in accordance with Section 01330 Submittal Procedures or Section 01 33 23 – Shop Drawings, Product Data, and Samples.
- B. Product Data: Submit catalog data in accordance with Section 01330 Submittal Procedures or Section 01 33 23 – Shop Drawings, Product Data, and Samples.
- C. Samples: Submit corner section in accordance with Section 01330 Submittal Procedures or Section 01 33 23 – Shop Drawings, Product Data, and Samples. Include glazing system, quality of construction, specified finish, and color.
- D. Installation Instructions.
- E. Quality Control Submittals: Certificates: Submit performance test results reported by independent laboratory or manufacturer's Statement of Qualification indicating compliance with specified performance and design requirements.

1.06 QUALITY ASSURANCE

- A. Insulating Glass – two certification programs: IGCC and IGMAC. Possible IGMA Certification (harmonized IGMAC & SIGMA).
- B. NFRC Certification Program for Energy Rating of Fenestration.
- C. WDMA Hallmark Program. Be sure to check the Air-Water-Structural Test Reports Manual on our website at <http://www.kolbe-kolbe.com>.
- D. IGMAC-Insulating Glass Manufacturer's Association Canada.
- E. [If required: Mock Up: Provide sample installation for field testing unit performance requirements for approval - Contractor to perform tests in accordance with AAMA 502-02 using Method A and/or Method B.]

1.07 DELIVERY, STORAGE AND HANDLING

- A. Proceed in accordance with Section 01650 – Product Delivery Requirements, Section 01660 – Product Storage and Handling Requirements, and Installation Instructions.
- B. Deliver in original packaging, store in an upright position off the ground in a clean, dry area. Protect from weather and construction activities.
- C. Prime or seal wood surfaces, including surfaces to be concealed by wall construction if more than 30 days will expire between delivery and installation.

1.08 WARRANTY

- A. Glass: See Kolbe & Kolbe Glass Warranty for details and exclusions.
 - B. Pre-finishing: See Kolbe & Kolbe Finish Warranty for details and exclusions.
 - C. Product Defects: See Kolbe & Kolbe Product Warranty for details and exclusions.
 - D. International: See Kolbe & Kolbe International Warranty for details and exclusions.
- These warranties are available on our website at <http://www.kolbe-kolbe.com>

PART 2 PRODUCTS

2.01 MANUFACTURED UNITS

For Individual and Mulled Window Units Only:

- A. Description: Double hung windows [field mulled], with non-tilting and removable sash, fixed studio units, and transoms are factory assembled, as manufactured by Kolbe & Kolbe Millwork Co., Inc., Wausau, Wisconsin. Website: www.kolbe-kolbe.com.
- B. Units available: [High Performance] [Impact Performance].
Note: All vertical mulled units and excessively high units with transoms above will be factory built as individual windows and field mulled.

2.02 MATERIALS

The following are standard and optional product items. Edit for Project Requirements.

- A. Frame: Constructed of kiln-dried pine and pine veneered hard maple, with pine interior stops, water repellent, preservative treated in accordance with WDMA I.S. 4-07A. The frame is composed of wood components visible to the interior with applied 6063-T5 extruded aluminum components visible to the exterior. Ultra assembled frames have factory installed heavy vinyl nailing fins at head, side jambs, and sill. Nailing fin at head has integral drip cap. Transom head drip cap to be field applied to frame. Units with brickmould or casing do not have a vinyl nailing fin factory applied as standard.
 - 1. Jamb Thickness: 3/4 inch (19 mm) at the side jambs and head.
 - 2. Standard overall jamb with extensions applied: 6-9/16 inch (167 mm).
 - 3. Interior Head Filler: 3-1/8 inch (79mm) x 3/4 inch (19mm) solid wood.
 - 4. Sill thickness: 1-3/16 inch (30mm) with 14° slope. [Transom sill is 3/4 inch (19 mm) thick.]
 - 5. Exterior: All frame parts are a minimum of .050 inch (1.3 mm) thick 6063 extruded aluminum alloy with accessory grooves for exterior aluminum trim and PVC nailing fin attachments, press fit onto the wood frame. PVC jamb liners are press fitted with extruded aluminum flanges at the exterior and a PVC [wood wrapped] top closure at the interior.
 - 6. Wood Corner Construction: Wood head and sill frames are dadoed with wood side jambs fastened by screws.
 - 7. Aluminum Corner Construction: Extruded aluminum head and top side jamb ends have mitered corners and use internal corner keys with sealer. The bottom side jamb ends are profile cut to the sill and utilize internal end keys with sealer. Sill ends are square cut.
 - 8. Available Wood Species: [Pine (standard)] [Alder] [Fir] [Maple] [Oak] [Cherry] [Mahogany] [Walnut] [Bamboo] [other] on exposed wood frame components.
 - 9. [FSC Certified wood requiring Chain of Custody (COC) label (Kolbe & Kolbe's COC No.: 002040)]
 - 10. [Prep for stool]
- B. Sash: Constructed of kiln dried pine, water repellent, preservative treated in accordance with WDMA I.S. 4-07'A.
 - 1. Thickness: 2-7/32 inch (56 mm).
 - 2. Face Dimensions: 3 inch (76 mm) top rail, 2-1/8 inch (54 mm) check rail and stiles, and 4-1/8 inch (105 mm) bottom rail.
 - 3. Interior: Rails have LVL cores with pine edge band and veneer on exposed faces. Stiles have finger joint cores with pine edge band and veneer on exposed faces.
 - 4. Exterior: Sash parts are completely covered by a .050 inch (1.3 mm) thick 6063 extruded aluminum alloy with kerf mount, press fit and mechanically fastened onto the wood sash base.
 - 5. Wood Corner Construction: Mortise-and-tenon.
 - 6. Aluminum Corner Construction: Aluminum profile ends are square cut or coped to adjoin mating sash parts.

