

SECTION 085203

CERTIFIED WOOD WINDOWS

CSI 3-PART **LONG-FORM** GUIDE SPECIFICATION
USE FOR CONTRACT DOCUMENT (CD) SPECIFICATION ISSUES
EDIT TO SUIT PROJECT

PART 1 - GENERAL

1.1 SUMMARY

A. Work of this Section includes wood window assemblies, and includes but is not limited to the following:

1. Wood window frames
 - a. Hung Windows
 - 1). Single hung
 - 2). Double hung
 - 3). Triple hung
 - b. Sliding Windows
 - c. Fixed Windows
 - d. Casement Windows
 - 1). Out-swing
 - 2). In-swing
 - e. Awning Windows
 - f. Hopper Windows
 - g. Tilt & Turn Windows
 - h. Pivot Windows
 - i. Folding Windows: (Bi-Fold, Tri-Fold)
 - j. Combination Window Units
2. Glazing
3. Hardware
4. Accessories
 - a. Weatherstrip
 - b. Insect Screen
 - c. Removable grille
 - d. Grille between glass
 - e. Simulated divided lites
 - f. Jamb extension

B. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections include, but is not limited to the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and DIVISION 01 General Requirements, Specification Sections, apply to this Section.
2. SECTION 061003, CERTIFIED ROUGH CARPENTRY: Window installation.
3. Items furnished by other Sections but installed under this Section.
 - a. SECTION 060530, CERTIFIED WOOD TYPES: Forest, tree and timber management and sourcing.
 - b. SECTION 079100, PREFORMED JOINT SEALS: window gaskets and seals

NOTE: Delete item below if glazing is provided under this section as Woodstone windows does.

- c. SECTION 088000, GLAZING: Factory-installed glazing and glazing sealants.
- 4. Work Provided by Other Sections that are attached to products Furnished by this Section.

NOTE: Delete each item below that is furnished by the manufacturer.

- a. SECTION 062003, CERTIFIED FINISH CARPENTRY: Interior trim at window jambs.
- b. SECTION 079200, JOINT SEALANTS: Sealing of frame perimeter to rough opening.
- c. SECTION 099100, PAINTING: Field-applied paint
- d. SECTION 099300, STAINING AND TRANSPARENT FINISHING: Field-applied staining and top coating.
- 5. Products Furnished, But Not Installed, Under This Section include:

NOTE: Delete each item below that is provided at the factory.

- a. SECTION 062003, CERTIFIED FINISH CARPENTRY: Install items listed below furnished by window frame manufacturer.
 - 1). Stile and rail sash
 - 2). Exterior and interior architectural window trim
 - 3). Setup in dadoed or rabbeted jamb/frame
 - 4). Prepare for and install window hardware
- b. SECTION 099100, PAINTING: Field finish paint furnished by window frame manufacturer and applied under 099100 or 099300.

1.2 REFERENCES

NOTE: Coordinate and edit to the correct Section number below. The three numbers shown indicate broad-format, medium-format and narrow-format numbers of the CSI MasterFormat® 2004 system.

- A. Abbreviations and Acronyms per SECTION 011000 or 011100 or 011110, SECTION 014000, and as follows:
 - 1. AHJ. Authority Having Jurisdiction from local, state and federal regulatory agencies.
 - 2. CoC. Chain-of-Custody.
 - 3. F.O.B. or Free-on-Board. Means without charge to the buyer for delivering and placing a shipment on board a carrier at a specified location. Once on board the carrier, it belongs to the buyer. Factory, freight, prepaid to the job site.
 - 4. F.O.B. Destination. Free-on-board without charge to the buyer until it arrives at the job site destination.
 - 5. Per. In accordance with.
 - 6. Provide. To furnish and install.

NOTE: Edit Definitions and References below to suit project.

NOTE: Items may also be moved to Section 014000 and deleted here.

- B. Definitions per SECTION 011000 or 011100, SECTION 014000, and as follows:
 - 1. Certified Wood: Independent third party (FSC) verified wood from forests complying with responsibly managed forest standards that meet broad social, economic and environmental goals. This includes certifying that the timber was legally grown and harvested using conservation techniques, from mature tree stands, in areas not reserved for protection, and with the permission and full knowledge of the property owner.
 - 2. [HAP](#). Hazardous Air Pollutant
 - 3. HMA Hardwood Moldings [Glossary](#)
 - 4. [LEED®](#). Leadership in Energy and Environmental Design, a set of USGBC rating programs applicable to construction projects.
 - 5. [MIC](#). Methyl diisocyanate, an extremely toxic isocyanate chemical compound and HAP, used in making industrial adhesives and polyurethane.

RED NOTE: Extremely toxic, MIC has a NIOSH IDLH (immediately dangerous to life or health) exposure of 3 ppm. Higher levels of exposure, over 21 ppm, can result in pulmonary or lung edema, emphysema and hemorrhages, bronchial pneumonia and death.

There is no known antidote.

6. Northern Forest: Timber stands that range from the NY Adirondacks through Vermont and New Hampshire up into Maine. <http://www.northernforestalliance.org/explore.htm>
 7. S4S. Lumber that is dressed/surfaced on all four (4) sides.
 8. S2S. Lumber that is dressed/surfaced on two (2) sides.
 9. STC. Sound Transmission Coefficient; The ratio of the sound energy transmitted through a material to the sound energy incident on the material; comparative measurement of the ability of a material to minimize the passage of sound.
 10. Sustainably Harvested Wood: Wood harvested from forests managed in accordance with stated environmental, social, economic, legal, forest management, and systematic validation principles such as those proffered by the Northern Forest Alliance <http://www.northernforestalliance.org/about/sustainforest.htm>, FSC www.fsc.org/index.php?id=pc, ATFM http://65.109.144.60/cms/test/26_34.html and SFI <http://www.sfi-program.org/files/pdf/sfi-standard-2005-2009-sept%2008%20update.pdf>.
 11. Sustainable Forest Management: The UN-FF (United Nations Forum on Forests) in 2004 adopted these seven themes of sustainable forest management: Extent of forest resources; Biological diversity; Forest health and vitality; Productive functions of forest resources; Protective functions of forest resources; Socio-economic functions; and Legal, policy and institutional framework.
 12. Sustainably Recycled Wood: Wood products certified by a third party to be made from reused, reclaimed or salvaged wood timbers or post-consumer wood products.
 13. **VOC. Volatile Organic Compounds** are chemical compounds that have a high vapor pressure and low water solubility. They include a variety of chemicals, some of which may have short- and long-term adverse health effects when concentrated indoors.
- C. Referenced Standards per SECTION 014000 and as follows:
1. AAMA. American Architectural Manufacturers Association
 - a. AAMA / NWWDA 101/1.S.2/A440, Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors
 - b. AAMA 701/702, Combined Voluntary Specification for Pile Weatherstrip and Replaceable Fenestration Weatherseals
 - c. AAMA 902, Voluntary Specification for Sash Balances
 2. ANSI. American National Standards Institute; www.ansi.org
 - a. ANSI / NWWDA I.S. 2: "Industry Standard for Wood Windows"
 3. ASME. American Society of Mechanical Engineers; www.asme.org
 - a. ASME [B18.6.1](#), Wood Screws (Inch Series)
 - b. ASME [B18.6.4](#), Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws, Inch Series
 4. ASTM. ASTM International; www.astm.org
 - a. ASTM D6570, Standard Practice for Assigning Allowable Properties for Mechanically Graded Lumber
 - b. 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
 - c. ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
 - d. ASTM E547, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference
 - e. ASTM E1886, Standard Test Method for Performance of Exterior Windows, Curtain Walls, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials

- f. ASTM E1996, Standard Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors, and Storm Shutters Impacted by Window Borne Debris in Hurricanes
- 5. [AWI](#). Architectural Woodwork Institute; www.awinet.org
 - a. AWI / AWMAC - Quality Standards, 8th Edition, Version 1.0, 2003.
 - b. AWI / AWMAC / WI – Architectural Woodwork Standards – 2009, 1st Edition

NOTE: The AWS will be printed and available for distribution before August 1. The Woodwork Institute will adopt it as their official standard for work bidding after Oct 31, 2009.

