

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 Section 02 41 13 – Selective Site Demolition.
- .2 Section 06 03 40 – Historic - Wood Repair.
- .3 Section 07 92 00 – Joint Sealants.
- .4 Section 08 03 52.81 – Historic - Wood Window Replacement.
- .5 Section 08 03 80 – Historic - Glazing.
- .6 Section 09 03 91 – Historic - Painting.

1.02 REFERENCES

- .1 Architectural Woodwork Manufacturers Association of Canada (AWMAC)
 - .1 Architectural Woodwork Quality Standards Illustrated - 8th Edition, 2003.
- .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-O141-05, Softwood Lumber.
 - .2 CAN/CSA-A440.2-04/A440.3-04, Energy Performance of Windows and Other Fenestration Systems / User Guide to CSA A440.2-04, Energy Performance of Windows and Other Fenestration Systems
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 National Lumber Grading Authority (NLGA)
 - .1 NLGA Standard Grading Rules for Canadian Lumber 2007.

1.03 SEQUENCING

- .1 Rehabilitate wood windows in accordance with Work of this Section and related sections, as per the intervention type for each frame and sash of a window unit, ranging from standard intervention to replacement, as identified in the window schedule.
 - .1 Remove sashes and related wood window components including parting beads and sash stops.
 - .2 Salvage sashes, stops and glazing for reuse.
 - .3 Restore frames, sashes and stops, and hardware. Replace parting beads universally and other components such as weatherstripping as indicated.
 - .4 Repair wood window components as indicated and in accordance with Section 06 03 40 – Historic - Wood Repair.
 - .5 Fabricate replica sashes for replacement as indicated and in accordance with Section 08 03 52.81 – Historic – Wood Window Replacement.
 - .6 Install salvaged and new glazing in accordance with Section 08 03 80 – Historic - Glazing; replace as indicated.
 - .7 Paint wood windows in accordance with Section 09 03 91 – Historic - Painting.
 - .8 Install restored and new hardware.

- .9 Install restored and new sashes, related wood window components and new weatherstripping. Touch-up affected adjacent finishes.
- .10 Seal frames and sashes in accordance with Section 07 92 00 – Joint Sealants.

1.04 ACTION AND INFORMATION SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for windows and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings.
 - .2 Indicate materials and details in large scale for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units, elevations of unit, anchorage details, description of related components and exposed finishes, limit of different finishes, weatherstripping, fasteners, and caulking.
 - .3 Prior to preparation of shop drawings, take field measurements as material is removed to confirm dimensions and details.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will not be returned for inclusion into work.
 - .3 Submit 150 mm long samples of parting beads and each type of weatherstripping.
 - .4 Submit 250 mm long samples of moulding profiles; assume custom profiles requiring the fabrication of custom cutters.
 - .5 Submit samples of each type of hardware.
- .5 Test and Evaluation Reports:
 - .1 Submit test reports from approved independent testing laboratories in accordance with Section 01 45 00 - Quality Control.
- .6 Database:
 - .1 Prepare database table to record interventions as follows for each window unit:
 - .1 Repair type by wood component part of a frame and sash, to locate intervention within individual frame or sash.
 - .2 Replacement of a sash.
 - .3 Replacement of glazing by sash.
 - .4 Replacement of hardware components and related parts, by window operation type.
 - .2 A window schedule, identifying each window unit, to be provided by the Departmental Representative following Notice to proceed to serve as a basis for information; interventions will not be indicated.

- .3 Before submitting first progress claim, submit proposed table in PDF format as directed by Departmental Representative.
- .4 After approval by Departmental Representative, database will serve as the basis of monthly progress claims.
- .7 Photographic Documentation:
 - .1 Submit photographs of exiting conditions, prior to commencing work, in accordance with Section 02 41 13 – Selective Site Demolition.
 - .2 Submit photographs for each of the following stage of the work, for site and shop work, with separate submittals at each stage:
 - .1 Post disassembly.
 - .2 Post paint removal.
 - .3 During repairs.
 - .4 Post repair but prior to painting.
 - .3 Submit photographs for each of the aforementioned stage of the work, for mock-ups, with separate submittals for each mock-up.

1.05 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for windows for incorporation into manual.
- .3 Record Documentation:
 - .1 Submit assembled documentation in the form of a Conservation Report to document every step of the restoration process from examination of exiting conditions to reinstallation.
 - .2 Submit Database to locate interventions by type for each window unit.