7. Available Wood Species: [Pine (standard)] [Alder] [Fir] [Maple] [Oak] [Cherry] [Mahogany] [Walnut] [Bamboo] [other] on exposed wood sash components.
 8. [FSC Certified wood requiring Chain of Custody (COC) label (Kolbe & Kolbe's COC No.: 002040)].
 9. Interior glazed.
 10. [Impact Performance:]
 - a. Glue all mortise & tenon joints on the sash.
 - b. Additional silicone is used.
 - c. Extra kerfs are put in all sash.
 - d. Extruded aluminum interlocks on top check rail and bottom check rail.
- C. Surface Finish:
1. Exterior Finish – Aluminum
 - a. Standard Paint Colors: Exterior aluminum frame and sash components, jambliner flanges, and PDL bars are to have a 70% fluoropolymer based coating in compliance with AAMA 2605-05 specifications. Color is to be [Abalone] [Alabaster] [Antique Red] [Basil] [Bay Leaf] [Beige] [Butterscotch] [Camel] [Cape Cod] [Chutney] [Coal Black] [Frosted Jade] [Gingersnap] [Green Tea Leaf] [Hartford Green] [Kiwi] [Manchester] [Merlot] [Mudpie] [Mystic Ivy] [Natural Cotton] [Patriotic Blue] [Pumpkin Spice] [Rustic] [Sand] [Slate] [Spiced Vinegar] [Timberwolf] [Truffle] [Ultra Pure White] [Waterford] [White]. (Some limitations apply for radius PDL bars.)
 - b. Aluminum Anodized: Exterior Components: Exterior aluminum frame and sash components, jambliner flanges, and PDL bars are to have an anodized finish in compliance with AAMA 611-98 specifications. The anodized finish is to be [Clear] [Champagne] [Light Bronze] [Medium Bronze] [Dark Bronze] [Black] [Auburn].
 - c. [Specify a custom paint color.]
 2. Interior Finish - Wood:
 - a. [Interior wood is to be treated bare wood without stain or top coat.]
 - b. [Interior wood is to be treated bare wood with an acrylic based double clear coat.]
 - c. [Interior wood is to have a water based stain with a clear water based top coat. Stain color is to be [Cherry] [Chestnut] [Coffee Bean] [Library Red] [Light Oak 998] [Red Wheat] [Spiced Walnut] [Sunset Oak] [Wheat].
 - d. [Specify a custom stain color]
 - e. [Interior wood is to have a primer coat only.]
 - f. [Interior wood is to have acrylic type paint applied. The interior paint color is to be [Abalone] [Beige] [Bright White] [Ivory Tusk] [Natural Cotton] [Silk] [Ultra Pure White].
 - g. [Specify a custom paint color.]
- D. Hardware
1. Top Rail Lock: The top sash is secured with self-locking hardware. The exposed hardware components are to be finished in [bright brass] [rustic umber] [satin nickel]. All top rail hardware attachment screws are hidden. The top lock is actuated with the aid of an operating pole when out of reach for direct hand operation.
 2. Check Rail Interlocks: The top and bottom check rails incorporate interlocking aluminum profiles to provide structural integrity under wind loads. Interlock profiles are painted [anodized] to complement adjacent window finishes. All interlock fasteners are concealed by a PVC cover.
 3. Bottom Rail Lock: The bottom sash is secured to the sill frame by a manually operated thumb turn lock [optional custodial keyed lock]. The exposed bottom rail hardware components are to be finished to match the top rail hardware. All bottom rail hardware attachment screws are to be hidden.