- 6. BAAQMD. Bay Area Air Quality Management District; www.baaqmd.gov
- 7. CARB. California Air Resources Board, a department of the California Environmental Protection Agency; www.arb.ca.gov

NOTE: CARB regulations (required by LEED™) govern formaldehyde emissions in both raw composite wood panels and finished products sold or used in California.

Both imported and domestic products are regulated and must be third-party certified and clearly labeled to indicate they meet California's requirements.

The regulation applies to hardwood plywood, particleboard, and medium density fiberboard (MDF) and all products (such as furniture, cabinets, flooring, store fixtures, moldings and millwork, countertops, decorative household items, doors, etc.) made with those products.

Phase I emission requirements are effective beginning January 1, 2009.

- 8. EPA. U.S. Environmental Protection Agency; www.epa.gov
- 9. FSC. Forest Stewardship Council; Certified Sustainably Managed Lumber; www.fsc.org; <http://www.fscus.org/>
 - a. Certifier: Rainforest Alliance 'SmartWood' Program (SW); <http://www.smartwood.org>
 - b. Certifier: Scientific Certification Systems (SCS) 'Forest Conservation Program' (FCP); <http://www.scscertified.com>
 - c. Certifier: Bureau Veritas Certification (BVC); <http://certification.us.bureauveritas.com/>
 - d. Certifier: Price Waterhouse Cooper LLC (PwC); <http://www.pwc.com/extweb/pwcpublishings.nsf/docid/0cca106f2a7b9d5585256fc50051263a>
 - e. Withdrawn Certifier: SGS Systems & Services Certification USA; http://www.us.sgs.com/forestry_us

NOTE: Key strengths of the FSC network and organization is its transparency and ability to pioneer approaches and adaptations to certification. FSC as a standard is more demanding especially in participatory approaches in forest management planning and in the identification and protection of threatened species. FSC also sets detailed requirements for the timber production methods. FSC is 6 to 12 times more prescriptive than PEFC and has more NGO influence credibility.

The VFF Certified Ecoforestry is equivalent to FSC for Vermont.

PEFC is more rigid towards contractors who are assessed during a group certification when working in certified forests. PEFC group certification is based on a management system that requires internal revisions at the group and local levels. PEFC allows more forest producer influence and is less stringent.

- 10. GANA. Glass Association of North America; www.glasswebsite.com
 - a. [GANA Glazing Manual](#) - 50th Anniversary Edition (formerly FGMA Glazing Manual)
- 11. [HMA](#). Hardwood Manufacturers Association; www.hardwoodinfo.com
- 12. ICC. International Code Council; www.iccsafe.org
- 13. ICC/ES. International Code Council / Evaluation Service; www.icc-es.org
- 14. IGCC. Insulated Glass Certification Council; <http://www.igcc.org/initprocess.cfm>
- 15. IGMA. The Insulating Glass Manufacturers Alliance (formerly SIGMA - Sealed Insulating

- Glass Manufacturers Association); www.igmaonline.org
- a. CBA Level per ASTM E773 and E774
 - b. ASTM E2190, Harmonized Insulating Glass Standard (HIGS); and gas content
16. ISO/IEC. International Organization for Standardization, International Electrotechnical Commission; www.iec.ch/
17. NFRC. National Fenestration Rating Council; www.nfrc.org
18. [PEFC](#). Programme for the Endorsement of Forest Certification schemes, Geneva-based; [PEFC Annex 4](#) Chain of Custody; (SFI, CSA, and ATFS are endorsed by PEFC.)
- a. Member: [SFI](#). Sustainable Forestry Initiative, Washington DC; www.sfiprogram.org
 - b. Member: [ATFS](#). American Tree Farm System Certified; www.treefarmssystem.org
 - c. Member: [CSA](#). Canadian Standards Association; <http://certifiedwood.csa.ca>
 - d. Certifier: Bureau Veritas Certification (BVC); <http://certification.us.bureauveritas.com/>
 - e. Certifier: Price Waterhouse Coopers LLC (PwC); <http://www.pwc.com/extweb/pwcpublications.nsf/docid/0cca106f2a7b9d5585256fc50051263a>
19. SCAQMD. South Coast Air Quality Management District; www.aqmd.gov
20. SGCC. Safety Glazing Certification Council; www.sgcc.org
21. SMA. Screen Manufacturer's Association; www.smainfo.org
22. SIGMA. See IGMA above.
23. USGBC. United States Green Building Council; www.usgbc.org
24. VFF. Vermont Family Forests; www.familyforests.org
- a. VFF Certified Ecoforestry; <http://www.familyforests.org/ecoforestry/>
25. WDMA (or NWWDA.) (North American) Window and Door Manufacturers Association; www.wdma.com

1.3 ADMINISTRATIVE REQUIREMENTS

[NOTE: Coordinate and edit to the correct Section number below.](#)

A. Coordination per SECTION 013000 or 013100, and as follows:

1. Coordinate certified material chain-of-custody from original material resource to project site.
2. Coordinate rough opening measurements with manufactured window units.
3. Coordinate air sealing and testing per SECTION 018316.

[NOTE: Coordinate and edit to the correct Section number below.](#)

B. Preinstallation Meetings per SECTION 013000 or 013100 and as follows:

1. Meeting purpose is to review site conditions, installation procedures, schedules, coordination with other work, blocking & shim requirements, air sealing procedures & testing, and warranty requirements.

[NOTE: Coordinate and edit to the correct Section number below.](#)

C. Sequencing: Per SECTION 010000 or 011100, and SECTION 060530.

[NOTE: Coordinate and edit to the correct Section number below.](#)

D. Scheduling: Per SECTION 010000 or 011100, and SECTION 013000 or 013200.

1. Production and Delivery Schedules shall be based on reviewed Shop Drawings and sample submittals.
2. Payment Schedules shall be based on reviewed Shop Drawings and sample submittals.

1.4 SUBMITTALS

[NOTE: Coordinate and edit to the correct Section number below.](#)

- A. Product Data per SECTION 013000 or 013300 and as follows: Submit manufacturer's printed descriptions of materials, components, adhesives, fasteners, and treatment systems; performance criteria; use limitations; preparation instructions and recommendations; storage and handling requirements and recommendations; and installation methods including:
1. Construction details and fabrication methods.
 2. Profiles and dimensions of individual components.
 3. Glazings, hardware, accessories and finishes.
 4. Installation, site finishing, maintenance and cleaning.

NOTE: Coordinate and edit to the correct Section number below.