1.06 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Carry out window restoration work of this section using skilled tradespersons trained and experienced in rehabilitation and installation of wood windows as per Pre-qualification requirements.
 - .2 Competent worker: equipped with tools and equipment necessary to carry out work in a traditional manner.
 - .3 Contractor's Field Supervision and Crew Qualifications: maintain full-time supervisor/foreperson on job site during times work is in progress. Supervisor must have window rehabilitation training and experience in window rehabilitation similar in nature and scope to specified work as per Pre-qualification requirements.
 - .1 Shop crew makeup: trade qualified journeyperson carpenters and registered apprentices in the ratio of no more that one to one (at least one journeyperson to one apprentice).
 - .4 Only workers accepted by Departmental Representative during mock-ups will be authorized to perform Work of this section.
- .2 Mock-ups:

- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .2 Construct mock-up to demonstrate understanding of specified procedures, techniques and formulations for each intervention.
 - .3 Prepare mock-ups for inspection by Departmental Representative before proceeding with further Work.
 - .4 Mock-up:
 - .1 Size: full size for each window type.
 - .2 Surfaces: ready for coatings but not treated with coatings.
 - .3 Install new weatherstripping and restored hardware.
 - .5 Mock-up will be used:
 - .1 To judge quality of work, substrate preparation, operation of equipment and material application.
 - .6 Locate where directed by Departmental Representative.
 - .7 Notify Departmental Representative 5 working days in advance of mock-up preparation.
 - .8 When accepted, mock-ups will demonstrate minimum standard for this work. Approved mock-up may remain as part of finished work.
- .3 Inspections:
- .1 Allow Departmental Representative access to Work in accordance with Section 01 45 00 – Quality Control.
 - .2 Give 5 working days notice requesting inspection of Work by Departmental Representative to confirm interventions.
 - .1 Schedule in situ review of wood window frames.
 - .2 Schedule shop review of sashes and related wood components, post glazing and paint removal, and simultaneously of hardware following cleaning.
 - .3 Layout materials in shop to allow review of all facets with limited manipulation.
 - .4 Group work to minimize the number of reviews.
 - .5 Use Database to record interventions.
 - .6 Inspections during and post repair to occur as part of mock-up reviews and during regular site visits.

1.07 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect windows from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

- .4 Packaging Waste Management: remove for reuse and return of pallets, crates, padding, and packaging materials in accordance with Section 01 00 10 – General Instruction, Waste Management.

PART 2 PRODUCTS

2.01 MATERIALS

- .1 Dimension lumber: to CAN/CSA-O141 and National Lumber Grades Authority (NLGA) requirements.
 - .1 Replacement parting beads and brick moulds, and new sash blocks.
 - .1 Use Douglas fir, grain orientation to match adjacent wood component.
 - .2 Grade: "C" select, quarter cut, free of holes, insect damage and defects.
 - .3 Moisture content: maximum 12%.
 - .2 Replacement sash stops.
 - .1 Use birch, grain orientation to match adjacent wood component.
 - .2 Grade: clear of knots or other imperfections, with straight grain to match existing.
 - .3 Moisture content: maximum 12%.
- .2 For dutchman repairs and replacement of individual components, wood for splicing and replications in accordance with Section 06 03 40 – Historic - Wood Repair.
- .3 For replacement sashes, wood for replications in accordance with Section 08 03 52.81 – Historic - Wood Window Replacement.
- .4 Fasteners:
 - .1 Exposed fasteners to be solid brass, select brass type to match the colour of parent brass components.
 - .2 Replacement screws where missing, for hardware: brass, slotted, round head or flat head to match original, size to suit application.
 - .3 New adjustable grommets with screws, for sash stops: brass, round head slot screws, to match original, size to suit application.
 - .4 Nails: brass or stainless steel 300 series finishing nails, size to suit application.
- .5 Glazing: in accordance with Section 08 03 80 – Historic - Glazing.
- .6 Hardware: to be solid brass, type to match the colour and thickness of original hardware.
 - .1 Replacements: sash lifts, lock sets, chains, pulleys and escutcheon plates, hinges; select models to match size and profile of original hardware.
 - .2 New custom meeting rail plates and angled plates for transoms; dimension and profile to suit application.
- .7 Weatherstripping:
 - .1 Sprung bronze, male-female interlocking, frame and sash kerf mounted as per existing.
 - .2 Compressible bead, extruded thermoplastic elastomer, kerf mounted barb with 7 mm outside dia. bulb head.

.3 Thick felt (for meeting rail plates).

.8 Sealants: in accordance with Section 07 92 00 – Joint Sealants.

.9 Finishes: in accordance with Section 09 03 91 – Historic - Painting.

2.02 FABRICATION

.1 Beads and mouldings on frame members specified as solid to be run in solid stock and not simulated with an applied moulding.

.2 Dry fit and assemble window components before completing fabrication.

.3 Fabricate units square and true.

.4 Tolerances for weatherstripping, to ensure effective and easy operation, to be determined during mock ups.

2.03 TOOLS

.1 Paraffin wax.

.2 Penetrating oil.

.3 Vinegar.

PART 3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation.

.1 Visually inspect substrate.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

.2 Preparation: remove storms, ceiling tiles and other obstacles directly related to windows work, store and reinstall as indicated in the windows schedule «Remarks». Protect removed items and immovable obstacles as required in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and Section 02 41 13 - Selective Site Demolition.

3.02 DISMANTLING

.1 Salvage window components for reuse in accordance with Section 02 41 13 – Selective Site Demolition. Protect and transport to an off site facility for shop work.

.2 Label salvaged components with gasket paper, mark with a waterproof marker, and securely attach to the component on a hidden surface. For smaller components such as hardware, place in a sealable plastic bag with label visible within the bag. Mark “Property of Government of Canada” on hidden surface of salvaged components removed from site.