*Note: Custodial keyed locks have a high impact plastic housing, colored black, and the front screw access cover is finished to match the top rail hardware.

4. Impact Rated product requires standard double hung cam locks to be applied to the top and bottom check rails.
5. Balance System: Top and bottom sash are hung with a Class-5 spiral balance system. Balance tension is to be factory pre-set by the balance manufacture to accurately correlate with the weight of each sash. Balance casings are concealed by PVC [wood wrapped] Jambliner covers at the interior and aluminum flanges at the exterior. Balance system uses a carrier & bracket attachment system for safe and efficient sash installation and removal. Sashes are non-tilting by design for safety and structural integrity.

Note: Glass sizes over 54" x 54" (1.37 meters x 1.37 meters) may require the unit to be a single hung for safety concerns. Sash weighing over 150 lbs. may have an operational force greater than 50 lbs. Sash weight is not to exceed 200 lbs.

6. Optional Sash Lift Handles: Bottom sash lift handles are to be corrosion resistant and finished in [bright brass] [rustic umber] [satin nickel].

E. Weatherstripping:

1. Top Rail: Weatherstripping consists of a dual durometer, low-friction skin, and hollow polymer bulb fused on a PVC "L"-base with flexible barbs. Two rows of weatherstripping are installed in the top rail kerfs. Color is black.
2. Top Check Rail: The weatherstripping consists of a 70 durometer neoprene fin with dense barbs. One row of weatherstripping is installed in the top check rail aluminum interlock kerf. Color is black.
3. Bottom Check Rail: The weather seal is accomplished with a dual durometer, low-friction skin, and hollow polymer bulb with a PVC "L"-base and flexible barbs. One row of weatherstripping is installed in the bottom check rail wood kerf. Color is black.
4. Bottom Rail: Weatherstripping consists of a dual durometer, low-friction skin, and hollow polymer bulb fused on a PVC "L"-base with flexible barbs. Two rows of weatherstripping are installed in the bottom rail kerfs. Color is black.
5. Top & Bottom Sash Stiles: The side weatherstripping is a low-friction skin, foam filled polymer bulb on a PVC "L"-base with flexible barbs. Two rows of weatherstripping are installed in the top and bottom sash stile kerfs. Color is black.
6. Jambliner: Two sets of [gray] [white] PVC Jambliners are friction fit into each side frame. The top ends of jambliners are sealed with a black vinyl-nitrile dense foam pad attached to the head frame. The lower end at the bottom sash jambliner is sealed by a white cross-linked polyethylene dense foam plug located at the end of the side frame center parting stop base.
7. Sill Frame and Sill Extension Jamb: The sill frame and sill extension jamb wood are protected from moisture by a [gray] [white] weatherable UV-resistant PVC water seal. This water seal is held by a kerf in the sill frame wood and is siliconed to the inside face of the sill extension jamb.
8. Bottom Sash Check Rail Ends-to-Balances: A black dense pile pad is adhered to the bottom end of balance casings to seal against the bottom sash check rail at each end.
9. Bottom Check Rail-to-Top Check Rail Ends: A black dense pile pad is applied directly to the top end of the exterior inboard bottom aluminum flange. This pile pad provides a continuous seal between all check rail ends and the jambliner flanges.

<p><i>The following are optional materials and accessories. Edit for project requirements.</i></p>

- F. Screens: Sent loose as standard on all units.