- B. Shop Drawings per SECTION 013000 or 013300 and as follows: Submit location plan, along with elevation, section, and detail drawings showing extent of wood window assembly, with keyed detail drawings indicating expansion, material transition, specific attachments and attachment requirements including the following:
1. Field Measurements: Indicate rough or masonry opening field measurements on the Shop Drawings.
 2. Drawings:
 - a. Elevations of Each Window:
 - 1). Scale: Minimum 3/4" = 1'-0" (1:20)
 - 2). Overall dimensions for each unit (width & height) clearly indicated as required, including;
 - a). (M.O.) Masonry openings
 - b). Trim width & height (complete finish perimeter, as assembled or knocked down by window manufacturer.)
 - c). (R.O.) Rough opening
 - d). Frame (jamb) width & height
 - 3). Visible Glass Opening per pane and per sash opening
 - 4). Total sash opening; call out if opening is a means of egress
 - 5). Stile & rail widths (face dimensions)
 - 6). Section references
 - b. Window Section Details:
 - 1). One-half scale (1:2) for typical frame/jamb/sash sections and full size (1:1) for typical composite members recommended.
 - 2). Head trim, jamb, sash, and glass
 - 3). Side trim, jamb, sash, and glass
 - 4). Sill trim, jamb, sash, and glass
 - 5). Meeting (check) rails at hung & sliding units; astragal rails at swinging pairs.
 - 6). Mullions (vertical trim, jamb, sash, & glass members between window units)
 - 7). Sill-to-header mullions (horizontal trim, jamb, sash, & glass members between window units)
 - 8). Bars and muntins (including, but not limited to, profile and glazing dimensions)
 - c. Weather-strip systems
 - d. Hardware and accessory systems
 - e. Glazing details
- C. Window Schedule: Indicating each window in project, referencing each unit to a specific elevation and style.

NOTE: Coordinate and edit to the correct Section number below.

- D. Samples per SECTION 013000 or 013300 and as follows:
1. Initial for Selection: Submit printed color charts or sample chains indicating manufacturer's complete range for each type of material finish exposed to view that is not yet selected by

- Architect or specified.
2. Final Selection: Submit minimum 6 inch (150mm) long samples of each different profile (grain and species for clear finish) with proposed finishes, and fasteners.
 - a. Molding Profiles: Custom or standard
 - 1). Sash stiles, rails and muntins with glazing stops
 - 2). As applied to jamb/frame
 - 3). As applied to trim
 - b. Visible Components including, but not limited to:
 - 1). Glazing
 - 2). Screen fabric
 - 3). Hardware escutcheons
 - 4). Handles
 - 5). Catches
 - 6). Chains
 - 7). Ropes
 - c. Each wood species to be used with selected finish indicating full range of expected variations.
- E. Quality Assurance Submittals per SECTION 014000 and as follows:
1. Certificates: Submit printed certificates or manufacturer's letterhead with manufacturer's signature certifying that each window product and assembly to be used meets each regulatory requirement, sustainability characteristic, performance requirement, design criteria, and applicable standard specified.
 - a. Certificates of Grade: Certificate of Inspection for grade marked material by (ALSC) recognized inspection agency
 - b. KD Certificates: Kiln-dried moisture content by (ALSC) recognized inspection agency.
 2. Test and Evaluation Reports: Submit certified test results by a recognized testing laboratory in accordance with specified test methods for each product and/or system indicating physical, chemical and performance characteristics.
 - a. Indicate fire-retardant-treated wood and wood composites that comply with building code in effect for Project.
 - b. Rot-resistant preservative-treated wood and wood composites that comply with standards and other requirements.
 3. Qualification Statements: Submit a letter, on printed letterhead and signed by an officer of the firm, for each listed quality assurance qualification listed, attesting to meeting each requirement called out.

NOTE: Edit LEED Requirements below to suit project. Delete irrelevant credit language.

- F. Sustainable Design (USGBC [LEED](#)®) Submittals: Submit the following in accordance with the requirements of SECTION 018113, LEED REQUIREMENTS:
1. LEED Credit MR, Materials & Resources. Submit completed LEED 2009-NC v.3 Submittal Templates in accordance with SECTION 017419, CONSTRUCTION WASTE MANAGEMENT, and other required paperwork as follows:
 - a. MR 4.1: Recycled Content: 10 Percent (post-consumer + 1/2 pre-consumer)
 - b. MR 4.2: Recycled Content: 20 Percent (post-consumer + 1/2 pre-consumer)
 - 1). Submit product data indicating percentage by weight of recycled content with a statement indicating costs for each.
 - c. MR 5.1: Regional Materials, Regionally Extracted, Processed & Manufactured Products, 10 Percent
 - d. MR 5.2: Regional Materials, Regionally Extracted, Processed & Manufactured Products, 20 Percent

- 1). Submit product data indicating name of the manufacturer, product cost, distance between the project site and the manufacturer, and the distance between the project site and the extraction site for each raw material
- e. MR 6: Rapidly Renewable Materials
 - 1). Submit the product name, material manufacturer, total product cost for each tracked material, total product cost for each tracked material, percentage of product by weight, for each material that meets the rapidly renewable criteria.
- f. MR 7: FSC Certified Wood
 - 1). Submit certificates of chain-of-custody signed by manufacturers or fabricators certifying materials and products specified are made from certified wood obtained from forests certified by a Forest Stewardship Council accredited certification body.
 - 2). Submit evidence sawmill is certified for chain-of-custody by an FSC-accredited certification body.
2. LEED Credit IEQ, Indoor Environmental Quality. Submit completed LEED 2009-NC v.3 Submittal Templates and required paperwork as follows:
 - a. IEQ 4.1: Low Emitting Materials, Adhesives & Sealants, VOC Data
 - 1). Submit manufacturers' product data for construction adhesives and sealants, including printed statement of VOC content and MSDS Sheets.
 - 2). Submit manufacturer's certification that products meet the requirements of SCAQMD Rule 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur.
 - 3). Submit manufacturer's certification that products meet the requirements of BAAQMD Regulation 8, Rule 51 for containers larger than 16 oz and with CARB for containers 16 oz or less, for areas where freeze/thaw conditions do exist or direct exposure to moisture can occur.
 - b. IEQ 4.2: Low Emitting Materials, Paints & Coatings, VOC Data
 - 1). Submit manufacturers' product data for interior paints and coatings, including printed statement of VOC content and MSDS Sheets.
 - 2). Clear wood finishes, floor coatings, stains, sealers, and shellacs applied to interior elements meet the VOC content limit requirements established by SCAQMD Rule 1113, Architectural Coatings, effective January 1, 2004.
 - c. IEQ 4.4: Low Emitting Materials, Indoor Composite Wood & Agrifiber, No Added Urea-Formaldehyde Content
 - 1). Submit manufacturers' product data for composite wood products used in the building showing they contain no added urea-formaldehyde.

NOTE: Coordinate and edit to the correct Section number below.

- G. Closeout Submittals per SECTION 017000 or 017700, and as follows:
1. Operation and Maintenance Data: Including, but not limited to, methods for maintaining installed products.
 2. Executed Warranty Documentation: Manufacturers' material warranties and installers workmanship warranty.
 3. Record Documents: Drawings, Specifications, and Product Data.

NOTE: Edit LEED Requirements below to suit project.

4. Sustainable Design Closeout Documentation: Submit completed USGBC LEED® [Worksheet Templates](#) for the following credits:
 - a. MR 4.1, MR 4.2, MR 5.1, MR 5.2, MR 6, MR 7
 - b. IEQ 4.1, IEQ 4.2, IEQ 4.4

1.5 QUALITY ASSURANCE

- A. Qualifications:

1. Window Manufacturer/Fabricator: A firm experienced a minimum ten (10) years in producing products similar to those indicated and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
 - a. Manufacturer/Fabricator/Supplier shall be capable of providing Third Party Certification that wood materials were legally harvested from sustainably managed forests.
2. Testing Agency: An independent testing agency with the experience and capability to conduct the testing indicated, meeting requirements of ISO/IEC Standard 17025 or ASTM E699 and ASTM E329.

B. Certifications:

1. Provide Manufactured composite wood products sourced from sustainably managed forests as certified by one of the following independent third-party agents SmartWood (SW), SCS, SGS, BVC, SFI, ATFS, CSA, or VFF, and displaying the FSC, PEFC, PEFC member, or VFF label.
2. Provide window units rated for air infiltration, water penetration and structural performance per AAMA/NWWDA 101/1.S.2/A440-05 and as certified by an independent third-party agent.
3. Provide window units rated and certified for thermal performance by NFRC, and for seal integrity of insulating glass seal.
4. Provide third-party certification that window meets or exceeds ASTM E1886 and ASTM E1996 Impact Resistant ratings.