.3 Remove perimeter caulking Section 07 92 00 – Joint Sealants.

.4 Remove stops, sashes, hardware and salvage for reuse. Remove and discard transom fall chains and associated hooks.

- .5 Remove and discard double-hung weatherstripping. Protect transom weatherstripping to remain in-situ; remove and discard deformed lengths.
- .6 Remove glazing and salvage for reuse in accordance with Section 08 03 80 – Historic - Glazing.
- .7 Cut out parting beads, to facilitate sash removal, and universally replace in sequence with sash installation. Beads at head may remain in-situ for restoration with frame related components.
- .8 Where components are let into a groove or mortise, such as beads and the leaves of butt hinges, neatly cut adjacent paint using a sharp chisel or knife to avoid tear out.
- .9 Unfasten stops and hardware, and clean fasteners in sequence with hardware restoration.
- .10 Clean the screw heads for removal. Apply penetrating oil 24 hours in advance of removal. Use screw drivers that fit the heads.
- .11 Remove existing sash supports, brackets and obsolete fasteners and discard. To remove nails, cut or pull nail through the back of component. Do not drive nail through face of component.
- .12 Once the sashes are removed for shop repair, fit the openings with weather tight closures in accordance with Section 01 56 00- Temporary Barriers and Enclosures.

3.03**RESTORATION OF FRAMES AND SASHES**

- .1 Repair frame and salvaged sashes with epoxy and/or dutchman repairs in accordance with Section 06 03 40 – Historic - Wood Repair.
- .2 Stabilize joinery of salvaged sashes. Drill holes in 2 of 4 joints, inject adhesive, and fill gaps with epoxy patch in accordance with Section 06 03 40 – Historic - Wood Repair.
- .3 Plug holes in frames and salvaged sashes from discarded hardware and weatherstripping, and from obsolete fasteners.
- .4 Prepare kerfs for weatherstripping and hardware.
- .5 Detach weight pocket covers and remove debris from the bottom of weight pockets to clean weight pocket cavities. Vacuum thoroughly.
- .6 Add or remove weight from pair of sash weights to achieve weight differential. Reinstall upper sash with counter weight and chains without adjustment.
 - .1 Weigh pair of sash weights, and weigh lower sashes.
 - .2 Ensure pair of sash weights is 0.9 kg lighter than each supported sash.
- .7 Restoration of salvaged hardware and screws.
 - .1 Cleaning: boil in vinegar with a double boiler to remove paint.
 - .2 Following paint removal, adjust hardware for correct function.
 - .3 Lubricate pulleys prior to re-installation.
- .8 Finish wood windows in accordance with Section 09 03 91 – Historic - Painting.
 - .1 Prime the outside faces of frames, and top and sides of weight pocket covers, beads, mouldings and sash stops.
- .9 Apply caulking to the exterior perimeter of frames in accordance with Section 07 92 00 – Joint Sealants.

3.04 REPLACEMENT

- .1 Universally replace removed parting beads.
- .2 Replace missing or damaged sash stops, head parting beads, and brick moulds. Assume 10% of each component type requires replacement.
- .3 Replace individual stile or rail as indicated in window schedule in accordance with Section 06 03 40 – Historic - Wood Repair.
- .4 Replace sashes as indicated in window schedule in accordance with Section 08 03 52.81 – Historic - Wood Window Replacement.
- .5 Replace glazing as indicated in window schedule in accordance with Section 08 03 80 – Historic - Glazing.
- .6 Replace hardware as indicated in window schedule; re-create sets using salvaged parts where possible. Additionally, assume 5% of upper double hung sash chains, 5% of pulleys, and 5% of escutcheon plates require replacement.
- .7 Universally replace lower sash and meeting rail weatherstripping.

3.05 INSTALLATION OF SASHES

- .1 Brace shop fabricated window components to maintain squareness and rigidity during shipment and installation.
- .2 Install sashes and associated trim namely restored weight pocket covers, new parting beads and restored sash stops.
- .3 Install hardware in accordance with instructions given on drawings, and hardware schedule.
- .4 Coordinate installation of lower sash with installation of weatherstripping and new meeting rail plates with felt.
- .5 Install interlocking type weatherstripping at lower sash. Fasten with nails provided by manufacturer. Install compressible bead weatherstripping at meeting rail.
- .6 Once the lower sashes are fitted against the weatherstripping, rub the edges of the stiles generously with paraffin wax.
- .7 Insure that lower sashes are operable their full height.
- .8 Secure transom and upper sashes using respectively exposed angled metal plates and wood blocks.
- .9 Secure existing brick mouldings and fasten replacements in kind.
- .10 Seal perimeter of upper and transom sashes from the interior in accordance with Section 07 92 00 – Joint Sealants.
- .11 Re-adjust windows and hardware just prior to completion of the work to function freely and properly.

3.06 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions, Cleaning.
 - .1 Leave Work area clean at end of each day.

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 – General Instructions, Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 00 10 – General Instructions, Waste Management.

3.07 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by window installation.

END OF SECTION