1. Application: Screens are only available as a half screen, located directly under the top sash. This type of screen installation will render the operating window unit to function as a single hung. The assembled half screen top frame is captured by a head receiving channel and is held in side receiving channels with plungers located at the lower end of the screen.
Note: Full screens are not available due to the large size of this product.
 2. Surrounds: [Half-screen] [Retractable Screen – charcoal fiberglass screen cloth only].
 3. Screen cloth: BetterVue® Black fiberglass is standard iVis (improved visibility insect screen) 10% better insect protection, airflow, and clearer view.
 [UltraVue® Black fiberglass eVis (excellent visibility insect screen) 20% better insect protection, 15% better airflow, and clearer view] [Bright aluminum (not available with Brass screen frame)] [Charcoal aluminum].
 4. Screen Frames: .024 inch (0.6 mm) thick roll formed aluminum.
 5. Attachment: Spring loaded plungers.
 6. Corner Construction and Finish Color: Screen channel colors to match exterior colors. Channels are joined and reinforced with a corner key.
- G. Jamb Extensions: Provide factory installed jamb extensions up to 12 inches (305mm) for wall thickness indicated or required. Jamb extensions over 12 inches (305mm) are sent loose to be field installed.
1. Finish: Match interior frame finish.
 2. Other wood species available: [Pine (standard)] [Alder] [Fir] [Maple] [Oak] [Cherry] [Mahogany] [Walnut] [Bamboo] [other]
- H. Removable Grilles:
1. Surround: Full, constructed of kiln-dried pine [7/8 inch (22 mm)] [1-1/8 inch (29 mm)].
 2. Pattern: [rectangular] [custom lite layout].
 3. Finish: Bare wood.
 4. Profile: [beveled-standard] [ovolo].
 5. Other wood species available: [Pine (standard)] [Alder] [Fir] [Maple] [Oak] [Cherry] [Mahogany] [Walnut] [Bamboo] [other]
- I. Grilles-in-the-airspace: Installed inside the hermetically sealed glass unit.
1. Material: [aluminum flat bars, 5/8 inch (16mm) wide] [aluminum profiled bars, 3/4 inch (19mm) wide, available for units with 7/8 inch (22mm) or 9/16 inch (14mm) insulating glass] [Brass pencil bars, 5/16 inch (8mm) wide, available for units with 7/8 inch (22mm) insulating glass] [Pewter pencil bars, 5/16" (8mm) wide, available for units with 7/8 inch (22mm) insulating glass].
 2. Color options: [3/4 inch Profiled bars: White, Beige, Sand, Rustic, Hartford Green, Chutney, Light Wood & Dark Wood faux finishes] [5/8" Flat bars: White, Beige, Sand, Rustic, Hartford Green, Chutney, Light Wood & Dark Wood faux finishes, Brass] [Two-tone contour or flat grilles available with light or dark wood faux finishes to the interior and White to the exterior.
- J. Performance Divided Lites (PDL): PDL system utilizes a permanently adhered wood grille bar to the interior and a permanently adhered aluminum grille bar to the exterior glass.
1. Material: Muntin is constructed of .050 inch (1mm) thick 6063 extruded aluminum alloy on exterior, pine on interior [5/8 inch (16mm) wide] [7/8 inch (22mm) wide] [1-1/8 inch (29mm) wide] [1-3/4 inch (44mm) wide] [2-1/4 inch (57mm) wide] [4-1/2 inch (114 mm)].
 2. Pattern: [rectangular] [custom lite cuts-subject to approval of Kolbe & Kolbe Millwork Co., Inc.].
 3. Spacer bar between the glass. Finish: Standard [Champagne]. Optional [Aluminum mill-finish] [Black finish].
 4. Exterior surface finish: To match frame and sash exterior. (Some limitations apply for PDL bars on radius and special grid patterns.)
- K. Accessories & Trim
1. Casings

- a. [1-15/16 inch (49mm) brickmould] [3-1/2 inch (89mm) profiled brickmould] [3-1/2 inch (89mm) flat casing] [3-1/2 inch (89mm) flat casing with backband, 4-1/4 inch (108mm) overall face dimension] [3/4 inch (19mm) Ogee casing] [1-15/16 inch (49mm) bull nose casing] [2 inch (49mm) flat casing] [1-13/16 inch (46mm) historic trim] [1-1/2 inch (38 mm) pavilion brickmould] [2-3/16 inch (56mm) stucco casing] [1-5/8 inch (41mm) brickmould] [3-1/2 inch (89mm) beaded casing]
- 2. Nosings
 - a. [1-7/16 inch (37mm) traditional sill nosing] [1-9/16 inch (40mm) sill drip] [1-5/8 inch (41mm) projected sill nosing with end caps] [2-1/8 inch (54mm) projected sill nosing with end caps] [2-1/8 inch (54mm) projected sill nosing with 2 inch (51mm) overall face dimension, with end caps] [3-3/16 inch (81mm) stucco trim sill nosing] [5-3/16 inch (132mm) extended sill nosing] [extended sill horns] [no nosing]
- 3. Frame Expanders
 - a. [1 inch (25mm)] [2-1/2 inch (64mm)] [4 inch (102mm)] [6 inch (152mm)] [7 inch (178mm)]
- 4. Mull Covers
 - a. [1/2 inch (13mm)] [1 inch (25mm)] [1-1/2 inch (38mm)] [2 inch (51mm)] [2-1/2 inch (64mm)] [3 inch (76mm)] [3-1/2 inch (89mm)] [4 inch (102mm)] [5-1/2 inch (140mm)] [6 inch (152mm)]

2.03 GLAZING

A. Glass:

- 1. Standard one lite IG is 7/8 inch (23 mm) with LoE²-270, argon filled.
- 2. Standard IG or single glazed has a standard design pressure of 65 psf (DP 65). See Website www.kolbe-kolbe.com for high performance ratings.
- 3. High altitude IG has open breather tube.
- 4. All glass is select quality complying with FS-DD-G-451D.
- 5. IG complies with ASTM E2190-08'.