[NOTE: Edit source limits paragraph below to suit manufacturers. Most companies do not fabricate glazing like Woodstone windows does.](#)

C. Source Limitations: Obtain woodwork, fabricated glazing, accessories and window assembly through one source from a single manufacturer.

D. Sustainability Standards and Certifications:

[NOTE: Edit sustainability standards and certifications below to suit project.](#)

1. Adhesive and Sealant VOC Limits: According to South Coast Air Quality Management District [Rule 1168](#) and [GS-36](#) for aerosols.
2. VOC Limits: As tested using U.S. EPA Reference Test Method 24 and as defined by
 - a. South Coast Air Quality Management District Rules: In areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur.
 - 1). SCAQMD [Rule 1113](#), Architectural Coatings
 - 2). SCAQMD [Rule 1168](#), Adhesive and Sealant Applications
 - b. Bay Area Air Quality Management District Regulation: For containers larger than 16 oz., for areas where freeze/thaw conditions do exist or direct exposure to moisture can occur.
 - 1). BAAQMD [Regulation 8, Rule 51](#)
 - c. California Air Resources Board: For areas where freeze/thaw conditions do exist or direct exposure to moisture can occur.
 - 1). CARB for containers 16 oz. or less.
 - d. Green Seal Standards:
 - 1). [GS-11](#), Low Odor or Low VOC Paint
 - 2). [GC-03](#), Anti-Corrosive Paints, Second Edition, January 7, 1997
3. Certified Wood Materials: According to [FSC-STD-40-004 CoC](#) requirements.

[NOTE: Coordinate and edit to the correct Section number below.](#)

E. Prototypes per SECTION 014000 or 014300, and as follows. Provide window material components or assemblies of each window unit type for review and approval prior to manufacturing or fabrication production indicating each different:

1. Joint connection detail
2. Support, and exposed fastener
3. Bend, angle and corner
4. Finish
5. Special grain patterns and acceptable wood defects.
6. Hardware
7. Sealant and gasket
8. Glazing

NOTE: Delete Mockups article below if an independent assembly testing is not required.

- F. Mockups per SECTION 014000, and as follows: Provide mockup window assemblies as required for lab testing, either in the field or off-site.
1. Full scale three-dimensional assemblies utilizing final specified materials and final production techniques, constructed to be fully tested to ensure that the systems meet the performance requirements of the Specification by application of the maximum applied loads, climatic conditions, and structural movements.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery, Storage and Handling per industry and fabricator guidelines, SECTION 016000, and as follows:
1. Delivery and Acceptance Requirements
 - a. Fully insured shipments by the Manufacturer shall be made F.O.B. Destination.
 - b. Deliver materials to Project site in an undamaged condition, in original crates or cartons, and bearing intact labels.
 - c. Inspect shipped materials immediately upon delivery to ensure compliance with requirements of Contract Documents and to ensure that products are undamaged and properly protected.
 - 1). Reject damaged goods, immediately and properly filing claims
 - 2). Accept properly ordered, protected and undamaged goods.
 - d. Mark products with Shop Drawing location reference, unless already properly marked.
 - 1). Use removable tags or concealed markings.
 2. Storage and Handling Requirements
 - a. Protect wood window materials and accessories during shipping, handling, storage and installation from soiling, deterioration, and other damage. Handle wood window materials with proper care in proportion to the fragility and hazard of each product and its finished surfaces.
 - b. Store product materials from exposure to harmful conditions including, but not limited to, weather, direct sunlight, extreme changes in temperature, extreme dryness or humidity, water, denting, chipping, gouging, warping, peeling, construction operations, and other damage.
 - 1). Store certified materials separately for auditing.
 3. Packaging Waste Management
 - a. Require in writing that manufacturers, fabricators, suppliers and shippers provide least amount of packaging that adequately and properly protects, supports and contains the items shipped, and is reusable, returnable or recyclable.

1.7 FIELD CONDITIONS

- A. Conditions and Measurements: Visit jobsite to verify installation conditions and rough or masonry opening measurements.

1.8 WARRANTY

- A. Manufacturer Warranty: Submit a written materials and workmanship warranty, executed by the window manufacturer, agreeing to repair or replace window units that fail in materials or workmanship within the specified warranty period.
1. Warranty Period:
 - a. Woodwork: Three (3) years from the date of Substantial Completion.
 - b. Insulating Glass: Ten (10) years from the date of Substantial Completion.
 2. Hardware Furnished by Window Manufacturer:

NOTE: Choose one of the following deleting the one not selected, or editing to project requirements.

- a. Limited Lifetime
- b. Three (3) years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS / FABRICATORS

- A. Vermont Window Manufacturers / Fabricators: Subject to compliance with requirements, provide window assembly products by one of the following:
1. Green Mountain Window & Door Company, 92 Park Street, Rutland, VT 05701; 802.747.6915; www.greenmountainwindow.com
 2. H. Hirschmann Ltd. (1980), 467 Sheldon Ave., Rutland, VT 05777; 802.438.4447; www.hhirschmannltd.com
 3. J. S. Benson Woodworking & Design, LLC, 118 Birge Street, Brattleboro, VT 05301; 802.254.3515; www.jsbensonwoodworking.com
 4. The Woodstone Company (1978), 17 Morse Brook Road, Westminster, VT 05158; 800.682.8223; www.woodstone.com

NOTE: Coordinate and edit to the correct Section numbers below.

- B. Substitution Limitations: Manufacturers of equivalent products beyond those listed above shall be considered when submitted per SECTION 013000 or 013300, and SECTION 016000, using CSI Substitution Request Form 1.5C (During the Bidding Phase) or Form 13.1 (After the Bidding Phase.) [link](#)
- C. Product Options

NOTE: Select from items below to suit project and delete items not chosen.

1. Operational Options
 - a. Dual Operation: Provide single or double hung windows that also open like a casement.
 - b. Dual Operation: Provide single or double hung windows that also open like an awning.
 - c. Dual Operation: Provide single or double hung windows that also open like a hopper.
 - d. Combination Operation: Provide (European) hardware that allows tilt and turn movements.
 - e. Combination Operation: Provide (European) hardware that allows slide and tilt movements.
 - f. Provide swing-range limiting devices for large outswing casements to protect hardware from wind shear.
2. Accessory Options:
 - a. Provide screens for each operating window
 - b. Provide storm windows for each window

- c. Provide shutters for each window
- d. Provide wall pockets for sliding units for increased opening area.
- e. Provide wall pockets for hung units for increased opening area.
- 3. Wood Species Options: Provide third-party certified sustainable wood; see SECTION 060530.

NOTE: The following wood species were compiled from the Vermont window manufacturers listed: (Other wood species may be available.)

- a. Eastern White Pine (*Pinus strobus*)
- b. Black Cherry (*Prunus serotina*)
- c. White Oak (*Quercus alba*)
- d. Walnut (*Juglans nigra*)
- e. Honduran Bigleaf Mahogany or Caoba (*Swietenia macrophylla*)
- f. Teak (Common) (*Tectona grandis*)
- 4. Finish Options:
 - a. Factory finish per Manufacturer as selected by Architect from manufacturer's full range.
 - b. Field finish per SECTION 099100
 - 1). Clear transparent
 - 2). Stained with clear topcoat
 - 3). Paint coating (use for finger-jointed or other engineered type wood products)

2.2 DESCRIPTION

A. Regulatory Requirements

- 1. Glazing Standards: Comply with [GANA Glazing Manual](#) except where more stringent requirements are indicated.
- 2. Grade Quality per ANSI/NWWDA I.S. – 2: Per air-infiltration, water penetration, operating force, and structural performance.

NOTE: Select from items below to suit project and delete items not chosen.

- a. Grade 20 (Residential)
- b. Grade 40 (Light Commercial)
- c. Grade 60 (Heavy Commercial)
- 3. Safety Glass: Per ANSI Z97.1 and 16 CFR Part 1201 testing requirements for Category II materials.
 - a. Safety glass shall be permanently marked with SGCC certification label.
 - 1). Exception: Safety glass without permanent markings may be provided when accompanied by written affidavit from the Window Manufacturer and/or the Glass Tempering Vendor certifying that safety glass has been provided in accordance with Federal law.
 - a). Contractor shall verify certification acceptability to the AHJ over the end use of specified window units.
- 4. Insulating Glass Certification: Per IGCC and SIGMA recommendations except where more stringent requirements are indicated.
- 5. AWI Grade 1, plain sawn with AWI Premium Grade Assembly for joinery, sanding, and tolerance deviation.
 - a. Each sash stile and rail connection shall be glued and pegged/pinned, haunched mortise and tenon.
 - b. Each bar and muntin connection shall be glued and pegged/pinned, coped, mortise and tenon.
 - c. Jamb/frame assembly joinery shall be connected with dadoes or rabbeted joints and factory assembled.
 - d. Sand surfaces to 120-grit without visible cross-sanding marks.

- e. Deviation Tolerances at Longitudinal Joints: Maximum 0.015 x 8 inch (0.38mm x 203mm) of gap (minimum spacing 4 feet (1.2m))
- f. Deviation Tolerances at Intersecting Joints: Maximum 0.025 inch (0.635mm) of gap.
- g. Glue: Waterproof; applied in accordance with glue manufacturer's directions.

B. Sustainability Characteristics

- 1. Finger-jointed lumber provides an efficient use of the timber resource allowing mills to combine shorter pieces of wood into dimensional, structural lumber.
- 2. [USGBC LEED®](#) Rating: Comply with project requirements intended to achieve the following Rating, as measured and documented according to the [USGBC LEED® Green Building Rating and Version](#) indicated:

NOTE: Each LEED Version requires a different credit total to achieve the desired LEED Rating.

NOTE. Select one of the following Ratings:

- a. Rating: Certified
- b. Rating: Silver
- c. Rating: Gold
- d. Rating: Platinum

NOTE. Select one of the following Versions:

- e. Version: [LEED 2009-NC](#) v. 3 (New Construction)
- f. Version: [LEED 2009-EB](#) v. 3 (Existing Building)
- g. Version: [LEED 2009-CI](#) v. 3 (Commercial Interiors)
- h. Version: [LEED 2009 for Schools](#)
- i. Version: [LEED for Retail](#), v. 2 (July 2008) Draft (Commercial Interiors)
- j. Version: [LEED for Health Care](#)
- 3. Applicable LEED Credits: Performance requirements of the following LEED Categories and Credits apply to this Section and shall be met:
 - a. Materials & Resources (MR) Credits: 4.1, 4.2, 5.1, 5.2, 6, 7
 - b. Indoor Environmental Quality (IEQ) Credits: 4.1, 4.2, 4.4

2.3 PERFORMANCE / DESIGN CRITERIA

NOTE: Delete performance criteria below if using Grade Quality Standards under 2.2.A.

A. Performance Capacities

NOTE: Verify state energy code requirements for site and edit below to be in conformance.

- 1. Thermal Efficiency. Whole Unit per NFRC U-Value shall equal a maximum:
 - a. 0.35
 - b. 0.41
 - c. 0.45
- 2. Air Infiltration at 1.56 psf pressure differential:
 - a. Maximum 0.34 cfm / lineal ft. of opening crack
 - b. Maximum 0.25 cfm / lineal ft. of opening crack
 - c. Maximum 0.10 cfm / lineal ft. of opening crack
- 3. Water Infiltration Not Allowed at:
 - a. 2.86 psf pressure differential
 - b. 4.43 psf pressure differential
 - c. 6.24 psf pressure differential
- 4. Structural: No glass breakage, damage to hardware or permanent deflection greater than:
 - a. 0.4 percent of span at 20 psf
 - b. 0.4 percent of span at 40 psf

- c. 0.4 percent of span at 60 psf
- 5. Structural: Operating Force may not exceed:
 - a. 25 lbs
 - b. 30 lbs
 - c. 35 lbs
- 6. Structural: Design Load shall meet or exceed:
 - a. 13.3 psf
 - b. 27 psf
 - c. 40 psf
 - d. 50 psf
- 7. Impact Cycle Pressure per ASTM E1886 (Cyclic) and ASTM E1996 (Hurricane): 50 psf for sizes up to 73 x 63 inches (1.85m x 1.6m)
- 8. Acoustical Whole Unit STC:
 - a. 36
 - b. 40

B. Design Criteria

- 1. Wood Frame for Transparent Finish:
 - a. Solid wood grain pattern cut
 - 1). Plain sawn (flat-sawn or flat-grained)
 - 2). Quarter sawn (straight-grained, edge grained or straight-grained)
 - 3). Rift sawn
 - b. Wood veneer
 - 1). Rotary-cut veneer (peeled)
 - 2). Sliced veneer
 - 3). Sawn veneer (thick)
- 2. Wood Frame for Opaque Finish:
 - a. Solid
 - b. Fingerjointed

2.4 MISCELLANEOUS MATERIALS

- A. Window Construction Adhesive: Non-HAP formulation complying with ASTM D5751 and/or ASTM D5572 recommended for indicated use by adhesive manufacturer.

NOTE: Select one of the following deleting the other.

- 1. Use adhesives that comply with LEED Credit EQ 4.1 requirements.
 - 2. Use adhesives that have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Glue: Non-HAP aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.
- 1. Use glues that comply with LEED Credit EQ 4.1 requirements.

2.5 WOOD TREATMENTS

- A. Lumber for window frame system shall be water-repellent preservative treated after machining, or made from a naturally rot-resistant wood species.
- 1. Preservative Treatment: Sherwin Williams [Sher-Wood® Homoclad®](#) or Architect's acceptable equivalent; 3 minute dip

GREEN NOTE: Naturally rot-resistant, untreated wood species have an average service life roughly equivalent to and sometimes better than treated lumber (9-50) depending on the species,

treatment, and application.

2. Naturally Rot-Resistant (Untreated) Wood Species: Heartwood
 - a. Vermont Sourced: Black Locust, White Oak, Larch (Tamarack)
 - b. Other North America Sourced: Osage-orange, Western juniper, Pacific yew, Red Cedar, Yellow Cedar, Redwood
 - c. International Sourced: (Central & South) American Mahogany (Swietenia spp.), Ipé, Baldcypress, Teak, Jarah