For Individual and Mull Window Units Only:

- 6. For operating double hung units, Standard Impact Resistant Laminated Glass is Lami 28 for insulating glass.
- 7. For fixed double hung studio units, Standard Impact Resistant Laminated Glass is Lami 27 for insulating glass.

B. Glazing Methods:

- 1. Standard Performance option operating units and fixed units have K-Glaze with 3/16 inch (5mm) wide glazing tape and primary silicone on #1 surface along sight line paired with latex sealant on #4 surface at bottom wood glazing bead.
- 2. High Performance option operating units and fixed units have silicone-glaze structural silicone bedding sealant on #1 surface with a 0.5 inch (13 mm) bite, and supplemental siliconized latex sealant on #4 surface at bottom wood glazing bead.
- 3. Impact Glazing option: [S-glaze for IG units utilizes a reinforcing vinyl bracket installed into a kerf in the sash and siliconed] See Website www.kolbe-kolbe.com for Impact performance ratings.

C. Glass Options:

- 1. [LoE² 240 –Glare Control] [LoE³ 366]. [ThermaPlus LoE glass has a [LoE²-270] [LoE²-366] option on surface 2 and a LoE hard coat on surface 4 plus permanent coating (interior pane)].
- 2. Patterned, bronze, or gray-lite.
- 3. Tempered or laminated glass.
- 4. Protective film.

5. Other options: Standard to the industry. [With] [Without] argon gas. (Argon gas may not be included in units to be installed in or shipping through high altitude areas.)
 6. Special Applications: ¾" (19 mm) double pane I.G. and 1-3/8" (35 mm) triple pane I.G. are available for projects having unique thermal or STC requirements.
 7. Tempered Glass: Tempered glass may be required to prevent serious personal injury of a person falling into glass, prevent glass breakage from the top sash operating pole, for added structural integrity of the glass under high wind loads, and minimize excessive sash weights.
- D. Glazing Bead Options:
1. Beveled profile is standard. Options: [ovolo] [square]
 2. Support brackets for impact glazing.

2.04 ACCESSORIES AND TRIM

<i>Edit for project requirements.</i>

A. Installation Accessories:

For Individual, Mull Window Units, and Transoms:

1. Galvanized steel installation clips (number required to meet DP20 may be attached to unit). Kolbe & Kolbe recommends that all units with exterior casing be installed using installation clips. Units without exterior casing are shipped with a factory applied nailing fin.
2. Mull anchors.
3. Strip mull anchors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Before installation, verify that openings are plumb and square and of proper dimension. Report frame defects or unsuitable conditions to the General Contractor before proceeding.
- B. Acceptance: Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

- A. Install windows according to manufacturer's installation instructions, reviewed shop drawings and in accordance with Section 01730 – Execution *or* Section 01 73 19 – *Installation*.
Note: Certain codes require the use of pressure-treated lumber to line rough openings. Corrosion-resistant materials, such as stainless steel or hot-dip galvanized steel, must be used for fasteners and anchors having direct contact with pressure-treated lumber.
- B. All sash are shipped loose and field installed due to the special requirements of the spiral balance system and due to the heavy sash weights for safety and damage prevention.
- C. Install sealant and related flashing materials at perimeter of assembly in accordance with Section 07900 Joint Sealers *or* 07 92 00 – *Joint Sealants*.
- D. Install accessory items as required.

3.03 ADJUSTING AND CLEANING

- A. Adjust operable sash to work freely with hardware functioning properly. Re-adjust at completion of the project if directed.

- B. Remove visible labels.
- C. Leave windows in a job clean condition. Final cleaning of glass will be done in accordance with Section 01740 – Cleaning.

3.04 PROTECTION

- A. Cover windows, in accordance with Section 01760 – Protecting Installed Construction, during spray painting or other construction operations (such as muretic acid washing after completion of masonry) that might cause damage.

END OF SECTION