2.6 ASSEMBLY / FABRICATION

A. General:

1. Jamb/Frames: Comply with AWI Premium Grade.
 - a. Wood Joinery: Wood Joinery shall conform to AWI Premium Grade Standards.
 - b. Jamb: Solid Rabbeted, unless noted otherwise
 - c. Expansion / Contraction Movement: Assemble wood products using details that allow for expansion and contraction due to changes in environmental conditions.
2. Sash: Comply with AWI Premium Grade
 - a. Setup: Exterior Flat Casing or Standard Brickmold as selected by Architect
 - b. Operable without removing screens
 - c. Glazing stops shall be applied from interior stile and rail face and be coped where molded corners are specified.
 - d. Miters and butt joints acceptable only on square edged or non-molded stops.
 - e. Trim extraneous glazing sealants from visible glass of sash bars and muntins
 - f. Sash Pairs: In-swing or out-swing sash specified in pairs (two or more sash in one jamb/frame opening) shall include an astragaled, shiplaped or knuckled meeting rail sufficient in size and shape to accept specified hardware function and weatherstrip system.
3. Screens:
 - a. Removable and against or flush to the exterior blind stop with bullet catches or fasteners sufficient to hold screen frame securely in place and maintain taught fabric.
 - b. Frames (Stiles & Rails):
 - 1). Wooden Frame: Comply with AWI Premium Grade.
 - 2). Aluminum Frame - Custom: Heavy gage 1-1/4 x 3/8 inch (32mm x 9.5mm) extruded aluminum; standard colors.
 - 3). Aluminum Frame - Economy: Light gage 7/8 x 5/16 inch (22mm x 8mm) extruded aluminum; standard colors.
 - c. Screen Fabric: As selected by the Architect
 - 1). Fiberglass; Charcoal
 - 2). Anodized Aluminum; Charcoal
 - 3). Bronze
4. Hardware:
 - a. Double lined Jamb with a combination of bronze interlocking sill, and weather-strip around the full sash perimeter.
 - b. Sash widths over 48 inches (1.2m) shall include two (2) sash locks.
 - c. Finishes: As selected by Architect from manufacturer's full range.

B. Combination Window Units:

1. Mull combinations of fixed and/or operable sash shall include detailing necessary to coordinate mullioned jambs from any one function to another as required, including interior and exterior trim systems to maintain fenestration site lines specified.

NOTE: Select applicable window types and edit, deleting items not chosen.

C. Awning Windows: Sash, Screens and

1. Hardware:
 - a. Rotor or lever operators shall be installed with independent sash locks, if required.
 - b. Concealed hinge track and support arms with corrosion protection coating, and thermoplastic shoe with stainless steel insert.
 - 1). Egress hinge action shall be available to maximize the opening area and an offset hinge action shall be available to allow easy access for cleaning the exterior glass surface from the inside.
 - 2). Butt hinges shall be solid brass.
- D. Casement (Out-Swing) Windows: Sash, Screens and
 1. Hardware:
 - a. Rotor or lever operators shall be installed with independent sash locks.
 - b. Multipoint locking system with locking points activated by a single lever handle.
 - c. Concealed hinge track and support arms with corrosion protection coating, and thermoplastic shoe with stainless steel insert.
 - 1). Egress hinge action shall be available to maximize the opening area and an offset hinge action shall be available to allow easy access for cleaning the exterior glass surface from the inside.
 - 2). Butt hinges shall be solid brass.
- E. Casement (In-Swing) Windows: Sash, Screens and
 1. Hardware:
 - a. European multipoint locking system
 - b. Crank and/or lever operators not recommended.
 - c. Butt Hinges, Handle, and Escutcheon: Solid brass
 - d. Turn Latches: Traditional
 - e. Powder-coated corrosion resistant finish
- F. Hopper Windows: (Recommended In-Swing Only) Sash, Screens and
 1. Hardware:
 - a. Sash shall be secured with an Ives #80 brass transom latch and chain.
 - 1). Provide pole operator.
 - b. Butt Hinges: Solid brass
 - c. Turn Latches: Traditional
- G. Tilt & Turn Windows: (In-Swing only)
 1. Sash:

NOTE: Select one of the following two deleting the other.

 - a. Flush frame with concealed hinges.
 - b. Shiplap with exposed hinges.
 2. Screens
 3. Hardware:
 - a. Manual operating hardware
 - b. European multipoint locking system
 - c. Solid brass handle, and escutcheon
 - d. Powder-coated corrosion resistant finish

NOTE: Verify arched unit restrictions per Window Manufacturer.
- H. Hung Windows: Single, Double and Triple Hung Windows with the following functions:
 1. Premium Grade Weight & Pulley:

NOTE: This system provides a weatherstripping platform that can achieve the most stringent NWWDA Grade 60 and Canadian A3 performance certification.

- a. Sash:
 - 1). Fixed or free sliding as required including Blind Stops, Parting Stops and Adjustable Interior Beaded Stops.
 - 2). Offset meeting or check rails.
 - 3). 12 degree pitched sill unless otherwise specified with extended nosing and side horns to support exterior trim.
- b. Screens
- c. Hardware:
 - 1). Balance System shall include:
 - a). Rolled Steel Counter-Weights; Epoxy coated
 - b). Cast Bronze Pulleys

NOTE: Select sash cord or chain below, deleting the one not used.

- c). Synthetic Sash Cord; Brown or White as selected by Architect
 - d). Chain
 - e). Sealed Weight Pockets with Weatherproof Access Panel in each side jamb.
 - 2). Lifts and locks to be supplied un-installed for units requiring on-site painting or as recommended by the Window Manufacturer.
 - 3). Lifts and/or pole rings and poles as selected by Architect.
- 2. Premium Grade Clockspring:

NOTE: Balances with stainless steel sash tape are compatible with Premium Jamb Systems and shall be specified where space for weight pockets is not available and lighter sash are used. Clockspring balance systems, however, are not suitable for the high performance weatherstrip system that can be used with the Weight & Pulley counterbalance.

- a. Sash:
 - 1). Fixed or free sliding as selected by Architect.
 - 2). Offset meeting or check rails as selected by Architect.
 - 3). 12 degree pitched sill with extended nosing and side horns to support exterior trim.
- b. Screens
- c. Hardware:
 - 1). Lifts and locks to be supplied un-installed for units requiring on-site painting or as recommended by the Window Manufacturer.
 - 2). Lifts and/or pole rings and poles as selected by Architect.
- 3. Custom Grade Thermoplastic Balance Systems including:
 - a. Magnum Series:

NOTE: This system cannot achieve Grade 60 performance standards.

- 1). Sash:
 - a). Fixed or free sliding as required in the Jamb System, which includes a Parting Stop at the head only.
 - b). Offset meeting or check rails.
 - c). Maximum sash weight shall be 79 lbs (36 kg).
 - d). Sash thickness shall be 1-3/4 inch (44mm).
- 2). Screens
- 3). Hardware:
 - a). Weather-strip shall include Bronze Interlock at Top and Bottom Rails, Compression at the Meeting/Check Rail and 12 degree pitched sill with extended nosing and side horns to support exterior trim.
 - b). Lifts and/or pole rings and poles to be supplied.
 - c). Lifts and locks to be supplied un-installed for units requiring on-site finish painting or as recommended by the Window Manufacturer.

- b. EZ Tilt
 - 1). Sash:
 - a). Fixed or free sliding with Parting Stop at the head only and Tilt Out.
 - b). Offset meeting or check rails.
 - c). Maximum sash weight shall be 39 lbs. (17.7 kg).
 - d). Thickness shall be 1-1/4 to 1-3/8 (32mm to 35mm).
 - 2). Screens
 - 3). Hardware:
 - a). Weather-strip: Bronze Interlock at Top and Bottom Rails, Compression at the Meeting/Check Rail and 12 degree pitched sill with extended nosing and side horns to support exterior trim.
 - b). Lifts and/or pole rings and poles to be supplied.
 - c). Lifts and locks to be supplied un-installed for units requiring on-site painting or as recommended by the Window Manufacturer.

I. Pivot Windows:

NOTE: Screen applications are significantly limited with Pivot Windows.
Vertical pivot functions are not recommended.

- 1. Sash:
 - a. Operation: In-swing at top, out-swing at bottom
 - b. Secure sash with an Ives #80 brass transom latch and chain, with pole operator.
- 2. Hardware:
 - a. Pivot Cam Hardware: Engineered for unit size and weight.
 - b. Traditional turn latches of finish as selected by Architect from manufacturer's full range.

J. Folding Windows: (Bi-fold, Tri-fold, etc.) Sash, Screens and

- 1. Hardware:
 - a. Casement Latches - Manual Operating: Ives solid brass
 - b. Multipoint locking system
 - c. Solid brass handle and escutcheon
 - d. Solid brass surface bolts or flush bolts shall be used to secure secondary leaf.
 - e. Hinges: Solid brass butts or adjustable hinges as selected by the Architect
 - f. Powder-coated finish

K. Sliding Windows:

- 1. Sash:
 - a. Setup fixed or free as selected by the Architect including Blind Stops, Parting Stops & Adjustable Interior Beaded Stops
 - b. Offset meeting or check rails
- 2. Screens:
 - a. Fixed or sliding as selected by the Architect
 - b. Sliding Screens: Wooden framed on solid brass track with
 - 1). Non-locking solid brass flush pulls
 - 2). D style handles
- 3. Hardware:
 - a. Double lined Jamb with a combination of bronze interlocking sill, compression, and weather-strip around the full sash perimeter and meeting / check rails.
 - b. Head and sill deadbolts with standard handles
 - c. Stile latch or surface bolts
 - d. Units over 60 inch in height shall include solid brass adjustable meeting rail interlocking weatherstrip.
 - e. Solid Brass or extruded aluminum sill track with adjustable height nylon rollers.

L. Fixed Window Sash:

1. Setup in jamb/frame types as consistent in design and shape as possible with related or adjacent operable sash wherever required to maintain fenestration site lines.
2. Fixed in place with removable stops or permanently attached to the jamb/frame with galvanized or stainless steel screws.
3. Fixed Sash Screwed into Jambs: Seal full perimeter with paintable sealant
4. Removable Fixed Sash: Seal with full perimeter weatherseal gasketing

2.7 ACCESSORIES

- A. Window Hardware: Manufacturer's recommended hardware necessary to operate, tightly close and securely lock windows so as to comply with requirements.

NOTE: Select acceptable hardware manufacturers applicable to project deleting items not chosen.

1. GU Hardware; <http://www.g-u.com/>
2. Truth Hardware; <http://www.truth.com/home.html>
3. Baldwin Hardware; <http://www.baldwin-brass-central.com/>
4. Bronzecraft; <http://www.bronzecraft.com/woodware.html>
5. Rocky Mountain; <http://www.rockymountainhardware.com/index.asp>
6. Von Morris; <http://www.vonmorris.com/main.html>
7. Merit Hardware; <http://www.meritmetal.com/>
8. Whitechapel LTD; <http://www.mountaintopcomputers.com/>
9. E.R. Butler; <http://www.erbutler.com/>
10. P.E. Guerin Ltd.; <http://www.peguerin.com/>
11. Phelps Hardware; <http://www.phelpscompany.com/>
12. Accurate; <http://www.accurate.to/main.asp>
13. AGB; <http://www.agb.it/DesktopDefault.aspx?menuid=11&menuindex=0>
14. Anuba; <http://www.anuba.de/produkte-de.html>
15. The Architectural Resource Center; <http://www.aresource.com/>
16. Baldwin; <http://www.baldwinhardware.com/>
17. BKS; <http://www.g-u.com/index.php?id=207&Lang=1>
18. Bouvet; <http://www.bouvet.com/>
19. Bronze Craft; <http://www.bronzecraft.com/>
20. Centor; <http://www.centor.com.au/>
21. Classic Brass; <http://www.classic-brass.com/>
22. D-line; <http://www.d-line.com/>
23. Ferco; <http://www.ferco.fr/>
24. FFI; <http://www.fenestration.net/>
25. Fuhr; <http://www.fuhr.de/fuhr/en/index.php>
26. G-U <http://www.g-u.com/index.php?id=201005&Lang=20>
27. Hafele; <http://www.hafele.com/us/services/4396.asp>
28. The Harwick Company, Hoppe US; <http://www.us.hoppe.com/index.aspx>
29. Heritage Hardware; <http://www.heritagehardware.net/>
30. Ives; <http://www.ives.ingersollrand.com/>
31. KFV; <http://www.kfv.de/>
32. L.B. Brass; <http://www.lbbrass.com/>
33. Phelps Company; <http://www.phelpscompany.com/>
34. Rocky Mountain Hardware; <http://www.rockymountainhardware.com/>
35. Siegenia; <http://www.siegenia-aubi.com/>
36. Stone River Bronze; <http://www.us.hoppe.com/index.aspx?id=32>
37. Sugatsune; <http://www.sugatsune.com/>
38. Tiger; <http://www.tiger.de/>

- 39. Truth; <https://www.truth.com/main/>
- 40. Valli Valli; <http://www.vallievalli.com/>
- 41. Von Morris; <http://www.vonmorris.com/>

B. Glass and Glazing:

1. General:
 - a. Provide glazing materials that are produced, fabricated and installed to withstand normal thermal movement and wind loading.
 - b. Glass thickness' indicated on Drawings are for design detailing only.
 - c. Glass lites for the various size openings, including thickness' and strengths (annealed or tempered), shall meet or exceed performance requirements.
2. Insulating Glass: Fabricated glazing shall be sealed with compatible materials from a single source manufacturer as follows:
 - a. Insulating glass shall be double sealed using desiccated aluminum spacer, Tremco Poly-isobutylene (PIB) primary sealant, Tremco Proglaze silicone secondary sealant, set in Tremco JS-950 Silicone glazing sealant; or Architect acceptable equivalents.
 - b. Insulating glass may also be fabricated with Edgetec Composite Super Spacer with hot-melt PIB sealant backer; or Architect acceptable equivalents.
 - c. Spacer colors to be chosen from readily available supplies held in stock by the Manufacturer.
 - d. Insulated glass described in this paragraph shall be supplied by a glazing company under contract with the window manufacturer or a division of the window manufacturer.
3. Specialty Glazings:
 - a. Designated Heat Mirror products shall be supplied by licensee of Southwall Technologies; or an Architect acceptable equivalent.
 - b. Window Manufacture shall indicate the supplier of each specialty glass material for Architect's review.
4. Insulated glass with sealed edges shall be set in rabbeted sash from the Interior sash face, permanently sealed to the Exterior of the sash rabbet in silicone sealant and fixed in place with wooden glazing stops set from the Interior and unsealed to the sash frame to allow condensation and other potential moisture accumulation to evaporate.
5. Refer to SECTION 088000, GLAZING.

C. Fasteners: Corrosion-resistant of appropriate type, length and durability for wood product used to securely fasten to the substrate for the intended life and use of the unit.

RED NOTE: Avoid specifying bright chromium plated metal finishes, which contain carcinogenic hexavalent chromium in a non-recyclable arsenic heavy metal salt bath.

1. Sash: Tenons shall be pegged/pinned with hardwood pegs or stainless steel pins.
2. Jamb/Frames: Dadoed joints shall be screwed with galvanized or stainless steel screws.
3. Glazing stops shall be fastened with galvanized or painted head nails resistant to bleed through.
4. Jamb/Frame assemblies shall be fastened to Rough Openings with galvanized or stainless steel screws per ASME B18.6.1 and ASME 18.6.4 as supplied by Window Manufacturer. Other fasteners required for a successful installation are the responsibility of the Installing Contractor, as approved by the architect.
5. Trim systems shall be fastened to Jamb/Frame assemblies with galvanized or painted head nails resistant to bleed through or galvanized screws.
6. Adhesive sealants between trim and jamb and at all dadoed jamb connections shall be Tremco JS-950 silicone or an Architect acceptable equivalent suitable for painting.

D. Accessories: Accessory items include, but are not limited to, Security System Hardware and other Sensory Devices, Decoration and other materials not necessarily required to operate, tightly close and securely lock windows.

2.8 FINISH

A. Paint Finish

1. Pretreatment: Sherwin Williams Sher-Wood® Homoclad® Preservative Treatment; or an Architect acceptable equivalent.
2. Primer: One or two coats of Sherwin-Williams® A-100 Alkyd Exterior Wood White pigmented primer; or an Architect acceptable equivalent.
3. Finish Coats: Two of Sherwin-Williams' exterior Acrylic SUPERPAINT; or an Architect acceptable equivalent.
 - a. Topcoat: A-100 shall be top coated with an acrylic, alkyd or oil based finish.
 - b. 20 Year SW Warranty

B. Clear Finish: Tung oil with UV inhibitors

1. One coat of [Waterlox Marine Sealer](#); or an Architect acceptable equivalent.
2. Two coats of Waterlox Marine Finish; or an Architect acceptable equivalent.
 - a. high gloss (8-9 coats)
 - b. semi-gloss
 - c. natural weathered appearance (2 coats)

NOTE: Conversion varnishes and paints (i.e.. Urethanes) are not recommended for exterior applications.

C. WOOD STABILIZATION & PRESERVATIVE TREATMENT: (for extreme exposures)

1. Sherwin-Williams Sher-Wood® Homoclad® preservative treatment; or an Architect acceptable equivalent.

PART 3 - EXECUTION

3.1 EXAMINATION

NOTE: Coordinate and edit to the correct Section number below.

A. Examination per SECTION 017000 or 017100 or 017116, and as follows:

1. Acceptance of Conditions: Carefully examine installation areas with Installer/Applicator present, for compliance with requirements affecting Work performance.
 - a. Verify that field measurements, rough or masonry openings, surfaces, substrates, structural support, connections, tolerances, levelness, plumbness, humidity, moisture content level, cleanliness and other conditions are as required by the manufacturer, and ready to receive Work.
 - 1). Test substrates as recommended by manufacturer to verify proper conditions.
 - a). Cleanliness
 - b). Moisture content
 - b. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

NOTE: Coordinate and edit to the correct Section numbers below.

A. Preparation per SECTION 017000 or 017100 or 017123, and as follows:

1. Layout installation by marking extents of each item, and anchoring / fastening locations coordinated with blocking or other structural support.
 - a. Marks shall be covered up and hidden by installation.
 - b. Locate areas out-of-level and correct.

2. Protect adjacent conditions per SECTION 017000 or 017100, and as follows:
 - a. Protect adjacent substrates, installed work and existing items from damage by construction operations with temporary but effective means.
 3. Product Preparation: Handle products in accordance with manufacturer's instructions and warranty requirement including, but not limited to:
 - a. Remove shipping / storage protection
 - b. Acclimatize product to installation location.
 - c. Strictly adhering to manufacturer's handling and installation requirements.
- B. Provide fasteners, sealants and other accessory materials required to successfully complete the window installation that are not specified and supplied by the Window Manufacturer.

3.3 INSTALLATION

NOTE: Coordinate and edit to the correct Section number below.

- A. Installation per manufacturer's written instructions, SECTION 017000 or 017300 or 017316, SECTION 061003 or 062003, and the following:
1. General:
 - a. Place rough carpentry to indicated levels and lines, with members plumb, aligned, cut, and fitted.
 - b. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit.
 - c. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - d. Install wood framing per ANSI / AF&PA [NDS-2005](#), and SECTION 061003
 - e. Install engineered wood products per manufacturer's written instructions, and SECTION 061703.
 - f. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated, and as required by AHJ.
 - g. Fasten or anchor materials and units in a concealed manner with fasteners appropriate to use and anticipated durability. Attach rough carpentry work to substrate securely by anchoring and fastening as indicated, complying with ICC Table 2304.9.1, Fastening Schedule, and ICC-ES / [ESR-1539](#).
 - 1). Do NOT use chromium-plated metal fasteners and anchors.
 - 2). Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials.
 - 3). Make tight connections between members.
 - 4). Install fasteners without splitting wood; countersink nail heads, unless noted otherwise.
 - 5). Place fasteners, when exposed, aligned in straight rows parallel with edges of members for exposed work, with fasteners evenly spaced, and with adjacent rows staggered.
 2. Special Techniques
 - a. Select preservative treated wood members in accordance with appropriate untreated lumber and plywood span tables.
 - 1). Provide ventilation of building cavities as required by code.
 - b. Install preservative treated wood in accordance with requirements of applicable codes and SECTION 061003.
 - 1). Avoid milling operations that could adversely affect preservative characteristics of borate preservative treated wood.
 - c. End Cut Treatment: Treat end cuts of borate preservative treated wood members over 2 inches (51mm) in thickness with field-applied end-coat prior to installation for Spruce-Pine-Fir (SPF) and Douglas Fir (DF) only.
 - d. Sill Plate: Where applicable, provide sill plate of preservative treated wood.

- e. Fasten wood and wood products though sound wood, sorting and selecting to avoid characteristic imperfections like knots and checks.

NOTE: For installation of specific rough carpentry types refer to manufacturer written instructions and ANSI / AF&PA NDS-2005.

3.4 FIELD QUALITY CONTROL

NOTE: Coordinate and edit to the correct Section number below.

- A. Site Tests and Inspections: Per SECTION 014000 or 014500 or 014523, SECTION 019100, and as follows:
 - 1. Field water spray test of installed window(s) for leaks per ASTM E547. Installed window(s) for testing as selected by Architect.
 - 2. Field blower door testing per SECTION 018316, and ASTM E779 or CGSB Standard 149.

NOTE: Coordinate and edit below to Project requirements.

- a. Air-Leakage Rate: Equal to or less than 0.15 cfm/sf (0.0456 m³min/m²) of building shell at 4.935 atmospheres (50 Pascal) as adjusted for temperature (ΔT)
- B. Non-Conforming Work per General Conditions and as follows:
 - 1. Remove, Repair and Reinstall or Restore in Place damaged items.
 - a. Finish touch-up damaged surface finishes.
 - b. Replace damaged materials or items with New if repair not acceptable to Architect.
 - 2. Locate and repair leaks identified during field-testing. Re-test and reseal until tests pass.

3.5 CLEANING

NOTE: Coordinate and edit to the correct Section number below.

- A. Waste Management per SECTION 017000 or 017400 or 017419, and as follows:
 - 1. Disposal Requirements:
 - a. Handle hazardous waste in strict accordance with manufacturers' recommendations and AHJ rules and regulations for materials regulated under RCRA (Resource Conservation and Recovery Act).
 - b. On-site incineration not allowed.
 - 2. Reuse and Recycling:
 - a. Store and return pallets, containers and packaging to manufacturer or recycler for reuse or recycling.
 - b. Store scrap materials to be returned to manufacturer for recycling into new product. Coordinate take-back program with manufacturer, if applicable.

NOTE: Coordinate and edit to the correct Section number below.

- B. Provide Progress Cleaning per SECTION 017000 or 017400 or 017413.
- C. Provide Final Cleaning immediately prior to Substantial Completion inspection per SECTION 017000 or 017400 or 017423.

3.6 CLOSEOUT ACTIVITIES

- A. Substantial Completion Requirements per SECTION 017000 or 017700.

3.7 PROTECTION

- A. Protect installed work from construction operations and other damage until Final Completion or Owner occupancy, whichever comes first.

END OF SECTION

NOTE: Please **contact us** with comments, additions and deletions about this GuideSpec so we can make it better.

VERMONT SUSTAINABLE JOBS FUND

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RED NOTE: Be sure to obtain the latest version of this Guide Specification.

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